



FINAL PROJECT – TI 184833

**FEASIBILITY STUDY OF MUNICIPAL SOLID WASTE
MANAGEMENT SYSTEM (MSW-MS) IN SIDOARJO DISTRICT**

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INSTITUT TEKNOLOGI SEPULUH NOPEMBER
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APPROVAL SHEET

FEASIBILITY STUDY OF MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM (MSW-MS) IN SIDOARJO DISTRICT

FINAL PROJECT

Proposed to Fulfill the Requirement to Obtain
The Bachelor Degree of Engineering in
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Faculty of Industrial Technology and System Engineering
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Surabaya, August, 2020

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ABSTRACT

Sidoarjo Municipal Solid Waste Management System (MSW-MS) currently facing a problem to fulfill their needs of Municipal Solid Waste (MSW) processing, as the data shown by Dinas Lingkungan Hidup dan Kebersihan (DLHK) of Sidoarjo district stated that their service cover only 48% of Sidoarjo total area with the amount of potentially unmanaged MSW per day reach about 83% of it or equal to 1032 ton of MSW per day. In regards to this condition, there is a need to determine a new integrated approach of MSW-MS so that MSW in Sidoarjo district can be more properly managed to reduce its potential implied expense, gain potential benefits from it, and prevent potential negative impacts from improperly managed MSW. In this research, the implementation of proposed integrated MSW-MS will be carried out by a private business entity in collaboration with DLHK of Sidoarjo district in a Public Private Partnership (PPP) scheme represented in form of Business Plan Scenario (BPS). This research focused on determining the best BPS to be implemented in Sidoarjo district which targeted to optimize implied benefits from Sidoarjo District regional government perspective as its priority but still considering BPS feasibility to be implemented by related private business. This process is done by making a financial model according to the proposed BPS that are complemented with linear regression-based for its waste generation input variable and Benefit-Cost Analysis (BCA). Feasibility for each BPS implementation for private business entity perspective determined according to its financial valuation parameters value and Benefit Cost Ratio (BCR) for DLHK of Sidoarjo district perspective. The result of it is that BPS 1 and 3 considered feasible to be implemented according to its BCR value but it needs an adjustment in several private business parameter to ensure the feasibility of its implementation in terms of private business entity perspective. It is done using sensitivity and incremental analysis which resulted that WTE plant (BPS 1) is more beneficial to be implemented in Sidoarjo district with the maximum threshold of private business entity Availability Payment (AP) escalation rate adjustment until 73% and 105% for baseline and UUK condition respectively.

Key Words: Feasibility Study, Financial Modelling, Benefit Cost Analysis, Municipal Solid Waste Management System

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Surabaya, July 2020

Author

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LIST OF ABBREVIATIONS

AP	: Availability Payment
BCR	: Benefit Cost Ratio
BOT	: Build, Operate, Transfer
BOOT	: Build, Operate, Own, Transfer
BPS	: Business Plan Scenario
CAPEX	: Capital Expenditure
DLHK	: <i>Dinas Lingkungan Hidup dan Kebersihan</i>
DPP	: Discounted Payback Period
IRR	: Internal Rate of Return
MSW	: Municipal Solid Waste
MSW-MS	: Municipal Solid Waste Management System
NPV	: Net Present Value
OPEX	: Operational Expenditure
PP	: Payback Period
PPP	: Public Private Partnership
WTE	: Waste to Energy

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CHAPTER 1

INTRODUCTION

In chapter 1, there will be an information about the basic things related to the research done by the author including research background, problems formulation, objectives, benefits, scopes, and its report writing systematic.

1.1 Background

Municipal Solid Waste (MSW) is a subcategory of waste, specifically solid waste, that is included in the category of non-hazardous waste which produced through daily activities such as household garbage, product packaging, furniture, clothing, and else (United States Environment Protection Agency (EPA), 2018). In United States (US), MSW includes several different categories of waste which are paper and paperboard; glass; metal; plastic; paper, leather, and textiles; wood; yard trimmings; food waste; and others (United States Environmental Protection Agency (EPA), 2012). MSW also can be categorized into a simpler categories which are organic and non-organic as its categorization depends on the objective of doing so. As its name imply organic MSW consists of MSW types that can be decomposed naturally, such food waste and garden waste. Meanwhile, inorganic MSW consist of MSW types that cannot decomposed naturally such as paper, paperboard, glass, plastic, and rubber (Standar Nasional Indonesia (SNI), 2008). Therefore, whether people realize it or not, actually MSW cannot be separated from the majority of human daily life. Hence, it is pretty logical to think that its amount, in terms of volume and weight, must be huge as every human will produce MSW routinely throughout their life. To give a representation of how much waste human produced regularly, World Bank Group Urban Development Series report called What a Waste 2.0 stated that now the world generates 2.01 billion tonnes of MSW annually and expected to grow to 3.40 billion tonnes by 2050 (Kaza et al., 2018). This amount of MSW generation level is not good as it is brings several potential negative impacts if its left alone, as not all countries are able to manage their own MSW.

The potential negative impacts that can be caused by improperly managed MSW is a multidimensional problem which means that it includes several different aspects that interrelated to each other (Badan Pusat Statistik (BPS) Indonesia, 2018). The first one is its environmental potential impact through air, water, and land pollution. Improperly managed MSW that piled up over time may produce what known as leachate that may penetrates soil and pollute ground water. Moreover, it may also contributes to the greenhouse gas growth rate development as it also experience carbon release naturally, or even from an improper waste processing such as open incinerating. These environmental impacts correlate with the second potential negative impacts which is public health through becoming a potential infection medium of several infectious diseases such as diarrhea. In several developing countries, this kind of disease still considered as lethal disease as it still has a relatively high lethal rate that are caused by unsanitary environment. This impact also related to the third potential negative impacts which is in financial sector through budget dissipation if the MSW Management System (MSW-MS) is not properly implemented as well as environmental sustainability-related fine that can be implied from it if an environmental sustainability standard is proven to be violated. The fourth potential negative impact is spatial aspect through the implementation of controlled and open landfill waste processing method which needed a vast dedicated area to accommodate it. The negative impact lies on the opportunity cost of the area that is not utilized optimally as it only treated as a dump area that cannot be used for other financial purpose. Hence, it can be said that this aspect directly related to financial aspect as well. And last, there is a potential negative impact of social aspect through the unaesthetic MSW pile up and it may contributes to the emergence of slump area.

In regards to all of the potential negative impacts that may arise if improperly managed MSW is left alone, there is a need to determine the correct MSW-MS to prevent it from happening. In order to determine the correct MSW-MS to be implemented there is a need to know the important factors which influence MSW generation significantly. The importance of it lies on how effective the MSW will cope with the important factors which significantly influence MSW generation level. These factors including the level of consumption, population growth, and

economic activity (United States Environmental Protection Agency (EPA), 2018). It means that to build a proper MSW-MS, current condition of economic activity, level of consumption, and population growth of the region must be considered as well as the available resources to realize it. This is become the challenge for every country existed nowadays, including Indonesia.

Indonesia current condition of MSW-MS can be assessed by viewing the condition of MSW generation level important factors and compare it with the current condition of how MSW-MS being implemented in their country. Starting with the economic activity and level of consumption, Indonesia is listed as one of the tenth largest country in terms of its purchasing power parity. It is also supported by the market size available in Indonesia as Indonesia is the fourth most populated country in the world with population of approximately 267 million people in 2018 (World Bank Group, 2018). In accordance to this condition, it is logical to expect that with that huge amount of people living in there and with a sufficient purchasing power Indonesia is a potential waste generator. Hence, it is unsurprising that the expected MSW generation level of Indonesia reach a level of 150.000 tons of waste per day only in their urban area.

Because of that condition, Indonesia government apply several regulation of specific management system and standard for their MSW-MS to make sure their huge amount of waste can be managed properly in order to prevent any potential negative impacts from occurring. Those regulation including Undang-Undang Republik Indonesia Nomor 18 Tahun 2008 tentang Pengelolaan Sampah, Standar Nasional Indonesia (SNI) 3242:2008 tentang Pengelolaan Sampah di Pemukiman, and SNI 2454:2002 tentang Tata Cara Teknik Operasional Pengelolaan Sampah Perkotaan. Under these laws, MSW processing in Indonesia is standardized that follow several steps including containment and sorting, collection, processing, moving, and transporting as can be seen in Figure 1.1 for the general process and 1.2 for MSW-MS standard for settlements area. The first MSW containment and sorting activity can be done individually or communally, and in this regulation there is several list of standard need to be fulfilled such as the amount of rubbish bin according to MSW categories listed in SNI, which are organic and non-organic. The second activity is waste collection that is divided into four patterns which are

indirect-individual from door to door, direct-individual to public sanitary facilities, direct-communal for commercial area, and indirect-communal for densely populated settlement area. The third activity is waste processing which are done in sanitary facility or MSW-MS facility provided by Indonesia government. It has three main types which are Tempat Penampungan Sementara (TPS) for waste collection pooling point, Tempat Pengolahan Sampah Terpadu (TPST) for circular economy-based, composting, or incineration waste processing activities, and Tempat Pemrosesan Akhir (TPA) for controlled or open landfill process to residual waste. There are also an additional type of MSW-MS facilities known as Bank Sampah for circular economy dedicated waste processing activities; and Tempat Pengolahan Sampah berbasis prinsip Reduce, Reuse, Recycle (TPS3R) for 3R dedicated waste processing activities.

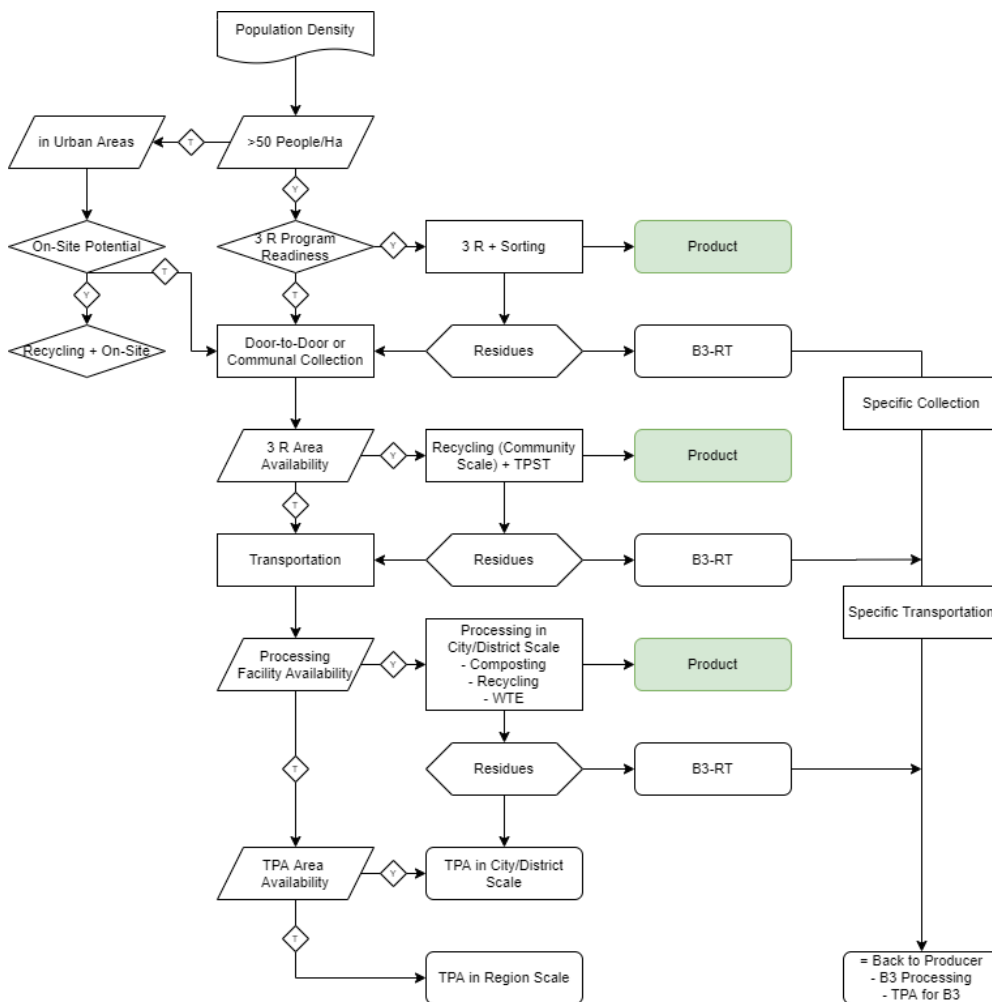


Figure 1.1 Flow Diagram of Waste Management Technical Operation (Source: SNI, 2008)

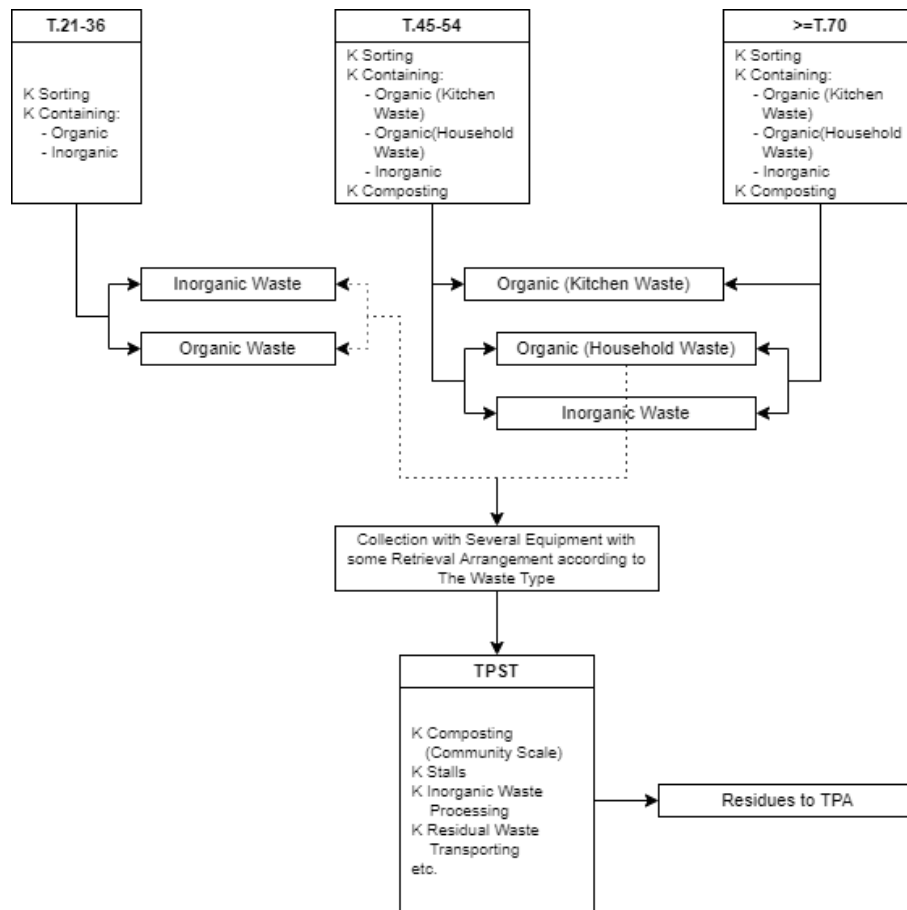


Figure 1.2 Waste Management Process Diagram
(Source: SNI, 2008)

But, the problem is Indonesia's current MSW-MS still being poorly implemented as approximately 40% of Indonesia's total population do not have access to basic waste collection services (Kaza et al., 2018). In a smaller scale, the same condition also occurred in one of Indonesia's district, which is Sidoarjo district. Before going further to the MSW-MS condition in Sidoarjo district there is a need to understand the background of MSW generation level important factors in there. In terms of population numbers and growth, Sidoarjo district is the fourth most populated city in East Java region with the total population of 2.262.440 people in 2019, also with the highest population growth rate in that region, which reach 1,53% in 2017 (Badan Pusat Statistik Provinsi Jawa Timur, 2018). Meanwhile, in terms of purchasing power parity and economic activity Sidoarjo is industrial secondary city that focus on manufacturing, trading, and retail sector

which contributes as much as 8.57% of the total East Java region Gross Regional Domestic Product (GRDP) and make Sidoarjo the second largest economic contributor in there (Badan Pusat Statistik (BPS) Indonesia, 2016). So it is also pretty reasonable to expect high level of MSW produced in Sidoarjo district.

To cope with the existing condition in Sidoarjo district, in terms of MSW important factors aspect, its MSW-MS is run by Dinas Lingkungan Hidup dan Kebersihan (DLHK) of Sidoarjo district. Their service area stretches as wide as 714.24 km² (Sistem Informasi Pengelolaan Sampah Nasional, 2018). But, the amount of service coverage area of the MSW-MS only reach 48% of it. This condition is not very ideal because Sidoarjo district has a waste generation level with the value of 1280 tons/day in 2017 and that can be potentially dangerous if it is not managed properly. The detailed composition of this MSW generation according to its material type can be seen through Figure 1.3. Actually in order to manage their MSW, DLHK of Sidoarjo district already prepared with an implementation of system and standard that are regulated by Indonesia government in form of waste collection and processing plant. It can be categorized into several different categories according to what Indonesia's regulation has stated including TPA facility called TPA Griyomulyo which categorized as medium-sized TPA facility with has 6 hectares area size with controlled landfill WMS operational system, 75 facilities of TPST located all over Sidoarjo, and 17 facilities of TPS located in four different sub-district settlements in Sidoarjo which are Krian, Taman, Waru, and Gedangan. Other than that, there are two other extended types of sanitary facilities which known as Bank Sampah and TPS3R. There are 10 facilities of Bank Sampah registered in Sidoarjo district, meanwhile among the 75 registered TPST 62 of them already implementing TPS3R approach.

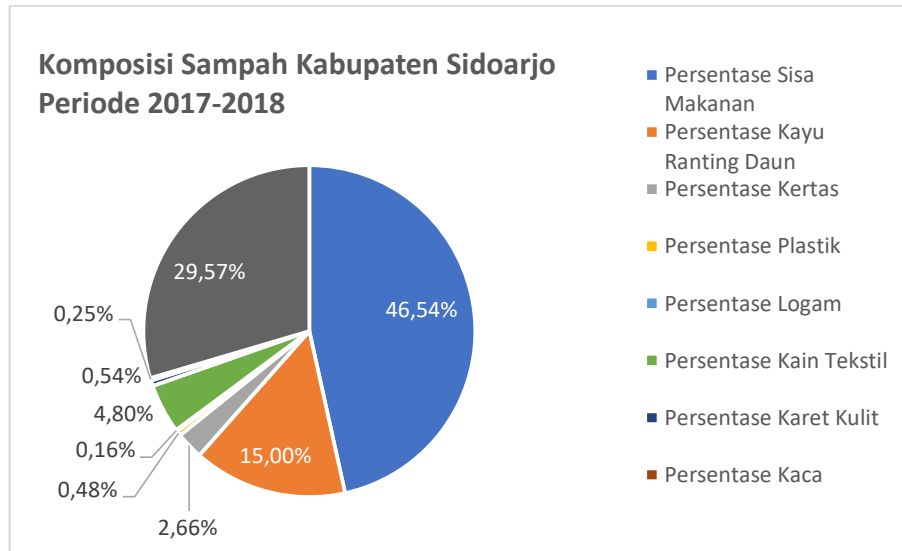


Figure 1.3 Sidoarjo District Solid Waste Composition in 2017-2018 Period (Source: sispn.menlhk.go.id)

But even so, the condition of Sidoarjo MSW-MS is far from being ideal. As can be seen from Sistem Informasi Pengolahan Sampah Nasional (SIPSN) data that from the total MSW generated in Sidoarjo district in 2017, which reach a level of 1280 tons/day that resulted both from Sidoarjo and out of Sidoarjo, only 24% of it can be processed using pre-determined standard which consists of composting, material recycling, creative industry recycling, fuel production, biogas, Bank Sampah, and others. Meanwhile, 45% of it which is equal to 575 ton of MSW managed using open landfill processing as they will be treated as residual TPA and transported to TPA. Moreover, 31% of it, which is equal to 395 ton of MSW per day, is still left unmanaged until now. The detail of the SIPSN data of MSW condition in Sidoarjo district can be seen through Table 1.1 (Sistem Informasi Pengelolaan Sampah Nasional, 2018). This condition also can be compared with DLHK of Sidoarjo district report in March 2020 which shows that in all of TPST located in Sidoarjo district the amount of waste processed in there currently only around 5%. Meanwhile, the rest 95% of it still left unmanaged and transported directly to TPA. The detailed data of it can be seen in Table 1.2.

Table 1.1 MSW-MS Condition in Sidoarjo in 2017

MSW-MS Condition	Parameters Value	Units	%
Service Coverage Area	714,24	km2	
%Served Area	48%	%	

MSW-MS Condition	Parameters Value	Units	%
Served Area	342,84	km2	
% Unserved Area	52%	%	
Unserved Area	371,40	km2	
Total Waste Generation per day (a+b)	1280	ton	
a. from Sidoarjo	1112	ton	87%
b. from out of Sidoarjo	168	ton	13%
Total Waste Processed per day	310	ton	24%
Residual Waste in TPA per day	575	ton	45%
Total Unmanaged Waste per day	395	ton	31%
Total Unmanaged Waste per day (only Sidoarjo)	227	ton	18%

(Source: SIPSN)

Table 1.2 DLHK of Sidoarjo District Report of MSW-MS (TPST) MSW Condition in March 2020

MSW-MS TPST Condition	March 2020, Week			
	1	2	3	4
MSW Input to TPST (ton)	312,78	310,14	311,37	301,20
Residual Waste (ton)	296,21	294,45	294,25	285,84
% MSW Output from TPST	94,70%	94,94%	94,50%	94,90%

(Source: DLHK of Sidoarjo District)

Regarding to this condition, DLHK of Sidoarjo district needs to reconsider their MSW-MS planning as if it goes by it is very possible that the unwanted negative impacts from unmanaged MSW may start to emerge. Hence, in order to resolve this problem, there is a need of an innovative approach to manage or even utilize this waste. This innovative approach must be designed to be able to accommodate the amount of MSW according to its estimated production level. Sidoarjo district regional government, as a part of their Smart City Development Program, planned to implement a new approach of MSW-MS in order to deal with this problem. The answer of this problem can be found by doing a benchmarking process with other countries in the world as already have been mentioned before that MSW problem is global problem that is faced by all of the country in the world.

Common MSW-MS approach that are implemented by many countries in the world done by considering several aspects including circular economy implementation to manifest sustainable development of their country growth which starting with conserving resource usage, protect human health and environment, and increase their economy through waste generation and management; waste prevention through implementing public sector measure of waste volume reduction by raising awareness and make a supportive regulation of lean, durable, and

repairable product usage, avoid short-lived item, focus on service, and using rather than own a goods. It aims to raise and emphasize public awareness of how important collective efforts is to achieve sustainability; waste recovery and disposal according to circular economy regulation by treating organic waste using mechanical and biological or thermal treatment before going to landfilling process, and treating inorganic waste processed further accordingly depends on its type that includes incineration, substitute fuel plant, bio-mechanical plant, and landfill; commercial waste recycling to fulfil the demand of commercial waste-based goods such wood, plastic, and else; and bio-waste processing using bio-chemical process to produce compost and digestate (Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, 2018).

As can be seen through the description in previous paragraph, basically MSW-MS commonly can be differentiated into three main aspects which are MSW volume reduction through implementing 3R concept in every level of its MSW-MS, organic waste processing using specific treatment to produce compost, and inorganic waste processing using circular economy approach. This MSW-MS also being implemented in Germany, and it is proven to be able to develop decreasing trend of MSW generation in there and also able stabilize it until 2015 (Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, 2018). This MSW-MS approach also gives an economic boost to the country that implemented it as it can gives both financial and non-financial benefits through its implementation. It also opens a new business and industrial sector that have a high potential for rapid development in the future.

Therefore through this research, the author intend to determine an innovative business plan scenario of MSW-MS approach that can be implemented in Sidoarjo district so that it can be the solution suggestion for the MSW problem that they currently faced. But, there is a limitation of the innovation according to the detailed standard of this particular MSW-MS approach that currently being implemented in Indonesia, which stated in SNI 2454:2002 tentang Tata Cara Teknik Operasional Pengelolaan Sampah Perkotaan, that differentiate it into several types including bio-gasification, composting, and fodder production for organic waste; and recycling, controlled incineration, and chopping and compacting for

inorganic waste. Moreover, there is also a need to determine all implied costs, in terms of investment and routine expense, that Sidoarjo district needs to consider before choosing the correct MSW-MS business plan scenario alternatives to be implemented. As they need to make sure that the benefits they may acquire from implementing it should be higher than the cost implied by it through a specific time horizon of feasibility planning. They also need to consider the current condition and its volatility so that the solution they want to implement is proven to be able to accommodate MSW condition in their district. Hence, through this research there will be a process of determining the best MSW-MS business plan scenario for Sidoarjo district.

1.2 Problems Formulation

According to the problem identification that already have been done before by the author, the formulated problem that will be the focus in this research is about how to determine the best Municipal Solid Waste Management System (MSW-MS) business plan scenario for Sidoarjo district according to feasibility study with consideration to financial and benefit-cost aspect.

1.3 Research Objectives

The objectives of this final project research are:

1. Propose an alternative(s) of MSW-MS in form of a business plan scenario for Sidoarjo district.
2. Conduct a feasibility study to the preferred MSW-MS business plan scenario alternative(s) in Sidoarjo district according to the implied benefit and cost for each of the alternative.
3. Determine best MSW-MS business plan scenario to be implemented in Sidoarjo district which targeted to optimize implied benefits from Sidoarjo District regional government perspective with considering business plan scenario feasibility to be implemented by related private business and also possible changes of observed factor(s) impact to financial parameters.

1.4 Research Benefits

The benefits of this final project research are differentiated into two types which are benefits for Sidoarjo district government, specifically for their Dinas Lingkungan Hidup dan Kebersihan (DLHK), and for the authors. The benefits for DLHK of Sidoarjo district are:

1. Propose a new way of MSW-MS that can be implemented by DLHK of Sidoarjo district in form of business plan scenario as an innovation to tackle solid waste problem currently faced by them.
2. Facilitates capital and operational expenditure cost calculation of proposed MSW-MS and or other waste utilization business plan scenario alternatives for DLHK of Sidoarjo district.
3. Facilitates decision making process on determining the best scenario of MSW-MS business plan to be implemented by DLHK of Sidoarjo district using feasibility study that already considers financial aspect using BCA approach.
4. Facilitates sensitivity analysis for the preferred alternative of MSW-MS business plan scenario to be implemented by DLHK of Sidoarjo district to know its feasibility boundaries according to observed factor(s).

The benefits for the author are:

1. As an opportunity for the author to hone his problem solving skill to come with an innovative and systematic way to solve a real case faced by DLHK of Sidoarjo district.
2. As an opportunity for the author to implement scenario analysis as the base to support decision making process using feasibility study with BCA approach.
3. As an opportunity for the author to implement sensitivity analysis to consider uncertainty of observed factor(s) in determining feasibility boundaries of selected alternative.

1.5 Research Scopes

The scopes of this final project research include several lists of limitations and assumptions used in this research.

1.5.1 Limitations

The limitations used in this final project research are:

1. The observed system and facilities of this research limited only to waste processing facilities existed in Sidoarjo district which include TPS, TPST, TPS3R, and TPA and other supporting resources listed in DLHK of Sidoarjo district report.
2. BCA aspects that will be considered in this research limited only to MSW-MS operational activities of DLHK of Sidoarjo district.
3. Location determination and space requirement calculation of new waste processing facilities proposed to be build is not included in this research.

1.5.2 Assumptions

The assumptions used in this final project research are:

1. There are no changes in external and internal policy related to Sidoarjo district MSW-MS during the period of this research.
2. Inflation rate projection used in the time horizon of financial modelling of this research assumed to be flat and follow Bank Indonesia inflation rate target in 2020 which is 3%.
3. Income and expense with no specific implied growth rate is assumed to have growth rate equal to inflation.
4. New waste processing facilities proposed to be build is made according to previous related research so that its capital expenditure will be used directly and it is assumed to be able to accommodate Sidoarjo district waste generation level and other conditions at given area in TPA Griyomulyo.

1.6 Report Writing Systematics

This research report systematics will briefly explain about each part of all six chapters included in this report.

CHAPTER 1 INTRODUCTION

In this chapter, there will be an information about the basic things related to the research done by the author including research background, problems formulation, objectives, benefits, scopes, and its report writing systematic.

CHAPTER 2 LITERATURE REVIEW

In this chapter, there will be an information about basic theories that will be used by the author as the reference for doing this research. These basic theories include solid waste, Waste Management System (WMS), waste-based industry business process, linear regression, Benefit Cost Analysis (BCA), financial modelling, and sensitivity analysis.

CHAPTER 3 RESEARCH METHODOLOGY

In this chapter, there will be an information about the steps that were done by the author in conducting this research including problems identification and formulation, data collection, data processing, data analysis and interpretation, and drawing conclusions and suggestions.

CHAPTER 4 DATA COLLECTION AND PROCESSING

In this chapter, there will be an information about data collection and processing steps that were done by the author in doing this research so that the objectives of this research can be fulfilled.

CHAPTER 5 DATA ANALYSIS AND INTERPRETATION

In this chapter, there will be an information about data analysis and interpretation processes that were done to the previously collected and processed data by the author in doing this research.

CHAPTER 6 CONCLUSIONS AND SUGGESTIONS

In this chapter, there will be an information about conclusions that can be drawn by the authors from this research according to pre-determined research objectives which already have been stated before and suggestions from the authors for improvement on further research development.

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CHAPTER 2

LITERATURE REVIEW

In chapter 2, there will be an information about basic theories that will be used by the author as the reference for doing this research.

2.1 Municipal Solid Waste (MSW)

Waste defined as any matter or objects that are already being unused and did not intended for sale or any added value activities and or anything declared as waste by an environment protection policy. They also further described that waste cab be considered as everything that is considered no longer have any value to offer so that it can be disposed (United States Environment Protection Agency (EPA), 2018). Hence, it can be concluded that the main point that make something can be considered as waste is its functionality value still remain or not. Waste can be categorized into three different types according to its form, which are solid, liquid, and gaseous waste. But, the type of waste that will be the focus in this report is only solid waste. As its name imply, according to EPA, solid waste includes all type of waste which basically have a solid form and or solid container resulted from human activities. In its practice, solid waste can be differentiated into two main categories according to its potential impact on environment and human health. EPA categorization of solid waste follows specific identification steps which represented in Figure 2.1.

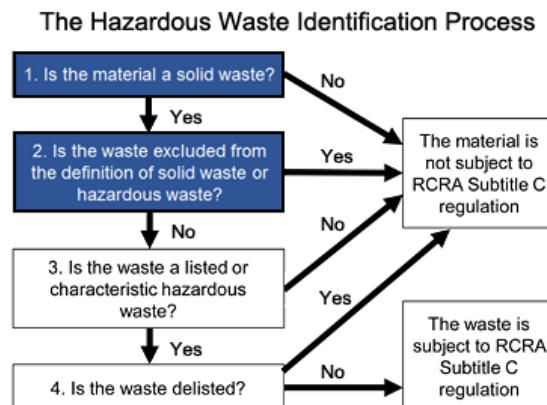


Figure 2.1 EPA Hazardous Waste Identification Process
(Source: epa.gov)

The result of EPA solid waste categorization can be seen below.

1. Hazardous Waste – is a type of waste that considered potentially dangerous for the environment and human health. EPA further divided hazardous waste into detailed subcategories, which are:
 - a. Listed Waste (F, K, P, U) are categories of hazardous waste that are already listed in Code of Federal Regulations (CFR) section 261 with the detail of F-list waste come from common manufacturing and or industrial process with non-specific sources, K-list waste come from source-specific industry and or manufacturing process, while P and U-list come from pure and unused chemical disposal.
 - b. Characteristic Waste is a category of hazardous waste that are have a dangerous properties as it is and may become a threat if it is not being treated properly. This type of waste have four different categories depend on the waste properties which are ignitability, corrosivity, reactivity, and toxicity.
 - c. Mixed Radiological and Hazardous Waste are the categories of hazardous waste which contain radioactive material which considered dangerous and may cause a threat if it is not being treated properly.
2. Non-hazardous Waste – is a type of waste that considered does not have or insignificantly give any dangerous impact for the environment and human health. EPA further divided non-hazardous waste into detailed subcategories, which are:
 - a. Municipal Solid Waste (MSW) is a category of non-hazardous waste which produced through daily activities such as household garbage, product packaging, furniture, clothing, and else. The common sources of this type of waste come from household, business, school, hospital, and many other common institution.
 - b. Industrial Solid Waste (ISW) is a category of non-hazardous waste which produced through routine industrial activities but it does not

considered to have any hazardous potential as it mainly come from general activities such as paper, plastic, appliances, and many more.

In United States (US), MSW includes several different categories of waste which are paper and paperboard; glass; metal; plastic; paper, leather, and textiles; wood; yard trimmings; food waste; and others (United States Environmental Protection Agency (EPA), 2012). MSW also can be categorized into a simpler categories which are organic and non-organic as its categorization depends on the objective of doing so. As its name imply organic MSW consists of MSW types that can be decomposed naturally, such food waste and garden waste. Meanwhile, inorganic MSW consist of MSW types that cannot decomposed naturally such as paper, paperboard, glass, plastic, and rubber (Standar Nasional Indonesia (SNI), 2008).

2.2 Waste Management System (WMS)

Waste Management System (WMS) is an effort to manage waste by form of reuse, recycling, storage, treatment, and or disposal activities. (United States Environmental Protection Agency (EPA), 2018). Meanwhile in terms of solid WMS, it's range of activities include waste generation, reuse, recycling, composting, Waste-to-Energy (WTE) conversion, and landfilling which aim to reduce the amount of generated waste as it is a part to minimize and or prevent waste's potential negative impact for human life and environment (Seo, 2013). In this part of the report, there will be several information of different WMS that are currently being implemented by several countries and or any other relevant institutions.

2.2.1 Indonesia Waste Management System

Indonesia WMS currently regulated in several regulations such as Undang-Undang (UU) No. 18 Tahun 2008 tentang Pengelolaan Sampah, Standar Nasional Indonesia (SNI) 3242:2008 tentang Pengelolaan Sampah di Permukiman, and SNI 19-2454-2002 tentang Tata Cara Teknik Operasional Pengelolaan Sampah Perkotaan. The important point of all of those regulations are it ensure that the waste management process done in all over Indonesia follow specified Standard

Operating Procedure (SOP) that represented through Figure 1.1 and 1.2 that already shows in previous chapter of this report. The important information from Figure 1.1 and 1.2 is it regulates operational flow of Indonesia waste management which consist of:

1. Waste containment (individual and communal).
2. Number of waste container requirement.
3. Waste management and regulation in settlement and non-settlement area.
4. Waste collection method (indirect individual, direct individual, direct communal, and indirect communal).
5. Waste sorting and processing in Tempat Penampungan Sementara (TPS) and Tempat Pengolahan Sampah Terpadu (TPST) (composting process for organic waste, recycling process for inorganic waste, manage hazardous waste according to specified regulation, and contain residual waste for further process).
6. Waste utilization for economic purpose (specifically for economically valuable waste such as paper, glass, and plastic) and selling it to a pre-determined dealer.
7. Residual waste collection in container.
8. Residual waste transportation in Tempat Pembuangan Akhir (TPA).

2.2.2 South Korea Integrated Solid Waste Management System

South Korea Integrated Solid WMS include several range of activities starting from waste generation, reuse, recycling, composting, WTE conversion, and landfilling (Seo, 2013). Its implementation follows a specified hierarchy of waste management that can be seen through Figure 2.2.

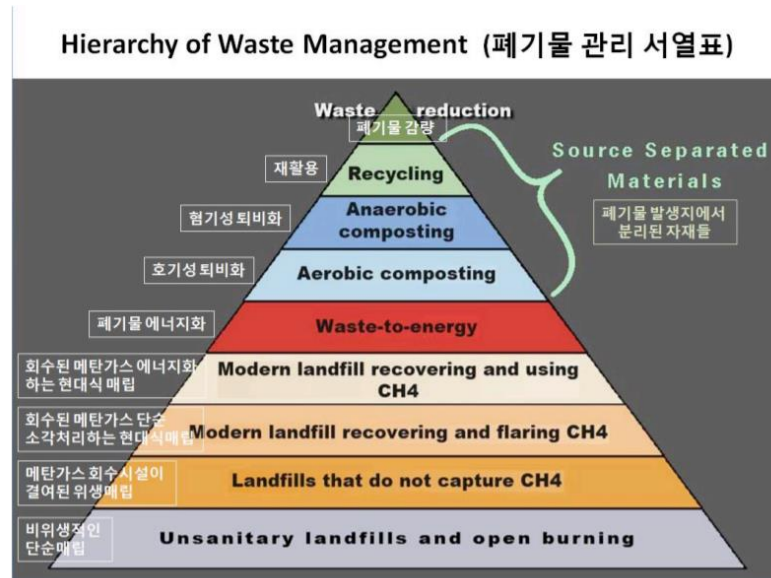


Figure 2.2 South Korea Hierarchy of Waste Management
(Source: Seo, 2013)

The activities included in South Korea Hierarchy of Waste management are:

1. Waste reduction and prevention of several waste source's that potentially can be reduced such as the use of packaging, food leftovers, disposable item, and short-life product. This process aims to reduce resources allocation for handling 'unnecessary' waste in terms of volume as actually it can be reduced to a minimum level. It is done through implementing supportive government regulation which encouraging South Korea people to participate in it.
2. Recycling as a recovery, reprocess, and or reuse processes of several recyclable materials such as plastic, metal, glass, and paper. It is done through waste collection process from curb side, waste drop-off centre, and or waste deposit or refund program then will be transporter further to a processing facility. The processes done in this facility include sorting, cleaning, and forming into a more manufacture-able form.
3. Aerobic composting and anaerobic digestion for material which consist a rich composition suitable for fertilizer such as food leftovers. Moreover, anaerobic digestion can also be done by using landfill method and let the materials produce methane that will be further utilized as an energy source. Anaerobic digestion commonly take place

in a waste processing facility such as landfill. Meanwhile, aerobic composting may take place in a household as South Korea government encourage their people to do it in order to minimize the space they need to preserve for conducting this process.

4. Waste-to-Energy (WTE) done by incineration process of waste before it goes to landfill process which aim to produce an additional energy (electricity) which also can act as a recovered energy and at the same time reducing waste volume to be processed using landfill method. It is done in an MSW combustion facility.
5. Landfilling is the last preferable method of waste management in South Korea as basically it leaves waste leftovers that cannot be processed and or prevented in a dedicated space and will be covered periodically using clay, ash, or soil to minimize its odour and prevent vermin outbreak. Landfilling system includes two main supporting system which are liner system and drains which both aim to prevent groundwater and any other potential environment pollution that may be caused by landfilling.

The operational flow chart of South Korea hierarchy of waste management can be seen through Figure 2.3.

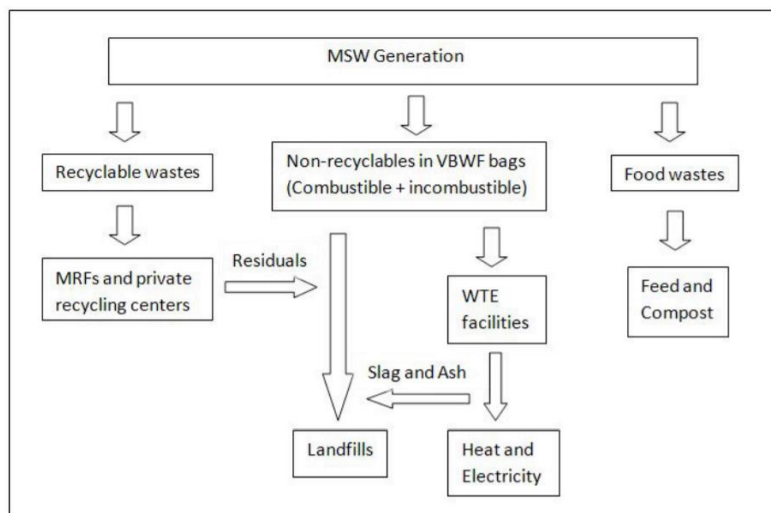


Figure 2.3 MSW Flow System in South Korea
(Source: Seo, 2013)

The trend that occurred all over the world which is by shifting waste management concept that previously only focus on managing waste as it is into waste utilization that also consider how to deal with waste at its source and how to utilize waste to gain a potential benefits also happening in South Korea. In South Korea starting from 1995-2009 there is a trend of minimizing landfilling process and emphasize more on WTE process through waste incineration and recycling and composting process as can be seen in Figure 2.4.

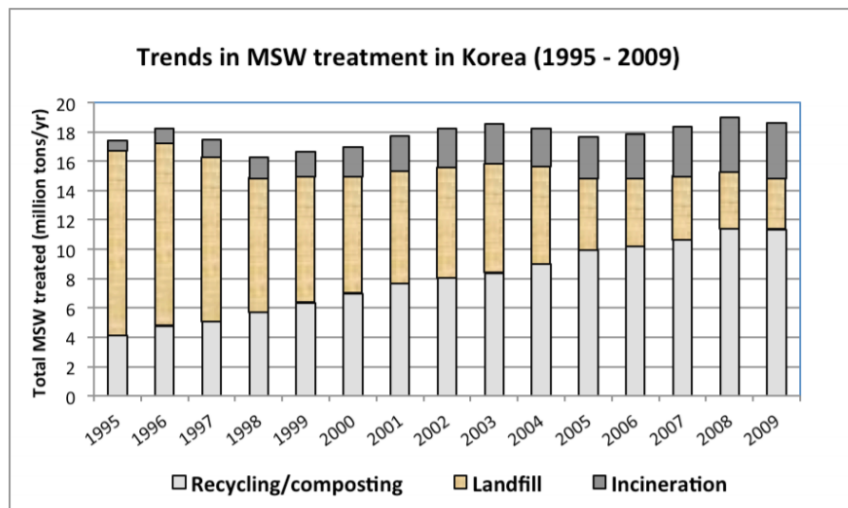


Figure 2.4 Trends in MSW Management in South Korea
(Source: Seo, 2013)

Besides the routine operation of WMS that are already explained before, South Korea also has several waste management policy to ensure their goals to achieve a sustainable development can be manifested. This policies including:

1. Waste Deposit Refund System (DRS) have been enforced starting from 1991 that requires manufacturers of a certain products to pay a deposit fee and after they already certainly fulfilled waste treatment regulation and procedure the government will pay back their deposit in form of a reimbursement. The targeted product and its rates per unit can be seen in Table 2.1.

Table 2.1 Target Items and Prices by DRS

Categories	Items	Rates per unit (USD)
Beverage containers	Tetra paks	0.0003 – 0.0005
	Aluminum cans	0.003 – 0.005
	Glass bottles	0.002 – 0.004
	PET bottles	0.004 – 0.009
Batteries	Mercury batteries	0.125
	Oxidized silver batteries	0.063
Tires	Large size	0.5
	Medium to small size	0.125
	Bicycle tires	0.05
Lubricating oil	Lubricating oil	0.025 per liter
Bulky electronics	TV, Washer, Air conditioners, etc.	0.038 per kg

(Source: Seo, 2013)

2. Act on the Promotion of Saving and Recycling of Resources since have been enforced since 1992. It acts as the base for waste reduction and recycling activities in South Korea. Through this act, South Korea government encourage business owners to reduce unnecessary packaging materials, use recyclable and other environment friendly material, replace disposable material with reusable one, and prohibit free plastic bag providing.
3. Volume-Based Waste Fee (VBWF) system have been enforced since 1995. It is a regulation that obliged South Korea citizen to pay their waste tax according to their own waste volume generation and also they need to buy a VBWF bag. This regulation aims to gain a more fair revenue stream for government and also to encourage South Korea citizen to reduce their waste generation volume. The regulation also set the category of MSW and how they should be managed as can be seen in Table 2.2.

Table 2.2 MSW Generation and Management in South Korea

Source		Type	Use of VBWF bag	Cost at the source	Note
Households and small commercial sector	Urban Area	Household waste	Yes	Yes	Separate collection
		Recyclable waste	No	No	Separate collection
		Food waste	Yes/ No (when collected in designated food waste bins)	Yes	Separate collection
	Bulky waste (Furniture, electric home appliance such as refrigerator, air conditioner, etc.)	No	Yes	Separate collection with a sticker purchased at a local government office	
	Rural village (farming/fishing)	Agricultural waste	No	Yes	Use of village's communal VBWF bag
Large commercial sector/small business		MSW type	No	Yes	Wastes volume larger than 0.3 ton/day are not subject to the VBWF system

(Source: Seo, 2013)

This regulation also set the average price level of each size of VBWF bag that South Korea citizen should buy as their waste container as can be seen in Table 2.3.

Table 2.3 VBWF Bag Average Price Level in South Korea

Size (liter)	2006	2007	2008	2009	2010
3L	0.07	0.06	0.06	0.07	0.06
5L	0.09	0.11	0.11	0.11	0.11
10L	0.18	0.21	0.21	0.21	0.21
20L	0.36	0.41	0.42	0.42	0.42
30L	0.60	0.58	0.57	0.58	0.58
50L	0.89	1.02	1.04	1.04	1.04
75L	1.57	1.51	1.44	1.53	1.52
100L	1.84	2.04	2.09	2.10	2.10

(Source: Seo, 2013)

The composition of MSW disposed in VBWF in South Korea on 2009 can be seen in Figure 2.5.

Composition of MSW disposed in VBWF Bag (2009)

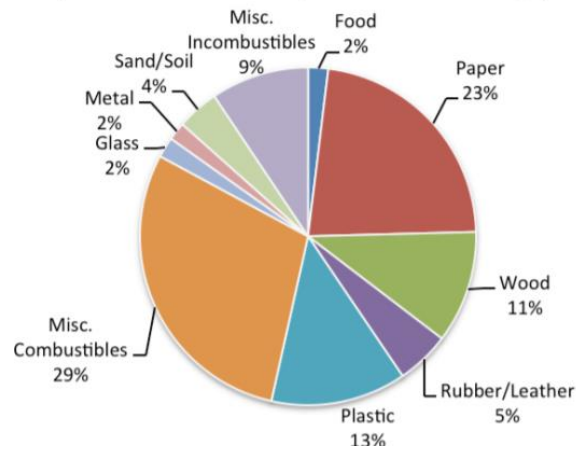


Figure 2.5 Composition of MSW Disposed in VBWF Bag in South Korea (Source: Seo, 2013)

- Extended Producer Responsibility (EPR) Initiatives have been enforced starting from 2003. It encourage the concept of responsibility of every producer for their product in all of its life-cycle phase. This policy leads to a further development of product development approach that become more sustainable-minded starting since then. The example of EPR requirements shown through Table 2.4.

Table 2.4 EPR Producer Requirements

Existing items for deposit (DRS)	Products	Electric home appliances (TVs, washers, air conditioners, refrigerators, tires, lubricants, fluorescent lights, batteries, etc.)
	Packaging materials	Tetra paks, aluminum cans, glass bottles, PET bottles (from food and beverage products, liquors, cosmetics, detergents, some medical and pharmaceutical products)
Newly adopted items (EPR)	Products	Mobile phones, audio equipments, computers
	Packaging materials	Plastic packaging materials (from Food and beverage products, medical and pharmaceutical products, liquors, detergents, cosmetics, etc.) Foamy synthetic resin buffers (from electric & electronic equipments)

(Source: Seo, 2013)

- Mandatory Food Waste Separation have been enforced starting from 2006. Through this policy South Korea government provide a food leftovers (waste) collection facilities that are able to process the leftovers into fertilizers or animal feeds. Moreover, starting from the late 1990s South Korea government already starting a campaign to reduce food waste volume.

2.2.3 Bangladesh Municipal Solid Waste (MSW) Management System

Bangladesh MSW Management System (MSWMS) responsible for managing approximately 7500 tons of MWS daily only from their six major cities with a total population over 17.5 million people. (Ahsan, 2014). Bangladesh MSWMS consists of two major department which are conservancy and engineering department. The range of activities it covers are solid waste management starting from waste collection and transfer also its related utility services which are done by conservancy department; and operation and maintenance services in their waste management cycle which are done by engineering department. The condition of MSW in Bangladesh can be seen through Table 2.5 and 2.6.

Table 2.5 Basic MSW Information of Bangladesh Six Major Cities

City corporation	City area (sq. km)	Population (million)	Number of Wards	Wastes generation rate (kg/cap/day)	Total generation (tons/day)	Ultimate disposal site
Dhaka	360	11.00	90	0.40–0.55	5000–5500	2
Chittagong	156	3.65	45	0.30–0.45	1200–1400	2
Khulna	47	1.50	31	0.30–0.40	420–520	1
Rajshahi	48	0.45	30	0.25–0.35	160–210	1
Barisal	45	0.40	30	0.20–0.25	100–140	1
Sylhet	26.5	0.50	27	0.35–0.45	200–240	1

(Source: Ahsan, 2014)

Table 2.6 MSW Transportation Facilities and Responsibilities of Bangladesh Six Major Cities

City	Number of motorized vehicles	Amount collected, transported, and dumped (tons/day)
Dhaka	373	2000–2400
Chittagong	49	500–550
Khulna	32	240–260
Rajshahi	15	60–80
Barisal	7	30–40
Sylhet	17	60–80

(Source: Ahsan, 2014)

In its implementation, Bangladesh MSWMS has an organization chart that represents their responsibilities setup internally as can be seen in Figure 2.6.

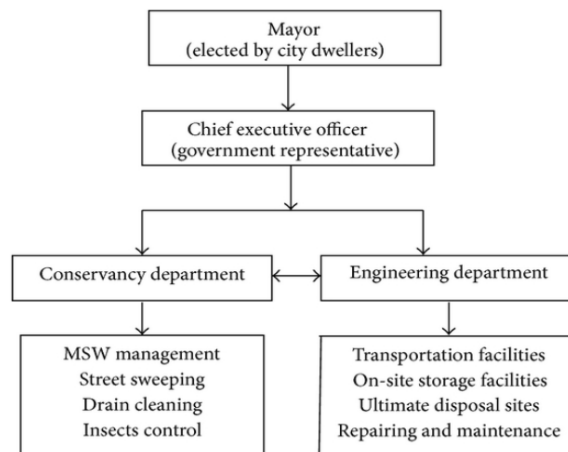


Figure 2.6 Bangladesh MSWMS Organization Chart
(Source: Ahsan, 2014)

In its implementation, MSWMS operational flowchart consist of several processes including:

1. Source storage and waste collection in Bangladesh initially designed to run in a door-to-door basis by means of the sanitary workers are obliged to take MSW from each of citizen's address periodically using garbage truck and container. Other than that, in here there is a recycling process step called source separation. Source separation separate MSW according to its economic value and sell to street 'hawkers' or broker. These brokers then will sell the accumulated valuable WMS to recycling shops called "Vangari Dokans." But in its implementation there are still a flaw in this system because not all Bangladesh's citizen can afford to have a proper waste container so that they often make an 'unofficial' waste containment space and they need to take their garbage there on their own. Hence, there is still too much uncertainties in the existing system of MSWMS in terms of source storage and waste collection. Therefore, in its operational activities this process involve several Non-Governmental Organization (NGO).
2. On-site storage consists of Secondary Disposal Sites (SDS), transfer station, and handover point facilities. But in its implementation all of those facilities are just an open space that is dedicated to accumulate MSW from several different waste collection areas. On-site storage acts

as a transit point before the accumulated MSW picked up by a larger dump truck and transported to the ultimate disposal sites. Other than that, in here there is a recycling process step called scavenger's collection in on-site storage. These scavengers collect residual valuable goods that are still contained in on-site storage and then sell it on their own. The problem faced by Bangladesh nowadays are this on-site storage already gives a negative impact aesthetically and if it left alone like that over time it will steadily get wider and take up more space which can be very costly for the government and potentially dangerous for local citizen's health and environment.

3. Waste transportation activities done using several transportation modes including dump truck, normal truck, open truck, tractor with trolley, tipping truck, desledging vacuum tanker tractor, and power tiller that are used according to the type and condition of waste collection area. The transportation process done by picking up accumulated MSW in SDS using those transportation modes and then it will be taken to ultimate disposal sites for further processing.
4. Ultimate Disposal Sites (UDS) is where all the waste processing activities of Bangladesh MSWMS takes place. The major part of it consists of landfilling process of the residual waste. But besides that there are still recycling and composting process which are done in UDS. The recycling process in here is also done by scavengers who hunt a residual valuable item in UDS. While, composting process is done by involving NGO to support its operational process. But in its implementation there are several problems in UDS such as potential threat to worker's health as they do not want to follow health and safety procedure while in work, not to mention financial, technology, proper location, and many other problems.

The representation of Bangladesh MSWMS flowchart can be seen through Figure 2.7.

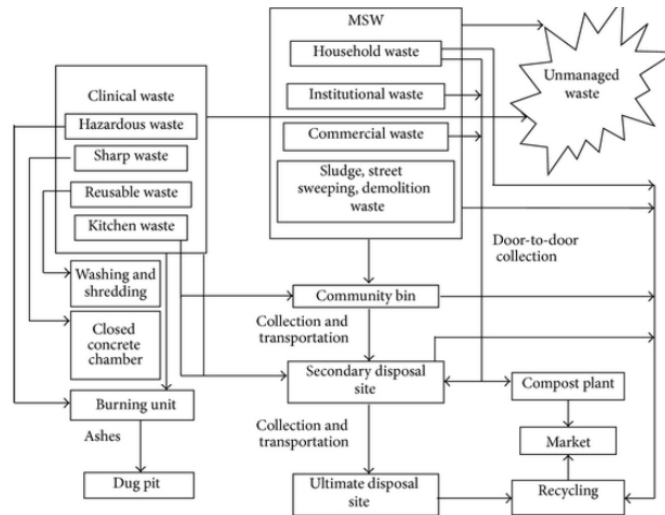


Figure 2.7 Bangladesh MSWMS Flowchart
(Source: Ahsan, 2014)

2.2.4 Germany Waste Management System

Because of the limitation of space for landfilling purpose and any other waste management method, Germany WMS already implement circular economy approach since the 1990s (Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, 2018). Hence, their point of view of WMS already has been changed since then, as they are considered waste can be treated as a resource ever since. The trend of waste generation in Germany steadily decreasing and tend to stabilize until 2015 as can be seen in Figure 2.8.

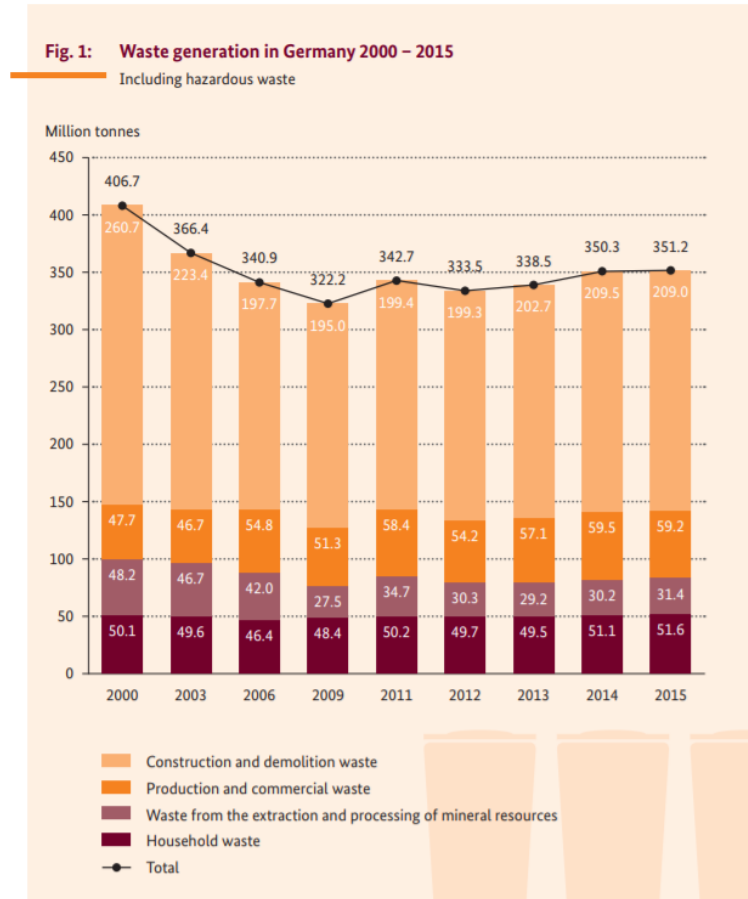


Figure 2.8 Waste Generation in Germany from 2000-2015
(Source: Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, 2018)

In its implementation, Germany WMS follows a basic principles of waste hierarchy according to their law and European Union law as can be seen in Figure 2.9.

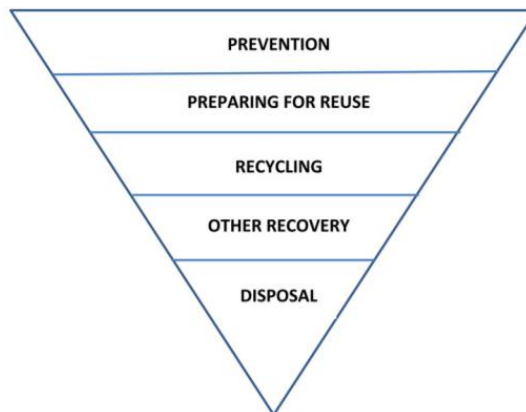


Figure 2.9 Waste Hierarchy of Germany and European Union Law
(Source: Nelles, 2016)

There are several important points in the development of Germany WMS, which are:

1. Germany modern circular economy development which develop rapidly since the enforcement of Circular Economy Act on 1 June 2012. Through this policy Germany government enforce circular economy implementation into national law to give a guideline on its basis and fundamental principles. This process aims to manifest sustainable development of their country growth which starting with conserving resource usage, protect human health and environment, and increase their economy through waste generation and management.
2. Waste prevention through implementing public sector measure of waste volume reduction program starting from 2013 in collaboration with Federal States. Its implementation is mainly by raising awareness and make a supportive regulation of lean, durable, and repairable product usage; avoid short-lived item; focus on service; and using rather than own a goods. It aims to raise and emphasize public awareness of how important collective efforts is to achieve sustainability.
3. Recovery and disposal activities which are done according to circular economy and five-tier waste hierarchy Germany implements (Nelles, Grunes, & Morscheck, 2016). It means that waste recovery and disposal are done to wastes that cannot be prevented and must be managed safely according to Germany and EU regulation. For example, organic waste must be processed through mechanical and biological or thermal treatment before going to landfilling process. Meanwhile inorganic waste can be processed further accordingly depends on its type. The available methods are incineration (68 facilities with 20 million tonnes annual capacity), substitute fuel plant (32 facilities with 5 million tonnes annual capacity), 45 bio-mechanical plant (45 facilities with 4.5 million tonnes annual capacity), and 0.5 million tonnes annual capacity of landfill.

4. Commercial waste is treated through sorting it and then it will undergo recycling process. For the one that still included in mixed MSW need to undergo pre-treatment before being recycled. Hence, this commercial waste will be used as a raw material to fulfil the demand of commercial waste-based goods such wood, plastic, and else. Meanwhile, graphic or used paper also undergo the same process become the responsibilities of a coalition of paper manufacturing industry in Germany called AGRAPA with an approximate annual recycling rate around 80%. And last, packaging waste also treated specially as it already must be separated at source and will be recycled as well; its annual recycling rate approximately at 97% level.
5. Bio-waste in Germany mainly consists of bio-degradable waste from agriculture and forestry, landscaping, and private household. This type of waste mainly being treated using bio-chemical process to produce compost and digestate. There are 868 composting facilities and 1392 digestion plants that can produce up to 4 million tonnes of compost and fermentation substrate from around 7 million tonnes of bio-waste annually.

2.3 Waste Industry Business Process

Waste Industry or waste-based business process is a business which implement concept of using waste as an input to be processed further so that it can used to produce expected output. In this part of the report there will be an information of several alternatives of waste-based business process.

2.3.1 Waste-to-Energy (WTE) Business Process

Waste-to-Energy (WTE) is an approach to utilize unrecyclable waste to produce an equivalent energy recovery units using a combination of mechanical, biological, and chemical process (Seo, 2013). In this part of the report there will be an information about how WTE can be approach using business process point of view. There are several alternatives of WTE technologies that possible to be implemented as can be seen in Figure 2.10 (Gumisiriza et al., 2017).

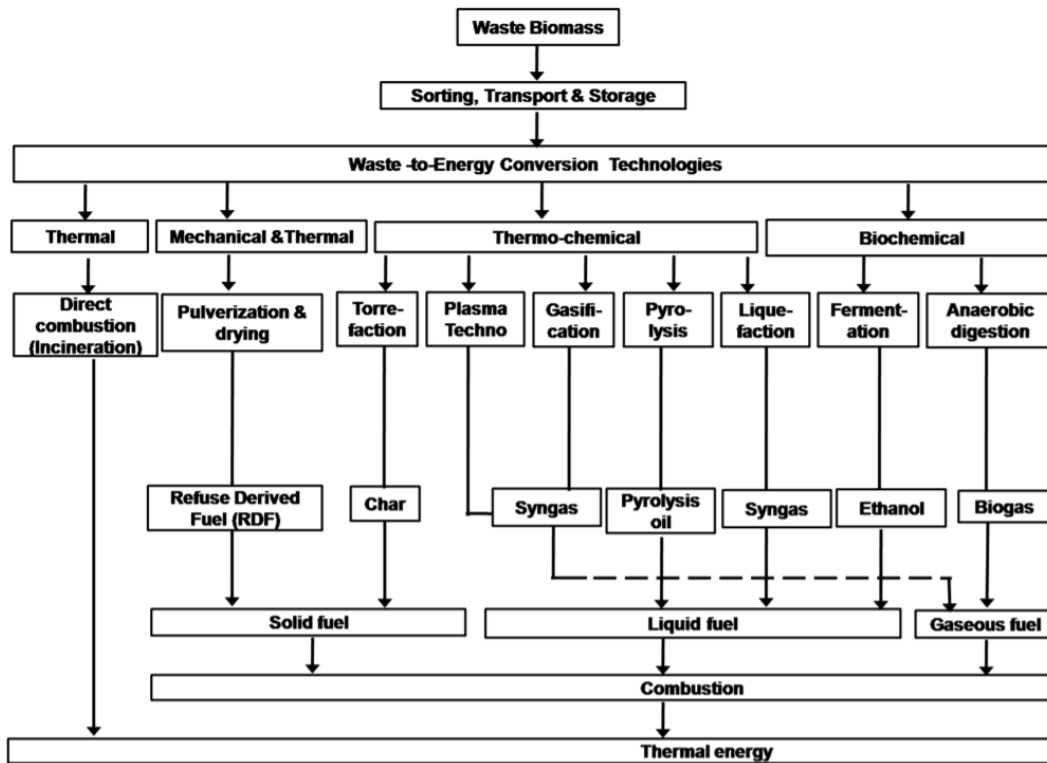


Figure 2.10 WTE Technology Alternatives
(Source: Gumisiriza et al., 2017)

The basic input-process-output diagram of WTE plant is represented through Figure 2.11 (Margallo, et al., 2014).

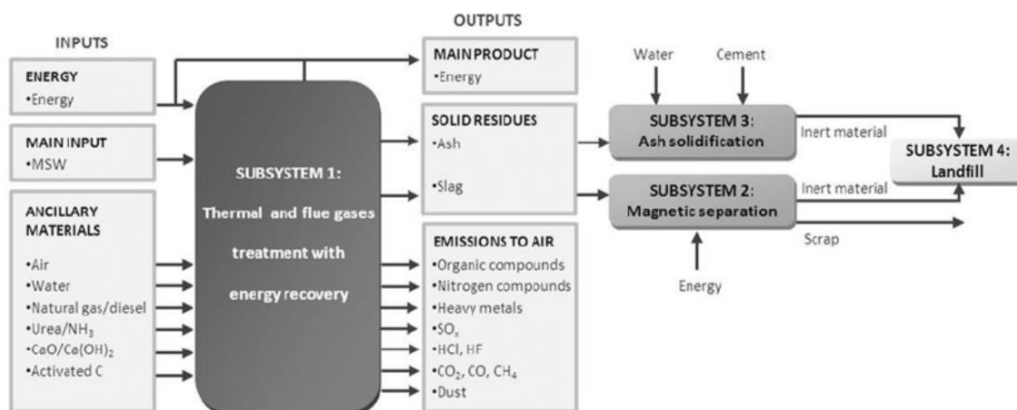


Figure 2.11 WTE Incineration Process Flow Diagram
(Source: Margallo, et al., 2014)

2.3.1.1 WTE Business Plan

In this part of the report there will be an information of WTE business plan implementation using direct combustion (incineration) approach that are planned to be built in Denpasar, Bali (JFE Engineering Corporation Clean Authority of Tokyo, 2017). This feasibility study is done by making a comprehensive analysis of the targeted location relevant information to WTE business process such as demand of energy in Bali, Bali MSW generation rate, expected population growth, economic growth and many more. The available alternatives of incinerator method for this case can be seen in Figure 2.12.

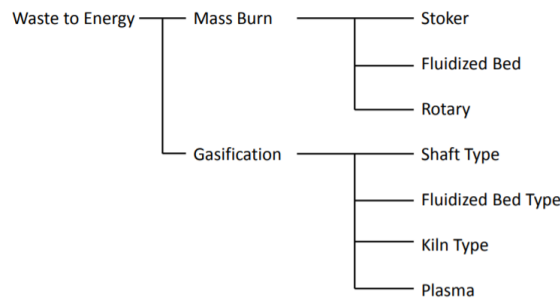


Figure 2.12 Incineration Method Alternatives
(Source: JFE Engineering Corporation Clean Authority of Tokyo, 2017)

The implementation of incineration method alternative should consider several important points which are total construction and operation costs, stability, residue volume, environmental load, and implementation result according to the designated location of planned WTE. From there it is identified that in this case the proper incineration method to be implemented in WTA in Bali is stoker mass burn plant as can be seen to the result seen in Table 2.7.

Table 2.7 Summary of Comparison of Various Incineration Methods

	Mass Burn		Gasification	
	Stoker	Fluidized Bed	Stoker	Fluidized Bed
Expenditure	A	B	C	D
Stability	A	C	A	D
Residue Ratio	B	B	A	A
Environmental Load	A	B	C	C
Records	A	B	C	D

Evaluation index: A:Excellent, B:Good, C:Acceptable, D:Not Acceptable
(Source: JFE Engineering Corporation Clean Authority of Tokyo, 2017)

2.3.1.2 WTE in South Korea

South Korea already beginning to develop their WTE facilities starting from 1985 as at that time they already build their incineration facilities. But, their WTE facilities actively involved in energy recovery generation in form of heat and or electricity starting from 2010. Out of 177 available incinerators plant in South Korea, only 35 of them capable of being used as WTE plant. The capacity of it reach the level of 3.1 million tons of waste incineration which are equal to 90% of the total amount of waste incineration in South Korea. Here are the detailed information of it.

1. Total WTE capacity: 12,380 tons/day
2. Total waste incinerated in 2010: 3,081,477 tons
3. Korean standard for dioxin emission as of 2010: 0.1ngTEQ/Nm³ while
Average dioxin emission of all WTE: 0.005 ngTEQ/Nm³ 2010
4. Dioxin emissions of all Korean WTE plants, grams TEQ: 0.08gTEQ

The distribution of South Korea incineration and WTE facilities can be seen through Figure 2.13.

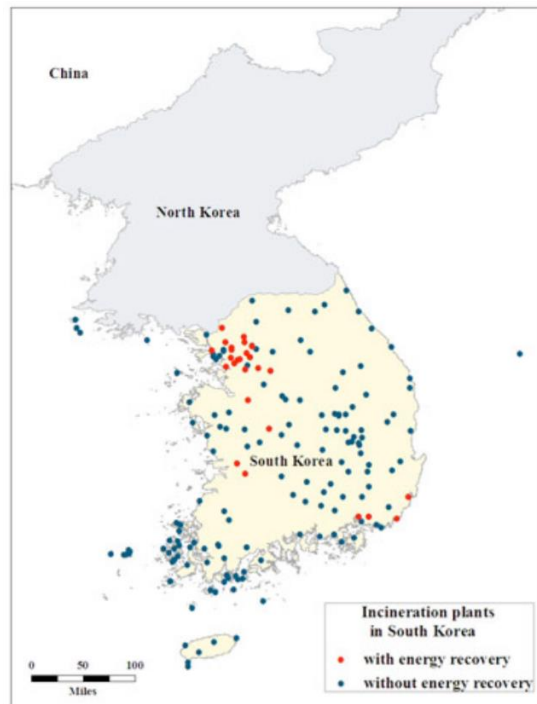


Figure 2.13 South Korea Incineration and WTE Facilities
(Source: Seo, 2013)

Energy recovery generation resulted from 35 WTE plants in South Korea resulted to a 4,503,520 MWh in form of district heating and electricity to grid. The amount of waste received by all of the WTE plants in a year reach a level of 3,072,157 tonnes; which means that each ton of waste can approximately produce 1.47 MWh equivalent energy units. In the other hand as already have been said before this WTE plant implement incineration process to convert MSW into energy, and in South Korea the amount of thermal energy input to manifest this process is 8,293,333 MWh; which means that currently energy recovery percentage of South Korea WTE facilities reach a level of 54.30%. It means that by implementing WTE method at this level South Korea can already cut their expenditure for energy generation that is dedicated as waste management purpose by more than a half annually. The detailed information of it can be seen through Table 2.8.

Table 2.8 Energy Generation and Usage in 35 WTE Facilities of South Korea

WTE plants	Waste Received (ton/y)	Thermal Energy Input (MWh)	In-plant electricity and heat use/loss (MWh)	District heating (MWh)	Electricity to grid (MWh)
Kangnam	264,035	771,667	179,722	591,944	0
Mapo	202,134	617,222	159,722	448,611	1,007
Nowon	161,915	316,111	48,611	267,500	0
Suwon	159,172	389,167	105,833	283,333	0
Songdo	137,152	391,389	173,611	217,778	0
Seongnam	132,385	401,944	138,056	264,167	0
Seongseo	127,819	283,333	76,389	164,167	109
Cheongna	123,887	311,944	96,111	49,444	1,193
Yangcheon	109,972	322,222	95,556	213,889	1,479
Ulsan	107,231	266,111	51,111	100,556	776
Haeoonda	104,282	209,722	71,111	120,833	1,425
Myungji	103,931	298,056	124,167	170,000	121
Daejeon	103,181	280,833	89,722	191,111	0
Changwon	98,362	310,833	131,111	76,944	514
Jeonju	87,161	275,556	41,111	8,611	12,518
Icheon	85,827	244,444	156,944	51,667	23,307
Sangmu	84,723	190,000	26,944	46,389	1,256
Gwangmyeong	80,162	179,722	20,000	159,722	0
Daejang	71,664	225,000	66,111	157,778	0
Yongin	68,733	163,333	31,944	18,889	1,946
Goyang	67,073	189,722	62,778	126,944	890
Iksan	62,673	207,222	47,500	18,056	6,468
Cheonan	57,832	147,500	26,389	121,111	0
Ansan	54,768	175,278	90,556	84,722	0
Anyang	51,695	136,667	20,556	116,389	0
Sanbuk	48,329	118,611	48,889	556	0

Uijeongbu	47,889	125,278	46,944	2,778	365
Gimhae	46,579	147,500	55,833	82,500	2,252
Guri	45,556	110,556	35,278	13,333	0
Dadae	45,537	111,944	63,611	40,833	46
Paju	41,296	146,667	56,944	74,167	1,459
Gunpo	31,568	103,056	36,944	66,111	0
Gwacheon	24,107	48,889	13,611	36,667	0
Suji	22,491	40,000	3,889	36,111	0
Samjung	11,036	35,833	13,056	22,778	0
Total of 35 plants	3,072,157	8,293,333	2,506,667	4,446,389	57,131

(Source: Seo, 2013)

2.3.2 Waste Recycling and Processing Business Process

As its name implies, waste recycling and processing business process focus on gaining revenue stream for the business through doing a recycling process of waste. The revenue stream comes from the gap between economic value of the waste before and after the recycling process is done. Other than that, waste recycling and processing business process is a part of circular economy concept which means that this business contributes to public health and environmental sustainable development as well. It is differentiated into types according to the type of MSW it is accommodate which are organic and inorganic waste business process. It will be informed in detail in this part of the report.

2.3.2.1 Organic Waste Business Process

Organic waste is a sub-category of MSW that can be decomposed naturally over time. Commonly, all over the worlds, it becomes the majority of MSW composition produced in each country and region. It is usually managed through mechanical and biological or thermal treatment. Meanwhile, in Indonesia these processes is specified further through the standard of SNI 2454:2002 tentang Tata Cara Teknik Operasional Pengelolaan Sampah Perkotaan. From that standard, in Indonesia, it is regulated that organic waste can be processed using three approach which are bio-gasification, composting, and fodder production. It will be explained in more detail below.

The first one is composting. Theoretically, composting is a biological process that transforms a particular objects back into its organic matters composition and it is done by microorganism. Deliberate composting of MSW commonly being implemented nowadays as a part of MSW-MS specifically for

organic waste. It brings economic benefits in form of reduce the volume of residual waste needs to be processed using landfill method which sacrifice the potential value of an area economically, it can be sold as a commodities, and also good for the environment (Khalib et al., 2014). The common business process of organic waste composting (Prasetyo et al., 2016), including:

1. Organic waste collection that will be used as the raw material for composting. Commonly, it can be in form of MSW or livestock solid waste.
2. Organic waste transportation to composting plant.
3. Organic waste processing in composting plant that includes several processes which are bio-decomposer liquid mixture preparation, fermentation, and compost harvesting process.
4. Compost grinding and milling to make it breakdown into small pieces.
5. Compost packaging.
6. Compost delivery and distribution to customer.

These input-process-output steps of composting method represented through Figure 2.14 (Andersen et al., 2010).

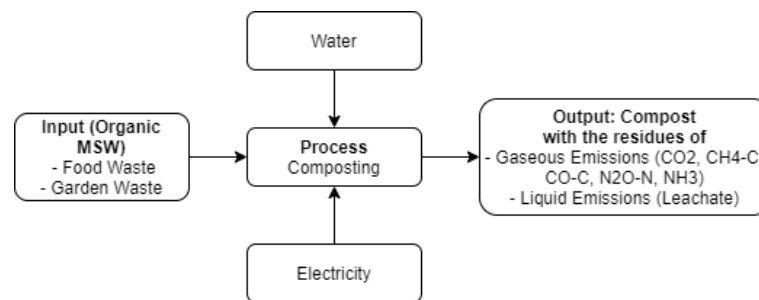


Figure 2.14 Input-Process-Output Diagram of Composting Method
(Source: Andersen et al., 2010)

The second one is bio-gasification. These input-process-output steps of bio-gasification method represented through Figure 2.15 (Groleau et al., 2019).

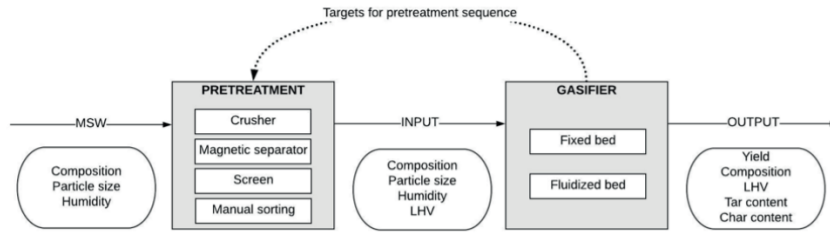


FIGURE 1: Gasification module structure.

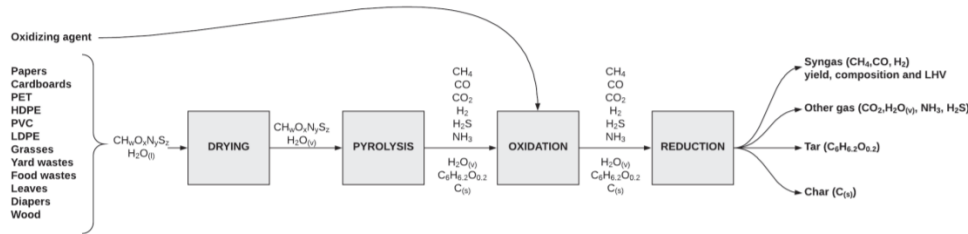


Figure 2.15 Input-Process-Output Diagram of Bio-gasification Method (Source: Groleau et al., 2019)

2.3.2.2 Inorganic Waste Circular Economic-Based Business Process

As already mentioned before inorganic waste is a sub-category of MSW that cannot or is difficult to experience decomposition naturally over time. It commonly includes glass, plastic, paper, paperboard, metal, rubber, leather, and others categories. Theoretically, circular economy is a concept of a business model that connects one industry's output, in terms of waste, as an input for the other industry so that a closed-loop industrial ecosystem framework will be build. It aims to enhance sustainability of the industrial ecosystem by minimizing waste and follow sustainability development standards (Valavanidis, 2018). In Indonesia these processes is specified through the standard of SNI 2454:2002 tentang Tata Cara Teknik Operasional Pengelolaan Sampah Perkotaan. From that standard, in Indonesia, it is regulated that inorganic waste can be processed using three approach which are recycling, controlled incineration, chopping, and compacting. These processes mainly done in a MSW-MS facility provided by their government which known as Bank Sampah program. Business process of Bank Sampah program (Suryani, 2014), includes:

1. Waste sorting done by individual according to its categories
2. Waste collection in Bank Sampah facilities
3. Registration of waste depositor
4. Waste weighing

5. Transaction recording and data entry
6. Transaction receipt
7. Waste processing in Bank Sampah according to its processing capability by means of methods and volume
8. Excess waste will be transported by contracted collectors.

These business processes represented through Figure 2.16.

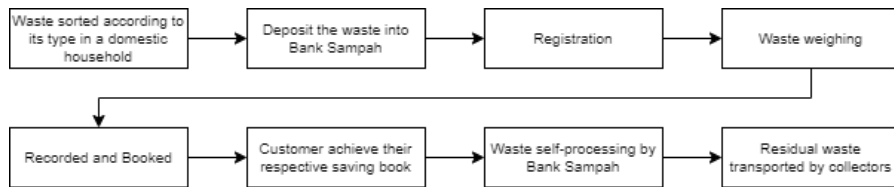


Figure 2.16 Bank Sampah Workflow
(Source: Suryani, 2014)

2.4 Linear Regression

Linear regression is a relationship estimation techniques between multiple variables which one of them act as an independent variable and other act as a dependent variable (Massachusetts Institute of Technology (MIT), 2014). In regression, this relationship is represented using a mathematical formula. There are many types of regression method according to the type of graph that the mathematical formula resulted. But, the most basic one is linear regression which can be differentiated into two general types which are simple linear regression and multiple linear regression. In this research the types that will be the focus is simple linear regression to project the growth of MSW generated in Sidoarjo district periodically. Hence, the independent variable used in this research is the period or the years during the planning horizon of financial modelling and feasibility study. Meanwhile, the dependent variable is the MSW generation. In simple linear regression such relation can be represented using a general formula that can be seen through Formula 2.1 below.

$$Y = a + bX \quad (2.1)$$

Where:

Y : Dependent Variable (Response Variable)

- X : Independent Variable (Explanatory Variable)
a : Constant Value (Intercept) in X and Y Relation
b : Coefficient Value (Slope) in X and Y Relation

In this research the formulation of simple linear regression between two observed variables that are already stated before will be done using Minitab 16 software. Its process and result will be informed in detail in Chapter 4 of this report.

2.5 Financial Modelling

Financial modelling refers to the process of formulating a mathematical-based model of a financial decision alternatives according to its financial and operational characteristics (DePamphilis, 2019). Its implementations in a business include corporate valuation, capital budgeting, cost structure, financial statement analysis, and financial monitoring and control. In this report, the author focuses on financial modelling topics of Financial Projection Model, Discounted Cash Flow (DCF), Free Cash Flow (FCF), cost of capital, terminal value, depreciation, amortization, and inflation.

2.5.1 Financial Projection Model

Financial projection model, which can be said as integrated financial statement projection model specifically, is a spreadsheet developed method which is custom-made to do an integrated financial calculation of a specific financial condition of a business so that it can produce a financial disclosure of a projected financial performance of the business with the same manner as the present financial statements (Tjia, 2009). This model commonly done in an annual time-bound to preserve its consistency. As already mentioned before, the focus of this model is representing business performance projection through the interrelation between each of the financial statements that includes income statement, balance sheet, and cash flow statement. The explanation for each financial statements can be seen below.

1. Income statement is a detailed list of revenues and expenses recorded based on matching concept and as an implication of a business activity

over the reporting period. It can be in form of an annual, semester, quarter, or even monthly report. There are two types of revenues considered in income statement which are direct revenue which acquired from usual business activity; and indirect gain which are acquired unusually such as from increase in economy advantage. There are also two types of expenses which are direct expense form business activity; and loss from unusual activity such as disaster impact. According to the financial condition of the business activity this report can give a two different representation of it, which are profit or loss. A business can be considered gaining profit when they generated revenues more than the expenses needed. Meanwhile it consider as loss when the opposites occurred.

2. Balance sheet is a temporary capture of a business financial condition at a specific time period that represents the balance of business assets, liabilities, and equities.
3. Cash flow statement is a report of inflow and outflow cash of a business from its operational, investment, and financing activities.

The interrelation of each financial statements type as can be seen through Figure 2.17.

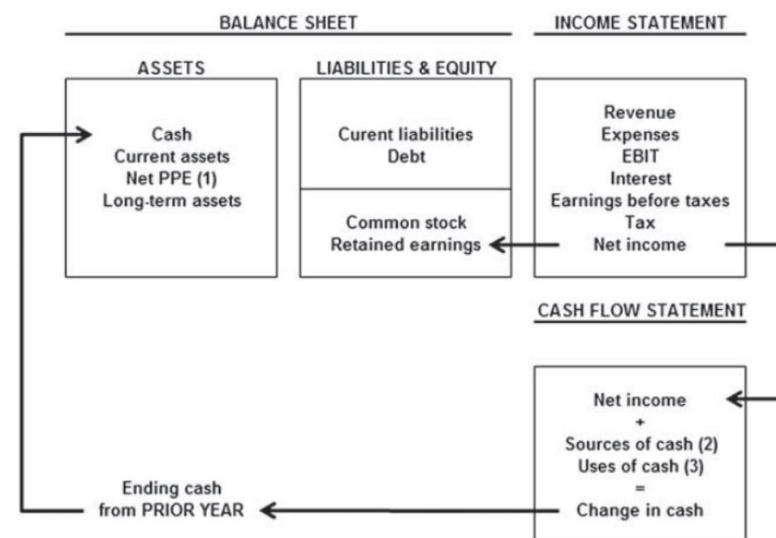


Figure 2.17 Interlinks of Financial Statements
(Source: Tjia, 2009)

With an additional information of:

- (1) PPE stands for Plant, Property, and Equipment.
- (2) Sources of cash from decreases in assets or increases in liabilities between this year and the prior year.
- (3) Uses of cash from increases in assets or decreases in liabilities or equity between this year and the prior year.

From Figure 2.17, it can be seen that this integrated model required a clear financial information from prior and present year to be able to generate a correct interrelation between each of the financial statements. But, the important concept is that financial projection model should never be treated fully as a future projection. Instead, it should be used as an estimator of a potential business performance and financial profile in the future according to certain assumption used. A proper financial project model should be able to measures business:

1. Earnings before Interest and Tax (EBIT) for revenue-generating operation earning power measurement.
2. Earnings before Interest, Tax, Depreciation, and Amortization (EBITDA) for company's core operation cash generating measurement.
3. Revenue and Net Income for revenue-generating ability and profitability measurement.
4. Cash flow from operations
5. Operating working capital
6. Net Plant, Property, and Equipment (PPE); and CAPEX
7. Levels of debt and equity

2.5.2 *Discounted Cash Flow (DCF)*

Discounted Cash Flow (DCF) is a method used for estimate economic value of a financial decision according to its forecasted cash flow over an observed time horizon (Chen, 2020). As its name imply, DCF has two main components which are 'discount' rate and cash flow. In DCF, discount rate is the expected return level of a financial decision over a specific period of time. Meanwhile, cash flow is the representation of total flow of cash over that specific time period. DCF formula represented through Formula 2.2 below.

$$DCF = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} \quad (2.2)$$

Where,

DCF : Discounted Cash Flow

CF_t : Cash Flow at Period t

r : Discount Rate

DCF is one of many financial modelling method used to determine the value of a financial decision over a period time. It is an important tools for decision making process as it will become the base for further financial parameter calculation resulted from Free Cash Flow calculation including Net Present Value, Internal Rate of Return, and Payback Period.

2.5.3 Free Cash Flow (FCF)

Free Cash Flow (FCF) is a profitability measure of a company that calculate the amount of cash they own after subtracting company operational expense and working capital from their revenue generated for each period in a specific time horizon (Jagerson, 2019). Or in other words, FCF shows the availability of cash available for investor, in terms of equity or credits, after the company already paid all of their operational expenditure and net investment for all of their fixed and current assets (Gitman et al., 2013). The formula for calculating FCF can be seen through Formula 2.3 below.

$$FCF = (EAT + Depreciation + Interest \times (1 - Tax)) \\ - (Working Capital Investment \\ + Fixed and Others Assets Investment) \quad (2.3)$$

2.5.4 Cost of Capital

Cost of capital is the amount of return an investor required to get over a financial decision alternative (Kenton, 2019). Other than that, cost of capital can be defined as the reward an investor can expect to earn for investing in a given

company (C.Liang, 2013). Hence, from business point of view, cost of capital is a forecast of cost that needs to be fulfilled as its represent the level of return investor expect from their contribution to the corporate capital. This level of return will be used as the base of investor decision making whether to invest in a certain financial decision alternative or not. In its practice, cost of capital calculation includes two basic components which are risk-free interest rate and risk premium. Those two components will be included in a further calculation using Weighted Average Cost of Capital approach which also includes the calculation of cost of equity and cost of debt that will be discussed further below (Gunarta, 2019).

2.5.4.1 Cost of Equity

Cost of equity is an approach to calculate cost of capital with the assumption if the corporate's capital is fully funded by the corporate itself by means of the equity gained from their shareholders or owner(s). It also can be stated that cost of equity represents compensation rate demanded by the market for owning an assets and its implied risks that usually used to determine required rate of return in a financial decision making (Kenton, 2020). In its practice, this theory represented through the calculation of cost of equity using Capital Asset Pricing Model (CAPM) approach. CAPM is a model used to estimates cost of capital which considers risk free interest rate, market return, market risk premium, and beta parameters of the related financial decision (Boyte-White, 2019). Here is the formula used for CAPM calculation as can be seen through Formula 2.4 below.

$$R_E = R_f + \beta i(R_m - R_f) \quad (2.4)$$

Where,

R_E : Cost of equity

R_f : Risk Free Rate

R_m : Market Return

$R_m - R_f$: Market Risk Premium

β : Un-diversifiable Risk of Stock Relative to Market Return

The parameters used in CAPM calculation be defined as follow:

1. Risk free rate (R_f) – return rate of a ‘safe’ or ‘guaranteed’ investment by means of it has a stable expected return, as there is an institution who guarantee that amount of return or profit.
2. Market return (R_m) – return rate of a general financial market where the investment or financial decision to be observed take places.
3. Market risk premium ($R_m - R_f$) – difference of risk free return with general market return in a specific time and period where the financial decision to be observed take places, which can be used as measurement for determining the expected return for cost of capital calculation.
4. Beta (β) – risk level of a specific stock security relative to the general financial market where the investment or financial decision to be observed take places.

2.5.4.2 Cost of Debt

Cost of debt is a part of a company capital structure which represent the rate company need to pay because of their capital structure that funded from any forms of debt (Chen, 2020). Or in other words, cost of debt represents the effective rate that the company must paid to paid off their capital’s debt. There are two approaches for calculating cost of debt according to tax payment period, which are before and after tax rate implementation. However, in its practice, almost all of business form implements after tax rate cost of debt calculation as tax payment is one of the eligibilities that a business must fulfil. The formula after tax approach can be seen in more detail below.

1. Loan interest rate calculation which considers three credit risks including borrower’s payment failure, loan period length, and difficulty for loan offering which represented through formula below (Crundwell, 2008).

$$R = \gamma_F + IP + DRP + LP + MRP \quad (2.5)$$

Where,

- R : Loan Interest Rate
 γ_F : Actual Risk Free Rate
 IP : Inflation Premium

- DRP : Default Risk Premium
- LP : Liquidity Premium
- MRP : Maturity Risk Premium

2. After tax cost of debt formula can be seen through Formula 2.6 below (Crundwell, 2008).

$$R_D = R_{DBT}(1 - T) \quad (2.6)$$

Where,

- R_D : Cost of Debt
- R_{DBT} : Loan Interest Rate before Tax Implementation
- T : Tax Rate

2.5.4.3 Weighted Average Cost of Capital (WACC)

Weighted Average Cost of Capital (WACC) is a method for calculating firm's cost of capital according to its proportional weight of funding source which mainly separated into two sources, which are from their own funding and debt (Hargrave, 2019). Here is the formula that will be used for WACC (Crundwell, 2008) as can be seen in Formula 2.7 below.

$$WACC = \left(\frac{E}{E + D}\right)R_E + \left(\frac{D}{E + D}\right)R_D \quad (2.7)$$

Where,

- WACC : Weighted Average Cost of Capital
- E : Amount of Capital Sourced from Equity
- D : Amount of Capital Sourced from Debt
- R_E : Cost of Equity
- R_D : Cost of Debt

2.5.5 Terminal Value (TV)

Terminal Value (TV) is an approach to measure the closure value of financial decision alternative according to its forecasted future cash flow which implements perpetuity concept (Ganti, 2020). There are two approaches to calculate

TV which known as stable growth model and liquidation value (Gunarta, 2017). Here are the explanation for each approach:

1. Stable Growth Model – where company’s cash flow growth assumed to be constant over time and the company can do a reinvestment to extend their business life. The formula of this model shown in Formula 2.8 below.

$$\text{Terminal Cash Flow} = \frac{\text{Cash Flow } n}{\text{Cost of Capital} - \text{Growth}} \quad (2.8)$$

2. Liquidation Value – where company’s operational condition assumed to be stop at a certain period and all of its assets are assumed will be sold at highest economic value. The formula of this model shown in Formula 2.9 below.

$$\begin{aligned} \text{Terminal Cash Flow} &= \text{Salvage Value} \\ &\pm \text{Tax Effect on Capital Gain or Loss} \\ &+ \text{Recapture of Net Working Capital} \end{aligned} \quad (2.9)$$

2.5.6 Depreciation and Amortization

Depreciation is an approach which represent asset’s value reduction over time due to its usage, time-related, weariness, outdated, and or obsolescence reasons (Rahman, 2013). There are four approaches to calculate depreciation, which are:

1. Straight-line Depreciation is an approach where the historical cost value of an assets divided into equal portion according to the usage life of the related assets. This concept can be represented into a Formula 2.11 below.

$$\text{Depreciation Expense} = \frac{\text{Cost} - \text{Residual}}{\text{Life (Years, months, etc)}} \quad (2.11)$$

2. Units-of-Production Depreciation is an approach where the analyst determine depreciation rate per unit of production occurred for the base of determining the total depreciation expense. In other words, the depreciation

is calculated based on the assets usage. This concept can be represented into a Formula 2.12 and Formula 2.13 below.

$$\text{Depreciation Rate per Unit} = \frac{\text{Cost} - \text{Residual}}{\text{Life in Units}} \quad (2.12)$$

$$\begin{aligned} \text{Depreciation Expense} \\ = \text{Depreciation Rate per Unit} \times \text{Units Used} \end{aligned} \quad (2.13)$$

3. Sum-of-Years-Digit (SOYD) Depreciation is an accelerated approach for determining depreciation rate where depreciation expense will be larger in the earlier years as in this method as SOYD fraction is used as the multiplication factor for it. This concept can be represented into a Formula 2.14 and Formula 2.15 below.

$$\text{SOYD Fraction} = \frac{n(n + 1)}{2} \quad (2.14)$$

Where,

n : depreciation period starting from year 0 until the end of usage life

$$\text{Depreciation Expense} = \text{SOYD Fraction} \times (\text{Cost} - \text{Residual}) \quad (2.15)$$

4. Double-Declining-Balance (DDB) Depreciation is an accelerated approach for determining depreciation rate where depreciation expense will be larger in the earlier years as in this method as its use DDB ratio as the multiplier factor of asset's book value to calculate depreciation expense. This concept can be represented through Formula 2.16 and Formula 2.17 below.

$$\text{DDB}\% = \left(\frac{100\%}{\text{Lifetime}} \right) * 2 \quad (2.16)$$

$$\begin{aligned} \text{Depreciation Expense} \\ = \text{DDB}\% \times (\text{Cost} - \text{Accumulated Depreciation}) \end{aligned} \quad (2.17)$$

In Indonesia, depreciation rate calculation follows regulated through taxation law, specifically in Undang-Undang No. 36 Tahun 2008 tentang Pajak Penghasilan. According to this regulation calculation of depreciation rate and amortization can be charged as a fiscal cost as an income tax. The important points of this calculation are:

1. Period of depreciation and amortization calculation should be done in the same month when the expense is being charged; or when a work on an asset in a year(s) is complete and it can be divided into equal portion depend on its period; or calculated with an approval by Direktur Jenderal Pajak in the month where the asset is used to get, collect, and or maintain revenue generation or when the assets is start to producing revenue.
2. Depreciation rate of tangible assets according to Indonesia taxation law only considers two methods of depreciation rate calculation can be properly used which are straight line and declining balance. It can be seen in more detail through Table 2.9.

Table 2.9 Depreciation Rate and Tangible Assets Grouping according to Income Taxation Law in Indonesia

Tangible Assets Groups	Usage Life	Depreciation Rate	
		Straight Line	Declining Balance
Not a Building			
Group 1	4 Years	25%	50%
Group 2	8 Years	12.5%	25%
Group 3	16 years	6.25%	12.5%
Group 4	20 Years	5%	10%
Building			
Not Permanent	10 Years	10%	-
Permanent	20 Years	5%	-

(Source: UU No. 36 Tahun 2008 about Income Taxation in Indonesia, 2008)

2.5.7 Inflation

Inflation is a quantitative approach used to measure change rate of an average price level of goods and or services over time (Chen, Inflation, 2020). Theoretically, there are three main causes of inflation which are demand-pull, cost-push, and built-in. Demand-pull occurs when the demand of goods and or services exceed their production capacity; hence as the result the price of the goods and or

services will go higher. Cost-push occurs when there are an increase in cost of production process's input which will resulted to the higher price of finished goods. And last, built-in occurs as a result of cause-and-effect relation resulted from a third cause. Inflation affects how an individuals and or an organizations view their assets value as it will may have both negative or positive impact depends on the asset types and time horizon of the financing activities. Hence, to control its rate to minimize its negative impact, each country and or states usually have a monetary authority organization called central bank. In Indonesia, this role is done by Bank Indonesia. They set a target level of inflation rate periodically and maintain its volatility through times by implementing what is known as monetary policy.

2.6 Financial Feasibility Parameters for Alternative Selection

In this subchapter there will be an explanation about three financial modelling parameters commonly used for alternative selection including Net Present Value, Internal Rate of Return, and Payback Period (Gunarta, 2020).

2.6.1 Net Present Value (NPV)

Net Present Value (NPV) is an equivalent total and or difference between outflow and inflow in a set of cash flow ranging in a specific time horizon at specific interest rate. It is also known as Present Value (PV) or Present Worth approach. Hence, mathematically NPV can be represented as equal sum of discounted cash inflow and outflow (Arnold, 2014). Representing that explanation, here is the mathematical model of NPV calculation.

$$PW(i^*) = \sum_{t=0}^n F_t(1 + i^*)^{-t} \quad (2.6)$$

Where,

PW : Present Worth

F_t : Cash Flow on Period t

i : Interest Rate ($0 \leq i \leq \infty$)

t : Investment Time Horizon

NPV calculation result analysis has a simple basic rule of thumb principle which states that a financial decision can be considered as feasible if and only if its NPV value equal to or larger than zero. Other than that, NPV calculation has several defining characteristics including:

1. NPV consider sum of DCF at certain level of interest rate.
2. NPV consider that sum of DCF at certain level of interest rate equivalent to the present value when the financial decision take place, by means at period $t=0$.
3. Single NPV value affected by the level of interest instead of the cash flow pattern.

2.6.2 *Internal Rate of Return (IRR)*

Internal Rate of Return (IRR) is an approach to measure profitability, in form of rate of return, of a financial decision (Hayes, 2019). Its measurement based on the calculation of NPV, as IRR conceptually is the rate of return acquired when NPV is equal to zero. Here is the Formula 2.18 that will be used for IRR calculation (Thuesen & Fabrycky, 2001).

$$\begin{aligned}
 IRR &= 0 = NPV \\
 IRR &= 0 = PW(i^*) \\
 IRR &= 0 = \sum_{t=0}^n F_t(1 + i^*)^{-t} \qquad (2.18)
 \end{aligned}$$

Where,

- IRR : Internal Rate of Return
n : Number of period in time horizon
 F_t : Future value of cash flow in period t
 i^* : Required return rate
t : Period in time horizon ($0 \leq t \leq n$)

IRR calculation result analysis has a simple basic rule of thumb principle which states that a financial decision can be considered as feasible if and only if its

IRR value equal to or larger than the level of return or interest rate used for the DCF calculation.

2.6.3 Payback Period (PP)

Payback Period (PP) is a mathematical approach to determine the amount of time needed of a financial decision in form of investment generate an equivalent income amount by means of Break-Even Point (BEP) (Kagan, 2020). There are two approaches of PP that are commonly used which are basic PP and discounted PP. Basic PP does not consider the impact of time value of money so that it assumes that the interest rate in the financial modelling time horizon equal to zero (Pujawan, 2019). Here is the Formula 2.19 for basic PP calculation.

$$\sum_{t=0}^n F_t \geq 0 \quad (2.19)$$

Where,

F_0 : Initial Investment Amount

F_t : Net Cash Flow on Period t

Meanwhile, discounted PP consider the impact of time value of money so that it assumes that the interest rate in the financial modelling time horizon follow some pre-determined interest rate according to expected return of the financial decision. Here is the Formula 2.20 for discounted PP calculation.

$$\sum_{t=0}^n F_t(1+i)^{n-t} \geq 0 \quad (2.20)$$

Where,

F_0 : Initial Investment Amount

F_t : Net Cash Flow on Period t

i : Interest Rate

The rule of thumb for alternative selection according to PP calculation result considers two main factors which are PP duration and IRR level of the financial

decision. For a financial decision with the same level of IRR, shorter PP duration will always be more preferable. But, it get more complex when comparing financial decisions with a different level of IRR. Basically, a financial decision return will get more risky if the PP become longer. However, the financial decision for each company will differ for this case according to the corporate risk appetite and targeted IRR level.

2.7 Benefit Cost Analysis (BCA)

Benefit Cost Analysis (BCA) is an approach that commonly implemented for evaluating financial decision done through making a comparison of its implied economic benefits and costs. (Shively, 2012). Other than that, BCA also can be implemented as an accounting framework to empower decision making analysis especially for non-profit purpose (Zerbe & Scott, 2015). The basic formula of BCA described through Formula 2.21 below.

$$BCR = \frac{PV\ Benefit(s)}{PV\ Cost(s)} \quad (2.21)$$

Where,

BCR : Benefit-Cost Ratio

PV Benefit(s) : Present value of identified benefits over time horizon

PV Cost(s) : Present value of identified costs over time horizon

The problem in implementing BCA method lies in the method of determining the economic value of implied benefits and costs of the decision to be made. Hence, there are several basic steps that can be executed to implement BCA properly including:

1. Define BCA scope and assumptions, which includes:
 - a. Clear problem statement that covers description of what problem to be analysed and in which perspective it will be approached in terms of its economic standing.
 - b. Determine number of market included in the BCA according to Partial Equilibrium (PE) or General Equilibrium (GE) approach.

2. Identify possible decision alternatives and its implied outcome, costs, and benefits using several approach including:
 - a. Shadow price – determined price for valuation of a non-market or non-profit object using income and expense forecasting approach related to the implied consequences of the object selection.
 - b. Survey method – determined price for contingent valuation (CV) of a non-market or non-profit object using Willingness to Pay (WTP) and or Willingness to Accept (WTA) approach. This method is done by present alternatives of object selection and asked knowledgeable stakeholder to determine WTP and or WTA level regarding to the object selection that will be used as the bottom line for further BCA process.
3. Calculate BCA interest rate and present value for cost and benefit of each alternative using Formula 2.22 below.

$$PV = \sum_{t=0}^N \frac{F_t}{(1+r)^t} \quad (2.22)$$

Where,

PV : Present Value

F_t : Net Cash Flow at t Time Horizon

r : Interest Rate

N : Number of Periods

4. Determine a measurement parameter for supporting the calculation for alternative selection using Net Present Value and Benefit Cost Ratio approach.
5. Consider and manage risk and uncertainty of the selected alternative using sensitivity analysis.

2.8 Sensitivity Analysis

Sensitivity analysis is an approach used to determine how significant an independent control variables affect a targeted dependent variable (Kenton, Sensitivity Analysis, 2019). The purpose of conducting sensitivity analysis is to act

as a supportive tools for decision making using financial model. This approach also known as what-if analysis. There are many ways to implement sensitivity analysis to a financial model, but basically they are all just the same in a way that the procedures consist of varying a specific independent control variables value in order to analyse its impact on the related dependent variable parameters. There are two basic approach to implement this method which are one-way and multi-way sensitivity analysis. The difference between these methods lies in the number of independent variable included in the calculation.

As its name imply, one-way sensitivity analysis only consider one main factor as the independent control variable. The output of this analysis is a collection of cause-and-effect result of the dependent variable for each change in the independent variable, which are usually represented using a tornado diagram. Meanwhile, multi-way sensitivity analysis consider combination of several factors as the independent control variables. The most common multi-way sensitivity analysis to be used is two-way sensitivity analysis as it still gives a sufficient complexity in form of factors combination with a least difficulty level compared to the more other multi-way sensitivity analysis which involves more parameters, as well as capability to be represented in graphical form for further analysis purpose.

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CHAPTER 3

RESEARCH METHODOLOGY

In chapter 3, there will be an information about the steps that were done by the author in conducting this research including problems identification and formulation, data collection, data processing, data analysis and interpretation, and drawing conclusions and suggestions.

3.1 Flowchart of Research Methodology

In subchapter 3.1, there will be an information about the author's steps of conducting this research. It will be represented in the form of flowchart that can be seen through Figure 3.1 and 3.2.

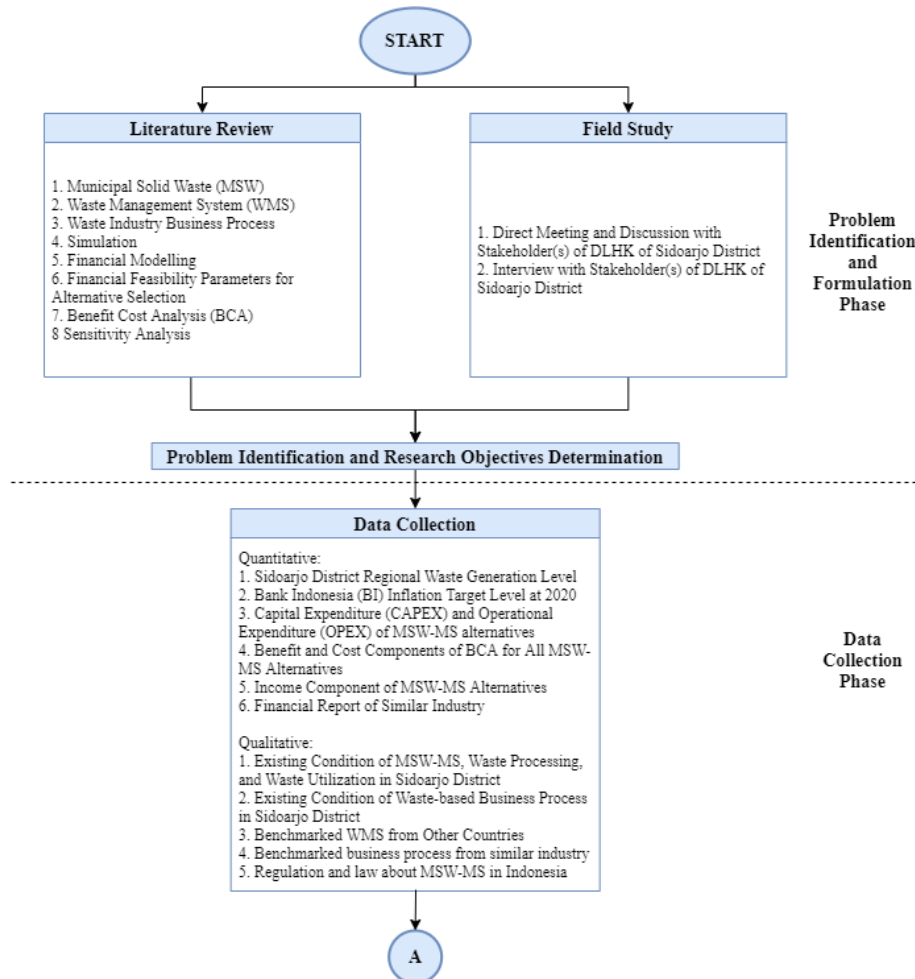


Figure 3.1 Research Methodology Flowchart
(Source: Author's Document)

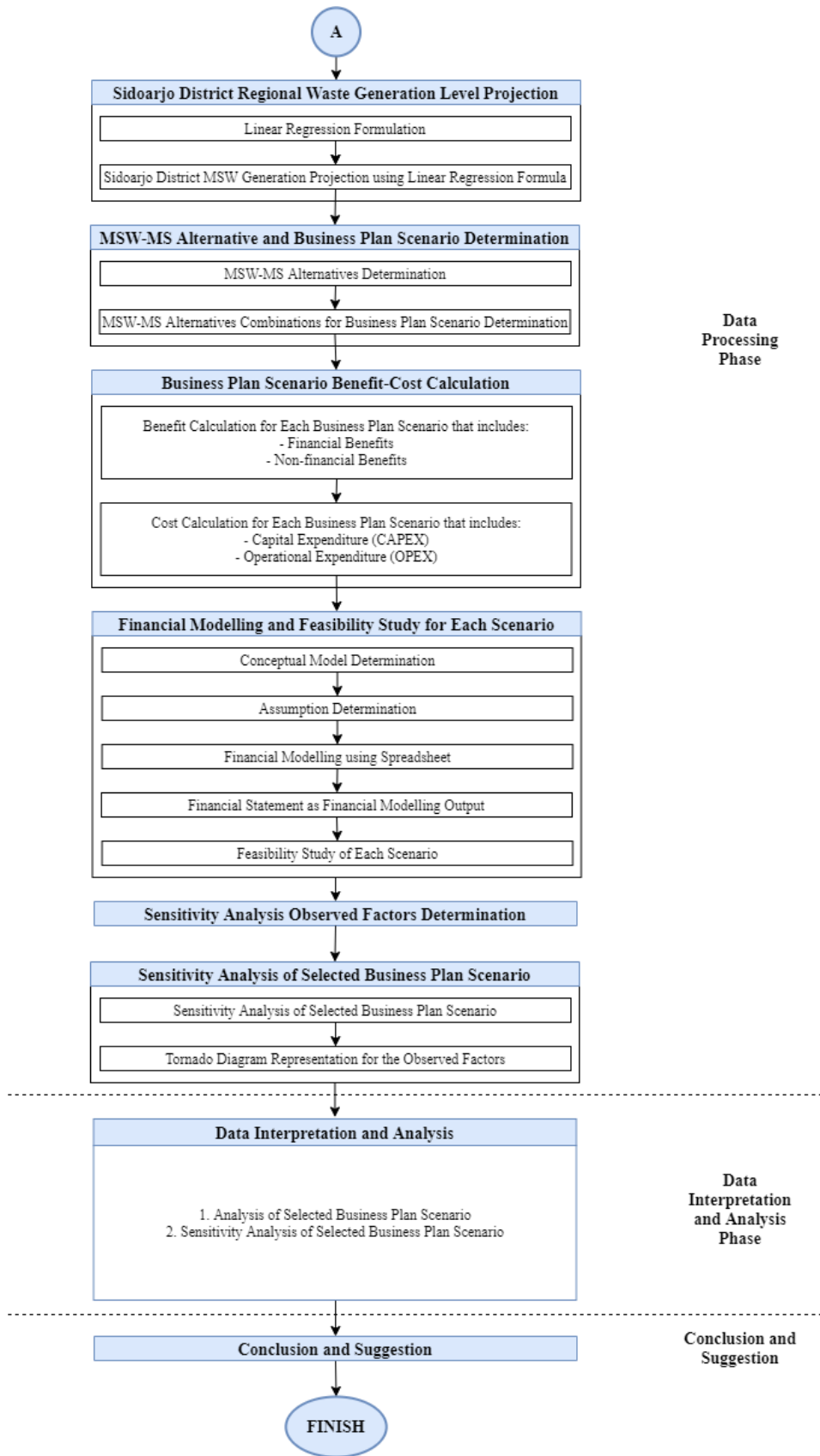


Figure 3.2 Research Methodology Flowchart (con't)
(Source: Author's Document)

3.2 Description of Research Methodology Steps

In this subchapter, there will be a detailed explanation of each step included in research methodology that are done in order to fulfil the research objectives that already stated in the first chapter.

3.2.1 Problem Identification and Formulation Phase

This is the first phase of this research methodology. This phase started with two different activities which are literature review and field study that will be used to identify and formulate problem of the related research which is to determine the best MSW-MS business plan scenario for Sidoarjo district according to feasibility study with consideration to financial and benefit-cost aspect. Literature review related to it includes the topics of solid waste definition, characteristic, and other attributes; general MSW-MS regulation and operational standards in Indonesia and in benchmarked country; waste-based business process of the benchmarked country and or institution; and the related methodology that will be used in this research including, linear regression, BCA, financial modelling, and sensitivity analysis. Meanwhile, the field study related to it includes a direct meeting and discussion also online interview with the stakeholders of DLHK of Sidoarjo district.

3.2.2 Data Collection Phase

This is the second phase of this research methodology. In this phase there will be a data collection process of the supporting data that will be used to determine the best MSW-MS business plan scenario for Sidoarjo district according to feasibility study with consideration to financial and benefit-cost aspect. These data can be categorized into two different types according to its data type including quantitative and qualitative data. The quantitative data that will be used in this research includes Sidoarjo district regional waste generation level that acquired from DLHK of Sidoarjo district report which will be used as the input for project its generation level in the observed time horizon using linear regression; BI inflation target level in 2020 that acquired from BI official website which will be used as the growth rate for income and expenses over time in financial modelling; CAPEX and

OPEX of each MSW-MS alternative that acquired from literature review and field study which will be used as the outflow input of financial modelling; benefit and cost component for all MSW-MS alternative that acquired from literature review and field study which will be used as the input of financial modelling; income component of MSW-MS alternatives which will be used as the inflow input of financial modelling; and financial report of similar industry which will be used as the input for determining cost of capital in financial modelling. Meanwhile, the qualitative data that will be used in this research includes existing condition of MSW-MS, waste processing, and waste utilization in Sidoarjo district that acquired from field study; existing condition of waste-based business in Sidoarjo district that acquired from literature review and field study; benchmarked WMS from other countries that acquired from literature review; benchmarked business process from similar industry that acquired from literature review; and regulation and law about MSW-MS in Indonesia that acquired from literature review.

3.2.3 Data Processing Phase

In this phase there will be a data processing step of the previously-collected supporting data that will be used to determine the best MSW-MS business plan scenario for Sidoarjo district according to feasibility study with consideration to financial and benefit-cost aspect. These data processing steps can be divided into several phases including phase of Sidoarjo district regional waste production projection using linear regression, MSW-MS alternative(s) and business plan scenario determination, business plan scenario benefit cost calculation, financial modelling and feasibility study, sensitivity analysis observed factor determination, and sensitivity analysis of selected MSW-MS alternative(s) and or business plan scenario. First, Sidoarjo district regional waste production projection is done using linear regression approach approach. This process is done so that each region in Sidoarjo district can have a projection of their waste generation level in accordance to their historical data. It will be used as the input of the financial model later on.

Next, there is a process of MSW-MS alternative(s) and business plan scenario determination. It is done according to the assumption used in conducting this research that each MSW-MS alternative that oblige DLHK of Sidoarjo district

build a new facilities, it is assumed that the newly built facilities are capable to accommodate Sidoarjo waste generation level. This concept will be used to determine the possible combination of MSW-MS alternative which limits the number of possible business plan scenario to be assessed. After that, there is a process of business plan scenario benefit cost calculation. It is done by listing all of the possible benefits, in terms of financial and non-financial, and costs, in terms of capital and operational expenditure that will be used as the base for making financial model in the next step.

The fourth step is financial modelling and feasibility study. Financial modelling of business plan scenario in this research will be made starting by making a conceptual model of the business plan scenario. The conceptual model will consists of general input and output of the financial model. The general input will be inflation rate according to BI target level, Sidoarjo district regional waste generation level acquired from liner regression result, CAPEX and OPEX of each business plan scenario according to literature review and field study, price list of expected output from waste-based business process as revenue stream of the business plan, financial statements and condition of similar industry, and related benefit cost component that not included yet in CAPEX, OPEX, and revenue stream. This input will be used to do a calculation process of several supporting financial concepts to construct the financial model including, cost of capital, terminal value, depreciation and amortization, inflation value, DCF, and FCF. Meanwhile, the output is financial statements of the business plan scenario over the observed time horizon. The observed time horizon will be set accordingly to the expected MSW-MS life cycle and validated according to DLHK of Sidoarjo district preference acquired from interview with their stakeholder and will be calculated using terminal value approach. The next step of financial modelling is done by determining assumption needed to keep the model focused which are including inflation rate BI inflation rate target in 2020 which is 3% in the model; assume income and expense with no specific implied growth rate to have growth rate equal to inflation; and assume new waste processing facilities proposed to be build is made according to previous related research so that its capital expenditure will be used directly. The last step of financial modelling is to build the conceptual model

in a spreadsheet with implementing the pre-determined assumption, input, and business plan scenario financial attributes so that it resulted to a proper financial statements. Then, feasibility study is done by using the financial statements as its input to build DCF and FCF to calculate the relevant financial and benefit cost parameters that will used to determine business plan scenario feasibility. Feasibility study for each of the proposed MSW-MS business plan scenario will implement NPV, IRR, and payback period approach for financial consideration; and BCR for accommodates non-financial consideration.

Next, there is a step of determining observed factor for sensitivity analysis and conducting sensitivity analysis to the business plan scenario. Determining observed factor for sensitivity analysis is done according to literature review and heuristic testing of the model. Sensitivity analysis of this observed factor is used for testing how volatile the result of the previous process is and which factors contribute most significantly to its change the author than do a sensitivity analysis of selected business plan scenario. There will be two methods of sensitivity analysis done in here which are one-way and two-way sensitivity analysis. And to represents the significance of each observed factor's impact Tornado diagram will be used as the representation method.

3.2.4 Data Analysis and Interpretation Phase

In this phase there will be a data analysis and interpretation step of the previously-processed data that will be used to determine the best MSW-MS business plan scenario for Sidoarjo district according to feasibility study with consideration to financial and benefit-cost aspect. The first analysis in this report is the analysis of selected business plan scenario. It will includes the analysis of reasoning behind its selection as the best alternative of business plan scenario to be implemented by DLHK of Sidoarjo district according to financial and benefit cost approach.

The second analysis is about sensitivity analysis explanation of the selected BPS. This analysis is done to consider a critical aspect in terms of independent variables included in the financial model and feasibility calculation of it and how it

change may affect the decision making of the selected solution. These two analysis will be informed in detail in Chapter 5 of this report.

3.2.5 Drawing Conclusions and Suggestions Phase

In this phase there will be a step of making conclusion according to all of the previous process that already have been done before. The conclusion in here will be made to answers the research objectives. Moreover, in this phase there will be a process of making several suggestions that are made for DLHK of Sidoarjo district as the observation object of this research, and for further similar research.\

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CHAPTER 4

DATA COLLETION AND PROCESSING

In chapter 4, there will be an information about the steps that were done by the author in conducting data collection and processing in this research. Data collection part will explain about collection process of required data of MSW-MS in Sidoarjo district and other relevant information to conduct this research. Meanwhile, data processing will explain about the process done by the author to conduct the research using collected data that include the process of forecasting of Sidoarjo district MSW generation level, BPS determination, BPS implied benefit and cost calculation, BPS financial modelling, and sensitivity analysis.

4.1 Data Collection

In subchapter 4.1, there will be an information about required data for conducting further process of this research. It is done through interview with stakeholders of DLHK of Sidoarjo district, related documents, and supporting literature review.

4.1.1 General Description of Existing Condition of MSW-MS in Sidoarjo District

MSW-MS in Sidoarjo district is managed by one specific function of Sidoarjo District Regional Government which is Dinas Lingkungan Hidup dan Kebersihan (DLHK) of Sidoarjo district. Its main function is to make sure daily produced MSW in Sidoarjo district can be managed well so that its potential negative impact can be prevented. Furthermore, in the document of Rencana Kerja (Renja) DLHK of Sidoarjo district in 2019 (Dinas Lingkungan Hidup dan Kebersihan Kabupaten Sidoarjo, 2019) it is stated that now one of the main Key Performance Indicator (KPI) of DLHK of Sidoarjo district is the percentage of added value managed waste compared to daily generation level of MSW in Sidoarjo district. Hence, to make sure its main function and KPI fulfilled, DLHK of Sidoarjo district already implement several MSW-MS facilities, system, and development plan. Their MSW-MS system follows Indonesia MSW-MS standard stated in Standar Nasional Indonesia (SNI) 3242:2008 tentang Pengelolaan Sampah di

Pemukiman, and SNI 2454:2002 tentang Tata Cara Teknik Operasional Pengelolaan Sampah Perkotaan as can be seen in Figure 1.1 and 1.2. Their basic existing MSW-MS facilities, which consist of TPS, TPST, and TPA also standardized using the same legal protection, but there is an innovation by Indonesia government called Bank Sampah regulated through Peraturan Menteri Negara Lingkungan Hidup (LHK) Republik Indonesia Nomor 13 Tahun 2012 tentang Pedoman Pelaksanaan Reduce, Reuse, dan Recycle Melalui Bank Sampah. All of those facilities information implemented in Sidoarjo district can be seen through Table 4.1.

Table 4.1 Sidoarjo District MSW-MS Facilities

Level	No	Facilities	Location (Sub-District)
Regional /District (1)	1.1	<i>Tempat Pemrosesan Akhir (TPA)</i>	Jabon
Sub-District (2)	2.1	<i>Tempat Pengolahan Sampah Terpadu (TPST)</i>	
	2.1.1	Wonokupang	Balongbendo
	2.1.2	Jabaran	Balongbendo
	2.1.3	Penambangan	Balongbendo
	2.1.4	Kemangsen	Balongbendo
	2.1.5	Suwaluh	Balongbendo
	2.1.6	Watesari	Balongbendo
	2.1.7	Bakung Temenggungan	Balongbendo
	2.1.8	Sawohan	Buduran
	2.1.9	Dukuh Tengah	Buduran
	2.1.10	Sukorejo	Buduran
	2.1.11	Damarsi	Buduran
	2.1.12	Wadungasih	Buduran
	2.1.13	Sidomulyo	Buduran
	2.1.14	Prasung	Buduran
	2.1.15	Siwalanpanji	Buduran
	2.1.16	Sidokerto	Buduran
	2.1.17	Ngampelsari	Candi
	2.1.18	Gelam	Candi
	2.1.19	Bligo	Candi
	2.1.20	Durung Bedug	Candi
	2.1.21	Pasar Larangan	Candi
	2.1.22	Tebel	Gedangan
	2.1.23	Gemurung	Gedangan
	2.1.24	Bangah	Gedangan
	2.1.25	Sruni	Gedangan
	2.1.26	Kragan	Gedangan
	2.1.27	Karangbong	Gedangan
	2.1.28	Keboansikep	Gedangan
	2.1.29	Ketajen	Gedangan
	2.1.30	Pasar Gedangan	Gedangan
	2.1.31	Gedangan	Gedangan
	2.1.32	Semambung	Gedangan
	2.1.33	Jemirahan	Jabon
	2.1.34	Pangreh	Jabon
	2.1.35	Rumah Kompos Kalisogo	Jabon

Level	No	Facilities	Location (Sub-District)
	2.1.36	Keboguyang	Jabon
	2.1.37	Cangkring	Krembung
	2.1.38	Mojoruntut	Krembung
	2.1.39	Terung Kulon	Krian
	2.1.40	Tambak Kemerakan	Krian
	2.1.41	Ponokawan	Krian
	2.1.42	Barengkrajan	Krian
	2.1.43	Kraton	Krian
	2.1.44	Krian	Krian
	2.1.45	Katerungan	Krian
	2.1.46	Tropodo	Krian
	2.1.47	Pasar Krian	Krian
	2.1.48	Junwangi	Krian
	2.1.49	Terik	Krian
	2.1.50	Terung Wetan	Krian
	2.1.51	Candi Pari	Porong
	2.1.52	Lapas Porong	Porong
	2.1.53	Bendotretak	Prambon
	2.1.54	Simpang	Prambon
	2.1.55	Kedung Kembar	Prambon
	2.1.56	Jedong Cangkring	Prambon
	2.1.57	Sedati Gede	Sedati
	2.1.58	Pepe	Sedati
	2.1.59	Betro	Sedati
	2.1.60	Buncitan	Sedati
	2.1.61	Kalanganyar	Sedati
	2.1.62	Banjar Kemuning	Sedati
	2.1.63	Cemandi	Sedati
	2.1.64	Pranti	Sedati
	2.1.65	Segorotambak	Sedati
	2.1.66	Sedati Agung	Sedati
	2.1.67	Kemiri	Sidoarjo
	2.1.68	Cemeng Bakalan	Sidoarjo
	2.1.69	Bluru Kidul	Sidoarjo
	2.1.70	Sekardangan	Sidoarjo
	2.1.71	Banjarbendo	Sidoarjo
	2.1.72	Rangkah Kidul	Sidoarjo
	2.1.73	Taman Pinang	Sidoarjo
	2.1.74	Sarirogo	Sidoarjo
	2.1.75	Rumah kompos suko	Sidoarjo
	2.1.76	Plumbungan	Sukodono
	2.1.77	Suruh 1	Sukodono
	2.1.78	Masangan Wetan	Sukodono
	2.1.79	Pekarungan	Sukodono
	2.1.80	Suruh 2	Sukodono
	2.1.81	Sambibulu	Taman
	2.1.82	Taman	Taman
	2.1.83	Tawang Sari	Taman
	2.1.84	Pasar Taman	Taman
	2.1.85	Sadang	Taman
	2.1.86	Kalisampurno	Tanggulangin
	2.1.87	Banjar Panji	Tanggulangin
	2.1.88	Randegan	Tanggulangin
	2.1.89	Penatar Sewu	Tanggulangin
	2.1.90	Ngaban	Tanggulangin
	2.1.91	Ketegan	Tanggulangin
	2.1.92	Gempolsari	Tanggulangin
	2.1.93	Tulangan	Tulangan
	2.1.94	Grabagan	Tulangan

Level	No	Facilities	Location (Sub-District)
	2.1.95	Kepuh Kemiri	Tulangan
	2.1.96	Pangkemiri	Tulangan
	2.1.97	Gelang	Tulangan
	2.1.98	Kebaron	Tulangan
	2.1.99	Kepatihan	Tulangan
	2.1.100	Kenongo	Tulangan
	2.1.101	Kedondong	Tulangan
	2.1.102	Modong	Tulangan
	2.1.103	Bungurasih	Waru
	2.1.104	Kedungrejo	Waru
	2.1.105	Ngingas	Waru
	2.1.106	Janti	Waru
	2.1.107	Tambak Rejo	Waru
	2.1.108	Brebek	Waru
	2.1.109	Kepuhkiriman	Waru
	2.1.110	Perumahan Deltasari	Waru
	2.1.111	Tambak Oso	Waru
	2.1.112	Jimbaran Kulon	Wonoayu
	2.1.113	Sumberejo	Wonoayu
	2.1.114	Wonoayu	Wonoayu
	2.1.115	Sawo Cangkring	Wonoayu
	2.1.116	Ploso	Wonoayu

(Source: DLHK of Sidoarjo District, 2020)

Each MSW-MS facilities level has their own designated function. Bank Sampah is a facilities provided by DLHK of Sidoarjo district to involve Sidoarjo community as a stakeholder of Sidoarjo district MSW-MS. This involvement aims to raise the awareness of the community that they are also responsible to do a proper MSW processing activities starting from their own household. Bank Sampah does this function through facilitates MSW collection or even pickup in community household and giving a standardized measurement of economic value of the MSW. Meanwhile, TPST is a facilities that provide a simple mechanical or chemical waste processing that aims to exploit the potential economic value of MSW according to its type. The processes commonly done in TPST are composting, reselling, and recycling. And last, TPA is a facilities to accommodate residual MSW, which considered does not have any economic value anymore, and will be processed using controlled or sanitary landfill method. These facilities accommodate daily MSW generated in Sidoarjo district until nowadays. The amount of managed MSW-MS in Sidoarjo district projected by consultant for Sidoarjo District regional policy and strategies (*Kebijakan dan Strategi Daerah* (Jakstrada)), which mainly considers population growth rate and waste production level per person per period as its variable, can be seen through Table 4.2 and 4.3 below.

Table 4.2 Projection of Sidoarjo District MSW Generation Level (Ton/Year) (2017-2019)

Sub-District	Sidoarjo District MSW Generation Level (Ton/Year)		
	2017	2018	2019
Balombangdo	15457	15766	16081
Buduran	20497	20907	21325
Candi	31941	32580	33232
Gedangan	26045	26566	27097
Jabon	11868	12105	12347
Kremlung	14536	14826	15123
Krian	26573	27104	27646
Porong	16894	17232	17577
Prambon	16384	16712	17046
Sedati	21289	21715	22149
Sidoarjo	43999	44879	45776
Sukodono	25075	25577	26089
Taman	45465	46374	47301
Tanggulangin	20779	21194	21618
Tarik	13911	14190	14473
Tulangan	20330	20736	21151
Waru	46835	47772	48727
Wonoayu	17240	17585	17937
Total	435118	443820	452697

(Source: DLHK of Sidoarjo District, 2020)

Table 4.3 Projection of Sidoarjo District MSW Generation Level (Ton/Year) (2020-2025)

Sub-District	Projection of Sidoarjo District MSW Generation Level (Ton/Year)					
	2020	2021	2022	2023	2024	2025
Balombangdo	16403	16731	17066	17407	17755	18110
Buduran	21751	22186	22630	23083	22559	23010
Candi	33897	34574	35266	35971	36691	37424
Gedangan	27639	28192	28756	29331	29918	30516
Jabon	12594	12846	13103	13365	13632	13905
Kremlung	15425	15734	16048	16369	16697	17031
Krian	28199	28763	29338	29925	30524	31134
Porong	17929	18287	18653	19026	19406	19795
Prambon	17387	17735	18089	18451	18820	19196
Sedati	22592	23044	23505	23975	24455	24944
Sidoarjo	46692	47626	48578	49550	50541	51552
Sukodono	26610	27142	27685	28239	28804	29380
Taman	48247	49212	50197	51201	52225	53269
Tanggulangin	22051	22492	22942	23400	23868	24346
Tarik	14763	15058	15359	15666	15980	16299
Tulangan	21574	22006	22446	22895	23352	23819
Waru	49702	50696	51710	52744	53799	54875
Wonoayu	18295	18661	19035	19415	19804	20200
Total	461751	470986	480405	490013	498828	508805

(Source: DLHK of Sidoarjo District, 2020)

These projection of Sidoarjo district MSW generation level become a concern for DLHK of Sidoarjo district as even nowadays the capacity of their MSW facilities and system cannot fulfil the needs of MSW processing in accordance to their current MSW generation level. This problem can be represented through a flow diagram that can be seen in Figure 4.1 and Table 4.4.

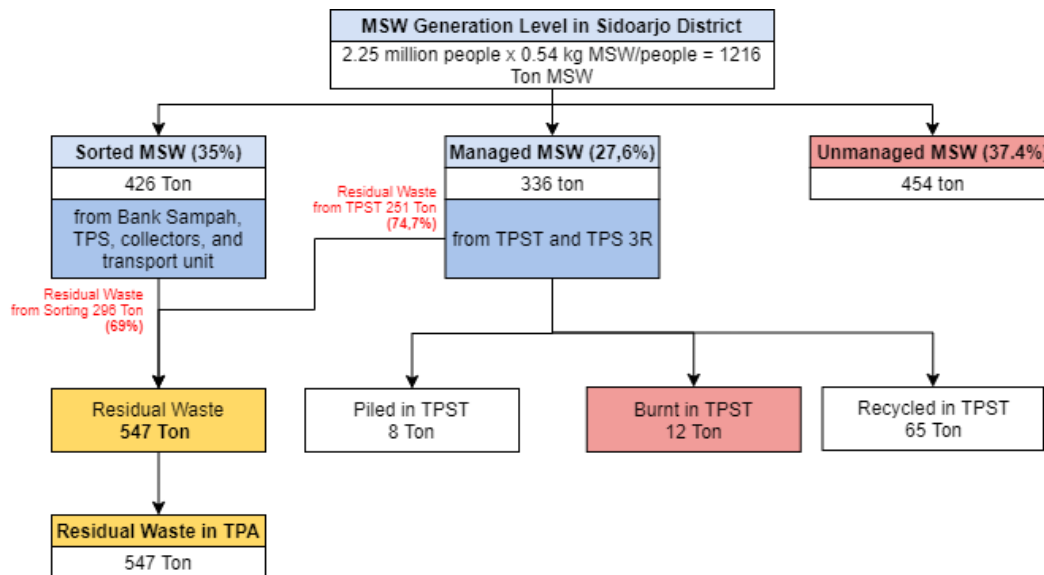


Figure 4.1 Existing Condition of MSW Processing in Sidoarjo District
(Source: DLHK of Sidoarjo District, 2020)

Table 4.4 Existing Condition of MSW Processing in Sidoarjo District

No	Description	MSW Ton	%MSW	Information
1	Bank Sampah, TPS, Collectors, and Transport Unit	426	35%	
1.1	Sorted	132	31%	
1.2	Residual	294	69%	TPA
2	TPST	336	28%	
2.1	Piled	8	2%	
2.2	Burnt	12	4%	
2.3	Recycled	65	19%	
2.4	Residual	251	75%	TPA
3	Unmanaged	455	37%	
Total		1216	100%	

(Source: DLHK of Sidoarjo District, 2020)

The data and information shown in Table 4.3 and 4.4 before acquired from TPST management report and consultant projection with an empirical-based constant used as its base due to limitation infrastructure and equipment used to measure it. Furthermore, the generated MSW in Sidoarjo district can be differentiated into several categories according to SIPSN according to its type which are inorganic and organic one. The organic MSW consists of food and garden waste. Meanwhile, the inorganic MSW consists of textile, paper, rubber, leather, plastic, glass, metal, and other waste. The ratio of it in 2018 can be seen through Table 4.5.

Table 4.5 Sidoarjo District MSW Generation Percentage by Its Type in 2018

Type of MSW	%MSW	%MSW Type
Food Waste	46,54%	61,54% (Organic)
Garden Waste	15%	
Textile Waste	4,80%	
Paper Waste	2,66%	
Rubber & Leather Waste	0,54%	38,46% (Inorganic)
Plastic Waste	0,48%	
Glass Waste	0,25%	
Metal Waste	0,16%	
Other Waste	29,57%	
Total	100,00%	

(Source: SIPSN, 2018)

And last the condition of TPA, as the main facilities to accommodate of MSW generated in Sidoarjo district can be represented through Figure 4.2.

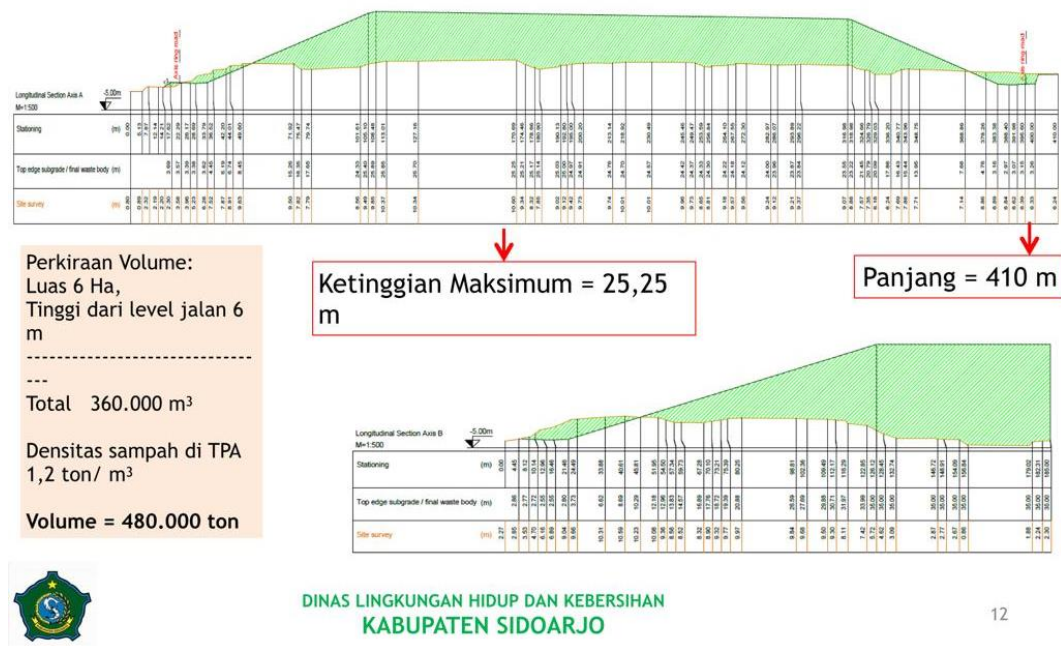


Figure 4.2 Existing Condition of Sidoarjo District's TPA (TPA Jabon)
(Source: DLHK of Sidoarjo District, 2020)

Existing condition in TPA Griyomulyo acquired from a potential landfill mining study done by DLHK of Sidoarjo district with a collaboration with external consultant to get a general or macro measurement of potential waste to be processed in there. This study is done using manual equipment complemented with an empirical constant to represent the existing condition that cannot be captured because of the limitation infrastructure and equipment used to measure it. From this

study, it is found out that the existing condition of TPA located in a dedicated 9.1 ha area located in Jabon sub-district. And over time its capacity will be no longer able to stand Sidoarjo waste generation level with its potential growth rate. Because of that, DLHK of Sidoarjo already made a development plan for their MSW-MS main facilities and system in accordance to their Renja. Their main development plan is to expand the dedicated area for TPA and make a dedicated function to each part of it. Head of DLHK of Sidoarjo district stated that they already prepare approximately 28 ha area to implement this development plan. The detail of its usage are 9.1 ha for existing TPA (controlled landfill), 6.5 ha for sanitary landfill, 2 ha for buffer zone, 2 ha for reserved zone, and 9 ha for innovate MSW processing using advanced alternative technology. All of these data will be used to forecast MSW generation level in Sidoarjo district within the planned time horizon of this research and financial modelling phase.

4.1.2 Supporting Financial Data

Supporting financial data will be used as the base for further calculation process in financial modelling phase. It includes the data of Indonesia Inflation rate target in 2020, historical data of stock market price, and historical data of benchmarked industries.

4.1.2.1 Inflation

Inflation rate target in a nation commonly set by a monetary authority organization called central bank. In Indonesia, this role is done by Bank Indonesia. They set a target level of inflation rate periodically, commonly three years, and maintain its volatility through times by implementing what is known as monetary policy. In the time horizon of this research this inflation rate is set according to Peraturan Menteri Keuangan No. 124/PMK.010/2017 for the period of 2019-2021. For 2020 the inflation target level is targeted at 3% with a deviation of 1%. This target level will be used as a fixed inflation rate during the time horizon of financial modelling and feasibility study.

4.1.2.2 Historical Data of Stock Market Index Price

Historical data of stock market index price in this research will be used to determine market rate of return (R_m) as a part of cost of capital calculation formula. Historical data of stock market index price that will be included in this research are NYA (NYSE) stock exchange as it is represent market condition of benchmarked industry. The historical data that will be included in here is starting from 10 years ago, which is 1 January 2010 until 1 December 2019. There is also a simple calculation to get a monthly rate of return which can done using Formula 4.1 below.

$$\text{Periodical rate of return} = \frac{(\text{Adj Close}_{n+1} - \text{Adj Close}_n)}{\text{Adj Close}_n} \quad (4.1)$$

Where:

n : Initial Period

Hence, it can be calculated as follow for monthly rate of return of NYSE price index in 1 January 2010:

$$\text{Periodical rate of return} = \frac{(\text{Adj Close}_{2010+1} - \text{Adj Close}_{2010})}{\text{Adj Close}_{2010}}$$

$$\text{Periodical rate of return} = \frac{(6884 - 7185)}{7185}$$

$$\text{Periodical rate of return} = -4\%$$

The recapitulation of the historical data of NYSE price index and its implied monthly rate of return can be seen in Table 4.6 below.

Table 4.6 Historical Data of NYSE Stock Market Index Price (2010-2019)

NYSE (Market)							
Date	Open	High	Low	Close	Adj Close	Volume	Return
2009-12-01	7092	7288	7002	7185	7185	83.734.190.000	
2010-01-01	7185	7471	6869	6884	6884	90.947.580.000	-4%
2010-02-01	6884	7112	6632	7035	7035	84.561.340.000	2%
2010-03-01	7035	7498	7035	7448	7448	103.683.550.000	6%
2010-04-01	7448	7744	7437	7474	7474	116.741.910.000	0%
2010-05-01	7474	7560	6452	6792	6792	127.662.780.000	-9%
2010-06-01	6791	7089	6454	6470	6470	110.106.750.000	-5%
2010-07-01	6470	7093	6356	6999	6999	94.778.110.000	8%
2010-08-01	6999	7197	6595	6704	6704	85.738.250.000	-4%
2010-09-01	6704	7377	6704	7281	7281	76.528.290.000	9%

NYSE (Market)							
Date	Open	High	Low	Close	Adj Close	Volume	Return
2010-10-01	7281	7615	7240	7513	7513	90.148.480.000	3%
2010-11-01	7513	7817	7386	7431	7431	87.151.070.000	-1%
2010-12-01	7431	7983	7431	7964	7964	79.698.940.000	7%
2011-01-01	7964	8223	7909	8139	8139	92.164.940.000	2%
2011-02-01	8139	8520	8139	8439	8439	59.223.660.000	4%
2011-03-01	8439	8470	7873	8405	8405	89.507.640.000	0%
2011-04-01	8405	8678	8206	8671	8671	77.364.810.000	3%
2011-05-01	8671	8718	8209	8477	8477	81.708.980.000	-2%
2011-06-01	8477	8477	7901	8319	8319	86.122.730.000	-2%
2011-07-01	8319	8496	8011	8079	8079	81.102.170.000	-3%
2011-08-01	8124	8172	6891	7528	7528	108.419.170.000	-7%
2011-09-01	7528	7585	6641	6792	6792	102.786.820.000	-10%
2011-10-01	6792	7864	6415	7563	7563	98.063.670.000	11%
2011-11-01	7565	7681	6898	7485	7485	84.275.050.000	-1%
2011-12-01	7485	7596	7130	7477	7477	71.765.620.000	0%
2012-01-01	7477	7930	7459	7838	7838	79.567.560.000	5%
2012-02-01	7838	8210	7838	8113	8113	78.385.710.000	4%
2012-03-01	8136	8328	7899	8207	8207	83.899.660.000	1%
2012-04-01	8207	8306	7835	8119	8119	74.761.710.000	-1%
2012-05-01	8115	8212	7387	7464	7464	86.920.490.000	-8%
2012-06-01	7368	7802	7223	7802	7802	76.913.090.000	5%
2012-07-01	7811	7939	7538	7864	7864	73.103.810.000	1%
2012-08-01	7891	8160	7711	8015	8015	70.283.810.000	2%
2012-09-01	8013	8516	7961	8251	8251	69.784.280.000	3%
2012-10-01	8276	8471	8153	8221	8221	71.752.320.000	0%
2012-11-01	8232	8340	7842	8260	8260	71.489.310.000	0%
2012-12-01	8260	8519	8205	8444	8444	66.388.180.000	2%
2013-01-01	8572	8944	8571	8895	8895	75.848.510.000	5%
2013-02-01	8931	9004	8701	8869	8869	69.273.480.000	0%
2013-03-01	8828	9129	8780	9107	9107	68.527.110.000	3%
2013-04-01	9098	9277	8890	9277	9277	77.098.000.000	2%
2013-05-01	9248	9695	9170	9302	9302	76.447.250.000	0%
2013-06-01	9317	9412	8815	9113	9113	74.946.790.000	-2%
2013-07-01	9154	9682	9075	9559	9559	68.106.820.000	5%
2013-08-01	9617	9690	9247	9271	9271	64.802.810.000	-3%
2013-09-01	9358	9906	9296	9621	9621	66.174.410.000	4%
2013-10-01	9624	10128	9442	10010	10010	76.647.400.000	4%
2013-11-01	10010	10230	9910	10183	10183	63.628.190.000	2%
2013-12-01	10174	10407	9926	10400	10400	64.958.820.000	2%
2014-01-01	10353	11335	9908	9968	9968	75.871.910.000	-4%
2014-02-01	9968	10472	9732	10426	10426	69.725.590.000	5%
2014-03-01	10349	10550	10272	10528	10528	71.885.030.000	1%
2014-04-01	10538	10669	10271	10627	10627	71.595.810.000	1%
2014-05-01	10627	10761	10519	10756	10756	63.623.630.000	1%
2014-06-01	10761	11026	10730	10979	10979	63.283.380.000	2%
2014-07-01	11002	11106	10726	10726	10726	66.524.690.000	-2%
2014-08-01	10700	11054	10558	11046	11046	58.131.140.000	3%
2014-09-01	11051	11108	10685	10703	10703	66.706.000.000	-3%
2014-10-01	10689	10846	9886	10845	10845	93.694.040.000	1%
2014-11-01	10834	11068	10705	10955	10955	63.600.190.000	1%
2014-12-01	10933	11009	10360	10839	10839	80.743.820.000	-1%
2015-01-01	10860	10889	10443	10537	10537	77.330.040.000	-3%
2015-02-01	10568	11143	10496	11063	11063	68.775.560.000	5%
2015-03-01	11054	11116	10659	10899	10899	76.675.850.000	-1%
2015-04-01	10906	11249	10834	11050	11050	72.060.940.000	1%
2015-05-01	11075	11255	10961	11056	11056	65.187.730.000	0%
2015-06-01	11082	11171	10769	10805	10805	73.192.620.000	-2%
2015-07-01	10844	11033	10622	10882	10882	77.920.590.000	1%
2015-08-01	10883	10916	9510	10177	10177	84.626.790.000	-6%

NYSE (Market)							
Date	Open	High	Low	Close	Adj Close	Volume	Return
2015-09-01	10177	10362	9565	9800	9800	79.989.370.000	-4%
2015-10-01	9832	10538	9697	10461	10461	85.844.900.000	7%
2015-11-01	10475	10642	10142	10410	10410	75.943.590.000	0%
2015-12-01	10447	10524	9880	10143	10143	83.649.260.000	-3%
2016-01-01	10020	10040	8938	9633	9633	92.409.770.000	-5%
2016-02-01	9579	9683	8944	9560	9560	93.049.560.000	-1%
2016-03-01	9627	10282	9614	10207	10207	92.639.420.000	7%
2016-04-01	10133	10593	10005	10437	10437	81.124.990.000	2%
2016-05-01	10450	10503	10120	10441	10441	75.101.210.000	0%
2016-06-01	10386	10648	9919	10490	10490	86.852.700.000	0%
2016-07-01	10495	10815	10308	10786	10786	69.530.250.000	3%
2016-08-01	10769	10892	10619	10765	10765	75.610.310.000	0%
2016-09-01	10762	10904	10488	10722	10722	77.270.240.000	0%
2016-10-01	10722	10722	10426	10482	10482	73.196.630.000	-2%
2016-11-01	10508	10890	10281	10838	10838	88.299.760.000	3%
2016-12-01	10860	11688	10813	11057	11057	75.251.240.000	2%
2017-01-01	11139	11345	11094	11223	11223	70.483.180.000	2%
2017-02-01	11245	11590	11172	11512	11512	69.162.420.000	3%
2017-03-01	11593	11687	11325	11493	11493	81.547.770.000	0%
2017-04-01	11495	11653	11325	11536	11536	65.265.670.000	0%
2017-05-01	11550	11667	11375	11598	11598	72.244.930.000	1%
2017-06-01	11616	11838	11603	11762	11762	77.145.350.000	1%
2017-07-01	11801	11990	11685	11968	11968	63.169.400.000	2%
2017-08-01	12007	12020	11671	11876	11876	70.616.030.000	-1%
2017-09-01	11898	12209	11784	12209	12209	66.337.980.000	3%
2017-10-01	12209	12444	12200	12341	12341	70.871.570.000	1%
2017-11-01	12384	12674	12179	12628	12628	73.173.260.000	2%
2017-12-01	12637	12886	12464	12809	12809	65.251.190.000	1%
2018-01-01	12861	13637	12842	13368	13368	76.850.120.000	4%
2018-02-01	13339	13415	12049	12653	12653	79.579.410.000	-5%
2018-03-01	12644	12963	12167	12452	12452	76.369.800.000	-2%
2018-04-01	12433	12774	12108	12515	12515	69.648.590.000	1%
2018-05-01	12490	12853	12256	12527	12527	75.617.280.000	0%
2018-06-01	12597	12889	12377	12504	12504	77.439.710.000	0%
2018-07-01	12431	12989	12401	12963	12963	64.542.170.000	4%
2018-08-01	12950	13148	12648	13017	13017	69.238.220.000	0%
2018-09-01	12976	13262	12873	13083	13083	62.492.080.000	1%
2018-10-01	13146	13176	11820	12208	12208	91.327.930.000	-7%
2018-11-01	12208	12682	12016	12458	12458	80.080.110.000	2%
2018-12-01	12610	12625	10724	11374	11374	78.342.100.000	-9%
2019-01-01	11239	12315	11169	12299	12299	80.399.630.000	8%
2019-02-01	12312	12770	12187	12645	12645	70.183.430.000	3%
2019-03-01	12698	12855	12336	12697	12697	78.596.280.000	0%
2019-04-01	12776	13067	12774	13061	13061	69.604.840.000	3%
2019-05-01	13066	13069	12238	12264	12264	76.860.120.000	-6%
2019-06-01	12289	13096	12273	13050	13050	70.881.390.000	6%
2019-07-01	13050	13255	12979	13067	13067	70.349.470.000	0%
2019-08-01	13054	13154	12326	12737	12737	79.599.440.000	-3%
2019-09-01	12720	13178	12601	13005	13005	73.992.330.000	2%
2019-10-01	13002	13249	12482	13172	13172	77.564.550.000	1%
2019-11-01	13231	13611	13231	13545	13545	72.179.920.000	3%
2019-12-01	13554	13979	13280	13913	13913	72.054.000.000	3%

(Source: finance.yahoo.com, 2020)

Beginning and end value of these specific time horizon for NYSE stock market index price will be used as the input for R_m calculation and levered beta of

the benchmarked industry as a part of cost of capital calculation of the proposed industry.

4.1.2.3 Historical Data of Benchmarking Industry Stock Price and Debt-to-Equity Ratio (DER)

Historical data of benchmarking industry stock price will be used to determine beta value as a part of cost capital determination of the proposed industry. Benchmarking industry in this research determined in accordance to the type of service the business offer as its main business process and it must be similar to the proposed industry in this research. Hence, there are three selected benchmarking industry from NYA (NYSE) market in U.S.A. which are Clean Harbors Inc. (CLH), Covanta Holding Corporation (CVA), and Republic Services Inc. (RSG). These benchmarking industry selected from foreign market, which is NYSE, outside of Indonesia as there is a limitation on stock price data availability of similar industry in Indonesia stock market. The acquired initial data from this data is levered beta, DER, and unlevered beta from each benchmarking industry. The average of the unlevered beta will be used as the input for determine the levered beta of the proposed industry. The stock price and DER for each benchmarking industry from 2010 until 2019 can be seen in detail below.

1. Clean Harbors Inc. (CLH)

CLH stock price, its implied monthly rate of return, and DER data from 2010 until 2019 can be seen in Table 4.7 until Table 4.9 below.

Table 4.7 Historical Data of Clean Harbors Inc. Stock Price (2010-2019)

Clean Harbors Inc. (CLH)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2009-12-01	27	30	26	30	30	7.132.000	
2010-01-01	30	33	28	29	29	5.886.400	-4%
2010-02-01	29	30	26	28	28	7.394.400	-1%
2010-03-01	28	29	28	28	28	7.223.800	-2%
2010-04-01	28	32	27	32	32	10.578.200	14%
2010-05-01	33	35	29	32	32	32.053.200	0%
2010-06-01	32	36	31	33	33	18.187.400	5%
2010-07-01	33	34	30	32	32	12.551.000	-5%
2010-08-01	32	33	29	30	30	14.404.600	-4%
2010-09-01	31	35	30	34	34	10.910.200	12%
2010-10-01	34	36	33	35	35	7.089.200	4%
2010-11-01	35	38	35	37	37	8.816.400	5%
2010-12-01	37	43	37	42	42	7.077.400	14%
2011-01-01	42	46	40	45	45	7.532.600	7%
2011-02-01	45	48	44	46	46	6.468.800	2%

Clean Harbors Inc. (CLH)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2011-03-01	46	51	44	49	49	9.798.600	7%
2011-04-01	50	53	47	49	49	8.226.200	0%
2011-05-01	49	53	48	51	51	7.895.600	3%
2011-06-01	51	52	47	52	52	8.083.000	2%
2011-07-01	52	57	51	53	53	8.022.600	2%
2011-08-01	53	59	46	54	54	15.915.100	2%
2011-09-01	54	57	50	51	51	10.443.500	-5%
2011-10-01	51	60	45	58	58	9.508.900	14%
2011-11-01	56	60	54	60	60	9.411.200	3%
2011-12-01	60	65	57	64	64	6.614.100	6%
2012-01-01	65	66	60	63	63	5.572.200	0%
2012-02-01	64	72	63	67	67	6.432.200	6%
2012-03-01	67	70	65	67	67	7.264.900	0%
2012-04-01	67	69	63	68	68	8.962.100	1%
2012-05-01	68	69	59	62	62	10.237.600	-9%
2012-06-01	61	61	54	56	56	14.796.800	-9%
2012-07-01	57	62	55	61	61	8.063.300	7%
2012-08-01	61	61	54	54	54	11.113.300	-10%
2012-09-01	54	55	48	49	49	10.496.700	-10%
2012-10-01	49	62	47	58	58	11.094.600	19%
2012-11-01	59	61	55	57	57	16.444.000	-2%
2012-12-01	57	58	51	55	55	11.592.800	-4%
2013-01-01	56	59	54	56	56	11.739.800	1%
2013-02-01	56	57	50	52	52	18.650.700	-7%
2013-03-01	51	60	48	58	58	13.597.700	13%
2013-04-01	60	61	54	57	57	11.066.300	-2%
2013-05-01	56	60	51	57	57	10.348.400	0%
2013-06-01	57	57	50	51	51	10.728.500	-12%
2013-07-01	51	57	50	56	56	9.670.400	12%
2013-08-01	57	58	50	57	57	12.024.600	1%
2013-09-01	57	60	54	59	59	9.567.900	3%
2013-10-01	59	64	57	62	62	8.222.800	5%
2013-11-01	62	62	52	53	53	14.979.900	-15%
2013-12-01	53	60	52	60	60	11.885.700	14%
2014-01-01	60	60	56	56	56	11.751.300	-6%
2014-02-01	56	56	45	47	47	21.381.800	-16%
2014-03-01	47	56	47	55	55	17.226.500	16%
2014-04-01	54	64	52	60	60	17.059.000	10%
2014-05-01	59	62	59	61	61	11.911.600	2%
2014-06-01	61	64	60	64	64	7.478.200	5%
2014-07-01	65	66	58	58	58	9.754.600	-10%
2014-08-01	58	61	57	61	61	8.299.000	5%
2014-09-01	61	61	54	54	54	9.162.700	-11%
2014-10-01	54	54	46	50	50	18.396.000	-8%
2014-11-01	50	50	43	47	47	16.788.400	-6%
2014-12-01	47	51	44	48	48	20.194.400	3%
2015-01-01	48	49	45	47	47	16.563.800	-2%
2015-02-01	48	58	47	56	56	13.564.800	18%
2015-03-01	56	58	54	57	57	10.890.800	2%
2015-04-01	57	59	54	55	55	7.891.400	-3%
2015-05-01	56	58	51	56	56	8.983.100	2%
2015-06-01	56	57	53	54	54	7.139.900	-5%
2015-07-01	54	54	46	50	50	10.878.300	-8%
2015-08-01	49	54	45	49	49	10.375.900	-1%
2015-09-01	48	50	43	44	44	7.176.100	-10%
2015-10-01	44	48	43	46	46	10.827.900	6%
2015-11-01	46	47	41	43	43	12.921.200	-7%
2015-12-01	44	44	40	42	42	8.975.400	-4%
2016-01-01	41	44	38	44	44	11.584.200	6%

Clean Harbors Inc. (CLH)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2016-02-01	44	45	37	43	43	13,210,500	-4%
2016-03-01	43	50	43	49	49	9,376,700	16%
2016-04-01	49	51	47	49	49	9,066,300	0%
2016-05-01	49	52	46	51	51	8,072,800	4%
2016-06-01	51	55	49	52	52	8,241,500	1%
2016-07-01	52	54	51	51	51	5,509,600	-1%
2016-08-01	52	52	48	48	48	6,508,300	-7%
2016-09-01	48	48	45	48	48	7,093,000	0%
2016-10-01	48	49	45	47	47	6,239,800	-1%
2016-11-01	47	53	43	53	53	10,821,600	12%
2016-12-01	53	58	53	56	56	9,084,700	5%
2017-01-01	56	57	53	56	56	8,644,200	0%
2017-02-01	56	58	53	58	58	7,890,300	4%
2017-03-01	59	59	53	56	56	7,586,700	-4%
2017-04-01	56	59	54	58	58	5,800,900	4%
2017-05-01	58	62	56	58	58	5,858,300	1%
2017-06-01	59	60	53	56	56	6,823,900	-4%
2017-07-01	56	58	54	57	57	4,054,400	2%
2017-08-01	57	58	50	54	54	7,618,800	-5%
2017-09-01	54	57	54	57	57	6,134,000	5%
2017-10-01	57	58	52	54	54	5,403,600	-6%
2017-11-01	56	56	51	52	52	10,520,600	-3%
2017-12-01	54	55	52	54	54	6,689,600	4%
2018-01-01	54	58	53	55	55	5,777,800	2%
2018-02-01	55	56	47	50	50	7,144,900	-10%
2018-03-01	48	54	47	49	49	6,913,500	-2%
2018-04-01	49	50	46	46	46	8,853,300	-6%
2018-05-01	46	54	45	53	53	10,266,900	16%
2018-06-01	53	56	52	56	56	7,404,500	5%
2018-07-01	55	58	55	57	57	6,511,000	2%
2018-08-01	58	69	57	69	69	10,311,800	20%
2018-09-01	69	73	68	72	72	8,924,800	4%
2018-10-01	72	72	61	68	68	10,820,800	-5%
2018-11-01	68	68	63	65	65	7,923,000	-5%
2018-12-01	65	66	46	49	49	12,295,100	-24%
2019-01-01	49	60	48	59	59	12,031,900	20%
2019-02-01	59	69	56	68	68	8,616,000	15%
2019-03-01	68	72	66	72	72	9,681,900	5%
2019-04-01	72	76	71	76	76	9,165,600	6%
2019-05-01	77	77	63	64	64	8,109,000	-16%
2019-06-01	64	71	64	71	71	5,388,000	11%
2019-07-01	72	78	68	78	78	6,182,300	9%
2019-08-01	78	80	71	74	74	8,311,100	-5%
2019-09-01	73	78	72	77	77	6,085,500	5%
2019-10-01	78	86	71	82	82	6,769,500	7%
2019-11-01	82	86	81	83	83	6,605,500	0%
2019-12-01	83	88	82	86	86	6,554,100	4%

(Source: finance.yahoo.com, 2020)

Table 4.8 Historical Data of Clean Harbors Inc. DER (2010-2014)

CLH	2010	2011	2012	2013	2014
Total Liabilities	\$ 821.648	\$ 1,184.816	\$ 2,393.734	\$ 2,478.039	\$ 2,441.407
Total Equity	\$ 780.827	\$ 900.987	\$ 1,432.072	\$ 1,475.639	\$ 1,262.871
DER	1,05	1,32	1,67	1,68	1,93

(Source: <https://www.clh.es>, 2020)

Table 4.9 Historical Data of Clean Harbors Inc. DER (2015-2019)

CLH	2015	2016	2017	2018	2019
Total Liabilities	\$ 2.335.146	\$ 2.597.679	\$ 2.518.368	\$ 2.568.565	\$ 2.839.091
Total Equity	\$ 1.096.282	\$ 1.084.241	\$ 1.188.202	\$ 1.169.756	\$ 1.269.813
DER	2,13	2,40	2,12	2,20	2,24

(Source: <https://www.clh.es>, 2020)

2. Covanta Holding Corporation (CVA)

CVA stock price, its implied monthly rate of return, and DER data from 2010 until 2019 can be seen in Table 4.10 until Table 4.12 below.

Table 4.10 Historical Data of Covanta Holding Corporation Stock Price (2010-2019)

Covanta Holding Corporation (CVA)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2009-12-01	17	18	17	18	10	22.944.400	
2010-01-01	18	20	17	18	10	26.137.000	-2%
2010-02-01	18	18	16	17	9	35.355.600	-4%
2010-03-01	17	18	16	17	9	34.955.100	-1%
2010-04-01	17	18	17	17	10	37.819.200	5%
2010-05-01	18	18	15	15	9	39.748.700	-12%
2010-06-01	15	19	14	17	9	58.780.600	8%
2010-07-01	17	17	15	15	8	35.061.400	-9%
2010-08-01	15	15	13	14	9	22.797.600	5%
2010-09-01	15	16	15	16	10	23.444.700	9%
2010-10-01	16	16	15	16	10	15.778.300	0%
2010-11-01	16	16	15	16	10	19.230.700	0%
2010-12-01	16	18	16	17	11	21.386.900	9%
2011-01-01	17	17	17	17	10	21.299.500	-2%
2011-02-01	17	18	16	17	10	29.337.400	0%
2011-03-01	17	17	16	17	10	24.568.300	1%
2011-04-01	17	18	16	17	11	25.608.000	1%
2011-05-01	17	17	16	17	10	25.976.200	-1%
2011-06-01	17	17	16	16	10	21.843.300	-3%
2011-07-01	17	18	16	17	11	18.883.800	5%
2011-08-01	17	18	14	16	10	39.732.900	-5%
2011-09-01	17	17	13	15	9	29.244.900	-7%
2011-10-01	15	16	13	15	9	33.161.800	-3%
2011-11-01	14	15	14	15	9	20.737.300	2%
2011-12-01	15	15	13	14	8	27.366.000	-8%
2012-01-01	14	14	13	14	9	16.798.200	5%
2012-02-01	14	17	14	16	10	23.190.800	14%
2012-03-01	16	17	16	16	10	14.754.300	-1%
2012-04-01	16	16	16	16	10	13.145.200	0%
2012-05-01	16	16	16	16	10	15.373.600	-3%
2012-06-01	16	17	15	17	11	14.800.500	10%
2012-07-01	17	17	16	17	11	15.673.400	1%
2012-08-01	17	18	17	17	11	10.930.400	0%
2012-09-01	17	18	17	17	11	9.948.400	0%
2012-10-01	17	18	17	18	12	12.818.200	6%
2012-11-01	18	19	17	19	12	15.108.400	6%
2012-12-01	19	19	18	18	12	12.735.700	-2%
2013-01-01	19	20	18	20	13	23.173.300	8%
2013-02-01	20	20	19	20	13	20.379.000	-1%
2013-03-01	20	20	19	20	13	9.871.900	3%
2013-04-01	20	20	19	20	13	24.098.300	0%
2013-05-01	20	21	20	20	13	23.584.700	2%

Covanta Holding Corporation (CVA)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2013-06-01	20	21	19	20	13	20.269.300	-2%
2013-07-01	20	21	20	21	14	19.031.900	5%
2013-08-01	21	22	21	21	14	13.843.400	2%
2013-09-01	21	22	21	21	14	14.593.100	1%
2013-10-01	21	22	17	17	11	83.841.200	-19%
2013-11-01	17	19	17	18	12	61.380.900	4%
2013-12-01	18	18	17	18	12	35.050.300	-1%
2014-01-01	18	18	17	18	12	24.963.600	2%
2014-02-01	18	19	17	18	12	39.172.600	0%
2014-03-01	18	18	16	18	12	42.196.300	0%
2014-04-01	18	19	17	18	13	47.642.000	3%
2014-05-01	18	19	18	19	13	45.537.300	3%
2014-06-01	19	21	19	21	14	33.664.200	8%
2014-07-01	21	21	20	20	14	30.756.700	0%
2014-08-01	20	21	20	21	14	18.545.700	3%
2014-09-01	21	22	21	21	15	27.794.400	1%
2014-10-01	21	22	21	22	15	38.868.900	5%
2014-11-01	22	25	22	25	17	34.530.200	14%
2014-12-01	25	25	21	22	15	33.211.400	-12%
2015-01-01	22	22	20	20	14	16.440.600	-6%
2015-02-01	20	22	19	22	15	18.926.200	6%
2015-03-01	22	23	21	22	16	16.538.900	4%
2015-04-01	22	23	20	20	14	12.885.500	-8%
2015-05-01	20	23	20	22	16	16.812.200	9%
2015-06-01	22	23	21	21	15	13.846.800	-4%
2015-07-01	21	22	19	20	14	25.970.000	-6%
2015-08-01	20	21	19	20	14	21.065.600	0%
2015-09-01	20	20	17	17	13	16.670.700	-12%
2015-10-01	17	18	16	17	12	24.211.500	-3%
2015-11-01	17	17	15	16	12	19.976.800	-4%
2015-12-01	16	17	14	15	11	37.720.800	-4%
2016-01-01	15	16	12	14	10	24.553.600	-7%
2016-02-01	14	14	13	14	10	27.710.900	-1%
2016-03-01	14	18	14	17	12	27.907.600	21%
2016-04-01	17	17	16	16	12	18.175.500	-2%
2016-05-01	16	17	16	17	13	20.353.500	3%
2016-06-01	17	17	16	16	12	21.481.500	-1%
2016-07-01	16	17	16	16	12	17.937.100	-1%
2016-08-01	16	16	15	15	11	18.390.400	-7%
2016-09-01	15	15	14	15	12	17.906.300	3%
2016-10-01	15	15	14	15	12	20.108.500	-1%
2016-11-01	15	15	13	15	11	28.869.500	-3%
2016-12-01	15	16	14	16	12	36.366.400	7%
2017-01-01	16	16	15	16	13	20.761.300	5%
2017-02-01	16	17	15	16	13	21.372.900	1%
2017-03-01	16	16	15	16	12	22.598.400	-3%
2017-04-01	16	16	14	15	12	20.698.700	-6%
2017-05-01	15	15	14	15	12	22.858.500	1%
2017-06-01	15	15	13	13	11	36.088.800	-11%
2017-07-01	13	15	13	15	12	28.112.900	16%
2017-08-01	15	15	14	14	12	26.903.900	-5%
2017-09-01	14	15	14	15	12	17.288.500	3%
2017-10-01	15	16	15	16	14	23.532.600	12%
2017-11-01	16	16	15	16	13	23.192.700	-3%
2017-12-01	15	17	15	17	14	21.069.900	9%
2018-01-01	17	17	16	16	14	15.306.900	-2%
2018-02-01	16	17	14	15	13	19.492.400	-9%
2018-03-01	15	16	14	15	12	20.394.800	-3%
2018-04-01	14	17	14	15	13	17.717.000	5%

Covanta Holding Corporation (CVA)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2018-05-01	15	17	15	16	14	20,036,100	9%
2018-06-01	16	17	16	17	14	13,479,700	1%
2018-07-01	16	18	16	18	16	14,154,000	11%
2018-08-01	18	18	17	18	16	11,509,400	-2%
2018-09-01	18	18	16	16	14	12,351,000	-8%
2018-10-01	16	16	14	15	13	19,631,600	-8%
2018-11-01	15	17	15	17	15	12,353,500	13%
2018-12-01	17	17	13	13	12	19,807,200	-19%
2019-01-01	13	16	13	16	15	15,054,200	22%
2019-02-01	16	18	16	17	16	19,053,800	5%
2019-03-01	17	18	16	17	16	16,197,000	2%
2019-04-01	17	18	17	18	17	13,862,500	6%
2019-05-01	18	18	17	17	16	12,296,800	-7%
2019-06-01	17	18	17	18	17	12,824,100	6%
2019-07-01	18	18	16	17	16	15,073,300	-2%
2019-08-01	17	17	16	17	16	12,216,100	0%
2019-09-01	17	18	17	17	16	11,678,800	1%
2019-10-01	17	18	14	14	14	28,445,700	-15%
2019-11-01	15	15	14	15	14	15,839,900	2%
2019-12-01	15	15	14	15	14	14,137,300	1%

(Source: finance.yahoo.com, 2020)

Table 4.11 Historical Data of Covanta Holding Corporation DER (2010-2014)

CVA	2010	2011	2012	2013	2014
Total Liabilities (in mil)	\$ 3.516	\$ 3.297	\$ 3.471	\$ 3.467	\$ 3.420
Total Equity (in mil)	\$ 1.160	\$ 1.088	\$ 1.055	\$ 911	\$ 784
DER	3,03	3,03	3,29	3,81	4,36

(Source: annualreports.com, 2020)

Table 4.12 Historical Data of Covanta Holding Corporation DER (2015-2019)

CVA	2015	2016	2017	2018	2019
Total Liabilities (in mil)	\$ 3.619	\$ 3.815	\$ 4.014	\$ 3.356	\$ 3.339
Total Equity (in mil)	\$ 640	\$ 469	\$ 427	\$ 487	\$ 376
DER	5,65	8,13	9,40	6,89	8,88

(Source: annualreports.com, 2020)

3. Republic Services Inc. (RSG)

RSG stock price, its implied monthly rate of return and DER data from 2010 until 2019 can be seen in Table 4.13 until Table 4.15 below

Table 4.13 Historical Data of Republic Services Inc. Stock Price (2010-2019)

Republic Services Inc. (RSG)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2009-12-01	29	30	28	28	21	39,527,300	
2010-01-01	29	29	27	27	20	33,858,900	-4%
2010-02-01	27	28	25	28	21	48,307,400	5%
2010-03-01	28	30	28	29	22	57,957,200	3%
2010-04-01	29	31	29	31	24	53,280,300	8%
2010-05-01	31	32	28	29	22	67,074,400	-6%
2010-06-01	29	32	28	30	23	60,454,900	2%
2010-07-01	30	33	29	32	25	52,264,000	8%
2010-08-01	32	33	29	29	23	58,184,700	-8%

Republic Services Inc. (RSG)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2010-09-01	30	32	30	30	24	64.700.800	4%
2010-10-01	31	32	30	30	23	60.080.200	-2%
2010-11-01	30	30	28	28	22	76.710.200	-6%
2010-12-01	28	31	28	30	23	62.313.300	6%
2011-01-01	30	32	29	31	24	42.427.000	4%
2011-02-01	30	31	29	30	23	66.198.400	-4%
2011-03-01	30	30	28	30	24	73.948.700	1%
2011-04-01	30	32	29	32	25	47.886.800	6%
2011-05-01	32	33	31	32	25	58.342.100	0%
2011-06-01	31	32	30	31	24	47.179.700	-2%
2011-07-01	31	32	28	29	23	47.719.200	-5%
2011-08-01	29	31	25	30	24	109.221.700	5%
2011-09-01	30	31	26	28	22	63.418.900	-8%
2011-10-01	28	30	26	28	23	61.026.300	2%
2011-11-01	28	28	26	27	22	59.244.100	-4%
2011-12-01	27	28	26	28	22	60.814.300	0%
2012-01-01	28	29	27	29	24	48.927.800	7%
2012-02-01	30	30	29	30	24	49.298.100	2%
2012-03-01	30	31	29	31	25	34.305.300	2%
2012-04-01	31	31	27	27	22	54.823.700	-10%
2012-05-01	27	28	25	26	21	70.393.800	-4%
2012-06-01	26	27	25	26	22	55.011.200	0%
2012-07-01	26	29	26	29	24	62.429.800	10%
2012-08-01	29	29	27	28	23	38.075.300	-4%
2012-09-01	28	29	27	28	23	51.112.800	-1%
2012-10-01	28	29	27	28	23	31.601.100	4%
2012-11-01	28	29	26	28	24	65.059.900	0%
2012-12-01	29	30	28	29	24	33.643.900	3%
2013-01-01	30	32	29	32	27	34.164.900	10%
2013-02-01	32	32	30	31	26	43.908.400	-1%
2013-03-01	31	33	31	33	28	31.296.600	5%
2013-04-01	33	35	32	34	29	36.078.600	4%
2013-05-01	34	35	34	34	29	36.500.200	0%
2013-06-01	34	35	33	34	29	33.490.000	0%
2013-07-01	34	36	33	34	29	27.490.200	1%
2013-08-01	34	35	32	33	27	27.290.500	-4%
2013-09-01	33	34	32	33	28	34.223.600	3%
2013-10-01	33	34	32	33	29	35.436.700	1%
2013-11-01	34	35	34	35	30	27.254.300	4%
2013-12-01	35	35	32	33	28	31.497.500	-5%
2014-01-01	33	33	32	32	28	48.322.300	-3%
2014-02-01	32	34	31	34	29	42.366.800	6%
2014-03-01	34	35	33	34	29	31.138.200	0%
2014-04-01	34	35	34	35	30	29.167.500	4%
2014-05-01	35	35	34	35	31	22.766.400	1%
2014-06-01	35	38	35	38	33	31.880.000	7%
2014-07-01	38	38	37	38	33	36.445.500	1%
2014-08-01	38	40	38	39	34	33.725.200	4%
2014-09-01	39	40	39	39	34	35.552.600	-1%
2014-10-01	39	40	37	38	34	41.703.200	-1%
2014-11-01	38	40	38	40	35	30.564.900	3%
2014-12-01	39	41	38	40	35	36.205.600	2%
2015-01-01	40	42	40	40	35	31.094.800	-1%
2015-02-01	40	41	39	41	36	27.734.000	3%
2015-03-01	41	42	40	41	36	34.888.700	-1%
2015-04-01	40	41	39	41	36	34.629.600	1%
2015-05-01	41	41	39	40	36	32.499.700	-1%
2015-06-01	40	41	39	39	35	27.218.400	-3%
2015-07-01	39	43	39	43	38	32.461.200	9%

Republic Services Inc. (RSG)							
Date	Open	High	Low	Close	Adj. Close	Volume	Return
2015-08-01	43	44	39	41	37	33.464.300	-4%
2015-09-01	40	42	40	41	37	36.106.100	1%
2015-10-01	41	45	41	44	39	31.230.000	7%
2015-11-01	44	45	43	44	40	28.888.100	0%
2015-12-01	44	45	43	44	40	35.818.300	0%
2016-01-01	43	45	42	44	40	47.818.400	1%
2016-02-01	43	47	43	46	42	36.977.100	5%
2016-03-01	46	49	46	48	44	35.778.500	4%
2016-04-01	48	48	46	47	43	35.896.200	-1%
2016-05-01	47	49	47	48	44	28.364.800	3%
2016-06-01	48	51	48	51	47	28.294.300	6%
2016-07-01	51	53	51	51	47	24.435.500	1%
2016-08-01	51	52	50	51	47	27.193.900	-1%
2016-09-01	51	52	49	50	47	27.788.700	0%
2016-10-01	50	53	49	53	49	28.566.100	5%
2016-11-01	52	56	51	55	52	31.035.700	5%
2016-12-01	55	58	55	57	53	23.606.700	3%
2017-01-01	57	58	56	57	54	23.004.100	1%
2017-02-01	57	62	57	62	58	27.662.800	8%
2017-03-01	62	64	62	63	59	28.928.400	1%
2017-04-01	63	64	62	63	59	22.604.500	1%
2017-05-01	63	64	61	64	60	30.022.900	1%
2017-06-01	64	65	63	64	60	21.488.500	0%
2017-07-01	64	66	63	64	61	16.557.000	1%
2017-08-01	64	65	64	65	61	19.574.600	1%
2017-09-01	65	67	64	66	63	18.705.500	2%
2017-10-01	66	67	62	65	62	30.200.400	-1%
2017-11-01	65	65	62	65	62	26.802.200	0%
2017-12-01	65	68	64	68	64	26.818.600	4%
2018-01-01	68	69	66	69	66	37.274.900	2%
2018-02-01	69	69	60	67	64	41.703.000	-2%
2018-03-01	67	69	65	66	63	45.213.200	-1%
2018-04-01	66	68	64	65	62	33.587.800	-2%
2018-05-01	65	69	64	67	65	31.539.600	4%
2018-06-01	68	70	68	68	66	30.369.900	1%
2018-07-01	68	73	68	72	70	30.342.300	7%
2018-08-01	73	75	72	73	71	30.742.600	1%
2018-09-01	73	76	72	73	70	22.349.000	-1%
2018-10-01	73	73	67	73	71	32.613.300	1%
2018-11-01	73	77	71	77	75	33.754.100	6%
2018-12-01	78	79	69	72	70	39.096.800	-7%
2019-01-01	71	77	70	77	75	26.024.000	7%
2019-02-01	77	79	75	78	77	26.356.000	2%
2019-03-01	79	81	77	80	79	25.261.800	2%
2019-04-01	81	83	76	83	81	27.666.800	4%
2019-05-01	83	85	81	85	83	23.730.100	2%
2019-06-01	85	88	84	87	85	20.027.400	2%
2019-07-01	87	91	86	89	87	19.207.300	3%
2019-08-01	89	91	86	89	88	23.957.200	1%
2019-09-01	89	90	85	87	85	22.512.000	-3%
2019-10-01	87	89	84	88	87	21.848.100	2%
2019-11-01	88	89	85	89	88	18.756.800	1%
2019-12-01	89	90	87	90	89	20.314.000	1%

(Source: finance.yahoo.com, 2020)

Table 4.14 Historical Data of Republic Services Inc. DER (2010-2014)

RSG	2010	2011	2012	2013	2014
Total Liabilities (in mil)	\$ 11.613	\$ 11.868	\$ 11.911	\$ 12.043	\$ 12.346

RSG	2010	2011	2012	2013	2014
Total Equity (in mil)	\$ 7.849	\$ 7.683	\$ 7.706	\$ 7.906	\$ 7.748
DER	1,48	1,54	1,55	1,52	1,59

(Source: annualreports.com, 2020)

Table 4.15 Historical Data of Republic Services Inc. DER (2015-2019)

RSG	2015	2016	2017	2018	2019
Total Liabilities (in mil)	\$ 12.801	\$ 12.936	\$ 13.186	\$ 13.688	\$ 14.563
Total Equity (in mil)	\$ 7.777	\$ 7.694	\$ 7.961	\$ 7.930	\$ 8.121
DER	1,65	1,68	1,66	1,73	1,79

(Source: annualreports.com, 2020)

4.1.3 Initial Data Formulation

In initial data formulation there will be a basic calculation and assumption that will be used as the base for financial modelling and feasibility study. It includes planning horizon determination, WACC calculation, and financial model micro and macro assumption determination.

4.1.3.1 Planning Horizon Determination

Planning horizon is the assumption of time horizon used in the financial modelling and feasibility study process. In this research the planning horizon is divided into two which are construction and operation phase. Its determination follows a previous research of Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration: Waste to Energy Power Plant Project for Bali Province in Indonesia. In this research, construction phase is assumed to take 5 years to complete starting from 2021; and operation phase is assumed to be started from 2026 until 2075. In the initial 5 years of operation phase the capacity of the plant is assumed not to be utilized fully; it started with 50% capacity in 2026 and will increase by 10% for each year.

4.1.3.2 WACC Calculation

WACC calculation in this research is done by considering two components which are cost of equity and cost of debt. The formula that shows their mathematical relation can be seen in Formula 2.13, and also can be seen below.

$$WACC = \left(\frac{E}{E + D} \right) R_E + \left(\frac{D}{E + D} \right) R_D$$

Where,

- WACC : Weighted Average Cost of Capital
- E : Amount of Capital Sourced from Equity
- D : Amount of Capital Sourced from Debt
- R_E : Cost of Equity
- R_D : Cost of Debt

The first calculation in here is Cost of equity (R_E) calculation. It will be calculated using CAPM approach as can be seen in Formula 2.10, and also can be seen below.

$$R_E = R_f + \beta i(R_m - R_f)$$

Where,

- R_E : Cost of equity
- R_f : Risk Free Rate
- R_m : Market Return
- R_m-R_f : Market Risk Premium
- β : Un-diversifiable Risk of Stock Relative to Market Return

In this research, NYSE market price index used as the base for most of cost of capital calculation as the benchmarked industry listed in there. Hence, risk free rate (R_f) also acquired NYSE standard which is from US 3 month treasury bill at the rate of 2.35%. Meanwhile, beta (β) calculation for the proposed industry started with the calculation of levered beta and average DER for each benchmarked industry. Average DER calculated using average function in Ms. Excel software. Meanwhile, levered β calculated using slope function in Ms. Excel software with the y-axis is the return rate per period of stock price (corporate return) and x-axis is the return rate per period of market index price (market return). The example of the calculation can be seen through Table 4.16 below.

Table 4.16 Levered Beta Calculation Example of Clean Harbors Inc.

Date	Corporate Return (CLH)	Market Return (NYA)
2010-01-01	-4%	-4%
2010-02-01	-1%	2%

Date	Corporate Return (CLH)	Market Return (NYA)
2010-03-01	-2%	6%
2010-04-01	14%	0%
2010-05-01	0%	-9%
2010-06-01	5%	-5%
2010-07-01	-5%	8%
2010-08-01	-4%	-4%
2010-09-01	12%	9%
2010-10-01	4%	3%
2010-11-01	5%	-1%
2010-12-01	14%	7%
2011-01-01	7%	2%
2011-02-01	2%	4%
2011-03-01	7%	0%
2011-04-01	0%	3%
2011-05-01	3%	-2%
2011-06-01	2%	-2%
2011-07-01	2%	-3%
2011-08-01	2%	-7%
2011-09-01	-5%	-10%
2011-10-01	14%	11%
2011-11-01	3%	-1%
2011-12-01	6%	0%
2012-01-01	0%	5%
2012-02-01	6%	4%
2012-03-01	0%	1%
2012-04-01	1%	-1%
2012-05-01	-9%	-8%
2012-06-01	-9%	5%
2012-07-01	7%	1%
2012-08-01	-10%	2%
2012-09-01	-10%	3%
2012-10-01	19%	0%
2012-11-01	-2%	0%
2012-12-01	-4%	2%
2013-01-01	1%	5%
2013-02-01	-7%	0%
2013-03-01	13%	3%
2013-04-01	-2%	2%
2013-05-01	0%	0%
2013-06-01	-12%	-2%
2013-07-01	12%	5%
2013-08-01	1%	-3%
2013-09-01	3%	4%
2013-10-01	5%	4%
2013-11-01	-15%	2%
2013-12-01	14%	2%
2014-01-01	-6%	-4%
2014-02-01	-16%	5%
2014-03-01	16%	1%
2014-04-01	10%	1%
2014-05-01	2%	1%
2014-06-01	5%	2%
2014-07-01	-10%	-2%
2014-08-01	5%	3%
2014-09-01	-11%	-3%
2014-10-01	-8%	1%
2014-11-01	-6%	1%
2014-12-01	3%	-1%
2015-01-01	-2%	-3%
2015-02-01	18%	5%

Date	Corporate Return (CLH)	Market Return (NYA)
2015-03-01	2%	-1%
2015-04-01	-3%	1%
2015-05-01	2%	0%
2015-06-01	-5%	-2%
2015-07-01	-8%	1%
2015-08-01	-1%	-6%
2015-09-01	-10%	-4%
2015-10-01	6%	7%
2015-11-01	-7%	0%
2015-12-01	-4%	-3%
2016-01-01	6%	-5%
2016-02-01	-4%	-1%
2016-03-01	16%	7%
2016-04-01	0%	2%
2016-05-01	4%	0%
2016-06-01	1%	0%
2016-07-01	-1%	3%
2016-08-01	-7%	0%
2016-09-01	0%	0%
2016-10-01	-1%	-2%
2016-11-01	12%	3%
2016-12-01	5%	2%
2017-01-01	0%	2%
2017-02-01	4%	3%
2017-03-01	-4%	0%
2017-04-01	4%	0%
2017-05-01	1%	1%
2017-06-01	-4%	1%
2017-07-01	2%	2%
2017-08-01	-5%	-1%
2017-09-01	5%	3%
2017-10-01	-6%	1%
2017-11-01	-3%	2%
2017-12-01	4%	1%
2018-01-01	2%	4%
2018-02-01	-10%	-5%
2018-03-01	-2%	-2%
2018-04-01	-6%	1%
2018-05-01	16%	0%
2018-06-01	5%	0%
2018-07-01	2%	4%
2018-08-01	20%	0%
2018-09-01	4%	1%
2018-10-01	-5%	-7%
2018-11-01	-5%	2%
2018-12-01	-24%	-9%
2019-01-01	20%	8%
2019-02-01	15%	3%
2019-03-01	5%	0%
2019-04-01	6%	3%
2019-05-01	-16%	-6%
2019-06-01	11%	6%
2019-07-01	9%	0%
2019-08-01	-5%	-3%
2019-09-01	5%	2%
2019-10-01	7%	1%
2019-11-01	0%	3%
2019-12-01	4%	3%
Slope		0.93

(Source: Author's Document)

From these process it is found out that the levered beta of CLH is 0.93. The recapitulation of all levered β and average DER value for each benchmarked industry can be seen through Table 4.17.

Table 4.17 Recapitulation of Benchmarked Industry β and Average DER

Benchmarked Industry	Levered β	Average DER
CLH	0.93	1.87
CVA	0.75	5.65
RSG	0.55	1.62

(Source: Author's Document)

After this process there will be a process of unlevered beta calculation for each benchmarked industry. The formula of it can be seen through Formula 4.2 below.

$$Unlevered \beta = \frac{Levered \beta}{1 + ((1 - t) \times DER)} \quad (4.2)$$

Where:

t : Tax Rate (in here U.S.A corporate tax rate of 21% will be used)

The example of its calculation will be done to CLH benchmarked industry as can be seen below.

$$Unlevered \beta = \frac{0.93}{1 + ((1 - 21\%) \times 1.87)}$$

$$Unlevered \beta = 0.38$$

From these process it is found out that the unlevered β of CLH is 0.41. The recapitulation of all unlevered β and its average calculation can be seen through Table 4.18.

Table 4.18 Benchmarked Industry Unlevered β Calculation Recapitulation

Benchmarked Industry	Unlevered β
CLH	0.38
CVA	0.14
RSG	0.24
Average Unlevered β	0.25

(Source: Author's Document)

From the average unlevered β there will be a further calculation of levered β for the proposed industry using the Formula 4.3 below.

$$\text{Relevered } \beta = \text{Average Unlevered } \beta \times (1 + ((1 - t) \times \text{DER})) \quad (4.3)$$

Where:

t : Tax Rate (in here U.S.A corporate tax rate of 21% will be used)

DER : Proposed Industry DER

The DER that will be used in here will be inputted according to the proposed industry capital structure assumption used in this research which are 70% (Debt):30% (Equity) or equal to 2.33. Its calculation can be seen below.

$$\text{Relevered } \beta = 0.25 \times (1 + ((1 - 21\%) \times 2.33))$$

$$\text{Relevered } \beta = 0.72$$

The next step is calculating average market return (R_m) of the proposed Industry using NYSE price index historical data. Its calculation done using Formula 4.4 below.

$$R_m = \left(\frac{\text{Ending Value}}{\text{Beginning Value}} \right)^{\left(\frac{1}{n}\right)} - 1 \quad (4.4)$$

Where:

Ending Value : Last period stock price

Beginning Value : First period stock price

n : Number of period (Years)

The value of the variables used in Formula 4.4 acquired from historical data of NYSE price index annual rate of return for the past 10 years. Hence, the data used in here is starting from its end value in 2009 until 2019. This data can be seen through Table 4.19 below.

Table 4.19 NYSE Price Index Annual Rate of Return Historical Data (2009-2019)

Year	Adj Close	Annual Return
2009	7184,96	24,80%
2010	7964,02	10,84%
2011	7477,03	-6,11%
2012	8443,51	12,93%
2013	10400,32	23,18%
2014	10839,24	4,22%
2015	10143,42	-6,42%
2016	11056,9	9,01%
2017	12808,84	15,84%
2018	11374,39	-11,20%
2019	13913,03	22,32%

(Source: finance.yahoo.com, 2020)

Using these historical data, expected market return (R_m) of NYSE price index can be calculated as follow:

$$R_m = \left(\frac{13913,03}{7184,96} \right)^{\left(\frac{1}{10} \right)} - 1$$

$$R_m = 6,83\%$$

From there using Formula 2.10, cost of equity of the proposed industry can be calculated as follow:

$$R_E = 2.35\% + 0.72(6.83\% - 2.35\%)$$

$$R_E = 5.56\%$$

In this research there is a difference between benchmarked market with the targeted market of the proposed industry. Benchmark market in here is NYSE market price index meanwhile the targeted market is JKSE. Hence, there is modification needed to add to the conventional cost of capital calculation. The modification in here is made by adding a country release hurdle rate factor that represents the uncertainty factor that may influence cost of capital rate. The formula of it can be seen through Formula 4.5 below

$$R_{E'} = R_E + h \tag{4.5}$$

Where:

- $R_{E'}$: Modified Cost of Equity
- R_E : Initial Cost of Equity
- h : Hurdle Rate according to Indonesia Country Risk Premium (2.8%)

Hence, it can be calculated as follow:

$$R_{E'} = 5.56\% + 2.80\% = 8.36\%$$

The second phase of WACC calculation is cost of debt calculation which follow Formula 2.12 as can be seen below.

$$R_D = R_{DBT}(1 - T)$$

Where,

- R_D : Cost of Debt
- R_{DBT} : Loan Interest Rate before Tax Implementation (Average of Investment Credit Interest Rate in First Quarter of 2020 by BI – 11.27%)
- T : Tax Rate (Indonesia Tax Rate – 25%)

Cost of debt of the proposed industry according to its capital structure assumption can be calculated as follow:

$$R_D = 11.27\% \times (1 - 25\%)$$

$$R_D = 8.45\%$$

The last phase is WACC calculation of the proposed industry according to its capital structure assumption can be calculated as follow:

$$WACC = \left(\frac{E}{E + D}\right)R_E + \left(\frac{D}{E + D}\right)R_D$$

$$WACC = (30\%) \times 8.36\% + (70\%) \times 8.45\%$$

$$WACC = 8.43\%$$

WACC value for the proposed industry according to its assumed capital structure is 8.43%. This value will be used for further process in calculating financial parameters as the last phase of feasibility study process.

4.1.3.3 Financial Model Micro and Macro Assumption Determination

In this research there is a need determine several micro and macro assumption in order to build proposed business plan scenario's financial model and feasibility study. Its detailed information can be seen through Table 4.20 and 4.21.

Table 4.20 Macro Assumption of Financial Model

Macro Assumption	Value	Additional Information
Inflation Rate	3%	Fixed per year accordance to BI target
Risk Free Rate	2.35%	US 3-Month Treasury Bill
Indonesia Country Risk Premium (Hurdle Rate %)	2.80%	
USD to IDR Conversion Rate	\$1 = Rp13.887	Indonesia to USD Exchange Rate Historical Data (31 Dec 2019)
Investment Credit Rate and Interest During Construction (IDC)	11.27%	Average of Investment Credit Interest Rate in First Quarter of 2020 by BI
Provision Fee	1%	
Tenor	20	Years
Construction Phase and Grace Period	5	Years
Account Receivable Ratio per Year	8% of Total Revenue per Year	It will be paid in the following operational period

(Source: Author's Document)

Table 4.21 Micro Assumption of Financial Model

Micro Assumption	Value	Additional Information
Usage Life		
Property and Plant	50 Years	Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration: Waste to Energy Power Plant Project for Bali Province in Indonesia
Office Equipment	15 Years	Nevada Department of Taxation Personal Property Manual
Operational and Safety Equipment	10 Years	
Supporting Equipment	15 Years	
Bulldozer	15 Years	
Excavator	15 Years	
Dump Truck	10 Years	
Land Acquisition Fee/m ²	Rp2,000,000	
General Construction Fee/m ²	Rp4,500,000	
Initial Plant Capacity (1 st) Year + Increasing Capacity Gradient/Year	50% + 10% Year (Until 5 th Year)	

Micro Assumption	Value	Additional Information
Plant Efficiency	85%	Common OEE target for sustainable long-term industry
Diesel Fuel Price/Liter	Rp9,448	Indonesia Diesel Fuel Price Standard (Dexlite) 2020
Additional Freight Expense Cap + Insurance Expense %	10% + 0,25%	Represent additional loading, unloading, and installation cost
Direct : Indirect Labour Ratio	4:1	
Business Plan Scenario 1		
Plant Availability/Year	310 Days (85%)	Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration: Waste to Energy Power Plant Project for Bali Province in Indonesia
Labour Working Hours/Day × Working Shifts/Day	8 Hours × 3 Shifts	
WTE Plant Construction Fee	\$118,000,000	
WTE Plant Capacity/Day	1000 Ton MSW	
WTE Production Floor Area	5 ha	
WTE Supporting Facilities Area	1 ha	
MSW(Raw Material) Piling Height	2 meter	
Expected Electricity Output/Day	20,000 kwh/day (20 kwh/ton)	
Electricity Selling Price/kwh	Rp1,869	Peraturan Presiden No. 35 Tahun 2018
Expected Bottom Ash Residues/Day	88 tons/day	Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration: Waste to Energy Power Plant Project for Bali Province in Indonesia
Expected Fly Ash Residues/Day	33 tons/day	
Bottom Ash and Fly Ash Waste Management Cost/Ton	Rp100,000	
Business Plan Scenario 2		
Plant Availability/Year	310 Days (85%)	Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration: Waste to Energy Power Plant Project for Bali Province in Indonesia
Labour Working Hours/Day × Working Shifts/Day	8 Hours × 1 Shifts	
Production Plant Expansion Coefficient	10%	
Row Space between Machine	2 meter per each machine	
MSW(Raw Material) Piling Height	2 meter	
@Dump Truck (km/travel)	10 km	
Electricity Expense/kwh	Rp997	PLN Electricity Price Standard for High Voltage Industry with >30,000 kVA (2020)
Recyclable Unmanaged MSW Ratio	20%	

(Source: Author's Document)

4.2 Data Processing

In subchapter 4.3, there will be an information about data processing phase done in this research. It includes forecasting of MSW generation level in Sidoarjo district, BPS determination and benefit cost implication calculation, financial modelling and feasibility study of each BPS, and sensitivity analysis of selected BPS.

4.2.1 Forecasting of MSW Generation Level in Sidoarjo District

Forecasting of MSW generation level in Sidoarjo district is done according to the historical data acquired from DLHK of Sidoarjo district statement from 2017-2019 and projection 2020-2025. The processing of this data will be done using linear regression method through Minitab 16 software. Linear regression formula result got from Minitab 16 software can be seen in Figure 4.3.

Regression Analysis: MSW Generation versus Year

The regression equation is
 MSW Generation = - 18157509 + 9218 Year

Predictor	Coef	SE Coef	T	P
Constant	-18157509	107614	-168,73	0,000
Year	9217,66	53,25	173,11	0,000

S = 412,454 R-Sq = 100,0% R-Sq(adj) = 100,0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	5097914431	5097914431	29966,85	0,000
Residual Error	7	1190829	170118		
Total	8	5099105260			

Figure 4.3 Linear Regression Result of MSW Generation Level Projection in Sidoarjo District
 (Source: Author's Document)

$$y = -18,158,509 + 9217,66 \times Year \quad (4.6)$$

Where:

y : MSW Generation Level Projection in Sidoarjo District

Year : Year of Plant Operation Period (2026-2075)

This linear regression calculation result needs to be validated based on standard statistic hypothesis using p-value interpretation. P-value interpretation follows significance test hypothesis basis as follow:

H₀ (Null Hypothesis) : There is no significant relationship between the variables in the linear regression model

H₁ (Alternative Hypothesis) : There is significant relationship between the variables in the linear regression model

Significance test of p-value oblige to compare linear regression model p-value with the standard α used in this research which is 5% (0.05). The linear regression model can be considered valid and reject the null hypothesis if its value less than α . As can be seen in Figure 4.3 p-value of the linear regression model is 0.000. Hence, it can be said this linear regression model is valid as its variables has a significant relationship. Because of that, Formula 4.6 that acquired from this process can be considered valid and will be used to forecast the MSW generation level in Sidoarjo district during the planning horizon of this research. This calculation is done using Ms. Excel software and its result can be seen in Table 4.22 until Table 4.26 below.

Table 4.22 Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2026-2035)

Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2026-2035) (Ton/Year)									
2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
517470	526688	535905	545123	554341	563558	572776	581994	591211	600429

(Source: Author's Document)

Table 4.23 Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2036-2045)

Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2036-2045) (Ton/Year)									
2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
609647	618864	628082	637300	646517	655735	664953	674170	683388	692606

(Source: Author's Document)

Table 4.24 Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2046-2055)

Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2046-2055) (Ton/Year)									
2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
701823	711041	720259	729476	738694	747912	757129	766347	775565	784782

(Source: Author's Document)

Table 4.25 Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2056-2065)

Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2056-2065) (Ton/Year)									
2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
794000	803218	812435	821653	830871	840088	849306	858524	867741	876959

(Source: Author's Document)

Table 4.26 Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2066-2075)

Linear Regression Forecast of MSW Generation Level in Sidoarjo District (2066-2075) (Ton/Year)									
2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
886177	895394	904612	913830	923047	932265	941483	950700	959918	969136

(Source: Author's Document)

Based on the needs of calculation in financial modelling and feasibility study of each BPS, there will be several ratio used in here to calculate the proportion of the MSW according to its type, cubic meter (m³) needed, and potential processing. Proportion calculation of MSW according to its type and potential processing is done according to the historical data given by DLHK of Sidoarjo district as can be seen in Figure 4.1 and Table 4.4. Meanwhile, m³ needed per each type will be based on EPA conversion factors. In this report the example of its calculation will be done for 1st period of operational year of the proposed industry which is 2026. The result of this calculation can be seen in Table 4.27 until Table 4.29. Meanwhile, the recapitulation for each year can be seen in Table 4.30 until Table 4.37 below.

Table 4.27 Proportion of MSW in Sidoarjo District according to Its Potential Processing Ratio in 2026

Projected MSW in 2026	%MSW in 2026	MSW in 2026	MSW Information	Description
517,470 Ton	83%	430,323 Ton	Unmanaged MSW	Unmanaged MSW + Residual MSW in TPA + Burnt MSW in TPST
	17%	87,047 Ton	Managed MSW	Managed MSW in TPS, TPST, TPS 3R, Bank Sampah and other facilities or by other parties
Total	100%	517,470 Ton		

(Source: Author's Document)

Table 4.28 Proportion of Unmanaged MSW in Sidoarjo District in 2026 according to Its Type

Projected Unmanaged MSW in 2026	%MSW in 2026	Ton MSW in 2026	MSW Information	MSW Type (Ton)
430,323 Ton	46,54%	200,319	Food Waste	Organic (264,882)
	15,00%	64,563	Garden Waste	
	4,80%	20,660	Textile Waste	
	2,66%	11,449	Paper Waste	Inorganic (165,541)
	0,54%	2,324	Rubber & Leather Waste	
	0,48%	2,066	Plastic Waste	
	0,25%	1,076	Glass Waste	
	0,16%	689	Metal Waste	
	29,57%	127,276	Other Waste	
Total	100%	430,423		

(Source: Author's Document)

Table 4.29 Conversion of Unmanaged MSW in Sidoarjo District per Type into m³ Unit

MSW Type	Projected Unmanaged MSW/Type in 2026 (Ton)	EPA CF (ton/m ³)	Projected Unmanaged MSW/Type in 2026 (m ³)
Food Waste	200,319	0,30	661,575
Garden Waste	64,563	0,16	394,898
Textile Waste	20,660	0,11	180,525
Paper Waste	11,449	0,25	46,071
Rubber & Leather Waste	2,324	0,20	11,847
Plastic Waste	2,066	0,02	98,725
Glass Waste	1,076	0,17	6,280
Metal Waste	689	0,09	7,262
Other Waste	127,276	0,20	648,730
	Total = 430,423	Average = 0,24	Total = 2,055,915

(Source: Author's Document)

Table 4.30 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2026-2032)

Description	2026	2027	2028	2029	2030	2031	2032
Unmanaged MSW/Year	430423	438090	445757	453424	461091	468758	476425
Organic/Year (Ton)	264882	269601	274319	279037	283756	288474	293192
Food Waste	200319	203887	207455	211024	214592	218160	221728
Garden Waste	64563	65713	66864	68014	69164	70314	71464
Organic/Year (m ³)	1056474	1075293	1094112	1112930	1131749	1150568	1169387
Food Waste	661575	673360	685145	696929	708714	720498	732283
Garden Waste	394898	401933	408967	416001	423035	430070	437104
Inorganic/Year (Ton)	165541	168489	171438	174387	177336	180284	183233
Textile Waste	20660	21028	21396	21764	22132	22500	22868
Paper Waste	11449	11653	11857	12061	12265	12469	12673
Rubber & Leather Waste	2324	2366	2407	2448	2490	2531	2573
Plastic Waste	2066	2103	2140	2176	2213	2250	2287
Glass Waste	1076	1095	1114	1134	1153	1172	1191
Metal Waste	689	701	713	725	738	750	762
Other Waste	127276	129543	131810	134078	136345	138612	140879
Inorganic/Year (m ³)	999441	1017244	1035047	1052850	1070653	1088456	1106259
Textile Waste	180525	183741	186956	190172	193388	196603	199819
Paper Waste	46071	46892	47713	48533	49354	50175	50995
Rubber & Leather Waste	11847	12058	12269	12480	12691	12902	13113
Plastic Waste	98725	100483	102242	104000	105759	107517	109276
Glass Waste	6280	6392	6504	6616	6728	6840	6951
Metal Waste	7262	7392	7521	7651	7780	7909	8039
Other Waste	648730	660286	671842	683398	694953	706509	718065

(Source: Author's Document)

Table 4.31 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2033-2039)

Description	2033	2034	2035	2036	2037	2038	2039
Unmanaged MSW/Year	484092	491760	499427	507094	514761	522428	530095
Organic/Year (Ton)	297911	302629	307347	312065	316784	321502	326220
Food Waste	225297	228865	232433	236001	239570	243138	246706
Garden Waste	72614	73764	74914	76064	77214	78364	79514
Organic/Year (m ³)	1188206	1207025	1225844	1244663	1263482	1282301	1301119
Food Waste	744068	755852	767637	779421	791206	802991	814775
Garden Waste	444138	451173	458207	465241	472276	479310	486344
Inorganic/Year (Ton)	186182	189131	192079	195028	197977	200926	203875

Description	2033	2034	2035	2036	2037	2038	2039
Textile Waste	23236	23604	23972	24340	24709	25077	25445
Paper Waste	12877	13081	13285	13489	13693	13897	14101
Rubber & Leather Waste	2614	2656	2697	2738	2780	2821	2863
Plastic Waste	2324	2360	2397	2434	2471	2508	2544
Glass Waste	1210	1229	1249	1268	1287	1306	1325
Metal Waste	775	787	799	811	824	836	848
Other Waste	143146	145413	147680	149948	152215	154482	156749
Inorganic/Year (m ³)	1124062	1141865	1159668	1177470	1195273	1213076	1230879
Textile Waste	203035	206250	209466	212682	215897	219113	222329
Paper Waste	51816	52637	53457	54278	55099	55919	56740
Rubber & Leather Waste	13324	13535	13746	13957	14168	14379	14590
Plastic Waste	111035	112793	114552	116310	118069	119827	121586
Glass Waste	7063	7175	7287	7399	7511	7623	7734
Metal Waste	8168	8297	8427	8556	8686	8815	8944
Other Waste	729621	741176	752732	764288	775844	787400	798955

(Source: Author's Document)

Table 4.32 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2040-2046)

Description	2040	2041	2042	2043	2044	2045	2046
Unmanaged MSW/Year	537762	545429	553096	560763	568430	576098	583765
Organic/Year (Ton)	330939	335657	340375	345094	349812	354530	359249
Food Waste	250274	253843	257411	260979	264548	268116	271684
Garden Waste	80664	81814	82964	84115	85265	86415	87565
Organic/Year (m ³)	1319938	1338757	1357576	1376395	1395214	1414033	1432852
Food Waste	826560	838344	850129	861914	873698	885483	897267
Garden Waste	493378	500413	507447	514481	521516	528550	535584
Inorganic/Year (Ton)	206823	209772	212721	215670	218618	221567	224516
Textile Waste	25813	26181	26549	26917	27285	27653	28021
Paper Waste	14304	14508	14712	14916	15120	15324	15528
Rubber & Leather Waste	2904	2945	2987	3028	3070	3111	3152
Plastic Waste	2581	2618	2655	2692	2728	2765	2802
Glass Waste	1344	1364	1383	1402	1421	1440	1459
Metal Waste	860	873	885	897	909	922	934
Other Waste	159016	161283	163551	165818	168085	170352	172619
Inorganic/Year (m ³)	1248682	1266485	1284288	1302091	1319894	1337697	1355500
Textile Waste	225544	228760	231976	235191	238407	241623	244839
Paper Waste	57561	58381	59202	60023	60843	61664	62485
Rubber & Leather Waste	14801	15012	15223	15434	15645	15856	16068
Plastic Waste	123345	125103	126862	128620	130379	132137	133896
Glass Waste	7846	7958	8070	8182	8294	8406	8518
Metal Waste	9074	9203	9332	9462	9591	9720	9850
Other Waste	810511	822067	833623	845179	856734	868290	879846

(Source: Author's Document)

Table 4.33 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2047-2053)

Description	2047	2048	2049	2050	2051	2052	2053
Unmanaged MSW/Year	591432	599099	606766	614433	622100	629767	637434
Organic/Year (Ton)	363967	368685	373404	378122	382840	387559	392277
Food Waste	275252	278821	282389	285957	289525	293094	296662
Garden Waste	88715	89865	91015	92165	93315	94465	95615
Organic/Year (m ³)	1451671	1470489	1489308	1508127	1526946	1545765	1564584
Food Waste	909052	920837	932621	944406	956190	967975	979760
Garden Waste	542619	549653	556687	563721	570756	577790	584824
Inorganic/Year (Ton)	227465	230413	233362	236311	239260	242208	245157
Textile Waste	28389	28757	29125	29493	29861	30229	30597
Paper Waste	15732	15936	16140	16344	16548	16752	16956

Description	2047	2048	2049	2050	2051	2052	2053
Rubber & Leather Waste	3194	3235	3277	3318	3359	3401	3442
Plastic Waste	2839	2876	2912	2949	2986	3023	3060
Glass Waste	1479	1498	1517	1536	1555	1574	1594
Metal Waste	946	959	971	983	995	1008	1020
Other Waste	174886	177154	179421	181688	183955	186222	188489
Inorganic/Year (m ³)	1373303	1391106	1408909	1426712	1444515	1462318	1480121
Textile Waste	248054	251270	254486	257701	260917	264133	267348
Paper Waste	63305	64126	64947	65767	66588	67409	68230
Rubber & Leather Waste	16279	16490	16701	16912	17123	17334	17545
Plastic Waste	135655	137413	139172	140930	142689	144448	146206
Glass Waste	8629	8741	8853	8965	9077	9189	9301
Metal Waste	9979	10109	10238	10367	10497	10626	10755
Other Waste	891402	902957	914513	926069	937625	949181	960736

(Source: Author's Document)

Table 4.34 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2054-2060)

Description	2054	2055	2056	2057	2058	2059	2060
Unmanaged MSW/Year	645101	652768	660436	668103	675770	683437	691104
Organic/Year (Ton)	396995	401714	406432	411150	415869	420587	425305
Food Waste	300230	303798	307367	310935	314503	318072	321640
Garden Waste	96765	97915	99065	100215	101365	102516	103666
Organic/Year (m ³)	1583403	1602222	1621041	1639860	1658678	1677497	1696316
Food Waste	991544	1003329	1015113	1026898	1038683	1050467	1062252
Garden Waste	591859	598893	605927	612961	619996	627030	634064
Inorganic/Year (Ton)	248106	251055	254004	256952	259901	262850	265799
Textile Waste	30965	31333	31701	32069	32437	32805	33173
Paper Waste	17160	17364	17568	17772	17975	18179	18383
Rubber & Leather Waste	3484	3525	3566	3608	3649	3691	3732
Plastic Waste	3096	3133	3170	3207	3244	3280	3317
Glass Waste	1613	1632	1651	1670	1689	1709	1728
Metal Waste	1032	1044	1057	1069	1081	1093	1106
Other Waste	190756	193024	195291	197558	199825	202092	204359
Inorganic/Year (m ³)	1497924	1515727	1533530	1551333	1569136	1586939	1604742
Textile Waste	270564	273780	276995	280211	283427	286642	289858
Paper Waste	69050	69871	70692	71512	72333	73154	73974
Rubber & Leather Waste	17756	17967	18178	18389	18600	18811	19022
Plastic Waste	147965	149723	151482	153240	154999	156758	158516
Glass Waste	9413	9524	9636	9748	9860	9972	10084
Metal Waste	10885	11014	11143	11273	11402	11532	11661
Other Waste	972292	983848	995404	1006960	1018515	1030071	1041627

(Source: Author's Document)

Table 4.35 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2061-2067)

Description	2061	2062	2063	2064	2065	2066	2067
Unmanaged MSW/Year	698771	706438	714105	721772	729439	737107	744774
Organic/Year (Ton)	430024	434742	439460	444179	448897	453615	458334
Food Waste	325208	328776	332345	335913	339481	343049	346618
Garden Waste	104816	105966	107116	108266	109416	110566	111716
Organic/Year (m ³)	1715135	1733954	1752773	1771592	1790411	1809230	1828048
Food Waste	1074036	1085821	1097606	1109390	1121175	1132959	1144744
Garden Waste	641099	648133	655167	662202	669236	676270	683304
Inorganic/Year (Ton)	268747	271696	274645	277594	280542	283491	286440
Textile Waste	33541	33909	34277	34645	35013	35381	35749
Paper Waste	18587	18791	18995	19199	19403	19607	19811
Rubber & Leather Waste	3773	3815	3856	3898	3939	3980	4022
Plastic Waste	3354	3391	3428	3465	3501	3538	3575

Description	2061	2062	2063	2064	2065	2066	2067
Glass Waste	1747	1766	1785	1804	1824	1843	1862
Metal Waste	1118	1130	1143	1155	1167	1179	1192
Other Waste	206627	208894	211161	213428	215695	217962	220230
Inorganic/Year (m ³)	1622545	1640348	1658151	1675954	1693757	1711560	1729363
Textile Waste	293074	296289	299505	302721	305936	309152	312368
Paper Waste	74795	75616	76436	77257	78078	78898	79719
Rubber & Leather Waste	19233	19444	19655	19866	20077	20288	20499
Plastic Waste	160275	162033	163792	165550	167309	169068	170826
Glass Waste	10196	10307	10419	10531	10643	10755	10867
Metal Waste	11790	11920	12049	12178	12308	12437	12567
Other Waste	1053183	1064738	1076294	1087850	1099406	1110962	1122517

(Source: Author's Document)

Table 4.36 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2068-2071)

Description	2068	2069	2070	2071
Unmanaged MSW/Year	752441	760108	767775	775442
Organic/Year (Ton)	463052	467770	472489	477207
Food Waste	350186	353754	357322	360891
Garden Waste	112866	114016	115166	116316
Organic/Year (m ³)	1846867	1865686	1884505	1903324
Food Waste	1156529	1168313	1180098	1191882
Garden Waste	690339	697373	704407	711442
Inorganic/Year (Ton)	289389	292337	295286	298235
Textile Waste	36117	36485	36853	37221
Paper Waste	20015	20219	20423	20627
Rubber & Leather Waste	4063	4105	4146	4187
Plastic Waste	3612	3649	3685	3722
Glass Waste	1881	1900	1919	1939
Metal Waste	1204	1216	1228	1241
Other Waste	222497	224764	227031	229298
Inorganic/Year (m ³)	1747166	1764968	1782771	1800574
Textile Waste	315583	318799	322015	325230
Paper Waste	80540	81360	82181	83002
Rubber & Leather Waste	20710	20921	21132	21343
Plastic Waste	172585	174343	176102	177860
Glass Waste	10979	11091	11202	11314
Metal Waste	12696	12825	12955	13084
Other Waste	1134073	1145629	1157185	1168741

(Source: Author's Document)

Table 4.37 Recapitulation of Forecasted Unmanaged MSW in Sidoarjo District according to Its Designated Proportion (2072-2075)

Description	2072	2073	2074	2075
Unmanaged MSW/Year	783109	790776	798443	806110
Organic/Year (Ton)	481925	486644	491362	496080
Food Waste	364459	368027	371595	375164
Garden Waste	117466	118616	119766	120917
Organic/Year (m ³)	1922143	1940962	1959781	1978600
Food Waste	1203667	1215452	1227236	1239021
Garden Waste	718476	725510	732545	739579
Inorganic/Year (Ton)	301184	304133	307081	310030
Textile Waste	37589	37957	38325	38693
Paper Waste	20831	21035	21239	21443
Rubber & Leather Waste	4229	4270	4312	4353
Plastic Waste	3759	3796	3833	3869
Glass Waste	1958	1977	1996	2015
Metal Waste	1253	1265	1278	1290

Description	2072	2073	2074	2075
Other Waste	231565	233833	236100	238367
Inorganic/Year (m ³)	1818377	1836180	1853983	1871786
Textile Waste	328446	331662	334877	338093
Paper Waste	83822	84643	85464	86284
Rubber & Leather Waste	21554	21765	21976	22187
Plastic Waste	179619	181378	183136	184895
Glass Waste	11426	11538	11650	11762
Metal Waste	13213	13343	13472	13601
Other Waste	1180296	1191852	1203408	1214964

(Source: Author's Document)

These recapitulation of forecasted unmanaged MSW in Sidoarjo district according its designated proportion from 2026-2075 will be the input as the main raw material in the proposed industry financial modelling and feasibility study.

4.2.2 Business Plan Scenario Determination

Business Plan Scenario (BPS) determination is done to determine alternative scenarios of the proposed industry that focus on maximizing potential economic value of the unmanaged MSW in Sidoarjo district. There are two basic alternatives which are BPS 1 and 2. Meanwhile, BPS 3 is a combination of both BPS. The detail for its BPS will be informed in this part of the report.

4.2.2.1 Business Plan Scenario 1 – Waste-to-Energy Business

BPS 1 is focusing on utilizing unmanaged MSW in Sidoarjo district especially residual MSW as a Refuse-Derived Fuel (RDF) as the main material of WTE plant. The type of WTE plant used in this BPS is incinerator plant with stocker furnace with each plant capacity of 1,000 ton MSW per day. In this WTE plant, residual waste as the RDF will be burnt at a high temperature to substitutes the function of coal in electric steam power plant. The heat acquired from RDF burning will vaporize water inside its tank that will be the power source for the turbine generator inside the WTE. The expected output per day of this plant is 20,000 kWh of low voltage electricity as the main product; and 88 ton of bottom ash and 33 ton of fly ash as its residual waste. This plant is planned to operate at 85% availability rate per year or equal to 310 days per year with the expected useful life of 50 years. Its construction is estimated to take 5 years to complete. It is planned to be managed by a third-private party which called as Badan Usaha (BU) in Indonesia. Because

of the area of this private industry moves, which is a public sector of municipal sanitary, this BPS follows a Public Private Partnership (PPP) business scheme. The public sector included in here is municipal sanitary which previously managed by DLHK of Sidoarjo District that is directly related to Sidoarjo community and PT. Perusahaan Listrik Negara (PLN) as the only government-owned electricity distributor in Indonesia. Meanwhile, the relation of each stakeholders within this PPP scheme are represented through Figure 4.4 below.



Figure 4.4 BPS 1 - PPP Scheme Stakeholders of MSW-MS for WTE Plant
(Source: Pusat Pendidikan dan Pelatihan Jalan, Perumahan, Permukiman, dan Pengembangan Infrastruktur Wilayah, 2019)

According to Modul Penyelenggaraan Pengolahan Sampah Menjadi Energi melalui KPBU (Pusat Pendidikan dan Pelatihan Jalan, Perumahan, Permukiman, dan Pengembangan Infrastruktur Wilayah, 2019), the implementation of PPP scheme of WTE plant in Indonesia standardized in such a way that:

1. WTE plant and infrastructure investment funded partly or fully by private business (BU).
2. Private business return on investment given by government in form of Availability Payment (AP).
3. It implements Build, Operate, Transfer PPP scheme, which means that after its determined useful life has expired the facilities will be acquired by government.
4. The limitation of business activities done by private business (BU) limited only to residual MSW processing as RDF. MSW sorting and transporting process still considered as government responsibility.

According to Acuan Lokasi Risiko KPBU di Indonesia (PT Penjaminan Infrastruktur Indonesia, 2019) implementation of BOT-AP commonly done

through routine AP given by government for the private business in order to support the feasibility and continuity of their service. This AP is given at a specific return rate in order to cover initial and routine CAPEX and OPEX of the WTE plant. However, through this implementation, the output and revenue gained from WTE operation transferred to government. The representation of this PPP scheme can be seen through Figure 4.5 and Figure 4.6 below.

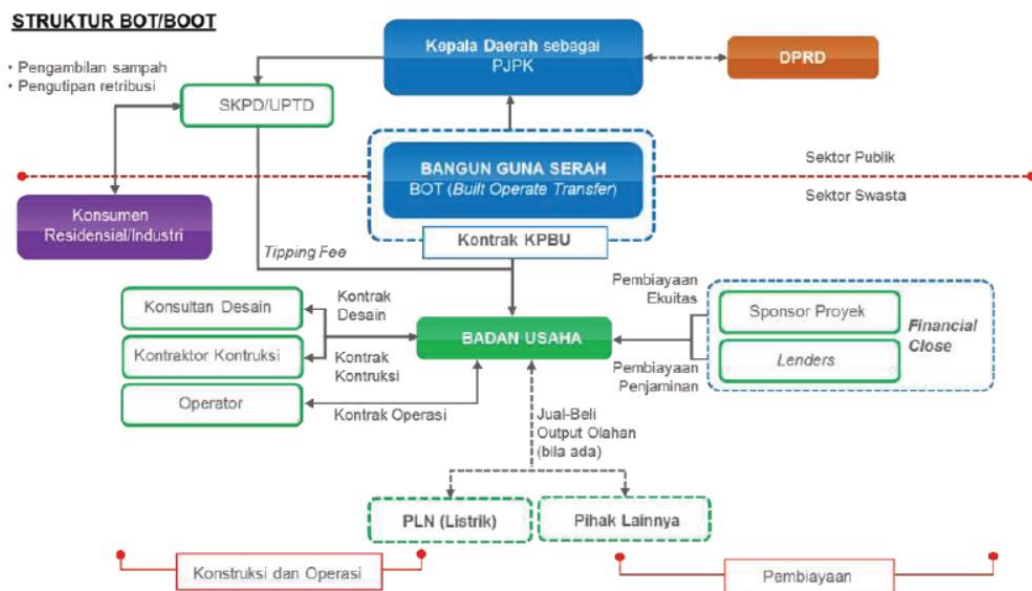


Figure 4.5 BPS 1 - BOT Structure in PPP Scheme of WTE Plant
(Source: PT Penjaminan Infrastruktur Indonesia, 2019)

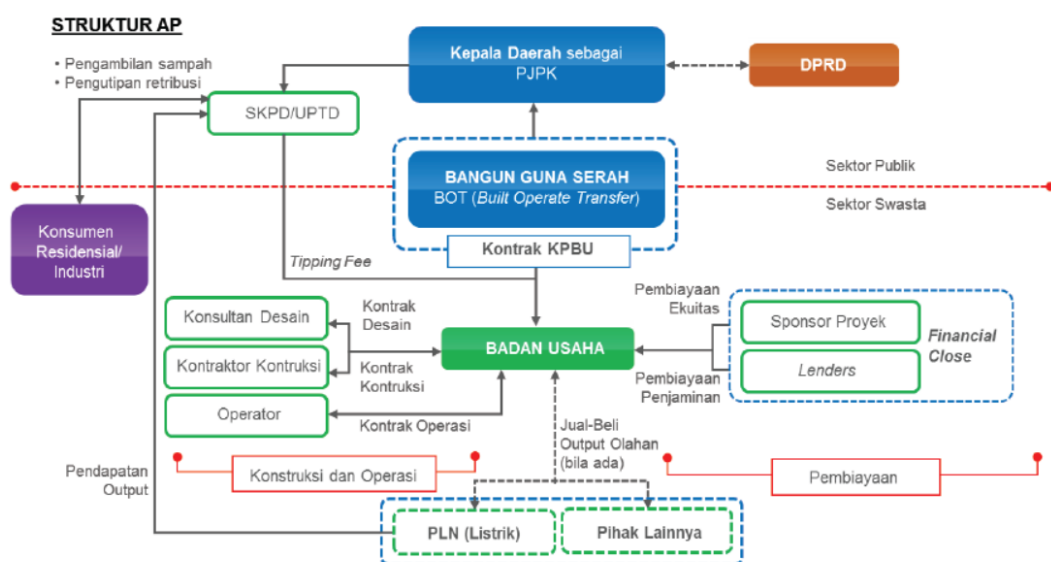


Figure 4.6 BPS 1 - AP Structure in PPP Scheme of WTE Plant
(Source: PT Penjaminan Infrastruktur Indonesia, 2019)

Next, in this part of the report, there will be an information of infrastructure needed to build WTE plant in form CAPEX; and the expense needed to run it in form OPEX. The calculation of CAPEX needed to fund WTE plant infrastructure in BPS 1 calculated by comparing the capacity of each asset with the needed capacity according to MSW generation level in Sidoarjo district and other relevant factors. In this report this calculation will be represented using one example which is the calculation of WTE Plant required in 2026. It can be seen through Formula 4.7 below.

$$y(t) = \frac{n}{w \times C} \quad (4.7)$$

Where:

- $y(t)$: Number of WTE Plant Needed in t period (2026)
- n : Sidoarjo District Unmanaged MSW Generation Level/Day in t period (2026)
- w : Number of WTE Plant Working Days/Year (310 Days)
- C : Single MSW Plant Capacity (1000 ton/day)

Hence, it can be calculated as can be seen below.

$$y(2026) = \frac{430,423 \text{ Ton}}{310 \text{ Days} \times 1000 \text{ Ton/Day}}$$

$$y(2026) = 1,39 \approx 2 \text{ WTE Plants}$$

Other than that, there is a term used in this research which is routine CAPEX. Routine CAPEX is an investment expenditure of a certain assets which made because there is an increase of the amount of asset needed in accordance to the increase of the managed MSW as the raw material in BPS 1. Routine CAPEX also considers asset's useful life expectation to do reinvestment of a fully depreciated asset. Useful life expectation used in this research made in accordance to Nevada Department of Taxation Personal Property Manual and all of the assets is assumed to be run normally during its useful life and only will be replaced when

its useful have been used up. The recapitulation of assets useful life expectation used in this research can be seen through Table 4.38 below.

Table 4.38 BPS 1 – Assets Usage Life and Capacity Recapitulation

No	Tangible Assets	Usage Life (Years)	Usage Capacity
1	Incinerator Construction + Freight + Installation	50	1000 Ton/Day
2	Land Acquisition Fee	50	
3	Supporting and Office Facilities Construction	50	
4	Office Equipment	15	
5	Operational and Safety Equipment	10	
6	Supporting Equipment	15	
7	Bulldozer	15	2 m ³ /Taking
8	Excavator	15	0.5 m ³ /Taking
No	Intangible Assets	Usage Life (Years)	
1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB - BPHTB - AJB - PBNP - PPN - AMDAL - Insurance and other relevant legal document	50 (With an extension every 5 Year for some documents)	

(Source: Author's Document)


The rest of the assets included in CAPEX of WTE Plant in BPS 1 calculated using almost similar formula with Formula ... but with a modification relevant to the assets type and with accordance to its usage life. The recapitulation of this calculation can be seen in Table 4.39 below.

Table 4.39 BPS 1 - Recapitulation of Assets Requirement per Year

No	Tangible Assets	Units	Units Needed		
			2026	...	2075
1	Incinerator Construction + Freight + Installation	Plant	2		3
2	Land Acquisition Fee	m2	68807		75347
3	Supporting and Office Facilities Construction	m2	8807		15347
4	Office Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	81		138
5	Operational and Safety Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	81		138
6	Supporting Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	81		138
7	Bulldozer	Unit	4		6
8	Excavator	Unit	6		9
No	Intangible Assets	Units	Units Needed		
1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB	Unit	1		1

No	Tangible Assets	Units	Units Needed		
			2026	...	2075
	- BPHTB - AIB - PBNP - PPN - AMDAL - Insurance and other relevant legal document				

(Source: Author's Document)

 : Fixed-amount assets, which means that its initial amount will sourced from the requirement from the last period (2075)

The number of each assets represented in Table 4.39 above, shows the requirement of each asset per year, which means that if there is an increase from period to period there will be another purchase of asset which known as routine CAPEX as already mentioned before. The example of it can be seen through the difference of initial amount of bulldozer in 2026 and 2074. Other than the number of purchased asset per period, total acquisition cost for each asset per period is affected with inflation and currency conversion of USD to IDR. Both of their value already stated in Table 4.20 as a part of the macro assumption of building the financial model in this research. The calculation of routine CAPEX in a specific period can be seen through Formula 4.8 below.

$$p(t) = y(t) \times p \times c \times (F/P, i, n) \quad (4.8)$$

Where:

- p(t) : Acquisition Cost of Certain Asset in t period
- y(t) : Amount of Certain Asset Acquired in t period
- p : Initial Baseline Price of Certain Asset
- c : Currency Conversion from USD to IDR (13.887 IDR/USD)
- (F/P, i, n) : Single Payment Compound Amount Factor (F/P is its compounding type, i is interest rate according to inflation rate, and n is the number of compounding period)

Hence, it can be calculated with a rounded requirement to the nearest Rp10.000 unit as can be seen below.

$$\begin{aligned}
p(t) &= 4 \times \$60,000 \times Rp13.887/\$1 \times (F/P, 3\%, (2025 - 2020)) \\
p(t) &= Rp3.332.870.400 \times 1,1593 \\
p(t) &= Rp3.863.720.000
\end{aligned}$$

As the financial model in this research is made using Ms. Excel software, Formula 4.8 represented using Ms. Excel Function as can be seen in Formula 4.9 below.

$$\begin{aligned}
&= MROUND(FV(rate; nper; pmt; [pv]; [type]) * c; multiple) \\
&\quad \times p(t) \tag{4.9}
\end{aligned}$$

Where:

- MROUND : Function to Round the Calculation Result to the Nearest Rp10.000 Unit (multiple)
- FV : Function to Do Future Value (FV) Calculation according to Single Payment Compound Amount Factor
- rate : Interest Rate used in FV Calculation (Using Inflation Rate)
- nper : Number of Compounding Period in FV Calculation
- pv : Initial Baseline Price of Certain Asset
- c : Currency Conversion from USD to IDR (14.000 IDR/USD)
- p(t) : Amount of Certain Asset Acquired in t period

Hence, it can be calculated as can be seen below.

$$\begin{aligned}
&= MROUND(FV(3\%; 2025 - 2020; 0; \$60,000; 0) \\
&\quad * Rp13.887/\$1; 10,000) \times 4 \\
&= Rp3.863.720.000
\end{aligned}$$

The recapitulation of CAPEX calculation for all asset according to the similar formula like Formula 4.9 can be seen through Table 4.40 below.

Table 4.40 BPS 1 – Initial and Routine CAPEX Calculation Recapitulation

No	Tangible Assets	Baseline Price/Unit	Baseline Year	Initial CAPEX	Routine CAPEX
				2025	2075
1	Incinerator Construction + Freight + Installation	Rp1.652.000.000.000	2017	Rp 6.227.421.249.097	Rp -
2	Land Acquisition Fee	Rp2.000.000	2020	Rp 174.695.039.397	Rp -
3	Supporting and Office Facilities Construction	Rp4.500.000	2020	Rp80.059.838.583	Rp -
4	Office Equipment	Rp8.461.066	2020	Rp692.600.000	Rp -
5	Operational and Safety Equipment	Rp1.436.706	2020	Rp122.080.000	Rp47.346.185
6	Supporting Equipment	Rp886.706	2020	Rp72.520.000	Rp311.739.557
7	Bulldozer	Rp840.000.000	2020	Rp3.863.720.000	Rp -
8	Excavator	Rp938.000.000	2020	Rp6.471.720.000	Rp -
No	Intangible Assets	Baseline Price/Unit	Baseline Year	Initial CAPEX	Routine CAPEX
1	Legal Document	Rp1.050.000.000	2017	Rp1.330.108.585	Rp -

(Source: Author’s Document)

Other than the acquisition cost, there will be a need to consider freight, installation, and other implied cost in preparing the assets to be used in BPS 1 operation. Freight expense only implied to bulldozer and excavator as the other assets acquired from local source. Meanwhile, WTE plant infrastructures, machinery, and equipment freight, installation, and additional cost already included in its baseline price. Hence, the calculation of implied, freight, and installation cost can be seen in Ms. Excel Formula 4.10 below.

$$= \text{SUMPRODUCT}(F_e; y(t)) * (100\% + f_c) + \text{SUM}(E - E_F) * f_c + \text{SUM}(E) * i_e \quad (4.10)$$

Where:

SUMPRODUCT : Formula to Do Array Multiplication and Addition

SUM : Formula to Do Array Addition

F_e : Freight, Installation, and Other Expense of Certain Asset (Can be seen in Table 4.41 below)

Table 4.41 BPS 1 – F_e Implication for Certain Assets

No	Tangible Assets	Expected F_e /Unit	Baseline
7	Bulldozer	Rp48.690.000	2020
8	Excavator	Rp32.460.000	2020

(Source: Author’s Document)

$y(t)$: Amount of Certain Asset Acquired in t period

E : Sum of Variable Assets CAPEX Amount in t period

- E_F : Sum of Variable Assets that Already Have F_e
- f_c : Additional Freight Expense Cap for Variable Assets with no F_e
- i_e : Insurance Fee

F_e implication in t period also affected by inflation so that Formula 4.10 also included in its complete formula. Hence, it can be calculated as can be seen below.

$$\begin{aligned}
 &= \text{SUMPRODUCT}(FV(3\%; (2025 \\
 &\quad - 2020)); ; Rp\ 48.690.000: Rp\ 32.460.000); 4: 6) \\
 &\quad * (100\% + 10\%) \\
 &\quad + \text{SUM}(Rp11.222.640.000 - Rp10.335.440.000) \\
 &\quad * (10\%) + \text{SUM}(Rp11.222.640.000) * 0.25\% \\
 &\quad = Rp541.816.600
 \end{aligned}$$

Freight, installation, and other additional expense related to acquisition expense also included as a part of the CAPEX and routine CAPEX needed to run BPS 1. The recapitulation of it alongside with routine CAPEX per year can be seen in Table 4.42 below.

Table 4.42 BPS 1 - Freight Expenses, Initial, and Routine CAPEX Recapitulation

Expenses	Initial CAPEX		Routine CAPEX	
	2025	2026	...	2075
Freight Expense	Rp541.816.600	Rp-		Rp36.806.289
Total CAPEX	Rp6.495.270.692.262	Rp-		Rp395.892.031

(Source: Author's Document)

The amount of CAPEX in Table 4.42 above is not complete yet as it is not including another intangible asset known as Interest During Construction (IDC). Its calculation will be explained in detail in the subchapter of financial modelling and feasibility study. The next component of BPS 1 cost is Operational Expenditure (OPEX). In this research the OPEX calculation differentiated into two, which are calculated using mathematical formula to represent its correlation with the input and its capacity (Type 1) and using common size of benchmarked industry (Type 2). Type 1 OPEX includes the calculation of communication expense, direct

material expense, transportation expense, and waste management expense. The example of its calculation that will be shown in this report is the calculation of sodium bicarbonate needed in 2026 and the expense needed to fund it. Its calculation can be seen in Formula 4.11 and Formula 4.12 below.

$$n(t) = r \times X(t) \quad (4.11)$$

$$O(t) = n(t) \times FV(\text{rate}; \text{nper}; \text{pmt}; [\text{pv}]; [\text{type}]) \quad (4.12)$$

Where:

- n(t) : Amount of Direct Material Needed in t period
- r : Ratio of Direct Material Need per Unit of RDF (For BPS 1 the r ratio can be seen through Table 4.43 below)

Table 4.43 BPS 1 – Ratio of Direct Material Needed

Material Name	Amount	Unit	Ratio with RDF (r)
Sodium Bicarbonate	600	ton	3,00%
Ammonia	180	ton	0,90%
Active Carbon	200	ton	1,00%
RDF	20000	ton	
Water	1,6	cbm/MWh	

(Source: Kokalj and Samec, 2013)

- X(t) : Amount of RDF in t period
- O(t) : Direct Material Expense in t period
- FV : Function to Do Future Value (FV) Calculation according to Single Payment Compound Amount Factor
- rate : Interest Rate used in FV Calculation (Using Inflation Rate)
- nper : Number of Compounding Period in FV Calculation
- pv : Initial Baseline Price of Direct Material (For BPS 1 the initial baseline price for each direct material can be seen through Table 4.44 below)

Table 4.44 BPS 1 – Direct Material Baseline Price

Material Name	Baseline Price/Unit (pv)	Baseline Year
Sodium Bicarbonate	Rp4.500.000/Ton	2020
Ammonia	Rp6.000.000/Ton	2020
Active Carbon	Rp15.400.000/Ton	2020
Water	Rp16,300/1000 Liter	2020

(Source: Author's Document)

Hence, the amount of sodium bicarbonate in 2026 and the fund needed to pay for it can be calculated as can be seen below.

$$n(t) = 3\% \times 465,000 \text{ Ton}$$

$$n(t) = 13,950 \text{ Ton}$$

$$O(t) = 13,950 \text{ Ton} \times FV(3\%; (2026 - 2020); 0; Rp4.500.000; 0)$$

$$O(t) = Rp74.337.863.165$$

The other Type 1 OPEX calculation base recapitulation can be seen through Table 4.45 below.

Table 4.45 BPS 1 – Overhead Expense Base Conversion Factor

Transportation Expense Factor	Energy Needed/Unit	Unit
Bulldozer	21	liter/hour
Excavator	20	liter/hour
Electricity Expense Factor	Energy Needed	Unit
Office Equipment	25	kWh/day
Other Equipment	4	kWh/day

(Source: Author's Document)

For Type 2 OPEX its calculation will follow common size acquired from benchmarked industry parameters ratio. The example of its calculation that will be included in this report is the calculation of general and administrative (G&A) expense ratio using data acquired from benchmarked industries of CLH, CVA, and RSG. The formula used in this calculation can be seen in Formula 4.13 until Formula 4.15 below.

$$G\&A \text{ Ratio} = \frac{G\&A \text{ Expense in } t \text{ period}}{Total \text{ OPEX in } t \text{ period}} \quad (4.13)$$

$$Average \text{ G\&A Ratio} = \sum_{i=2010}^{2019} G\&A \text{ Ratio}_i \quad (4.14)$$

$$Common \text{ Size G\&A Ratio} = AVERAGE(Average \text{ G\&A Ratio } (CLH + CVA + RSG)) \quad (4.15)$$

The result of this calculation can be seen in Table 4.46 until Table 4.48 below.

Table 4.46 BPS 1 – Common G&A Ratio Calculation of Benchmarked Industry (2010-2014)

CLH	2010	2011	2012	2013	2014
G&A Expense	\$205.812.000	\$254.137.000	\$273.520.000	\$470.477.000	\$437.921.000
Total OPEX	\$1.426.859.000	\$1.643.808.000	\$1.824.058.000	\$3.024.651.000	\$3.013.743.000
CLH G&A Ratio	0.14	0.15	0.15	0.16	0.15
CVA	2010	2011	2012	2013	2014
G&A Expense	\$102.582.000	\$103.000.000	\$97.000.000	\$84.000.000	\$97.000.000
Total OPEX	\$1.200.300.000	\$1.208.000.000	\$1.170.000.000	\$1.186.000.000	\$1.317.000.000
CVA G&A Ratio	0.09	0.09	0.08	0.07	0.07
RSG	2010	2011	2012	2013	2014
G&A Expense	\$858.000.000	\$825.400.000	\$820.900.000	\$853.800.000	\$918.900.000
Total OPEX	\$5.733.800.000	\$5.796.600.000	\$5.949.200.000	\$6.329.500.000	\$6.648.300.000
RSG G&A Ratio	0.15	0.14	0.14	0.13	0.14

(Source: Author's Document)

Table 4.47 BPS 1 – Common G&A Ratio Calculation of Benchmarked Industry (2015-2019)

CLH	2015	2016	2017	2018	2019
G&A Expense	\$414.164.000	\$422.015.000	\$456.648.000	\$503.747.000	\$484.054.000
Total OPEX	\$2.813.364.000	\$2.399.062.000	\$2.528.781.000	\$2.819.104.000	\$2.882.009.000
CLH G&A Ratio	0.15	0.18	0.18	0.18	0.17
CVA	2015	2016	2017	2018	2019
G&A Expense	\$93.000.000	\$100.000.000	\$112.000.000	\$115.000.000	\$122.000.000
Total OPEX	\$1.338.000.000	\$1.383.000.000	\$1.436.000.000	\$1.587.000.000	\$1.559.000.000
CVA G&A Ratio	0.07	0.07	0.08	0.07	0.08
RSG	2015	2016	2017	2018	2019
G&A Expense	\$983.100.000	\$969.800.000	\$1.057.400.000	\$1.059.500.000	\$1.091.900.000
Total OPEX	\$6.585.600.000	\$6.859.100.000	\$7.336.700.000	\$7.271.700.000	\$7.471.700.000
RSG G&A Ratio	0.15	0.14	0.14	0.15	0.15

(Source: Author's Document)

Table 4.48 BPS 1 – G&A Expense Common Size Ratio Calculation

Business Code	Average G&A Ratio	Common Size G&A Ratio
CLH	0.16	13% of Total OPEX
CVA	0.08	
RSG	0.14	

(Source: Author's Document)

The recapitulation of Type 2 OPEX common size ratio can be seen through Table 4.49 below.

Table 4.49 BPS 1 – Type 2 OPEX Common Size Ratio Recapitulation

Type 2 OPEX Components	Common Size Ratio	
Labor and Related	33%	of cost of operation
Maintenance and Repair	16%	of cost of operation
Risk Management	3%	of cost of operation
Selling, General, and Administrative	13%	of total OPEX

(Source: Author's Document)

These common size ratio will ensure Type 2 OPEX will have a fixed ratio within the planning horizon of financial modelling and feasibility study done in this research. The recapitulation of BPS 1 OPEX can be seen through Table 4.50 below.

Table 4.50 BPS 1 – Total OPEX/Year (in IDR, million)

Process	OPEX Sources	in million				
		2026	2027	...	2074	2075
Operating Expense - General	Communication Expense	Rp14	Rp15		Rp59	Rp61
	General and Administrative Expense	Rp52.823	Rp64.841		Rp370.967	Rp385.503
	Maintenance Expense	Rp46.214	Rp56.729		Rp324.560	Rp337.278
	Indirect Labor Expense	Rp18.906	Rp23.208		Rp132.778	Rp137.981
	Risk Management Expense	Rp9.749	Rp11.967		Rp68.466	Rp71.148
Cost of Operation	Direct Material					
	Sodium Bicarbonate	Rp74.338	Rp91.882		Rp527.458	Rp548.499
	Ammonia	Rp29.840	Rp36.882		Rp211.725	Rp220.171
	Active Carbon	Rp84.816	Rp104.832		Rp601.803	Rp625.809
	Water	Rp246	Rp304		Rp1.747	Rp1.816
	Direct Labor	Rp75.626	Rp92.832		Rp531.114	Rp551.925
	Overhead					
	Transportation Expense					
	Bulldozer Fuel Expense	Rp7.118	Rp7.331		Rp44.119	Rp45.443
	Excavator Fuel Expense	Rp10.169	Rp12.220		Rp63.033	Rp64.924
	Waste Management Expense					
	Fly Ash Management Expense	Rp5.339	Rp6.599		Rp37.883	Rp39.395
	Bottom Ash Management Expense	Rp2.002	Rp2.475		Rp14.206	Rp14.773
Total OPEX/Year	Rp417.201	Rp512.116		Rp2.929.918	Rp3.044.726	

(Source: Author's Document)

The last part in BPS 1 is about the calculation of expected managed MSW in WTE plant and the output acquired from its processing. These calculation can be done by making a mathematical representation of the amount of managed MSW relation with several factors that already listed in micro assumption stated in Table 4.21 including WTE plant OEE, initial capacity and gradient, and the WTE plant numbers. The calculation example of it can be seen through Formula 4.16 below.

$$m(t) = \frac{U(t)}{n} \quad (4.16)$$

Where:

m(t) : Amount of MSW Potential Input as MSW Plant's RDF in t period

U(t) : Amount of Unmanaged MSW in Sidoarjo District in t period

n : Number of WTE Plant Working Days

For example, the amount of MSW potential input as MSW plant's RDF in 2026 can be calculated as follow:

$$m(t) = \frac{430,423 \text{ Ton}}{310 \text{ Days}} = 1388 \text{ Ton/Day}$$

In order determine the amount of MSW input can be managed by WTE plant certain mathematical logics is implemented in BPS 1 model. It is represented through Formula 4.17 of Ms. Excel below.

$$= \text{if}(\text{Logical Test}; \text{Value if True}; \text{Value if False}) \quad (4.17)$$

Where:

IF : Ms. Excel IF Function to Perform Logical Test according to Return a Value based on a Certain Condition

Logical Test : Certain Condition to be Met

Value if True : Value to be Returned if the Condition is Met

Value if False : Value to be Returned if the Condition is not Met

For example, the amount of MSW input that can be managed as MSW plant's RDF in 2026 can be determined as follow:

$$m_i = \text{if}((C \times p_n \times C_F)_t < m(t); (C \times p_n \times C_F)_t; m(t))$$

Where:

m_i : Manageable MSW Input in 2026

C : Initial Plant Capacity (1000 Ton/Day)

p_n : Number of WTE Plant (3 Plants)

C_F : Capacity Factors in 2026 (50%)

$$m_i = \text{if}\left(\left(1000 \frac{\text{Ton}}{\text{Day}} \times 3 \times 50\%\right)_{2026} < 1388 \text{ Ton/Day}; \left(1000 \frac{\text{Ton}}{\text{Day}} \times 3 \times 50\%\right)_{2026}; 1388 \text{ Ton/Day}\right)$$

$$m_i = \text{if} \left(\frac{1500 \text{Ton}}{\text{Day}} < 1388 \frac{\text{Ton}}{\text{Day}}; 1500 \frac{\text{Ton}}{\text{Day}}; 1388 \frac{\text{Ton}}{\text{Day}} \right)$$

$$m_i = 1388 \frac{\text{Ton}}{\text{Day}}$$

The rest of the unused capacity of the WTE Plant in BPS 1 will be used to accommodate piled MSW in TPA Jabon of Sidoarjo district. This accommodation is made until the amount of MSW in TPA Jabon that can be used as RDF, which approximately reach about 480,000 ton, used up. This calculation can be seen through Formula 4.18 below.

$$m_{TPA t} = ((C \times p_n \times C_F)_t - m_i) \times n \quad (4.18)$$

Where:

m_{TPA} : Manageable MSW Input Left from TPA Jabon in t period

C : Initial Plant Capacity (1000 Ton/Day)

p_n : Number of WTE Plant (3 Plants)

C_F : Capacity Factors in t period

It can be calculated as follow:

$$m_{TPA 2026} = \left(\left(1000 \frac{\text{Ton}}{\text{Day}} \times 3 \times 50\% \right) - 1388 \frac{\text{Ton}}{\text{Day}} \right) \times 310 \text{ Days}$$

$$m_{TPA 2026} = 34.577 \text{ Ton}$$

There is also a need to find the amount of manageable MSW in BPS 1 WTE plant in another units which is m^3/day to support the calculation of certain assets which using m^3/day as their baseline capacity and also to determine the needs of certain areas in this plant such as warehouse. The calculation steps of doing so can be seen through Formula 4.19 below.

$$m_{i \text{ MSW Type}} = \frac{m_i \times \text{MSW Type Ratio in Sidoarjo District}}{\text{EPA CF for MSW Type}} \quad (4.19)$$

For example the calculation of manageable food waste in 2026 can be calculated as follow:

$$m_{i \text{ Food Waste}} = \frac{1500 \frac{\text{Ton}}{\text{Day}} \times 46.5\%}{0.30 \frac{\text{ton}}{\text{cbm}}} = 2327 \text{ m}^3 / \text{Day}$$

The recapitulation of calculation result for each type of MSW in 2026 can be seen through Table 4.51 below.

Table 4.51 BPS 1 – Manageable MSW Unit Conversion (2026)

MSW Type	%MSW	MSW Ton/Day	EPA CF	MSW m ³ /Day
m_i (Total MSW)		1388		
Food Waste	46,54%	646	0,30	2134
Garden Waste	15,00%	208	0,16	1274
Textile Waste	4,80%	67	0,11	582
Paper Waste	2,66%	37	0,25	149
Rubber & Leather Waste	0,54%	7	0,20	38
Plastic Waste	0,48%	7	0,02	318
Glass Waste	0,25%	3	0,17	20
Metal Waste	0,16%	2	0,09	23
Other Waste	29,57%	411	0,20	2093
Total	100%	1388		6632

(Source: Author's Document)

Last, there is a calculation of expected electricity output per year produced from WTE plant with consideration to the plant OEE rate. This calculation can be represented using Fomula 4.20 below.

$$E_{Ot} = m_i(t) \times n \times E_{CF} \times OEE \quad (4.20)$$

Where:

E_o : Expected Electricity Output of WTE Plant in t period

$m_i(t)$: Expected Manageable MSW per day in t period

n : Number of Working Days/Year (310 Days)

E_{CF} : RDF-to-Electricity Conversion Factor (20 kWh/ton)

OEE : Overall Equipment Effectiveness (85%)

For example the expected electricity output produced in 2026 by BPS 1 Plant can be calculated as follow:

$$E_{Ot} = 1500 \frac{\text{Ton}}{\text{Day}} \times 310 \text{ Days} \times 20 \frac{\text{kWh}}{\text{Ton}} \times 85\%$$

$$E_{Ot} = 7.905.000 \text{ kWh}$$

Recapitulation of the amount of manageable MSW per period in ton and m³ units as well as the expected electricity output that may be produced from it can be seen through Table 4.52 below.

Table 4.52 BPS 1 – Expected Manageable MSW and Electricity Output

Information	2026	2027	...	2074	2075
WTE Plant Capacity	1500	1800		3000	3000
Manageable MSW – BPS 1 (ton/day)	1388	1413		2576	2600
MSW from TPA – BPS 1 (ton/day)	112	387		0	0
Manageable MSW – BPS 1 (m ³ /day)	7165	8598		12302	12421
Manageable MSW – BPS 1 (ton/year)	465.000	558.000		798.443	806.110
Manageable MSW – BPS 1 (m ³ /year)	2.221.072	2.665.287		3.813.764	3.850.386
Expected Electricity Output/Year (kWh)	7.905.000	9.486.000		13.573.535	13.703.876

(Source: Author's Document)

4.2.2.2 Business Plan Scenario 2 – Integrated MSW Recycling Business

BPS 2 is focusing utilizing unmanaged MSW in Sidoarjo district as an input for an integrated recycling process. The coverage business process activities in this BPS is MSW recycling according to its type. The grand division of MSW type as already mentioned before are organic and inorganic. In BPS 2, all organic MSW is treated as a material for compost production. Meanwhile, the inorganic MSW will be treated accordingly to its type. These recycling processes done to both type of MSW started with detailed MSW sorting represented through Figure 4.7 below.

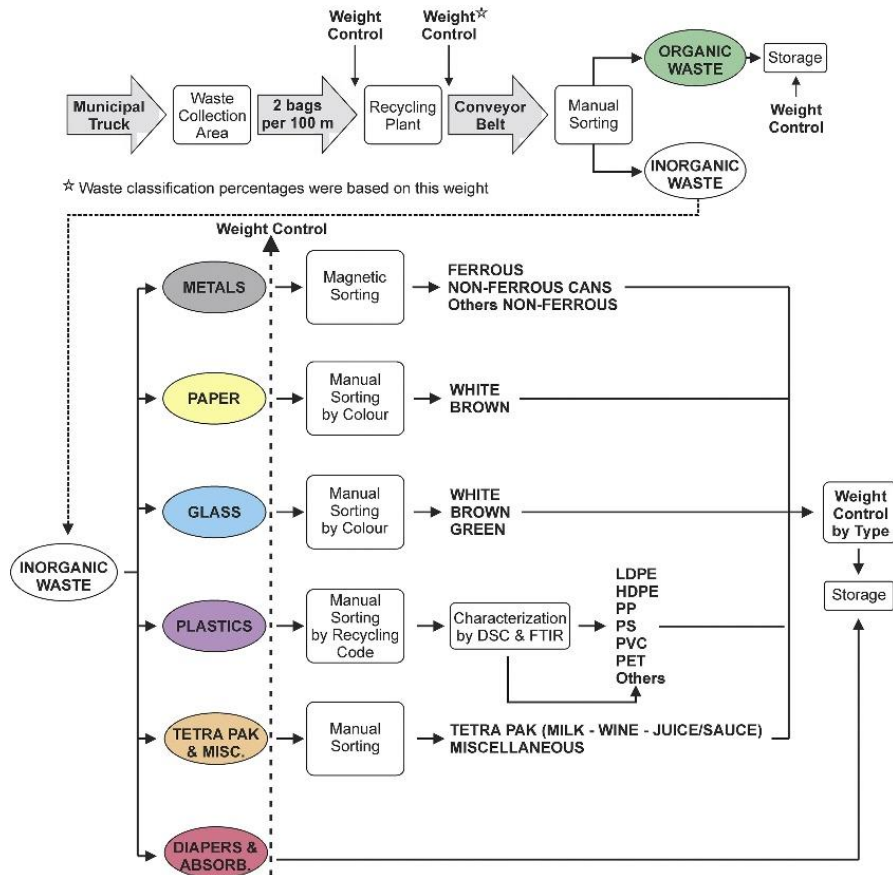


Figure 4.7 BPS 2 - Unmanaged MSW Sorting
(Source: Vazquez et al, 2020)

After manual sorting for all MSW done, the main recycling process is done. From common practice experience, it is found out that approximately only 20% of the total sorted MSW is recyclable. Hence, in this research the expected raw material that will be processed in BPS 2 use this common ratio as one of the micro assumption. At an OEE level of 85%, recycling processes output resulted from each material represented through Figure 4.8 below.

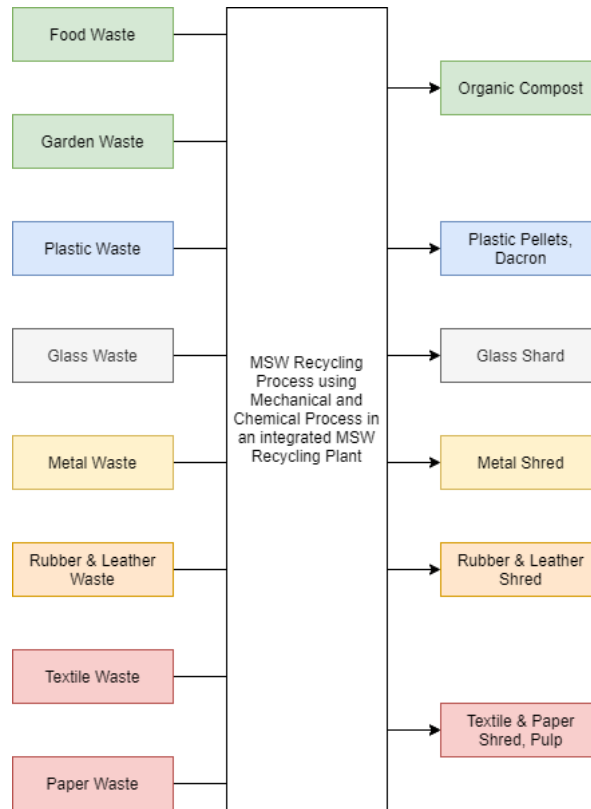


Figure 4.8 BPS 2 – MSW Recycling Plant Output
(Source: Author’s Document)

These output is expected to be sold to a related manufacture or home industry This MSW recycling plant is planned to operate at 85% availability rate per year or equal to 310 days per year with the expected useful life of 50 years. Its construction is estimated to take 5 years to complete. It is planned to be managed by a third-private party which called as Badan Usaha (BU) in Indonesia. Because of the area of this private industry moves, which is a public sector of municipal sanitary, this BPS follows a Public Private Partnership (PPP) business scheme. The public sector included in here is municipal sanitary which previously managed by DLHK of Sidoarjo District that is directly related to Sidoarjo community and related manufacture or home industry as the main consumer of the recycled goods produced from this plant. The relation of each stakeholders within this PPP scheme are represented through Figure 4.9 below.

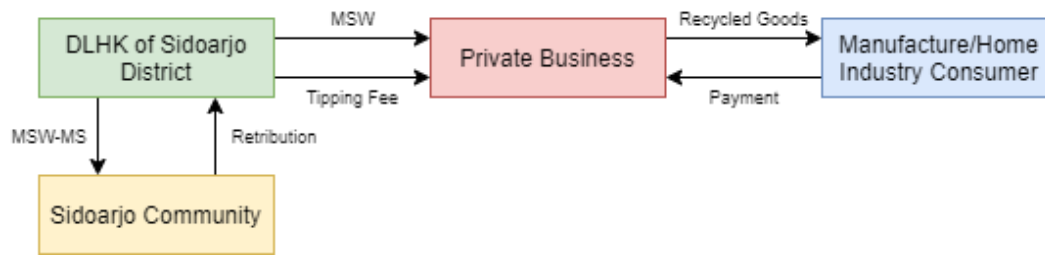


Figure 4.9 BPS 2 - PPP Scheme Stakeholders of MSW-MS for MSW Recycling Business
(Source: Author's Document)

The same as BPS 1, the implementation of PPP scheme of WTE plant in BPS 2 standardized according to Indonesian standard stated in Modul Penyelenggaraan Pengolahan Sampah Menjadi Energi melalui KPBU (Pusat Pendidikan dan Pelatihan Jalan, Perumahan, Permukiman, dan Pengembangan Infrastruktur Wilayah, 2019), in such a way that:

1. Waste recycling plant and infrastructure investment funded partly or fully by private business (BU).
2. Private business return on investment given by government in form of Availability Payment (AP).
3. It implements Build, Operate, Own, and Transfer (BOOT) PPP scheme, which means that after its determined useful life has expired the facilities will be acquired by government. But during its useful life, private business has the authority to run the business under their own good corporate governance.
4. The limitation of business activities done by private business (BU) limited only to detailed sorting of recyclable unmanaged MSW and its processing with the output of recycled goods represented in Figure 4.7. General MSW sorting and transporting process still considered as government responsibility.

According to Acuan Lokasi Risiko KPBU di Indonesia (PT Penjaminan Infrastruktur Indonesia, 2019) implementation of BOOT-AP commonly done through routine AP given by government for the private business in order to support the feasibility and continuity of their service. However, in BPS 2, its implementation is slightly different as they generate their own revenue stream through their operation. In BPS 2, AP is given at a specific return rate in order to

cover initial and routine CAPEX of integrated waste recycling plant. The representation of this PPP scheme can be seen through Figure 4.5 and Figure 4.6 in subchapter 4.2.2.1.

Next, in this part of the report, there will be an information of infrastructure needed to build integrated waste recycling plant in form CAPEX; and the expense needed to run it in form OPEX. The calculation of CAPEX needed to fund integrated waste recycling plant infrastructure in BPS 2 calculated by comparing the capacity of each asset with the needed capacity according to MSW generation level in Sidoarjo district and other relevant factors. The example of its calculation can be seen through Formula 4.7 in subchapter 4.2.2.1. But, beforehand, there is a need to determine usage life of its assets that will be listed in CAPEX for BPS 2 to determine the reinvestment that will affect reinvestment decision. The recapitulation of assets usage life for BPS 2 can be seen through Table 4.53 below.

Table 4.53 BPS 2 – Assets Usage Life and Capacity Recapitulation

Process	Code	Tangible Assets	Usage Life (Years)	Usage Capacity
General (1)	1.1	Integrated MSW Recycling Infrastructure	50	
	1.2	Land Acquisition Fee	50	
	1.3	Supporting and Office Facilities Construction	50	
	1.4	Office Equipment	15	
	1.5	Operational and Safety Equipment	10	
	1.6	Supporting Equipment	15	
	1.7	Laboratory Equipment	15	
	1.8	Belt Conveyor	15	1117 m ³ /hour
	1.9	Bulldozer	15	2 m ³ /Taking
	1.10	Dump Truck	15	0.5 m ³ /Taking
Organic (2)	2.1	Compost Turning Machine	15	500 m ³ /hour
	2.2	Semi-Wet Material Crusher	15	8 ton/hour
	2.3	Sieving Machine	15	20 ton/hour
	2.4	Mixing Machine	15	15 ton/hour
	2.5	Granulator	15	33 ton/hour
	2.6	Drying Machine	15	40 ton/hour
	2.7	Cooling Machine	15	22 ton/hour
	2.8	Screener Machine	15	20 ton/hour
	2.9	Coating Machine	15	30 ton/hour
	2.10	Packing Machine	15	29 ton/hour
Inorganic (3)	3.1	Plastic Recycling Line	15	1.5 ton/hour
	3.2	Glass Recycling Line	20	1 ton/hour
	3.3	Metal Recycling Line	20	5 ton/hour
	3.4	Rubber Recycling Line	15	1 ton/hour
	3.5	Textile and Paper Recycling Line	15	0.9 ton/hour
	No	Intangible Assets	Usage Life (Years)	
	1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB	50 (With an extension every 5 Year for some documents)	

Process	Code	Tangible Assets	Usage Life (Years)	Usage Capacity
		<ul style="list-style-type: none"> - BPHTB - AJB - PBNP - PPN - AMDAL - Insurance and other relevant legal document 		

(Source: Author's Document)

Considering the factors of usage life and number of MSW to be processed, initial CAPEX and routine CAPEX of BPS 2 calculated using similar approach as already explained in subchapter 4.2.2.1. But first there is a need to determine each asset required amount per period. Its recapitulation can be seen in Table 4.54 below.

Table 4.54 BPS 2 - Recapitulation of Assets Requirement per Year

Process	Code	Tangible Assets	Units	Units Needed		
				2026	...	2075
General (1)	1.1	Integrated MSW Recycling Infrastructure	Plant	1		1
	1.2	Land Acquisition Fee	m ²	18.816		18.816
	1.3	Supporting and Office Facilities Construction	m ²			
	1.4	Office Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	62		201
	1.5	Operational and Safety Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	62		201
	1.6	Supporting Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	62		201
	1.7	Laboratory Equipment	Lab	3		3
	1.8	Belt Conveyor	m	57		446
	1.9	Bulldozer	Unit	1		1
	1.10	Dump Truck	Unit	1		2
Organic (2)	2.1	Compost Turning Machine	Unit	1		1
	2.2	Semi-Wet Material Crusher	Unit	2		6
	2.3	Sieving Machine	Unit	1		3
	2.4	Mixing Machine	Unit	2		7
	2.5	Granulator	Unit	1		4
	2.6	Drying Machine	Unit	1		3
	2.7	Cooling Machine	Unit	2		5
	2.8	Screener Machine	Unit	2		6
	2.9	Coating Machine	Unit	1		4
	2.10	Packing Machine	Unit	1		4
Inorganic (3)	3.1	Plastic Recycling Line	Unit	1		1
	3.2	Glass Recycling Line	Unit	1		1
	3.3	Metal Recycling Line	Unit	1		1
	3.4	Rubber Recycling Line	Unit	1		1
	3.5	Textile and Paper Recycling Line	Unit	2		5
	Code	Intangible Assets	Units	Units Needed		
				2025	...	2075
	1	Legal Document + Notary Fee <ul style="list-style-type: none"> - SKDP - SIUP - TDP - IMB - BPHTB - AJB - PBNP 	Unit	1		1

Process	Code	Tangible Assets	Units	Units Needed		
				2026	...	2075
		- PPN - AMDAL - Insurance and other relevant legal document				

(Source: Author's Document)

■ : Fixed-amount assets, which means that its initial amount will sourced from the requirement from the last period (2075)

The recapitulation of CAPEX calculation for all asset according to the similar formula like Formula 4.9 in subchapter 4.2.2.1 can be seen through Table 4.55 and Table 4.56 below.

Table 4.55 BPS 2 – Initial and Routine CAPEX Calculation Recapitulation

Process	Code	Tangible Assets	Baseline Year	Baseline Price/Unit in 2025
General (1)	1.1	Integrated MSW Recycling Infrastructure	2020	Rp36.606.489.671
	1.2	Land Acquisition Fee	2020	Rp2.000.000
	1.3	Supporting and Office Facilities Construction		
	1.4	Office Equipment (Standardized for specific number of worker per period)	2020	Rp14.957.636
	1.5	Operational and Safety Equipment (Standardized for specific number of worker per period)	2020	Rp1.391.722
	1.6	Supporting Equipment (Standardized for specific number of worker per period)	2020	Rp1.008.974
	1.7	Laboratory Equipment	2020	Rp172.521.757
	1.8	Belt Conveyor	2020	Rp3.220.000
	1.9	Bulldozer	2020	Rp840.000.000
	1.10	Dump Truck	2020	Rp350.000.000
Organic (2)	2.1	Compost Turning Machine	2020	Rp109.200.000
	2.2	Semi-Wet Material Crusher	2020	Rp119.000.000
	2.3	Sieving Machine	2020	Rp103.600.000
	2.4	Mixing Machine	2020	Rp336.000.000
	2.5	Granulator	2020	Rp130.200.000
	2.6	Drying Machine	2020	Rp2.307.494.000
	2.7	Cooling Machine	2020	Rp700.000.000
	2.8	Screener Machine	2020	Rp280.000.000
	2.9	Coating Machine	2020	Rp224.000.000
	2.10	Packing Machine	2020	Rp193.900.000
Inorganic (3)	3.1	Plastic Recycling Line	2020	Rp420.000.000
	3.2	Glass Recycling Line	2020	Rp630.000.000
	3.3	Metal Recycling Line	2020	Rp1.400.000.000
	3.4	Rubber Recycling Line	2020	Rp429.660.000
	3.5	Textile and Paper Recycling Line	2020	Rp700.000.000
Process	Code	Intangible Assets	Baseline Year	Baseline Price/Unit in 2025
	1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB - BPHTB - AJB - PBNP - PPN - AMDAL	2017	Rp1.330.108.585

Process	Code	Tangible Assets	Baseline Year	Baseline Price/Unit in 2025
		- Insurance and other relevant legal document		

(Source: Author's Document)

Table 4.56 BPS 2 – Initial and Routine CAPEX Calculation Recapitulation (con't)

Process	Code	Tangible Assets	Initial CAPEX	Routine CAPEX
			2025	2075
General (1)	1.1	Integrated MSW Recycling Infrastructure	Rp42.436.954.427	Rp -
	1.2	Land Acquisition Fee	Rp18.872.679.119	Rp -
	1.3	Supporting and Office Facilities Construction		
	1.4	Office Equipment (Standardized for specific number of worker per period)	Rp1.075.080.000	Rp1.014.874.243
	1.5	Operational and Safety Equipment (Standardized for specific number of worker per period)	Rp100.030.000	Rp199.073.172
	1.6	Supporting Equipment (Standardized for specific number of worker per period)	Rp72.520.000	Rp311.739.557
	1.7	Laboratory Equipment	Rp600.000.000	Rp -
	1.8	Belt Conveyor	Rp306.348.571	Rp602.473.941
	1.9	Bulldozer	Rp965.930.000	Rp -
	1.10	Dump Truck	Rp402.470.000	Rp1.764.390.655
Organic (2)	2.1	Compost Turning Machine	Rp125.570.000	Rp -
	2.2	Semi-Wet Material Crusher	Rp273.679.476	Rp599.892.551
	2.3	Sieving Machine	Rp119.131.066	Rp1.044.518.794
	2.4	Mixing Machine	Rp772.742.050	Rp -
	2.5	Granulator	Rp149.718.772	Rp -
	2.6	Drying Machine	Rp2.653.419.111	Rp -
	2.7	Cooling Machine	Rp1.609.879.270	Rp -
	2.8	Screener Machine	Rp643.951.708	Rp1.411.511.884
	2.9	Coating Machine	Rp257.580.683	Rp -
	2.10	Packing Machine	Rp222.968.279	Rp977.471.980
Inorganic (3)	3.1	Plastic Recycling Line	Rp482.963.781	Rp -
	3.2	Glass Recycling Line	Rp724.445.671	Rp -
	3.3	Metal Recycling Line	Rp1.609.879.270	Rp -
	3.4	Rubber Recycling Line	Rp494.071.948	Rp -
	3.5	Textile and Paper Recycling Line	Rp1.609.879.270	Rp -
Process	Code	Intangible Assets	Initial CAPEX	Routine CAPEX
			2025	2075
	1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB - BPHTB - AJB - PBNP - PPN - AMDAL - Insurance and other relevant legal document	Rp1.330.108.585	Rp -

(Source: Author's Document)

Other than the acquisition cost, there will be a need to consider freight, installation, and other implied cost in preparing the assets to be used in BPS 2 operation. Freight expense implied to belt conveyor, bulldozer, dump truck, organic composting line, and inorganic recycling line, as the other assets acquired from

local source. The calculation of implied, freight, and installation cost based on certain baseline price as can be seen in Table 4.57 below.

Table 4.57 BPS 2 – F_e Implication for Certain Assets

Code	Tangible Assets	Baseline	Expected F _e /Unit
1.9	Bulldozer	2020	Rp48.690.000
1.10	Excavator	2020	Rp32.460.000
2.1	Compost Turning Machine	2020	Rp24.340.000
2.2	Semi-Wet Material Crusher	2020	Rp24.340.000
2.3	Sieving Machine	2020	Rp24.340.000
2.4	Mixing Machine	2020	Rp32.460.000
2.5	Granulator	2020	Rp24.340.000
2.6	Drying Machine	2020	Rp97.380.000
2.7	Cooling Machine	2020	Rp48.690.000
2.8	Screener Machine	2020	Rp32.460.000
2.9	Coating Machine	2020	Rp32.460.000
2.10	Packing Machine	2020	Rp32.460.000
3.1	Plastic Recycling Line	2020	Rp48.690.000
3.2	Glass Recycling Line	2020	Rp113.610.000
3.3	Metal Recycling Line	2020	Rp129.840.000
3.4	Rubber Recycling Line	2020	Rp48.690.000
3.5	Textile and Paper Recycling Line	2020	Rp48.690.000

(Source: Author's Document)

Freight, installation, and other additional expense related to acquisition expense also included as a part of the CAPEX and routine CAPEX needed to run BPS 2. The recapitulation of it alongside with routine CAPEX per year can be seen in Table 4.58 below.

Table 4.58 BPS 2 - Freight Expenses, Initial, and Routine CAPEX Recapitulation (2025-2030)

Expenses	Initial CAPEX		Routine CAPEX	
	2025	2026	...	2075
Freight Expense	Rp1.378.130.504	Rp-		Rp1.047.840.202
Total CAPEX	Rp79.290.131.563	Rp-		Rp8.973.786.980

(Source: Author's Document)

The amount of CAPEX in Table 4.58 above is not complete yet as it is not including another intangible asset known as Interest During Construction (IDC). Its calculation will be explained in detail in the subchapter of financial modelling and feasibility study. The next component of BPS 2 cost is Operational Expenditure (OPEX). In this research the OPEX calculation differentiated into two, which are calculated using mathematical formula to represent its correlation with the input and its capacity (Type 1) and using common size of benchmarked industry (Type 2). Type 1 OPEX includes the calculation of communication expense, direct

material expense, transportation expense, electricity expense, and compost turner fuel expense. Recapitulation for calculation bases of BPS 2 OPEX can be seen through Table 4.59 until 4.61 below.

Table 4.59 BPS 2 – Ratio of Direct Material Needed for Composting

Material Name	Amount	Unit	Compost Ratio (%)
Organic Waste	14400	Ton	33,72%
Straw	9900	Ton	23,18%
Husk Charcoal	660	ton	1,55%
Animal Droppings	4950	ton	11,59%
EM4	6600	ton	15,45%
Water	6197	liter	14,51%

(Source: Author's Document)

Table 4.60 BPS 2 – Direct Material Baseline Price

Material Name	Baseline Price/Unit (pv)	Baseline Year
Straw	Rp150.000/ton	2020
Husk Charcoal	Rp200.000/ton	2020
Animal Droppings	Rp500.000/ton	2020
EM4	Rp20.000/ton	2020
Water	Rp15.600/m ³	2020
Packaging	Rp1000/piece (Capacity @1 kg)	2020

(Source: Author's Document)

Table 4.61 BPS 2 – Overhead Expense Base Conversion Factor

Transportation Expense Factor	Energy Needed/Unit	Unit
Bulldozer	21	liter/hour
Dump Truck	0,3	liter/km
Compost Turning Machine	6	liter/hour
Electricity Expense Factor	Energy Needed	Unit
Office Equipment	8,3	kWh/day
Other Equipment	1,3	kWh/day
Belt Conveyor	1480	kWh/day
Compost Production Line	2378	kWh/day
Inorganic MSW Recycling Line	4495	kWh/Day
Laboratory Equipment	8	kWh/Day

(Source: Author's Document)

As what have been done in subchapter 4.2.2.1, common size ratio will ensure Type 2 OPEX will have a fixed ratio within the planning horizon of financial modelling and feasibility study done in this research. These ratios can be seen in Table 4.48 form subchapter 4.2.2.1. The recapitulation of BPS 2 OPEX can be seen through Table 4.62 below.

Table 4.62 BPS 2 – Total OPEX/Year (in IDR, million)

Process	OPEX Sources	in million				
		2026	2027	...	2074	2075
	Communication Expense	Rp14	Rp15		Rp59	Rp61

Process	OPEX Sources	in million				
		2026	2027	...	2074	2075
Operating Expense - General	General and Administrative Expense	Rp34.940	Rp42.364		Rp472.676	Rp493.393
	Maintenance Expense	Rp30.568	Rp37.063		Rp413.548	Rp431.673
	Indirect Labor Expense	Rp12.505	Rp15.163		Rp169.184	Rp176.599
	Risk Management Expense	Rp6.448	Rp7.818		Rp87.237	Rp91.061
Cost of Operation	Direct Material					
	Straw	Rp4.132	Rp5.198		Rp63.344	Rp65.871
	Husk Charcoal	Rp367	Rp462		Rp5.631	Rp5.855
	Animal Droppings	Rp6.886	Rp8.663		Rp105.573	Rp109.784
	EM4	Rp367	Rp462		Rp5.631	Rp5.855
	Water	Rp222	Rp279		Rp3.401	Rp3.537
	Packaging	Rp96.616	Rp121.545		Rp1.481.202	Rp1.540.289
	Direct Labour Wage (Organic)	Rp25.011	Rp30.326		Rp338.367	Rp353.198
	Direct Labor Wage (Inorganic)	Rp25.011	Rp30.326		Rp338.367	Rp353.198
	Overhead					
	Transportation Expense					
	Bulldozer Fuel Expense	Rp593	Rp611		Rp2.451	Rp2.525
	Dump Truck Fuel Expense	Rp11	Rp12		Rp92	Rp95
	Electricity Expense	Rp32.102	Rp34.122		Rp245.794	Rp263.169
Compost Turner Fuel Expense	Rp162	Rp167		Rp669	Rp689	
Total OPEX/Year		Rp275.955	Rp334.594		Rp3.733.225	Rp3.896.852

(Source: Author's Document)

The last part in BPS 2 is about the calculation of expected managed MSW in integrated recycling plant and the output acquired from its processing. For example the expected compost output produced in 2026 by BPS 2 Plant can be calculated using similar formula like Formula 4.18 in subchapter 4.2.2.1 as follow:

$$m_{i \text{ Organic Waste}} = (646 + 208) \frac{\text{Ton}}{\text{Day}} \times 20\% \times 50\% = 85 \frac{\text{Ton}}{\text{Day}}$$

$$C_{O2026} = 85 \frac{\text{Ton}}{\text{Day}} \times 310 \text{ Days} \times 2.97 \frac{\text{Ton Compost}}{\text{Ton}} \times 85\%$$

$$C_{O2026} = 66,774 \text{ Ton Compost}$$

Recapitulation of the amount of manageable MSW per period in ton and m³ units as well as the expected output that may be produced from it can be seen through Table 4.63 below.

Table 4.63 BPS 2– Expected Manageable MSW and Recycling Output

Information	2026	2027	...	2074	2075
Manageable MSW – BPS 1 (ton/day)	98	119		363	366
Manageable MSW – BPS 1 (m ³ /day)	454	554		1.684	1.700
Manageable MSW – BPS 1 (ton/year)	30.315	37.026		112.469	113.549
Manageable MSW – BPS 1 (m ³ /year)	140.718	171.870		522.071	527.084
Expected Output					
Organic Compost (ton/year)	66.774	81.556		247.734	250.113
Textile Shred (ton/year)	1.756	2.145		6.515	6.578
Paper Shred & Pulp (ton/year)	973	1.189		3.611	3.645
Rubber and Leather Shred (ton/year)	198	241		733	740
Plastic Pellets (ton/year)	176	214		652	658
Glass Shard (ton/year)	91	112		339	343
Metal Shred (ton/year)	59	71		217	219

(Source: Author’s Document)

4.2.2.3 Business Plan Scenario 1 – Combination of BPS 1 and BPS 2

BPS 3 focusing on implementing both scenario as a complimentary industry. The main relation in this scenario is that unrecyclable MSW from BPS 2 will be processed as an RDF for BPS 1. The scheme of PPP implemented in this scenario is the same as well which are, BOT-AP for BPS 1 and BOOT-AP for BPS 2. Each scenario and as well as their relation will be explained in detail in this part of the report. In BPS 3, WTE plant business will be called as PT. X. Meanwhile, integrated recycling plant business will be called as PT. Y. BPS 3 explanation started with the division of manageable MSW for both business entities that can be seen through Table 4.64 below.

Table 4.64 BPS 3– Expected Manageable MSW and Recycling Output

Information	2026	2027	...	2074	2075
PT Y					
Manageable MSW – PT Y (ton/day)	98	119		363	366
Manageable MSW – PT Y (m ³ /day)	454	554		1.684	1.700
Manageable MSW – PT Y (ton/year)	30.315	37.026		112.469	113.549
Manageable MSW – PT Y (m ³ /year)	140.718	171.870		522.071	527.084
Expected Output					
Organic Compost (ton/year)	66.774	81.556		247.734	250.113
Textile Shred (ton/year)	1.756	2.145		6.515	6.578
Paper Shred & Pulp (ton/year)	973	1.189		3.611	3.645
Rubber and Leather Shred (ton/year)	198	241		733	740
Plastic Pellets (ton/year)	176	214		652	658
Glass Shard (ton/year)	91	112		339	343
Metal Shred (ton/year)	59	71		217	219
PT X					
WTE Plant Capacity	1500	1800	...	3000	3000
Manageable MSW – BPS 1 (ton/day)	1291	1294		2213	2234
MSW from TPA – BPS 1 (ton/day)	209	506		0	0
Manageable MSW – BPS 1 (m ³ /day)	7165	8598		10570	10671
Manageable MSW – BPS 1 (ton/year)	465.000	558.000		685.975	692.562
Manageable MSW – BPS 1 (m ³ /year)	2.221.072	2.665.287		3.276.557	3.308.021
Expected Electricity Output/Year (kWh)	7.905.000	9.486.000		11.661.567	11.773.548

(Source: Author’s Document)


1. PT. X - BPS 3 (WTE Plant)

The rest of the assets included in CAPEX of WTE Plant in BPS 3 calculated using almost similar formula with Formula 4.7 but with a modification relevant to the assets type and with accordance to its usage life. The recapitulation of this calculation can be seen in Table 4.65 below.

Table 4.65 BPS 3 (PT X) - Recapitulation of Assets Requirement per Year

No	Tangible Assets	Units	Units Needed		
			2026	...	2075
1	Incinerator Construction + Freight + Installation	Plant	2		3
2	Land Acquisition Fee	m2	68807		73473
3	Supporting and Office Facilities Construction	m2	8807		13473
4	Office Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	82		120
5	Operational and Safety Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	82		120
6	Supporting Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	82		120
7	Bulldozer	Unit	4		5
8	Excavator	Unit	6		8
No	Intangible Assets	Units	Units Needed		
			2026	...	2079
1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB - BPHTB - AJB - PBNP - PPN - AMDAL - Insurance and other relevant legal document	Unit	1		1

(Source: Author's Document)

 : Fixed-amount assets, which means that its initial amount will sourced from the requirement from the last period (2075)

The number of each assets represented in Table 4.65 above, shows the requirement of each asset per year, which means that if there is an increase from period to period there will be another purchase of asset which known as routine CAPEX as already mentioned before. The recapitulation of CAPEX calculation for all asset according to the similar formula like Formula 4.9 can be seen through Table 4.66 below.

Table 4.66 BPS 3 (PT X) – Initial and Routine CAPEX Calculation Recapitulation

No	Tangible Assets	Baseline Price/Unit	Baseline Year	Initial CAPEX	Routine CAPEX
				2025	2075
1	Incinerator Construction + Freight + Installation	Rp1.652.000.000.000	2017	Rp 6.227.421.249.097	Rp -
2	Land Acquisition Fee	Rp2.000.000	2020	Rp 170.349.577.087	Rp -
3	Supporting and Office Facilities Construction	Rp4.500.000	2020	Rp70.282.548.385	Rp -
4	Office Equipment	Rp8.461.066	2020	Rp692.600.000	Rp -
5	Operational and Safety Equipment	Rp1.436.706	2020	Rp122.080.000	Rp47.346.185
6	Supporting Equipment	Rp886.706	2020	Rp72.520.000	Rp311.739.557
7	Bulldozer	Rp840.000.000	2020	Rp3.863.720.000	Rp -
8	Excavator	Rp938.000.000	2020	Rp6.471.720.000	Rp -
No	Intangible Assets	Baseline Price/Unit	Baseline Year	Initial CAPEX	Routine CAPEX
1	Legal Document	Rp1.050.000.000	2017	Rp1.330.108.585	Rp -

(Source: Author’s Document)

Other than the acquisition cost, there will be a need to consider freight, installation, and other implied cost in preparing the assets to be used in BPS 1 operation. Freight expense only implied to bulldozer and excavator as the other assets acquired from local source. Meanwhile, WTE plant infrastructures, machinery, and equipment freight, installation, and additional cost already included in its baseline price which can be seen in subchapter 4.2.2.1. Freight, installation, and other additional expense related to acquisition expense also included as a part of the CAPEX and routine CAPEX needed to run BPS 3 (PT X). The recapitulation of it alongside with routine CAPEX per year can be seen in Table 4.67 below.

Table 4.67 BPS 3 (PT X) - Freight Expenses, Initial, and Routine CAPEX Recapitulation

Expense	Initial CAPEX	2026	Routine CAPEX
	2025		2075
Freight Expense	Rp541.816.600	Rp -	Rp36.806.289
Total CAPEX	Rp6.481.147.939.754	Rp -	Rp395.892.031

(Source: Author’s Document)

The amount of CAPEX in Table 4.67 above is not complete yet as it is not including another intangible asset known as Interest During Construction (IDC). Its calculation will be explained in detail in the subchapter of financial modelling and feasibility study. The next component of BPS 3 (PT X) cost is Operational Expenditure (OPEX). In this research the OPEX calculation differentiated into two, which are calculated using mathematical formula to represent its correlation with the input and its capacity (Type 1) and using common size of benchmarked industry (Type 2). Type 1 OPEX includes the calculation of communication expense, direct

material expense, transportation expense, and waste management expense. Type 2 OPEX includes the calculation of general and administration expense, maintenance expense, labour expense, and risk management expense according to specific common size ratio. As what have been done in subchapter 4.2.2.1, common size ratio will ensure Type 2 OPEX will have a fixed ratio within the planning horizon of financial modelling and feasibility study done in this research. These ratios can be seen in Table 4.48 form subchapter 4.2.2.1. The recapitulation of BPS 2 OPEX can be seen through Table 4.68 below.

Table 4.68 BPS 3 (PT X) – Total OPEX/Year (in million)

Process	OPEX Sources	in million				
		2026	2027	...	2074	2075
Operating Expense - General	Communication Expense	Rp14	Rp15		Rp59	Rp61
	General and Administrative Expense	Rp52.823	Rp64.841		Rp318.895	Rp331.390
	Maintenance Expense	Rp46.214	Rp56.729		Rp279.001	Rp289.933
	Indirect Labor Expense	Rp18.906	Rp23.208		Rp114.140	Rp118.612
	Risk Management Expense	Rp9.749	Rp11.967		Rp58.855	Rp61.161
Cost of Operation	Direct Material					
	Sodium Bicarbonate	Rp74.338	Rp91.882		Rp453.160	Rp471.237
	Ammonia	Rp29.840	Rp36.882		Rp181.901	Rp189.158
	Active Carbon	Rp84.816	Rp104.832		Rp517.033	Rp537.657
	Water	Rp246	Rp304		Rp1.501	Rp1.560
	Direct Labor	Rp75.626	Rp92.832		Rp456.561	Rp474.449
	Overhead					
	Transportation Expense					
	Bulldozer Fuel Expense	Rp7.118	Rp7.331		Rp36.766	Rp37.869
	Excavator Fuel Expense	Rp10.169	Rp12.220		Rp56.030	Rp57.711
	Waste Management Expense					
	Fly Ash Management Expense	Rp5.339	Rp6.599		Rp32.547	Rp33.845
	Bottom Ash Management Expense	Rp2.002	Rp2.475		Rp12.205	Rp12.692
Total OPEX/Year		Rp417.201	Rp512.116		Rp2.518.656	Rp2.617.336

(Source: Author's Document)

2. PT. Y - BPS 2 (Integrated Recycling Plant)


Considering the factors of usage life and number of MSW to be processed, initial CAPEX and routine CAPEX of BPS 2 calculated using similar approach as

already explained in subchapter 4.2.2.1. But first there is a need to determine each asset required amount per period. Its recapitulation can be seen in Table 4.69 below.

Table 4.69 BPS 3 (PT Y) - Recapitulation of Assets Requirement per Year

Process	Code	Tangible Assets	Units	Units Needed		
				2026	...	2075
General (1)	1.1	Integrated MSW Recycling Infrastructure	Plant	1		1
	1.2	Land Acquisition Fee	m ²	18.816		18.816
	1.3	Supporting and Office Facilities Construction	m ²			
	1.4	Office Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	62		201
	1.5	Operational and Safety Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	62		201
	1.6	Supporting Equipment (Standardized for specific number of worker per period)	Workers Equivalent Unit	62		201
	1.7	Laboratory Equipment	Lab	3		3
	1.8	Belt Conveyor	m	57		446
	1.9	Bulldozer	Unit	1		1
	1.10	Dump Truck	Unit	1		2
Organic (2)	2.1	Compost Turning Machine	Unit	1		1
	2.2	Semi-Wet Material Crusher	Unit	2		6
	2.3	Sieving Machine	Unit	1		3
	2.4	Mixing Machine	Unit	2		7
	2.5	Granulator	Unit	1		4
	2.6	Drying Machine	Unit	1		3
	2.7	Cooling Machine	Unit	2		5
	2.8	Screener Machine	Unit	2		6
	2.9	Coating Machine	Unit	1		4
	2.10	Packing Machine	Unit	1		4
Inorganic (3)	3.1	Plastic Recycling Line	Unit	1		1
	3.2	Glass Recycling Line	Unit	1		1
	3.3	Metal Recycling Line	Unit	1		1
	3.4	Rubber Recycling Line	Unit	1		1
	3.5	Textile and Paper Recycling Line	Unit	2		5
	Code	Intangible Assets	Units	Units Needed		
				2025	...	2075
	1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB - BPHTB - AJB - PBNP - PPN - AMDAL - Insurance and other relevant legal document	Unit	1		1

(Source: Author's Document)

 : Fixed-amount assets, which means that its initial amount will sourced from the requirement from the last period (2075)

The recapitulation of CAPEX calculation for all asset according to the similar formula like Formula 4.9 in subchapter 4.2.2.1 can be seen through Table 4.70 below.

Table 4.70 BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation

Process	Code	Tangible Assets	Initial CAPEX	Routine CAPEX	
			2025	...	2075
General (1)	1.1	Integrated MSW Recycling Infrastructure	Rp42.436.954.427		Rp -
	1.2	Land Acquisition Fee	Rp18.872.679.119		Rp -
	1.3	Supporting and Office Facilities Construction			
	1.4	Office Equipment (Standardized for specific number of worker per period)	Rp1.075.080.000		Rp1.014.874.243
	1.5	Operational and Safety Equipment (Standardized for specific number of worker per period)	Rp100.030.000		Rp199.073.172
	1.6	Supporting Equipment (Standardized for specific number of worker per period)	Rp72.520.000		Rp311.739.557
	1.7	Laboratory Equipment	Rp600.000.000		Rp -
	1.8	Belt Conveyor	Rp306.348.571		Rp602.473.941
	1.9	Bulldozer	Rp965.930.000		Rp -
	1.10	Dump Truck	Rp402.470.000		Rp1.764.390.655
Organic (2)	2.1	Compost Turning Machine	Rp125.570.000		Rp -
	2.2	Semi-Wet Material Crusher	Rp273.679.476		Rp599.892.551
	2.3	Sieving Machine	Rp119.131.066		Rp1.044.518.794
	2.4	Mixing Machine	Rp772.742.050		Rp -
	2.5	Granulator	Rp149.718.772		Rp -
	2.6	Drying Machine	Rp2.653.419.111		Rp -
	2.7	Cooling Machine	Rp1.609.879.270		Rp -
	2.8	Screener Machine	Rp643.951.708		Rp1.411.511.884
	2.9	Coating Machine	Rp257.580.683		Rp -
	2.10	Packing Machine	Rp222.968.279		Rp977.471.980
Inorganic (3)	3.1	Plastic Recycling Line	Rp482.963.781		Rp -
	3.2	Glass Recycling Line	Rp724.445.671		Rp -
	3.3	Metal Recycling Line	Rp1.609.879.270		Rp -
	3.4	Rubber Recycling Line	Rp494.071.948		Rp -
	3.5	Textile and Paper Recycling Line	Rp1.609.879.270		Rp -
Process	Code	Intangible Assets	Initial CAPEX	Routine CAPEX	
			2025	...	2075
	1	Legal Document + Notary Fee - SKDP - SIUP - TDP - IMB - BPHTB - AJB - PBNP - PPN - AMDAL - Insurance and other relevant legal document	Rp1.330.108.585		Rp -

(Source: Author's Document)

Other than the acquisition cost, there will be a need to consider freight, installation, and other implied cost in preparing the assets to be used in BPS 2 operation. Freight expense implied to belt conveyor, bulldozer, dump truck, organic

composting line, and inorganic recycling line, as the other assets acquired from local source.

Freight, installation, and other additional expense related to acquisition expense also included as a part of the CAPEX and routine CAPEX needed to run BPS 2. The recapitulation of it alongside with routine CAPEX per year can be seen in Table 4.71 below.

Table 4.71 BPS 3 (PT Y) - Freight Expenses, Initial, and Routine CAPEX Recapitulation

Expenses	Initial CAPEX		Routine CAPEX		
	2025	2026	...	2074	2075
Freight Expense	Rp1.378.130.504	Rp-			Rp1.047.840.202
Total CAPEX	Rp79.290.131.563	Rp-			Rp8.973.786.980

(Source: Author's Document)

The amount of CAPEX in Table 4.71 above is not complete yet as it is not including another intangible asset known as Interest During Construction (IDC). Its calculation will be explained in detail in the subchapter of financial modelling and feasibility study. The next component of BPS 2 cost is Operational Expenditure (OPEX). In this research the OPEX calculation differentiated into two, which are calculated using mathematical formula to represent its correlation with the input and its capacity (Type 1) and using common size of benchmarked industry (Type 2). Type 1 OPEX includes the calculation of communication expense, direct material expense, transportation expense, electricity expense, and compost turner fuel expense. As what have been done in subchapter 4.2.2.1, common size ratio will ensure Type 2 OPEX will have a fixed ratio within the planning horizon of financial modelling and feasibility study done in this research. These ratios can be seen in Table 4.48 form subchapter 4.2.2.1. The recapitulation of BPS 2 OPEX can be seen through Table 4.72 below.

Table 4.72 BPS 3 (PT Y) – Total OPEX/Year (in million)

Process	OPEX Sources	in million				
		2026	2027	...	2074	2075
Operating Expense - General	Communication Expense	Rp14	Rp15		Rp59	Rp61
	General and Administrative Expense	Rp34.940	Rp42.364		Rp472.676	Rp493.393
	Maintenance Expense	Rp30.568	Rp37.063		Rp413.548	Rp431.673
	Indirect Labor Expense	Rp12.505	Rp15.163		Rp169.184	Rp176.599

Process	OPEX Sources	in million				
		2026	2027	...	2074	2075
	Risk Management Expense	Rp6.448	Rp7.818		Rp87.237	Rp91.061
Cost of Operation	Direct Material					
	Straw	Rp4.132	Rp5.198		Rp63.344	Rp65.871
	Husk Charcoal	Rp367	Rp462		Rp5.631	Rp5.855
	Animal Droppings	Rp6.886	Rp8.663		Rp105.573	Rp109.784
	EM4	Rp367	Rp462		Rp5.631	Rp5.855
	Water	Rp222	Rp279		Rp3.401	Rp3.537
	Packaging	Rp96.616	Rp121.545		Rp1.481.202	Rp1.540.289
	Direct Labour Wage (Organic)	Rp25.011	Rp30.326		Rp338.367	Rp353.198
	Direct Labor Wage (Inorganic)	Rp25.011	Rp30.326		Rp338.367	Rp353.198
	Overhead					
	Transportation Expense					
	Bulldozer Fuel Expense	Rp593	Rp611		Rp2.451	Rp2.525
	Dump Truck Fuel Expense	Rp11	Rp12		Rp92	Rp95
	Electricity Expense	Rp32.102	Rp34.122		Rp245.794	Rp263.169
Compost Turner Fuel Expense	Rp162	Rp167		Rp669	Rp689	
Total OPEX/Year	Rp275.955	Rp334.594		Rp3.733.225	Rp3.896.852	

(Source: Author's Document)

4.2.3 Financial Modelling and Feasibility Study of Each Business Plan Scenario

Financial modelling and feasibility study done in this research will be done for each BPS. The detail calculation for each BPS will explained in detail in this part of the report.

4.2.3.1 Financial Modelling and Feasibility Study of BPS 1 – Waste-to-Energy Business

The first thing needed to be included in financial modelling is the funding of BPS 1. As already mentioned in Table 4.20 as a part of the macro assumption BPS 1 will be funded with a proportion of 30%:70% of self-funding and bank loan. Its proportion for BPS 1 can be seen through Table 4.73 below.

Table 4.73 BPS 1 – Initial Debt/Equity Ratio (in IDR, million)

BPS 1		
Initial Debt/Equity	%	Amount
Initial Equity Ratio	30,00%	Rp1.948.581
Initial Debt Ratio	70,00%	Rp4.546.689
	Total	Rp6.495.271

(Source: Author's Document)

Because of this funding policy, therefore there are some implications known as financing cost resulted from bank loan funding acquired by BPS 1 business entity. The form of this financing cost are IDC and provision fee. IDC will be calculated during the construction period of BPS 1, which is 5 years, at the bank loan interest rate of 11.27%. Meanwhile, provision fee calculated as much as 1% from the loan drawdown for each period during the construction period. But beforehand, there is a need to determine project investment schedule to allocate BPS 1 funding along the construction period. In this research, this allocation is made 1:2:4:2:1 ratio for the construction period to represent normal distribution graph of project life cycle cost. The allocation of BPS 1 funding can be seen through Table 4.74 below.

Table 4.74 BPS 1 – Project Investment Schedule (in IDR, million)

BPS 1 - Project Investment Schedule (in IDR, million)						
No	Tangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Incinerator Construction + Freight + Installation	Rp622.742	Rp1.245.484	Rp2.490.968	Rp1.245.484	Rp622.742
2	Land Acquisition Fee	Rp17.470	Rp34.939	Rp69.878	Rp34.939	Rp17.470
3	Supporting and Office Facilities Construction	Rp8.006	Rp16.012	Rp32.024	Rp16.012	Rp8.006
4	Office Equipment					Rp693
5	Operational and Safety Equipment					Rp122
6	Supporting Equipment					Rp73
7	Bulldozer					Rp1.932
8	Excavator					Rp3.236
	Freight Expense					Rp271
No	Intangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Legal Document					Rp665
Total Investment/Year		Rp648.218	Rp1.296.435	Rp2.592.870	Rp1.302.539	Rp655.208
%Total Investment/Year		9,98%	19,96%	39,92%	20,05%	10,09%

(Source: Author's Document)

From total investment per period acquired from BPS 1 project investment schedule IDC and provision calculation result can be seen through Table 4.75 below.

Table 4.75 BPS 1 – IDC and Provision Calculation (in IDR, million)

Tangible Assets	BPS 1 – IDC and Provision Calculation					Total
	Construction Phase					
	2021	2022	2023	2024	2025	
Total Investment/Year	Rp648.218	Rp1.296.435	Rp2.592.870	Rp1.302.539	Rp655.208	Rp6.495.271
Self-Investment (30%)	Rp194.465	Rp388.931	Rp777.861	Rp390.762	Rp196.563	Rp1.948.581
Debt (70%)	Rp453.752	Rp907.505	Rp1.815.009	Rp911.777	Rp458.646	Rp4.546.689
IDC	Rp51.138	Rp153.414	Rp357.965	Rp460.723	Rp512.412	Rp1.535.651
Provision	Rp4.538	Rp9.075	Rp18.150	Rp9.118	Rp4.586	Rp45.467

(Source: Author's Document)

Provision fee will be paid by BPS 1 business entity when loan drawdown occurred. Meanwhile, IDC will be paid alongside the instalment of the investment debt with the offset period equal to the grace period used in this research which is 5 years with the tenor of 20 years. This calculation will result to total instalment need to be paid by BPS 1 business entity per year. The calculation for instalment for loan drawdown during each period of construction can be done using Ms. Excel formula represented through Formula 4.21 below.

$$Instalment\ for\ Loan\ Drawdown_t = \frac{l_t}{T} \quad (4.21)$$

Where:

t ; t Period during Construction

l_t : Loan Drawdown on t Period during Construction

T : Debt tenor

Hence, it can be calculated as follow:

$$Instalment\ for\ Loan\ Drawdown_{2021} = \frac{Rp453.752}{20}$$

$$Instalment\ for\ Loan\ Drawdown_{2021} = Rp22.688$$

The recapitulation of instalment during the tenor period can be seen through Table 4.76 below.

Table 4.76 BPS 1 – Debt Schedule Repayment (in IDR, million)

Description	Years during Tenor				
	2026	2027	...	2048	2049
Initial Loan Balance	Rp4.546.689	Rp4.524.002		Rp91.453	Rp22.932
Installment for loan drawdown Year 0 (2021)	Rp22.688	Rp22.688		Rp-	Rp-

Description	Years during Tenor				
	2026	2027	...	2048	2049
Installment for loan drawdown Year 1 (2022)	Rp-	Rp45.375		Rp-	Rp-
Installment for loan drawdown Year 2 (2023)	Rp-	Rp-		Rp-	Rp-
Installment for loan drawdown Year 3 (2024)	Rp-	Rp-		Rp45.589	Rp-
Installment for loan drawdown Year 4 (2025)	Rp-	Rp-		Rp22.932	Rp22.932
Total Installment	Rp22.688	Rp68.063		Rp68.521	Rp22.932
Ending Loan Balance	Rp4.524.002	Rp4.455.939		Rp22.932	Rp0

(Source: Author's Document)

From here there is an adjustment needed to the CAPEX calculation of BPS 1 as there is an implication in form of financing cost implied to fund this CAPEX which are IDC and provision. Both of them will be included as a part of the equity. Hence, the initial debt and equity ratio of the business entity of BPS 1 will be modified accordingly as can be seen through Table 4.77 below.

Table 4.77 BPS 1 – Final Debt/Equity Ratio (in IDR, million)

BPS 1		
Final Debt/Equity	%	Amount
Final Equity Ratio	43,70%	Rp3.529.699
Final Debt Ratio	56,30%	Rp4.546.689
	Total	Rp8.076.389

(Source: Author's Document)

Next, there is a need to calculate depreciation expense for depreciable assets owned by BPS 1. In this research, depreciation approach implemented is straight line method which divide the acquisition cost of an asset according to its useful life. It is represented through Formula 4.22 below.

$$D = \frac{a_c}{u} \quad (4.22)$$

Where:

- D : Depreciation Expense of Certain Depreciable Asset
- a_c : Acquisition Cost of Certain Depreciable Asset
- u : Useful Life of Certain Depreciable Asset

The example of this formula usage will be implemented to calculate WTE plant depreciation expense as can be seen below.

$$D = \frac{Rp6.227.249.097}{50 \text{ Years}}$$

$$D = Rp124.548.424.982 \approx Rp124.548 \text{ (in million)}$$

The recapitulation of depreciation expense per year for all depreciable assets of BPS 1 can be seen through Table 4.78 below.

Table 4.78 BPS 1 – Depreciation Expense Projection (in IDR, million)

Description	2026	2027	...	2074	2075
Asset's Acquisition Cost	Rp8.030.922	Rp8.030.922		Rp8.177.041	Rp8.177.057
Depreciation & Amortization Expense	Rp203.883	Rp203.883		Rp131.144	Rp131.144
Accumulative Depreciation & Amortization Expense	Rp203.883	Rp407.766		Rp7.827.567	Rp7.958.711
Remaining Assets Book Value	Rp7.827.039	Rp7.624.347		Rp349.490	Rp218.742

(Source: Author's Document)

After all expenses of BPS 1 already have been recapped there is a need to determine revenue stream implied by BOT-AP PPP scheme. AP provided government will return initial and routine CAPEX needed by BPS 1 business entity as well as the OPEX needed to run it. But, the output of the business entity which is electricity and its sales will be transferred to regional government of Sidoarjo district. The calculation of AP given by government can be done using Ms. Excel PMT formula for PV of initial and routine CAPEX at a WACC interest rate and add it with the corresponding OPEX at a specific period during the planning horizon. It can be represented using Formula 4.23 below

$$AP_t = SUM(PMT(WACC; nper; ; Initial CAPEX); PMT(WACC; nper; (NPV(WACC; Routine CAPEX)); OPEX_t)) \quad (4.23)$$

Where:

AP_t : Availability Payment at t Period

SUM : Addition Function in Ms. Excel Software

PMT : Annuity Function in Ms. Excel Software at Given Rate equal to WACC with nper in Accordance to Corresponding t period

NPV : Net Present Value Function in Ms. Excel Software at Given Rate equal to WACC

$OPEX_t$: OPEX at t period

For example AP for BPS 1 in 2026 can be calculated as can be seen below.

$$AP_{2026} = SUM(PMT(8.43\%; 2026 \\ - 2025; ; Rp8.078.388.760.870); \\ PMT(8.43\%; nper; (NPV(8.43\%; Routine CAPEX)); \\ Rp417.201.174.505))$$

$$AP_{2026} = Rp1.111.288.910.851$$

The recapitulation of all AP during the planning horizon can be seen in Table 4.79 below with an implementation of 8% account receivable ratio as already stated in macro assumption. AP that is considered as account receivable will be received in the next period.

Table 4.79 BPS 1 – AP Recapitulation (in IDR, million)

Description	2026	2027	...	2074	2075
AP for BPS 1	1.111.289	1.206.204		3.624.006	3.738.814
Cash (92%)	1.018.682	1.105.687		3.322.005	3.427.246
Account Receivable (8%)	92.607	100.517		302.000	311.568

(Source: Author's Document)

Financial report of BPS 1 will be informed in detail below:

1. Income Statement

Income statement of BPS 1 business entity operational activities can be seen through Table 4.80 below. The detailed version of it can be seen in Attachment section.

Table 4.80 BPS 1 – Income Statement Projection (in IDR, million)

Description	2026	2027	...	2074	2075
Sales	Rp1.111.289	Rp1.206.204		Rp3.624.006	Rp3.738.814
Cost of Goods Sold	(Rp289.494)	(Rp355.357)		(Rp2.033.088)	(Rp2.112.755)
Gross Profit	Rp821.795	Rp850.847		Rp1.590.917	Rp1.626.059
Operating Expenses					
Communication Expenses	(Rp14)	(Rp15)		(Rp59)	(Rp61)
General & Administrative Expenses	(Rp52.823)	(Rp64.841)		(Rp370.967)	(Rp385.503)
Maintenance Expense	(Rp46.214)	(Rp56.729)		(Rp324.560)	(Rp337.278)
Indirect Labour Expense	(Rp18.906)	(Rp23.208)		(Rp132.778)	(Rp137.981)
Risk Management Expense	(Rp9.749)	(Rp11.967)		(Rp68.466)	(Rp71.148)
Total Operating Expenses	(Rp127.707)	(Rp156.759)		(Rp896.829)	(Rp931.971)

Description	2026	2027	...	2074	2075
EBITDA	Rp694.088	Rp694.088		Rp694.088	Rp694.088
Depreciation Expenses	(Rp203.883)	(Rp203.883)		(Rp131.144)	(Rp131.144)
Operating Profit (EBIT)	Rp490.205	Rp490.205		Rp562.944	Rp562.944
Other Revenue & Expenses					
Interest Expenses	(Rp512.412)	(Rp509.855)		(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp512.412)	(Rp509.855)		(Rp0)	(Rp0)
Earning Before Tax (EBT)	(Rp22.207)	(Rp19.650)		Rp562.944	Rp562.944
Tax (25%)	Rp0	Rp0		(Rp140.736)	(Rp140.736)
EAT	(Rp22.207)	(Rp19.650)		Rp422.208	Rp422.208

(Source: Author's Document)

2. Cash Flow Statement

Cash flow statement during BPS 1 business entity construction and operational activities can be seen through Table 4.81 and Table 4.82 below. The detailed version of it can be seen in Attachment section.

Table 4.81 BPS 1 – Cash Flow Statement Projection during Construction Period (in IDR, million)

Description	2021	...	2025
Operational Cash Flow			
Sales	Rp0		Rp0
Account Receivable	Rp0		Rp0
Cost of Operation	Rp0		Rp0
Operating Expense	Rp0		Rp0
Interest Expense	Rp0		Rp0
Tax (25%)	Rp0		Rp0
Total Operational Cash Flow	Rp0		Rp0
Investment Cash Flow			
Project Cost	(Rp703.893)		(Rp1.172.207)
Routine CAPEX	Rp0		Rp0
Total Investment Cash Flow	(Rp703.893)		(Rp1.172.207)
Financing Cash Flow			
Shareholder's Equity	Rp250.141		Rp713.561
Loan Drawdown	Rp453.752		Rp458.646
Bank Loan Main Instalment	Rp0		Rp0
Total Financing Cash Flow	Rp703.893		Rp1.172.207
Net Cash Flow	Rp0		Rp0
Cash – Beginning Balance	Rp0		Rp0
Cash – Ending Balance	Rp0		Rp0

(Source: Author's Document)

Table 4.82 BPS 1 – Cash Flow Statement Projection during Operational Period (in IDR, million)

Description	2026	...	2075
Operational Cash Flow			
Sales	Rp1.111.289		Rp4.040.814
Account Receivable	(Rp92.607)		(Rp311.568)
Cost of Operation	(Rp289.494)		(Rp2.112.755)
Operating Expense	(Rp127.707)		(Rp931.971)
Interest Expense	(Rp512.412)		(Rp0)

Description	2026	...	2075
Tax (25%)	Rp0		(Rp140.736)
Total Operational Cash Flow	Rp89.068		Rp543.784
Investment Cash Flow			
Project Cost	Rp0		Rp0
Routine CAPEX	Rp0		(Rp396)
Total Investment Cash Flow	Rp0		(Rp396)
Financing Cash Flow			
Shareholder's Equity	Rp0		Rp0
Loan Drawdown	Rp0		Rp0
Bank Loan Main Instalment	(Rp22.688)		Rp0
Total Financing Cash Flow	(Rp22.688)		Rp0
Net Cash Flow	Rp66.381		Rp543.389
Cash – Beginning Balance	Rp0		Rp17.651.262
Cash – Ending Balance	Rp66.381		Rp18.194.651

(Source: Author's Document)

3. Balance Sheet

Balance sheet during BPS 1 business entity construction and operational activities can be seen through Table 4.83 and Table 4.84 below. The detailed version of it can be seen in Attachment section.

Table 4.83 BPS 1 – Balance Sheet Projection during Construction Period (in IDR, million)

Description	2021	...	2025
ASSETS			
Current Assets			
Cash	Rp0		Rp0
Marketable Securities	Rp0		Rp0
Account Receivable	Rp0		Rp0
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0
Total Current Assets	Rp0		Rp0
Fixed Assets			
Net Plant and Equipment	Rp703.893		Rp8.076.389
Routine CAPEX	Rp0		Rp0
Accumulated Depreciation	Rp0		Rp0
Total Fixed Assets	Rp703.893		Rp8.076.389
TOTAL ASSETS	Rp703.893		Rp8.076.389
LIABILITIES			
Current Liabilities			
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp453.752		Rp4.546.689
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp453.752		Rp4.546.689
TOTAL LIABILITIES	Rp453.752		Rp4.546.689

Description	2021	...	2025
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp250.141		Rp3.529.699
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp0
Profit this Year	Rp0		Rp0
TOTAL EQUITIES	Rp250.141		Rp3.529.699
TOTAL EQUITIES DAN LIABILITIES	Rp703.893		Rp8.076.389

(Source: Author's Document)

Table 4.84 BPS 1 – Balance Sheet Projection during Operational Period (in IDR, million)

Description	2026	...	2075
ASSETS			
Current Assets			
Cash	Rp66.381		Rp18.194.651
Marketable Securities	Rp0		Rp0
Account Receivable	Rp92.607		Rp311.568
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0
Total Current Assets	Rp158.988		Rp18.506.218
Fixed Assets			
Net Plant and Equipment	Rp8.076.389		Rp8.076.389
Routine CAPEX	Rp0		Rp146.531
Accumulated Depreciation	(Rp203.883)		(Rp7.958.711)
Total Fixed Assets	Rp7.872.506		Rp264.209
TOTAL ASSETS	Rp8.031.494		Rp18.770.427
LIABILITIES			
Current Liabilities	Rp0		Rp0
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp4.524.002		Rp0
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp4.524.002		Rp0
TOTAL LIABILITIES	Rp4.524.002		Rp0
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp3.529.699		Rp3.529.699
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp14.818.520
Profit this Year	(Rp22.207)		Rp422.208
TOTAL EQUITIES	Rp3.507.492		Rp18.770.427
TOTAL EQUITIES DAN LIABILITIES	Rp8.031.494		Rp18.770.427

(Source: Author's Document)

From the balance sheet shown in Table 83 and Table 84 above, it can be seen that total assets owned by BPS 1 business entity in each period equal to its

total liabilities plus total equities. The calculation resulted from the these financial report will be used to construct free cash flow calculation to do a valuation purpose using pre-determined financial parameters which are NPV, IRR and payback period. It can be seen through Table 4.85 below

Table 4.85 BPS 1 – Free Cash Flow Projection during Construction Period (in IDR, million

Description	2021	...	2025
Net profit	Rp0		Rp0
Depreciation Expense	Rp0		Rp0
Interest Expense x (1 - Tax)	Rp0		Rp0
Terminal Value	Rp0		Rp0
Total Cash Inflow	Rp0		Rp0
Investment	(Rp703.893)		(Rp1.172.207)
Changes in Working Capital	Rp0		(Rp104.300)
Total Cash Outflow	(Rp703.893)		(Rp1.276.507)
Net Cash Flow	(Rp703.893)		(Rp1.276.507)
Accumulated Net Cash Flow	(Rp703.893)		(Rp8.180.689)
Discounted Cash Flow	Rp0		(Rp8.180.689)
Accumulated Discounted Cash Flow	Rp0		(Rp8.180.689)

(Source: Author's Document)

Table 4.86 BPS 1 – Free Cash Flow Projection during Operational Period (in IDR, million

Description	2026	...	2075
Net profit	(Rp22.207)		Rp422.208
Depreciation Expense	Rp203.883		Rp131.144
Interest Expense x (1 - Tax)	Rp384.309		Rp0
Terminal Value	Rp0		Rp104.300
Total Cash Inflow	Rp565.985		Rp657.652
Investment	Rp0		Rp0
Changes in Working Capital	Rp0		Rp0
Total Cash Outflow	Rp0		Rp0
Net Cash Flow	Rp565.985		Rp657.652
Accumulated Net Cash Flow	(Rp7.614.704)		Rp19.928.100
Discounted Cash Flow	Rp522.003		Rp11.518
Accumulated Discounted Cash Flow	(Rp7.658.686)		(Rp1.565.773)

(Source: Author's Document)

The result acquired from this calculation is net cash flow that will be used to calculate certain financial parameters which are NPV, IRR, and Payback Period.

NPV will be calculated using WACC rate. The result of this calculation can be seen in Table 4.87 below.

Table 4.87 BPS 1 – Valuation Result using NPV, IRR, and Payback Period Parameters

Valuation	
Financial Parameters	Value
NPV	(Rp1.565.773)
IRR	6,65%
Payback Period	- (More than planned horizon)

(Source: Author's Document)

Next, there is an implication of BPS 1 to related stakeholders which is DLHK of Sidoarjo district. This implication is calculated using BCA approach with the parameters of BCR to determine its feasibility. Hence, BCR calculation will be done using DLHK of Sidoarjo district perspective. Benefits factor that are included in this calculation and its bases for calculation will be shown through Table 4.88 below.

Table 4.88 BPS 1 – Benefits Factors Calculation Bases

No	Benefits Factors	Calculation Bases	Value
1	BPS 1 Business Entity Operating Revenue	Projected BPS 1 Business Entity Operating Revenue during Planning Horizon	
2	BPS 1 Business Entity Plant Acquisition in 2075	Projected Remaining Book Value of BPS 1 Business Entity Plant	
3	Avoided Operational Cost of MSW-MS in TPA Jabon	Historical Data of Sidoarjo's TPA Operational Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp40.600/Ton of MSW (2019)
4	Avoided Land Acquisition Cost due to Dedicated Landfill Area Needs Increase	Average Land Price around Dedicated Landfill Area (Jabon)	Rp2.000.000/m ² (2020)
5	Carbon Credit Savings Gained through WTE Operation	Incineration WTE Common Carbon Savings Ratio per Ton (Jeswani et al., 2012)	5,73 Carbon Credit/Ton of MSW and Rp48.743 per Ton of CO _{2-e}

(Source: Author's Document)

The calculation for benefits that will be included as an example in this report are avoided operational cost of MSW-MS in TPA Jabon. Its baseline is determined according to the used budget of TPA Jabon operational cost divided by the expected amount of managed MSW in there. From Renja of DLHK of Sidoarjo district in 2019 it is found out that to manage approximately 480.000 ton of MSW in TPA Jabon, DLHK of Sidoarjo district spend Rp18.379.648.071. It is equal to Rp40.600 per ton of MSW. This baseline price will be compounded according to

assumed inflation rate and will be timed with the corresponding expected MSW generation in t period during the planning horizon and an addition of raw material acquired from TPA Jabon. This mathematical relation is represented through Formula 4.24 below.

$$OC_{TPAt} = FV(rate; nper; ; -pv) \times (U_{MSWt} + TPA_{MSWt}) \quad (4.24)$$

Where:

OC_{TPAt} : Operational Cost of TPA in t Period

FV : Future Value Formula in Ms. Excel

U_{MSWt} : Projected Amount of MSW Generated in t Period

TPA_{MSWt} : Projected Amount of TPA MSW Reduction in t period

For example projected operational cost of TPA Jabon in 2026 can be calculated as follow:

$$OC_{TPA2026} = FV(3\%; 2026 - 2019; ; -Rp40.600) \times (465.000)$$

$$OC_{TPA2026} = Rp23.218.991.886$$

The rest of the benefits factors value are calculated using similar methods that is modified to adjust with each factor calculation logics. Expected benefits recapitulation for all period during the planning horizon can be seen in Table 4.89 below.

Table 4.89 BPS 1 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million)

Benefits Factors	2026	...	2075
BPS 1 Business Entity Operating Revenue	Rp18.024		Rp132.989
BPS 1 Business Entity Plant Acquisition in 2075	Rp-		Rp218.742
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp23.219		Rp171.320
Avoided Land Acquisition Cost due to Dedicated Landfill Area Needs Increase	Rp-		Rp12.302.222
Carbon Credit Savings Gained through WTE Operation	Rp155.166		Rp1.144.889
Total Benefits	Rp196.409		Rp13.970.162

(Source: Author's Document)

Meanwhile, costs factor that are included in this calculation and its bases for calculation will be shown through Table 4.90 below.

Table 4.90 BPS 1 – Costs Factors Calculation Bases

No	Costs Factors	Calculation Bases	Value
1	Operational Cost of Remaining MSW-MS in TPA Jabon	Historical Data of Sidoarjo's TPA Operational Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp40.600/Ton of MSW (2019) for temporary unprocessed MSW left in TPA
2	Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Historical Data of Sidoarjo's MSW Transportation and Sorting Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp35.706/Ton of MSW (2019)
3	AP to BPS 1 Business Entity	Projected according to BPS 1 Business Entity Initial and Routine CAPEX (Resulted to an Annuity Level at WACC rate) and Corresponding OPEX in t period	Rp694.087.736.347/Year (Annuity) + OPEX in t period during planning horizon

(Source: Author's Document)

The calculation for costs that will be included as an example in this report are transportation and sorting cost of MSW in Sidoarjo district. Its baseline is determined according to the used budget of DLHK of Sidoarjo district for transportation and sorting cost divided by the expected amount of managed MSW in there. From the historical data given by DLHK of Sidoarjo district in 2019 it is found out that to manage approximately 452,697 ton of MSW in their region, DLHK of Sidoarjo district spend Rp15.847.244.976. It is equal to Rp35.706 per ton of MSW. This baseline price will be compounded according to assumed inflation rate and will be timed with the corresponding expected MSW generation in t period during the planning horizon. This mathematical relation is represented through Formula 4.25 below.

$$TSC_t = FV(rate; nper; ; -pv) \times U_{MSWt} \quad (4.25)$$

Where:

TSC_t : Transportation and Sorting Cost of MSW in t Period

FV : Future Value Formula in Ms. Excel

U_{MSWt} : Projected Amount of MSW Generated in t Period

For example projected transportation and sorting cost in 2026 can be calculated as follow:

$$TSC_{2026} = FV(3\%; 2026 - 2019; ; -Rp35.706) \times (430.423)$$

$$OC_{TPA2026} = Rp18.901.769.313$$

The rest of the costs factors value are calculated using similar methods that is modified to adjust with each factor calculation logics. Expected costs recapitulation for all period during the planning horizon can be seen in Table 4.91 below.

Table 4.91 BPS 1 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million)

Costs Factors	2026	...	2075
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp22.241		Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp18.902		Rp150.670
AP to BPS 1 Business Entity	Rp1.111.289		Rp3.738.814
Total Costs	Rp1.152.432		Rp3.889.483

(Source: Author's Document)

From the calculation result of benefits and costs in Table 4.91 above, then there will be BCR calculation process according to Formula 2.x. The result of this calculation will be shown in Table 4.92 below.

Table 4.92 BPS 1 – BCR Calculation Result (in IDR, million)

Description	PV (2025)
Total Benefits	Rp76.352.078
Total Costs	Rp46.527.450
BCR	1.64

(Source: Author's Document)

4.2.3.2 Financial Modelling and Feasibility Study of BPS 2 – Integrated MSW Recycling Business

The first thing needed to be included in financial modelling is the funding of BPS 2. As already mentioned in Table 4.20 as a part of the macro assumption BPS 2 will be funded with a proportion of 30%:70% of self-funding and bank loan. Its proportion for BPS 2 can be seen through Table 4.93 below.

Table 4.93 BPS 2 – Initial Debt/Equity Ratio (in IDR, million)

BPS 2		
Initial Debt/Equity	%	Amount
Initial Equity Ratio	30,00%	Rp23.787
Initial Debt Ratio	70,00%	Rp55.503
Total		Rp79.290

(Source: Author's Document)

Because of this funding policy, therefore there are some implications known as financing cost resulted from bank loan funding acquired by BPS 2 business entity. The form of this financing cost are IDC and provision fee. IDC will be calculated during the construction period of BPS 2, which is 5 years, at the bank loan interest rate of 11.27%. Meanwhile, provision fee calculated as much as 1% from the loan drawdown for each period during the construction period. But beforehand, there is a need to determine project investment schedule to allocate BPS 2 funding along the construction period. In this research, this allocation is made 1:2:4:2:1 ratio for the construction period to represent normal distribution graph of project life cycle cost. The allocation of BPS 2 funding can be seen through Table 4.94 below.

Table 4.94 BPS 2 – Project Investment Schedule (in IDR, million)

BPS 2 - Project Investment Schedule (in IDR, million)						
No	Tangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Construction Fee	Rp4.244	Rp8.487	Rp16.975	Rp8.487	Rp4.244
2	Land Acquisition Fee	Rp1.887	Rp3.775	Rp7.549	Rp3.775	Rp1.887
3	Operational and Safety Equipment					Rp100
4	Office Equipment					Rp1.075
5	Supporting Equipment					Rp73
6	Laboratory Equipment	Rp60	Rp120	Rp240	Rp120	Rp60
7	Belt Conveyor	Rp31	Rp61	Rp123	Rp61	Rp31
8	Bulldozer				Rp483	Rp483
9	Dump Truck				Rp201	Rp201
10	Compost Turning Machine	Rp13	Rp25	Rp50	Rp25	Rp13
11	Semi-Wet Material Crusher	Rp27	Rp55	Rp109	Rp55	Rp27
12	Sieving Machine	Rp12	Rp24	Rp48	Rp24	Rp12
13	Mixing Machine	Rp77	Rp155	Rp309	Rp155	Rp77
14	Granulator	Rp15	Rp30	Rp60	Rp30	Rp15
15	Drying Machine	Rp265	Rp531	Rp1.061	Rp531	Rp265
16	Cooling Machine	Rp161	Rp322	Rp644	Rp322	Rp161
17	Screener Machine	Rp64	Rp129	Rp258	Rp129	Rp64
18	Coating Machine	Rp26	Rp52	Rp103	Rp52	Rp26
19	Packing Machine	Rp22	Rp45	Rp89	Rp45	Rp22
20	Plastic Recycling Machine	Rp48	Rp97	Rp193	Rp97	Rp48
21	Glass Recycling Machine	Rp72	Rp145	Rp290	Rp145	Rp72
22	Metal Recycling Machine	Rp161	Rp322	Rp644	Rp322	Rp161
23	Rubber Recycling Machine	Rp49	Rp99	Rp198	Rp99	Rp49
24	Textile and Paper Recycling Machine	Rp161	Rp322	Rp644	Rp322	Rp161
	Freight Expense	Rp138	Rp276	Rp551	Rp276	Rp138
No	Intangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Legal Document				Rp665	Rp665
Total Investment/Year		Rp7.534	Rp15.069	Rp30.138	Rp16.418	Rp10.131
Cum. % Total Investment/Year		9,50%	28,51%	66,52%	87,22%	100,00%

(Source: Author's Document)

From total investment per period acquired from BPS 2 project investment schedule IDC and provision calculation result can be seen through Table 4.95 below.

Table 4.95 BPS 2 – IDC and Provision Calculation (in IDR, million)

Tangible Assets	BPS 2 – IDC and Provision Calculation					Total
	Construction Phase					
	2021	2022	2023	2024	2025	
Total Investment/Year	Rp7.534	Rp15.069	Rp30.138	Rp16.418	Rp10.131	Rp79.290
Self-Investment (30%)	Rp2.260	Rp4.521	Rp9.041	Rp4.925	Rp3.039	Rp23.787
Debt (70%)	Rp5.274	Rp10.548	Rp21.096	Rp11.493	Rp7.092	Rp55.503
IDC	Rp594	Rp1.783	Rp4.161	Rp5.456	Rp6.255	Rp18.249
Provision	Rp53	Rp105	Rp211	Rp115	Rp71	Rp555

(Source: Author's Document)

Provision fee will be paid by BPS 2 business entity when loan drawdown occurred. Meanwhile, IDC will be paid alongside the instalment of the investment debt with the offset period equal to the grace period used in this research which is 5 years with the tenor of 20 years. This calculation will resulted to total instalment need to be paid by BPS 2 business entity per year. The calculation for instalment for loan drawdown during each period of construction can be done using Ms. Excel formula represented through Formula ... below. The recapitulation of instalment during the tenor period can be seen through Table 4.96 below.

Table 4.96 BPS 2 – Debt Schedule Repayment (in IDR, million)

Description	Years during Tenor				
	2026	2027	...	2048	2049
Initial Loan Balance	Rp55.503	Rp55.239		Rp1.284	Rp355
Installment for loan drawdown Year 0 (2021)	Rp264	Rp264		Rp0	Rp0
Installment for loan drawdown Year 1 (2022)	Rp0	Rp527		Rp0	Rp0
Installment for loan drawdown Year 2 (2023)	Rp0	Rp0		Rp0	Rp0
Installment for loan drawdown Year 3 (2024)	Rp0	Rp0		Rp575	Rp0
Installment for loan drawdown Year 4 (2025)	Rp0	Rp0		Rp355	Rp355
Total Installment	Rp264	Rp791		Rp929	Rp355
Ending Loan Balance	Rp55.239	Rp54.448		Rp355	Rp0

(Source: Author's Document)

From here there is an adjustment needed to the CAPEX calculation of BPS 2 as there is an implication in form of financing cost implied to fund this CAPEX which are IDC and provision. Both of them will be included as a part of the equity. Hence, the initial debt and equity ratio of the business entity of BPS 2 will be modified accordingly as can be seen through Table 4.97 below.

Table 4.97 BPS 2 – Final Debt/Equity Ratio (in IDR, million)

BPS 2		
Final Debt/Equity	%	Amount
Final Equity Ratio	43,42%	Rp42.591
Final Debt Ratio	56,58%	Rp55.503
	Total	Rp98.095

(Source: Author's Document)

Next, there is a need to calculate depreciation expense for depreciable assets owned by BPS 2. In this research, depreciation approach implemented is straight line method which divide the acquisition cost of an asset according to its useful life. The recapitulation of depreciation expense per year for all depreciable assets of BPS 2 can be seen through Table 4.98 below.

Table 4.98 BPS 2 – Depreciation Expense Projection (in IDR, million)

Description	2026	2027	...	2074	2075
Asset's Acquisition Cost	Rp97.540	Rp97.540		Rp97.540	Rp97.540
Depreciation & Amortization Expense	Rp3.126	Rp3.126		Rp10.575	Rp11.230
Accumulative Depreciation & Amortization Expense	Rp3.126	Rp6.251		Rp280.558	Rp291.788
Remaining Assets Book Value	Rp94.414	Rp91.288		Rp87.778	Rp101.682

(Source: Author's Document)

After all expenses of BPS 2 already have been recapped there is a need to determine revenue stream implied by BOOT-AP PPP scheme. AP provided government will return initial and routine CAPEX needed by BPS 2 business entity. Different than BPS 1, BPS 2 business entity will cover their own OPEX during the operational period. Other than that, Indonesia government also offers a bonus of Rp500.000 per ton for business entity which implement a proper MSW-MS. Hence, the output of the business entity which is recycled goods and composts and its implied sales will be their revenue stream alongside government AP and MSW processing bonus. The recapitulation of all revenue stream during the planning horizon of BPS 2 business entity can be seen in Table 4.99 below with an implementation of 8% account receivable ratio as already stated in macro assumption. Revenue that is considered as account receivable will be received in the next period.

Table 4.99 BPS 2 – AP Recapitulation (in IDR, million)

Description	2026	2027	...	2074	2075
AP for BPS 2	Rp11.393	Rp11.393		Rp11.393	Rp11.393
Tipping Fee for BPS 2	Rp17.756	Rp22.337		Rp272.214	Rp283.073
Sales	Rp247.278	Rp311.080		Rp3.790.981	Rp3.942.205
Total Revenue per Year	Rp276.427	Rp344.810		Rp4.074.587	Rp4.236.670
Cash (92%)	Rp253.391	Rp316.076		Rp3.735.038	Rp3.883.615
Account Receivable (8%)	Rp23.036	Rp28.734		Rp339.549	Rp353.056

(Source: Author's Document)

Financial report of BPS 2 will be informed in detail below:

1. Income Statement

Income statement of BPS 2 business entity operational activities can be seen through Table 4.100 below. The detailed version of it can be seen in Attachment section.

Table 4.100 BPS 2 – Income Statement Projection (in IDR, million)

Description	2026	2027	...	2074	2075
Sales	Rp276.427	Rp344.810		Rp4.074.587	Rp4.236.670
Cost of Goods Sold	(Rp191.480)	(Rp232.170)		(Rp2.590.522)	(Rp2.704.064)
Gross Profit	Rp84.947	Rp112.640		Rp1.484.066	Rp1.532.606
Operating Expenses					
Communication Expenses	(Rp14)	(Rp15)		(Rp59)	(Rp61)
General & Administrative Expenses	(Rp34.940)	(Rp42.364)		(Rp472.676)	(Rp493.393)
Maintenance Expense	(Rp30.568)	(Rp37.063)		(Rp413.548)	(Rp431.673)
Indirect Labour Expense	(Rp12.505)	(Rp15.163)		(Rp169.184)	(Rp176.599)
Risk Management Expense	(Rp6.448)	(Rp7.818)		(Rp87.237)	(Rp91.061)
Total Operating Expenses	(Rp84.475)	(Rp102.423)		(Rp1.142.704)	(Rp1.192.788)
EBITDA	Rp472	Rp10.216		Rp341.362	Rp339.819
Depreciation Expenses	(Rp3.126)	(Rp3.126)		(Rp10.575)	(Rp11.230)
Operating Profit (EBIT)	(Rp2.653)	Rp7.091		Rp330.787	Rp328.589
Other Revenue & Expenses					
Interest Expenses	(Rp6.255)	(Rp6.225)		(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp6.255)	(Rp6.225)		(Rp0)	(Rp0)
Earning Before Tax (EBT)	(Rp8.908)	Rp865		Rp330.787	Rp328.589
Tax (25%)	Rp0	(Rp216)		(Rp82.697)	(Rp82.147)
EAT	(Rp8.908)	Rp649		Rp248.090	Rp246.441

(Source: Author's Document)

2. Cash Flow Statement

Cash flow statement during BPS 2 business entity construction and operational activities can be seen through Table 4.101 and Table 4.102 below. The detailed version of it can be seen in Attachment section.

Table 4.101 BPS 2 – Cash Flow Statement Projection during Construction Period (in IDR, million)

Description	2021	...	2025
Operational Cash Flow			
Sales	Rp0		Rp0
Account Receivable	Rp0		Rp0
Cost of Operation	Rp0		Rp0
Operating Expense	Rp0		Rp0
Interest Expense	Rp0		Rp0
Tax (25%)	Rp0		Rp0
Total Operational Cash Flow	Rp0		Rp0
Investment Cash Flow			
Project Cost	(Rp8.182)		(Rp16.457)
Routine CAPEX	Rp0		Rp0
Total Investment Cash Flow	(Rp8.182)		(Rp16.457)
Financing Cash Flow			
Shareholder's Equity	Rp2.907		Rp9.366
Loan Drawdown	Rp5.274		Rp7.092
Bank Loan Main Instalment	Rp0		Rp0
Total Financing Cash Flow	Rp8.182		Rp16.457
Net Cash Flow	Rp0		Rp0
Cash – Beginning Balance	Rp0		Rp0
Cash – Ending Balance	Rp0		Rp0

(Source: Author's Document)

Table 4.102 BPS 2 – Cash Flow Statement Projection during Operational Period (in IDR, million)

Description	2026	...	2075
Operational Cash Flow			
Sales	Rp276.427		Rp4.576.219
Account Receivable	(Rp23.036)		(Rp353.056)
Cost of Operation	(Rp191.480)		(Rp2.704.064)
Operating Expense	(Rp84.475)		(Rp1.192.788)
Interest Expense	(Rp6.255)		(Rp0)
Tax (25%)	Rp0		(Rp82.147)
Total Operational Cash Flow	(Rp28.818)		Rp244.164
Investment Cash Flow			
Project Cost	Rp0		Rp0
Routine CAPEX	Rp0		(Rp8.974)
Total Investment Cash Flow	Rp0		(Rp8.974)
Financing Cash Flow			
Shareholder's Equity	Rp0		Rp0
Loan Drawdown	Rp0		Rp0
Bank Loan Main Instalment	(Rp264)		Rp0
Total Financing Cash Flow	(Rp264)		Rp0
Net Cash Flow	(Rp29.082)		Rp235.191
Cash – Beginning Balance	Rp0		Rp4.235.319
Cash – Ending Balance	(Rp29.082)		Rp4.470.510

(Source: Author's Document)

3. Balance Sheet

Balance sheet during BPS 2 business entity construction and operational activities can be seen through Table 4.103 and Table 4.104 below. The detailed version of it can be seen in Attachment section.

Table 4.103 BPS 2 – Balance Sheet Projection during Construction Period (in IDR, million)

Description	2021	...	2025
ASSETS			
Current Assets			
Cash	Rp0		Rp0
Marketable Securities	Rp0		Rp0
Account Receivable	Rp0		Rp0
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0
Total Current Assets	Rp0		Rp0
Fixed Assets			
Net Plant and Equipment	Rp8.182		Rp98.095
Routine CAPEX	Rp0		Rp0
Accumulated Depreciation	Rp0		Rp0
Total Fixed Assets	Rp8.182		Rp98.095
TOTAL ASSETS			
	Rp8.182		Rp98.095
LIABILITIES			
Current Liabilities			
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp5.274		Rp55.503
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp5.274		Rp55.503
TOTAL LIABILITIES			
	Rp5.274		Rp55.503
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp2.907		Rp42.591
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp0
Profit this Year	Rp0		Rp0
TOTAL EQUITIES			
	Rp2.907		Rp42.591
TOTAL EQUITIES DAN LIABILITIES			
	Rp8.182		Rp98.095

(Source: Author's Document)

Table 4.104 BPS 2 – Balance Sheet Projection during Operational Period (in IDR, million)

Description	2026	...	2075
ASSETS			
Current Assets			
Cash	(Rp29.082)		Rp4.470.510
Marketable Securities	Rp0		Rp0
Account Receivable	Rp23.036		Rp353.056
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0
Total Current Assets	(Rp6.047)		Rp4.823.566
Fixed Assets			

Description	2026	...	2025
Net Plant and Equipment	Rp98.095		Rp98.095
Routine CAPEX	Rp0		Rp304.904
Accumulated Depreciation	(Rp3.126)		(Rp291.788)
Total Fixed Assets	Rp94.969		Rp111.211
TOTAL ASSETS	Rp88.922		Rp4.934.776
LIABILITIES			
Current Liabilities			
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp55.239		Rp0
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp55.239		Rp0
TOTAL LIABILITIES	Rp55.239		Rp0
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp42.591		Rp42.591
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp4.645.743
Profit this Year	(Rp8.908)		Rp246.441
TOTAL EQUITIES	Rp33.683		Rp4.934.776
TOTAL EQUITIES DAN LIABILITIES	Rp88.922		Rp4.934.776

(Source: Author's Document)

From the balance sheet shown in Table 4.103 and 4.104 above, it can be seen that total assets owned by BPS 2 business entity in each period equal to its total liabilities plus total equities. The calculation resulted from the these financial report will be used to construct free cash flow calculation to do a valuation purpose using pre-determined financial parameters which are NPV, IRR and payback period. It can be seen through Table 4.105 and Table 4.106 below.

Table 4.105 BPS 2 – Free Cash Flow Projection during Construction Period (in IDR, million)

Description	2021	...	2025
Net profit	Rp0		Rp0
Depreciation Expense	Rp0		Rp0
Interest Expense x (1 - Tax)	Rp0		Rp0
Terminal Value	Rp0		Rp0
Total Cash Inflow	Rp0		Rp0
Investment	(Rp8.182)		(Rp16.457)
Changes in Working Capital	Rp0		(Rp68.989)
Total Cash Outflow	(Rp8.182)		(Rp85.446)
Net Cash Flow	(Rp8.182)		(Rp85.446)

Description	2021	...	2025
Accumulated Net Cash Flow	(Rp8.182)		(Rp167.083)
Discounted Cash Flow	Rp0		(Rp167.083)
Accumulated Discounted Cash Flow	Rp0		(Rp167.083)

(Source: Author's Document)

Table 4.106 BPS 2 – Free Cash Flow Projection during Operational Period (in IDR, million)

Description	2026	...	2075
Net profit	(Rp8.908)		Rp246.441
Depreciation Expense	Rp3.126		Rp11.230
Interest Expense x (1 - Tax)	Rp4.691		Rp0
Terminal Value	Rp0		Rp68.989
Total Cash Inflow	(Rp1.092)		Rp326.660
Investment	Rp0		Rp0
Changes in Working Capital	Rp0		Rp0
Total Cash Outflow	Rp0		Rp0
Net Cash Flow	(Rp1.092)		Rp326.660
Accumulated Net Cash Flow	(Rp168.175)		Rp5.144.908
Discounted Cash Flow	(Rp1.007)		Rp5.721
Accumulated Discounted Cash Flow	(Rp168.890)		Rp380.061

(Source: Author's Document)

The result acquired from this calculation is net cash flow that will be used to calculate certain financial parameters which are NPV, IRR, and Payback Period. NPV will be calculated using WACC rate. The result of this calculation can be seen in Table 4.107 below.

Table 4.107 BPS 2 – Valuation Result using NPV, IRR, and Payback Period Parameters

Valuation	
Financial Parameters	Value
NPV	Rp380.061
IRR	16,83%
Payback Period	Less than 12 Years

(Source: Author's Document)

Next, there is an implication of BPS 2 to related stakeholders which is DLHK of Sidoarjo district. This implication is calculated using BCA approach with the parameters of BCR to determine its feasibility. Hence, BCR calculation will be done using DLHK of Sidoarjo district perspective. Benefits factor that are included

in this calculation and its bases for calculation will be shown through Table 4.108 below.

Table 4.108 BPS 2 – Benefits Factors Calculation Bases

No	Benefits Factors	Calculation Bases	Value
1	BPS 2 Business Entity Plant Acquisition in 2075	Projected Remaining Book Value of BPS 2 Business Entity Plant	
2	Avoided Operational Cost of MSW-MS in TPA Jabon	Historical Data of Sidoarjo's TPA Operational Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp40.600/Ton of MSW (2019)
3	Carbon Credit Savings Gained through WTE Operation	Incineration WTE Common Carbon Savings Ratio per Ton (Jeswani et al., 2012)	5,73 Carbon Credit/Ton of MSW and Rp48.743 per Ton of CO _{2-e}

(Source: Author's Document)

The calculation for benefits in BPS 2 using similar approach that already explained in Formula 4.24 in subchapter 4.2.3.1. The rest of the benefits factors value are calculated using similar methods that is modified to adjust with each factor calculation logics. Expected benefits recapitulation for all period during the planning horizon can be seen in Table 4.109 below.

Table 4.109 BPS 2 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million)

Benefits Factors	2026	...	2075
BPS 2 Business Entity Plant Acquisition in 2075	Rp-		Rp101.682
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp1.485		Rp23.675
Carbon Credit Savings Gained through WTE Operation	Rp1.365		Rp21.760
Total Benefits	Rp2.850		Rp147.117

(Source: Author's Document)

Meanwhile, costs factor that are included in this calculation and its bases for calculation will be shown through Table 4.110 below.

Table 4.110 BPS 2 – Costs Factors Calculation Bases

No	Costs Factors	Calculation Bases	Value
1	Projected Land Acquisition Cost due to Dedicated Landfill Area Needs Increase	Average Land Price around Dedicated Landfill Area (Jabon)	Rp2.000.000/m ² (2020)
2	Operational Cost of Remaining MSW-MS in TPA Jabon	Historical Data of Sidoarjo's TPA Operational Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp40.600/Ton of MSW (2019) for temporary unprocessed MSW left in TPA
3	Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Historical Data of Sidoarjo's MSW Transportation and Sorting Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp35.706/Ton of MSW (2019)
4	AP to BPS 2 Business Entity	Projected according to BPS 1 Business Entity Initial and Routine CAPEX (Resulted to an Annuity Level at WACC rate)	Rp11.392.613.186/Year (Annuity) during planning horizon

No	Costs Factors	Calculation Bases	Value
5	Tipping Fee to BPS 2 Business Entity	Standard Tipping Fee by Indonesia Government Given to Business Entity	Maximum rate Rp500.000/Ton (2020)

(Source: Author's Document)

The calculation for costs in BPS 2 using similar approach that already explained in Formula 4.24 in subchapter 4.2.3.1. The rest of the costs factors value are calculated using similar methods that is modified to adjust with each factor calculation logics. Expected costs recapitulation for all period during the planning horizon can be seen in Table 4.111 below.

Table 4.111 BPS 2 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million)

Costs Factors	2026	...	2075
Projected Land Acquisition Cost due to Dedicated Landfill Area Needs Increase	Rp120.414		Rp59.123.911
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp43.947		Rp5.766.283
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp18.902		Rp150.670
AP to BPS 2 Business Entity	Rp11.393		Rp11.393
Tipping Fee to BPS 2 Business Entity	Rp17.756		Rp283.073
Total Costs	Rp212.411		Rp65.335.328

(Source: Author's Document)

From the calculation result of benefits and costs in Table 4.111 above, then there will be BCR calculation process according to Formula 2.21 and Formula 2.22. The result of this calculation will be shown in Table 4.112 below.

Table 4.112 BPS 2 – BCR Calculation Result (in IDR, million)

Description	PV (2025)
Total Benefits	Rp412.144
Total Costs	Rp342.057.017
BCR	0.001

(Source: Author's Document)

4.2.3.3 Financial Modelling and Feasibility Study of BPS 3 – BPS 1 & 2 Combination

In this part of report financial modelling for PT X (BPS 1) and PT Y (BPS 2) combination will be done separately. It will be informed in detail through two points below

1. PT X (BPS 1)

The first thing needed to be included in financial modelling is the funding of PT X. As already mentioned in Table 4.20 as a part of the macro assumption PT X will be funded with a proportion of 30%:70% of self-funding and bank loan. Its proportion for PT X can be seen through Table 4.113 below.

Table 4.113 BPS 3 (PT X) – Initial Debt/Equity Ratio (in IDR, million)

BPS 3 (PT X)		
Initial Debt/Equity	%	Amount
Initial Equity Ratio	30,00%	Rp1.944.344
Initial Debt Ratio	70,00%	Rp4.536.804
	Total	Rp6.481.148

(Source: Author's Document)

Because of this funding policy, therefore there are some implications known as financing cost resulted from bank loan funding acquired by PT X business entity. The form of this financing cost are IDC and provision fee. IDC will be calculated during the construction period of PT X, which is 5 years, at the bank loan interest rate of 11.27%. Meanwhile, provision fee calculated as much as 1% from the loan drawdown for each period during the construction period. But beforehand, there is a need to determine project investment schedule to allocate PT X funding along the construction period. In this research, this allocation is made 1:2:4:2:1 ratio for the construction period to represent normal distribution graph of project life cycle cost. The allocation of PT X funding can be seen through Table 4.114 below.

Table 4.114 BPS 3 (PT X) – Project Investment Schedule (in IDR, million)

BPS 3 (PT X) - Project Investment Schedule (in IDR, million)						
No	Tangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Incinerator Construction + Freight + Installation	Rp622.742	Rp1.245.484	Rp2.490.968	Rp1.245.484	Rp622.742
2	Land Acquisition Fee	Rp17.035	Rp34.070	Rp68.140	Rp34.070	Rp17.035
3	Supporting and Office Facilities Construction	Rp7.028	Rp14.057	Rp28.113	Rp14.057	Rp7.028
4	Office Equipment					Rp692
5	Operational and Safety Equipment					Rp122
6	Supporting Equipment					Rp73
7	Bulldozer				Rp1.932	Rp1.932
8	Excavator				Rp3.236	Rp3.236
	Freight Expense				Rp271	Rp271
No	Intangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Legal Document				Rp665	Rp665
Total Investment/Year		Rp646.805	Rp1.293.611	Rp2.587.221	Rp1.299.714	Rp653.796
Cum. % Total Investment/Year		9,98%	29,94%	69,86%	89,91%	100,00%

(Source: Author's Document)

From total investment per period acquired from PT X project investment schedule IDC and provision calculation result can be seen through Table 4.115 below.

Table 4.115 BPS 3 (PT X) – IDC and Provision Calculation (in IDR, million)

Tangible Assets	BPS 3 (PT X) – IDC and Provision Calculation					Total
	Construction Phase					
	2021	2022	2023	2024	2025	
Total Investment/Year	Rp646.805	Rp1.293.611	Rp2.587.221	Rp1.299.714	Rp653.796	Rp6.481.148
Self-Investment (30%)	Rp194.042	Rp388.083	Rp776.166	Rp389.914	Rp196.139	Rp1.944.344
Debt (70%)	Rp452.764	Rp905.527	Rp1.811.055	Rp909.800	Rp457.657	Rp4.536.804
IDC	Rp51.026	Rp153.079	Rp357.185	Rp459.720	Rp511.298	Rp1.532.309
Provision	Rp4.528	Rp9.055	Rp18.111	Rp9.098	Rp4.577	Rp45.368

(Source: Author's Document)

Provision fee will be paid by PT X when loan drawdown occurred. Meanwhile, IDC will be paid alongside the instalment of the investment debt with the offset period equal to the grace period used in this research which is 5 years with the tenor of 20 years. This calculation will resulted to total instalment need to be paid by PT X per year. The recapitulation of instalment during the tenor period can be seen through Table 4.116 below.

Table 4.116 BPS 3 (PT X) – Debt Schedule Repayment (in IDR, million)

Description	Years during Tenor				
	2026	2027	...	2048	2049
Initial Loan Balance	Rp4.536.804	Rp4.514.165		Rp91.256	Rp22.883
Installment for loan drawdown Year 0 (2021)	Rp22.638	Rp22.638		Rp0	Rp0
Installment for loan drawdown Year 1 (2022)	Rp0	Rp45.276		Rp0	Rp0
Installment for loan drawdown Year 2 (2023)	Rp0	Rp0		Rp0	Rp0
Installment for loan drawdown Year 3 (2024)	Rp0	Rp0		Rp45.490	Rp0
Installment for loan drawdown Year 4 (2025)	Rp0	Rp0		Rp22.883	Rp22.883
Total Installment	Rp22.638	Rp67.915		Rp68.373	Rp22.883
Ending Loan Balance	Rp4.514.165	Rp4.446.251		Rp22.883	Rp0

(Source: Author's Document)

From here there is an adjustment needed to the CAPEX calculation of PT X as there is an implication in form of financing cost implied to fund this CAPEX which are IDC and provision. Both of them will be included as a part of the equity. Hence, the initial debt and equity ratio of the business entity of PT X will be modified accordingly as can be seen through Table 4.117 below.

Table 4.117 BPS 3 (PT X) – Final Debt/Equity Ratio (in IDR, million)

BPS 3 (PT X)		
Final Debt/Equity	%	Amount
Final Equity Ratio	43,70%	Rp3.522.021
Final Debt Ratio	56,30%	Rp4.536.804
	Total	Rp8.058.825

(Source: Author's Document)

Next, there is a need to calculate depreciation expense for depreciable assets owned by PT X. In this research, depreciation approach implemented is straight line method which divide the acquisition cost of an asset according to its useful life. The recapitulation of depreciation expense per year for all depreciable assets of PT X can be seen through Table 4.118 below.

Table 4.118 BPS 3 (PT X) – Depreciation Expense Projection (in IDR, million)

Description	2025	2026	...	2074	2075
Asset's Acquisition Cost	Rp8.013.457	Rp8.013.457		Rp8.013.457	Rp8.013.457
Depreciation & Amortization Expense	Rp203.520	Rp203.520		Rp130.455	Rp130.455
Accumulative Depreciation & Amortization Expense	Rp203.520	Rp407.040		Rp7.811.034	Rp7.941.489
Remaining Assets Book Value	Rp7.809.937	Rp7.607.607		Rp341.222	Rp211.162

(Source: Author's Document)

After all expenses of PT X already have been recapped there is a need to determine revenue stream implied by BOT-AP PPP scheme. AP provided government will return initial and routine CAPEX needed by PT X as well as the OPEX needed to run it. But, the output of the business entity which is electricity and its sales will be transferred to regional government of Sidoarjo district. The recapitulation of all AP during the planning horizon can be seen in Table 4.119 below with an implementation of 8% account receivable ratio as already stated in macro assumption. AP that is considered as account receivable will be received in the next period.

Table 4.119 BPS 3 (PT X) – AP Recapitulation (in IDR, million)

Description	2026	2027	...	2074	2075
AP for BPS 1	Rp1.109.760	Rp1.204.675		Rp3.211.215	Rp3.309.895
Cash (92%)	Rp1.017.280	Rp1.104.286		Rp2.943.614	Rp3.034.070
Account Receivable (8%)	Rp92.480	Rp100.390		Rp267.601	Rp275.825

(Source: Author's Document)

Financial report of PT X will be informed in detail below:

a. Income Statement

Income statement of PT X operational activities can be seen through Table 4.120 below. The detailed version of it can be seen in Attachment section.

Table 4.120 BPS 3 (PT X) – Income Statement Projection (in IDR, million)

Description	2026	2027	...	2074	2075
Sales	Rp1.109.760	Rp1.204.675		Rp3.211.215	Rp3.309.895
Cost of Goods Sold	(Rp289.494)	(Rp355.357)		(Rp1.747.705)	(Rp1.816.179)
Gross Profit	Rp820.267	Rp849.318		Rp1.463.511	Rp1.493.716
Operating Expenses					
Communication Expenses	(Rp14)	(Rp15)		(Rp59)	(Rp61)
General & Administrative Expenses	(Rp52.823)	(Rp64.841)		(Rp318.895)	(Rp331.390)
Maintenance Expense	(Rp46.214)	(Rp56.729)		(Rp279.001)	(Rp289.933)
Indirect Labour Expense	(Rp18.906)	(Rp23.208)		(Rp114.140)	(Rp118.612)
Risk Management Expense	(Rp9.749)	(Rp11.967)		(Rp58.855)	(Rp61.161)
Total Operating Expenses	(Rp127.707)	(Rp156.759)		(Rp770.951)	(Rp801.156)
EBITDA	Rp692.559	Rp692.559		Rp692.559	Rp692.559
Depreciation Expenses	(Rp203.520)	(Rp203.520)		(Rp130.455)	(Rp130.455)
Operating Profit (EBIT)	Rp489.039	Rp489.039		Rp562.105	Rp562.104
Other Revenue & Expenses					
Interest Expenses	(Rp511.298)	(Rp508.746)		(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp511.298)	(Rp508.746)		(Rp0)	(Rp0)
Earning Before Tax (EBT)	(Rp22.259)	(Rp19.707)		Rp562.105	Rp562.104
Tax (25%)	Rp0	Rp0		(Rp140.526)	(Rp140.526)
EAT	(Rp22.259)	(Rp19.707)		Rp421.578	Rp421.578

(Source: Author's Document)

b. Cash Flow Statement

Cash flow statement during PT X construction and operational activities can be seen through Table 4.121 and Table 4.122 below. The detailed version of it can be seen in Attachment section.

Table 4.121 BPS 3 (PT X) – Cash Flow Statement Projection during Construction Period (in IDR, million)

Description	2021	...	2025
Operational Cash Flow			
Sales	Rp0		Rp0
Account Receivable	Rp0		Rp0
Cost of Operation	Rp0		Rp0
Operating Expense	Rp0		Rp0
Interest Expense	Rp0		Rp0
Tax (25%)	Rp0		Rp0
Total Operational Cash Flow	Rp0		Rp0
Investment Cash Flow			
Project Cost	(Rp702.359)		(Rp1.169.671)
Routine CAPEX	Rp0		Rp0
Total Investment Cash Flow	(Rp702.359)		(Rp1.169.671)

Description	2021	...	2025
Financing Cash Flow			
Shareholder's Equity	Rp249.596		Rp712.013
Loan Drawdown	Rp452.764		Rp457.657
Bank Loan Main Instalment	Rp0		Rp0
Total Financing Cash Flow	Rp702.359		Rp1.169.671
Net Cash Flow	Rp0		Rp0
Cash – Beginning Balance	Rp0		Rp0
Cash – Ending Balance	Rp0		Rp0

(Source: Author's Document)

Table 4.122 BPS 3 (PT X) – Cash Flow Statement Projection during Operational Period (in IDR, million)

Description	2026	...	2075
Operational Cash Flow			
Sales	Rp1.109.760		Rp3.577.496
Account Receivable	(Rp92.480)		(Rp275.825)
Cost of Operation	(Rp289.494)		(Rp1.816.179)
Operating Expense	(Rp127.707)		(Rp801.156)
Interest Expense	(Rp511.298)		(Rp0)
Tax (25%)	Rp0		(Rp140.526)
Total Operational Cash Flow	Rp88.781		Rp543.810
Investment Cash Flow			
Project Cost	Rp0		Rp0
Routine CAPEX	Rp0		(Rp396)
Total Investment Cash Flow	Rp0		(Rp396)
Financing Cash Flow			
Shareholder's Equity	Rp0		Rp0
Loan Drawdown	Rp0		Rp0
Bank Loan Main Instalment	(Rp22.638)		Rp0
Total Financing Cash Flow	(Rp22.638)		Rp0
Net Cash Flow	Rp66.143		Rp543.414
Cash – Beginning Balance	Rp0		Rp17.652.977
Cash – Ending Balance	Rp66.143		Rp18.196.391

(Source: Author's Document)

c. Balance Sheet

Balance sheet during PT X construction and operational activities can be seen through Table 4.123 and Table 4.123 below. The detailed version of it can be seen in Attachment section.

Table 4.123 BPS 3 (PT X) – Balance Sheet Projection during Construction Period (in IDR, million)

Description	2021	...	2025
ASSETS			
Current Assets			
Cash	Rp0		Rp0
Marketable Securities	Rp0		Rp0
Account Receivable	Rp0		Rp0
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0

Description	2021	...	2025
Total Current Assets	Rp0		Rp0
Fixed Assets			
Net Plant and Equipment	Rp702.359		Rp8.058.825
Routine CAPEX	Rp0		Rp0
Accumulated Depreciation	Rp0		Rp0
Total Fixed Assets	Rp702.359		Rp8.058.825
TOTAL ASSETS	Rp702.359		Rp8.058.825
LIABILITIES			
Current Liabilities			
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp452.764		Rp4.536.804
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp452.764		Rp4.536.804
TOTAL LIABILITIES	Rp452.764		Rp4.536.804
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp249.596		Rp3.522.021
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp0
Profit this Year	Rp0		Rp0
TOTAL EQUITIES	Rp249.596		Rp3.522.021
TOTAL EQUITIES DAN LIABILITIES	Rp702.359		Rp8.058.825

(Source: Author's Document)

Table 4.124 BPS 3 (PT X) – Balance Sheet Projection during Operational Period (in IDR, million)

Description	2026	...	2075
ASSETS			
Current Assets			
Cash	Rp66.143		Rp18.196.391
Marketable Securities	Rp0		Rp0
Account Receivable	Rp92.480		Rp275.825
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0
Total Current Assets	Rp158.623		Rp18.472.216
Fixed Assets			
Net Plant and Equipment	Rp8.058.825		Rp8.058.825
Routine CAPEX	Rp0		Rp139.195
Accumulated Depreciation	(Rp203.520)		(Rp7.941.489)
Total Fixed Assets	Rp7.855.305		Rp256.530
TOTAL ASSETS	Rp8.013.928		Rp18.728.746
LIABILITIES			
Current Liabilities			
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp4.514.165		Rp0

Description	2026	...	2075
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp4.514.165		Rp0
TOTAL LIABILITIES	Rp4.514.165		Rp0
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp3.522.021		Rp3.522.021
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp14.785.147
Profit this Year	(Rp22.259)		Rp421.578
TOTAL EQUITIES	Rp3.499.763		Rp18.728.746
TOTAL EQUITIES DAN LIABILITIES	Rp8.013.928		Rp18.728.746

(Source: Author's Document)

From the balance sheet shown in Table 4.123 and 4.124 above, it can be seen that total assets owned by PT X in each period equal to its total liabilities plus total equities. The calculation resulted from the these financial report will be used to construct free cash flow calculation to do a valuation purpose using pre-determined financial parameters which are NPV, IRR and payback period. It can be seen through Table 4.125 and Table 4.126 below.

Table 4.125 BPS 3 (PT X) – Free Cash Flow Projection during Construction Period (in IDR, million)

Description	2021	...	2025
Net profit	Rp0		Rp0
Depreciation Expense	Rp0		Rp0
Interest Expense x (1 - Tax)	Rp0		Rp0
Terminal Value	Rp0		Rp0
Total Cash Inflow	Rp0		Rp0
Investment	(Rp702.359)		(Rp1.169.671)
Changes in Working Capital	Rp0		(Rp104.300)
Total Cash Outflow	(Rp702.359)		(Rp1.273.971)
Net Cash Flow	(Rp702.359)		(Rp1.273.971)
Accumulated Net Cash Flow	(Rp702.359)		(Rp8.163.125)
Discounted Cash Flow	Rp0		(Rp8.163.125)
Accumulated Discounted Cash Flow	Rp0		(Rp8.163.125)

(Source: Author's Document)

Table 4.126 BPS 3 (PT X) – Free Cash Flow Projection during Operational Period (in IDR, million)

Description	2026	...	2075
Net profit	(Rp22.259)		Rp421.578
Depreciation Expense	Rp203.520		Rp130.455
Interest Expense x (1 - Tax)	Rp383.473		Rp0
Terminal Value	Rp0		Rp104.300

Description	2026	...	2075
Total Cash Inflow	Rp564.735		Rp656.333
Investment	Rp0		Rp0
Changes in Working Capital	Rp0		Rp0
Total Cash Outflow	Rp0		Rp0
Net Cash Flow	Rp564.735		Rp656.333
Accumulated Net Cash Flow	(Rp7.598.390)		Rp19.883.995
Discounted Cash Flow	Rp520.850		Rp11.495
Accumulated Discounted Cash Flow	(Rp7.642.275)		(Rp1.562.608)

(Source: Author's Document)

The result acquired from this calculation is net cash flow that will be used to calculate certain financial parameters which are NPV, IRR, and Payback Period. NPV will be calculated using WACC rate. The result of this calculation can be seen in Table 4.127 below.

Table 4.127 BPS 3 (PT X) – Valuation Result using NPV, IRR, and Payback Period Parameters

Valuation	
Financial Parameters	Value
NPV	(Rp1.562.608)
IRR	6.65%
Payback Period	- (More than planned horizon)

(Source: Author's Document)

The implication of PT X to related stakeholders which is DLHK of Sidoarjo district will be combined with PT Y as BPS 3 benefit cost implications that will be informed later in this part of the report.

2. PT Y (BPS 2)

The first thing needed to be included in financial modelling is the funding of PT Y. As already mentioned in Table 4.20 as a part of the macro assumption PT Y will be funded with a proportion of 30%:70% of self-funding and bank loan. Its proportion for PT Y can be seen through Table 4.128 below.

Table 4.128 BPS 3 (PT Y) – Initial Debt/Equity Ratio (in IDR, million)

BPS 3 (PT Y)		
Initial Debt/Equity	%	Amount
Initial Equity Ratio	30,00%	Rp23.787
Initial Debt Ratio	70,00%	Rp55.503
	Total	Rp79.290

(Source: Author's Document)

Because of this funding policy, therefore there are some implications known as financing cost resulted from bank loan funding acquired by PT Y. The form of this financing cost are IDC and provision fee. IDC will be calculated during the construction period of PT Y, which is 5 years, at the bank loan interest rate of 11.27%. Meanwhile, provision fee calculated as much as 1% from the loan drawdown for each period during the construction period. But beforehand, there is a need to determine project investment schedule to allocate PT Y funding along the construction period. In this research, this allocation is made 1:2:4:2:1 ratio for the construction period to represent normal distribution graph of project life cycle cost. The allocation of PT Y funding can be seen through Table 4.129 below.

Table 4.129 BPS 3 (PT Y) – Project Investment Schedule (in IDR, million)

BPS 3 (PT Y) - Project Investment Schedule (in IDR, million)						
No	Tangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Construction Fee	Rp4.244	Rp8.487	Rp16.975	Rp8.487	Rp4.244
2	Land Acquisition Fee	Rp1.887	Rp3.775	Rp7.549	Rp3.775	Rp1.887
3	Operational and Safety Equipment					Rp100
4	Office Equipment					Rp1.075
5	Supporting Equipment					Rp73
6	Laboratory Equipment	Rp60	Rp120	Rp240	Rp120	Rp60
7	Belt Conveyor	Rp31	Rp61	Rp123	Rp61	Rp31
8	Bulldozer				Rp483	Rp483
9	Dump Truck				Rp201	Rp201
10	Compost Turning Machine	Rp13	Rp25	Rp50	Rp25	Rp13
11	Semi-Wet Material Crusher	Rp27	Rp55	Rp109	Rp55	Rp27
12	Sieving Machine	Rp12	Rp24	Rp48	Rp24	Rp12
13	Mixing Machine	Rp77	Rp155	Rp309	Rp155	Rp77
14	Granulator	Rp15	Rp30	Rp60	Rp30	Rp15
15	Drying Machine	Rp265	Rp531	Rp1.061	Rp531	Rp265
16	Cooling Machine	Rp161	Rp322	Rp644	Rp322	Rp161
17	Screener Machine	Rp64	Rp129	Rp258	Rp129	Rp64
18	Coating Machine	Rp26	Rp52	Rp103	Rp52	Rp26
19	Packing Machine	Rp22	Rp45	Rp89	Rp45	Rp22
20	Plastic Recycling Machine	Rp48	Rp97	Rp193	Rp97	Rp48
21	Glass Recycling Machine	Rp72	Rp145	Rp290	Rp145	Rp72
22	Metal Recycling Machine	Rp161	Rp322	Rp644	Rp322	Rp161
23	Rubber Recycling Machine	Rp49	Rp99	Rp198	Rp99	Rp49
24	Textile and Paper Recycling Machine	Rp161	Rp322	Rp644	Rp322	Rp161
	Freight Expense	Rp138	Rp276	Rp551	Rp276	Rp138
No	Intangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
1	Legal Document				Rp665	Rp665
	Total Investment/Year	Rp7.534	Rp15.069	Rp30.138	Rp16.418	Rp10.131

BPS 3 (PT Y) - Project Investment Schedule (in IDR, million)						
No	Tangible Assets	Construction Phase				
		2021	2022	2023	2024	2025
Cum. %Total Investment/Year		9,50%	28,51%	66,52%	87,22%	100,00%

(Source: Author's Document)

From total investment per period acquired from PT Y project investment schedule IDC and provision calculation result can be seen through Table 4.130 below.

Table 4.130 BPS 3 (PT Y) – IDC and Provision Calculation (in IDR, million)

BPS 3 (PT Y) – IDC and Provision Calculation						Total
Tangible Assets	Construction Phase					
	2021	2022	2023	2024	2025	
Total Investment/Year	Rp7.534	Rp15.069	Rp30.138	Rp16.418	Rp10.131	Rp79.290
Self-Investment (30%)	Rp2.260	Rp4.521	Rp9.041	Rp4.925	Rp3.039	Rp23.787
Debt (70%)	Rp5.274	Rp10.548	Rp21.096	Rp11.493	Rp7.092	Rp55.503
IDC	Rp594	Rp1.783	Rp4.161	Rp5.456	Rp6.255	Rp18.249
Provision	Rp53	Rp105	Rp211	Rp115	Rp71	Rp555

(Source: Author's Document)

Provision fee will be paid by PT Y when loan drawdown occurred. Meanwhile, IDC will be paid alongside the instalment of the investment debt with the offset period equal to the grace period used in this research which is 5 years with the tenor of 20 years. This calculation will result to total instalment need to be paid by BPS 2 business entity per year. The recapitulation of instalment during the tenor period can be seen through Table 4.131 below.

Table 4.131 BPS 3 (PT Y) – Debt Schedule Repayment (in IDR, million)

Description	Years during Tenor				
	2026	2027	...	2048	2049
Initial Loan Balance	Rp55.503	Rp55.239		Rp1.284	Rp355
Installment for loan drawdown Year 0 (2021)	Rp264	Rp264		Rp0	Rp0
Installment for loan drawdown Year 1 (2022)	Rp0	Rp527		Rp0	Rp0
Installment for loan drawdown Year 2 (2023)	Rp0	Rp0		Rp0	Rp0
Installment for loan drawdown Year 3 (2024)	Rp0	Rp0		Rp575	Rp0
Installment for loan drawdown Year 4 (2025)	Rp0	Rp0		Rp355	Rp355
Total Installment	Rp264	Rp791		Rp929	Rp355
Ending Loan Balance	Rp55.239	Rp54.448		Rp355	Rp0

(Source: Author's Document)

From here there is an adjustment needed to the CAPEX calculation of PT Y as there is an implication in form of financing cost implied to fund this CAPEX which are IDC and provision. Both of them will be included as a part of the equity.

Hence, the initial debt and equity ratio of the business entity of PT Y will be modified accordingly as can be seen through Table 4.132 below.

Table 4.132 BPS 3 (PT Y) – Final Debt/Equity Ratio (in IDR, million)

BPS 3 (PT Y)		
Final Debt/Equity	%	Amount
Final Equity Ratio	43,42%	Rp42.591
Final Debt Ratio	56,58%	Rp55.503
	Total	Rp98.095

(Source: Author's Document)

Next, there is a need to calculate depreciation expense for depreciable assets owned by PT Y. In this research, depreciation approach implemented is straight line method which divide the acquisition cost of an asset according to its useful life. The recapitulation of depreciation expense per year for all depreciable assets of PT Y can be seen through Table 4.133 below.

Table 4.133 BPS 3 (PT Y) – Depreciation Expense Projection (in IDR, million)

Description	2025	2026	...	2074	2075
Asset's Acquisition Cost	Rp97.540	Rp97.540		Rp97.540	Rp97.540
Depreciation & Amortization Expense	Rp3.126	Rp3.126		Rp10.575	Rp11.230
Accumulative Depreciation & Amortization Expense	Rp3.126	Rp6.251		Rp280.558	Rp291.788
Remaining Assets Book Value	Rp94.414	Rp91.288		Rp87.778	Rp101.682

(Source: Author's Document)

After all expenses of PT Y already have been recapped there is a need to determine revenue stream implied by BOOT-AP PPP scheme. AP provided government will return initial and routine CAPEX needed by PT Y. Different than BPS 1, PT Y will cover their own OPEX during the operational period. Other than that, Indonesia government also offers a bonus of Rp500.000 per ton for business entity which implement a proper MSW-MS. Hence, the output of the business entity which is recycled goods and composts and its implied sales will be their revenue stream alongside government AP and MSW processing bonus. The recapitulation of all revenue stream during the planning horizon of PT Y can be seen in Table 4.134 below with an implementation of 8% account receivable ratio as already

stated in macro assumption. Revenue that is considered as account receivable will be received in the next period.

Table 4.134 BPS 3 (PT Y) – AP Recapitulation (in IDR, million)

Description	2026	2027	...	2074	2075
AP for BPS 2	Rp11.393	Rp11.393		Rp11.393	Rp11.393
Tipping Fee for BPS 2	Rp17.756	Rp22.337		Rp272.214	Rp283.073
Sales	Rp247.278	Rp311.080		Rp3.790.981	Rp3.942.205
Total Revenue per Year	Rp276.427	Rp344.810		Rp4.074.587	Rp4.236.670
Cash (92%)	Rp253.391	Rp316.076		Rp3.735.038	Rp3.883.615
Account Receivable (8%)	Rp23.036	Rp28.734		Rp339.549	Rp353.056

(Source: Author's Document)

Financial report of PT Y will be informed in detail below:

a. Income Statement

Income statement of PT Y business entity operational activities can be seen through Table 4.135 below. The detailed version of it can be seen in Attachment section.

Table 4.135 BPS 3 (PT Y) – Income Statement Projection (in IDR, million)

Description	2026	2027	...	2074	2075
Sales	Rp276.427	Rp344.810		Rp4.074.587	Rp4.236.670
Cost of Goods Sold	(Rp191.480)	(Rp232.170)		(Rp2.590.522)	(Rp2.704.064)
Gross Profit	Rp84.947	Rp112.640		Rp1.484.066	Rp1.532.606
Operating Expenses					
Communication Expenses	(Rp14)	(Rp15)		(Rp59)	(Rp61)
General & Administrative Expenses	(Rp34.940)	(Rp42.364)		(Rp472.676)	(Rp493.393)
Maintenance Expense	(Rp30.568)	(Rp37.063)		(Rp413.548)	(Rp431.673)
Indirect Labour Expense	(Rp12.505)	(Rp15.163)		(Rp169.184)	(Rp176.599)
Risk Management Expense	(Rp6.448)	(Rp7.818)		(Rp87.237)	(Rp91.061)
Total Operating Expenses	(Rp84.475)	(Rp102.423)		(Rp1.142.704)	(Rp1.192.788)
EBITDA	Rp472	Rp10.216		Rp341.362	Rp339.819
Depreciation Expenses	(Rp3.126)	(Rp3.126)		(Rp10.575)	(Rp11.230)
Operating Profit (EBIT)	(Rp2.653)	Rp7.091		Rp330.787	Rp328.589
Other Revenue & Expenses					
Interest Expenses	(Rp6.255)	(Rp6.225)		(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp6.255)	(Rp6.225)		(Rp0)	(Rp0)
Earning Before Tax (EBT)	(Rp8.908)	Rp865		Rp330.787	Rp328.589
Tax (25%)	Rp0	(Rp216)		(Rp82.697)	(Rp82.147)
EAT	(Rp8.908)	Rp649		Rp248.090	Rp246.441

(Source: Author's Document)

b. Cash Flow Statement

Cash flow statement during PT Y construction and operational activities can be seen through Table 4.136 and Table 4.137 below. The detailed version of it can be seen in Attachment section

Table 4.136 BPS 3 (PT Y) – Cash Flow Statement Projection during Construction Period (in IDR, million)

Description	2021	...	2025
Operational Cash Flow			
Sales			
Account Receivable			
Cost of Operation			
Operating Expense			
Interest Expense			
Tax (25%)			
Total Operational Cash Flow			
Investment Cash Flow			
Project Cost	(Rp8.182)		(Rp16.457)
Routine CAPEX	Rp0		Rp0
Total Investment Cash Flow	(Rp8.182)		(Rp16.457)
Financing Cash Flow			
Shareholder's Equity	Rp2.907		Rp9.366
Loan Drawdown	Rp5.274		Rp7.092
Bank Loan Main Instalment	Rp0		Rp0
Total Financing Cash Flow	Rp8.182		Rp16.457
Net Cash Flow			
Cash – Beginning Balance			
Cash – Ending Balance			

(Source: Author's Document)

Table 4.137 BPS 3 (PT Y) – Cash Flow Statement Projection during Operational Period (in IDR, million)

Description	2026	...	2075
Operational Cash Flow			
Sales	Rp276.427		Rp4.576.219
Account Receivable	(Rp23.036)		(Rp353.056)
Cost of Operation	(Rp191.480)		(Rp2.704.064)
Operating Expense	(Rp84.475)		(Rp1.192.788)
Interest Expense	(Rp6.255)		(Rp0)
Tax (25%)	Rp0		(Rp82.147)
Total Operational Cash Flow	(Rp28.818)		Rp244.164
Investment Cash Flow			
Project Cost	Rp0		Rp0
Routine CAPEX	Rp0		(Rp8.974)
Total Investment Cash Flow	Rp0		(Rp8.974)
Financing Cash Flow			
Shareholder's Equity	Rp0		Rp0
Loan Drawdown	Rp0		Rp0
Bank Loan Main Instalment	(Rp264)		Rp0
Total Financing Cash Flow	(Rp264)		Rp0
Net Cash Flow	(Rp29.082)		Rp235.191

Description	2026	...	2075
Cash – Beginning Balance	Rp0		Rp4.235.319
Cash – Ending Balance	(Rp29.082)		Rp4.470.510

(Source: Author's Document)

c. Balance Sheet

Balance sheet during PT Y construction and operational activities can be seen through Table 4.138 and Table 4.139 below. The detailed version of it can be seen in Attachment section.

Table 4.138 BPS 3 (PT Y) – Balance Sheet Projection during Construction Period (in IDR, million)

Description	2021	...	2025
ASSETS			
Current Assets			
Cash	Rp0		Rp0
Marketable Securities	Rp0		Rp0
Account Receivable	Rp0		Rp0
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0
Total Current Assets	Rp0		Rp0
Fixed Assets			
Net Plant and Equipment	Rp8.182		Rp98.095
Routine CAPEX	Rp0		Rp0
Accumulated Depreciation	Rp0		Rp0
Total Fixed Assets	Rp8.182		Rp98.095
TOTAL ASSETS	Rp8.182		Rp98.095
LIABILITIES			
Current Liabilities			
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp5.274		Rp55.503
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp5.274		Rp55.503
TOTAL LIABILITIES	Rp5.274		Rp55.503
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp2.907		Rp42.591
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp0
Profit this Year	Rp0		Rp0
TOTAL EQUITIES	Rp2.907		Rp42.591
TOTAL EQUITIES DAN LIABILITIES	Rp8.182		Rp98.095

(Source: Author's Document)

Table 4.139 BPS 3 (PT Y) – Balance Sheet Projection during Operational Period (in IDR, million)

Description	2026	...	2075
ASSETS			
Current Assets			
Cash	(Rp29.082)		Rp4.470.510
Marketable Securities	Rp0		Rp0
Account Receivable	Rp23.036		Rp353.056
Inventories	Rp0		Rp0
Prepaid Expense	Rp0		Rp0
Total Current Assets	(Rp6.047)		Rp4.823.566
Fixed Assets			
Net Plant and Equipment	Rp98.095		Rp98.095
Routine CAPEX	Rp0		Rp304.904
Accumulated Depreciation	(Rp3.126)		(Rp291.788)
Total Fixed Assets	Rp94.969		Rp111.211
TOTAL ASSETS	Rp88.922		Rp4.934.776
LIABILITIES			
Current Liabilities			
Accounts Payable	Rp0		Rp0
Accrued Expenses	Rp0		Rp0
Short-Term Notes	Rp0		Rp0
Total Current Liabilities	Rp0		Rp0
Long Term Liabilities			
Long Term Notes	Rp55.239		Rp0
Mortgages	Rp0		Rp0
Total Long Term Liabilities	Rp55.239		Rp0
TOTAL LIABILITIES	Rp55.239		Rp0
EQUITIES			
Preferred Stock	Rp0		Rp0
Common Stock (PAR Value)	Rp42.591		Rp42.591
Paid in Capital	Rp0		Rp0
Retained Earnings	Rp0		Rp4.645.743
Profit this Year	(Rp8.908)		Rp246.441
TOTAL EQUITIES	Rp33.683		Rp4.934.776
TOTAL EQUITIES DAN LIABILITIES	Rp88.922		Rp4.934.776

(Source: Author's Document)

From the balance sheet shown in Table 4.138 and Table 4.139 above, it can be seen that total assets owned by PT Y in each period equal to its total liabilities plus total equities. The calculation resulted from the these financial report will be used to construct free cash flow calculation to do a valuation purpose using pre-determined financial parameters which are NPV, IRR and payback period. It can be seen through Table 4.140 and Table 4.141 below.

Table 4.140 BPS 3 (PT Y) – Free Cash Flow Projection during Construction Period (in IDR, million)

Description	2021	...	2025
Net profit	Rp0		Rp0
Depreciation Expense	Rp0		Rp0
Interest Expense x (1 - Tax)	Rp0		Rp0

Description	2021	...	2025
Terminal Value	Rp0		Rp0
Total Cash Inflow	Rp0		Rp0
Investment	(Rp8.182)		(Rp16.457)
Changes in Working Capital	Rp0		(Rp68.989)
Total Cash Outflow	(Rp8.182)		(Rp85.446)
Net Cash Flow	(Rp8.182)		(Rp85.446)
Accumulated Net Cash Flow	(Rp8.182)		(Rp167.083)
Discounted Cash Flow	Rp0		(Rp167.083)
Accumulated Discounted Cash Flow	Rp0		(Rp167.083)

(Source: Author's Document)

Table 4.141 BPS 3 (PT Y) – Free Cash Flow Projection during Operational Period (in IDR, million)

Description	2026	...	2075
Net profit	(Rp8.908)		Rp246.441
Depreciation Expense	Rp3.126		Rp11.230
Interest Expense x (1 - Tax)	Rp4.691		Rp0
Terminal Value	Rp0		Rp68.989
Total Cash Inflow	(Rp1.092)		Rp326.660
Investment	Rp0		Rp0
Changes in Working Capital	Rp0		Rp0
Total Cash Outflow	Rp0		Rp0
Net Cash Flow	(Rp1.092)		Rp326.660
Accumulated Net Cash Flow	(Rp168.175)		Rp5.144.908
Discounted Cash Flow	(Rp1.007)		Rp5.721
Accumulated Discounted Cash Flow	(Rp168.090)		Rp380.061

(Source: Author's Document)

The result acquired from this calculation is net cash flow that will be used to calculate certain financial parameters which are NPV, IRR, and Payback Period. NPV will be calculated using WACC rate. The result of this calculation can be seen in Table 4.142 below.

Table 4.142 BPS 3 (PT Y) – Valuation Result using NPV, IRR, and Payback Period Parameters

Valuation	
Financial Parameters	Value
NPV	Rp380.061
IRR	16.83%
Payback Period	Less than 12 Years

(Source: Author's Document)

Next, there is an implication of BPS 3 to related stakeholders which is DLHK of Sidoarjo district. This implication is calculated using BCA approach with the parameters of BCR to determine its feasibility. Hence, BCR calculation will be done using DLHK of Sidoarjo district perspective. Benefits factor that are included in this calculation and its bases for calculation will be shown through Table 4.143 below.

Table 4.143 BPS 3 – Benefits Factors Calculation Bases

No	Benefits Factors	Calculation Bases	Value
1	PT X Operating Revenue	Projected PT X Operating Revenue during Planning Horizon	
2	PT X Plant Acquisition in 2075	Projected Remaining Book Value of PT X Plant	
3	PT Y Plant Acquisition in 2075	Projected Remaining Book Value of PT Y Plant	
4	Avoided Operational Cost of MSW-MS in TPA Jabon	Historical Data of Sidoarjo's TPA Operational Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp40.600/Ton of MSW (2019)
5	Avoided Land Acquisition Cost due to Dedicated Landfill Area Needs Increase	Average Land Price around Dedicated Landfill Area (Jabon)	Rp2.000.000/m2 (2020)
6	Carbon Credit Savings Gained through WTE Operation	Incineration WTE Common Carbon Savings Ratio per Ton (Jeswani et al., 2012)	5,73 Carbon Credit/Ton of MSW and Rp48.743 per Ton of CO _{2-e}

(Source: Author's Document)

The calculation for benefits in BPS 3 using similar approach that already explained in Formula 4.24 in subchapter 4.2.3.1. The rest of the benefits factors value are calculated using similar methods that is modified to adjust with each factor calculation logics. Expected benefits recapitulation for all period during the planning horizon can be seen in Table 4.144 below.

Table 4.144 BPS 3 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million)

Benefits Factors	2026	...	2075
PT X Operating Revenue	Rp18.024		Rp114.256
PT X Plant Acquisition in 2075	Rp-		Rp211.162
PT Y Plant Acquisition in 2075	Rp-		Rp101.682
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp24.704		Rp10.574.629
Avoided Land Acquisition Cost due to Dedicated Landfill Area Needs Increase	Rp-		Rp15.861.943
Carbon Credit Savings Gained through WTE Operation	Rp156.531		Rp1.005.380
Total Benefits	Rp199.259		Rp12.177.972

(Source: Author's Document)

Meanwhile, costs factor that are included in this calculation and its bases for calculation will be shown through Table 4.145 below.

Table 4.145 BPS 3 – Costs Factors Calculation Bases

No	Costs Factors	Calculation Bases	Value
1	Operational Cost of Remaining MSW-MS in TPA Jabon	Historical Data of Sidoarjo's TPA Operational Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp40.600/Ton of MSW (2019) for temporary unprocessed MSW left in TPA
2	Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Historical Data of Sidoarjo's MSW Transportation and Sorting Cost in 2019 (Renja DLHK of Sidoarjo District)	Rp35.706/Ton of MSW (2019)
3	AP to PT X	Projected according to PT X Initial and Routine CAPEX (Resulted to an Annuity Level at WACC rate) and Corresponding OPEX in t period	Rp692.559.242.811/ Year (Annuity) + OPEX in t period during planning horizon
4	AP to PT Y	Projected according to BPS 1 Business Entity Initial and Routine CAPEX (Resulted to an Annuity Level at WACC rate)	Rp11.392.613.186/Year (Annuity) during planning horizon
5	Tipping Fee to PT Y	Standard Tipping Fee by Indonesia Government Given to Business Entity	Maximum rate Rp500.000/Ton (2020)

(Source: Author's Document)

The calculation for costs in BPS 3 using similar approach that already explained in Formula 4.25 in subchapter 4.2.3.1. The rest of the costs factors value are calculated using similar methods that is modified to adjust with each factor calculation logics. Expected costs recapitulation for all period during the planning horizon can be seen in Table 4.146 below.

Table 4.146 BPS 3 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million)

Costs Factors	2026	...	2075
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp20.728		Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp18.902		Rp150.670
AP to PT X	Rp1.109.760		Rp3.309.895
AP to PT Y	Rp17.756		Rp283.073
Tipping Fee to PT Y	Rp11.393		Rp11.393
Total Costs	Rp1.178.539		Rp3.755.030

(Source: Author's Document)

From the calculation result of benefits and costs in Table 4.146 above, then there will be BCR calculation process according to Formula 2.21 and Formula 2.22. The result of this calculation will be shown in Table 4.147 below.

Table 4.147 BPS 3 – BCR Calculation Result (in IDR, million)

Description	PV (2025)
Total Benefits	Rp66.110.631
Total Costs	Rp45.720.506
BCR	1.45

(Source: Author's Document)

From the result of all BPS financial modelling and feasibility study there are two alternatives considered as feasible, in DLHK of Sidoarjo district perspective, and will processed further using sensitivity analysis. Those two alternatives are BPS 1 and BPS 3. BPS 2 will not be considered as a feasible alternatives as the BCR value of its initial condition is far below 1. Meanwhile, even though BPS 1 and BPS 3 have a non-feasible result for their business entity, the value of their BCR is feasible for DLHK of Sidoarjo to implement. Moreover, according to the implementation of Undang-Undang Nomor 2 Tahun 2017 tentang Jasa Konstruksi, PPP scheme AP must be set accordingly so that it gives a proper return to the business entity which is commonly 2% above their cost of capital. This process will be done to BPS 1 and BPS 3 in sensitivity analysis.

4.2.4 Sensitivity Analysis of Selected Business Plan Scenario

In this part of the report there will be an information about the process and result of sensitivity analysis done to BPS 1 and BPS 3 according to their respective independent variables to be tested. The consideration to determine some sensitivity analysis parameters, which is the independent variables included in the financial model and feasibility study calculation, that will be the focus in this research is done by reviewing the models that already made before and determine which parameter give significant impact to the overall conclusion given by the model. Sensitivity analysis in this research is done using Ms. Excel software data analysis function. The detail of each process and the result of it will be explained in detail through subchapters below.

4.2.4.1 Sensitivity Analysis of BPS 1 – WTE Plant

In sensitivity analysis of BPS 1, the parameter that will be used in here is AP escalation as its value correlates with the value of BPS 1 business entity revenue and DLHK of Sidoarjo district cost. Hence, this AP level must be set accordingly

so that both parties included in this PPP scheme receive a proper amount of benefits so that the decision they are going to make is considered and calculated as feasible for them. In order to achieve that condition, AP escalation level is set to change the initial and routine CAPEX annuity need to be paid by DLHK of Sidoarjo district. Sensitivity analysis logics for that AP escalation level represented through Formula 4.26 below.

$$AP_t = A \times (100\% + e) + OPEX_t \quad (4.26)$$

Where:

AP_t : AP in t Period

A : Annuity According to Initial and Routine CAPEX

e : AP Escalation Factor

$OPEX_t$: OPEX in t Period

For example AP in 2026 at an escalation rate of 10 % can be calculated as follow:

$$\begin{aligned} AP_{2026} &= Rp694.087.736.347 \times (100\% + 10\%) \\ &\quad + Rp417.201.174.505 \\ AP_{2026} &= Rp1.180.697.684.486 \end{aligned}$$

This escalation gives a difference of Rp69.408.737.635 with the initial AP need to be paid in 2026 that can be seen in Formula ... The difference gained through the implementation of this sensitivity parameter will resulted to a different in NPV, IRR, payback period for BPS 1 business entity; and BCR for DLHK of Sidoarjo district. The recapitulation of sensitivity process result can be seen through Table 4.148 below.

Table 4.148 BPS 1 – AP Escalation Level Factors Sensitivity Analysis Result

BPS 1 – AP Escalation Level Factors Sensitivity Analysis Result						
Escalation Rate	BPS 1 Valuation Indicator				DLHK	Information
	IRR	NPV	PP (Less than ... Years)	DPP (Less than ... Years)	BCR	
-100%	-9,08%	(Rp9.081.721)	None	None	2,66	Not Feasible for BPS 1 Business Entity
-90%	-3,48%	(Rp8.272.369)	None	None	2,51	Not Feasible for BPS 1 Business Entity
-80%	-1,30%	(Rp7.467.076)	None	None	2,37	Not Feasible for BPS 1 Business Entity
-70%	0,07%	(Rp6.692.368)	50	None	2,24	Not Feasible for BPS 1 Business Entity
-60%	1,25%	(Rp5.920.252)	38	None	2,13	Not Feasible for BPS 1 Business Entity
-50%	2,31%	(Rp5.154.333)	30	None	2,03	Not Feasible for BPS 1 Business Entity
-40%	3,28%	(Rp4.399.854)	25	None	1,94	Not Feasible for BPS 1 Business Entity
-30%	4,19%	(Rp3.659.578)	21	None	1,85	Not Feasible for BPS 1 Business Entity
-20%	5,05%	(Rp2.937.653)	18	None	1,78	Not Feasible for BPS 1 Business Entity
-10%	5,87%	(Rp2.237.808)	16	None	1,71	Not Feasible for BPS 1 Business Entity
0%	6,65%	(Rp1.565.773)	15	None	1,64	Not Feasible for BPS 1 Business Entity
10%	7,36%	(Rp947.095)	14	None	1,58	Not Feasible for BPS 1 Business Entity
20%	8,05%	(Rp340.082)	13	None	1,52	Not Feasible for BPS 1 Business Entity
30%	8,72%	Rp266.932	12	38	1,47	Feasible for both Parties (but is not fulfil UUK requirement)
40%	9,39%	Rp873.945	11	27	1,42	Feasible for both Parties (but is not fulfil UUK requirement)
50%	10,05%	Rp1.480.959	10	22	1,38	Feasible for both Parties (but is not fulfil UUK requirement)
60%	10,71%	Rp2.087.973	10	19	1,33	Feasible for both Parties
70%	11,36%	Rp2.694.986	9	17	1,29	Feasible for both Parties
80%	12,01%	Rp3.302.000	9	15	1,26	Feasible for both Parties

BPS 1 – AP Escalation Level Factors Sensitivity Analysis Result						
Escalation Rate	BPS 1 Valuation Indicator				DLHK	Information
	IRR	NPV	PP (Less than ... Years)	DPP (Less than ... Years)	BCR	
90%	12,66%	Rp3.909.014	8	14	1,22	Feasible for both Parties
100%	13,31%	Rp4.516.027	8	13	1,19	Feasible for both Parties
110%	13,95%	Rp5.123.041	8	12	1,15	Feasible for both Parties
120%	14,59%	Rp5.730.055	7	11	1,12	Feasible for both Parties
130%	15,23%	Rp6.337.068	7	10	1,09	Feasible for both Parties
140%	15,87%	Rp6.944.082	7	10	1,07	Feasible for both Parties
150%	16,51%	Rp7.551.095	7	9	1,04	Feasible for both Parties
160%	17,15%	Rp8.158.109	6	9	1,02	Feasible for both Parties
170%	17,79%	Rp8.765.123	6	8	0,99	Not Feasible for DLHK
180%	18,43%	Rp9.372.136	6	8	0,97	Not Feasible for DLHK
190%	19,07%	Rp9.979.150	6	8	0,95	Not Feasible for DLHK
200%	19,70%	Rp10.586.164	6	7	0,93	Not Feasible for DLHK

(Source: Author's Document)

4.2.4.2 Sensitivity Analysis of BPS 3 – Integrated WTE and MSW Recycling Plant (Combination of BPS 1 & 2)

In sensitivity analysis of BPS 3, the parameters that will be used in here is AP escalation of PT X and tipping fee change for PT Y as its value correlates with the value of each business entity revenue and DLHK of Sidoarjo district cost. Hence, both level of this variables must be set accordingly so that the parties included in this PPP scheme receive a proper amount of benefits so that the decision they are going to make is considered and calculated as feasible for them. In order to achieve that condition, AP escalation level calculation in here is similar to the one that already have been done in subchapter 4.3.4.1. In here, the example of the calculation that will be made is about the calculation for PT Y tipping fee sensitivity. The mathematical representation of it can be seen through Formula 4.27 below.

$$TF_t = TF_r \times \text{Processed MSW by PT Y at } t \text{ period} \quad (4.27)$$

Where:

TF_t : Total Tipping Fee for PT Y in t Period

TF_r : Standard Tipping Fee Rate per Ton of Processed MSW

For example tipping fee for PT Y in 2026 at a tipping fee standard of Rp500.000/ton of processed MSW can be calculated as follow:

$$TF_t = Rp500.000/Ton \times 29.741 Ton$$

$$AP_{2026} = Rp17.755.982.892$$

The difference gained through the implementation of this sensitivity parameters will resulted to a different in NPV, IRR, payback period for BPS 3 business entity; and BCR for DLHK of Sidoarjo district. The recapitulation of sensitivity process result can be seen through Table 4.149 and Table 4.150 below.

Table 4.149 BPS 3 – PT X AP Escalation Level Factors Sensitivity Analysis Result

BPS 3 – PT X AP Escalation Level Factors Sensitivity Analysis Result						
Escalation Rate	PT X Valuation Indicator				DLHK	Information
	IRR	NPV	PP (Less than ... Years)	DPP (Less than ... Years)	BCR	
-100%	-9,08%	(Rp9.062.194)	None	None	2,37	Not Feasible for PT X
-90%	-3,48%	(Rp8.254.625)	None	None	2,23	Not Feasible for PT X
-80%	-1,30%	(Rp7.451.091)	None	None	2,10	Not Feasible for PT X
-70%	0,07%	(Rp6.678.082)	50	None	1,99	Not Feasible for PT X
-60%	1,25%	(Rp5.907.666)	38	None	1,89	Not Feasible for PT X
-50%	2,31%	(Rp5.143.418)	30	None	1,80	Not Feasible for PT X
-40%	3,28%	(Rp4.390.582)	25	None	1,71	Not Feasible for PT X
-30%	4,19%	(Rp3.651.921)	21	None	1,64	Not Feasible for PT X
-20%	5,05%	(Rp2.931.556)	18	None	1,57	Not Feasible for PT X
-10%	5,87%	(Rp2.233.213)	16	None	1,50	Not Feasible for PT X
0%	6,65%	(Rp1.562.608)	15	None	1,45	Not Feasible for PT X
10%	7,36%	(Rp945.229)	14	None	1,39	Not Feasible for PT X
20%	8,05%	(Rp339.552)	13	None	1,34	Not Feasible for PT X
30%	8,72%	Rp266.125	12	38	1,29	Feasible for both Parties (but is not

BPS 3 – PT X AP Escalation Level Factors Sensitivity Analysis Result						
Escalation Rate	PT X Valuation Indicator				DLHK	Information
	IRR	NPV	PP (Less than ... Years)	DPP (Less than ... Years)	BCR	
						fulfil UUJK requirement)
40%	9,39%	Rp871.802	11	27	1,25	Feasible for both Parties (but is not fulfil UUJK requirement)
50%	10,05%	Rp1.477.479	10	22	1,21	Feasible for both Parties (but is not fulfil UUJK requirement)
60%	10,71%	Rp2.083.156	10	19	1,17	Feasible for PT X and DLHK
70%	11,36%	Rp2.688.833	9	17	1,14	Feasible for PT X and DLHK
80%	12,01%	Rp3.294.509	9	15	1,10	Feasible for PT X and DLHK
90%	12,66%	Rp3.900.186	8	14	1,07	Feasible for PT X and DLHK
100%	13,31%	Rp4.505.863	8	13	1,04	Feasible for PT X and DLHK

(Source: Author's Document)

Table 4.150 BPS 3 – PT Y Tipping Fee Change Factors Sensitivity Analysis Result

BPS 3 – PT Y Tipping Fee Change Factors Sensitivity Analysis Result						
Tipping Fee Amount	PT Y Valuation Indicator				DLHK	Information
	IRR	NPV	PP (Less than ... Years)	DPP (Less than ... Years)	BCR	
Rp-	2,96%	(Rp186.201)	39	None	1,53	Not Feasible for PT Y
Rp25.000	4,08%	(Rp154.174)	32	None	1,52	Not Feasible for PT Y
Rp50.000	5,08%	(Rp122.556)	27	None	1,52	Not Feasible for PT Y
Rp75.000	5,98%	(Rp92.091)	25	None	1,51	Not Feasible for PT Y
Rp100.000	6,79%	(Rp63.006)	22	None	1,51	Not Feasible for PT Y
Rp125.000	7,54%	(Rp34.787)	20	None	1,51	Not Feasible for PT Y
Rp150.000	8,26%	(Rp6.578)	19	None	1,50	Not Feasible for PT Y
Rp175.000	8,96%	Rp21.631	17	42	1,50	Feasible for both Parties (but is not fulfil UUJK requirement)
Rp200.000	9,63%	Rp49.802	16	34	1,49	Feasible for both Parties (but is not fulfil UUJK requirement)
Rp225.000	10,29%	Rp77.689	14	29	1,49	Feasible for both Parties (but is not fulfil UUJK requirement)
Rp250.000	10,93%	Rp105.577	13	26	1,49	Feasible for PT Y and DLHK

BPS 3 – PT Y Tipping Fee Change Factors Sensitivity Analysis Result						
Tipping Fee Amount	PT Y Valuation Indicator				DLHK	Information
	IRR	NPV	PP (Less than ... Years)	DPP (Less than ... Years)	BCR	
Rp275.000	11,56%	Rp133.464	12	23	1,48	Feasible for PT Y and DLHK
Rp300.000	12,18%	Rp161.090	12	21	1,48	Feasible for PT Y and DLHK
Rp325.000	12,78%	Rp188.710	11	19	1,47	Feasible for PT Y and DLHK
Rp350.000	13,38%	Rp216.302	10	17	1,47	Feasible for PT Y and DLHK
Rp375.000	13,97%	Rp243.626	10	16	1,47	Feasible for PT Y and DLHK
Rp400.000	14,55%	Rp270.950	10	15	1,46	Feasible for PT Y and DLHK
Rp425.000	15,13%	Rp298.273	9	14	1,46	Feasible for PT Y and DLHK
Rp450.000	15,70%	Rp325.597	9	13	1,45	Feasible for PT Y and DLHK
Rp475.000	16,27%	Rp352.921	8	12	1,45	Feasible for PT Y and DLHK
Rp500.000	16,83%	Rp380.061	8	12	1,45	Feasible for PT Y and DLHK

(Source: Author's Document)

The result of one way sensitivity analysis for BPS 3 shown in Table 4.149 and Table 4.150 above will be the input for the further calculation of two way sensitivity analysis which consider both sensitivity parameters to determine the feasible range of BPS 3 to be implemented. The result of this processing can be seen through Table 4.151 until Table 4.153 below.

Table 4.151 BPS 3 – Two-Way Sensitivity Analysis of PT X AP and PT Y Tipping Fee Result (BCR)

BCR PT X AP	PT Y Tipping Fee						
	Rp-	Rp25.000	Rp50.000	Rp75.000	Rp100.000	Rp125.000	Rp150.000
-100%	2,59	2,58	2,57	2,56	2,55	2,53	2,52
-90%	2,43	2,41	2,40	2,39	2,38	2,37	2,36
-80%	2,28	2,27	2,26	2,25	2,24	2,23	2,22
-70%	2,14	2,14	2,13	2,12	2,11	2,10	2,10
-60%	2,03	2,02	2,01	2,01	2,00	1,99	1,98
-50%	1,92	1,92	1,91	1,90	1,90	1,89	1,88
-40%	1,83	1,82	1,82	1,81	1,80	1,80	1,79
-30%	1,74	1,74	1,73	1,73	1,72	1,71	1,71
-20%	1,66	1,66	1,65	1,65	1,64	1,64	1,63
-10%	1,59	1,59	1,58	1,58	1,57	1,57	1,57
0%	1,53	1,52	1,52	1,51	1,51	1,51	1,50
10%	1,47	1,46	1,46	1,45	1,45	1,45	1,44
20%	1,41	1,41	1,40	1,40	1,40	1,39	1,39
30%	1,36	1,36	1,35	1,35	1,35	1,34	1,34
40%	1,31	1,31	1,30	1,30	1,30	1,30	1,29
50%	1,27	1,26	1,26	1,26	1,25	1,25	1,25
60%	1,22	1,22	1,22	1,22	1,21	1,21	1,21
70%	1,19	1,18	1,18	1,18	1,18	1,17	1,17
80%	1,15	1,15	1,14	1,14	1,14	1,14	1,13

BCR	PT Y Tipping Fee							
	PT X AP	Rp-	Rp25.000	Rp50.000	Rp75.000	Rp100.000	Rp125.000	Rp150.000
90%		1,11	1,11	1,11	1,11	1,11	1,10	1,10
100%		1,08	1,08	1,08	1,08	1,07	1,07	1,07

(Source: Author's Document)

Table 4.152 BPS 3 – Two-Way Sensitivity Analysis of PT X AP and PT Y Tipping Fee Result (BCR) (con't)

BCR	PT Y Tipping Fee							
	PT X AP	Rp175.000	Rp200.000	Rp225.000	Rp250.000	Rp275.000	Rp300.000	Rp325.000
-100%		2,51	2,50	2,49	2,48	2,47	2,45	2,44
-90%		2,35	2,34	2,33	2,32	2,31	2,30	2,29
-80%		2,21	2,20	2,19	2,19	2,18	2,17	2,16
-70%		2,09	2,08	2,07	2,06	2,06	2,05	2,04
-60%		1,98	1,97	1,96	1,95	1,95	1,94	1,93
-50%		1,88	1,87	1,86	1,86	1,85	1,84	1,84
-40%		1,79	1,78	1,77	1,77	1,76	1,76	1,75
-30%		1,70	1,70	1,69	1,69	1,68	1,68	1,67
-20%		1,63	1,62	1,62	1,61	1,61	1,61	1,60
-10%		1,56	1,56	1,55	1,55	1,54	1,54	1,53
0%		1,50	1,49	1,49	1,49	1,48	1,48	1,47
10%		1,44	1,44	1,43	1,43	1,42	1,42	1,42
20%		1,39	1,38	1,38	1,38	1,37	1,37	1,36
30%		1,34	1,33	1,33	1,33	1,32	1,32	1,32
40%		1,29	1,29	1,28	1,28	1,28	1,27	1,27
50%		1,25	1,24	1,24	1,24	1,23	1,23	1,23
60%		1,21	1,20	1,20	1,20	1,20	1,19	1,19
70%		1,17	1,17	1,16	1,16	1,16	1,16	1,15
80%		1,13	1,13	1,13	1,13	1,12	1,12	1,12
90%		1,10	1,10	1,09	1,09	1,09	1,09	1,09
100%		1,07	1,06	1,06	1,06	1,06	1,06	1,05

(Source: Author's Document)


Table 4.153 BPS 3 – Two-Way Sensitivity Analysis of PT X AP and PT Y Tipping Fee Result (BCR) (con't)

BCR	PT Y Tipping Fee							
	PT X AP	Rp350.000	Rp375.000	Rp400.000	Rp425.000	Rp450.000	Rp475.000	Rp500.000
-100%		2,43	2,42	2,41	2,40	2,39	2,38	2,37
-90%		2,28	2,27	2,26	2,25	2,25	2,24	2,23
-80%		2,15	2,14	2,13	2,13	2,12	2,11	2,10
-70%		2,03	2,03	2,02	2,01	2,00	2,00	1,99
-60%		1,93	1,92	1,91	1,91	1,90	1,89	1,89
-50%		1,83	1,83	1,82	1,81	1,81	1,80	1,80
-40%		1,75	1,74	1,73	1,73	1,72	1,72	1,71
-30%		1,67	1,66	1,66	1,65	1,65	1,64	1,64
-20%		1,60	1,59	1,59	1,58	1,58	1,57	1,57
-10%		1,53	1,53	1,52	1,52	1,51	1,51	1,50
0%		1,47	1,47	1,46	1,46	1,45	1,45	1,45
10%		1,41	1,41	1,41	1,40	1,40	1,40	1,39
20%		1,36	1,36	1,35	1,35	1,35	1,34	1,34
30%		1,31	1,31	1,31	1,30	1,30	1,30	1,29
40%		1,27	1,27	1,26	1,26	1,26	1,25	1,25
50%		1,23	1,22	1,22	1,22	1,22	1,21	1,21
60%		1,19	1,18	1,18	1,18	1,18	1,17	1,17
70%		1,15	1,15	1,15	1,14	1,14	1,14	1,14
80%		1,12	1,11	1,11	1,11	1,11	1,10	1,10
90%		1,08	1,08	1,08	1,08	1,07	1,07	1,07
100%		1,05	1,05	1,05	1,05	1,04	1,04	1,04

(Source: Author's Document)

Where:

 : Non-Feasible Region because of PT Y Limitation

 : Non-Feasible Region because of PT X Limitation

After sensitivity analysis for both BPS already have been done there will be an additional process which is incremental analysis to compare between both of them which one is more beneficial to be implemented by DLHK of Sidoarjo district. It will be explained in detail in the next subchapter.

4.2.4.3 Incremental BCR Analysis between Selected BPS

As there are two feasible alternatives to be implemented as a potential solution for the problem in this research, there will be a need to conduct an additional process of incremental analysis to select a more beneficial alternatives in DLHK of Sidoarjo district perspective. The first process of this step is by determining the minimum investment that both BPS able to perform and then the incremental analysis will take place. BPS 1 minimum investment as can be seen in Table 4.151 until Table 4.153 can be implemented at the approximate AP rate of 30% to fulfil feasibility of both parties; and at 60% rate to fulfil UUJK requirements. Meanwhile, BPS 3 minimum investment can be seen in Table Table 4.151 until Table 4.153 It can be implemented at the approximate PT X AP rate of 30% and PT Y tipping fee of Rp175.000 to fulfil all party feasibility; and at 60% PT X AP rate and PT Y tipping fee at Rp250.000. Incremental analysis in this part of the report will be done using Formula 4.28 as can be seen below.

$$BCR_i = \frac{\sum_{t=2026}^{2075} (Benefit_1 - Benefit_0)}{\sum_{t=2026}^{2075} (Cost_1 - Cost_0)} \quad (4.28)$$

Where:

BCR_i : Incremental BCR Value (If its value > 1; challenger condition is better to be implemented (condition with higher investment))

Benefit₀ : Benefits Value from Defender Condition (condition with lower investment) in t period

Benefit₁ : Benefits Value from Challenger Condition in t period

Cost₀ : Costs Value from Defender Condition in t period

Cost₁ : Costs Value from Challenger Condition in t period

Defender and challenger determined in this research by comparing PV of implied cost for BPS 1 and BPS 3 before the beginning of the operational period as can be seen through Table 4.154 below.

Table 4.154 Incremental BCR Analysis – Challenger Determination between BPS 1 and BPS 3

Condition	BPS	Implied Costs PV (in IDR, million)	Decision
Baseline	BPS 1	Rp51.885.064	BPS 1 as Challenger
	BPS 3	Rp49.491.197	
UUJK	BPS 1	Rp57.242.678	BPS 1 as Challenger
	BPS 3	Rp55.200.503	

(Source: Author's Document)

Hence, BPS 1 as the challenger and BPS 3 as the defender, the recapitulation of calculation of BCR_i for baseline and UUJK condition can be seen in Table 4.155 and Table 4.156 below.

Table 4.155 Incremental BCR Analysis Input for BPS 1 and BPS 3 for Baseline Condition (in IDR, million)

Baseline Condition	BPS	2026	2027	...	2074	2075
Benefits	BPS 1	Rp196.409	Rp293.047		Rp13.022.466	Rp13.970.162
	BPS 3	Rp199.259	Rp287.119		Rp11.236.957	Rp12.076.290
Costs	BPS 1	Rp1.360.658	Rp1.450.987		Rp3.977.122	Rp4.097.710
	BPS 3	Rp1.374.765	Rp1.464.747		Rp3.670.540	Rp3.778.800
Incremental Benefit		Rp(2.850)	Rp5.928		Rp1.785.509	Rp1.893.872
Incremental Cost		Rp(14.106)	Rp(13.760)		Rp306.581	Rp318.909

(Source: Author's Document)

Table 4.156 Incremental BCR Analysis Input for BPS 1 and BPS 3 for UUJK Condition (in IDR, million)

UUJK Condition	BPS	2026	2027	...	2074	2075
Benefits	BPS 1	Rp196.409	Rp293.047		Rp13.022.466	Rp13.970.162
	BPS 3	Rp199.259	Rp287.119		Rp11.236.957	Rp12.076.290
Costs	BPS 1	Rp1.568.885	Rp1.659.214		Rp4.185.348	Rp4.305.936
	BPS 3	Rp1.585.196	Rp1.675.866		Rp3.919.140	Rp4.029.029
Incremental Benefit		Rp(2.850)	Rp5.928		Rp1.785.509	Rp1.893.872
Incremental Cost		Rp(16.311)	Rp(16.652)		Rp266.208	Rp276.907

(Source: Author's Document)

Incremental BCR calculation can be done using Formula 2.21 with the interest rate equal to inflation rate. Hence, the recapitulation of calculation for both condition can be seen in Table 4.157 below.

Table 4.157 Incremental BCR Calculation Result

Condition	Information	Value	Incremental BCR
Baseline	PV Benefits	Rp10.241.448	4.28
	PV Costs	Rp2.393.867	
UUIK	PV Benefits	Rp10.241.448	5.01
	PV Costs	Rp2.042.175	

(Source: Author's Document)

From the result acquired in Table 4.156 it is determined that the MSW-MSW method that will be more beneficial if implemented in Sidoarjo district is BPS 1 WTE plant. However, these result is only a relative best solution. Its range determined using further sensitivity analysis of BPS 1 sensitivity analysis parameter which is AP for baseline and UUIK condition. The result of it can be seen through Table 4.158 below.

Table 4.158 Incremental BCR Sensitivity Analysis Result

Baseline Condition			UUIK Condition		
AP Escalation Rate	Incremental BCR	Decision	AP Escalation Rate	Incremental BCR	Decision
30% (Bottom Line)	4.28	Select BPS 1	60% (Bottom Line)	5.01	Select BPS 1
70%	1,07	Select BPS 1	100%	1,11	Select BPS 1
71%	1,05	Select BPS 1	101%	1,09	Select BPS 1
72%	1,03	Select BPS 1	102%	1,07	Select BPS 1
73%	1,01	Select BPS 1	103%	1,05	Select BPS 1
74%	0,99	Select BPS 3	104%	1,03	Select BPS 1
75%	0,98	Select BPS 3	105%	1,02	Select BPS 1
76%	0,96	Select BPS 3	106%	0,99	Select BPS 3
77%	0,94	Select BPS 3	107%	0,98	Select BPS 3
78%	0,93	Select BPS 3	108%	0,96	Select BPS 3
79%	0,91	Select BPS 3	109%	0,95	Select BPS 3
80%	0,90	Select BPS 3	110%	0,93	Select BPS 3

(Source: Author's Document)

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CHAPTER 5

DATA ANALYSIS AND INTERPRETATION

In chapter 5, there will be an information about the steps that were done by the author in conducting data analysis and interpretation in this research. These analysis and interpretation were made according to the pre-determined objectives of this research with considering the result of data processing phase. It will include the analysis of selected BPS and sensitivity analysis of the selected BPS. It will be informed in detail through subchapters below.

5.1 Analysis of Selected Business Plan Scenario

As already mentioned in the earlier part of the report, BPS alternatives to be assessed in this research are BPS 1 with the implementation of WTE plant, BPS 2 with the implementation of integrated MSW recycling plant, and BPS 3 which are the combination of two previous BPS resulted to integrated WTE and MSW recycling plant. In determining the best BPS to be implemented in Sidoarjo district, there is also a need to consider the existing condition of MSW-MS in there. These value will be implied in several BCR calculation factors using DLHK of Sidoarjo district perspective. The method to do a selection of the best BPS to be implemented is made according to the BCR calculation result using DLHK of Sidoarjo district perspective. BPS with a value of BCR higher than 1 will be considered as potentially feasible to be tested and will undergo further process in sensitivity analysis. But, because this BPS is implemented using PPP scheme, which means that there is a private business sector included in here, there is a need to determine BPS scheme so that the implemented BPS can be beneficial for all parties included in it. For private business sector perspective, financial valuation parameters of NPV, IRR, payback period, and discounted payback period will be used to determine its feasibility to be implemented.

BPS 1 implements WTE plant approach to process MSW generated in Sidoarjo district per period into electricity. The initial outlay needed to implement this BPS consists of CAPEX needed to fund this BPS which calculated as much as Rp8.076.388.760.870 and the expected amount of NWC as much as

Rp104.300.293.626. For their annual cash flow, as BPS 1 is implemented using BOT-AP PPP scheme so that their main revenue stream comes from government funding not the output of their operation. AP rate that will be paid by government to BPS 1 business entity will be in form of an annuity rate that is calculated according their initial and routine CAPEX and their corresponding OPEX for each period during the planning horizon. But, the consequences of it is that their output which is electricity sales will be taken over by DLHK of Sidoarjo district. The positive points for DLHK of Sidoarjo district of the electricity sales is that it is regulated through Peraturan Presiden Nomor 18 Tahun 2016 that PT PLN as the only electricity distributor in Indonesia must buy all of the generated electricity from WTE plant at a given rate. Hence, it will have a stable revenue stream from their operation. And last their terminal cash flow will be acquired equal to the recapture of their NWC only as in the last period of the planning horizon their plant will be acquired by government. From there it is calculated that the NPV of BPS 1 business entity equal to (Rp1.565.773.189.507) with IRR rate of 6.65% and unidentifiable discounted payback period. It seems not feasible to be implemented for the private business sector at first, but it has a room for modification as according to UUK Nomor 2 Tahun 2017 private business sector included in a PPP scheme commonly need to be paid a certain value so that their return will reach about 2% from their cost of capital. As already have been calculated in subchapter 4.1.3.2, BPS 1 cost of capital is 8.43%, it means that the standard IRR according to UUK that BPS 1 business entity should get is about 10.43%. To achieve such condition government side, which is DLHK of Sidoarjo district, needs to consider to increase AP rate that are being paid periodically to BPS 1 business entity to a certain level so that the standard IRR requirement and UUK standard of IRR can be fulfilled. But, DLHK of Sidoarjo district need to make sure that their BCR is also feasible. BCR calculation in BPS 1 affected by several benefits factors which are earning gained from electricity sales, acquisition of WTE plant, avoided cost of TPA operational activities as the MSW will be burnt as RDF instead, avoided cost of potential landfill area usage if this BPS is not implemented, and carbon credit savings. Meanwhile, for costs factors included in it are expected cost of MSW-MS operational activities for temporarily unmanaged MSW due to WTE plant

processing capacity limitation, MSW sorting and transporting cost to TPA, and AP for BPS 1 business entity. From there it is calculated that in BPS 1 DLHK of Sidoarjo district BCR currently has the value of 1.64 at the rate of AP escalation equal to 0%, is considered feasible. This process will be done in sensitivity analysis.

BPS 2 implements integrated MSW recycling plant approach to process MSW generated in Sidoarjo district into electricity. Unlike BPS 1, BPS 2 has the limitation to process approximately only 20% of the total generated MSW per period as their process depend on whether the MSW have the value to be processed or not. The initial outlay needed to implement this BPS consists of CAPEX needed to fund this BPS which calculated as much as Rp98.094.578.846 and the expected amount of NWC as much as Rp68.988.655.107. For their annual cash flow, as BPS 2 is implemented using BOOT-AP PPP scheme their main revenue stream comes from their own sales of recycled goods. There are also another payment given by Indonesia government in form of tipping fee with the maximum rate of Rp500.000/per ton of processed MSW using green approach and AP annuity which calculated according to BPS 2 initial and routine CAPEX. Different than BOT scheme, BOOT scheme business entity will cover their own OPEX using their generated revenue from their operation. And last their terminal cash flow will be acquired equal to the recapture of their NWC only as in the last period of the planning horizon their plant will be acquired by government. From there it is calculated that the NPV of BPS 1 business entity equal to Rp 380.060.973.186 with IRR equal to 16.83% and discounted payback period less than 12 years. It is feasible to be implemented for the private business perspective. But there is still a need to determine feasibility from DLHK of Sidoarjo district perspective using BCR approach. Their BCR calculation benefits factors including avoided cost of TPA operating activities equal to their amount of recycled MSW and acquisition of integrated MSW recycling plant. Meanwhile, its costs including projected land acquisition cost need to be made to accommodate residual waste that cannot be recycled, projected TPA operational activities cost for the remaining residual MSW, MSW sorting and transporting cost, AP and tipping fee for BPS 2 business entity. BCR calculation for BPS 2 resulted to the amount of 0.001. Hence, it will

not be processed further in sensitivity analysis as it considered not feasible to be implemented from DLHK of Sidoarjo district perspective.

BPS 3 consists of two different private business entities that are collaborate together to construct and implement an integrated WTE and MSW recycling plant. Its concept is that the MSW with an economic value potential will be processed separately in a recycling plant. Meanwhile, the rest of MSW which considered as residual waste will be main raw material of RDF for electricity generating purpose. Business entity that managed the WTE plant is called as PT X; and the other one will be called as PT Y. The initial outlay needed by PT X to implement their operation consists of CAPEX needed to fund it which calculated as much as Rp8.058.824.717.259 and the expected amount of NWC as much as Rp104.300.293.626. For their annual cash flow, it is the same as BPS 1 as it is implemented using BOT-AP PPP scheme so that their main revenue stream also comes from government funding not the output of their operation. And last their terminal cash flow will be acquired equal to the recapture of their NWC only as in the last period of the planning horizon their plant will be acquired by government. From there it is calculated that the NPV of PT X equal to (Rp1.562.608.332.775) with IRR rate of 6.65% and unidentifiable discounted payback period. The same as BPS 1 in here DLHK of Sidoarjo district also needs to consider to increase AP rate that are being paid periodically to PT X to a certain level so that the standard IRR requirement and UUK standard of IRR can be fulfilled. Meanwhile, just like BPS 2, PT Y implements integrated MSW recycling plant approach to process MSW generated in Sidoarjo district into electricity. It also has the limitation to process approximately only 20% of the total generated MSW per period as their process depend on whether the MSW have the value to be processed or not. But the difference is that the unmanaged MSW will be PT X raw material. The initial outlay needed to implement this BPS consists of CAPEX needed to fund this BPS which calculated as much as Rp98.094.578.846 and the expected amount of NWC as much as Rp68.988.655.107. For their annual cash flow, as BPS 2, PT Y is implemented using BOOT-AP PPP scheme their main revenue stream comes from their own sales of recycled goods. There are also another revenue stream for PT Y in form of AP and tipping fee as well like in BPS 2. And last their terminal cash flow will be

acquired equal to the recapture of their NWC only as in the last period of the planning horizon their plant will be acquired by government. From there it is calculated that the NPV of PT Y equal to Rp 380.060.973.186 with IRR equal to 16.83% and discounted payback period less than 12 years. It is feasible to be implemented for the private business perspective. From DLHK of Sidoarjo district perspective the benefits of implementing BPS 3 are electricity sales from PT X, acquisition of both plant at the end of planning horizon period, avoided operational cost of TPA as the residual waste being burnt by PT X, avoided increase of potential landfill needed, and carbon credit savings. Meanwhile the costs are operational cost of TPA for temporarily remaining MSW because of PT X limited processing capacity, MSW transportation and sorting cost, AP for PT X and PT Y, and tipping fee for PT Y. It is resulted to a BCR value of 1.45 for DLHK of Sidoarjo. Hence, it will be considered as feasible to be implemented.

From the three alternatives of BPS available, BPS 1 and BPS 3 resulted to a feasible conclusion to be implemented in terms of DLHK of Sidoarjo district perspective. Moreover, there is still a plenty room of it to be modified, by means of settings several independent variables value in it so that the private business party included in the PPP scheme will also receive a proper rate of return according to UUIK. Hence, BPS 1 and BPS 3 are the selected BPS to be assessed further using sensitivity analysis approach.

5.2 Sensitivity Analysis of Selected Business Plan Scenario

Sensitivity analysis is done for both selected BPS which are BPS 1 and BPS 3. It is done to test the volatility of certain independent variables included in the financial model and feasibility study calculation. Volatility in here means that how reactive the decision making indicators will change if a certain independent variables in the financial model and feasibility study change. In this research, the independent variables that will be tested for both BPS is not fully similar. BPS 1 sensitivity analysis parameters is AP escalation level for its business entity. Meanwhile, BPS 3 sensitivity analysis parameters are AP for PT X and tipping fee for PT Y. Last, the decision making indicators in here that will be included in the sensitivity analysis is financial valuation parameters specifically for private

business entity which consists of NPV, IRR, payback period, and discounted payback period; and BCR parameter for DLHK of Sidoarjo district. And at the end of sensitivity analysis as can be seen in subchapter 4.2.4.3 there is an incremental analysis done to determine which alternatives is the best one to be implemented in Sidoarjo district.

BPS 1 sensitivity analysis parameters only used AP as it is the only revenue stream that BPS 1 gain and it is also implied as a cost in DLHK of Sidoarjo district perspective. Hence, it must significantly influence the value of financial valuation and BCR parameters BPS. Its sensitivity analysis result shows that the decrease of AP will significantly decrease BPS 1 business entity NPV and IRR and increase payback period and discounted payback period. Meanwhile, an increase of it will have the opposite impact. At the initial condition, which is 0% escalation rate of AP, BPS 1 business entity has an NPV amount of (Rp1.565.773.189.507) with IRR rate of 6.65%, payback period of less than 15 years and unidentifiable discounted payback period. When decreased by -100% the NPV falls onto (Rp9.081.721.704.059) as well as the IRR to -9.08%; and their payback period and discounted payback period is unidentifiable. Meanwhile, increased until 200% the NPV become Rp10.586.164.610.459 with the IRR of 19.70%; and the payback period less than 6 years, also discounted payback period less than 7 years. The feasible range bottom line for BPS 1 business entity lies in the escalation rate of 30% for standard condition, and 60% for UUIK condition. Meanwhile, its BCR implication shows that if the AP decreases the BCR will increase. The threshold of it is lies on AP escalation rate of 180%. Hence, the minimum feasibility points of BPS 1 lies in AP 30% for standard condition; 60% for UUIK condition.

BPS 3 sensitivity analysis uses two sensitivity analysis parameters, which are PT X AP and PT Y tipping fee. The same as BPS 1 PT X AP it positively influence the value of financial valuation parameters of PT X. At the normal condition of PT X AP escalation rate equal to 0%, it has the NPV of (Rp1.562.608.332.775) with IRR rate of 6.65%, less than 15 years payback period, and unidentifiable discounted payback period. At the extreme negative value of AP reduction by 100%, the value of PT X NPV is (Rp9.062.193.886.887) with the IRR of -9.08% and unidentifiable payback and discounted payback period. Meanwhile

at the extreme positive point, its value of NPV is Rp4.505.863.282.672 with IRR of 13.31%, less than 8 years payback period, and less than 13 years discounted payback period. The feasible range bottom line for PT X lies in the escalation rate of 30% for standard condition, and 60% for UUIK condition. Meanwhile, its BCR implication shows that if the AP decreases the BCR will increase but still feasible for all designated values included in sensitivity range. PT Y tipping fee also positively influence the value of financial valuation parameters of PT Y. At the maximum condition of PT Y AP tipping fee, which is Rp500.000/ton in 2020, the value of its NPV is Rp380.060.973.186 with the IRR of 16.83%, payback period less than 8 years, and less than 12 years discounted payback period. At the minimum condition of PT Y AP tipping fee, which is null, the value of its NPV is (Rp186.201.452.642) with the IRR of 2.96%, less than 39 years of payback period, and unidentifiable discounted payback period. The feasible range bottom line for PT Y lies in the tipping fee rate of Rp175.000 for standard condition, and Rp250.000 for UUIK condition. Its BCR implication shows that if the PT Y tipping fee decreases the BCR will increase but still feasible for all designated values included in sensitivity range. Meanwhile, the BCR value acquired from two way sensitivity analysis of it is not show any non-feasible point. From it can be seen that the feasibility range of all the parties in BPS 3 can be determined using the limitation of PT X and PT Y, which is the PT X AP must be higher than 30% for standard condition, and 60% for UUIK condition; and PT Y tipping fee must be higher than Rp175.000 for standard condition, and Rp250.000 for UUIK condition. From the acquired benefits and costs of these bottom line points of BPS 1 and BPS 3 incremental benefits and costs are calculated for baseline and UUIK condition resulted to the finding that the incremental BCR value of the baseline condition is 4.28 and for the UUIK condition is 5.01. It means that both of the condition resulted to the same conclusion which is BPS 1 is better or more beneficial to be implemented in Sidoarjo district. But this solution is only a relative best solution with a threshold of 73% of AP escalation rate for baseline condition and 105% for UUIK condition as can be seen in Table. 4.157. If the threshold is passed, then BPS 3 will be a more beneficial solution to be implemented for each condition.

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CHAPTER 6

CONCLUSION AND SUGGESTION

In chapter 6, there will be an information about conclusion and suggestion made by the author through this research. The conclusion will be made according to the predetermined research objectives. Meanwhile, the suggestion will be made for further development of this research.

6.1 Conclusion

The conclusions that can be made through this research are:

1. Business plan scenario alternative that will be proposed to be implemented in Sidoarjo district through this research including BPS 1 with the implementation of WTE plant, BPS 2 with the implementation of integrated MSW recycling plant, and BPS 3 which are the combination of two previous BPS resulted to integrated WTE and MSW recycling plant.
2. Feasibility study of each BPS results at the initial unadjusted condition show that BPS 1 has NPV amount of (Rp1.565.773.189.507) with IRR rate of 6.65%, payback period less than 15 years, and unidentifiable discounted payback period with BCR value of 1.64; BPS 2 amount of NPV is Rp380.060.973.186 with IRR equal to 16.83%, payback period less than 8 years, land discounted payback period less than 12 years with BCR value of 0.001; BPS 3 amount of NPV is (Rp1.562.608.332.775) with IRR rate of 6.65%, less than 15 years payback period, and unidentifiable discounted payback period for PT X; and NPV is Rp380.060.973.186 with the IRR of 16.83%, payback period less than 8 years, and less than 12 years discounted payback period with a BCR value of 1.45. Hence, BPS 1 and BPS 3 are the alternatives considered feasible in DLHK of Sidoarjo district perspective in this research.
3. Sensitivity analysis results for BPS 1 show that the minimum threshold point for baseline condition lies on AP escalation rate of 30%; and 60%

for the UUIJK condition. Meanwhile, for BPS 3 the minimum threshold point for baseline condition lies on PT X AP escalation rate of 30% and PT Y tipping fee of Rp 175.000; and PT X AP escalation rate of 60% and PT Y tipping fee of Rp 250.000 for UUIJK condition. All of these condition already accommodate feasibility for public and private parties included in the PPP scheme. From there, incremental BCR analysis is performed between defender (BPS 3) and challenger (BPS 1) which resulted to the incremental BCR value of 4.28 for baseline condition and 5.01 for UUIJK condition. Hence, it can be concluded that from this research it is found out that BPS 1 which is WTE plant is the most beneficial MSW-MS method to be implemented in Sidoarjo district at the feasibility threshold for BPS 1 AP escalation rate until 73% for baseline condition and 105% for UUIJK condition.

6.2 Suggestion

The suggestions should be done for further development of this research are:

1. There is a need of a more detailed study for plant, machine, and equipment calculation and implementation which should be adjusted to the type of production line that the plant implements.
2. There is a need of a more detailed study according to Life Cycle Assessment related to conversion ratio related to MSW and its processing.
3. There is a need of further environmental impact, risk, and mitigation complementary study about MSW-MS alternative before it can be implemented.

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Attachment 1: Business Plan Scenario 1 – WTE Plant Detailed Information

BPS 1 – Recapitulation of Assets Requirement per Year (2026-2035)

No	Tangible Assets	Units	Units Needed									
			2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Incinerator Construction + Freight + Installation	Plant	2	2	2	2	2	2	2	2	2	2
2	Land Acquisition Fee	m2	68.807	70.789	72.334	71.093	69.287	69.410	69.533	69.656	69.779	69.902
3	Supporting and Office Facilities Construction	m2	8.807	10.789	12.334	11.093	9.287	9.410	9.533	9.656	9.779	9.902
4	Office Equipment	Workers Equivalent Unit	81	96	112	100	83	84	85	86	87	88
5	Operational and Safety Equipment	Workers Equivalent Unit	81	96	112	100	83	84	85	86	87	88
6	Supporting Equipment	Workers Equivalent Unit	81	96	112	100	83	84	85	86	87	88
7	Bulldozer	Unit	4	4	5	5	5	5	5	5	5	5
8	Excavator	Unit	6	7	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 1 – Recapitulation of Assets Requirement per Year (2036-2045)

No	Tangible Assets	Units	Units Needed									
			2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Incinerator Construction + Freight + Installation	Plant	2	2	2	2	2	2	2	2	2	2
2	Land Acquisition Fee	m2	70.025	70.148	70.271	70.394	70.517	70.640	70.763	70.886	71.009	71.132
3	Supporting and Office Facilities Construction	m2	10.025	10.148	10.271	10.394	10.517	10.640	10.763	10.886	11.009	11.132
4	Office Equipment	Workers Equivalent Unit	90	91	92	93	94	96	97	98	99	100
5	Operational and Safety Equipment	Workers Equivalent Unit	90	91	92	93	94	96	97	98	99	100
6	Supporting Equipment	Workers Equivalent Unit	90	91	92	93	94	96	97	98	99	100
7	Bulldozer	Unit	5	5	5	5	5	5	5	5	5	5
8	Excavator	Unit	8	8	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 1 – Recapitulation of Assets Requirement per Year (2046-2055)

No	Tangible Assets	Units	Units Needed									
			2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
1	Incinerator Construction + Freight + Installation	Plant	2	2	2	2	2	3	3	3	3	3
2	Land Acquisition Fee	m2	71.255	71.378	71.501	71.624	71.747	72.342	72.465	72.588	72.711	72.834
3	Supporting and Office Facilities Construction	m2	11.255	11.378	11.501	11.624	11.747	12.342	12.465	12.588	12.711	12.834
4	Office Equipment	Workers Equivalent Unit	101	103	104	105	106	107	109	110	111	112
5	Operational and Safety Equipment	Workers Equivalent Unit	101	103	104	105	106	107	109	110	111	112
6	Supporting Equipment	Workers Equivalent Unit	101	103	104	105	106	107	109	110	111	112
7	Bulldozer	Unit	5	5	5	5	5	5	5	5	5	5
8	Excavator	Unit	8	8	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 1 – Recapitulation of Assets Requirement per Year (2056-2065)

No	Tangible Assets	Units	Units Needed									
			2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
1	Incinerator Construction + Freight + Installation	Plant	3	3	3	3	3	3	3	3	3	3
2	Land Acquisition Fee	m2	72.957	73.080	73.203	73.326	73.449	73.572	73.695	73.818	73.959	74.082
3	Supporting and Office Facilities Construction	m2	12.957	13.080	13.203	13.326	13.449	13.572	13.695	13.818	13.959	14.082
4	Office Equipment	Workers Equivalent Unit	114	115	117	118	119	120	121	123	124	125
5	Operational and Safety Equipment	Workers Equivalent Unit	114	115	117	118	119	120	121	123	124	125
6	Supporting Equipment	Workers Equivalent Unit	114	115	117	118	119	120	121	123	124	125
7	Bulldozer	Unit	5	5	5	5	5	5	5	5	5	5
8	Excavator	Unit	8	8	8	8	8	8	8	8	9	9
No	Intangible Assets	Units	Units Needed									
			2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 1 – Recapitulation of Assets Requirement per Year (2066-2075)

No	Tangible Assets	Units	Units Needed									
			2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
1	Incinerator Construction + Freight + Installation	Plant	3	3	3	3	3	3	3	3	3	3

No	Tangible Assets	Units	Units Needed									
			2066	2057	2058	2059	2060	2061	2072	2073	2074	2075
2	Land Acquisition Fee	m2	74.205	74.328	74.452	74.609	74.732	74.855	74.978	75.101	75.224	75.347
3	Supporting and Office Facilities Construction	m2	14.205	14.328	14.452	14.609	14.732	14.855	14.978	15.101	15.224	15.347
4	Office Equipment	Workers Equivalent Unit	127	128	129	131	132	133	134	136	137	138
5	Operational and Safety Equipment	Workers Equivalent Unit	127	128	129	131	132	133	134	136	137	138
6	Supporting Equipment	Workers Equivalent Unit	127	128	129	131	132	133	134	136	137	138
7	Bulldozer	Unit	5	5	5	6	6	6	6	6	6	6
8	Excavator	Unit	9	9	9	9	9	9	9	9	9	9
No	Intangible Assets	Units	Units Needed									
			2066	2057	2058	2059	2060	2061	2072	2073	2074	2075
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 1 – Initial and Routine CAPEX Calculation Recapitulation (2025-2032)

No	Tangible Assets	Initial CAPEX	Routine CAPEX						
		2025	2026	2027	2028	2029	2030	2031	2032
1	Incinerator Construction + Freight + Installation	Rp 6.227.421.249.097	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp 174.695.039.397	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp80.059.838.583	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp692.600.000	Rp-	Rp-	Rp405.303.372	Rp-	Rp-	Rp442.885.937	Rp-
5	Operational and Safety Equipment	Rp122.080.000	Rp-	Rp-	Rp117.927.098	Rp-	Rp-	Rp128.862.124	Rp4.132.376
6	Supporting Equipment	Rp72.520.000	Rp-	Rp-	Rp-	Rp-	Rp29.944.049	Rp-	Rp-
7	Bulldozer	Rp3.863.720.000	Rp-	Rp-	Rp1.055.497.791	Rp-	Rp-	Rp-	Rp-
8	Excavator	Rp6.471.720.000	Rp-	Rp1.144.307.958	Rp1.178.637.197	Rp-	Rp-	Rp-	Rp-
No	Intangible Assets	Initial CAPEX	Routine CAPEX						
		2025	2026	2027	2028	2029	2030	2031	2032
1	Legal Document	Rp1.330.108.585	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-

BPS 1 – Initial and Routine CAPEX Calculation Recapitulation (2033-2040)

No	Tangible Assets	Routine CAPEX							
		2033	2034	2035	2036	2037	2038	2039	2040
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp-	Rp483.953.422	Rp-	Rp-	Rp528.828.971	Rp-	Rp-	Rp1.079.048.233
5	Operational and Safety Equipment	Rp-	Rp140.811.122	Rp14.514.297	Rp-	Rp153.868.115	Rp-	Rp5.082.301	Rp168.135.844

No	Tangible Assets	Routine CAPEX							
		2033	2034	2035	2036	2037	2038	2039	2040
6	Supporting Equipment	Rp-	Rp-	Rp95.565.894	Rp-	Rp-	Rp-	Rp-	Rp42.439.032
7	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp6.019.549.867
8	Excavator	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp10.082.728.889
No	Intangible Assets	Routine CAPEX							
		2033	2034	2035	2036	2037	2038	2039	2040
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 1 – Initial and Routine CAPEX Calculation Recapitulation (2041-2048)

No	Tangible Assets	Routine CAPEX							
		2041	2042	2043	2044	2045	2046	2047	2048
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp-	Rp-	Rp631.449.447	Rp-	Rp-	Rp690.001.860	Rp-	Rp-
5	Operational and Safety Equipment	Rp-	Rp-	Rp183.726.576	Rp-	Rp19.506.001	Rp207.013.580	Rp-	Rp-
6	Supporting Equipment	Rp-	Rp-	Rp-	Rp-	Rp128.432.570	Rp-	Rp-	Rp-
7	Bulldozer	Rp-	Rp-	Rp1.644.431.167	Rp-	Rp-	Rp-	Rp-	Rp-
8	Excavator	Rp-	Rp1.782.794.513	Rp1.836.278.349	Rp-	Rp-	Rp-	Rp-	Rp-
No	Intangible Assets	Routine CAPEX							
		2041	2042	2043	2044	2045	2046	2047	2048
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 1 – Initial and Routine CAPEX Calculation Recapitulation (2049-2056)

No	Tangible Assets	Routine CAPEX								
		2049	2050	2051	2052	2053	2054	2055	2056	2057
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp753.983.662	Rp-	Rp-	Rp823.898.305	Rp-	Rp-	Rp1.681.121.988	Rp-	Rp-
5	Operational and Safety Equipment	Rp219.379.140	Rp-	Rp-	Rp239.721.509	Rp7.687.437	Rp-	Rp288.164.601	Rp-	Rp-
6	Supporting Equipment	Rp-	Rp54.082.284	Rp-	Rp-	Rp-	Rp-	Rp176.025.074	Rp-	Rp-
7	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp9.378.262.555	Rp-	Rp-
8	Excavator	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp15.708.563.080	Rp-	Rp2.777.535.762
No	Intangible Assets	Routine CAPEX								
		2049	2050	2051	2052	2053	2054	2055	2056	2057

No	Tangible Assets	Routine CAPEX								
		2049	2050	2051	2052	2053	2054	2055	2056	2057
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 1 – Initial and Routine CAPEX Calculation Recapitulation (2058-2066)

No	Tangible Assets	Routine CAPEX								
		2058	2059	2060	2061	2062	2063	2064	2065	2066
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp983.777.663	Rp-	Rp-	Rp1.075.000.415	Rp-	Rp-	Rp1.174.681.978	Rp-	Rp-
5	Operational and Safety Equipment	Rp286.240.019	Rp-	Rp9.454.578	Rp312.782.197	Rp-	Rp-	Rp341.785.552	Rp35.230.008	Rp-
6	Supporting Equipment	Rp-	Rp-	Rp72.682.067	Rp-	Rp-	Rp-	Rp231.963.507	Rp-	Rp-
7	Bulldozer	Rp2.561.970.177	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
8	Excavator	Rp2.860.861.835	Rp-	Rp-	Rp-	Rp-	Rp-	Rp3.416.018.644	Rp-	Rp-
No	Intangible Assets	Routine CAPEX								
		2058	2059	2060	2061	2062	2063	2064	2065	2066
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 1 – Initial and Routine CAPEX Calculation Recapitulation (2067-2075)

No	Tangible Assets	Routine CAPEX								
		2067	2068	2069	2070	2071	2072	2073	2074	2075
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp1.283.606.714	Rp-	Rp-	Rp2.619.133.280	Rp-	Rp-	Rp1.532.693.545	Rp-	Rp-
5	Operational and Safety Equipment	Rp385.106.239	Rp-	Rp-	Rp408.109.823	Rp-	Rp-	Rp445.952.623	Rp14.300.897	Rp47.346.185
6	Supporting Equipment	Rp-	Rp-	Rp-	Rp103.010.671	Rp-	Rp-	Rp-	Rp-	Rp311.739.557
7	Bulldozer	Rp-	Rp-	Rp3.546.365.894	Rp14.611.027.485	Rp-	Rp-	Rp3.991.466.058	Rp-	Rp-
8	Excavator	Rp-	Rp-	Rp-	Rp24.473.429.440	Rp-	Rp4.327.310.216	Rp4.457.129.522	Rp-	Rp-
No	Intangible Assets	Routine CAPEX								
		2067	2068	2069	2070	2071	2072	2073	2074	2075
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 1 – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2025-2035)

Expenses	Initial CAPEX		Routine CAPEX								
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Freight Expense	Rp541.816.600	Rp-	Rp46.422.902	Rp171.388.951	Rp-	Rp3.069.265	Rp58.604.176	Rp423.569	Rp-	Rp64.038.366	Rp11.283.220
Total CAPEX	Rp6.495.270.692.262	Rp-	Rp1.190.730.860	Rp2.928.754.409	Rp-	Rp33.013.314	Rp630.352.237	Rp4.555.945	Rp-	Rp688.802.909	Rp121.363.410

BPS 1 – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2036-2045)

Expenses	Routine CAPEX									
	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Freight Expense	Rp-	Rp69.976.451	Rp-	Rp520.936	Rp940.111.585	Rp-	Rp72.325.369	Rp267.018.402	Rp-	Rp15.163.704
Total CAPEX	Rp-	Rp752.673.537	Rp-	Rp5.603.237	Rp18.332.013.450	Rp-	Rp1.855.119.882	Rp4.562.903.940	Rp-	Rp163.102.275

BPS 1 – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2046-2055)

Expenses	Routine CAPEX									
	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Freight Expense	Rp91.944.083	Rp-	Rp-	Rp99.769.687	Rp5.543.434	Rp-	Rp109.021.031	Rp787.962	Rp-	Rp1.478.615.607
Total CAPEX	Rp988.959.522	Rp-	Rp-	Rp1.073.132.489	Rp59.625.718	Rp-	Rp1.172.640.846	Rp8.475.399	Rp-	Rp28.710.752.905

BPS 1 – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2056-2065)

Expenses	Routine CAPEX									
	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Freight Expense	Rp-	Rp112.680.568	Rp416.005.969	Rp-	Rp8.419.006	Rp142.247.718	Rp-	Rp-	Rp294.020.808	Rp27.387.335
Total CAPEX	Rp-	Rp2.890.216.330	Rp7.108.855.663	Rp-	Rp90.555.651	Rp1.530.030.330	Rp-	Rp-	Rp5.226.506.982	Rp294.580.851

BPS 1 – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2066-2075)

Expenses	Routine CAPEX									
	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Freight Expense	Rp-	Rp171.043.078	Rp-	Rp234.998.853	Rp2.281.897.568	Rp-	Rp175.552.654	Rp648.123.746	Rp1.465.842	Rp36.806.289
Total CAPEX	Rp-	Rp1.839.756.031	Rp-	Rp3.781.364.748	Rp44.496.608.268	Rp-	Rp4.502.862.869	Rp11.075.365.493	Rp15.766.739	Rp395.892.031

BPS 1 – Total OPEX/Year (in IDR, million) (2026-2035)

Process	OPEX Sources	in million									
		2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Operating Expense - General	Communication Expense	Rp14	Rp15	Rp15	Rp16	Rp16	Rp17	Rp17	Rp18	Rp18	Rp19
	General and Administrative Expense	Rp52.823	Rp64.841	Rp77.998	Rp71.518	Rp60.431	Rp63.172	Rp66.023	Rp68.988	Rp72.072	Rp75.278
	Maintenance Expense	Rp46.214	Rp56.729	Rp68.240	Rp62.571	Rp52.870	Rp55.268	Rp57.763	Rp60.357	Rp63.055	Rp65.860
	Indirect Labor Expense	Rp18.906	Rp23.208	Rp27.917	Rp25.598	Rp21.629	Rp22.610	Rp23.631	Rp24.692	Rp25.796	Rp26.944
	Risk Management Expense	Rp9.749	Rp11.967	Rp14.395	Rp13.199	Rp11.153	Rp11.659	Rp12.185	Rp12.732	Rp13.301	Rp13.893
Cost of Operation	Direct Material										
	Sodium Bicarbonate	Rp74.338	Rp91.882	Rp110.411	Rp100.219	Rp82.965	Rp86.874	Rp90.944	Rp95.180	Rp99.588	Rp104.175
	Ammonia	Rp29.840	Rp36.882	Rp44.320	Rp40.228	Rp33.303	Rp34.872	Rp36.506	Rp38.206	Rp39.975	Rp41.817
	Active Carbon	Rp84.816	Rp104.832	Rp125.973	Rp114.344	Rp94.658	Rp99.119	Rp103.763	Rp108.596	Rp113.625	Rp118.858
	Water	Rp246	Rp304	Rp366	Rp332	Rp275	Rp288	Rp301	Rp315	Rp330	Rp345
	Direct Labor	Rp75.626	Rp92.832	Rp111.669	Rp102.391	Rp86.517	Rp90.441	Rp94.523	Rp98.769	Rp103.184	Rp107.775
	Overhead										
	Transportation Expense										
	Bulldozer Fuel Expense	Rp7.118	Rp7.331	Rp9.439	Rp9.722	Rp10.014	Rp10.314	Rp10.624	Rp10.943	Rp11.271	Rp11.609
	Excavator Fuel Expense	Rp10.169	Rp12.220	Rp14.385	Rp14.816	Rp15.261	Rp15.719	Rp16.190	Rp16.676	Rp17.176	Rp17.692
	Waste Management Expense										
	Fly Ash Management Expense	Rp5.339	Rp6.599	Rp7.930	Rp7.198	Rp5.959	Rp6.240	Rp6.532	Rp6.836	Rp7.153	Rp7.482
Bottom Ash Management Expense	Rp2.002	Rp2.475	Rp2.974	Rp2.699	Rp2.235	Rp2.340	Rp2.449	Rp2.564	Rp2.682	Rp2.806	
Total OPEX/Year		Rp417.201	Rp512.116	Rp616.033	Rp564.852	Rp477.285	Rp498.933	Rp521.451	Rp544.870	Rp569.226	Rp594.552

BPS 1 – Total OPEX/Year (in IDR, million) (2036-2045)

Process	OPEX Sources	in million									
		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Operating Expense - General	Communication Expense	Rp19	Rp20	Rp20	Rp21	Rp22	Rp22	Rp23	Rp24	Rp24	Rp25
	General and Administrative Expense	Rp78.612	Rp82.079	Rp85.683	Rp89.429	Rp93.322	Rp97.369	Rp101.575	Rp105.945	Rp110.487	Rp115.205
	Maintenance Expense	Rp68.777	Rp71.810	Rp74.963	Rp78.241	Rp81.647	Rp85.188	Rp88.867	Rp92.691	Rp96.664	Rp100.792
	Indirect Labor Expense	Rp28.137	Rp29.378	Rp30.668	Rp32.008	Rp33.402	Rp34.851	Rp36.356	Rp37.920	Rp39.546	Rp41.234
	Risk Management Expense	Rp14.509	Rp15.148	Rp15.813	Rp16.505	Rp17.223	Rp17.970	Rp18.746	Rp19.553	Rp20.391	Rp21.262
Cost of Operation	Direct Material										
	Sodium Bicarbonate	Rp108.948	Rp113.913	Rp119.078	Rp124.450	Rp130.037	Rp135.848	Rp141.891	Rp148.173	Rp154.705	Rp161.496
	Ammonia	Rp43.732	Rp45.725	Rp47.799	Rp49.955	Rp52.198	Rp54.530	Rp56.956	Rp59.478	Rp62.100	Rp64.825
	Active Carbon	Rp124.304	Rp129.969	Rp135.861	Rp141.991	Rp148.366	Rp154.996	Rp161.890	Rp169.058	Rp176.511	Rp184.258
	Water	Rp361	Rp377	Rp394	Rp412	Rp431	Rp450	Rp470	Rp491	Rp512	Rp535

Process	OPEX Sources	in million									
		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
	Direct Labor	Rp12.548	Rp17.511	Rp22.671	Rp128.034	Rp133.609	Rp139.402	Rp145.424	Rp151.681	Rp158.183	Rp164.938
	Overhead										
	Transportation Expense										
	Bulldozer Fuel Expense	Rp11.957	Rp12.316	Rp12.686	Rp13.066	Rp13.458	Rp13.862	Rp14.278	Rp14.706	Rp15.147	Rp15.602
	Excavator Fuel Expense	Rp18.222	Rp18.769	Rp19.332	Rp19.912	Rp20.509	Rp21.125	Rp21.758	Rp22.411	Rp23.084	Rp23.776
	Waste Management Expense										
	Fly Ash Management Expense	Rp7.825	Rp8.181	Rp8.552	Rp8.938	Rp9.340	Rp9.757	Rp10.191	Rp10.642	Rp11.111	Rp11.599
	Bottom Ash Management Expense	Rp2.934	Rp3.068	Rp3.207	Rp3.352	Rp3.502	Rp3.659	Rp3.822	Rp3.991	Rp4.167	Rp4.350
	Total OPEX/Year	Rp620.886	Rp648.264	Rp676.727	Rp706.314	Rp737.067	Rp769.029	Rp802.246	Rp836.764	Rp872.631	Rp909.897

BPS 1 – Total OPEX/Year (in IDR, million) (2046-2054)

Process	OPEX Sources	in million									
		2046	2047	2048	2049	2050	2051	2052	2053	2054	
Operating Expense - General	Communication Expense	Rp26	Rp27	Rp27	Rp28	Rp29	Rp30	Rp31	Rp32	Rp33	
	General and Administrative Expense	Rp120.107	Rp125.200	Rp130.489	Rp135.984	Rp141.691	Rp147.618	Rp153.773	Rp160.164	Rp166.801	
	Maintenance Expense	Rp105.081	Rp109.537	Rp114.165	Rp118.972	Rp123.965	Rp129.150	Rp134.535	Rp140.127	Rp145.934	
	Indirect Labor Expense	Rp42.989	Rp44.812	Rp46.705	Rp48.672	Rp50.714	Rp52.836	Rp55.039	Rp57.326	Rp59.702	
	Risk Management Expense	Rp22.167	Rp23.107	Rp24.083	Rp25.097	Rp26.150	Rp27.244	Rp28.380	Rp29.560	Rp30.785	
Cost of Operation	Direct Material										
	Sodium Bicarbonate	Rp168.554	Rp175.891	Rp183.516	Rp191.441	Rp199.676	Rp208.232	Rp217.123	Rp226.359	Rp235.954	
	Ammonia	Rp67.659	Rp70.604	Rp73.665	Rp76.846	Rp80.151	Rp83.586	Rp87.154	Rp90.862	Rp94.713	
	Active Carbon	Rp192.312	Rp200.683	Rp209.383	Rp218.424	Rp227.820	Rp237.582	Rp247.726	Rp258.264	Rp269.211	
	Water	Rp558	Rp582	Rp608	Rp634	Rp661	Rp690	Rp719	Rp750	Rp781	
	Direct Labor	Rp171.956	Rp179.247	Rp186.821	Rp194.687	Rp202.858	Rp211.343	Rp220.155	Rp229.306	Rp238.807	
	Overhead										
	Transportation Expense										
	Bulldozer Fuel Expense	Rp16.070	Rp16.552	Rp17.048	Rp17.560	Rp18.087	Rp18.629	Rp19.188	Rp19.764	Rp20.357	
	Excavator Fuel Expense	Rp24.489	Rp25.224	Rp25.981	Rp26.760	Rp27.563	Rp28.390	Rp29.242	Rp30.119	Rp31.022	
	Waste Management Expense										
Fly Ash Management Expense	Rp12.106	Rp12.633	Rp13.181	Rp13.750	Rp14.341	Rp14.956	Rp15.594	Rp16.258	Rp16.947		
Bottom Ash Management Expense	Rp4.540	Rp4.737	Rp4.943	Rp5.156	Rp5.378	Rp5.608	Rp5.848	Rp6.097	Rp6.355		
	Total OPEX/Year	Rp948.613	Rp988.834	Rp1.030.614	Rp1.074.010	Rp1.119.083	Rp1.165.894	Rp1.214.507	Rp1.264.986	Rp1.317.402	

BPS 1 – Total OPEX/Year (in IDR, million) (2055-2063)

Process	OPEX Sources	in million								
		2055	2056	2057	2058	2059	2060	2061	2062	2063
Operating Expense - General	Communication Expense	Rp34	Rp35	Rp36	Rp37	Rp38	Rp39	Rp40	Rp41	Rp43
	General and Administrative Expense	Rp173.691	Rp180.845	Rp188.272	Rp195.981	Rp203.984	Rp212.291	Rp220.912	Rp229.859	Rp239.145
	Maintenance Expense	Rp151.962	Rp158.221	Rp164.719	Rp171.464	Rp178.466	Rp185.733	Rp193.276	Rp201.104	Rp209.228
	Indirect Labor Expense	Rp62.168	Rp64.729	Rp67.387	Rp70.146	Rp73.011	Rp75.984	Rp79.070	Rp82.272	Rp85.596
	Risk Management Expense	Rp32.056	Rp33.377	Rp34.747	Rp36.170	Rp37.647	Rp39.180	Rp40.771	Rp42.423	Rp44.136
Cost of Operation	Direct Material									
	Sodium Bicarbonate	Rp245.921	Rp256.274	Rp267.026	Rp278.194	Rp289.790	Rp301.833	Rp314.337	Rp327.319	Rp340.798
	Ammonia	Rp98.714	Rp102.870	Rp107.186	Rp111.669	Rp116.324	Rp121.158	Rp126.177	Rp131.388	Rp136.798
	Active Carbon	Rp280.583	Rp292.395	Rp304.663	Rp317.405	Rp330.636	Rp344.375	Rp358.642	Rp373.454	Rp388.833
	Water	Rp814	Rp849	Rp884	Rp921	Rp960	Rp1.000	Rp1.041	Rp1.084	Rp1.129
	Direct Labor	Rp248.673	Rp258.915	Rp269.548	Rp280.586	Rp292.043	Rp303.936	Rp316.279	Rp329.089	Rp342.383
	Overhead									
	Transportation Expense									
	Bulldozer Fuel Expense	Rp20.967	Rp21.596	Rp22.244	Rp22.911	Rp23.599	Rp24.307	Rp25.036	Rp25.787	Rp26.561
	Excavator Fuel Expense	Rp31.953	Rp32.912	Rp33.899	Rp34.916	Rp35.963	Rp37.042	Rp38.154	Rp39.298	Rp40.477
	Waste Management Expense									
	Fly Ash Management Expense	Rp17.663	Rp18.406	Rp19.179	Rp19.981	Rp20.813	Rp21.678	Rp22.576	Rp23.509	Rp24.477
Bottom Ash Management Expense	Rp6.624	Rp6.902	Rp7.192	Rp7.493	Rp7.805	Rp8.129	Rp8.466	Rp8.816	Rp9.179	
Total OPEX/Year	Rp1.371.824	Rp1.428.325	Rp1.486.982	Rp1.547.873	Rp1.611.079	Rp1.676.684	Rp1.744.776	Rp1.815.444	Rp1.888.782	

BPS 1 – Total OPEX/Year (in IDR, million) (2064-2069)

Process	OPEX Sources	in million					
		2064	2065	2066	2067	2068	2069
Operating Expense - General	Communication Expense	Rp44	Rp45	Rp47	Rp48	Rp50	Rp51
	General and Administrative Expense	Rp250.068	Rp260.105	Rp270.520	Rp281.325	Rp292.535	Rp305.731
	Maintenance Expense	Rp218.785	Rp227.566	Rp236.678	Rp246.132	Rp255.940	Rp267.485
	Indirect Labor Expense	Rp89.505	Rp93.098	Rp96.826	Rp100.693	Rp104.706	Rp109.429
	Risk Management Expense	Rp46.152	Rp48.005	Rp49.927	Rp51.921	Rp53.990	Rp56.426
Cost of Operation	Direct Material						
	Sodium Bicarbonate	Rp354.790	Rp369.316	Rp384.394	Rp400.044	Rp416.287	Rp433.145
	Ammonia	Rp142.415	Rp148.246	Rp154.298	Rp160.580	Rp167.100	Rp173.867
	Active Carbon	Rp404.798	Rp421.371	Rp438.574	Rp456.429	Rp474.962	Rp494.196
	Water	Rp1.175	Rp1.223	Rp1.273	Rp1.325	Rp1.379	Rp1.434
Direct Labor	Rp358.022	Rp372.392	Rp387.303	Rp402.773	Rp418.823	Rp437.716	

Process	OPEX Sources	in million					
		2064	2065	2066	2067	2068	2069
	Overhead						
	Transportation Expense						
	Bulldozer Fuel Expense	Rp27.357	Rp28.178	Rp29.024	Rp29.894	Rp30.791	Rp38.058
	Excavator Fuel Expense	Rp46.903	Rp48.310	Rp49.759	Rp51.252	Rp52.790	Rp54.373
	Waste Management Expense						
	Fly Ash Management Expense	Rp25.482	Rp26.525	Rp27.608	Rp28.732	Rp29.899	Rp31.110
	Bottom Ash Management Expense	Rp9.556	Rp9.947	Rp10.353	Rp10.775	Rp11.212	Rp11.666
	Total OPEX/Year	Rp1.975.052	Rp2.054.328	Rp2.136.583	Rp2.221.924	Rp2.310.462	Rp2.414.686

BPS 1 – Total OPEX/Year (in IDR, million) (2070-2075)

Process	OPEX Sources	in million					
		2070	2071	2072	2073	2074	2075
Operating Expense - General	Communication Expense	Rp53	Rp54	Rp56	Rp57	Rp59	Rp61
	General and Administrative Expense	Rp317.843	Rp330.405	Rp343.435	Rp356.950	Rp370.967	Rp385.503
	Maintenance Expense	Rp278.081	Rp289.072	Rp300.472	Rp312.297	Rp324.560	Rp337.278
	Indirect Labor Expense	Rp113.764	Rp118.260	Rp122.924	Rp127.761	Rp132.778	Rp137.981
	Risk Management Expense	Rp58.661	Rp60.979	Rp63.384	Rp65.879	Rp68.466	Rp71.148
Cost of Operation	Direct Material						
	Sodium Bicarbonate	Rp450.639	Rp468.793	Rp487.631	Rp507.178	Rp527.458	Rp548.499
	Ammonia	Rp180.889	Rp188.177	Rp195.738	Rp203.584	Rp211.725	Rp220.171
	Active Carbon	Rp514.156	Rp534.869	Rp556.362	Rp578.664	Rp601.803	Rp625.809
	Water	Rp1.492	Rp1.552	Rp1.615	Rp1.680	Rp1.747	Rp1.816
	Direct Labor	Rp455.055	Rp473.041	Rp491.697	Rp511.046	Rp531.114	Rp551.925
	Overhead						
	Transportation Expense						
	Bulldozer Fuel Expense	Rp39.200	Rp40.376	Rp41.587	Rp42.834	Rp44.119	Rp45.443
	Excavator Fuel Expense	Rp56.004	Rp57.685	Rp59.415	Rp61.198	Rp63.033	Rp64.924
	Waste Management Expense						
	Fly Ash Management Expense	Rp32.366	Rp33.670	Rp35.023	Rp36.427	Rp37.883	Rp39.395
	Bottom Ash Management Expense	Rp12.137	Rp12.626	Rp13.134	Rp13.660	Rp14.206	Rp14.773
Total OPEX/Year	Rp2.510.340	Rp2.609.560	Rp2.712.474	Rp2.819.214	Rp2.929.918	Rp3.044.726	

BPS 1 – Expected Manageable MSW and Electricity Output (2026-2035)

Information	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
WTE Plant Capacity	1.500	1.800	2.100	2.400	2.700	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	1.388	1.413	1.438	1.463	1.487	1.512	1.537	1.562	1.586	1.611
MSW from TPA – BPS 1 (ton/day)	112	387	662	388	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	7.165	8.598	10.031	8.840	7.105	7.223	7.341	7.459	7.577	7.695
Manageable MSW – BPS 1 (ton/year)	465.000	558.000	651.000	573.694	461.091	468.758	476.425	484.092	491.760	499.427
Manageable MSW – BPS 1 (m ³ /year)	2.221.072	2.665.287	3.109.501	2.740.249	2.202.402	2.239.024	2.275.646	2.312.268	2.348.890	2.385.511
Expected Electricity Output/Year (kWh)	7.905.000	9.486.000	11.067.000	9.752.796	7.838.550	7.968.891	8.099.231	8.229.572	8.359.913	8.490.253

BPS 1 – Expected Manageable MSW and Electricity Output (2036-2045)

Information	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	1.636	1.661	1.685	1.710	1.735	1.759	1.784	1.809	1.834	1.858
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	7.813	7.931	8.050	8.168	8.286	8.404	8.522	8.640	8.758	8.877
Manageable MSW – BPS 1 (ton/year)	507.094	514.761	522.428	530.095	537.762	545.429	553.096	560.763	568.430	576.098
Manageable MSW – BPS 1 (m ³ /year)	2.422.133	2.458.755	2.495.377	2.531.999	2.568.621	2.605.243	2.641.864	2.678.486	2.715.108	2.751.730
Expected Electricity Output/Year (kWh)	8.620.594	8.750.934	8.881.275	9.011.615	9.141.956	9.272.297	9.402.637	9.532.978	9.663.318	9.793.659

BPS 1 – Expected Manageable MSW and Electricity Output (2046-2055)

Information	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	1.883	1.908	1.933	1.957	1.982	2.007	2.032	2.056	2.081	2.106
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	8.995	9.113	9.231	9.349	9.467	9.585	9.703	9.822	9.940	10.058
Manageable MSW – BPS 1 (ton/year)	583.765	591.432	599.099	606.766	614.433	622.100	629.767	637.434	645.101	652.768
Manageable MSW – BPS 1 (m ³ /year)	2.788.352	2.824.974	2.861.596	2.898.217	2.934.839	2.971.461	3.008.083	3.044.705	3.081.327	3.117.949
Expected Electricity Output/Year (kWh)	9.923.999	10.054.340	10.184.680	10.315.021	10.445.362	10.575.702	10.706.043	10.836.383	10.966.724	11.097.064

BPS 1 – Expected Manageable MSW and Electricity Output (2056-2065)

Information	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	2.130	2.155	2.180	2.205	2.229	2.254	2.279	2.304	2.328	2.353

Information	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	10.176	10.294	10.412	10.530	10.649	10.767	10.885	11.003	11.121	11.239
Manageable MSW – BPS 1 (ton/year)	660.436	668.103	675.770	683.437	691.104	698.771	706.438	714.105	721.772	729.439
Manageable MSW – BPS 1 (m ³ /year)	3.154.571	3.191.192	3.227.814	3.264.436	3.301.058	3.337.680	3.374.302	3.410.924	3.447.545	3.484.167
Expected Electricity Output/Year (kWh)	11.227.405	11.357.746	11.488.086	11.618.427	11.748.767	11.879.108	12.009.448	12.139.789	12.270.129	12.400.470

BPS 1 – Expected Manageable MSW and Electricity Output (2066-2075)

Information	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	2.378	2.402	2.427	2.452	2.477	2.501	2.526	2.551	2.576	2.600
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	11.357	11.476	11.594	11.712	11.830	11.948	12.066	12.184	12.302	12.421
Manageable MSW – BPS 1 (ton/year)	737.107	744.774	752.441	760.108	767.775	775.442	783.109	790.776	798.443	806.110
Manageable MSW – BPS 1 (m ³ /year)	3.520.789	3.557.411	3.594.033	3.630.655	3.667.277	3.703.898	3.740.520	3.777.142	3.813.764	3.850.386
Expected Electricity Output/Year (kWh)	12.530.811	12.661.151	12.791.492	12.921.832	13.052.173	13.182.513	13.312.854	13.443.195	13.573.535	13.703.876

BPS 1 – Debt Schedule Repayment (in IDR, million) (2026-2033)

Description	Years during Tenor							
	2026	2027	2028	2029	2030	2031	2032	2033
Initial Loan Balance	Rp4.546.689	Rp4.524.002	Rp4.455.939	Rp4.297.126	Rp4.092.724	Rp3.865.389	Rp3.638.055	Rp3.410.720
Installment for loan drawdown Year 0 (2021)	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688
Installment for loan drawdown Year 1 (2022)	Rp0	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375
Installment for loan drawdown Year 2 (2023)	Rp0	Rp0	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750
Installment for loan drawdown Year 3 (2024)	Rp0	Rp0	Rp0	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589
Installment for loan drawdown Year 4 (2025)	Rp0	Rp0	Rp0	Rp0	Rp22.932	Rp22.932	Rp22.932	Rp22.932
Total Installment	Rp22.688	Rp68.063	Rp158.813	Rp204.402	Rp227.334	Rp227.334	Rp227.334	Rp227.334
Ending Loan Balance	Rp4.524.002	Rp4.455.939	Rp4.297.126	Rp4.092.724	Rp3.865.389	Rp3.638.055	Rp3.410.720	Rp3.183.386

BPS 1 – Debt Schedule Repayment (in IDR, million) (2034-2041)

Description	Years during Tenor							
	2034	2035	2036	2037	2038	2039	2040	2041
Initial Loan Balance	Rp3.183.386	Rp2.956.051	Rp2.728.717	Rp2.501.382	Rp2.274.048	Rp2.046.713	Rp1.819.379	Rp1.592.044
Installment for loan drawdown Year 0 (2021)	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp22.688

Description	Years during Tenor							
	2034	2035	2036	2037	2038	2039	2040	2041
Installment for loan drawdown Year 1 (2022)	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375
Installment for loan drawdown Year 2 (2023)	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750
Installment for loan drawdown Year 3 (2024)	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589
Installment for loan drawdown Year 4 (2025)	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932
Total Installment	Rp227.334	Rp227.334	Rp227.334	Rp227.334	Rp227.334	Rp227.334	Rp227.334	Rp227.334
Ending Loan Balance	Rp2.956.051	Rp2.728.717	Rp2.501.382	Rp2.274.048	Rp2.046.713	Rp1.819.379	Rp1.592.044	Rp1.364.710

BPS 1 – Debt Schedule Repayment (in IDR, million) (2042-2049)

Description	Years during Tenor							
	2042	2043	2044	2045	2046	2047	2048	2049
Initial Loan Balance	Rp1.364.710	Rp1.137.375	Rp910.041	Rp682.706	Rp455.372	Rp250.725	Rp91.453	Rp22.932
Installment for loan drawdown Year 0 (2021)	Rp22.688	Rp22.688	Rp22.688	Rp22.688	Rp0	Rp0	Rp0	Rp0
Installment for loan drawdown Year 1 (2022)	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp45.375	Rp0	Rp0	Rp0
Installment for loan drawdown Year 2 (2023)	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp90.750	Rp0	Rp0
Installment for loan drawdown Year 3 (2024)	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp45.589	Rp0
Installment for loan drawdown Year 4 (2025)	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932	Rp22.932
Total Installment	Rp227.334	Rp227.334	Rp227.334	Rp227.334	Rp204.647	Rp159.272	Rp68.521	Rp22.932
Ending Loan Balance	Rp1.137.375	Rp910.041	Rp682.706	Rp455.372	Rp250.725	Rp91.453	Rp22.932	Rp0

BPS 1 – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2026-2035)

Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Asset's Acquisition Cost	Rp8.030.922	Rp8.030.922	Rp8.032.113	Rp8.035.041	Rp8.035.041	Rp8.035.074	Rp8.035.705	Rp8.035.709	Rp8.035.709	Rp8.036.398
D&A Expense	Rp203.883	Rp203.883	Rp203.962	Rp204.138	Rp204.138	Rp204.139	Rp204.164	Rp204.164	Rp204.164	Rp204.184
Accumulative D&A Expense	Rp203.883	Rp407.766	Rp611.728	Rp815.866	Rp1.020.004	Rp1.224.144	Rp1.428.308	Rp1.632.473	Rp1.836.637	Rp2.040.821
Remaining Assets Book Value	Rp7.827.039	Rp7.624.347	Rp7.423.314	Rp7.219.175	Rp7.015.070	Rp6.811.561	Rp6.607.401	Rp6.403.237	Rp6.199.761	Rp5.995.698

BPS 1 – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2036-2045)

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Asset's Acquisition Cost	Rp8.036.519	Rp8.036.519	Rp8.037.272	Rp8.037.272	Rp8.037.278	Rp8.055.610	Rp8.055.610	Rp8.057.465	Rp8.062.028	Rp8.062.028
D&A Expense	Rp204.187	Rp204.187	Rp204.209	Rp204.209	Rp204.209	Rp204.643	Rp204.643	Rp204.687	Rp204.802	Rp204.802
Accumulative D&A Expense	Rp2.245.008	Rp2.449.196	Rp2.653.405	Rp2.857.613	Rp3.061.822	Rp3.266.465	Rp3.471.108	Rp3.675.795	Rp3.880.597	Rp4.085.400

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Remaining Assets Book Value	Rp5.791.511	Rp5.588.076	Rp5.383.867	Rp5.179.664	Rp4.993.787	Rp4.789.144	Rp4.586.357	Rp4.386.232	Rp4.181.430	Rp3.976.791

BPS 1 – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2046-2055)

Description	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Asset's Acquisition Cost	Rp8.062.191	Rp8.063.180	Rp8.063.180	Rp8.063.180	Rp8.064.253	Rp8.064.313	Rp8.064.313	Rp8.065.485	Rp8.065.494	Rp8.065.494
D&A Expense	Rp128.024	Rp128.063	Rp128.063	Rp128.063	Rp128.093	Rp128.095	Rp128.095	Rp128.128	Rp128.128	Rp128.128
Accumulative D&A Expense	Rp4.213.424	Rp4.341.487	Rp4.469.550	Rp4.597.613	Rp4.725.706	Rp4.853.801	Rp4.981.896	Rp5.110.024	Rp5.238.153	Rp5.366.281
Remaining Assets Book Value	Rp3.849.756	Rp3.721.693	Rp3.593.630	Rp3.466.640	Rp3.338.606	Rp3.210.511	Rp3.083.589	Rp2.955.469	Rp2.827.341	Rp2.727.923

BPS 1 – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2056-2065)

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Asset's Acquisition Cost	Rp8.094.204	Rp8.094.204	Rp8.097.095	Rp8.104.204	Rp8.104.204	Rp8.104.294	Rp8.105.824	Rp8.105.824	Rp8.105.824	Rp8.111.051
D&A Expense	Rp129.388	Rp129.388	Rp129.462	Rp129.462	Rp129.050	Rp130.757	Rp130.757	Rp130.865	Rp131.144	Rp129.380
Accumulative D&A Expense	Rp5.495.083	Rp5.623.885	Rp5.752.756	Rp5.881.806	Rp6.010.856	Rp6.139.909	Rp6.269.022	Rp6.398.135	Rp6.527.248	Rp6.656.628
Remaining Assets Book Value	Rp2.599.121	Rp2.473.209	Rp2.351.447	Rp2.222.397	Rp2.093.438	Rp1.965.916	Rp1.836.802	Rp1.707.689	Rp1.583.803	Rp1.454.717

BPS 1 – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2066-2075)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Asset's Acquisition Cost	Rp8.111.345	Rp8.111.345	Rp8.113.185	Rp8.113.185	Rp8.116.966	Rp8.161.463	Rp8.161.463	Rp8.165.966	Rp8.177.041	Rp8.177.057
D&A Expense	Rp129.388	Rp129.388	Rp129.462	Rp129.462	Rp129.714	Rp130.757	Rp130.757	Rp130.865	Rp131.144	Rp131.144
Accumulative D&A Expense	Rp6.786.017	Rp6.915.405	Rp7.044.867	Rp7.174.329	Rp7.304.044	Rp7.434.801	Rp7.565.558	Rp7.696.423	Rp7.827.567	Rp7.958.711
Remaining Assets Book Value	Rp1.325.329	Rp1.197.780	Rp1.068.318	Rp942.637	Rp857.419	Rp726.662	Rp600.407	Rp480.618	Rp349.490	Rp218.742

BPS 1 – Income Statement Projection (in IDR, million) (2026-2035)

Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Sales	Rp1.111.289	Rp1.206.204	Rp1.310.120	Rp1.258.939	Rp1.171.372	Rp1.193.021	Rp1.215.538	Rp1.238.958	Rp1.263.313	Rp1.288.640
Cost of Goods Sold	(Rp289.494)	(Rp355.357)	(Rp427.467)	(Rp391.951)	(Rp331.186)	(Rp346.208)	(Rp361.833)	(Rp378.084)	(Rp394.984)	(Rp412.558)
Gross Profit	Rp821.795	Rp850.847	Rp882.654	Rp866.989	Rp840.187	Rp846.813	Rp853.706	Rp860.874	Rp868.329	Rp876.082
Operating Expenses										
Communication Expenses	(Rp14)	(Rp15)	(Rp15)	(Rp16)	(Rp16)	(Rp17)	(Rp17)	(Rp18)	(Rp18)	(Rp19)
General & Administrative Expenses	(Rp52.823)	(Rp64.841)	(Rp77.998)	(Rp71.518)	(Rp60.431)	(Rp63.172)	(Rp66.023)	(Rp68.988)	(Rp72.072)	(Rp75.278)
Maintenance Expense	(Rp46.214)	(Rp56.729)	(Rp68.240)	(Rp62.571)	(Rp52.870)	(Rp55.268)	(Rp57.763)	(Rp60.357)	(Rp63.055)	(Rp65.860)
Indirect Labour Expense	(Rp18.906)	(Rp23.208)	(Rp27.917)	(Rp25.598)	(Rp21.629)	(Rp22.610)	(Rp23.631)	(Rp24.692)	(Rp25.796)	(Rp26.944)

Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Risk Management Expense	(Rp9.749)	(Rp11.967)	(Rp14.395)	(Rp13.199)	(Rp11.153)	(Rp11.659)	(Rp12.185)	(Rp12.732)	(Rp13.301)	(Rp13.893)
Total Operating Expenses	(Rp127.707)	(Rp156.759)	(Rp188.566)	(Rp172.901)	(Rp146.099)	(Rp152.725)	(Rp159.618)	(Rp166.787)	(Rp174.242)	(Rp181.994)
EBITDA	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088
Depreciation Expenses	(Rp203.883)	(Rp203.883)	(Rp203.962)	(Rp204.138)	(Rp204.138)	(Rp204.139)	(Rp204.164)	(Rp204.164)	(Rp204.164)	(Rp204.184)
Operating Profit (EBIT)	Rp490.205	Rp490.205	Rp490.126	Rp489.949	Rp489.949	Rp489.948	Rp489.923	Rp489.923	Rp489.923	Rp489.904
Other Revenue & Expenses										
Interest Expenses	(Rp512.412)	(Rp509.855)	(Rp502.184)	(Rp484.286)	(Rp461.250)	(Rp435.629)	(Rp410.009)	(Rp384.388)	(Rp358.768)	(Rp333.147)
Total Other Revenue & Expenses	(Rp512.412)	(Rp509.855)	(Rp502.184)	(Rp484.286)	(Rp461.250)	(Rp435.629)	(Rp410.009)	(Rp384.388)	(Rp358.768)	(Rp333.147)
Earning Before Tax (EBT)	(Rp22.207)	(Rp19.650)	(Rp12.059)	Rp5.663	Rp28.700	Rp54.319	Rp79.915	Rp105.535	Rp131.156	Rp156.757
Tax (25%)	Rp0	Rp0	Rp0	(Rp1.416)	(Rp7.175)	(Rp13.580)	(Rp19.979)	(Rp26.384)	(Rp32.789)	(Rp39.189)
EAT	(Rp22.207)	(Rp19.650)	(Rp12.059)	Rp4.248	Rp21.525	Rp40.739	Rp59.936	Rp79.151	Rp98.367	Rp117.568

BPS 1 – Income Statement Projection (in IDR, million) (2036-2045)

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Sales	Rp1.314.974	Rp1.342.352	Rp1.370.815	Rp1.400.402	Rp1.431.155	Rp1.463.117	Rp1.496.334	Rp1.530.852	Rp1.566.719	Rp1.603.985
Cost of Goods Sold	(Rp430.831)	(Rp449.829)	(Rp469.580)	(Rp490.110)	(Rp511.450)	(Rp533.629)	(Rp556.678)	(Rp580.631)	(Rp605.519)	(Rp631.378)
Gross Profit	Rp884.142	Rp892.523	Rp901.235	Rp910.291	Rp919.705	Rp929.488	Rp939.656	Rp950.221	Rp961.200	Rp972.607
Operating Expenses										
Communication Expenses	(Rp19)	(Rp20)	(Rp20)	(Rp21)	(Rp22)	(Rp22)	(Rp23)	(Rp24)	(Rp24)	(Rp25)
General & Administrative Expenses	(Rp78.612)	(Rp82.079)	(Rp85.683)	(Rp89.429)	(Rp93.322)	(Rp97.369)	(Rp101.575)	(Rp105.945)	(Rp110.487)	(Rp115.205)
Maintenance Expense	(Rp68.777)	(Rp71.810)	(Rp74.963)	(Rp78.241)	(Rp81.647)	(Rp85.188)	(Rp88.867)	(Rp92.691)	(Rp96.664)	(Rp100.792)
Indirect Labour Expense	(Rp28.137)	(Rp29.378)	(Rp30.668)	(Rp32.008)	(Rp33.402)	(Rp34.851)	(Rp36.356)	(Rp37.920)	(Rp39.546)	(Rp41.234)
Risk Management Expense	(Rp14.509)	(Rp15.148)	(Rp15.813)	(Rp16.505)	(Rp17.223)	(Rp17.970)	(Rp18.746)	(Rp19.553)	(Rp20.391)	(Rp21.262)
Total Operating Expenses	(Rp190.055)	(Rp198.435)	(Rp207.147)	(Rp216.204)	(Rp225.617)	(Rp235.400)	(Rp245.568)	(Rp256.134)	(Rp267.112)	(Rp278.519)
EBITDA	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088
Depreciation Expenses	(Rp204.187)	(Rp204.187)	(Rp204.209)	(Rp204.209)	(Rp204.209)	(Rp204.643)	(Rp204.643)	(Rp204.687)	(Rp204.802)	(Rp204.802)
Operating Profit (EBIT)	Rp489.900	Rp489.900	Rp489.879	Rp489.879	Rp489.879	Rp489.445	Rp489.445	Rp489.400	Rp489.286	Rp489.286
Other Revenue & Expenses										
Interest Expenses	(Rp307.526)	(Rp281.906)	(Rp256.285)	(Rp230.665)	(Rp205.044)	(Rp179.423)	(Rp153.803)	(Rp128.182)	(Rp102.562)	(Rp76.941)
Total Other Revenue & Expenses	(Rp307.526)	(Rp281.906)	(Rp256.285)	(Rp230.665)	(Rp205.044)	(Rp179.423)	(Rp153.803)	(Rp128.182)	(Rp102.562)	(Rp76.941)
Earning Before Tax (EBT)	Rp182.374	Rp207.995	Rp233.594	Rp259.214	Rp284.835	Rp310.021	Rp335.642	Rp361.218	Rp386.724	Rp412.345
Tax (25%)	(Rp45.593)	(Rp51.999)	(Rp58.398)	(Rp64.804)	(Rp71.209)	(Rp77.505)	(Rp83.910)	(Rp90.305)	(Rp96.681)	(Rp103.086)
EAT	Rp136.780	Rp155.996	Rp175.195	Rp194.411	Rp213.626	Rp232.516	Rp251.731	Rp270.914	Rp290.043	Rp309.259

BPS 1 – Income Statement Projection (in IDR, million) (2046-2055)

Description	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Sales	Rp1.642.701	Rp1.682.921	Rp1.724.701	Rp1.768.098	Rp1.813.171	Rp1.859.982	Rp1.908.594	Rp1.959.074	Rp2.011.489	Rp2.065.911
Cost of Goods Sold	(Rp658.243)	(Rp686.153)	(Rp715.144)	(Rp745.257)	(Rp776.534)	(Rp809.016)	(Rp842.749)	(Rp877.777)	(Rp914.148)	(Rp951.912)
Gross Profit	Rp984.458	Rp996.769	Rp1.009.557	Rp1.022.841	Rp1.036.637	Rp1.050.966	Rp1.065.846	Rp1.081.297	Rp1.097.341	Rp1.113.999
Operating Expenses										
Communication Expenses	(Rp26)	(Rp27)	(Rp27)	(Rp28)	(Rp29)	(Rp30)	(Rp31)	(Rp32)	(Rp33)	(Rp34)
General & Administrative Expenses	(Rp120.107)	(Rp125.200)	(Rp130.489)	(Rp135.984)	(Rp141.691)	(Rp147.618)	(Rp153.773)	(Rp160.164)	(Rp166.801)	(Rp173.691)
Maintenance Expense	(Rp105.081)	(Rp109.537)	(Rp114.165)	(Rp118.972)	(Rp123.965)	(Rp129.150)	(Rp134.535)	(Rp140.127)	(Rp145.934)	(Rp151.962)
Indirect Labour Expense	(Rp42.989)	(Rp44.812)	(Rp46.705)	(Rp48.672)	(Rp50.714)	(Rp52.836)	(Rp55.039)	(Rp57.326)	(Rp59.702)	(Rp62.168)
Risk Management Expense	(Rp22.167)	(Rp23.107)	(Rp24.083)	(Rp25.097)	(Rp26.150)	(Rp27.244)	(Rp28.380)	(Rp29.560)	(Rp30.785)	(Rp32.056)
Total Operating Expenses	(Rp290.370)	(Rp302.681)	(Rp315.470)	(Rp328.753)	(Rp342.550)	(Rp356.878)	(Rp371.758)	(Rp387.209)	(Rp403.253)	(Rp419.911)
EBITDA	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088
Depreciation Expenses	(Rp128.024)	(Rp128.063)	(Rp128.063)	(Rp128.063)	(Rp128.093)	(Rp128.095)	(Rp128.095)	(Rp128.128)	(Rp128.128)	(Rp128.128)
Operating Profit (EBIT)	Rp566.064	Rp566.025	Rp566.025	Rp566.025	Rp565.994	Rp565.993	Rp565.993	Rp565.960	Rp565.959	Rp565.959
Other Revenue & Expenses										
Interest Expenses	(Rp51.320)	(Rp28.257)	(Rp10.307)	(Rp2.584)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp51.320)	(Rp28.257)	(Rp10.307)	(Rp2.584)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp514.743	Rp537.768	Rp555.718	Rp563.440	Rp565.994	Rp565.993	Rp565.993	Rp565.960	Rp565.959	Rp565.959
Tax (25%)	(Rp128.686)	(Rp134.442)	(Rp138.929)	(Rp140.860)	(Rp141.499)	(Rp141.498)	(Rp141.498)	(Rp141.490)	(Rp141.490)	(Rp141.490)
EAT	Rp386.057	Rp403.326	Rp416.788	Rp422.580	Rp424.496	Rp424.495	Rp424.495	Rp424.470	Rp424.469	Rp424.469

BPS 1 – Income Statement Projection (in IDR, million) (2056-2065)

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Sales	Rp2.122.413	Rp2.181.070	Rp2.241.961	Rp2.305.167	Rp2.370.772	Rp2.438.864	Rp2.509.532	Rp2.582.870	Rp2.669.140	Rp2.748.416
Cost of Goods Sold	(Rp991.119)	(Rp1.031.822)	(Rp1.074.074)	(Rp1.117.934)	(Rp1.163.458)	(Rp1.210.707)	(Rp1.259.744)	(Rp1.310.634)	(Rp1.370.498)	(Rp1.425.508)
Gross Profit	Rp1.131.294	Rp1.149.248	Rp1.167.886	Rp1.187.233	Rp1.207.314	Rp1.228.157	Rp1.249.788	Rp1.272.236	Rp1.298.642	Rp1.322.908
Operating Expenses										
Communication Expenses	(Rp35)	(Rp36)	(Rp37)	(Rp38)	(Rp39)	(Rp40)	(Rp41)	(Rp43)	(Rp44)	(Rp45)
General & Administrative Expenses	(Rp180.845)	(Rp188.272)	(Rp195.981)	(Rp203.984)	(Rp212.291)	(Rp220.912)	(Rp229.859)	(Rp239.145)	(Rp250.068)	(Rp260.105)
Maintenance Expense	(Rp158.221)	(Rp164.719)	(Rp171.464)	(Rp178.466)	(Rp185.733)	(Rp193.276)	(Rp201.104)	(Rp209.228)	(Rp218.785)	(Rp227.566)
Indirect Labour Expense	(Rp64.729)	(Rp67.387)	(Rp70.146)	(Rp73.011)	(Rp75.984)	(Rp79.070)	(Rp82.272)	(Rp85.596)	(Rp89.505)	(Rp93.098)
Risk Management Expense	(Rp33.377)	(Rp34.747)	(Rp36.170)	(Rp37.647)	(Rp39.180)	(Rp40.771)	(Rp42.423)	(Rp44.136)	(Rp46.152)	(Rp48.005)
Total Operating Expenses	(Rp437.206)	(Rp455.160)	(Rp473.799)	(Rp493.145)	(Rp513.227)	(Rp534.069)	(Rp555.700)	(Rp578.148)	(Rp604.554)	(Rp628.820)
EBITDA	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Depreciation Expenses	(Rp128.802)	(Rp128.802)	(Rp128.871)	(Rp129.050)	(Rp129.050)	(Rp129.053)	(Rp129.113)	(Rp129.113)	(Rp129.113)	(Rp129.380)
Operating Profit (EBIT)	Rp565.286	Rp565.286	Rp565.217	Rp565.038	Rp565.038	Rp565.035	Rp564.975	Rp564.975	Rp564.975	Rp564.708
Other Revenue & Expenses										
Interest Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp565.286	Rp565.286	Rp565.217	Rp565.038	Rp565.038	Rp565.035	Rp564.975	Rp564.975	Rp564.975	Rp564.708
Tax (25%)	(Rp141.321)	(Rp141.321)	(Rp141.304)	(Rp141.260)	(Rp141.260)	(Rp141.259)	(Rp141.244)	(Rp141.244)	(Rp141.244)	(Rp141.177)
EAT	Rp423.964	Rp423.964	Rp423.913	Rp423.779	Rp423.779	Rp423.776	Rp423.731	Rp423.731	Rp423.731	Rp423.531

BPS 1 – Income Statement Projection (in IDR, million) (2066-2075)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Sales	Rp2.830.670	Rp2.916.011	Rp3.004.550	Rp3.108.774	Rp3.204.428	Rp3.303.648	Rp3.406.562	Rp3.513.302	Rp3.624.006	Rp3.738.814
Cost of Goods Sold	(Rp1.482.585)	(Rp1.541.804)	(Rp1.603.242)	(Rp1.675.564)	(Rp1.741.940)	(Rp1.810.789)	(Rp1.882.202)	(Rp1.956.270)	(Rp2.033.088)	(Rp2.112.755)
Gross Profit	Rp1.348.085	Rp1.374.207	Rp1.401.308	Rp1.433.210	Rp1.462.489	Rp1.492.859	Rp1.524.360	Rp1.557.032	Rp1.590.917	Rp1.626.059
Operating Expenses										
Communication Expenses	(Rp47)	(Rp48)	(Rp50)	(Rp51)	(Rp53)	(Rp54)	(Rp56)	(Rp57)	(Rp59)	(Rp61)
General & Administrative Expenses	(Rp270.520)	(Rp281.325)	(Rp292.535)	(Rp305.731)	(Rp317.843)	(Rp330.405)	(Rp343.435)	(Rp356.950)	(Rp370.967)	(Rp385.503)
Maintenance Expense	(Rp236.678)	(Rp246.132)	(Rp255.940)	(Rp267.485)	(Rp278.081)	(Rp289.072)	(Rp300.472)	(Rp312.297)	(Rp324.560)	(Rp337.278)
Indirect Labour Expense	(Rp96.826)	(Rp100.693)	(Rp104.706)	(Rp109.429)	(Rp113.764)	(Rp118.260)	(Rp122.924)	(Rp127.761)	(Rp132.778)	(Rp137.981)
Risk Management Expense	(Rp49.927)	(Rp51.921)	(Rp53.990)	(Rp56.426)	(Rp58.661)	(Rp60.979)	(Rp63.384)	(Rp65.879)	(Rp68.466)	(Rp71.148)
Total Operating Expenses	(Rp653.997)	(Rp680.119)	(Rp707.220)	(Rp739.122)	(Rp768.401)	(Rp798.771)	(Rp830.272)	(Rp862.944)	(Rp896.829)	(Rp931.971)
EBITDA	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088	Rp694.088
Depreciation Expenses	(Rp129.388)	(Rp129.388)	(Rp129.462)	(Rp129.462)	(Rp129.714)	(Rp130.757)	(Rp130.757)	(Rp130.865)	(Rp131.144)	(Rp131.144)
Operating Profit (EBIT)	Rp564.699	Rp564.699	Rp564.626	Rp564.626	Rp564.373	Rp563.330	Rp563.330	Rp563.223	Rp562.944	Rp562.944
Other Revenue & Expenses										
Interest Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Earning Before Tax (EBT)	Rp564.699	Rp564.699	Rp564.626	Rp564.626	Rp564.373	Rp563.330	Rp563.330	Rp563.223	Rp562.944	Rp562.944
Tax (25%)	(Rp141.175)	(Rp141.175)	(Rp141.156)	(Rp141.156)	(Rp141.093)	(Rp140.833)	(Rp140.833)	(Rp140.806)	(Rp140.736)	(Rp140.736)
EAT	Rp423.524	Rp423.524	Rp423.469	Rp423.469	Rp423.280	Rp422.498	Rp422.498	Rp422.417	Rp422.208	Rp422.208

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2021-2028)

Description	2021	2022	2023	2024	2025	2026	2027	2028
Operational Cash Flow								
Sales	Rp0	Rp0	Rp0	Rp0	Rp0	Rp1.111.289	Rp1.298.811	Rp1.410.637
Account Receivable	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp92.607)	(Rp100.517)	(Rp109.177)
Cost of Operation	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp289.494)	(Rp355.357)	(Rp427.467)
Operating Expense	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp127.707)	(Rp156.759)	(Rp188.566)
Interest Expense	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp512.412)	(Rp509.855)	(Rp502.184)
Tax (25%)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Operational Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp89.068	Rp176.323	Rp183.244
Investment Cash Flow								
Project Cost	(Rp703.893)	(Rp1.458.924)	(Rp2.968.986)	(Rp1.772.379)	(Rp1.172.207)	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp1.191)	(Rp2.929)
Total Investment Cash Flow	(Rp703.893)	(Rp1.458.924)	(Rp2.968.986)	(Rp1.772.379)	(Rp1.172.207)	Rp0	(Rp1.191)	(Rp2.929)
Financing Cash Flow								
Shareholder's Equity	Rp250.141	Rp551.419	Rp1.153.976	Rp860.602	Rp713.561	Rp0	Rp0	Rp0
Loan Drawdown	Rp453.752	Rp907.505	Rp1.815.009	Rp911.777	Rp458.646	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp22.688)	(Rp68.063)	(Rp158.813)
Total Financing Cash Flow	Rp703.893	Rp1.458.924	Rp2.968.986	Rp1.772.379	Rp1.172.207	(Rp22.688)	(Rp68.063)	(Rp158.813)
Net Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp66.381	Rp107.070	Rp21.502
Cash – Beginning Balance	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp66.381	Rp173.450
Cash – Ending Balance	Rp0	Rp0	Rp0	Rp0	Rp0	Rp66.381	Rp173.450	Rp194.952

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2029-2036)

Description	2029	2030	2031	2032	2033	2034	2035	2036
Operational Cash Flow								
Sales	Rp1.368.116	Rp1.276.284	Rp1.290.635	Rp1.314.957	Rp1.340.253	Rp1.366.560	Rp1.393.916	Rp1.422.360

Description	2029	2030	2031	2032	2033	2034	2035	2036
Account Receivable	(Rp104.912)	(Rp97.614)	(Rp99.418)	(Rp101.295)	(Rp103.246)	(Rp105.276)	(Rp107.387)	(Rp109.581)
Cost of Operation	(Rp391.951)	(Rp331.186)	(Rp346.208)	(Rp361.833)	(Rp378.084)	(Rp394.984)	(Rp412.558)	(Rp430.831)
Operating Expense	(Rp172.901)	(Rp146.099)	(Rp152.725)	(Rp159.618)	(Rp166.787)	(Rp174.242)	(Rp181.994)	(Rp190.055)
Interest Expense	(Rp484.286)	(Rp461.250)	(Rp435.629)	(Rp410.009)	(Rp384.388)	(Rp358.768)	(Rp333.147)	(Rp307.526)
Tax (25%)	(Rp1.416)	(Rp7.175)	(Rp13.580)	(Rp19.979)	(Rp26.384)	(Rp32.789)	(Rp39.189)	(Rp45.593)
Total Operational Cash Flow	Rp212.651	Rp232.960	Rp243.075	Rp262.224	Rp281.364	Rp300.502	Rp319.641	Rp338.773
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	(Rp33)	(Rp630)	(Rp5)	Rp0	(Rp689)	(Rp121)	Rp0
Total Investment Cash Flow	Rp0	(Rp33)	(Rp630)	(Rp5)	Rp0	(Rp689)	(Rp121)	Rp0
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp204.402)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)
Total Financing Cash Flow	(Rp204.402)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)
Net Cash Flow	Rp8.249	Rp5.593	Rp15.110	Rp34.885	Rp54.030	Rp72.478	Rp92.185	Rp111.439
Cash – Beginning Balance	Rp194.952	Rp203.201	Rp208.793	Rp223.903	Rp258.788	Rp312.818	Rp385.296	Rp477.481
Cash – Ending Balance	Rp203.201	Rp208.793	Rp223.903	Rp258.788	Rp312.818	Rp385.296	Rp477.481	Rp588.920

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2037-2044)

Description	2037	2038	2039	2040	2041	2042	2043	2044
Operational Cash Flow								
Sales	Rp1.451.933	Rp1.482.677	Rp1.514.636	Rp1.547.855	Rp1.582.380	Rp1.618.261	Rp1.655.546	Rp1.694.290
Account Receivable	(Rp111.863)	(Rp114.235)	(Rp116.700)	(Rp119.263)	(Rp121.926)	(Rp124.695)	(Rp127.571)	(Rp130.560)
Cost of Operation	(Rp449.829)	(Rp469.580)	(Rp490.110)	(Rp511.450)	(Rp533.629)	(Rp556.678)	(Rp580.631)	(Rp605.519)
Operating Expense	(Rp198.435)	(Rp207.147)	(Rp216.204)	(Rp225.617)	(Rp235.400)	(Rp245.568)	(Rp256.134)	(Rp267.112)
Interest Expense	(Rp281.906)	(Rp256.285)	(Rp230.665)	(Rp205.044)	(Rp179.423)	(Rp153.803)	(Rp128.182)	(Rp102.562)
Tax (25%)	(Rp51.999)	(Rp58.398)	(Rp64.804)	(Rp71.209)	(Rp77.505)	(Rp83.910)	(Rp90.305)	(Rp96.681)
Total Operational Cash Flow	Rp357.902	Rp377.032	Rp396.154	Rp415.272	Rp434.495	Rp453.606	Rp472.724	Rp491.856
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp753)	Rp0	(Rp6)	(Rp18.332)	Rp0	(Rp1.855)	(Rp4.563)	Rp0
Total Investment Cash Flow	(Rp753)	Rp0	(Rp6)	(Rp18.332)	Rp0	(Rp1.855)	(Rp4.563)	Rp0

Description	2037	2038	2039	2040	2041	2042	2043	2044
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)
Total Financing Cash Flow	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)	(Rp227.334)
Net Cash Flow	Rp129.815	Rp149.698	Rp168.814	Rp169.606	Rp207.161	Rp224.417	Rp240.827	Rp264.522
Cash – Beginning Balance	Rp588.920	Rp718.735	Rp868.433	Rp1.037.247	Rp1.206.852	Rp1.414.013	Rp1.638.430	Rp1.879.257
Cash – Ending Balance	Rp718.735	Rp868.433	Rp1.037.247	Rp1.206.852	Rp1.414.013	Rp1.638.430	Rp1.879.257	Rp2.143.779

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2045-2052)

Description	2045	2046	2047	2048	2049	2050	2051	2052
Operational Cash Flow								
Sales	Rp1.734.545	Rp1.776.366	Rp1.819.813	Rp1.864.945	Rp1.911.823	Rp1.960.513	Rp2.011.080	Rp2.063.593
Account Receivable	(Rp133.665)	(Rp136.892)	(Rp140.243)	(Rp143.725)	(Rp147.342)	(Rp151.098)	(Rp154.998)	(Rp159.050)
Cost of Operation	(Rp631.378)	(Rp658.243)	(Rp686.153)	(Rp715.144)	(Rp745.257)	(Rp776.534)	(Rp809.016)	(Rp842.749)
Operating Expense	(Rp278.519)	(Rp290.370)	(Rp302.681)	(Rp315.470)	(Rp328.753)	(Rp342.550)	(Rp356.878)	(Rp371.758)
Interest Expense	(Rp76.941)	(Rp51.320)	(Rp28.257)	(Rp10.307)	(Rp2.584)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp103.086)	(Rp128.686)	(Rp134.442)	(Rp138.929)	(Rp140.860)	(Rp141.499)	(Rp141.498)	(Rp141.498)
Total Operational Cash Flow	Rp510.955	Rp510.855	Rp528.037	Rp541.370	Rp547.027	Rp548.833	Rp548.689	Rp548.539
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp163)	(Rp989)	Rp0	Rp0	(Rp1.073)	(Rp60)	Rp0	(Rp1.173)
Total Investment Cash Flow	(Rp163)	(Rp989)	Rp0	Rp0	(Rp1.073)	(Rp60)	Rp0	(Rp1.173)
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp227.334)	(Rp204.647)	(Rp159.272)	(Rp68.521)	(Rp22.932)	Rp0	Rp0	Rp0
Total Financing Cash Flow	(Rp227.334)	(Rp204.647)	(Rp159.272)	(Rp68.521)	(Rp22.932)	Rp0	Rp0	Rp0
Net Cash Flow	Rp283.457	Rp305.219	Rp368.766	Rp472.849	Rp523.021	Rp548.773	Rp548.689	Rp547.366
Cash – Beginning Balance	Rp2.143.779	Rp2.427.236	Rp2.732.456	Rp3.101.221	Rp3.574.070	Rp4.097.091	Rp4.645.865	Rp5.194.554
Cash – Ending Balance	Rp2.427.236	Rp2.732.456	Rp3.101.221	Rp3.574.070	Rp4.097.091	Rp4.645.865	Rp5.194.554	Rp5.741.919

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2053-2059)

Description	2053	2054	2055	2056	2057	2058	2059
Operational Cash Flow							
Sales	Rp2.118.123	Rp2.174.746	Rp2.233.535	Rp2.294.572	Rp2.357.937	Rp2.423.716	Rp2.491.997
Account Receivable	(Rp163.256)	(Rp167.624)	(Rp172.159)	(Rp176.868)	(Rp181.756)	(Rp186.830)	(Rp192.097)
Cost of Operation	(Rp877.777)	(Rp914.148)	(Rp951.912)	(Rp991.119)	(Rp1.031.822)	(Rp1.074.074)	(Rp1.117.934)
Operating Expense	(Rp387.209)	(Rp403.253)	(Rp419.911)	(Rp437.206)	(Rp455.160)	(Rp473.799)	(Rp493.145)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp141.490)	(Rp141.490)	(Rp141.490)	(Rp141.321)	(Rp141.321)	(Rp141.304)	(Rp141.260)
Total Operational Cash Flow	Rp548.391	Rp548.230	Rp548.063	Rp548.058	Rp547.878	Rp547.709	Rp547.561
Investment Cash Flow							
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp8)	Rp0	(Rp28.711)	Rp0	(Rp2.890)	(Rp7.109)	Rp0
Total Investment Cash Flow	(Rp8)	Rp0	(Rp28.711)	Rp0	(Rp2.890)	(Rp7.109)	Rp0
Financing Cash Flow							
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp548.383	Rp548.230	Rp519.352	Rp548.058	Rp544.988	Rp540.600	Rp547.561
Cash – Beginning Balance	Rp5.741.919	Rp6.290.302	Rp6.838.532	Rp7.357.884	Rp7.905.942	Rp8.450.930	Rp8.991.530
Cash – Ending Balance	Rp6.290.302	Rp6.838.532	Rp7.357.884	Rp7.905.942	Rp8.450.930	Rp8.991.530	Rp9.539.091

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2060-2065)

Description	2060	2061	2062	2063	2064	2065
Operational Cash Flow						
Sales	Rp2.562.869	Rp2.636.428	Rp2.712.771	Rp2.791.997	Rp2.884.379	Rp2.970.844
Account Receivable	(Rp197.564)	(Rp203.239)	(Rp209.128)	(Rp215.239)	(Rp222.428)	(Rp229.035)
Cost of Operation	(Rp1.163.458)	(Rp1.210.707)	(Rp1.259.744)	(Rp1.310.634)	(Rp1.370.498)	(Rp1.425.508)
Operating Expense	(Rp513.227)	(Rp534.069)	(Rp555.700)	(Rp578.148)	(Rp604.554)	(Rp628.820)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp141.260)	(Rp141.259)	(Rp141.244)	(Rp141.244)	(Rp141.244)	(Rp141.177)
Total Operational Cash Flow	Rp547.361	Rp547.155	Rp546.955	Rp546.733	Rp545.655	Rp546.305
Investment Cash Flow						
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2060	2061	2062	2063	2064	2065
Routine CAPEX	(Rp91)	(Rp1.530)	Rp0	Rp0	(Rp5.227)	(Rp295)
Total Investment Cash Flow	(Rp91)	(Rp1.530)	Rp0	Rp0	(Rp5.227)	(Rp295)
Financing Cash Flow						
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp547.271	Rp545.625	Rp546.955	Rp546.733	Rp540.428	Rp546.010
Cash – Beginning Balance	Rp9.539.091	Rp10.086.362	Rp10.631.987	Rp11.178.942	Rp11.725.674	Rp12.266.103
Cash – Ending Balance	Rp10.086.362	Rp10.631.987	Rp11.178.942	Rp11.725.674	Rp12.266.103	Rp12.812.113

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2066-2070)

Description	2066	2067	2068	2069	2070
Operational Cash Flow					
Sales	Rp3.059.705	Rp3.151.900	Rp3.247.551	Rp3.359.153	Rp3.463.493
Account Receivable	(Rp235.889)	(Rp243.001)	(Rp250.379)	(Rp259.065)	(Rp267.036)
Cost of Operation	(Rp1.482.585)	(Rp1.541.804)	(Rp1.603.242)	(Rp1.675.564)	(Rp1.741.940)
Operating Expense	(Rp653.997)	(Rp680.119)	(Rp707.220)	(Rp739.122)	(Rp768.401)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp141.175)	(Rp141.175)	(Rp141.156)	(Rp141.156)	(Rp141.093)
Total Operational Cash Flow	Rp546.058	Rp545.801	Rp545.553	Rp544.246	Rp545.023
Investment Cash Flow					
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	(Rp1.840)	Rp0	(Rp3.781)	(Rp44.497)
Total Investment Cash Flow	Rp0	(Rp1.840)	Rp0	(Rp3.781)	(Rp44.497)
Financing Cash Flow					
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp546.058	Rp543.961	Rp545.553	Rp540.465	Rp500.527
Cash – Beginning Balance	Rp12.812.113	Rp13.358.171	Rp13.902.133	Rp14.447.686	Rp14.988.150

Description	2066	2067	2068	2069	2070
Cash – Ending Balance	Rp13.358.171	Rp13.902.133	Rp14.447.686	Rp14.988.150	Rp15.488.677

BPS 1 – Cash Flow Statement Projection (in IDR, million) (2071-2075)

Description	2071	2072	2073	2074	2075
Operational Cash Flow					
Sales	Rp3.570.684	Rp3.681.866	Rp3.797.182	Rp3.916.781	Rp4.040.814
Account Receivable	(Rp275.304)	(Rp283.880)	(Rp292.775)	(Rp302.000)	(Rp311.568)
Cost of Operation	(Rp1.810.789)	(Rp1.882.202)	(Rp1.956.270)	(Rp2.033.088)	(Rp2.112.755)
Operating Expense	(Rp798.771)	(Rp830.272)	(Rp862.944)	(Rp896.829)	(Rp931.971)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp140.833)	(Rp140.833)	(Rp140.806)	(Rp140.736)	(Rp140.736)
Total Operational Cash Flow	Rp544.987	Rp544.679	Rp544.387	Rp544.126	Rp543.784
Investment Cash Flow					
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	(Rp4.503)	(Rp11.075)	(Rp16)	(Rp396)
Total Investment Cash Flow	Rp0	(Rp4.503)	(Rp11.075)	(Rp16)	(Rp396)
Financing Cash Flow					
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp544.987	Rp540.176	Rp533.312	Rp544.111	Rp543.389
Cash – Beginning Balance	Rp15.488.677	Rp16.033.664	Rp16.573.840	Rp17.107.151	Rp17.651.262
Cash – Ending Balance	Rp16.033.664	Rp16.573.840	Rp17.107.151	Rp17.651.262	Rp18.194.651

BPS 1 – Balance Sheet Projection (in IDR, million) (2021-2025)

Description	2021	2022	2023	2024	2025
ASSETS					
Current Assets					
Cash	Rp0	Rp0	Rp0	Rp0	Rp0
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp0	Rp0	Rp0	Rp0	Rp0
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2021	2022	2023	2024	2025
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp703.893	Rp2.162.817	Rp5.131.803	Rp6.904.182	Rp8.076.389
Routine CAPEX	Rp0	Rp0	Rp0	Rp0	Rp0
Accumulated Depreciation	Rp0	Rp0	Rp0	Rp0	Rp0
Total Fixed Assets	Rp703.893	Rp2.162.817	Rp5.131.803	Rp6.904.182	Rp8.076.389
TOTAL ASSETS	Rp703.893	Rp2.162.817	Rp5.131.803	Rp6.904.182	Rp8.076.389
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp453.752	Rp1.361.257	Rp3.176.266	Rp4.088.044	Rp4.546.689
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp453.752	Rp1.361.257	Rp3.176.266	Rp4.088.044	Rp4.546.689
TOTAL LIABILITIES	Rp453.752	Rp1.361.257	Rp3.176.266	Rp4.088.044	Rp4.546.689
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp250.141	Rp801.560	Rp1.955.536	Rp2.816.138	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp0	Rp0	Rp0	Rp0	Rp0
Profit this Year	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL EQUITIES	Rp250.141	Rp801.560	Rp1.955.536	Rp2.816.138	Rp3.529.699
TOTAL EQUITIES DAN LIABILITIES	Rp703.893	Rp2.162.817	Rp5.131.803	Rp6.904.182	Rp8.076.389

BPS 1 – Balance Sheet Projection (in IDR, million) (2026-2030)

Description	2026	2027	2028	2029	2030
ASSETS					
Current Assets					
Cash	Rp66.381	Rp173.450	Rp194.952	Rp203.201	Rp208.793

Description	2026	2027	2028	2029	2030
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp92.607	Rp100.517	Rp109.177	Rp104.912	Rp97.614
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp158.988	Rp273.967	Rp304.129	Rp308.112	Rp306.408
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp0	Rp1.191	Rp4.119	Rp4.119	Rp4.152
Accumulated Depreciation	(Rp203.883)	(Rp407.766)	(Rp611.728)	(Rp815.866)	(Rp1.020.004)
Total Fixed Assets	Rp7.872.506	Rp7.669.814	Rp7.468.781	Rp7.264.642	Rp7.060.537
TOTAL ASSETS	Rp8.031.494	Rp7.943.781	Rp7.772.909	Rp7.572.755	Rp7.366.945
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp4.524.002	Rp4.455.939	Rp4.297.126	Rp4.092.724	Rp3.865.389
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp4.524.002	Rp4.455.939	Rp4.297.126	Rp4.092.724	Rp3.865.389
TOTAL LIABILITIES	Rp4.524.002	Rp4.455.939	Rp4.297.126	Rp4.092.724	Rp3.865.389
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp0	(Rp22.207)	(Rp41.857)	(Rp53.916)	(Rp49.668)
Profit this Year	(Rp22.207)	(Rp19.650)	(Rp12.059)	Rp4.248	Rp21.525
TOTAL EQUITIES	Rp3.507.492	Rp3.487.842	Rp3.475.784	Rp3.480.031	Rp3.501.556
TOTAL EQUITIES DAN LIABILITIES	Rp8.031.494	Rp7.943.781	Rp7.772.909	Rp7.572.755	Rp7.366.945

BPS 1 – Balance Sheet Projection (in IDR, million) (2031-2035)

Description	2031	2032	2033	2034	2035
ASSETS					
Current Assets					
Cash	Rp223.903	Rp258.788	Rp312.818	Rp385.296	Rp477.481
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp99.418	Rp101.295	Rp103.246	Rp105.276	Rp107.387
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp323.322	Rp360.083	Rp416.064	Rp490.572	Rp584.868
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp4.783	Rp4.787	Rp4.787	Rp5.476	Rp5.598
Accumulated Depreciation	(Rp1.224.144)	(Rp1.428.308)	(Rp1.632.473)	(Rp1.836.637)	(Rp2.040.821)
Total Fixed Assets	Rp6.857.028	Rp6.652.868	Rp6.448.704	Rp6.245.228	Rp6.041.165
TOTAL ASSETS	Rp7.180.349	Rp7.012.951	Rp6.864.768	Rp6.735.800	Rp6.626.033
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp3.638.055	Rp3.410.720	Rp3.183.386	Rp2.956.051	Rp2.728.717
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp3.638.055	Rp3.410.720	Rp3.183.386	Rp2.956.051	Rp2.728.717
TOTAL LIABILITIES	Rp3.638.055	Rp3.410.720	Rp3.183.386	Rp2.956.051	Rp2.728.717
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	(Rp28.144)	Rp12.596	Rp72.532	Rp151.683	Rp250.050
Profit this Year	Rp40.739	Rp59.936	Rp79.151	Rp98.367	Rp117.568
TOTAL EQUITIES	Rp3.542.295	Rp3.602.231	Rp3.681.382	Rp3.779.749	Rp3.897.317
TOTAL EQUITIES DAN LIABILITIES	Rp7.180.349	Rp7.012.951	Rp6.864.768	Rp6.735.800	Rp6.626.033

BPS 1 – Balance Sheet Projection (in IDR, million) (2036-2040)

Description	2036	2037	2038	2039	2040
ASSETS					
Current Assets					
Cash	Rp588.920	Rp718.735	Rp868.433	Rp1.037.247	Rp1.206.852
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp109.581	Rp111.863	Rp114.235	Rp116.700	Rp119.263
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp698.501	Rp830.598	Rp982.667	Rp1.153.947	Rp1.326.115
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp5.598	Rp6.350	Rp6.350	Rp6.356	Rp24.688
Accumulated Depreciation	(Rp2.245.008)	(Rp2.449.196)	(Rp2.653.405)	(Rp2.857.613)	(Rp3.061.822)
Total Fixed Assets	Rp5.836.978	Rp5.633.543	Rp5.429.334	Rp5.225.131	Rp5.039.254
TOTAL ASSETS	Rp6.535.479	Rp6.464.141	Rp6.412.001	Rp6.379.078	Rp6.365.369
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp2.501.382	Rp2.274.048	Rp2.046.713	Rp1.819.379	Rp1.592.044
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp2.501.382	Rp2.274.048	Rp2.046.713	Rp1.819.379	Rp1.592.044
TOTAL LIABILITIES	Rp2.501.382	Rp2.274.048	Rp2.046.713	Rp1.819.379	Rp1.592.044
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp367.617	Rp504.398	Rp660.394	Rp835.589	Rp1.030.000
Profit this Year	Rp136.780	Rp155.996	Rp175.195	Rp194.411	Rp213.626
TOTAL EQUITIES	Rp4.034.097	Rp4.190.093	Rp4.365.288	Rp4.559.699	Rp4.773.325
TOTAL EQUITIES DAN LIABILITIES	Rp6.535.479	Rp6.464.141	Rp6.412.001	Rp6.379.078	Rp6.365.369

BPS 1 – Balance Sheet Projection (in IDR, million) (2041-2045)

Description	2041	2042	2043	2044	2045
ASSETS					
Current Assets					
Cash	Rp1.414.013	Rp1.638.430	Rp1.879.257	Rp2.143.779	Rp2.427.236
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp121.926	Rp124.695	Rp127.571	Rp130.560	Rp133.665
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp1.535.940	Rp1.763.125	Rp2.006.828	Rp2.274.339	Rp2.560.902
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp24.688	Rp26.543	Rp31.106	Rp31.106	Rp31.269
Accumulated Depreciation	(Rp3.266.465)	(Rp3.471.108)	(Rp3.675.795)	(Rp3.880.597)	(Rp4.085.400)
Total Fixed Assets	Rp4.834.611	Rp4.631.824	Rp4.431.699	Rp4.226.897	Rp4.022.258
TOTAL ASSETS	Rp6.370.551	Rp6.394.948	Rp6.438.527	Rp6.501.236	Rp6.583.160
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp1.364.710	Rp1.137.375	Rp910.041	Rp682.706	Rp455.372
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp1.364.710	Rp1.137.375	Rp910.041	Rp682.706	Rp455.372
TOTAL LIABILITIES	Rp1.364.710	Rp1.137.375	Rp910.041	Rp682.706	Rp455.372
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp1.243.626	Rp1.476.142	Rp1.727.873	Rp1.998.787	Rp2.288.830
Profit this Year	Rp232.516	Rp251.731	Rp270.914	Rp290.043	Rp309.259
TOTAL EQUITIES	Rp5.005.841	Rp5.257.573	Rp5.528.486	Rp5.818.530	Rp6.127.788

Description	2041	2042	2043	2044	2045
TOTAL EQUITIES DAN LIABILITIES	Rp6.370.551	Rp6.394.948	Rp6.438.527	Rp6.501.236	Rp6.583.160

BPS 1 – Balance Sheet Projection (in IDR, million) (2046-2050)

Description	2046	2047	2048	2049	2050
ASSETS					
Current Assets					
Cash	Rp2.732.456	Rp3.101.221	Rp3.574.070	Rp4.097.091	Rp4.645.865
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp136.892	Rp140.243	Rp143.725	Rp147.342	Rp151.098
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp2.869.347	Rp3.241.465	Rp3.717.795	Rp4.244.433	Rp4.796.962
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp32.258	Rp32.258	Rp32.258	Rp33.331	Rp33.391
Accumulated Depreciation	(Rp4.213.424)	(Rp4.341.487)	(Rp4.469.550)	(Rp4.597.613)	(Rp4.725.706)
Total Fixed Assets	Rp3.895.223	Rp3.767.160	Rp3.639.097	Rp3.512.107	Rp3.384.073
TOTAL ASSETS	Rp6.764.571	Rp7.008.625	Rp7.356.892	Rp7.756.540	Rp8.181.036
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp250.725	Rp91.453	Rp22.932	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp250.725	Rp91.453	Rp22.932	Rp0	Rp0
TOTAL LIABILITIES	Rp250.725	Rp91.453	Rp22.932	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2046	2047	2048	2049	2050
Retained Earnings	Rp2.598.089	Rp2.984.146	Rp3.387.472	Rp3.804.261	Rp4.226.841
Profit this Year	Rp386.057	Rp403.326	Rp416.788	Rp422.580	Rp424.496
TOTAL EQUITIES	Rp6.513.845	Rp6.917.171	Rp7.333.960	Rp7.756.540	Rp8.181.036
TOTAL EQUITIES DAN LIABILITIES	Rp6.764.571	Rp7.008.625	Rp7.356.892	Rp7.756.540	Rp8.181.036

BPS 1 – Balance Sheet Projection (in IDR, million) (2051-2055)

Description	2051	2052	2053	2054	2055
ASSETS					
Current Assets					
Cash	Rp5.194.554	Rp5.741.919	Rp6.290.302	Rp6.838.532	Rp7.357.884
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp154.998	Rp159.050	Rp163.256	Rp167.624	Rp172.159
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp5.349.552	Rp5.900.969	Rp6.453.558	Rp7.006.156	Rp7.530.043
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp33.391	Rp34.563	Rp34.572	Rp34.572	Rp63.283
Accumulated Depreciation	(Rp4.853.801)	(Rp4.981.896)	(Rp5.110.024)	(Rp5.238.153)	(Rp5.366.281)
Total Fixed Assets	Rp3.255.978	Rp3.129.056	Rp3.000.936	Rp2.872.808	Rp2.773.390
TOTAL ASSETS	Rp8.605.530	Rp9.030.025	Rp9.454.494	Rp9.878.964	Rp10.303.433
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					

Description	2051	2052	2053	2054	2055
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp4.651.336	Rp5.075.831	Rp5.500.326	Rp5.924.795	Rp6.349.265
Profit this Year	Rp424.495	Rp424.495	Rp424.470	Rp424.469	Rp424.469
TOTAL EQUITIES	Rp8.605.530	Rp9.030.025	Rp9.454.494	Rp9.878.964	Rp10.303.433
TOTAL EQUITIES DAN LIABILITIES	Rp8.605.530	Rp9.030.025	Rp9.454.494	Rp9.878.964	Rp10.303.433

BPS 1 – Balance Sheet Projection (in IDR, million) (2056-2060)

Description	2056	2057	2058	2059	2060
ASSETS					
Current Assets					
Cash	Rp7.905.942	Rp8.450.930	Rp8.991.530	Rp9.539.091	Rp10.086.362
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp176.868	Rp181.756	Rp186.830	Rp192.097	Rp197.564
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp8.082.810	Rp8.632.686	Rp9.178.360	Rp9.731.189	Rp10.283.926
Fixed Assets					
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp63.283	Rp66.173	Rp73.282	Rp73.282	Rp73.372
Accumulated Depreciation	(Rp5.495.083)	(Rp5.623.885)	(Rp5.752.756)	(Rp5.881.806)	(Rp6.010.856)
Total Fixed Assets	Rp2.644.588	Rp2.518.676	Rp2.396.914	Rp2.267.864	Rp2.138.905
TOTAL ASSETS	Rp10.727.398	Rp11.151.362	Rp11.575.275	Rp11.999.053	Rp12.422.832
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2056	2057	2058	2059	2060
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp6.773.734	Rp7.197.698	Rp7.621.663	Rp8.045.575	Rp8.469.354
Profit this Year	Rp423.964	Rp423.964	Rp423.913	Rp423.779	Rp423.779
TOTAL EQUITIES	Rp10.727.398	Rp11.151.362	Rp11.575.275	Rp11.999.053	Rp12.422.832
TOTAL EQUITIES DAN LIABILITIES	Rp10.727.398	Rp11.151.362	Rp11.575.275	Rp11.999.053	Rp12.422.832

BPS 1 – Balance Sheet Projection (in IDR, million) (2061-2065)

Description	2061	2062	2063	2064	2065
ASSETS					
Current Assets					
Cash	Rp10.631.987	Rp11.178.942	Rp11.725.674	Rp12.266.103	Rp12.812.113
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp203.239	Rp209.128	Rp215.239	Rp222.428	Rp229.035
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp10.835.225	Rp11.388.069	Rp11.940.914	Rp12.488.531	Rp13.041.147
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp74.902	Rp74.902	Rp74.902	Rp80.129	Rp80.423
Accumulated Depreciation	(Rp6.139.909)	(Rp6.269.022)	(Rp6.398.135)	(Rp6.527.248)	(Rp6.656.628)
Total Fixed Assets	Rp2.011.382	Rp1.882.269	Rp1.753.156	Rp1.629.269	Rp1.500.184
TOTAL ASSETS	Rp12.846.608	Rp13.270.339	Rp13.694.070	Rp14.117.801	Rp14.541.331
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2061	2062	2063	2064	2065
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp8.893.132	Rp9.316.909	Rp9.740.639	Rp10.164.370	Rp10.588.101
Profit this Year	Rp423.776	Rp423.731	Rp423.731	Rp423.731	Rp423.531
TOTAL EQUITIES	Rp12.846.608	Rp13.270.339	Rp13.694.070	Rp14.117.801	Rp14.541.331
TOTAL EQUITIES DAN LIABILITIES	Rp12.846.608	Rp13.270.339	Rp13.694.070	Rp14.117.801	Rp14.541.331

BPS 1 – Balance Sheet Projection (in IDR, million) (2066-2070)

Description	2066	2067	2068	2069	2070
ASSETS					
Current Assets					
Cash	Rp13.358.171	Rp13.902.133	Rp14.447.686	Rp14.988.150	Rp15.488.677
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp235.889	Rp243.001	Rp250.379	Rp259.065	Rp267.036
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp13.594.060	Rp14.145.133	Rp14.698.065	Rp15.247.215	Rp15.755.713
Fixed Assets					
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp80.423	Rp82.263	Rp82.263	Rp86.044	Rp130.541
Accumulated Depreciation	(Rp6.786.017)	(Rp6.915.405)	(Rp7.044.867)	(Rp7.174.329)	(Rp7.304.044)
Total Fixed Assets	Rp1.370.796	Rp1.243.247	Rp1.113.785	Rp988.104	Rp902.886
TOTAL ASSETS	Rp14.964.856	Rp15.388.380	Rp15.811.849	Rp16.235.319	Rp16.658.599
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2066	2067	2068	2069	2070
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp11.011.632	Rp11.435.157	Rp11.858.681	Rp12.282.150	Rp12.705.619
Profit this Year	Rp423.524	Rp423.524	Rp423.469	Rp423.469	Rp423.280
TOTAL EQUITIES	Rp14.964.856	Rp15.388.380	Rp15.811.849	Rp16.235.319	Rp16.658.599
TOTAL EQUITIES DAN LIABILITIES	Rp14.964.856	Rp15.388.380	Rp15.811.849	Rp16.235.319	Rp16.658.599

BPS 1 – Balance Sheet Projection (in IDR, million) (2071-2075)

Description	2071	2072	2073	2074	2075
ASSETS					
Current Assets					
Cash	Rp16.033.664	Rp16.573.840	Rp17.107.151	Rp17.651.262	Rp18.194.651
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp275.304	Rp283.880	Rp292.775	Rp302.000	Rp311.568
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp16.308.968	Rp16.857.720	Rp17.399.927	Rp17.953.263	Rp18.506.218
Fixed Assets	Rp0	Rp0	Rp0	Rp0	Rp0
Net Plant and Equipment	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389	Rp8.076.389
Routine CAPEX	Rp130.541	Rp135.044	Rp146.119	Rp146.135	Rp146.531
Accumulated Depreciation	(Rp7.434.801)	(Rp7.565.558)	(Rp7.696.423)	(Rp7.827.567)	(Rp7.958.711)
Total Fixed Assets	Rp772.129	Rp645.874	Rp526.085	Rp394.957	Rp264.209
TOTAL ASSETS	Rp17.081.096	Rp17.503.594	Rp17.926.011	Rp18.348.219	Rp18.770.427
LIABILITIES					
Current Liabilities					

Description	2071	2072	2073	2074	2075
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699	Rp3.529.699
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp13.128.899	Rp13.551.397	Rp13.973.895	Rp14.396.312	Rp14.818.520
Profit this Year	Rp422.498	Rp422.498	Rp422.417	Rp422.208	Rp422.208
TOTAL EQUITIES	Rp17.081.096	Rp17.503.594	Rp17.926.011	Rp18.348.219	Rp18.770.427
TOTAL EQUITIES DAN LIABILITIES	Rp17.081.096	Rp17.503.594	Rp17.926.011	Rp18.348.219	Rp18.770.427

BPS 1 – Free Cash Flow Projection (in IDR, million) (2021-2029)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029
Net profit	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp22.207)	(Rp19.650)	(Rp12.059)	Rp4.248
Depreciation Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp203.883	Rp203.883	Rp203.962	Rp204.138
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp384.309	Rp382.391	Rp376.638	Rp363.215
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp565.985	Rp566.624	Rp568.542	Rp571.600
Investment	(Rp703.893)	(Rp1.458.924)	(Rp2.968.986)	(Rp1.772.379)	(Rp1.172.207)	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	(Rp104.300)	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	(Rp703.893)	(Rp1.458.924)	(Rp2.968.986)	(Rp1.772.379)	(Rp1.276.507)	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	(Rp703.893)	(Rp1.458.924)	(Rp2.968.986)	(Rp1.772.379)	(Rp1.276.507)	Rp565.985	Rp566.624	Rp568.542	Rp571.600
Accumulated Net Cash Flow	(Rp703.893)	(Rp2.162.817)	(Rp5.131.803)	(Rp6.904.182)	(Rp8.180.689)	(Rp7.614.704)	(Rp7.048.080)	(Rp6.479.539)	(Rp5.907.938)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029
Discounted Cash Flow	Rp0	Rp0	Rp0	Rp0	(Rp8.180.689)	Rp522.003	Rp481.982	Rp446.032	Rp413.585
Accumulated Discounted Cash Flow	Rp0	Rp0	Rp0	Rp0	(Rp8.180.689)	(Rp7.658.686)	(Rp7.176.704)	(Rp6.730.672)	(Rp6.317.087)

BPS 1 – Free Cash Flow Projection (in IDR, million) (2030-2038)

Description	2030	2031	2032	2033	2034	2035	2036	2037	2038
Net profit	Rp21.525	Rp40.739	Rp59.936	Rp79.151	Rp98.367	Rp117.568	Rp136.780	Rp155.996	Rp175.195
Depreciation Expense	Rp204.138	Rp204.139	Rp204.164	Rp204.164	Rp204.164	Rp204.184	Rp204.187	Rp204.187	Rp204.209
Interest Expense x (1 - Tax)	Rp345.937	Rp326.722	Rp307.507	Rp288.291	Rp269.076	Rp249.860	Rp230.645	Rp211.429	Rp192.214
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp571.600	Rp571.601	Rp571.607	Rp571.607	Rp571.607	Rp571.612	Rp571.613	Rp571.613	Rp571.618
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp571.600	Rp571.601	Rp571.607	Rp571.607	Rp571.607	Rp571.612	Rp571.613	Rp571.613	Rp571.618
Accumulated Net Cash Flow	(Rp5.336.338)	(Rp4.764.737)	(Rp4.193.130)	(Rp3.621.523)	(Rp3.049.916)	(Rp2.478.305)	(Rp1.906.692)	(Rp1.335.079)	(Rp763.461)
Discounted Cash Flow	Rp381.445	Rp351.804	Rp324.469	Rp299.255	Rp276.000	Rp254.555	Rp234.774	Rp216.530	Rp199.705
Accumulated Discounted Cash Flow	(Rp5.935.642)	(Rp5.583.838)	(Rp5.259.369)	(Rp4.960.114)	(Rp4.684.114)	(Rp4.429.560)	(Rp4.194.786)	(Rp3.978.256)	(Rp3.778.551)

BPS 1 – Free Cash Flow Projection (in IDR, million) (2039-2047)

Description	2039	2040	2041	2042	2043	2044	2045	2046	2047
Net profit	Rp194.411	Rp213.626	Rp232.516	Rp251.731	Rp270.914	Rp290.043	Rp309.259	Rp386.057	Rp403.326
Depreciation Expense	Rp204.209	Rp204.209	Rp204.643	Rp204.643	Rp204.687	Rp204.802	Rp204.802	Rp128.024	Rp128.063
Interest Expense x (1 - Tax)	Rp172.998	Rp153.783	Rp134.568	Rp115.352	Rp96.137	Rp76.921	Rp57.706	Rp38.490	Rp21.193
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp571.618	Rp571.618	Rp571.727	Rp571.727	Rp571.738	Rp571.766	Rp571.766	Rp552.572	Rp552.582
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2039	2040	2041	2042	2043	2044	2045	2046	2047
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp571.618	Rp571.618	Rp571.727	Rp571.727	Rp571.738	Rp571.766	Rp571.766	Rp552.572	Rp552.582
Accumulated Net Cash Flow	(Rp191.843)	Rp379.775	Rp951.501	Rp1.523.228	Rp2.094.965	Rp2.666.732	Rp3.238.498	Rp3.791.070	Rp4.343.651
Discounted Cash Flow	Rp184.186	Rp169.873	Rp156.702	Rp144.525	Rp133.297	Rp122.945	Rp113.391	Rp101.069	Rp93.216
Accumulated Discounted Cash Flow	(Rp3.594.365)	(Rp3.424.491)	(Rp3.267.789)	(Rp3.123.263)	(Rp2.989.966)	(Rp2.867.022)	(Rp2.753.631)	(Rp2.652.562)	(Rp2.559.346)

BPS 1 – Free Cash Flow Projection (in IDR, million) (2048-2056)

Description	2048	2049	2050	2051	2052	2053	2054	2055	2056
Net profit	Rp416.788	Rp422.580	Rp424.496	Rp424.495	Rp424.495	Rp424.470	Rp424.469	Rp424.469	Rp423.964
Depreciation Expense	Rp128.063	Rp128.063	Rp128.093	Rp128.095	Rp128.095	Rp128.128	Rp128.128	Rp128.128	Rp128.802
Interest Expense x (1 - Tax)	Rp7.730	Rp1.938	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp552.582	Rp552.582	Rp552.589	Rp552.590	Rp552.590	Rp552.598	Rp552.598	Rp552.598	Rp552.766
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp552.582	Rp552.582	Rp552.589	Rp552.590	Rp552.590	Rp552.598	Rp552.598	Rp552.598	Rp552.766
Accumulated Net Cash Flow	Rp4.896.233	Rp5.448.814	Rp6.001.404	Rp6.553.993	Rp7.106.583	Rp7.659.181	Rp8.211.779	Rp8.764.376	Rp9.317.143
Discounted Cash Flow	Rp85.973	Rp79.292	Rp73.131	Rp67.448	Rp62.207	Rp57.374	Rp52.915	Rp48.803	Rp45.024
Accumulated Discounted Cash Flow	(Rp2.473.373)	(Rp2.394.082)	(Rp2.320.951)	(Rp2.253.502)	(Rp2.191.296)	(Rp2.133.922)	(Rp2.081.007)	(Rp2.032.204)	(Rp1.987.179)

BPS 1 – Free Cash Flow Projection (in IDR, million) (2057-2063)

Description	2057	2058	2059	2060	2061	2062	2063
Net profit	Rp423.964	Rp423.913	Rp423.779	Rp423.779	Rp423.776	Rp423.731	Rp423.731

Description	2057	2058	2059	2060	2061	2062	2063
Depreciation Expense	Rp128.802	Rp128.871	Rp129.050	Rp129.050	Rp129.053	Rp129.113	Rp129.113
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp552.766	Rp552.784	Rp552.828	Rp552.828	Rp552.829	Rp552.844	Rp552.844
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp552.766	Rp552.784	Rp552.828	Rp552.828	Rp552.829	Rp552.844	Rp552.844
Accumulated Net Cash Flow	Rp9.869.909	Rp10.422.693	Rp10.975.521	Rp11.528.349	Rp12.081.178	Rp12.634.022	Rp13.186.866
Discounted Cash Flow	Rp41.526	Rp38.300	Rp35.327	Rp32.581	Rp30.050	Rp27.715	Rp25.561
Accumulated Discounted Cash Flow	(Rp1.945.653)	(Rp1.907.353)	(Rp1.872.027)	(Rp1.839.445)	(Rp1.809.396)	(Rp1.781.681)	(Rp1.756.119)

BPS 1 – Free Cash Flow Projection (in IDR, million) (2064-2069)

Description	2064	2065	2066	2067	2068	2069
Net profit	Rp423.731	Rp423.531	Rp423.524	Rp423.524	Rp423.469	Rp423.469
Depreciation Expense	Rp129.113	Rp129.380	Rp129.388	Rp129.388	Rp129.462	Rp129.462
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp552.844	Rp552.911	Rp552.913	Rp552.913	Rp552.931	Rp552.931
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp552.844	Rp552.911	Rp552.913	Rp552.913	Rp552.931	Rp552.931

Description	2064	2065	2066	2067	2068	2069
Accumulated Net Cash Flow	Rp13.739.710	Rp14.292.621	Rp14.845.534	Rp15.398.447	Rp15.951.378	Rp16.504.310
Discounted Cash Flow	Rp23.575	Rp21.746	Rp20.056	Rp18.497	Rp17.061	Rp15.735
Accumulated Discounted Cash Flow	(Rp1.732.544)	(Rp1.710.798)	(Rp1.690.743)	(Rp1.672.245)	(Rp1.655.184)	(Rp1.639.450)

BPS 1 – Free Cash Flow Projection (in IDR, million) (2070-2075)

Description	2070	2071	2072	2073	2074	2075
Net profit	Rp423.280	Rp422.498	Rp422.498	Rp422.417	Rp422.208	Rp422.208
Depreciation Expense	Rp129.714	Rp130.757	Rp130.757	Rp130.865	Rp131.144	Rp131.144
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp104.300
Total Cash Inflow	Rp552.994	Rp553.255	Rp553.255	Rp553.282	Rp553.352	Rp657.652
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp552.994	Rp553.255	Rp553.255	Rp553.282	Rp553.352	Rp657.652
Accumulated Net Cash Flow	Rp17.057.304	Rp17.610.559	Rp18.163.814	Rp18.717.096	Rp19.270.448	Rp19.928.100
Discounted Cash Flow	Rp14.514	Rp13.392	Rp12.352	Rp11.392	Rp10.508	Rp11.518
Accumulated Discounted Cash Flow	(Rp1.624.936)	(Rp1.611.544)	(Rp1.599.192)	(Rp1.587.800)	(Rp1.577.292)	(Rp1.565.773)

BPS 1 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2026-2035)

Benefits Factors	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
BPS 1 Business Entity Operating Revenue	Rp18.024	Rp22.278	Rp26.770	Rp24.299	Rp20.116	Rp21.064	Rp22.050	Rp23.077	Rp24.146	Rp25.258
BPS 1 Business Entity Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-

Benefits Factors	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp23.219	Rp28.699	Rp34.486	Rp31.303	Rp25.914	Rp27.135	Rp28.406	Rp29.729	Rp31.106	Rp32.538
Avoided Land Acquisition Cost	Rp-	Rp50.285	Rp96.520	Rp146.276	Rp199.747	Rp257.135	Rp318.652	Rp384.521	Rp454.974	Rp530.254
Carbon Credit Savings Gained through WTE Operation	Rp155.166	Rp191.786	Rp230.463	Rp209.188	Rp173.173	Rp181.334	Rp189.829	Rp198.671	Rp207.872	Rp217.446
Total Benefits	Rp196.409	Rp293.047	Rp388.239	Rp411.066	Rp418.949	Rp486.667	Rp558.938	Rp635.998	Rp718.098	Rp805.497

BPS 1 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2036-2045)

Benefits Factors	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
BPS 1 Business Entity Operating Revenue	Rp26.415	Rp27.619	Rp28.872	Rp30.174	Rp31.529	Rp32.938	Rp34.403	Rp35.926	Rp37.510	Rp39.156
BPS 1 Business Entity Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp34.029	Rp35.580	Rp37.193	Rp38.871	Rp40.616	Rp42.431	Rp44.319	Rp46.281	Rp48.321	Rp50.442
Avoided Land Acquisition Cost	Rp610.616	Rp696.327	Rp787.664	Rp884.920	Rp988.398	Rp1.098.419	Rp1.215.316	Rp1.339.436	Rp1.471.144	Rp1.610.820
Carbon Credit Savings Gained through WTE Operation	Rp227.408	Rp237.772	Rp248.552	Rp259.766	Rp271.429	Rp283.558	Rp296.170	Rp309.284	Rp322.918	Rp337.092
Total Benefits	Rp898.469	Rp997.297	Rp1.102.281	Rp1.213.731	Rp1.331.973	Rp1.457.346	Rp1.590.207	Rp1.730.927	Rp1.879.893	Rp2.037.511

BPS 1 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2046-2055)

Benefits Factors	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
BPS 1 Business Entity Operating Revenue	Rp40.868	Rp42.647	Rp44.495	Rp46.417	Rp48.413	Rp50.488	Rp52.644	Rp54.883	Rp57.210	Rp59.626
BPS 1 Business Entity Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp52.647	Rp54.938	Rp57.320	Rp59.795	Rp62.368	Rp65.040	Rp67.817	Rp70.702	Rp73.699	Rp76.812
Avoided Land Acquisition Cost	Rp1.758.863	Rp1.915.688	Rp2.081.728	Rp2.257.438	Rp2.443.291	Rp2.639.782	Rp2.847.427	Rp3.066.766	Rp3.298.362	Rp3.542.802
Carbon Credit Savings Gained through WTE Operation	Rp351.825	Rp367.140	Rp383.056	Rp399.597	Rp416.786	Rp434.646	Rp453.203	Rp472.482	Rp492.510	Rp513.315
Total Benefits	Rp2.204.203	Rp2.380.412	Rp2.566.600	Rp2.763.247	Rp2.970.858	Rp3.189.956	Rp3.421.091	Rp3.664.833	Rp3.921.780	Rp4.192.554

BPS 1 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2056-2065)

Benefits Factors	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
BPS 1 Business Entity Operating Revenue	Rp62.136	Rp64.743	Rp67.451	Rp70.263	Rp73.182	Rp76.214	Rp79.362	Rp82.630	Rp86.023	Rp89.545

Benefits Factors	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
BPS 1 Business Entity Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp80.046	Rp83.404	Rp86.892	Rp90.514	Rp94.276	Rp98.181	Rp102.236	Rp106.446	Rp110.817	Rp115.354
Avoided Land Acquisition Cost	Rp3.800.700	Rp4.072.696	Rp4.359.459	Rp4.661.685	Rp4.980.102	Rp5.315.470	Rp5.668.579	Rp6.040.255	Rp6.431.360	Rp6.842.792
Carbon Credit Savings Gained through WTE Operation	Rp534.924	Rp557.368	Rp580.677	Rp604.883	Rp630.019	Rp656.119	Rp683.218	Rp711.352	Rp740.559	Rp770.878
Total Benefits	Rp4.477.805	Rp4.778.211	Rp5.094.479	Rp5.427.345	Rp5.777.580	Rp6.145.984	Rp6.533.395	Rp6.940.683	Rp7.368.758	Rp7.818.568

BPS 1 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2066-2075)

Benefits Factors	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
BPS 1 Business Entity Operating Revenue	Rp93.200	Rp96.995	Rp100.933	Rp105.020	Rp109.262	Rp113.664	Rp118.231	Rp122.971	Rp127.888	Rp132.989
BPS 1 Business Entity Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp218.742
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp120.063	Rp124.951	Rp130.025	Rp135.290	Rp140.754	Rp146.425	Rp152.309	Rp158.414	Rp164.748	Rp171.320
Avoided Land Acquisition Cost	Rp7.275.486	Rp7.730.421	Rp8.208.612	Rp8.711.123	Rp9.239.059	Rp9.793.573	Rp10.375.867	Rp10.987.195	Rp11.628.859	Rp12.302.222
Carbon Credit Savings Gained through WTE Operation	Rp802.350	Rp835.017	Rp868.922	Rp904.109	Rp940.625	Rp978.519	Rp1.017.840	Rp1.058.639	Rp1.100.970	Rp1.144.889
Total Benefits	Rp8.291.100	Rp8.787.384	Rp9.308.492	Rp9.855.542	Rp10.429.701	Rp11.032.181	Rp11.664.247	Rp12.327.218	Rp13.022.466	Rp13.970.162

BPS 1 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2026-2035)

Costs Factors	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp22.241	Rp16.742	Rp6.371	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp18.902	Rp19.816	Rp20.767	Rp21.758	Rp22.790	Rp23.864	Rp24.982	Rp26.145	Rp27.356	Rp28.616
AP to BPS 1 Business Entity	Rp1.111.289	Rp1.206.204	Rp1.310.120	Rp1.258.939	Rp1.171.372	Rp1.193.021	Rp1.215.538	Rp1.238.958	Rp1.263.313	Rp1.288.640
Total Costs	Rp1.152.432	Rp1.242.761	Rp1.337.259	Rp1.280.698	Rp1.194.162	Rp1.216.885	Rp1.240.520	Rp1.265.103	Rp1.290.670	Rp1.317.256

BPS 1 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2036-2045)

Costs Factors	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp29.927	Rp31.291	Rp32.710	Rp34.186	Rp35.721	Rp37.317	Rp38.977	Rp40.702	Rp42.497	Rp44.362
AP to BPS 1 Business Entity	Rp1.314.974	Rp1.342.352	Rp1.370.815	Rp1.400.402	Rp1.431.155	Rp1.463.117	Rp1.496.334	Rp1.530.852	Rp1.566.719	Rp1.603.985
Total Costs	Rp1.344.901	Rp1.373.643	Rp1.403.525	Rp1.434.587	Rp1.466.875	Rp1.500.434	Rp1.535.311	Rp1.571.554	Rp1.609.215	Rp1.648.347

BPS 1 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2046-2055)

Costs Factors	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp46.301	Rp48.316	Rp50.411	Rp52.588	Rp54.850	Rp57.200	Rp59.642	Rp62.180	Rp64.815	Rp67.553
AP to BPS 1 Business Entity	Rp1.642.701	Rp1.682.921	Rp1.724.701	Rp1.768.098	Rp1.813.171	Rp1.859.982	Rp1.908.594	Rp1.959.074	Rp2.011.489	Rp2.065.911
Total Costs	Rp1.689.002	Rp1.731.238	Rp1.775.112	Rp1.820.686	Rp1.868.021	Rp1.917.182	Rp1.968.237	Rp2.021.254	Rp2.076.305	Rp2.133.464

BPS 1 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2056-2065)

Costs Factors	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp70.397	Rp73.351	Rp76.418	Rp79.604	Rp82.912	Rp86.347	Rp89.913	Rp93.615	Rp97.459	Rp101.449
AP to BPS 1 Business Entity	Rp2.122.413	Rp2.181.070	Rp2.241.961	Rp2.305.167	Rp2.370.772	Rp2.438.864	Rp2.509.532	Rp2.582.870	Rp2.669.140	Rp2.748.416
Total Costs	Rp2.192.810	Rp2.254.420	Rp2.318.379	Rp2.384.771	Rp2.453.684	Rp2.525.210	Rp2.599.445	Rp2.676.485	Rp2.766.599	Rp2.849.865

BPS 1 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2066-2075)

Costs Factors	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-

Costs Factors	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp105.591	Rp109.890	Rp114.352	Rp118.982	Rp123.788	Rp128.775	Rp133.950	Rp139.319	Rp144.890	Rp150.670
AP to BPS 1 Business Entity	Rp2.830.670	Rp2.916.011	Rp3.004.550	Rp3.108.774	Rp3.204.428	Rp3.303.648	Rp3.406.562	Rp3.513.302	Rp3.624.006	Rp3.738.814
Total Costs	Rp2.936.261	Rp3.025.901	Rp3.118.902	Rp3.227.757	Rp3.328.216	Rp3.432.423	Rp3.540.512	Rp3.652.621	Rp3.768.895	Rp3.889.483

Attachment 2: Business Plan Scenario 2 and Business Plant Scenario 3 (PT Y) – Integrated MSW Recycling Plant Detailed Information

BPS 2 and BPS 3 (PT Y) – Recapitulation of Assets Requirement per Year (2026-2035)

Process	Code	Description	Units	Units Needed									
				2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
General (1)	1.1	Integrated MSW Recycling Infrastructure	Plant	1	1	1	1	1	1	1	1	1	1
	1.2	Land Acquisition Fee	m ²	8.135	8.999	9.867	10.821	11.741	12.688	12.822	13.003	13.136	13.282
	1.4	Office Equipment	Workers Equivalent Unit	62	72	82	97	109	121	121	125	127	129
	1.5	Operational and Safety Equipment	Workers Equivalent Unit	62	72	82	97	109	121	121	125	127	129
	1.6	Supporting Equipment	Workers Equivalent Unit	62	72	82	97	109	121	121	125	127	129
	1.7	Laboratory Equipment	Lab	3	3	3	3	3	3	3	3	3	3
	1.8	Belt Conveyor	m	57	66	103	129	133	183	183	206	206	211
	1.9	Bulldozer	Unit	1	1	1	1	1	1	1	1	1	1
	1.10	Dump Truck	Unit	1	1	1	1	1	1	1	1	1	1
	Organic (2)	2.1	Compost Turning Machine	Unit	1	1	1	1	1	1	1	1	1
2.2		Semi-Wet Material Crusher	Unit	2	2	2	3	3	3	3	4	4	4
2.3		Sieving Machine	Unit	1	1	1	1	2	2	2	2	2	2
2.4		Mixing Machine	Unit	2	3	3	4	4	4	4	5	5	5
2.5		Granulator	Unit	1	1	2	2	2	2	2	2	2	2
2.6		Drying Machine	Unit	1	1	1	2	2	2	2	2	2	2
2.7		Cooling Machine	Unit	2	2	2	3	3	3	3	3	3	3
2.8		Screener Machine	Unit	2	2	2	3	3	3	3	4	4	4
2.9		Coating Machine	Unit	1	2	2	2	2	2	2	3	3	3
2.10		Packing Machine	Unit	1	2	2	2	2	3	3	3	3	3
Inorganic (3)	3.1	Plastic Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.2	Glass Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.3	Metal Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.4	Rubber Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.5	Textile and Paper Recycling Line	Unit	2	2	2	3	3	3	3	3	3	4
Process	Code	Intangible Assets	Units	Units Needed									
				2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 2 and BPS 3 (PT Y) – Recapitulation of Assets Requirement per Year (2036-2045)

Process	Code	Description	Units	Units Needed										
				2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
General (1)	1.1	Integrated MSW Recycling Infrastructure	Plant	1	1	1	1	1	1	1	1	1	1	
	1.2	Land Acquisition Fee	m ²	13.415	13.549	13.682	13.839	13.973	14.106	14.239	14.373	14.506	14.639	
	1.4	Office Equipment	Workers Equivalent Unit	131	131	133	136	138	140	142	144	146	146	
	1.5	Operational and Safety Equipment	Workers Equivalent Unit	131	131	133	136	138	140	142	144	146	146	
	1.6	Supporting Equipment	Workers Equivalent Unit	131	131	133	136	138	140	142	144	146	146	
	1.7	Laboratory Equipment	Lab	3	3	3	3	3	3	3	3	3	3	3
	1.8	Belt Conveyor	m	211	211	211	223	223	223	223	223	223	223	223
	1.9	Bulldozer	Unit	1	1	1	1	1	1	1	1	1	1	1
	1.10	Dump Truck	Unit	1	1	1	1	1	1	1	1	1	1	1
	Organic (2)	2.1	Compost Turning Machine	Unit	1	1	1	1	1	1	1	1	1	1
2.2		Semi-Wet Material Crusher	Unit	4	4	4	4	4	4	4	4	4	4	
2.3		Sieving Machine	Unit	2	2	2	2	2	2	2	2	2	2	
2.4		Mixing Machine	Unit	5	5	5	5	5	5	5	5	5	5	
2.5		Granulator	Unit	2	2	2	3	3	3	3	3	3	3	
2.6		Drying Machine	Unit	2	2	2	2	2	2	2	2	2	2	
2.7		Cooling Machine	Unit	3	3	3	4	4	4	4	4	4	4	
2.8		Screener Machine	Unit	4	4	4	4	4	4	4	4	4	4	
2.9		Coating Machine	Unit	3	3	3	3	3	3	3	3	3	3	
2.10		Packing Machine	Unit	3	3	3	3	3	3	3	3	3	3	
Inorganic (3)	3.1	Plastic Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1	
	3.2	Glass Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1	
	3.3	Metal Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1	
	3.4	Rubber Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1	
	3.5	Textile and Paper Recycling Line	Unit	4	4	4	4	4	4	4	4	4	4	
Process	Code	Intangible Assets	Units	Units Needed										
				2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
	1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1	

BPS 2 and BPS 3 (PT Y) – Recapitulation of Assets Requirement per Year (2046-2055)

Process	Code	Description	Units	Units Needed									
				2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
General (1)	1.1	Integrated MSW Recycling Infrastructure	Plant	1	1	1	1	1	1	1	1	1	1
	1.2	Land Acquisition Fee	m ²	14.773	14.906	15.039	15.185	15.318	15.451	15.585	15.718	15.887	16.021
	1.4	Office Equipment	Workers Equivalent Unit	148	150	152	154	154	156	158	160	162	164
	1.5	Operational and Safety Equipment	Workers Equivalent Unit	148	150	152	154	154	156	158	160	162	164
	1.6	Supporting Equipment	Workers Equivalent Unit	148	150	152	154	154	156	158	160	162	164
	1.7	Laboratory Equipment	Lab	3	3	3	3	3	3	3	3	3	3
	1.8	Belt Conveyor	m	223	223	223	229	229	286	286	286	307	307
	1.9	Bulldozer	Unit	1	1	1	1	1	1	1	1	1	1
	1.10	Dump Truck	Unit	1	1	1	1	1	1	1	1	1	1
	Organic (2)	2.1	Compost Turning Machine	Unit	1	1	1	1	1	1	1	1	1
2.2		Semi-Wet Material Crusher	Unit	4	4	4	4	4	4	4	4	5	5
2.3		Sieving Machine	Unit	2	2	2	2	2	2	2	2	2	2
2.4		Mixing Machine	Unit	5	5	5	6	6	6	6	6	6	6
2.5		Granulator	Unit	3	3	3	3	3	3	3	3	3	3
2.6		Drying Machine	Unit	2	2	2	2	2	2	2	2	3	3
2.7		Cooling Machine	Unit	4	4	4	4	4	4	4	4	4	4
2.8		Screener Machine	Unit	4	4	4	4	4	4	4	4	5	5
2.9		Coating Machine	Unit	3	3	3	3	3	3	3	3	3	3
2.10		Packing Machine	Unit	3	3	3	3	3	3	3	3	3	3
Inorganic (3)	3.1	Plastic Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.2	Glass Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.3	Metal Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.4	Rubber Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.5	Textile and Paper Recycling Line	Unit	4	4	4	4	4	4	4	4	4	4
Process	Code	Intangible Assets	Units	Units Needed									
				2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
	1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 2 and BPS 3 (PT Y) – Recapitulation of Assets Requirement per Year (2056-2065)

Process	Code	Description	Units	Units Needed									
				2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
General (1)	1.1	Integrated MSW Recycling Infrastructure	Plant	1	1	1	1	1	1	1	1	1	1
	1.2	Land Acquisition Fee	m ²	16.154	16.299	16.433	16.566	16.711	16.845	16.990	17.124	17.281	17.414
	1.4	Office Equipment	Workers Equivalent Unit	166	168	170	172	174	176	178	181	181	183
	1.5	Operational and Safety Equipment	Workers Equivalent Unit	166	168	170	172	174	176	178	181	181	183
	1.6	Supporting Equipment	Workers Equivalent Unit	166	168	170	172	174	176	178	181	181	183
	1.7	Laboratory Equipment	Lab	3	3	3	3	3	3	3	3	3	3
	1.8	Belt Conveyor	m	307	314	314	314	321	321	329	329	343	343
	1.9	Bulldozer	Unit	1	1	1	1	1	1	1	1	1	1
	1.10	Dump Truck	Unit	1	1	1	1	1	1	1	1	1	1
	Organic (2)	2.1	Compost Turning Machine	Unit	1	1	1	1	1	1	1	1	1
2.2		Semi-Wet Material Crusher	Unit	5	5	5	5	5	5	5	5	5	5
2.3		Sieving Machine	Unit	2	2	2	2	2	2	2	2	2	2
2.4		Mixing Machine	Unit	6	6	6	6	6	6	6	6	7	7
2.5		Granulator	Unit	3	3	3	3	3	3	3	3	3	3
2.6		Drying Machine	Unit	3	3	3	3	3	3	3	3	3	3
2.7		Cooling Machine	Unit	4	4	4	4	4	4	5	5	5	5
2.8		Screener Machine	Unit	5	5	5	5	5	5	5	5	5	5
2.9		Coating Machine	Unit	3	3	3	3	3	3	3	3	4	4
2.10		Packing Machine	Unit	3	3	3	3	4	4	4	4	4	4
Inorganic (3)	3.1	Plastic Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.2	Glass Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.3	Metal Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.4	Rubber Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.5	Textile and Paper Recycling Line	Unit	4	5	5	5	5	5	5	5	5	5
Process	Code	Intangible Assets	Units	Units Needed									
				2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
	1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 2 and BPS 3 (PT Y) – Recapitulation of Assets Requirement per Year (2066-2075)

Process	Code	Description	Units	Units Needed									
				2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
General (1)	1.1	Integrated MSW Recycling Infrastructure	Plant	1	1	1	1	1	1	1	1	1	1
	1.2	Land Acquisition Fee	m ²	17.548	17.681	17.814	17.948	18.101	18.235	18.368	18.501	18.647	18.816
	1.4	Office Equipment	Workers Equivalent Unit	185	187	189	191	191	193	195	197	199	201
	1.5	Operational and Safety Equipment	Workers Equivalent Unit	185	187	189	191	191	193	195	197	199	201
	1.6	Supporting Equipment	Workers Equivalent Unit	185	187	189	191	191	193	195	197	199	201
	1.7	Laboratory Equipment	Lab	3	3	3	3	3	3	3	3	3	3
	1.8	Belt Conveyor	m	343	343	343	343	343	411	411	411	420	446
	1.9	Bulldozer	Unit	1	1	1	1	1	1	1	1	1	1
	1.10	Dump Truck	Unit	1	1	1	1	2	2	2	2	2	2
	Organic (2)	2.1	Compost Turning Machine	Unit	1	1	1	1	1	1	1	1	1
2.2		Semi-Wet Material Crusher	Unit	5	5	5	5	5	5	5	5	5	6
2.3		Sieving Machine	Unit	2	2	2	2	2	2	2	2	2	3
2.4		Mixing Machine	Unit	7	7	7	7	7	7	7	7	7	7
2.5		Granulator	Unit	3	3	3	3	3	3	3	3	4	4
2.6		Drying Machine	Unit	3	3	3	3	3	3	3	3	3	3
2.7		Cooling Machine	Unit	5	5	5	5	5	5	5	5	5	5
2.8		Screener Machine	Unit	5	5	5	5	5	5	5	5	5	6
2.9		Coating Machine	Unit	4	4	4	4	4	4	4	4	4	4
2.10		Packing Machine	Unit	4	4	4	4	4	4	4	4	4	4
Inorganic (3)	3.1	Plastic Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.2	Glass Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.3	Metal Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.4	Rubber Recycling Line	Unit	1	1	1	1	1	1	1	1	1	1
	3.5	Textile and Paper Recycling Line	Unit	5	5	5	5	5	5	5	5	5	5
Process	Code	Intangible Assets	Units	Units Needed									
				2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
	1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2025-2032)

Code	Tangible Assets	Initial CAPEX		Routine CAPEX					
		2025	2026	2027	2028	2029	2030	2031	2032
1.1	Integrated MSW Recycling Infrastructure	Rp42.436.954.427	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp18.872.679.119	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp1.075.080.000	Rp-	Rp47.517.711	Rp861.232.785	Rp97.345.257	Rp65.359.872	Rp954.931.384	Rp85.525.429
1.5	Operational and Safety Equipment	Rp100.030.000	Rp-	Rp6.715.497	Rp90.335.741	Rp14.248.942	Rp7.732.358	Rp100.527.263	Rp16.898.467
1.6	Supporting Equipment	Rp72.520.000	Rp-	Rp-	Rp-	Rp-	Rp29.944.049	Rp-	Rp-
1.7	Laboratory Equipment	Rp600.000.000	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.8	Belt Conveyor	Rp306.348.571	Rp-	Rp33.645.686	Rp150.171.911	Rp107.084.124	Rp18.382.775	Rp220.899.675	Rp-
1.9	Bulldozer	Rp965.930.000	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.10	Dump Truck	Rp402.470.000	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.1	Compost Turning Machine	Rp125.570.000	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.2	Semi-Wet Material Crusher	Rp273.679.476	Rp-	Rp-	Rp-	Rp154.014.331	Rp-	Rp-	Rp-
2.3	Sieving Machine	Rp119.131.066	Rp-	Rp-	Rp-	Rp-	Rp138.105.556	Rp-	Rp-
2.4	Mixing Machine	Rp772.742.050	Rp-	Rp409.901.020	Rp-	Rp434.863.992	Rp-	Rp-	Rp-
2.5	Granulator	Rp149.718.772	Rp-	Rp-	Rp163.601.745	Rp-	Rp-	Rp-	Rp-
2.6	Drying Machine	Rp2.653.419.111	Rp-	Rp-	Rp-	Rp2.986.446.587	Rp-	Rp-	Rp-
2.7	Cooling Machine	Rp1.609.879.270	Rp-	Rp-	Rp-	Rp905.966.651	Rp-	Rp-	Rp-
2.8	Screener Machine	Rp643.951.708	Rp-	Rp-	Rp-	Rp362.386.660	Rp-	Rp-	Rp-
2.9	Coating Machine	Rp257.580.683	Rp-	Rp273.267.347	Rp-	Rp-	Rp-	Rp-	Rp-
2.10	Packing Machine	Rp222.968.279	Rp-	Rp236.547.047	Rp-	Rp-	Rp-	Rp266.235.785	Rp-
3.1	Plastic Recycling Line	Rp482.963.781	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.2	Glass Recycling Line	Rp724.445.671	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.3	Metal Recycling Line	Rp1.609.879.270	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.4	Rubber Recycling Line	Rp494.071.948	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.5	Textile and Paper Recycling Line	Rp1.609.879.270	Rp-	Rp-	Rp-	Rp905.966.651	Rp-	Rp-	Rp-
Code	Intangible Assets	Initial CAPEX		Routine CAPEX					
		2025	2026	2027	2028	2029	2030	2031	2032
1	Legal Document + Notary Fee	Rp1.330.108.585	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2033-2039)

Code	Tangible Assets	Routine CAPEX						
		2033	2034	2035	2036	2037	2038	2039
1.1	Integrated MSW Recycling Infrastructure	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp130.147.958	Rp1.043.479.306	Rp109.031.936	Rp128.346.164	Rp1.140.238.012	Rp119.142.140	Rp196.651.790

Code	Tangible Assets	Routine CAPEX						
		2033	2034	2035	2036	2037	2038	2039
1.5	Operational and Safety Equipment	Rp18.393.502	Rp109.627.043	Rp35.237.487	Rp17.995.040	Rp121.317.994	Rp16.491.634	Rp35.848.376
1.6	Supporting Equipment	Rp-	Rp-	Rp95.565.894	Rp-	Rp-	Rp-	Rp-
1.7	Laboratory Equipment	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.8	Belt Conveyor	Rp107.132.555	Rp-	Rp28.414.232	Rp-	Rp-	Rp-	Rp63.960.937
1.9	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.10	Dump Truck	Rp-	Rp-	Rp540.886.025	Rp-	Rp-	Rp-	Rp-
2.1	Compost Turning Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.2	Semi-Wet Material Crusher	Rp173.344.486	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.3	Sieving Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.4	Mixing Machine	Rp489.443.254	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.5	Granulator	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp226.463.076
2.6	Drying Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.7	Cooling Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp1.217.543.421
2.8	Screener Machine	Rp407.869.379	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.9	Coating Machine	Rp326.295.503	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.10	Packing Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.1	Plastic Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.2	Glass Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.3	Metal Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.4	Rubber Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.5	Textile and Paper Recycling Line	Rp-	Rp-	Rp1.081.771.560	Rp-	Rp-	Rp-	Rp-
Code	Intangible Assets	Routine CAPEX						
		2033	2034	2035	2036	2037	2038	2039
1	Legal Document + Notary Fee	Rp-	Rp -	Rp	Rp	Rp	Rp	Rp

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2040-2046)

Code	Tangible Assets	Routine CAPEX						
		2040	2041	2042	2043	2044	2045	2046
1.1	Integrated MSW Recycling Infrastructure	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp1.711.053.295	Rp130.189.833	Rp208.126.574	Rp1.361.503.816	Rp171.983.874	Rp227.425.527	Rp1.487.751.981
1.5	Operational and Safety Equipment	Rp131.819.623	Rp18.470.171	Rp25.586.081	Rp146.817.827	Rp18.902.795	Rp55.339.248	Rp164.636.070
1.6	Supporting Equipment	Rp42.439.032	Rp-	Rp-	Rp-	Rp-	Rp128.432.570	Rp-
1.7	Laboratory Equipment	Rp934.780.450	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.8	Belt Conveyor	Rp329.398.825	Rp-	Rp52.418.882	Rp233.962.944	Rp166.833.576	Rp28.639.764	Rp344.154.496

Code	Tangible Assets	Routine CAPEX						
		2040	2041	2042	2043	2044	2045	2046
1.9	Bulldozer	Rp1.504.887.467	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.10	Dump Truck	Rp-	Rp-	Rp-	Rp-	Rp-	Rp726.905.589	Rp-
2.1	Compost Turning Machine	Rp195.633.969	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.2	Semi-Wet Material Crusher	Rp426.383.706	Rp-	Rp-	Rp-	Rp239.949.309	Rp-	Rp-
2.3	Sieving Machine	Rp185.602.319	Rp-	Rp-	Rp-	Rp-	Rp215.163.957	Rp-
2.4	Mixing Machine	Rp1.203.906.935	Rp-	Rp638.612.433	Rp-	Rp677.503.931	Rp-	Rp-
2.5	Granulator	Rp233.256.969	Rp-	Rp-	Rp254.886.188	Rp-	Rp-	Rp-
2.6	Drying Machine	Rp4.133.940.518	Rp-	Rp-	Rp-	Rp4.652.786.473	Rp-	Rp-
2.7	Cooling Machine	Rp2.508.139.447	Rp-	Rp-	Rp-	Rp1.411.466.522	Rp-	Rp-
2.8	Screener Machine	Rp1.003.255.779	Rp-	Rp-	Rp-	Rp564.586.609	Rp-	Rp-
2.9	Coating Machine	Rp401.302.312	Rp-	Rp425.741.622	Rp-	Rp-	Rp-	Rp-
2.10	Packing Machine	Rp347.377.313	Rp-	Rp368.532.592	Rp-	Rp-	Rp-	Rp414.786.679
3.1	Plastic Recycling Line	Rp752.441.834	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.2	Glass Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp1.308.429.466	Rp-
3.3	Metal Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp2.907.621.036	Rp-
3.4	Rubber Recycling Line	Rp769.747.996	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.5	Textile and Paper Recycling Line	Rp2.508.139.447	Rp-	Rp-	Rp-	Rp1.411.466.522	Rp-	Rp-
Code	Intangible Assets	Routine CAPEX						
		2040	2041	2042	2043	2044	2045	2046
1	Legal Document + Notary Fee	Rp-	Rp -	Rp	Rp	Rp	Rp	Rp

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2047-2053)

Code	Tangible Assets	Routine CAPEX						
		2047	2048	2049	2050	2051	2052	2053
1.1	Integrated MSW Recycling Infrastructure	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp155.453.470	Rp248.514.013	Rp1.649.266.842	Rp169.868.203	Rp249.948.928	Rp1.802.198.409	Rp185.619.572
1.5	Operational and Safety Equipment	Rp24.047.098	Rp31.715.535	Rp182.118.024	Rp24.978.771	Rp34.052.576	Rp189.387.101	Rp39.672.666
1.6	Supporting Equipment	Rp-	Rp-	Rp-	Rp54.082.284	Rp-	Rp-	Rp-
1.7	Laboratory Equipment	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.8	Belt Conveyor	Rp-	Rp166.909.031	Rp42.979.075	Rp44.268.448	Rp455.965.011	Rp-	Rp-
1.9	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.10	Dump Truck	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.1	Compost Turning Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-

Code	Tangible Assets	Routine CAPEX						
		2047	2048	2049	2050	2051	2052	2053
2.2	Semi-Wet Material Crusher	Rp-	Rp270.065.061	Rp-	Rp-	Rp-	Rp-	Rp-
2.3	Sieving Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.4	Mixing Machine	Rp-	Rp762.536.643	Rp785.412.742	Rp-	Rp-	Rp-	Rp-
2.5	Granulator	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.6	Drying Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.7	Cooling Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2.8	Screener Machine	Rp-	Rp635.447.202	Rp-	Rp-	Rp-	Rp-	Rp-
2.9	Coating Machine	Rp-	Rp508.357.762	Rp-	Rp-	Rp-	Rp-	Rp-
2.10	Packing Machine	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.1	Plastic Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.2	Glass Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.3	Metal Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.4	Rubber Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.5	Textile and Paper Recycling Line	Rp-	Rp-	Rp-	Rp1.685.364.842	Rp-	Rp-	Rp-
Code	Intangible Assets	Routine CAPEX						
		2047	2048	2049	2050	2051	2052	2053
1	Legal Document + Notary Fee	Rp-	Rp -	Rp	Rp	Rp	Rp	Rp

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2054-2060)

Code	Tangible Assets	Routine CAPEX						
		2054	2055	2056	2057	2058	2059	2060
1.1	Integrated MSW Recycling Infrastructure	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp411.927.650	Rp2.693.897.254	Rp202.831.518	Rp443.635.257	Rp2.151.919.149	Rp267.945.271	Rp525.376.259
1.5	Operational and Safety Equipment	Rp52.056.532	Rp244.765.148	Rp27.650.889	Rp61.956.491	Rp227.331.653	Rp40.514.156	Rp80.870.407
1.6	Supporting Equipment	Rp-	Rp176.025.074	Rp-	Rp-	Rp-	Rp-	Rp72.682.067
1.7	Laboratory Equipment	Rp-	Rp1.456.357.483	Rp-	Rp-	Rp-	Rp-	Rp-
1.8	Belt Conveyor	Rp286.491.035	Rp513.192.637	Rp-	Rp149.722.669	Rp364.506.643	Rp259.921.275	Rp118.986.184
1.9	Bulldozer	Rp-	Rp2.344.565.639	Rp-	Rp-	Rp-	Rp-	Rp-
1.10	Dump Truck	Rp-	Rp976.900.327	Rp-	Rp-	Rp-	Rp-	Rp-
2.1	Compost Turning Machine	Rp-	Rp304.791.349	Rp-	Rp-	Rp-	Rp-	Rp-
2.2	Semi-Wet Material Crusher	Rp322.471.806	Rp664.291.921	Rp-	Rp-	Rp-	Rp373.833.205	Rp-
2.3	Sieving Machine	Rp-	Rp289.162.366	Rp-	Rp-	Rp-	Rp-	Rp335.218.434
2.4	Mixing Machine	Rp-	Rp1.875.647.777	Rp-	Rp994.937.363	Rp-	Rp1.055.529.049	Rp-

Code	Tangible Assets	Routine CAPEX						
		2054	2055	2056	2057	2058	2059	2060
2.5	Granulator	Rp352.822.094	Rp363.406.757	Rp-	Rp-	Rp397.104.375	Rp-	Rp-
2.6	Drying Machine	Rp6.252.955.951	Rp6.440.544.629	Rp-	Rp-	Rp-	Rp7.248.889.722	Rp-
2.7	Cooling Machine	Rp1.896.892.978	Rp3.907.599.535	Rp-	Rp-	Rp-	Rp2.199.018.851	Rp-
2.8	Screener Machine	Rp758.757.191	Rp1.563.039.814	Rp-	Rp-	Rp-	Rp879.607.541	Rp-
2.9	Coating Machine	Rp-	Rp625.215.926	Rp-	Rp663.291.575	Rp-	Rp-	Rp-
2.10	Packing Machine	Rp-	Rp541.202.536	Rp-	Rp574.161.770	Rp-	Rp-	Rp627.402.068
3.1	Plastic Recycling Line	Rp-	Rp1.172.279.860	Rp-	Rp-	Rp-	Rp-	Rp-
3.2	Glass Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.3	Metal Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3.4	Rubber Recycling Line	Rp-	Rp1.199.242.297	Rp-	Rp-	Rp-	Rp-	Rp-
3.5	Textile and Paper Recycling Line	Rp-	Rp3.907.599.535	Rp-	Rp2.072.786.173	Rp-	Rp2.199.018.851	Rp-
Code	Intangible Assets	Routine CAPEX						
		2054	2055	2056	2057	2058	2059	2060
1	Legal Document + Notary Fee	Rp-	Rp-	Rp	Rp	Rp	Rp	Rp

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2061-2065)

Code	Tangible Assets	Routine CAPEX				
		2061	2062	2063	2064	2065
1.1	Integrated MSW Recycling Infrastructure	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp2.351.460.156	Rp276.790.218	Rp565.360.438	Rp2.687.602.438	Rp302.456.144
1.5	Operational and Safety Equipment	Rp250.845.989	Rp39.315.435	Rp76.931.083	Rp290.321.363	Rp90.032.243
1.6	Supporting Equipment	Rp-	Rp-	Rp-	Rp-	Rp231.963.507
1.7	Laboratory Equipment	Rp-	Rp-	Rp-	Rp-	Rp-
1.8	Belt Conveyor	Rp536.181.491	Rp78.895.276	Rp260.038.831	Rp234.359.997	Rp68.968.799
1.9	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-
1.10	Dump Truck	Rp-	Rp-	Rp-	Rp-	Rp1.312.872.350
2.1	Compost Turning Machine	Rp-	Rp-	Rp-	Rp-	Rp-
2.2	Semi-Wet Material Crusher	Rp-	Rp-	Rp420.752.565	Rp-	Rp-
2.3	Sieving Machine	Rp-	Rp-	Rp-	Rp-	Rp-
2.4	Mixing Machine	Rp-	Rp-	Rp1.188.007.243	Rp2.447.294.921	Rp-
2.5	Granulator	Rp-	Rp-	Rp-	Rp-	Rp-
2.6	Drying Machine	Rp-	Rp-	Rp-	Rp-	Rp-
2.7	Cooling Machine	Rp-	Rp2.402.927.272	Rp-	Rp-	Rp-

Code	Tangible Assets	Routine CAPEX				
		2061	2062	2063	2064	2065
2.8	Screener Machine	Rp-	Rp-	Rp990.006.036	Rp-	Rp-
2.9	Coating Machine	Rp-	Rp-	Rp792.004.829	Rp815.764.974	Rp-
2.10	Packing Machine	Rp646.224.131	Rp-	Rp-	Rp-	Rp-
3.1	Plastic Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-
3.2	Glass Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp2.363.169.159
3.3	Metal Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp5.251.487.019
3.4	Rubber Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-
3.5	Textile and Paper Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp2.625.743.509
Code	Intangible Assets	Routine CAPEX				
		2061	2062	2063	2064	2065
1	Legal Document + Notary Fee	Rp-	Rp-	Rp	Rp	Rp

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2066-2070)

Code	Tangible Assets	Routine CAPEX				
		2066	2067	2068	2069	2070
1.1	Integrated MSW Recycling Infrastructure	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp584.118.428	Rp2.887.985.330	Rp330.501.995	Rp726.874.121	Rp4.284.661.536
1.5	Operational and Safety Equipment	Rp77.076.081	Rp328.766.110	Rp48.441.783	Rp100.634.507	Rp338.377.196
1.6	Supporting Equipment	Rp-	Rp-	Rp-	Rp-	Rp103.010.671
1.7	Laboratory Equipment	Rp-	Rp-	Rp-	Rp-	Rp2.268.957.505
1.8	Belt Conveyor	Rp710.378.630	Rp-	Rp-	Rp446.343.698	Rp799.537.407
1.9	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp3.652.756.871
1.10	Dump Truck	Rp-	Rp-	Rp-	Rp-	Rp1.521.978.878
2.1	Compost Turning Machine	Rp-	Rp-	Rp-	Rp-	Rp474.854.990
2.2	Semi-Wet Material Crusher	Rp-	Rp-	Rp-	Rp502.400.567	Rp1.034.945.168
2.3	Sieving Machine	Rp-	Rp-	Rp-	Rp-	Rp450.505.544
2.4	Mixing Machine	Rp-	Rp-	Rp-	Rp-	Rp2.922.198.121
2.5	Granulator	Rp-	Rp-	Rp-	Rp549.685.326	Rp566.175.886
2.6	Drying Machine	Rp-	Rp-	Rp-	Rp9.741.901.629	Rp10.034.158.678
2.7	Cooling Machine	Rp-	Rp-	Rp-	Rp2.955.297.453	Rp6.087.912.753
2.8	Screener Machine	Rp-	Rp-	Rp-	Rp1.182.118.981	Rp2.435.165.101
2.9	Coating Machine	Rp-	Rp-	Rp-	Rp-	Rp974.066.040
2.10	Packing Machine	Rp-	Rp-	Rp-	Rp-	Rp843.175.916

Code	Tangible Assets	Routine CAPEX				
		2066	2067	2068	2069	2070
3.1	Plastic Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp1.826.373.826
3.2	Glass Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-
3.3	Metal Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-
3.4	Rubber Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp1.868.380.424
3.5	Textile and Paper Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp6.087.912.753
Code	Intangible Assets	Routine CAPEX				
		2061	2062	2063	2064	2065
1	Legal Document + Notary Fee	Rp-	Rp-	Rp	Rp	Rp

BPS 2 and BPS 3 (PT Y) – Initial and Routine CAPEX Calculation Recapitulation (2071-2075)

Code	Tangible Assets	Routine CAPEX				
		2071	2072	2073	2074	2075
1.1	Integrated MSW Recycling Infrastructure	Rp-	Rp-	Rp-	Rp-	Rp-
1.2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-
1.4	Office Equipment	Rp361.148.453	Rp737.667.139	Rp3.448.405.516	Rp516.109.169	Rp1.014.874.243
1.5	Operational and Safety Equipment	Rp54.024.256	Rp93.838.225	Rp372.315.894	Rp91.764.091	Rp199.073.172
1.6	Supporting Equipment	Rp-	Rp-	Rp-	Rp-	Rp311.739.557
1.7	Laboratory Equipment	Rp-	Rp-	Rp-	Rp-	Rp-
1.8	Belt Conveyor	Rp988.228.234	Rp233.263.040	Rp567.889.473	Rp539.931.837	Rp602.473.941
1.9	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-
1.10	Dump Truck	Rp-	Rp-	Rp-	Rp-	Rp1.764.390.655
2.1	Compost Turning Machine	Rp-	Rp-	Rp-	Rp-	Rp-
2.2	Semi-Wet Material Crusher	Rp-	Rp-	Rp-	Rp582.419.952	Rp599.892.551
2.3	Sieving Machine	Rp-	Rp-	Rp-	Rp-	Rp1.044.518.794
2.4	Mixing Machine	Rp-	Rp1.550.079.993	Rp-	Rp1.644.479.865	Rp-
2.5	Granulator	Rp-	Rp-	Rp618.675.677	Rp637.235.948	Rp-
2.6	Drying Machine	Rp-	Rp-	Rp-	Rp11.293.533.993	Rp-
2.7	Cooling Machine	Rp-	Rp-	Rp-	Rp3.425.999.719	Rp-
2.8	Screener Machine	Rp-	Rp-	Rp-	Rp1.370.399.888	Rp1.411.511.884
2.9	Coating Machine	Rp-	Rp1.033.386.662	Rp-	Rp-	Rp-
2.10	Packing Machine	Rp-	Rp894.525.330	Rp-	Rp-	Rp977.471.980
3.1	Plastic Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-
3.2	Glass Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-
3.3	Metal Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-

Code	Tangible Assets	Routine CAPEX				
		2071	2072	2073	2074	2075
3.4	Rubber Recycling Line	Rp-	Rp-	Rp-	Rp-	Rp-
3.5	Textile and Paper Recycling Line	Rp-	Rp3.229.333.320	Rp-	Rp3.425.999.719	Rp-
Code	Intangible Assets	Routine CAPEX				
		2061	2062	2063	2064	2065
1	Legal Document + Notary Fee	Rp-	Rp-	Rp-	Rp-	Rp-

BPS 2 and BPS 3 (PT Y) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2025-2033)

Expenses	Initial CAPEX		Routine CAPEX						
	2025	2026	2027	2028	2029	2030	2031	2032	2033
Freight Expense	Rp1.378.130.504	Rp-	Rp124.038.109	Rp142.365.692	Rp385.599.578	Rp43.586.833	Rp173.785.650	Rp10.498.449	Rp197.957.704
Total CAPEX	Rp79.290.131.563	Rp-	Rp1.131.632.417	Rp1.407.707.873	Rp6.353.922.771	Rp303.111.443	Rp1.716.379.757	Rp12.922.345	Rp1.850.584.342

BPS 2 and BPS 3 (PT Y) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2034-2042)

Expenses	Routine CAPEX								
	2034	2035	2036	2037	2038	2039	2040	2041	2042
Freight Expense	Rp118.193.401	Rp150.556.018	Rp14.999.973	Rp129.309.491	Rp13.902.462	Rp154.543.117	Rp1.646.250.290	Rp15.237.650	Rp208.542.289
Total CAPEX	Rp1.271.299.750	Rp2.041.463.152	Rp161.341.178	Rp1.390.865.496	Rp149.536.236	Rp1.895.010.718	Rp20.969.757.526	Rp163.897.655	Rp1.927.560.473

BPS 2 and BPS 3 (PT Y) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2043-2051)

Expenses	Routine CAPEX									
	2043	2044	2045	2046	2047	2048	2049	2050	2051	
Freight Expense	Rp224.446.520	Rp602.496.798	Rp649.684.124	Rp271.574.211	Rp18.398.808	Rp313.414.349	Rp266.087.403	Rp145.508.598	Rp75.846.568	
Total CAPEX	Rp2.221.617.295	Rp9.917.976.409	Rp6.247.641.280	Rp2.682.903.436	Rp197.899.375	Rp2.936.959.597	Rp2.925.864.087	Rp2.124.071.146	Rp815.813.083	

BPS 2 and BPS 3 (PT Y) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2052-2060)

Expenses	Routine CAPEX									
	2052	2053	2054	2055	2056	2057	2058	2059	2060	
Freight Expense	Rp204.137.515	Rp23.092.454	Rp685.144.389	Rp2.671.407.070	Rp23.624.447	Rp488.375.110	Rp352.687.185	Rp939.804.463	Rp258.610.094	
Total CAPEX	Rp2.195.723.024	Rp248.384.693	Rp11.019.519.627	Rp33.931.134.931	Rp254.106.854	Rp5.448.866.409	Rp3.493.549.005	Rp15.464.082.383	Rp2.019.145.513	

BPS 2 and BPS 3 (PT Y) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2061-2069)

Expenses	Routine CAPEX								
	2052	2053	2054	2055	2056	2057	2058	2059	2060
Freight Expense	Rp425.967.561	Rp205.100.007	Rp509.373.903	Rp673.945.026	Rp1.255.300.822	Rp140.586.247	Rp329.717.023	Rp38.841.737	Rp1.078.157.864
Total CAPEX	Rp4.210.679.328	Rp3.003.028.209	Rp4.802.474.929	Rp7.149.288.720	Rp13.501.993.553	Rp1.512.159.386	Rp3.546.468.463	Rp417.785.515	Rp17.283.414.146

BPS 2 and BPS 3 (PT Y) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2061-2069)

Expenses	Routine CAPEX								
	2061	2062	2063	2064	2065	2066	2067	2068	2069
Freight Expense	Rp425.967.561	Rp205.100.007	Rp509.373.903	Rp673.945.026	Rp1.255.300.822	Rp140.586.247	Rp329.717.023	Rp38.841.737	Rp1.078.157.864
Total CAPEX	Rp4.210.679.328	Rp3.003.028.209	Rp4.802.474.929	Rp7.149.288.720	Rp13.501.993.553	Rp1.512.159.386	Rp3.546.468.463	Rp417.785.515	Rp17.283.414.146

BPS 2 and BPS 3 (PT Y) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2070-2075)

Expenses	Routine CAPEX					
	2070	2071	2072	2073	2074	2075
Freight Expense	Rp4.148.995.621	Rp143.848.597	Rp765.363.023	Rp561.152.576	Rp1.605.728.655	Rp1.047.840.202
Total CAPEX	Rp52.724.100.884	Rp1.547.249.541	Rp8.537.456.731	Rp5.568.439.136	Rp25.133.602.834	Rp8.973.786.980

BPS 2 and BPS 3 (PT Y) – Total OPEX/Year (in IDR, million) (2026-2035)

Process	OPEX Sources	in million									
		2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Operating Expense - General	Communication Expense	Rp14	Rp15	Rp15	Rp16	Rp16	Rp17	Rp17	Rp18	Rp18	Rp19
	General and Administrative Expense	Rp34.940	Rp42.364	Rp50.323	Rp60.820	Rp70.126	Rp80.131	Rp83.689	Rp88.188	Rp92.057	Rp96.591
	Maintenance Expense	Rp30.568	Rp37.063	Rp44.027	Rp53.211	Rp61.352	Rp70.107	Rp73.219	Rp77.156	Rp80.541	Rp84.507
	Indirect Labor Expense	Rp12.505	Rp15.163	Rp18.011	Rp21.769	Rp25.099	Rp28.681	Rp29.954	Rp31.565	Rp32.949	Rp34.572
	Risk Management Expense	Rp6.448	Rp7.818	Rp9.287	Rp11.225	Rp12.942	Rp14.789	Rp15.445	Rp16.276	Rp16.990	Rp17.827
Cost of Operation	Direct Material										
	Straw	Rp4.132	Rp5.198	Rp6.355	Rp7.610	Rp8.967	Rp10.433	Rp10.922	Rp11.430	Rp11.960	Rp12.511
	Husk Charcoal	Rp367	Rp462	Rp565	Rp676	Rp797	Rp927	Rp971	Rp1.016	Rp1.063	Rp1.112
	Animal Droppings	Rp6.886	Rp8.663	Rp10.592	Rp12.683	Rp14.945	Rp17.388	Rp18.203	Rp19.051	Rp19.933	Rp20.851
	EM4	Rp367	Rp462	Rp565	Rp676	Rp797	Rp927	Rp971	Rp1.016	Rp1.063	Rp1.112
	Water	Rp222	Rp279	Rp341	Rp409	Rp481	Rp560	Rp586	Rp614	Rp642	Rp672
	Packaging	Rp96.616	Rp121.545	Rp148.612	Rp177.947	Rp209.682	Rp243.960	Rp255.389	Rp267.284	Rp279.662	Rp292.543
	Direct Labour Wage (Organic)	Rp25.011	Rp30.326	Rp36.023	Rp43.538	Rp50.199	Rp57.362	Rp59.908	Rp63.129	Rp65.899	Rp69.144
	Direct Labor Wage (Inorganic)	Rp25.011	Rp30.326	Rp36.023	Rp43.538	Rp50.199	Rp57.362	Rp59.908	Rp63.129	Rp65.899	Rp69.144
	Overhead										
Transportation Expense											

Process	OPEX Sources	in million									
		2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	Bulldozer Fuel Expense	Rp593	Rp611	Rp629	Rp648	Rp668	Rp688	Rp708	Rp730	Rp751	Rp774
	Dump Truck Fuel Expense	Rp11	Rp12	Rp12	Rp12	Rp13	Rp13	Rp13	Rp14	Rp14	Rp15
	Electricity Expense	Rp32.102	Rp34.122	Rp35.900	Rp45.408	Rp47.390	Rp49.350	Rp50.881	Rp55.703	Rp57.427	Rp61.276
	Compost Turner Fuel Expense	Rp162	Rp167	Rp172	Rp177	Rp182	Rp188	Rp193	Rp199	Rp205	Rp211
	Total OPEX/Year	Rp275.955	Rp334.594	Rp397.453	Rp480.362	Rp553.856	Rp632.883	Rp660.977	Rp696.516	Rp727.074	Rp762.881

BPS 2 and BPS 3 (PT Y) – Total OPEX/Year (in IDR, million) (2036-2045)

Process	OPEX Sources	in million									
		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Operating Expense - General	Communication Expense	Rp19	Rp20	Rp20	Rp21	Rp22	Rp22	Rp23	Rp24	Rp24	Rp25
	General and Administrative Expense	Rp100.787	Rp105.147	Rp109.679	Rp115.199	Rp120.116	Rp125.224	Rp130.531	Rp136.043	Rp141.769	Rp147.715
	Maintenance Expense	Rp88.178	Rp91.993	Rp95.958	Rp100.788	Rp105.090	Rp109.559	Rp114.202	Rp119.024	Rp124.034	Rp129.236
	Indirect Labor Expense	Rp36.074	Rp37.635	Rp39.257	Rp41.233	Rp42.992	Rp44.821	Rp46.720	Rp48.693	Rp50.743	Rp52.871
	Risk Management Expense	Rp18.601	Rp19.406	Rp20.242	Rp21.261	Rp22.169	Rp23.111	Rp24.091	Rp25.108	Rp26.165	Rp27.262
Cost of Operation	Direct Material										
	Straw	Rp13.084	Rp13.680	Rp14.300	Rp14.945	Rp15.617	Rp16.314	Rp17.040	Rp17.794	Rp18.579	Rp19.394
	Husk Charcoal	Rp1.163	Rp1.216	Rp1.271	Rp1.328	Rp1.388	Rp1.450	Rp1.515	Rp1.582	Rp1.651	Rp1.724
	Animal Droppings	Rp21.806	Rp22.800	Rp23.834	Rp24.909	Rp26.028	Rp27.191	Rp28.400	Rp29.657	Rp30.965	Rp32.324
	EM4	Rp1.163	Rp1.216	Rp1.271	Rp1.328	Rp1.388	Rp1.450	Rp1.515	Rp1.582	Rp1.651	Rp1.724
	Water	Rp703	Rp735	Rp768	Rp803	Rp839	Rp876	Rp915	Rp955	Rp998	Rp1.041
	Packaging	Rp305.946	Rp319.888	Rp334.393	Rp349.479	Rp365.170	Rp381.488	Rp398.456	Rp416.098	Rp434.441	Rp453.510
	Direct Labour Wage (Organic)	Rp72.148	Rp75.269	Rp78.513	Rp82.465	Rp85.985	Rp89.642	Rp93.440	Rp97.386	Rp101.485	Rp105.742
	Direct Labor Wage (Inorganic)	Rp72.148	Rp75.269	Rp78.513	Rp82.465	Rp85.985	Rp89.642	Rp93.440	Rp97.386	Rp101.485	Rp105.742
	Overhead										
	Transportation Expense										
	Bulldozer Fuel Expense	Rp797	Rp821	Rp846	Rp871	Rp897	Rp924	Rp952	Rp980	Rp1.010	Rp1.040
	Dump Truck Fuel Expense	Rp15	Rp15	Rp16	Rp16	Rp17	Rp17	Rp18	Rp18	Rp19	Rp20
	Electricity Expense	Rp63.171	Rp65.124	Rp67.137	Rp72.500	Rp74.739	Rp77.046	Rp79.425	Rp81.877	Rp84.404	Rp87.010
	Compost Turner Fuel Expense	Rp217	Rp224	Rp231	Rp238	Rp245	Rp252	Rp260	Rp267	Rp275	Rp284
Total OPEX/Year	Rp796.019	Rp830.459	Rp866.249	Rp909.851	Rp948.685	Rp989.029	Rp1.030.941	Rp1.074.477	Rp1.119.698	Rp1.166.665	

BPS 2 and BPS 3 (PT Y) – Total OPEX/Year (in IDR, million) (2046-2054)

Process	OPEX Sources	in million									
		2046	2047	2048	2049	2050	2051	2052	2053	2054	
	Communication Expense	Rp26	Rp27	Rp27	Rp28	Rp29	Rp30	Rp31	Rp32	Rp33	
	General and Administrative Expense	Rp153.891	Rp160.305	Rp166.964	Rp173.994	Rp181.177	Rp188.634	Rp196.376	Rp204.413	Rp214.913	

Process	OPEX Sources	in million								
		2046	2047	2048	2049	2050	2051	2052	2053	2054
Operating Expense - General	Maintenance Expense	Rp134.640	Rp140.251	Rp146.077	Rp152.228	Rp158.512	Rp165.037	Rp171.810	Rp178.842	Rp188.029
	Indirect Labor Expense	Rp55.081	Rp57.377	Rp59.761	Rp62.277	Rp64.848	Rp67.517	Rp70.288	Rp73.165	Rp76.923
	Risk Management Expense	Rp28.402	Rp29.586	Rp30.815	Rp32.112	Rp33.438	Rp34.814	Rp36.243	Rp37.726	Rp39.664
Cost of Operation	Direct Material									
	Straw	Rp20.242	Rp21.123	Rp22.039	Rp22.991	Rp23.980	Rp25.007	Rp26.075	Rp27.184	Rp28.336
	Husk Charcoal	Rp1.799	Rp1.878	Rp1.959	Rp2.044	Rp2.132	Rp2.223	Rp2.318	Rp2.416	Rp2.519
	Animal Droppings	Rp33.737	Rp35.205	Rp36.732	Rp38.318	Rp39.966	Rp41.679	Rp43.458	Rp45.307	Rp47.227
	EM4	Rp1.799	Rp1.878	Rp1.959	Rp2.044	Rp2.132	Rp2.223	Rp2.318	Rp2.416	Rp2.519
	Water	Rp1.087	Rp1.134	Rp1.183	Rp1.234	Rp1.288	Rp1.343	Rp1.400	Rp1.460	Rp1.522
	Packaging	Rp473.332	Rp493.935	Rp515.348	Rp537.602	Rp560.727	Rp584.756	Rp609.721	Rp635.659	Rp662.604
	Direct Labour Wage (Organic)	Rp110.163	Rp114.754	Rp119.521	Rp124.554	Rp129.696	Rp135.034	Rp140.576	Rp146.329	Rp153.846
	Direct Labor Wage (Inorganic)	Rp110.163	Rp114.754	Rp119.521	Rp124.554	Rp129.696	Rp135.034	Rp140.576	Rp146.329	Rp153.846
	Overhead									
	Transportation Expense									
	Bulldozer Fuel Expense	Rp1.071	Rp1.103	Rp1.137	Rp1.171	Rp1.206	Rp1.242	Rp1.279	Rp1.318	Rp1.357
	Dump Truck Fuel Expense	Rp20	Rp21	Rp21	Rp22	Rp23	Rp23	Rp24	Rp25	Rp26
	Electricity Expense	Rp89.696	Rp92.464	Rp95.319	Rp98.724	Rp101.771	Rp104.912	Rp108.149	Rp111.487	Rp123.667
Compost Turner Fuel Expense	Rp292	Rp301	Rp310	Rp319	Rp329	Rp339	Rp349	Rp359	Rp370	
Total OPEX/Year	Rp1.215.442	Rp1.266.096	Rp1.318.695	Rp1.374.214	Rp1.430.947	Rp1.489.847	Rp1.550.993	Rp1.614.467	Rp1.697.400	

BPS 2 and BPS 3 (PT Y) – Total OPEX/Year (in IDR, million) (2055-2063)

Process	OPEX Sources	in million								
		2055	2056	2057	2058	2059	2060	2061	2062	2063
Operating Expense - General	Communication Expense	Rp34	Rp35	Rp36	Rp37	Rp38	Rp39	Rp40	Rp41	Rp43
	General and Administrative Expense	Rp223.637	Rp232.690	Rp243.066	Rp252.845	Rp262.992	Rp273.636	Rp284.563	Rp297.171	Rp308.969
	Maintenance Expense	Rp195.661	Rp203.582	Rp212.660	Rp221.215	Rp230.093	Rp239.405	Rp248.965	Rp259.996	Rp270.319
	Indirect Labor Expense	Rp80.045	Rp83.286	Rp87.000	Rp90.500	Rp94.132	Rp97.942	Rp101.853	Rp106.365	Rp110.588
	Risk Management Expense	Rp41.274	Rp42.945	Rp44.860	Rp46.665	Rp48.538	Rp50.502	Rp52.519	Rp54.846	Rp57.023
Cost of Operation	Direct Material									
	Straw	Rp29.533	Rp30.777	Rp32.068	Rp33.409	Rp34.802	Rp36.248	Rp37.749	Rp39.309	Rp40.927
	Husk Charcoal	Rp2.625	Rp2.736	Rp2.850	Rp2.970	Rp3.093	Rp3.222	Rp3.356	Rp3.494	Rp3.638
	Animal Droppings	Rp49.222	Rp51.294	Rp53.446	Rp55.682	Rp58.003	Rp60.413	Rp62.916	Rp65.514	Rp68.212
	EM4	Rp2.625	Rp2.736	Rp2.850	Rp2.970	Rp3.093	Rp3.222	Rp3.356	Rp3.494	Rp3.638
	Water	Rp1.586	Rp1.653	Rp1.722	Rp1.794	Rp1.869	Rp1.946	Rp2.027	Rp2.111	Rp2.198
	Packaging	Rp690.593	Rp719.666	Rp749.861	Rp781.220	Rp813.786	Rp847.603	Rp882.717	Rp919.174	Rp957.025
	Direct Labour Wage (Organic)	Rp160.091	Rp166.572	Rp174.000	Rp181.000	Rp188.264	Rp195.883	Rp203.705	Rp212.731	Rp221.177
Direct Labor Wage (Inorganic)	Rp160.091	Rp166.572	Rp174.000	Rp181.000	Rp188.264	Rp195.883	Rp203.705	Rp212.731	Rp221.177	

Process	OPEX Sources	in million								
		2055	2056	2057	2058	2059	2060	2061	2062	2063
	Overhead									
	Transportation Expense									
	Bulldozer Fuel Expense	Rp1.398	Rp1.440	Rp1.483	Rp1.527	Rp1.573	Rp1.620	Rp1.669	Rp1.719	Rp1.771
	Dump Truck Fuel Expense	Rp26	Rp27	Rp28	Rp29	Rp30	Rp31	Rp31	Rp32	Rp33
	Electricity Expense	Rp127.475	Rp131.401	Rp139.418	Rp143.709	Rp148.131	Rp153.157	Rp157.869	Rp167.877	Rp173.038
	Compost Turner Fuel Expense	Rp381	Rp393	Rp404	Rp417	Rp429	Rp442	Rp455	Rp469	Rp483
	Total OPEX/Year	Rp1.766.298	Rp1.837.803	Rp1.919.753	Rp1.996.988	Rp2.077.130	Rp2.161.195	Rp2.247.495	Rp2.347.075	Rp2.440.259

BPS 2 and BPS 3 (PT Y) – Total OPEX/Year (in IDR, million) (2064-2069)

Process	OPEX Sources	in million					
		2064	2065	2066	2067	2068	2069
Operating Expense - General	Communication Expense	Rp44	Rp45	Rp47	Rp48	Rp50	Rp51
	General and Administrative Expense	Rp321.674	Rp334.383	Rp347.565	Rp361.237	Rp375.416	Rp390.122
	Maintenance Expense	Rp281.434	Rp292.554	Rp304.087	Rp316.048	Rp328.454	Rp341.320
	Indirect Labor Expense	Rp115.136	Rp119.685	Rp124.403	Rp129.296	Rp134.372	Rp139.635
	Risk Management Expense	Rp59.368	Rp61.714	Rp64.147	Rp66.670	Rp69.287	Rp72.001
Cost of Operation	Direct Material						
	Straw	Rp42.608	Rp44.352	Rp46.163	Rp48.042	Rp49.993	Rp52.017
	Husk Charcoal	Rp3.787	Rp3.942	Rp4.103	Rp4.270	Rp4.444	Rp4.624
	Animal Droppings	Rp71.013	Rp73.920	Rp76.938	Rp80.070	Rp83.321	Rp86.696
	EM4	Rp3.787	Rp3.942	Rp4.103	Rp4.270	Rp4.444	Rp4.624
	Water	Rp2.288	Rp2.382	Rp2.479	Rp2.580	Rp2.684	Rp2.793
	Packaging	Rp996.319	Rp1.037.109	Rp1.079.451	Rp1.123.399	Rp1.169.013	Rp1.216.352
	Direct Labour Wage (Organic)	Rp230.271	Rp239.369	Rp248.806	Rp258.593	Rp268.743	Rp279.270
	Direct Labor Wage (Inorganic)	Rp230.271	Rp239.369	Rp248.806	Rp258.593	Rp268.743	Rp279.270
	Overhead						
	Transportation Expense						
	Bulldozer Fuel Expense	Rp1.824	Rp1.879	Rp1.935	Rp1.993	Rp2.053	Rp2.114
	Dump Truck Fuel Expense	Rp34	Rp35	Rp37	Rp38	Rp39	Rp40
	Electricity Expense	Rp180.245	Rp185.785	Rp191.495	Rp197.381	Rp203.447	Rp209.700
	Compost Turner Fuel Expense	Rp497	Rp512	Rp528	Rp544	Rp560	Rp577
Total OPEX/Year	Rp2.540.602	Rp2.640.978	Rp2.745.090	Rp2.853.073	Rp2.965.063	Rp3.081.206	

BPS 2 and BPS 3 (PT Y) – Total OPEX/Year (in IDR, million) (2070-2075)

Process	OPEX Sources	in million					
		2060	2071	2072	2073	2074	2075
Operating Expense - General	Communication Expense	Rp53	Rp54	Rp56	Rp57	Rp59	Rp61
	General and Administrative Expense	Rp405.381	Rp421.195	Rp437.593	Rp454.595	Rp472.676	Rp493.393
	Maintenance Expense	Rp354.671	Rp368.506	Rp382.853	Rp397.729	Rp413.548	Rp431.673
	Indirect Labor Expense	Rp145.097	Rp150.757	Rp156.626	Rp162.712	Rp169.184	Rp176.599
	Risk Management Expense	Rp74.817	Rp77.736	Rp80.762	Rp83.900	Rp87.237	Rp91.061
Cost of Operation	Direct Material						
	Straw	Rp54.118	Rp56.299	Rp58.561	Rp60.908	Rp63.344	Rp65.871
	Husk Charcoal	Rp4.811	Rp5.004	Rp5.205	Rp5.414	Rp5.631	Rp5.855
	Animal Droppings	Rp90.197	Rp93.831	Rp97.601	Rp101.514	Rp105.573	Rp109.784
	EM4	Rp4.811	Rp5.004	Rp5.205	Rp5.414	Rp5.631	Rp5.855
	Water	Rp2.906	Rp3.023	Rp3.144	Rp3.270	Rp3.401	Rp3.537
	Packaging	Rp1.265.480	Rp1.316.461	Rp1.369.362	Rp1.424.252	Rp1.481.202	Rp1.540.289
	Direct Labour Wage (Organic)	Rp290.194	Rp301.514	Rp313.253	Rp325.424	Rp338.367	Rp353.198
	Direct Labor Wage (Inorganic)	Rp290.194	Rp301.514	Rp313.253	Rp325.424	Rp338.367	Rp353.198
	Overhead						
	Transportation Expense						
	Bulldozer Fuel Expense	Rp2.178	Rp2.243	Rp2.310	Rp2.380	Rp2.451	Rp2.525
	Dump Truck Fuel Expense	Rp82	Rp85	Rp87	Rp90	Rp92	Rp95
	Electricity Expense	Rp216.144	Rp222.787	Rp229.634	Rp236.691	Rp245.794	Rp263.169
	Compost Turner Fuel Expense	Rp594	Rp612	Rp630	Rp649	Rp669	Rp689
Total OPEX/Year	Rp3.201.728	Rp3.326.626	Rp3.456.137	Rp3.590.424	Rp3.733.225	Rp3.896.852	

BPS 2 and BPS 3 (PT Y) – Expected Manageable MSW and Recycling Output (2026-2035)

Information	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Manageable MSW – BPS 1 (ton/day)	98	119	142	165	189	213	216	220	223	227
Manageable MSW – BPS 1 (m ³ /day)	454	554	658	765	875	989	1.005	1.021	1.037	1.053
Manageable MSW – BPS 1 (ton/year)	30.315	37.026	43.953	51.095	58.454	66.029	67.109	68.189	69.269	70.349
Manageable MSW – BPS 1 (m ³ /year)	140.718	171.870	204.024	237.181	271.341	306.503	311.516	316.529	321.543	326.556
Expected Output										
Organic Compost (ton/year)	66.774	81.556	96.814	112.548	128.757	145.442	147.821	150.200	152.579	154.958
Textile Shred (ton/year)	1.756	2.145	2.546	2.960	3.386	3.825	3.888	3.950	4.013	4.075
Paper Shred & Pulp (ton/year)	973	1.189	1.411	1.640	1.877	2.120	2.154	2.189	2.224	2.258
Rubber and Leather Shred (ton/year)	198	241	286	333	381	430	437	444	451	458
Plastic Pellets (ton/year)	176	214	255	296	339	383	389	395	401	408
Glass Shard (ton/year)	91	112	133	154	176	199	202	206	209	212

Information	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Metal Shred (ton/year)	59	71	85	99	113	128	130	132	134	136

BPS 2 and BPS 3 (PT Y) – Expected Manageable MSW and Recycling Output (2036-2045)

Information	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Manageable MSW – BPS 1 (ton/day)	230	234	237	241	244	248	251	255	258	262
Manageable MSW – BPS 1 (m ³ /day)	1.070	1.086	1.102	1.118	1.134	1.150	1.167	1.183	1.199	1.215
Manageable MSW – BPS 1 (ton/year)	71.429	72.509	73.589	74.669	75.749	76.829	77.909	78.989	80.069	81.149
Manageable MSW – BPS 1 (m ³ /year)	331.569	336.582	341.595	346.609	351.622	356.635	361.648	366.662	371.675	376.688
Expected Output										
Organic Compost (ton/year)	157.337	159.716	162.095	164.473	166.852	169.231	171.610	173.989	176.368	178.747
Textile Shred (ton/year)	4.138	4.200	4.263	4.326	4.388	4.451	4.513	4.576	4.638	4.701
Paper Shred & Pulp (ton/year)	2.293	2.328	2.362	2.397	2.432	2.466	2.501	2.536	2.570	2.605
Rubber and Leather Shred (ton/year)	466	473	480	487	494	501	508	515	522	529
Plastic Pellets (ton/year)	414	420	426	433	439	445	451	458	464	470
Glass Shard (ton/year)	216	219	222	225	229	232	235	238	242	245
Metal Shred (ton/year)	138	140	142	144	146	148	150	153	155	157

BPS 2 and BPS 3 (PT Y) – Expected Manageable MSW and Recycling Output (2046-2055)

Information	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Manageable MSW – BPS 1 (ton/day)	265	269	272	276	279	283	286	290	293	297
Manageable MSW – BPS 1 (m ³ /day)	1.231	1.247	1.264	1.280	1.296	1.312	1.328	1.344	1.361	1.377
Manageable MSW – BPS 1 (ton/year)	82.229	83.309	84.389	85.469	86.549	87.629	88.709	89.789	90.869	91.949
Manageable MSW – BPS 1 (m ³ /year)	381.701	386.714	391.728	396.741	401.754	406.767	411.780	416.794	421.807	426.820
Expected Output										
Organic Compost (ton/year)	181.126	183.504	185.883	188.262	190.641	193.020	195.399	197.778	200.157	202.535
Textile Shred (ton/year)	4.764	4.826	4.889	4.951	5.014	5.076	5.139	5.201	5.264	5.327
Paper Shred & Pulp (ton/year)	2.640	2.674	2.709	2.744	2.778	2.813	2.848	2.882	2.917	2.952
Rubber and Leather Shred (ton/year)	536	543	550	557	564	571	578	585	592	599
Plastic Pellets (ton/year)	476	483	489	495	501	508	514	520	526	533
Glass Shard (ton/year)	248	251	255	258	261	264	268	271	274	277
Metal Shred (ton/year)	159	161	163	165	167	169	171	173	175	178

BPS 2 and BPS 3 (PT Y) – Expected Manageable MSW and Recycling Output (2056-2065)

Information	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Manageable MSW – BPS 1 (ton/day)	300	304	307	311	314	318	321	324	328	331
Manageable MSW – BPS 1 (m ³ /day)	1.393	1.409	1.425	1.442	1.458	1.474	1.490	1.506	1.522	1.539
Manageable MSW – BPS 1 (ton/year)	93.029	94.109	95.189	96.269	97.349	98.429	99.509	100.589	101.669	102.749
Manageable MSW – BPS 1 (m ³ /year)	431.833	436.847	441.860	446.873	451.886	456.899	461.913	466.926	471.939	476.952
Expected Output										
Organic Compost (ton/year)	204.914	207.293	209.672	212.051	214.430	216.809	219.188	221.567	223.945	226.324
Textile Shred (ton/year)	5.389	5.452	5.514	5.577	5.639	5.702	5.765	5.827	5.890	5.952
Paper Shred & Pulp (ton/year)	2.986	3.021	3.056	3.091	3.125	3.160	3.195	3.229	3.264	3.299
Rubber and Leather Shred (ton/year)	606	613	620	627	634	641	649	656	663	670
Plastic Pellets (ton/year)	539	545	551	558	564	570	576	583	589	595
Glass Shard (ton/year)	281	284	287	290	294	297	300	303	307	310
Metal Shred (ton/year)	180	182	184	186	188	190	192	194	196	198

BPS 2 and BPS 3 (PT Y) – Expected Manageable MSW and Recycling Output (2066-2075)

Information	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Manageable MSW – BPS 1 (ton/day)	335	338	342	345	349	352	356	359	363	366
Manageable MSW – BPS 1 (m ³ /day)	1.555	1.571	1.587	1.603	1.619	1.636	1.652	1.668	1.684	1.700
Manageable MSW – BPS 1 (ton/year)	103.829	104.909	105.989	107.069	108.149	109.229	110.309	111.389	112.469	113.549
Manageable MSW – BPS 1 (m ³ /year)	481.966	486.979	491.992	497.005	502.018	507.032	512.045	517.058	522.071	527.084
Expected Output										
Organic Compost (ton/year)	228.703	231.082	233.461	235.840	238.219	240.598	242.976	245.355	247.734	250.113
Textile Shred (ton/year)	6.015	6.077	6.140	6.202	6.265	6.328	6.390	6.453	6.515	6.578
Paper Shred & Pulp (ton/year)	3.333	3.368	3.403	3.437	3.472	3.507	3.541	3.576	3.611	3.645
Rubber and Leather Shred (ton/year)	677	684	691	698	705	712	719	726	733	740
Plastic Pellets (ton/year)	601	608	614	620	627	633	639	645	652	658
Glass Shard (ton/year)	313	317	320	323	326	330	333	336	339	343
Metal Shred (ton/year)	200	203	205	207	209	211	213	215	217	219

BPS 2 and BPS 3 (PT Y) – Debt Schedule Repayment (in IDR, million) (2026-2037)

Description	Years during Tenor											
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Initial Loan Balance	Rp55.503	Rp55.239	Rp54.448	Rp52.602	Rp50.182	Rp47.407	Rp44.631	Rp41.856	Rp39.081	Rp36.306	Rp33.531	Rp30.756
Installment for loan drawdown Year 0 (2021)	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264

Description	Years during Tenor											
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Installment for loan drawdown Year 1 (2022)	Rp0	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527
Installment for loan drawdown Year 2 (2023)	Rp0	Rp0	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055
Installment for loan drawdown Year 3 (2024)	Rp0	Rp0	Rp0	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575
Installment for loan drawdown Year 4 (2025)	Rp0	Rp0	Rp0	Rp0	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355
Total Installment	Rp264	Rp791	Rp1.846	Rp2.421	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775
Ending Loan Balance	Rp55.239	Rp54.448	Rp52.602	Rp50.182	Rp47.407	Rp44.631	Rp41.856	Rp39.081	Rp36.306	Rp33.531	Rp30.756	Rp27.981

BPS 2 and BPS 3 (PT Y) – Debt Schedule Repayment (in IDR, million) (2038-2049)

Description	Years during Tenor											
	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Initial Loan Balance	Rp27.981	Rp25.205	Rp22.430	Rp19.655	Rp16.880	Rp14.105	Rp11.330	Rp8.554	Rp5.779	Rp3.268	Rp1.284	Rp355
Installment for loan drawdown Year 0 (2021)	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp264	Rp0	Rp0	Rp0	Rp0
Installment for loan drawdown Year 1 (2022)	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp527	Rp0	Rp0	Rp0
Installment for loan drawdown Year 2 (2023)	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp1.055	Rp0	Rp0
Installment for loan drawdown Year 3 (2024)	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp575	Rp0
Installment for loan drawdown Year 4 (2025)	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355	Rp355
Total Installment	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.775	Rp2.511	Rp1.984	Rp929	Rp355
Ending Loan Balance	Rp25.205	Rp22.430	Rp19.655	Rp16.880	Rp14.105	Rp11.330	Rp8.554	Rp5.779	Rp3.268	Rp1.284	Rp355	Rp0

BPS 2 and BPS 3 (PT Y) – Depreciation Expense Projection (in IDR, million) (2026-2035)

Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Asset's Acquisition Cost	Rp97.540	Rp97.540	Rp98.671	Rp100.079	Rp106.433	Rp106.736	Rp108.452	Rp108.565	Rp110.416	Rp111.687
Depreciation & Amortization Expense	Rp3.126	Rp3.126	Rp3.214	Rp3.278	Rp3.727	Rp3.750	Rp3.824	Rp3.829	Rp3.968	Rp4.001
Accumulative Depreciation & Amortization Expense	Rp3.126	Rp6.251	Rp9.465	Rp12.743	Rp16.470	Rp20.219	Rp24.044	Rp27.872	Rp31.841	Rp35.841
Remaining Assets Book Value	Rp94.414	Rp91.288	Rp89.206	Rp87.336	Rp89.963	Rp86.517	Rp84.409	Rp80.693	Rp78.575	Rp75.846

BPS 2 and BPS 3 (PT Y) – Depreciation Expense Projection (in IDR, million) (2036-2045)

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Asset's Acquisition Cost	Rp113.729	Rp113.890	Rp115.281	Rp115.430	Rp117.325	Rp138.295	Rp138.459	Rp140.387	Rp142.608	Rp152.526
Depreciation & Amortization Expense	Rp4.107	Rp4.110	Rp4.150	Rp4.155	Rp4.285	Rp4.774	Rp4.779	Rp4.828	Rp4.901	Rp5.137
Accumulative Depreciation & Amortization Expense	Rp39.948	Rp44.058	Rp48.208	Rp52.363	Rp56.648	Rp61.422	Rp66.202	Rp71.030	Rp75.931	Rp81.068
Remaining Assets Book Value	Rp73.781	Rp69.832	Rp67.073	Rp63.067	Rp60.677	Rp76.873	Rp72.257	Rp69.357	Rp66.677	Rp71.458

BPS 2 and BPS 3 (PT Y) – Depreciation Expense Projection (in IDR, million) (2046-2055)

Description	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Asset's Acquisition Cost	Rp158.774	Rp161.457	Rp161.655	Rp164.592	Rp167.517	Rp169.641	Rp170.457	Rp172.653	Rp172.901	Rp183.921
Depreciation & Amortization Expense	Rp4.374	Rp4.446	Rp4.454	Rp4.525	Rp4.645	Rp4.694	Rp4.735	Rp4.799	Rp4.808	Rp5.442
Accumulative Depreciation & Amortization Expense	Rp85.442	Rp89.888	Rp94.341	Rp98.867	Rp103.512	Rp108.206	Rp112.942	Rp117.741	Rp122.548	Rp127.990
Remaining Assets Book Value	Rp73.332	Rp71.569	Rp67.313	Rp65.725	Rp64.006	Rp61.435	Rp57.516	Rp54.912	Rp50.353	Rp55.931

BPS 2 and BPS 3 (PT Y) – Depreciation Expense Projection (in IDR, million) (2056-2065)

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Asset's Acquisition Cost	Rp217.852	Rp218.106	Rp223.555	Rp227.049	Rp242.513	Rp244.532	Rp248.742	Rp251.746	Rp256.548	Rp263.697
Depreciation & Amortization Expense	Rp6.251	Rp6.259	Rp6.505	Rp6.620	Rp6.987	Rp7.095	Rp7.209	Rp7.410	Rp7.522	Rp7.835
Accumulative Depreciation & Amortization Expense	Rp134.242	Rp140.500	Rp147.005	Rp153.625	Rp160.612	Rp167.707	Rp174.916	Rp182.326	Rp189.848	Rp197.682
Remaining Assets Book Value	Rp83.610	Rp77.606	Rp76.550	Rp73.424	Rp81.901	Rp76.825	Rp73.826	Rp69.420	Rp66.700	Rp66.015

BPS 2 and BPS 3 (PT Y) – Depreciation Expense Projection (in IDR, million) (2066-2075)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Asset's Acquisition Cost	Rp277.199	Rp278.711	Rp282.258	Rp282.676	Rp299.959	Rp352.683	Rp354.230	Rp362.768	Rp368.336	Rp393.470
Depreciation & Amortization Expense	Rp8.154	Rp8.190	Rp8.288	Rp8.300	Rp8.708	Rp10.091	Rp10.177	Rp10.392	Rp10.575	Rp11.230
Accumulative Depreciation & Amortization Expense	Rp205.836	Rp214.026	Rp222.314	Rp230.614	Rp239.322	Rp249.414	Rp259.591	Rp269.983	Rp280.558	Rp291.788
Remaining Assets Book Value	Rp71.363	Rp64.686	Rp59.944	Rp52.062	Rp60.637	Rp103.270	Rp94.640	Rp92.785	Rp87.778	Rp101.682

BPS 2 and BPS 3 (PT Y) – Income Statement Projection (in IDR, million) (2026-2035)

Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Sales	Rp276.427	Rp344.810	Rp419.061	Rp499.531	Rp586.587	Rp680.617	Rp711.968	Rp744.598	Rp778.555	Rp813.890
Cost of Goods Sold	(Rp191.480)	(Rp232.170)	(Rp275.789)	(Rp333.321)	(Rp384.320)	(Rp439.158)	(Rp458.653)	(Rp483.314)	(Rp504.519)	(Rp529.366)
Gross Profit	Rp84.947	Rp112.640	Rp143.272	Rp166.210	Rp202.267	Rp241.459	Rp253.315	Rp261.284	Rp274.037	Rp284.524
Operating Expenses										
Communication Expenses	(Rp14)	(Rp15)	(Rp15)	(Rp16)	(Rp16)	(Rp17)	(Rp17)	(Rp18)	(Rp18)	(Rp19)
General & Administrative Expenses	(Rp34.940)	(Rp42.364)	(Rp50.323)	(Rp60.820)	(Rp70.126)	(Rp80.131)	(Rp83.689)	(Rp88.188)	(Rp92.057)	(Rp96.591)
Maintenance Expense	(Rp30.568)	(Rp37.063)	(Rp44.027)	(Rp53.211)	(Rp61.352)	(Rp70.107)	(Rp73.219)	(Rp77.156)	(Rp80.541)	(Rp84.507)
Indirect Labour Expense	(Rp12.505)	(Rp15.163)	(Rp18.011)	(Rp21.769)	(Rp25.099)	(Rp28.681)	(Rp29.954)	(Rp31.565)	(Rp32.949)	(Rp34.572)
Risk Management Expense	(Rp6.448)	(Rp7.818)	(Rp9.287)	(Rp11.225)	(Rp12.942)	(Rp14.789)	(Rp15.445)	(Rp16.276)	(Rp16.990)	(Rp17.827)
Total Operating Expenses	(Rp84.475)	(Rp102.423)	(Rp121.664)	(Rp147.040)	(Rp169.536)	(Rp193.724)	(Rp202.324)	(Rp213.202)	(Rp222.556)	(Rp233.516)
EBITDA	Rp472	Rp10.216	Rp21.608	Rp19.169	Rp32.731	Rp47.734	Rp50.991	Rp48.082	Rp51.481	Rp51.008
Depreciation Expenses	(Rp3.126)	(Rp3.126)	(Rp3.214)	(Rp3.278)	(Rp3.727)	(Rp3.750)	(Rp3.824)	(Rp3.829)	(Rp3.968)	(Rp4.001)
Operating Profit (EBIT)	(Rp2.653)	Rp7.091	Rp18.395	Rp15.891	Rp29.004	Rp43.985	Rp47.166	Rp44.254	Rp47.513	Rp47.008
Other Revenue & Expenses										
Interest Expenses	(Rp6.255)	(Rp6.225)	(Rp6.136)	(Rp5.928)	(Rp5.655)	(Rp5.343)	(Rp5.030)	(Rp4.717)	(Rp4.404)	(Rp4.092)
Total Other Revenue & Expenses	(Rp6.255)	(Rp6.225)	(Rp6.136)	(Rp5.928)	(Rp5.655)	(Rp5.343)	(Rp5.030)	(Rp4.717)	(Rp4.404)	(Rp4.092)
Earning Before Tax (EBT)	(Rp8.908)	Rp865	Rp12.258	Rp9.963	Rp23.349	Rp38.642	Rp42.136	Rp39.537	Rp43.108	Rp42.916
Tax (25%)	Rp0	(Rp216)	(Rp3.065)	(Rp2.491)	(Rp5.837)	(Rp9.661)	(Rp10.534)	(Rp9.884)	(Rp10.777)	(Rp10.729)
EAT	(Rp8.908)	Rp649	Rp9.194	Rp7.472	Rp17.512	Rp28.982	Rp31.602	Rp29.652	Rp32.331	Rp32.187

BPS 2 and BPS 3 (PT Y) – Income Statement Projection (in IDR, million) (2036-2045)

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Sales	Rp850.654	Rp888.902	Rp928.689	Rp970.074	Rp1.013.117	Rp1.057.879	Rp1.104.425	Rp1.152.823	Rp1.203.140	Rp1.255.449
Cost of Goods Sold	(Rp552.360)	(Rp576.258)	(Rp601.093)	(Rp631.349)	(Rp658.296)	(Rp686.292)	(Rp715.375)	(Rp745.585)	(Rp776.964)	(Rp809.555)
Gross Profit	Rp298.294	Rp312.644	Rp327.596	Rp338.725	Rp354.820	Rp371.587	Rp389.050	Rp407.237	Rp426.176	Rp445.894
Operating Expenses										
Communication Expenses	(Rp19)	(Rp20)	(Rp20)	(Rp21)	(Rp22)	(Rp22)	(Rp23)	(Rp24)	(Rp24)	(Rp25)
General & Administrative Expenses	(Rp100.787)	(Rp105.147)	(Rp109.679)	(Rp115.199)	(Rp120.116)	(Rp125.224)	(Rp130.531)	(Rp136.043)	(Rp141.769)	(Rp147.715)
Maintenance Expense	(Rp88.178)	(Rp91.993)	(Rp95.958)	(Rp100.788)	(Rp105.090)	(Rp109.559)	(Rp114.202)	(Rp119.024)	(Rp124.034)	(Rp129.236)
Indirect Labour Expense	(Rp36.074)	(Rp37.635)	(Rp39.257)	(Rp41.233)	(Rp42.992)	(Rp44.821)	(Rp46.720)	(Rp48.693)	(Rp50.743)	(Rp52.871)
Risk Management Expense	(Rp18.601)	(Rp19.406)	(Rp20.242)	(Rp21.261)	(Rp22.169)	(Rp23.111)	(Rp24.091)	(Rp25.108)	(Rp26.165)	(Rp27.262)
Total Operating Expenses	(Rp243.659)	(Rp254.201)	(Rp265.156)	(Rp278.502)	(Rp290.388)	(Rp302.738)	(Rp315.566)	(Rp328.892)	(Rp342.734)	(Rp357.110)
EBITDA	Rp54.635	Rp58.443	Rp62.441	Rp60.223	Rp64.432	Rp68.849	Rp73.484	Rp78.345	Rp83.442	Rp88.784
Depreciation Expenses	(Rp4.107)	(Rp4.110)	(Rp4.150)	(Rp4.155)	(Rp4.285)	(Rp4.774)	(Rp4.779)	(Rp4.828)	(Rp4.901)	(Rp5.137)
Operating Profit (EBIT)	Rp50.528	Rp54.333	Rp58.291	Rp56.068	Rp60.147	Rp64.075	Rp68.705	Rp73.517	Rp78.541	Rp83.647
Other Revenue & Expenses										
Interest Expenses	(Rp3.779)	(Rp3.466)	(Rp3.153)	(Rp2.841)	(Rp2.528)	(Rp2.215)	(Rp1.902)	(Rp1.590)	(Rp1.277)	(Rp964)
Total Other Revenue & Expenses	(Rp3.779)	(Rp3.466)	(Rp3.153)	(Rp2.841)	(Rp2.528)	(Rp2.215)	(Rp1.902)	(Rp1.590)	(Rp1.277)	(Rp964)
Earning Before Tax (EBT)	Rp46.749	Rp50.866	Rp55.138	Rp53.228	Rp57.619	Rp61.860	Rp66.803	Rp71.927	Rp77.264	Rp82.683
Tax (25%)	(Rp11.687)	(Rp12.717)	(Rp13.784)	(Rp13.307)	(Rp14.405)	(Rp15.465)	(Rp16.701)	(Rp17.982)	(Rp19.316)	(Rp20.671)
EAT	Rp35.062	Rp38.150	Rp41.353	Rp39.921	Rp43.214	Rp46.395	Rp50.102	Rp53.945	Rp57.948	Rp62.013

BPS 2 and BPS 3 (PT Y) – Income Statement Projection (in IDR, million) (2046-2055)

Description	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Sales	Rp1.309.824	Rp1.366.342	Rp1.425.083	Rp1.486.128	Rp1.549.564	Rp1.615.479	Rp1.683.964	Rp1.755.115	Rp1.829.029	Rp1.905.809
Cost of Goods Sold	(Rp843.402)	(Rp878.551)	(Rp915.050)	(Rp953.575)	(Rp992.943)	(Rp1.033.814)	(Rp1.076.244)	(Rp1.120.289)	(Rp1.177.838)	(Rp1.225.647)
Gross Profit	Rp466.422	Rp487.791	Rp510.033	Rp532.553	Rp556.621	Rp581.665	Rp607.720	Rp634.826	Rp651.191	Rp680.162
Operating Expenses										
Communication Expenses	(Rp26)	(Rp27)	(Rp27)	(Rp28)	(Rp29)	(Rp30)	(Rp31)	(Rp32)	(Rp33)	(Rp34)
General & Administrative Expenses	(Rp153.891)	(Rp160.305)	(Rp166.964)	(Rp173.994)	(Rp181.177)	(Rp188.634)	(Rp196.376)	(Rp204.413)	(Rp214.913)	(Rp223.637)
Maintenance Expense	(Rp134.640)	(Rp140.251)	(Rp146.077)	(Rp152.228)	(Rp158.512)	(Rp165.037)	(Rp171.810)	(Rp178.842)	(Rp188.029)	(Rp195.661)
Indirect Labour Expense	(Rp55.081)	(Rp57.377)	(Rp59.761)	(Rp62.277)	(Rp64.848)	(Rp67.517)	(Rp70.288)	(Rp73.165)	(Rp76.923)	(Rp80.045)
Risk Management Expense	(Rp28.402)	(Rp29.586)	(Rp30.815)	(Rp32.112)	(Rp33.438)	(Rp34.814)	(Rp36.243)	(Rp37.726)	(Rp39.664)	(Rp41.274)
Total Operating Expenses	(Rp372.040)	(Rp387.545)	(Rp403.645)	(Rp420.639)	(Rp438.004)	(Rp456.033)	(Rp474.749)	(Rp494.177)	(Rp519.562)	(Rp540.651)
EBITDA	Rp94.382	Rp100.247	Rp106.388	Rp111.914	Rp118.617	Rp125.632	Rp132.971	Rp140.648	Rp131.629	Rp139.511

Description	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Depreciation Expenses	(Rp4.374)	(Rp4.446)	(Rp4.454)	(Rp4.525)	(Rp4.645)	(Rp4.694)	(Rp4.735)	(Rp4.799)	(Rp4.808)	(Rp5.442)
Operating Profit (EBIT)	Rp90.009	Rp95.801	Rp101.934	Rp107.389	Rp113.972	Rp120.938	Rp128.236	Rp135.849	Rp126.821	Rp134.069
Other Revenue & Expenses										
Interest Expenses	(Rp651)	(Rp368)	(Rp145)	(Rp40)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp651)	(Rp368)	(Rp145)	(Rp40)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp89.357	Rp95.432	Rp101.790	Rp107.349	Rp113.972	Rp120.938	Rp128.236	Rp135.849	Rp126.821	Rp134.069
Tax (25%)	(Rp22.339)	(Rp23.858)	(Rp25.447)	(Rp26.837)	(Rp28.493)	(Rp30.234)	(Rp32.059)	(Rp33.962)	(Rp31.705)	(Rp33.517)
EAT	Rp67.018	Rp71.574	Rp76.342	Rp80.512	Rp85.479	Rp90.703	Rp96.177	Rp101.887	Rp95.116	Rp100.552

BPS 2 and BPS 3 (PT Y) – Income Statement Projection (in IDR, million) (2056-2065)

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Sales	Rp1.985.560	Rp2.068.391	Rp2.154.415	Rp2.243.749	Rp2.336.515	Rp2.432.837	Rp2.532.846	Rp2.636.677	Rp2.744.468	Rp2.856.363
Cost of Goods Sold	(Rp1.275.265)	(Rp1.332.131)	(Rp1.385.725)	(Rp1.441.337)	(Rp1.499.670)	(Rp1.559.555)	(Rp1.628.655)	(Rp1.693.316)	(Rp1.762.945)	(Rp1.832.598)
Gross Profit	Rp710.295	Rp736.260	Rp768.690	Rp802.412	Rp836.845	Rp873.282	Rp904.192	Rp943.361	Rp981.522	Rp1.023.765
Operating Expenses										
Communication Expenses	(Rp35)	(Rp36)	(Rp37)	(Rp38)	(Rp39)	(Rp40)	(Rp41)	(Rp43)	(Rp44)	(Rp45)
General & Administrative Expenses	(Rp232.690)	(Rp243.066)	(Rp252.845)	(Rp262.992)	(Rp273.636)	(Rp284.563)	(Rp297.171)	(Rp308.969)	(Rp321.674)	(Rp334.383)
Maintenance Expense	(Rp203.582)	(Rp212.660)	(Rp221.215)	(Rp230.093)	(Rp239.405)	(Rp248.965)	(Rp259.996)	(Rp270.319)	(Rp281.434)	(Rp292.554)
Indirect Labour Expense	(Rp83.286)	(Rp87.000)	(Rp90.500)	(Rp94.132)	(Rp97.942)	(Rp101.853)	(Rp106.365)	(Rp110.588)	(Rp115.136)	(Rp119.685)
Risk Management Expense	(Rp42.945)	(Rp44.860)	(Rp46.665)	(Rp48.538)	(Rp50.502)	(Rp52.519)	(Rp54.846)	(Rp57.023)	(Rp59.368)	(Rp61.714)
Total Operating Expenses	(Rp562.538)	(Rp587.622)	(Rp611.263)	(Rp635.793)	(Rp661.524)	(Rp687.940)	(Rp718.420)	(Rp746.943)	(Rp777.656)	(Rp808.380)
EBITDA	Rp147.757	Rp148.638	Rp157.427	Rp166.619	Rp175.320	Rp185.343	Rp185.772	Rp196.418	Rp203.866	Rp215.385
Depreciation Expenses	(Rp6.251)	(Rp6.259)	(Rp6.505)	(Rp6.620)	(Rp6.987)	(Rp7.095)	(Rp7.209)	(Rp7.410)	(Rp7.522)	(Rp7.835)
Operating Profit (EBIT)	Rp141.506	Rp142.380	Rp150.922	Rp160.000	Rp168.333	Rp178.247	Rp178.563	Rp189.008	Rp196.344	Rp207.550
Other Revenue & Expenses										
Interest Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp141.506	Rp142.380	Rp150.922	Rp160.000	Rp168.333	Rp178.247	Rp178.563	Rp189.008	Rp196.344	Rp207.550

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Tax (25%)	(Rp35.377)	(Rp35.595)	(Rp37.730)	(Rp40.000)	(Rp42.083)	(Rp44.562)	(Rp44.641)	(Rp47.252)	(Rp49.086)	(Rp51.888)
EAT	Rp106.130	Rp106.785	Rp113.191	Rp120.000	Rp126.250	Rp133.685	Rp133.922	Rp141.756	Rp147.258	Rp155.663

BPS 2 and BPS 3 (PT Y) – Income Statement Projection (in IDR, million) (2066-2075)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Sales	Rp2.972.513	Rp3.093.071	Rp3.218.197	Rp3.348.058	Rp3.482.824	Rp3.622.673	Rp3.767.789	Rp3.918.361	Rp4.074.587	Rp4.236.670
Cost of Goods Sold	(Rp1.904.843)	(Rp1.979.773)	(Rp2.057.484)	(Rp2.138.077)	(Rp2.221.709)	(Rp2.308.377)	(Rp2.398.246)	(Rp2.491.430)	(Rp2.590.522)	(Rp2.704.064)
Gross Profit	Rp1.067.670	Rp1.113.298	Rp1.160.713	Rp1.209.981	Rp1.261.115	Rp1.314.296	Rp1.369.542	Rp1.426.931	Rp1.484.066	Rp1.532.606
Operating Expenses										
Communication Expenses	(Rp47)	(Rp48)	(Rp50)	(Rp51)	(Rp53)	(Rp54)	(Rp56)	(Rp57)	(Rp59)	(Rp61)
General & Administrative Expenses	(Rp347.565)	(Rp361.237)	(Rp375.416)	(Rp390.122)	(Rp405.381)	(Rp421.195)	(Rp437.593)	(Rp454.595)	(Rp472.676)	(Rp493.393)
Maintenance Expense	(Rp304.087)	(Rp316.048)	(Rp328.454)	(Rp341.320)	(Rp354.671)	(Rp368.506)	(Rp382.853)	(Rp397.729)	(Rp413.548)	(Rp431.673)
Indirect Labour Expense	(Rp124.403)	(Rp129.296)	(Rp134.372)	(Rp139.635)	(Rp145.097)	(Rp150.757)	(Rp156.626)	(Rp162.712)	(Rp169.184)	(Rp176.599)
Risk Management Expense	(Rp64.147)	(Rp66.670)	(Rp69.287)	(Rp72.001)	(Rp74.817)	(Rp77.736)	(Rp80.762)	(Rp83.900)	(Rp87.237)	(Rp91.061)
Total Operating Expenses	(Rp840.248)	(Rp873.300)	(Rp907.579)	(Rp943.129)	(Rp980.019)	(Rp1.018.249)	(Rp1.057.890)	(Rp1.098.994)	(Rp1.142.704)	(Rp1.192.788)
EBITDA	Rp227.422	Rp239.998	Rp253.134	Rp266.852	Rp281.096	Rp296.047	Rp311.652	Rp327.937	Rp341.362	Rp339.819
Depreciation Expenses	(Rp8.154)	(Rp8.190)	(Rp8.288)	(Rp8.300)	(Rp8.708)	(Rp10.091)	(Rp10.177)	(Rp10.392)	(Rp10.575)	(Rp11.230)
Operating Profit (EBIT)	Rp219.269	Rp231.808	Rp244.846	Rp258.552	Rp272.387	Rp285.955	Rp301.475	Rp317.545	Rp330.787	Rp328.589
Other Revenue & Expenses										
Interest Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp219.269	Rp231.808	Rp244.846	Rp258.552	Rp272.387	Rp285.955	Rp301.475	Rp317.545	Rp330.787	Rp328.589
Tax (25%)	(Rp54.817)	(Rp57.952)	(Rp61.211)	(Rp64.638)	(Rp68.097)	(Rp71.489)	(Rp75.369)	(Rp79.386)	(Rp82.697)	(Rp82.147)
EAT	Rp164.451	Rp173.856	Rp183.634	Rp193.914	Rp204.291	Rp214.466	Rp226.106	Rp238.159	Rp248.090	Rp246.441

BPS 2 and BPS 3 (PT Y) – Cash Flow Statement Projection (in IDR, million) (2021-2029)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029
Operational Cash Flow									
Sales	Rp0	Rp0	Rp0	Rp0	Rp0	Rp276.427	Rp367.846	Rp447.796	Rp534.453
Account Receivable	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp23.036)	(Rp28.734)	(Rp34.922)	(Rp41.628)
Cost of Operation	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp191.480)	(Rp232.170)	(Rp275.789)	(Rp333.321)
Operating Expense	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp84.475)	(Rp102.423)	(Rp121.664)	(Rp147.040)
Interest Expense	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp6.255)	(Rp6.225)	(Rp6.136)	(Rp5.928)
Tax (25%)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp216)	(Rp3.065)	(Rp2.491)
Total Operational Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp28.818)	(Rp1.924)	Rp6.220	Rp4.044
Investment Cash Flow									
Project Cost	(Rp8.182)	(Rp16.957)	(Rp34.509)	(Rp21.989)	(Rp16.457)	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp1.132)	(Rp1.408)	(Rp6.354)
Total Investment Cash Flow	(Rp8.182)	(Rp16.957)	(Rp34.509)	(Rp21.989)	(Rp16.457)	Rp0	(Rp1.132)	(Rp1.408)	(Rp6.354)
Financing Cash Flow									
Shareholder's Equity	Rp2.907	Rp6.409	Rp13.413	Rp10.496	Rp9.366	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp5.274	Rp10.548	Rp21.096	Rp11.493	Rp7.092	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp264)	(Rp791)	(Rp1.846)	(Rp2.421)
Total Financing Cash Flow	Rp8.182	Rp16.957	Rp34.509	Rp21.989	Rp16.457	(Rp264)	(Rp791)	(Rp1.846)	(Rp2.421)
Net Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp29.082)	(Rp3.847)	Rp2.966	(Rp4.730)
Cash – Beginning Balance	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp29.082)	(Rp32.929)	(Rp29.963)
Cash – Ending Balance	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp29.082)	(Rp32.929)	(Rp29.963)	(Rp34.693)

BPS 2 and BPS 3 (PT Y) – Cash Flow Statement Projection (in IDR, million) (2030-2037)

Description	2030	2031	2032	2033	2034	2035	2036	2037
Operational Cash Flow								
Sales	Rp628.215	Rp729.499	Rp768.686	Rp803.929	Rp840.605	Rp878.769	Rp918.478	Rp959.790
Account Receivable	(Rp48.882)	(Rp56.718)	(Rp59.331)	(Rp62.050)	(Rp64.880)	(Rp67.824)	(Rp70.888)	(Rp74.075)
Cost of Operation	(Rp384.320)	(Rp439.158)	(Rp458.653)	(Rp483.314)	(Rp504.519)	(Rp529.366)	(Rp552.360)	(Rp576.258)
Operating Expense	(Rp169.536)	(Rp193.724)	(Rp202.324)	(Rp213.202)	(Rp222.556)	(Rp233.516)	(Rp243.659)	(Rp254.201)
Interest Expense	(Rp5.655)	(Rp5.343)	(Rp5.030)	(Rp4.717)	(Rp4.404)	(Rp4.092)	(Rp3.779)	(Rp3.466)
Tax (25%)	(Rp5.837)	(Rp9.661)	(Rp10.534)	(Rp9.884)	(Rp10.777)	(Rp10.729)	(Rp11.687)	(Rp12.717)
Total Operational Cash Flow	Rp13.984	Rp24.895	Rp32.814	Rp30.762	Rp33.470	Rp33.243	Rp36.105	Rp39.073
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2030	2031	2032	2033	2034	2035	2036	2037
Routine CAPEX	(Rp303)	(Rp1.716)	(Rp113)	(Rp1.851)	(Rp1.271)	(Rp2.041)	(Rp161)	(Rp1.391)
Total Investment Cash Flow	(Rp303)	(Rp1.716)	(Rp113)	(Rp1.851)	(Rp1.271)	(Rp2.041)	(Rp161)	(Rp1.391)
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)
Total Financing Cash Flow	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)
Net Cash Flow	Rp10.906	Rp20.404	Rp29.926	Rp26.136	Rp29.423	Rp28.427	Rp33.168	Rp34.907
Cash – Beginning Balance	(Rp34.693)	(Rp23.787)	(Rp3.384)	Rp26.542	Rp52.679	Rp82.102	Rp110.528	Rp143.697
Cash – Ending Balance	(Rp23.787)	(Rp3.384)	Rp26.542	Rp52.679	Rp82.102	Rp110.528	Rp143.697	Rp178.604

BPS 2 and BPS 3 (PT Y) – Cash Flow Statement Projection (in IDR, million) (2038-2045)

Description	2038	2039	2040	2041	2042	2043	2044	2045
Operational Cash Flow								
Sales	Rp1.002.765	Rp1.047.465	Rp1.093.956	Rp1.142.305	Rp1.192.582	Rp1.244.858	Rp1.299.208	Rp1.355.711
Account Receivable	(Rp77.391)	(Rp80.840)	(Rp84.426)	(Rp88.157)	(Rp92.035)	(Rp96.069)	(Rp100.262)	(Rp104.621)
Cost of Operation	(Rp601.093)	(Rp631.349)	(Rp658.296)	(Rp686.292)	(Rp715.375)	(Rp745.585)	(Rp776.964)	(Rp809.555)
Operating Expense	(Rp265.156)	(Rp278.502)	(Rp290.388)	(Rp302.738)	(Rp315.566)	(Rp328.892)	(Rp342.734)	(Rp357.110)
Interest Expense	(Rp3.153)	(Rp2.841)	(Rp2.528)	(Rp2.215)	(Rp1.902)	(Rp1.590)	(Rp1.277)	(Rp964)
Tax (25%)	(Rp13.784)	(Rp13.307)	(Rp14.405)	(Rp15.465)	(Rp16.701)	(Rp17.982)	(Rp19.316)	(Rp20.671)
Total Operational Cash Flow	Rp42.187	Rp40.627	Rp43.913	Rp47.439	Rp51.002	Rp54.741	Rp58.656	Rp62.790
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp150)	(Rp1.895)	(Rp20.970)	(Rp164)	(Rp1.928)	(Rp2.222)	(Rp9.918)	(Rp6.248)
Total Investment Cash Flow	(Rp150)	(Rp1.895)	(Rp20.970)	(Rp164)	(Rp1.928)	(Rp2.222)	(Rp9.918)	(Rp6.248)
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)
Total Financing Cash Flow	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)	(Rp2.775)
Net Cash Flow	Rp39.263	Rp35.957	Rp20.168	Rp44.500	Rp46.300	Rp49.744	Rp45.963	Rp53.767
Cash – Beginning Balance	Rp178.604	Rp217.866	Rp253.823	Rp273.991	Rp318.491	Rp364.791	Rp414.534	Rp460.497

Description	2038	2039	2040	2041	2042	2043	2044	2045
Cash – Ending Balance	Rp217.866	Rp253.823	Rp273.991	Rp318.491	Rp364.791	Rp414.534	Rp460.497	Rp514.265

BPS 2 and BPS 3 (PT Y) – Cash Flow Statement Projection (in IDR, million) (2046-2053)

Description	2046	2047	2048	2049	2050	2051	2052	2053
Operational Cash Flow								
Sales	Rp1.414.445	Rp1.475.494	Rp1.538.945	Rp1.604.885	Rp1.673.408	Rp1.744.609	Rp1.818.587	Rp1.895.445
Account Receivable	(Rp109.152)	(Rp113.862)	(Rp118.757)	(Rp123.844)	(Rp129.130)	(Rp134.623)	(Rp140.330)	(Rp146.260)
Cost of Operation	(Rp843.402)	(Rp878.551)	(Rp915.050)	(Rp953.575)	(Rp992.943)	(Rp1.033.814)	(Rp1.076.244)	(Rp1.120.289)
Operating Expense	(Rp372.040)	(Rp387.545)	(Rp403.645)	(Rp420.639)	(Rp438.004)	(Rp456.033)	(Rp474.749)	(Rp494.177)
Interest Expense	(Rp651)	(Rp368)	(Rp145)	(Rp40)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp22.339)	(Rp23.858)	(Rp25.447)	(Rp26.837)	(Rp28.493)	(Rp30.234)	(Rp32.059)	(Rp33.962)
Total Operational Cash Flow	Rp66.860	Rp71.310	Rp75.901	Rp79.950	Rp84.838	Rp89.905	Rp95.205	Rp100.757
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp2.683)	(Rp198)	(Rp2.937)	(Rp2.926)	(Rp2.124)	(Rp816)	(Rp2.196)	(Rp248)
Total Investment Cash Flow	(Rp2.683)	(Rp198)	(Rp2.937)	(Rp2.926)	(Rp2.124)	(Rp816)	(Rp2.196)	(Rp248)
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp2.511)	(Rp1.984)	(Rp929)	(Rp355)	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	(Rp2.511)	(Rp1.984)	(Rp929)	(Rp355)	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp61.666	Rp69.129	Rp72.035	Rp76.669	Rp82.714	Rp89.089	Rp93.010	Rp100.508
Cash – Beginning Balance	Rp514.265	Rp575.931	Rp645.059	Rp717.094	Rp793.764	Rp876.477	Rp965.566	Rp1.058.576
Cash – Ending Balance	Rp575.931	Rp645.059	Rp717.094	Rp793.764	Rp876.477	Rp965.566	Rp1.058.576	Rp1.159.084

BPS 2 and BPS 3 (PT Y) – Cash Flow Statement Projection (in IDR, million) (2054-2060)

Description	2054	2055	2056	2057	2058	2059	2060
Operational Cash Flow							
Sales	Rp1.975.289	Rp2.058.228	Rp2.144.377	Rp2.233.854	Rp2.326.781	Rp2.423.284	Rp2.523.494
Account Receivable	(Rp152.419)	(Rp158.817)	(Rp165.463)	(Rp172.366)	(Rp179.535)	(Rp186.979)	(Rp194.710)
Cost of Operation	(Rp1.177.838)	(Rp1.225.647)	(Rp1.275.265)	(Rp1.332.131)	(Rp1.385.725)	(Rp1.441.337)	(Rp1.499.670)
Operating Expense	(Rp519.562)	(Rp540.651)	(Rp562.538)	(Rp587.622)	(Rp611.263)	(Rp635.793)	(Rp661.524)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp31.705)	(Rp33.517)	(Rp35.377)	(Rp35.595)	(Rp37.730)	(Rp40.000)	(Rp42.083)

Description	2054	2055	2056	2057	2058	2059	2060
Total Operational Cash Flow	Rp93.764	Rp99.595	Rp105.735	Rp106.141	Rp112.528	Rp119.175	Rp125.507
Investment Cash Flow							
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp11.020)	(Rp33.931)	(Rp254)	(Rp5.449)	(Rp3.494)	(Rp15.464)	(Rp2.019)
Total Investment Cash Flow	(Rp11.020)	(Rp33.931)	(Rp254)	(Rp5.449)	(Rp3.494)	(Rp15.464)	(Rp2.019)
Financing Cash Flow							
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp82.745	Rp65.664	Rp105.481	Rp100.692	Rp109.034	Rp103.711	Rp123.487
Cash – Beginning Balance	Rp1.159.084	Rp1.241.829	Rp1.307.493	Rp1.412.974	Rp1.513.666	Rp1.622.700	Rp1.726.411
Cash – Ending Balance	Rp1.241.829	Rp1.307.493	Rp1.412.974	Rp1.513.666	Rp1.622.700	Rp1.726.411	Rp1.849.898

BPS 2 and BPS 3 (PT Y) – Cash Flow Statement Projection (in IDR, million) (2061-2068)

Description	2061	2062	2063	2064	2065	2066	2067
Operational Cash Flow							
Sales	Rp2.627.547	Rp2.735.583	Rp2.847.747	Rp2.964.191	Rp3.085.069	Rp3.210.543	Rp3.340.780
Account Receivable	(Rp202.736)	(Rp211.071)	(Rp219.723)	(Rp228.706)	(Rp238.030)	(Rp247.709)	(Rp257.756)
Cost of Operation	(Rp1.559.555)	(Rp1.628.655)	(Rp1.693.316)	(Rp1.762.945)	(Rp1.832.598)	(Rp1.904.843)	(Rp1.979.773)
Operating Expense	(Rp687.940)	(Rp718.420)	(Rp746.943)	(Rp777.656)	(Rp808.380)	(Rp840.248)	(Rp873.300)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp44.562)	(Rp44.641)	(Rp47.252)	(Rp49.086)	(Rp51.888)	(Rp54.817)	(Rp57.952)
Total Operational Cash Flow	Rp132.754	Rp132.797	Rp140.513	Rp145.797	Rp154.173	Rp162.926	Rp171.999
Investment Cash Flow							
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp4.211)	(Rp3.003)	(Rp4.802)	(Rp7.149)	(Rp13.502)	(Rp1.512)	(Rp3.546)
Total Investment Cash Flow	(Rp4.211)	(Rp3.003)	(Rp4.802)	(Rp7.149)	(Rp13.502)	(Rp1.512)	(Rp3.546)
Financing Cash Flow							
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2061	2062	2063	2064	2065	2066	2067
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp128.543	Rp129.794	Rp135.711	Rp138.648	Rp140.671	Rp161.414	Rp168.453
Cash – Beginning Balance	Rp1.849.898	Rp1.978.441	Rp2.108.235	Rp2.243.946	Rp2.382.594	Rp2.523.265	Rp2.684.678
Cash – Ending Balance	Rp1.978.441	Rp2.108.235	Rp2.243.946	Rp2.382.594	Rp2.523.265	Rp2.684.678	Rp2.853.131

BPS 2 and BPS 3 (PT Y) – Cash Flow Statement Projection (in IDR, million) (2068-2075)

Description	2068	2069	2070	2071	2072	2073	2074	2075
Operational Cash Flow								
Sales	Rp3.475.953	Rp3.616.241	Rp3.761.829	Rp3.912.908	Rp4.069.678	Rp4.232.343	Rp4.401.117	Rp4.576.219
Account Receivable	(Rp268.183)	(Rp279.005)	(Rp290.235)	(Rp301.889)	(Rp313.982)	(Rp326.530)	(Rp339.549)	(Rp353.056)
Cost of Operation	(Rp2.057.484)	(Rp2.138.077)	(Rp2.221.709)	(Rp2.308.377)	(Rp2.398.246)	(Rp2.491.430)	(Rp2.590.522)	(Rp2.704.064)
Operating Expense	(Rp907.579)	(Rp943.129)	(Rp980.019)	(Rp1.018.249)	(Rp1.057.890)	(Rp1.098.994)	(Rp1.142.704)	(Rp1.192.788)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp61.211)	(Rp64.638)	(Rp68.097)	(Rp71.489)	(Rp75.369)	(Rp79.386)	(Rp82.697)	(Rp82.147)
Total Operational Cash Flow	Rp181.495	Rp191.392	Rp201.768	Rp212.904	Rp224.190	Rp236.003	Rp245.646	Rp244.164
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp418)	(Rp17.283)	(Rp52.724)	(Rp1.547)	(Rp8.537)	(Rp5.568)	(Rp25.134)	(Rp8.974)
Total Investment Cash Flow	(Rp418)	(Rp17.283)	(Rp52.724)	(Rp1.547)	(Rp8.537)	(Rp5.568)	(Rp25.134)	(Rp8.974)
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp181.077	Rp174.109	Rp149.044	Rp211.357	Rp215.653	Rp230.435	Rp220.513	Rp235.191
Cash – Beginning Balance	Rp2.853.131	Rp3.034.209	Rp3.208.318	Rp3.357.362	Rp3.568.719	Rp3.784.372	Rp4.014.806	Rp4.235.319
Cash – Ending Balance	Rp3.034.209	Rp3.208.318	Rp3.357.362	Rp3.568.719	Rp3.784.372	Rp4.014.806	Rp4.235.319	Rp4.470.510

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2021-2027)

Description	2021	2022	2023	2024	2025	2026	2027
ASSETS							
Current Assets							
Cash		Rp0	Rp0	Rp0	Rp0	(Rp29.082)	(Rp32.929)

Description	2021	2022	2023	2024	2025	2026	2027
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp23.036	Rp28.734
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp6.047)	(Rp4.195)
Fixed Assets							
Net Plant and Equipment	Rp8.182	Rp25.139	Rp59.648	Rp81.637	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp1.132
Accumulated Depreciation	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp3.126)	(Rp6.251)
Total Fixed Assets	Rp8.182	Rp25.139	Rp59.648	Rp81.637	Rp98.095	Rp94.969	Rp92.975
TOTAL ASSETS	Rp8.182	Rp25.139	Rp59.648	Rp81.637	Rp98.095	Rp88.922	Rp88.780
LIABILITIES							
Current Liabilities							
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities							
Long Term Notes	Rp5.274	Rp15.822	Rp36.919	Rp48.411	Rp55.503	Rp55.239	Rp54.448
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp5.274	Rp15.822	Rp36.919	Rp48.411	Rp55.503	Rp55.239	Rp54.448
TOTAL LIABILITIES	Rp5.274	Rp15.822	Rp36.919	Rp48.411	Rp55.503	Rp55.239	Rp54.448
EQUITIES							
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp2.907	Rp9.317	Rp22.730	Rp33.226	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp8.908)
Profit this Year	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp8.908)	Rp649
TOTAL EQUITIES	Rp2.907	Rp9.317	Rp22.730	Rp33.226	Rp42.591	Rp33.683	Rp34.332
TOTAL EQUITIES DAN LIABILITIES	Rp8.182	Rp25.139	Rp59.648	Rp81.637	Rp98.095	Rp88.922	Rp88.780

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2028-2034)

Description	2028	2029	2030	2031	2032	2033	2034
ASSETS							
Current Assets							
Cash	(Rp29.963)	(Rp34.693)	(Rp23.787)	(Rp3.384)	Rp26.542	Rp52.679	Rp82.102
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp34.922	Rp41.628	Rp48.882	Rp56.718	Rp59.331	Rp62.050	Rp64.880
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp4.959	Rp6.935	Rp25.095	Rp53.335	Rp85.873	Rp114.728	Rp146.982
Fixed Assets							
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp2.539	Rp8.893	Rp9.196	Rp10.913	Rp11.026	Rp12.876	Rp14.148
Accumulated Depreciation	(Rp9.465)	(Rp12.743)	(Rp16.470)	(Rp20.219)	(Rp24.044)	(Rp27.872)	(Rp31.841)
Total Fixed Assets	Rp91.169	Rp94.245	Rp90.821	Rp88.788	Rp85.076	Rp83.098	Rp80.401
TOTAL ASSETS	Rp96.128	Rp101.180	Rp115.916	Rp142.123	Rp170.950	Rp197.827	Rp227.383
LIABILITIES							
Current Liabilities							
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities							
Long Term Notes	Rp52.602	Rp50.182	Rp47.407	Rp44.631	Rp41.856	Rp39.081	Rp36.306
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp52.602	Rp50.182	Rp47.407	Rp44.631	Rp41.856	Rp39.081	Rp36.306
TOTAL LIABILITIES	Rp52.602	Rp50.182	Rp47.407	Rp44.631	Rp41.856	Rp39.081	Rp36.306
EQUITIES							
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	(Rp8.260)	Rp934	Rp8.406	Rp25.918	Rp54.900	Rp86.502	Rp116.154
Profit this Year	Rp9.194	Rp7.472	Rp17.512	Rp28.982	Rp31.602	Rp29.652	Rp32.331
TOTAL EQUITIES	Rp43.526	Rp50.998	Rp68.509	Rp97.491	Rp129.093	Rp158.746	Rp191.077
TOTAL EQUITIES DAN LIABILITIES	Rp96.128	Rp101.180	Rp115.916	Rp142.123	Rp170.950	Rp197.827	Rp227.383

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2035-2041)

Description	2035	2036	2037	2038	2039	2040	2041
ASSETS							
Current Assets							
Cash	Rp110.528	Rp143.697	Rp178.604	Rp217.866	Rp253.823	Rp273.991	Rp318.491
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp67.824	Rp70.888	Rp74.075	Rp77.391	Rp80.840	Rp84.426	Rp88.157
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp178.353	Rp214.585	Rp252.679	Rp295.257	Rp334.663	Rp358.417	Rp406.648
Fixed Assets							
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp16.189	Rp16.350	Rp17.741	Rp17.891	Rp19.786	Rp40.756	Rp40.919
Accumulated Depreciation	(Rp35.841)	(Rp39.948)	(Rp44.058)	(Rp48.208)	(Rp52.363)	(Rp56.648)	(Rp61.422)
Total Fixed Assets	Rp78.442	Rp74.497	Rp71.778	Rp67.777	Rp65.517	Rp82.202	Rp77.592
TOTAL ASSETS	Rp256.795	Rp289.082	Rp324.456	Rp363.034	Rp400.180	Rp440.619	Rp484.239
LIABILITIES							
Current Liabilities							
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities							
Long Term Notes	Rp33.531	Rp30.756	Rp27.981	Rp25.205	Rp22.430	Rp19.655	Rp16.880
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp33.531	Rp30.756	Rp27.981	Rp25.205	Rp22.430	Rp19.655	Rp16.880
TOTAL LIABILITIES	Rp33.531	Rp30.756	Rp27.981	Rp25.205	Rp22.430	Rp19.655	Rp16.880
EQUITIES							
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp148.485	Rp180.673	Rp215.734	Rp253.884	Rp295.238	Rp335.158	Rp378.373
Profit this Year	Rp32.187	Rp35.062	Rp38.150	Rp41.353	Rp39.921	Rp43.214	Rp46.395
TOTAL EQUITIES	Rp223.264	Rp258.326	Rp296.476	Rp337.829	Rp377.750	Rp420.964	Rp467.359

Description	2035	2036	2037	2038	2039	2040	2041
TOTAL EQUITIES DAN LIABILITIES	Rp256.795	Rp289.082	Rp324.456	Rp363.034	Rp400.180	Rp440.619	Rp484.239

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2042-2048)

Description	2042	2043	2044	2045	2046	2047	2048
ASSETS							
Current Assets							
Cash	Rp364.791	Rp414.534	Rp460.497	Rp514.265	Rp575.931	Rp645.059	Rp717.094
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp92.035	Rp96.069	Rp100.262	Rp104.621	Rp109.152	Rp113.862	Rp118.757
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp456.826	Rp510.603	Rp560.759	Rp618.886	Rp685.083	Rp758.921	Rp835.851
Fixed Assets							
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp42.847	Rp45.069	Rp54.987	Rp61.234	Rp63.917	Rp64.115	Rp67.052
Accumulated Depreciation	(Rp66.202)	(Rp71.030)	(Rp75.931)	(Rp81.068)	(Rp85.442)	(Rp89.888)	(Rp94.341)
Total Fixed Assets	Rp74.740	Rp72.133	Rp77.150	Rp78.261	Rp76.570	Rp72.322	Rp70.805
TOTAL ASSETS	Rp531.566	Rp582.736	Rp637.909	Rp697.147	Rp761.653	Rp831.243	Rp906.656
LIABILITIES							
Current Liabilities							
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities							
Long Term Notes	Rp14.105	Rp11.330	Rp8.554	Rp5.779	Rp3.268	Rp1.284	Rp355
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp14.105	Rp11.330	Rp8.554	Rp5.779	Rp3.268	Rp1.284	Rp355
TOTAL LIABILITIES	Rp14.105	Rp11.330	Rp8.554	Rp5.779	Rp3.268	Rp1.284	Rp355
EQUITIES							
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2042	2043	2044	2045	2046	2047	2048
Retained Earnings	Rp424.768	Rp474.870	Rp528.815	Rp586.763	Rp648.776	Rp715.794	Rp787.368
Profit this Year	Rp50.102	Rp53.945	Rp57.948	Rp62.013	Rp67.018	Rp71.574	Rp76.342
TOTAL EQUITIES	Rp517.461	Rp571.407	Rp629.355	Rp691.367	Rp758.385	Rp829.959	Rp906.302
TOTAL EQUITIES DAN LIABILITIES	Rp531.566	Rp582.736	Rp637.909	Rp697.147	Rp761.653	Rp831.243	Rp906.656

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2049-2055)

Description	2049	2050	2051	2052	2053	2054
ASSETS						
Current Assets						
Cash	Rp793.764	Rp876.477	Rp965.566	Rp1.058.576	Rp1.159.084	Rp1.241.829
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp123.844	Rp129.130	Rp134.623	Rp140.330	Rp146.260	Rp152.419
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp917.608	Rp1.005.608	Rp1.100.190	Rp1.198.906	Rp1.305.344	Rp1.394.248
Fixed Assets						
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp69.978	Rp72.102	Rp72.918	Rp75.113	Rp75.362	Rp86.381
Accumulated Depreciation	(Rp98.867)	(Rp103.512)	(Rp108.206)	(Rp112.942)	(Rp117.741)	(Rp122.548)
Total Fixed Assets	Rp69.206	Rp66.685	Rp62.806	Rp60.266	Rp55.716	Rp61.927
TOTAL ASSETS	Rp986.813	Rp1.072.292	Rp1.162.996	Rp1.259.173	Rp1.361.060	Rp1.456.175
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES						

Description	2049	2050	2051	2052	2053	2054
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp863.710	Rp944.222	Rp1.029.701	Rp1.120.404	Rp1.216.581	Rp1.318.468
Profit this Year	Rp80.512	Rp85.479	Rp90.703	Rp96.177	Rp101.887	Rp95.116
TOTAL EQUITIES	Rp986.813	Rp1.072.292	Rp1.162.996	Rp1.259.173	Rp1.361.060	Rp1.456.175
TOTAL EQUITIES DAN LIABILITIES	Rp986.813	Rp1.072.292	Rp1.162.996	Rp1.259.173	Rp1.361.060	Rp1.456.175

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2055-2060)

Description	2055	2056	2057	2058	2059	2060
ASSETS						
Current Assets						
Cash	Rp1.307.493	Rp1.412.974	Rp1.513.666	Rp1.622.700	Rp1.726.411	Rp1.849.898
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp158.817	Rp165.463	Rp172.366	Rp179.535	Rp186.979	Rp194.710
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp1.466.310	Rp1.578.437	Rp1.686.032	Rp1.802.234	Rp1.913.390	Rp2.044.608
Fixed Assets						
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp120.313	Rp120.567	Rp126.015	Rp129.509	Rp144.973	Rp146.992
Accumulated Depreciation	(Rp127.990)	(Rp134.242)	(Rp140.500)	(Rp147.005)	(Rp153.625)	(Rp160.612)
Total Fixed Assets	Rp90.417	Rp84.419	Rp83.610	Rp80.598	Rp89.443	Rp84.475
TOTAL ASSETS	Rp1.556.727	Rp1.662.857	Rp1.769.641	Rp1.882.833	Rp2.002.832	Rp2.129.082
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2055	2056	2057	2058	2059	2060
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp1.413.584	Rp1.514.136	Rp1.620.265	Rp1.727.050	Rp1.840.241	Rp1.960.241
Profit this Year	Rp100.552	Rp106.130	Rp106.785	Rp113.191	Rp120.000	Rp126.250
TOTAL EQUITIES	Rp1.556.727	Rp1.662.857	Rp1.769.641	Rp1.882.833	Rp2.002.832	Rp2.129.082
TOTAL EQUITIES DAN LIABILITIES	Rp1.556.727	Rp1.662.857	Rp1.769.641	Rp1.882.833	Rp2.002.832	Rp2.129.082

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2061-2065)

Description	2061	2062	2063	2064	2065
ASSETS					
Current Assets					
Cash	Rp1.978.441	Rp2.108.235	Rp2.243.946	Rp2.382.594	Rp2.523.265
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp202.736	Rp211.071	Rp219.723	Rp228.706	Rp238.030
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp2.181.178	Rp2.319.305	Rp2.463.669	Rp2.611.300	Rp2.761.295
Fixed Assets					
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp151.203	Rp154.206	Rp159.008	Rp166.158	Rp179.660
Accumulated Depreciation	(Rp167.707)	(Rp174.916)	(Rp182.326)	(Rp189.848)	(Rp197.682)
Total Fixed Assets	Rp81.590	Rp77.384	Rp74.777	Rp74.404	Rp80.072
TOTAL ASSETS	Rp2.262.768	Rp2.396.690	Rp2.538.446	Rp2.685.704	Rp2.841.367
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2061	2062	2063	2064	2065
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp2.086.491	Rp2.220.176	Rp2.354.098	Rp2.495.855	Rp2.643.112
Profit this Year	Rp133.685	Rp133.922	Rp141.756	Rp147.258	Rp155.663
TOTAL EQUITIES	Rp2.262.768	Rp2.396.690	Rp2.538.446	Rp2.685.704	Rp2.841.367
TOTAL EQUITIES DAN LIABILITIES	Rp2.262.768	Rp2.396.690	Rp2.538.446	Rp2.685.704	Rp2.841.367

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2066-2070)

Description	2066	2067	2068	2069	2070
ASSETS					
Current Assets					
Cash	Rp2.684.678	Rp2.853.131	Rp3.034.209	Rp3.208.318	Rp3.357.362
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp247.709	Rp257.756	Rp268.183	Rp279.005	Rp290.235
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp2.932.388	Rp3.110.887	Rp3.302.392	Rp3.487.323	Rp3.647.597
Fixed Assets					
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp181.172	Rp184.718	Rp185.136	Rp202.420	Rp255.144
Accumulated Depreciation	(Rp205.836)	(Rp214.026)	(Rp222.314)	(Rp230.614)	(Rp239.322)
Total Fixed Assets	Rp73.430	Rp68.787	Rp60.917	Rp69.900	Rp113.916

Description	2066	2067	2068	2069	2070
TOTAL ASSETS	Rp3.005.818	Rp3.179.675	Rp3.363.309	Rp3.557.223	Rp3.761.513
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp2.798.775	Rp2.963.227	Rp3.137.083	Rp3.320.717	Rp3.514.631
Profit this Year	Rp164.451	Rp173.856	Rp183.634	Rp193.914	Rp204.291
TOTAL EQUITIES	Rp3.005.818	Rp3.179.675	Rp3.363.309	Rp3.557.223	Rp3.761.513
TOTAL EQUITIES DAN LIABILITIES	Rp3.005.818	Rp3.179.675	Rp3.363.309	Rp3.557.223	Rp3.761.513

BPS 2 and BPS 3 (PT Y) – Balance Sheet Projection (in IDR, million) (2071-2075)

Description	2071	2072	2073	2074	2075
ASSETS					
Current Assets					
Cash	Rp3.568.719	Rp3.784.372	Rp4.014.806	Rp4.235.319	Rp4.470.510
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp301.889	Rp313.982	Rp326.530	Rp339.549	Rp353.056
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp3.870.608	Rp4.098.354	Rp4.341.337	Rp4.574.868	Rp4.823.566

Description	2071	2072	2073	2074	2075
Fixed Assets					
Net Plant and Equipment	Rp98.095	Rp98.095	Rp98.095	Rp98.095	Rp98.095
Routine CAPEX	Rp256.691	Rp265.228	Rp270.797	Rp295.930	Rp304.904
Accumulated Depreciation	(Rp249.414)	(Rp259.591)	(Rp269.983)	(Rp280.558)	(Rp291.788)
Total Fixed Assets	Rp105.372	Rp103.732	Rp98.908	Rp113.467	Rp111.211
TOTAL ASSETS	Rp3.975.980	Rp4.202.086	Rp4.440.245	Rp4.688.335	Rp4.934.776
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp42.591	Rp42.591	Rp42.591	Rp42.591	Rp42.591
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp3.718.922	Rp3.933.388	Rp4.159.495	Rp4.397.653	Rp4.645.743
Profit this Year	Rp214.466	Rp226.106	Rp238.159	Rp248.090	Rp246.441
TOTAL EQUITIES	Rp3.975.980	Rp4.202.086	Rp4.440.245	Rp4.688.335	Rp4.934.776
TOTAL EQUITIES DAN LIABILITIES	Rp3.975.980	Rp4.202.086	Rp4.440.245	Rp4.688.335	Rp4.934.776

BPS 2 and BPS 3 (PT Y) – Free Cash Flow Projection (in IDR, million) (2021-2030)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Net profit	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp8.908)	Rp649	Rp9.194	Rp7.472	Rp17.512

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Depreciation Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp3.126	Rp3.126	Rp3.214	Rp3.278	Rp3.727
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp4.691	Rp4.669	Rp4.602	Rp4.446	Rp4.242
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp1.092)	Rp8.444	Rp17.010	Rp15.196	Rp25.480
Investment	(Rp8.182)	(Rp16.957)	(Rp34.509)	(Rp21.989)	(Rp16.457)	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	(Rp68.989)	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	(Rp8.182)	(Rp16.957)	(Rp34.509)	(Rp21.989)	(Rp85.446)	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	(Rp8.182)	(Rp16.957)	(Rp34.509)	(Rp21.989)	(Rp85.446)	(Rp1.092)	Rp8.444	Rp17.010	Rp15.196	Rp25.480
Accumulated Net Cash Flow	(Rp8.182)	(Rp25.139)	(Rp59.648)	(Rp81.637)	(Rp167.083)	(Rp168.175)	(Rp159.731)	(Rp142.721)	(Rp127.525)	(Rp102.045)
Discounted Cash Flow	Rp0	Rp0	Rp0	Rp0	(Rp167.083)	(Rp1.007)	Rp7.182	Rp13.344	Rp10.995	Rp17.004
Accumulated Discounted Cash Flow	Rp0	Rp0	Rp0	Rp0	(Rp167.083)	(Rp168.090)	(Rp160.908)	(Rp147.563)	(Rp136.568)	(Rp119.564)

BPS 2 and BPS 3 (PT Y) – Free Cash Flow Projection (in IDR, million) (2031-2040)

Description	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Net profit	Rp28.982	Rp31.602	Rp29.652	Rp32.331	Rp32.187	Rp35.062	Rp38.150	Rp41.353	Rp39.921	Rp43.214
Depreciation Expense	Rp3.750	Rp3.824	Rp3.829	Rp3.968	Rp4.001	Rp4.107	Rp4.110	Rp4.150	Rp4.155	Rp4.285
Interest Expense x (1 - Tax)	Rp4.007	Rp3.772	Rp3.538	Rp3.303	Rp3.069	Rp2.834	Rp2.600	Rp2.365	Rp2.130	Rp1.896
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp36.738	Rp39.199	Rp37.019	Rp39.603	Rp39.256	Rp42.003	Rp44.860	Rp47.868	Rp46.206	Rp49.395
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp36.738	Rp39.199	Rp37.019	Rp39.603	Rp39.256	Rp42.003	Rp44.860	Rp47.868	Rp46.206	Rp49.395
Accumulated Net Cash Flow	(Rp65.307)	(Rp26.108)	Rp10.911	Rp50.514	Rp89.771	Rp131.773	Rp176.633	Rp224.501	Rp270.708	Rp320.103
Discounted Cash Flow	Rp22.611	Rp22.251	Rp19.381	Rp19.122	Rp17.482	Rp17.251	Rp16.993	Rp16.724	Rp14.889	Rp14.679

Description	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Accumulated Discounted Cash Flow	(Rp96.953)	(Rp74.702)	(Rp55.321)	(Rp36.199)	(Rp18.717)	(Rp1.465)	Rp15.528	Rp32.251	Rp47.140	Rp61.819

BPS 2 and BPS 3 (PT Y) – Free Cash Flow Projection (in IDR, million) (2041-2050)

Description	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Net profit	Rp46.395	Rp50.102	Rp53.945	Rp57.948	Rp62.013	Rp67.018	Rp71.574	Rp76.342	Rp80.512	Rp85.479
Depreciation Expense	Rp4.774	Rp4.779	Rp4.828	Rp4.901	Rp5.137	Rp4.374	Rp4.446	Rp4.454	Rp4.525	Rp4.645
Interest Expense x (1 - Tax)	Rp1.661	Rp1.427	Rp1.192	Rp958	Rp723	Rp488	Rp276	Rp109	Rp30	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp52.831	Rp56.308	Rp59.966	Rp63.807	Rp67.872	Rp71.880	Rp76.296	Rp80.904	Rp85.067	Rp90.124
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp52.831	Rp56.308	Rp59.966	Rp63.807	Rp67.872	Rp71.880	Rp76.296	Rp80.904	Rp85.067	Rp90.124
Accumulated Net Cash Flow	Rp372.934	Rp429.242	Rp489.208	Rp553.014	Rp620.887	Rp692.767	Rp769.063	Rp849.968	Rp935.035	Rp1.025.159
Discounted Cash Flow	Rp14.480	Rp14.234	Rp13.981	Rp13.720	Rp13.460	Rp13.147	Rp12.871	Rp12.587	Rp12.207	Rp11.927
Accumulated Discounted Cash Flow	Rp76.299	Rp90.533	Rp104.514	Rp118.234	Rp131.694	Rp144.842	Rp157.712	Rp170.300	Rp182.506	Rp194.434

BPS 2 and BPS 3 (PT Y) – Free Cash Flow Projection (in IDR, million) (2051-2060)

Description	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
Net profit	Rp90.703	Rp96.177	Rp101.887	Rp95.116	Rp100.552	Rp106.130	Rp106.785	Rp113.191	Rp120.000	Rp126.250
Depreciation Expense	Rp4.694	Rp4.735	Rp4.799	Rp4.808	Rp5.442	Rp6.251	Rp6.259	Rp6.505	Rp6.620	Rp6.987
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp95.398	Rp100.912	Rp106.686	Rp99.924	Rp105.994	Rp112.381	Rp113.043	Rp119.696	Rp126.619	Rp133.237
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
Net Cash Flow	Rp95.398	Rp100.912	Rp106.686	Rp99.924	Rp105.994	Rp112.381	Rp113.043	Rp119.696	Rp126.619	Rp133.237
Accumulated Net Cash Flow	Rp1.120.557	Rp1.221.469	Rp1.328.155	Rp1.428.079	Rp1.534.072	Rp1.646.453	Rp1.759.496	Rp1.879.193	Rp2.005.812	Rp2.139.049
Discounted Cash Flow	Rp11.644	Rp11.360	Rp11.077	Rp9.568	Rp9.361	Rp9.154	Rp8.492	Rp8.293	Rp8.091	Rp7.852
Accumulated Discounted Cash Flow	Rp206.078	Rp217.438	Rp228.514	Rp238.083	Rp247.444	Rp256.597	Rp265.090	Rp273.383	Rp281.474	Rp289.326

BPS 2 and BPS 3 (PT Y) – Free Cash Flow Projection (in IDR, million) (2061-2068)

Description	2061	2062	2063	2064	2065	2066	2067	2068
Net profit	Rp133.685	Rp133.922	Rp141.756	Rp147.258	Rp155.663	Rp164.451	Rp173.856	Rp183.634
Depreciation Expense	Rp7.095	Rp7.209	Rp7.410	Rp7.522	Rp7.835	Rp8.154	Rp8.190	Rp8.288
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp140.781	Rp141.131	Rp149.166	Rp154.780	Rp163.497	Rp172.605	Rp182.046	Rp191.922
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp140.781	Rp141.131	Rp149.166	Rp154.780	Rp163.497	Rp172.605	Rp182.046	Rp191.922
Accumulated Net Cash Flow	Rp2.279.830	Rp2.420.961	Rp2.570.127	Rp2.724.907	Rp2.888.404	Rp3.061.009	Rp3.243.055	Rp3.434.978
Discounted Cash Flow	Rp7.652	Rp7.075	Rp6.897	Rp6.600	Rp6.430	Rp6.261	Rp6.090	Rp5.922
Accumulated Discounted Cash Flow	Rp296.979	Rp304.054	Rp310.951	Rp317.551	Rp323.981	Rp330.242	Rp336.333	Rp342.254

BPS 2 and BPS 3 (PT Y) – Free Cash Flow Projection (in IDR, million) (2069-2075)

Description	2069	2070	2071	2072	2073	2074	2075
Net profit	Rp193.914	Rp204.291	Rp214.466	Rp226.106	Rp238.159	Rp248.090	Rp246.441
Depreciation Expense	Rp8.300	Rp8.708	Rp10.091	Rp10.177	Rp10.392	Rp10.575	Rp11.230
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2069	2070	2071	2072	2073	2074	2075
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp68.989
Total Cash Inflow	Rp202.214	Rp212.999	Rp224.558	Rp236.283	Rp248.551	Rp258.665	Rp326.660
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp202.214	Rp212.999	Rp224.558	Rp236.283	Rp248.551	Rp258.665	Rp326.660
Accumulated Net Cash Flow	Rp3.637.192	Rp3.850.191	Rp4.074.748	Rp4.311.032	Rp4.559.583	Rp4.818.248	Rp5.144.908
Discounted Cash Flow	Rp5.754	Rp5.590	Rp5.436	Rp5.275	Rp5.118	Rp4.912	Rp5.721
Accumulated Discounted Cash Flow	Rp348.009	Rp353.599	Rp359.035	Rp364.310	Rp369.428	Rp374.340	Rp380.061

Attachment 3: Business Plan Scenario 3 (PT X) – Integrated WTE and MSW Recycling Plant Detailed Information

BPS 3 (PT X) – Expected Manageable MSW and Recycling Output (2026-2035)

Information	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
WTE Plant Capacity	1500	1800	2.100	2.400	2.700	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	1291	1294	1.296	1.298	1.299	1.299	1.320	1.342	1.363	1.384
MSW from TPA – BPS 1 (ton/day)	209	506	804	29	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	7165	8598	10.031	6.337	6.204	6.205	6.307	6.408	6.510	6.611
Manageable MSW – BPS 1 (ton/year)	465.000	558.000	651.000	411.306	402.637	402.729	409.316	415.903	422.490	429.077
Manageable MSW – BPS 1 (m ³ /year)	2.221.072	2.665.287	3.109.501	1.964.601	1.923.195	1.923.635	1.955.098	1.986.562	2.018.025	2.049.488
Expected Electricity Output/Year (kWh)	7.905.000	9.486.000	11.067.000	6.992.195	6.844.826	6.846.393	6.958.374	7.070.354	7.182.335	7.294.316

BPS 3 (PT X) – Expected Manageable MSW and Recycling Output (2036-2045)

Information	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	1.405	1.427	1.448	1.469	1.490	1.512	1.533	1.554	1.575	1.597
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	6.713	6.814	6.916	7.017	7.119	7.220	7.322	7.423	7.525	7.626
Manageable MSW – BPS 1 (ton/year)	435.665	442.252	448.839	455.426	462.013	468.600	475.187	481.774	488.361	494.948
Manageable MSW – BPS 1 (m ³ /year)	2.080.952	2.112.415	2.143.878	2.175.341	2.206.805	2.238.268	2.269.731	2.301.195	2.332.658	2.364.121
Expected Electricity Output/Year (kWh)	7.406.297	7.518.278	7.630.258	7.742.239	7.854.220	7.966.201	8.078.182	8.190.162	8.302.143	8.414.124

BPS 3 (PT X) – Expected Manageable MSW and Recycling Output (2046-2055)

Information	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	1.618	1.639	1.660	1.682	1.703	1.724	1.745	1.767	1.788	1.809
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	7.728	7.829	7.931	8.032	8.134	8.235	8.337	8.438	8.540	8.641
Manageable MSW – BPS 1 (ton/year)	501.536	508.123	514.710	521.297	527.884	534.471	541.058	547.645	554.232	560.820
Manageable MSW – BPS 1 (m ³ /year)	2.395.585	2.427.048	2.458.511	2.489.975	2.521.438	2.552.901	2.584.364	2.615.828	2.647.291	2.678.754
Expected Electricity Output/Year (kWh)	8.526.105	8.638.086	8.750.066	8.862.047	8.974.028	9.086.009	9.197.990	9.309.970	9.421.951	9.533.932

BPS 3 (PT X) – Expected Manageable MSW and Recycling Output (2056-2065)

Information	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	1.830	1.852	1.873	1.894	1.915	1.937	1.958	1.979	2.000	2.022
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	8.743	8.844	8.946	9.047	9.149	9.250	9.352	9.453	9.555	9.656
Manageable MSW – BPS 1 (ton/year)	567.407	573.994	580.581	587.168	593.755	600.342	606.929	613.516	620.103	626.691
Manageable MSW – BPS 1 (m ³ /year)	2.710.218	2.741.681	2.773.144	2.804.608	2.836.071	2.867.534	2.898.998	2.930.461	2.961.924	2.993.387
Expected Electricity Output/Year (kWh)	9.645.913	9.757.893	9.869.874	9.981.855	10.093.836	10.205.817	10.317.797	10.429.778	10.541.759	10.653.740

BPS 3 (PT X) – Expected Manageable MSW and Recycling Output (2066-2075)

Information	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
WTE Plant Capacity	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Manageable MSW – BPS 1 (ton/day)	2.043	2.064	2.085	2.107	2.128	2.149	2.170	2.192	2.213	2.234
MSW from TPA – BPS 1 (ton/day)	-	-	-	-	-	-	-	-	-	-
Manageable MSW – BPS 1 (m ³ /day)	9.758	9.859	9.961	10.062	10.164	10.265	10.367	10.468	10.570	10.671
Manageable MSW – BPS 1 (ton/year)	633.278	639.865	646.452	653.039	659.626	666.213	672.800	679.387	685.975	692.562
Manageable MSW – BPS 1 (m ³ /year)	3.024.851	3.056.314	3.087.777	3.119.241	3.150.704	3.182.167	3.213.631	3.245.094	3.276.557	3.308.021
Expected Electricity Output/Year (kWh)	10.765.721	10.877.701	10.989.682	11.101.663	11.213.644	11.325.625	11.437.605	11.549.586	11.661.567	11.773.548

BPS 3 (PT X) – Recapitulation of Assets Requirement per Year (2026-2035)

No	Tangible Assets	Units	Units Needed									
			2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Incinerator Construction + Freight + Installation	Plant	2	2	2	2	2	2	2	2	2	2
2	Land Acquisition Fee	m2	68.807	70.789	72.334	68.488	68.349	68.350	68.456	68.562	68.667	68.773
3	Supporting and Office Facilities Construction	m2	8.807	10.789	12.334	8.488	8.349	8.350	8.456	8.562	8.667	8.773
4	Office Equipment	Workers Equivalent Unit	81	96	112	74	73	73	74	75	77	78
5	Operational and Safety Equipment	Workers Equivalent Unit	81	96	112	74	73	73	74	75	77	78
6	Supporting Equipment	Workers Equivalent Unit	81	96	112	74	73	73	74	75	77	78
7	Bulldozer	Unit	4	4	5	5	5	5	5	5	5	5
8	Excavator	Unit	6	7	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 3 (PT X) – Recapitulation of Assets Requirement per Year (2036-2045)

No	Tangible Assets	Units	Units Needed									
			2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Incinerator Construction + Freight + Installation	Plant	2	2	2	2	2	2	2	2	2	2
2	Land Acquisition Fee	m2	68.879	68.984	69.090	69.196	69.302	69.407	69.513	69.619	69.724	69.830
3	Supporting and Office Facilities Construction	m2	8.879	8.984	9.090	9.196	9.302	9.407	9.513	9.619	9.724	9.830
4	Office Equipment	Workers Equivalent Unit	79	80	81	82	83	84	85	86	87	88
5	Operational and Safety Equipment	Workers Equivalent Unit	79	80	81	82	83	84	85	86	87	88
6	Supporting Equipment	Workers Equivalent Unit	79	80	81	82	83	84	85	86	87	88
7	Bulldozer	Unit	5	5	5	5	5	5	5	5	5	5
8	Excavator	Unit	8	8	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 3 (PT X) – Recapitulation of Assets Requirement per Year (2046-2055)

No	Tangible Assets	Units	Units Needed									
			2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
1	Incinerator Construction + Freight + Installation	Plant	2	2	2	2	2	2	2	2	2	2
2	Land Acquisition Fee	m2	69.936	70.041	70.147	70.253	70.358	70.464	70.570	70.675	70.781	70.887
3	Supporting and Office Facilities Construction	m2	9.936	10.041	10.147	10.253	10.358	10.464	10.570	10.675	10.781	10.887
4	Office Equipment	Workers Equivalent Unit	89	90	91	92	93	94	95	96	97	98
5	Operational and Safety Equipment	Workers Equivalent Unit	89	90	91	92	93	94	95	96	97	98
6	Supporting Equipment	Workers Equivalent Unit	89	90	91	92	93	94	95	96	97	98
7	Bulldozer	Unit	5	5	5	5	5	5	5	5	5	5
8	Excavator	Unit	8	8	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 3 (PT X) – Recapitulation of Assets Requirement per Year (2056-2065)

No	Tangible Assets	Units	Units Needed									
			2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
1	Incinerator Construction + Freight + Installation	Plant	2	2	2	2	2	2	2	2	3	3
2	Land Acquisition Fee	m2	70.993	71.098	71.204	71.310	71.415	71.521	71.627	71.732	72.310	72.416
3	Supporting and Office Facilities Construction	m2	10.993	11.098	11.204	11.310	11.415	11.521	11.627	11.732	12.310	12.416

No	Tangible Assets	Units	Units Needed									
			2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
4	Office Equipment	Workers Equivalent Unit	99	100	101	102	103	104	105	106	107	108
5	Operational and Safety Equipment	Workers Equivalent Unit	99	100	101	102	103	104	105	106	107	108
6	Supporting Equipment	Workers Equivalent Unit	99	100	101	102	103	104	105	106	107	108
7	Bulldozer	Unit	5	5	5	5	5	5	5	5	5	5
8	Excavator	Unit	8	8	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 3 (PT X) – Recapitulation of Assets Requirement per Year (2066-2075)

No	Tangible Assets	Units	Units Needed									
			2066	2057	2058	2059	2060	2061	2072	2073	2074	2075
1	Incinerator Construction + Freight + Installation	Plant	3	3	3	3	3	3	3	3	3	3
2	Land Acquisition Fee	m2	72.521	72.627	72.733	72.838	72.944	73.050	73.155	73.261	73.367	73.473
3	Supporting and Office Facilities Construction	m2	12.521	12.627	12.733	12.838	12.944	13.050	13.155	13.261	13.367	13.473
4	Office Equipment	Workers Equivalent Unit	109	110	111	112	114	115	116	117	118	119
5	Operational and Safety Equipment	Workers Equivalent Unit	109	110	111	112	114	115	116	117	118	119
6	Supporting Equipment	Workers Equivalent Unit	109	110	111	112	114	115	116	117	118	119
7	Bulldozer	Unit	5	5	5	5	5	5	5	5	5	5
8	Excavator	Unit	8	8	8	8	8	8	8	8	8	8
No	Intangible Assets	Units	Units Needed									
			2066	2057	2058	2059	2060	2061	2072	2073	2074	2075
1	Legal Document + Notary Fee	Unit	1	1	1	1	1	1	1	1	1	1

BPS 3 (PT X) – Initial and Routine CAPEX Calculation Recapitulation (2025-2032)

No	Tangible Assets	Initial CAPEX		Routine CAPEX						
		2025	2026	2027	2028	2029	2030	2031	2032	
1	Incinerator Construction + Freight + Installation	Rp 6.227.421.249.097	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	
2	Land Acquisition Fee	Rp170.349.577.087	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	
3	Supporting and Office Facilities Construction	Rp70.282.548.385	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	
4	Office Equipment	Rp692.600.000	Rp-	Rp-	Rp405.303.372	Rp-	Rp-	Rp442.885.937	Rp-	
5	Operational and Safety Equipment	Rp122.080.000	Rp-	Rp-	Rp117.927.098	Rp-	Rp-	Rp128.862.124	Rp4.132.376	
6	Supporting Equipment	Rp72.520.000	Rp-	Rp-	Rp-	Rp-	Rp29.944.049	Rp-	Rp-	
7	Bulldozer	Rp3.863.720.000	Rp-	Rp-	Rp1.055.497.791	Rp-	Rp-	Rp-	Rp-	
8	Excavator	Rp6.471.720.000	Rp-	Rp1.144.307.958	Rp1.178.637.197	Rp-	Rp-	Rp-	Rp-	
No	Intangible Assets	Initial CAPEX	Routine CAPEX							

No	Tangible Assets	Initial CAPEX		Routine CAPEX					
		2025	2026	2027	2028	2029	2030	2031	2032
		2025	2026	2027	2028	2029	2030	2031	2032
1	Legal Document	Rp1.330.108.585	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 3 (PT X) – Initial and Routine CAPEX Calculation Recapitulation (2033-2040)

No	Tangible Assets	Routine CAPEX							
		2033	2034	2035	2036	2037	2038	2039	2040
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp-	Rp483.953.422	Rp-	Rp-	Rp528.828.971	Rp-	Rp-	Rp1.079.048.233
5	Operational and Safety Equipment	Rp-	Rp140.811.122	Rp14.514.297	Rp-	Rp153.868.115	Rp-	Rp5.082.301	Rp168.135.844
6	Supporting Equipment	Rp-	Rp-	Rp95.565.894	Rp-	Rp-	Rp-	Rp-	Rp42.439.032
7	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp6.019.549.867
8	Excavator	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp10.082.728.889
No	Intangible Assets	Routine CAPEX							
		2033	2034	2035	2036	2037	2038	2039	2040
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 3 (PT X) – Initial and Routine CAPEX Calculation Recapitulation (2041-2048)

No	Tangible Assets	Routine CAPEX							
		2041	2042	2043	2044	2045	2046	2047	2048
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp-	Rp-	Rp631.449.447	Rp-	Rp-	Rp690.001.860	Rp-	Rp-
5	Operational and Safety Equipment	Rp-	Rp-	Rp183.726.576	Rp-	Rp19.506.001	Rp207.013.580	Rp-	Rp-
6	Supporting Equipment	Rp-	Rp-	Rp-	Rp-	Rp128.432.570	Rp-	Rp-	Rp-
7	Bulldozer	Rp-	Rp-	Rp1.644.431.167	Rp-	Rp-	Rp-	Rp-	Rp-
8	Excavator	Rp-	Rp1.782.794.513	Rp1.836.278.349	Rp-	Rp-	Rp-	Rp-	Rp-
No	Intangible Assets	Routine CAPEX							
		2041	2042	2043	2044	2045	2046	2047	2048
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 3 (PT X) – Initial and Routine CAPEX Calculation Recapitulation (2049-2057)

No	Tangible Assets	Routine CAPEX								
		2049	2050	2051	2052	2053	2054	2055	2056	2057
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp753.983.662	Rp-	Rp-	Rp823.898.305	Rp-	Rp-	Rp1.681.121.988	Rp-	Rp-
5	Operational and Safety Equipment	Rp219.379.140	Rp-	Rp-	Rp239.721.509	Rp7.687.437	Rp-	Rp288.164.601	Rp-	Rp-
6	Supporting Equipment	Rp-	Rp54.082.284	Rp-	Rp-	Rp-	Rp-	Rp176.025.074	Rp-	Rp-
7	Bulldozer	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp9.378.262.555	Rp-	Rp-
8	Excavator	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp15.708.563.080	Rp-	Rp2.777.535.762
No	Intangible Assets	Routine CAPEX								
		2049	2050	2051	2052	2053	2054	2055	2056	2057
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 3 (PT X) – Initial and Routine CAPEX Calculation Recapitulation (2058-2066)

No	Tangible Assets	Routine CAPEX								
		2058	2059	2060	2061	2062	2063	2064	2065	2066
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
4	Office Equipment	Rp983.777.663	Rp-	Rp-	Rp1.075.000.415	Rp-	Rp-	Rp1.174.681.978	Rp-	Rp-
5	Operational and Safety Equipment	Rp286.240.019	Rp-	Rp9.454.578	Rp312.782.197	Rp-	Rp-	Rp341.785.552	Rp35.230.008	Rp-
6	Supporting Equipment	Rp-	Rp-	Rp72.682.067	Rp-	Rp-	Rp-	Rp-	Rp231.963.507	Rp-
7	Bulldozer	Rp2.561.970.177	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
8	Excavator	Rp2.860.861.835	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
No	Intangible Assets	Routine CAPEX								
		2058	2059	2060	2061	2062	2063	2064	2065	2066
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 3 (PT X) – Initial and Routine CAPEX Calculation Recapitulation (2067-2075)

No	Tangible Assets	Routine CAPEX								
		2067	2068	2069	2070	2071	2072	2073	2074	2075
1	Incinerator Construction + Freight + Installation	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
2	Land Acquisition Fee	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
3	Supporting and Office Facilities Construction	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-

No	Tangible Assets	Routine CAPEX								
		2067	2068	2069	2070	2071	2072	2073	2074	2075
4	Office Equipment	Rp1.283.606.714	Rp-	Rp-	Rp2.619.133.280	Rp-	Rp-	Rp1.532.693.545	Rp-	Rp-
5	Operational and Safety Equipment	Rp385.106.239	Rp-	Rp-	Rp408.109.823	Rp-	Rp-	Rp445.952.623	Rp14.300.897	Rp47.346.185
6	Supporting Equipment	Rp-	Rp-	Rp-	Rp103.010.671	Rp-	Rp-	Rp-	Rp-	Rp311.739.557
7	Bulldozer	Rp-	Rp-	Rp-	Rp14.611.027.485	Rp-	Rp-	Rp3.991.466.058	Rp-	Rp-
8	Excavator	Rp-	Rp-	Rp-	Rp24.473.429.440	Rp-	Rp4.327.310.216	Rp4.457.129.522	Rp-	Rp-
No	Intangible Assets	Routine CAPEX								
		2067	2068	2069	2070	2071	2072	2073	2074	2075
1	Legal Document	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -

BPS 3 (PT X) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2025-2035)

Expenses	Initial CAPEX	Routine CAPEX									
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Freight Expense	Rp541.816.600	Rp-	Rp46.422.902	Rp171.388.951	Rp-	Rp3.069.265	Rp58.604.176	Rp423.569	Rp-	Rp64.038.366	Rp11.283.220
Total CAPEX	Rp6.481.147.939.754	Rp-	Rp1.190.730.860	Rp2.928.754.409	Rp-	Rp33.013.314	Rp630.352.237	Rp4.555.945	Rp-	Rp688.802.909	Rp121.363.410

BPS 3 (PT X) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2036-2045)

Expenses	Routine CAPEX										
	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
Freight Expense	Rp-	Rp69.976.451	Rp-	Rp520.936	Rp940.111.585	Rp-	Rp72.325.369	Rp267.018.402	Rp-	Rp15.163.704	
Total CAPEX	Rp-	Rp752.673.537	Rp-	Rp5.603.237	Rp18.332.013.450	Rp-	Rp1.855.119.882	Rp4.562.903.940	Rp-	Rp163.102.275	

BPS 3 (PT X) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2046-2055)

Expenses	Routine CAPEX										
	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	
Freight Expense	Rp91.944.083	Rp-	Rp-	Rp99.769.687	Rp5.543.434	Rp-	Rp109.021.031	Rp787.962	Rp-	Rp1.478.615.607	
Total CAPEX	Rp988.959.522	Rp-	Rp-	Rp1.073.132.489	Rp59.625.718	Rp-	Rp1.172.640.846	Rp8.475.399	Rp-	Rp28.710.752.905	

BPS 3 (PT X) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2056-2065)

Expenses	Routine CAPEX										
	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	
Freight Expense	Rp-	Rp112.680.568	Rp416.005.969	Rp-	Rp8.419.006	Rp142.247.718	Rp-	Rp-	Rp155.437.922	Rp27.387.335	
Total CAPEX	Rp-	Rp2.890.216.330	Rp7.108.855.663	Rp-	Rp90.555.651	Rp1.530.030.330	Rp-	Rp-	Rp1.671.905.452	Rp294.580.851	

BPS 3 (PT X) – Freight Expenses, Initial, and Routine CAPEX Recapitulation (2066-2075)

Expenses	Routine CAPEX									
	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Freight Expense	Rp-	Rp171.043.078	Rp-	Rp-	Rp2.281.897.568	Rp-	Rp175.552.654	Rp648.123.746	Rp1.465.842	Rp36.806.289
Total CAPEX	Rp-	Rp1.839.756.031	Rp-	Rp-	Rp44.496.608.268	Rp-	Rp4.502.862.869	Rp11.075.365.493	Rp15.766.739	Rp395.892.031

BPS 3 (PT X) – Total OPEX/Year (in IDR, million) (2026-2035)

Process	OPEX Sources	in million									
		2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Operating Expense - General	Communication Expense	Rp14	Rp15	Rp15	Rp16	Rp16	Rp17	Rp17	Rp18	Rp18	Rp19
	General and Administrative Expense	Rp52.823	Rp64.841	Rp77.998	Rp52.990	Rp53.561	Rp55.179	Rp57.656	Rp60.231	Rp62.910	Rp65.694
	Maintenance Expense	Rp46.214	Rp56.729	Rp68.240	Rp46.360	Rp46.860	Rp48.275	Rp50.442	Rp52.696	Rp55.039	Rp57.475
	Indirect Labor Expense	Rp18.906	Rp23.208	Rp27.917	Rp18.966	Rp19.171	Rp19.750	Rp20.636	Rp21.558	Rp22.517	Rp23.513
	Risk Management Expense	Rp9.749	Rp11.967	Rp14.395	Rp9.780	Rp9.885	Rp10.184	Rp10.641	Rp11.116	Rp11.610	Rp12.124
Cost of Operation	Direct Material										
	Sodium Bicarbonate	Rp74.338	Rp91.882	Rp110.411	Rp71.851	Rp72.447	Rp74.637	Rp78.134	Rp81.773	Rp85.560	Rp89.501
	Ammonia	Rp29.840	Rp36.882	Rp44.320	Rp28.841	Rp29.081	Rp29.960	Rp31.363	Rp32.824	Rp34.344	Rp35.926
	Active Carbon	Rp84.816	Rp104.832	Rp125.973	Rp81.978	Rp82.658	Rp85.157	Rp89.147	Rp93.299	Rp97.620	Rp102.116
	Water	Rp246	Rp304	Rp366	Rp238	Rp240	Rp247	Rp259	Rp271	Rp283	Rp296
	Direct Labor	Rp75.626	Rp92.832	Rp111.669	Rp75.865	Rp76.682	Rp78.999	Rp82.544	Rp86.232	Rp90.066	Rp94.053
	Overhead										
	Transportation Expense										
	Bulldozer Fuel Expense	Rp7.118	Rp7.331	Rp9.439	Rp9.722	Rp10.014	Rp10.314	Rp10.624	Rp10.943	Rp11.271	Rp11.609
	Excavator Fuel Expense	Rp10.169	Rp12.220	Rp14.385	Rp14.816	Rp15.261	Rp15.719	Rp16.190	Rp16.676	Rp17.176	Rp17.692
	Waste Management Expense										
	Fly Ash Management Expense	Rp5.339	Rp6.599	Rp7.930	Rp5.161	Rp5.203	Rp5.361	Rp5.612	Rp5.873	Rp6.145	Rp6.428
	Bottom Ash Management Expense	Rp2.002	Rp2.475	Rp2.974	Rp1.935	Rp1.951	Rp2.010	Rp2.104	Rp2.202	Rp2.304	Rp2.411
Total OPEX/Year	Rp417.201	Rp512.116	Rp616.033	Rp418.520	Rp423.030	Rp435.809	Rp455.370	Rp475.711	Rp496.864	Rp518.857	

BPS 3 (PT X) – Total OPEX/Year (in IDR, million) (2036-2045)

Process	OPEX Sources	in million									
		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Operating Expense - General	Communication Expense	Rp19	Rp20	Rp20	Rp21	Rp22	Rp22	Rp23	Rp24	Rp24	Rp25
	General and Administrative Expense	Rp68.589	Rp71.599	Rp74.728	Rp77.980	Rp81.359	Rp84.872	Rp88.521	Rp92.314	Rp96.254	Rp100.348
	Maintenance Expense	Rp60.008	Rp62.641	Rp65.378	Rp68.223	Rp71.180	Rp74.253	Rp77.446	Rp80.764	Rp84.212	Rp87.793

Process	OPEX Sources	in million									
		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
	Indirect Labor Expense	Rp24.549	Rp25.627	Rp26.747	Rp27.910	Rp29.120	Rp30.377	Rp31.684	Rp33.041	Rp34.451	Rp35.917
	Risk Management Expense	Rp12.659	Rp13.214	Rp13.791	Rp14.392	Rp15.015	Rp15.664	Rp16.337	Rp17.037	Rp17.764	Rp18.520
Cost of Operation	Direct Material										
	Sodium Bicarbonate	Rp93.601	Rp97.867	Rp102.304	Rp106.920	Rp111.720	Rp116.713	Rp121.904	Rp127.302	Rp132.913	Rp138.747
	Ammonia	Rp37.572	Rp39.284	Rp41.066	Rp42.918	Rp44.845	Rp46.849	Rp48.933	Rp51.100	Rp53.352	Rp55.694
	Active Carbon	Rp106.794	Rp111.661	Rp116.724	Rp121.990	Rp127.467	Rp133.163	Rp139.086	Rp145.244	Rp151.647	Rp158.303
	Water	Rp310	Rp324	Rp339	Rp354	Rp370	Rp386	Rp404	Rp422	Rp440	Rp459
	Direct Labor	Rp98.198	Rp102.507	Rp106.986	Rp111.642	Rp116.480	Rp121.509	Rp126.734	Rp132.164	Rp137.805	Rp143.666
	Overhead										
	Transportation Expense										
	Bulldozer Fuel Expense	Rp11.957	Rp12.316	Rp12.686	Rp13.066	Rp13.458	Rp13.862	Rp14.278	Rp14.706	Rp15.147	Rp15.602
	Excavator Fuel Expense	Rp18.222	Rp18.769	Rp19.332	Rp19.912	Rp20.509	Rp21.125	Rp21.758	Rp22.411	Rp23.084	Rp23.776
	Waste Management Expense										
	Fly Ash Management Expense	Rp6.723	Rp7.029	Rp7.348	Rp7.679	Rp8.024	Rp8.383	Rp8.755	Rp9.143	Rp9.546	Rp9.965
	Bottom Ash Management Expense	Rp2.521	Rp2.636	Rp2.755	Rp2.880	Rp3.009	Rp3.143	Rp3.283	Rp3.429	Rp3.580	Rp3.737
	Total OPEX/Year	Rp541.723	Rp565.494	Rp590.204	Rp615.887	Rp642.580	Rp670.321	Rp699.147	Rp729.100	Rp760.221	Rp792.553

BPS 3 (PT X) – Total OPEX/Year (in IDR, million) (2046-2054)

Process	OPEX Sources	in million									
		2046	2047	2048	2049	2050	2051	2052	2053	2054	
Operating Expense - General	Communication Expense	Rp26	Rp27	Rp27	Rp28	Rp29	Rp30	Rp31	Rp32	Rp33	
	General and Administrative Expense	Rp104.600	Rp109.018	Rp113.606	Rp118.372	Rp123.321	Rp128.461	Rp133.798	Rp139.339	Rp145.093	
	Maintenance Expense	Rp91.514	Rp95.379	Rp99.393	Rp103.563	Rp107.893	Rp112.389	Rp117.059	Rp121.907	Rp126.941	
	Indirect Labor Expense	Rp37.439	Rp39.020	Rp40.662	Rp42.368	Rp44.139	Rp45.979	Rp47.889	Rp49.873	Rp51.932	
	Risk Management Expense	Rp19.305	Rp20.120	Rp20.967	Rp21.846	Rp22.760	Rp23.708	Rp24.693	Rp25.716	Rp26.778	
Cost of Operation	Direct Material										
	Sodium Bicarbonate	Rp144.812	Rp151.115	Rp157.666	Rp164.474	Rp171.549	Rp178.901	Rp186.539	Rp194.474	Rp202.718	
	Ammonia	Rp58.128	Rp60.659	Rp63.288	Rp66.021	Rp68.861	Rp71.812	Rp74.878	Rp78.063	Rp81.372	
	Active Carbon	Rp165.223	Rp172.414	Rp179.889	Rp187.657	Rp195.729	Rp204.116	Rp212.831	Rp221.885	Rp231.290	
	Water	Rp480	Rp500	Rp522	Rp545	Rp568	Rp592	Rp618	Rp644	Rp671	
	Direct Labor	Rp149.755	Rp156.079	Rp162.648	Rp169.471	Rp176.557	Rp183.915	Rp191.556	Rp199.491	Rp207.728	
	Overhead										
	Transportation Expense										
	Bulldozer Fuel Expense	Rp16.070	Rp16.552	Rp17.048	Rp17.560	Rp18.087	Rp18.629	Rp19.188	Rp19.764	Rp20.357	
	Excavator Fuel Expense	Rp24.489	Rp25.224	Rp25.981	Rp26.760	Rp27.563	Rp28.390	Rp29.242	Rp30.119	Rp31.022	
	Waste Management Expense										
Fly Ash Management Expense	Rp10.401	Rp10.853	Rp11.324	Rp11.813	Rp12.321	Rp12.849	Rp13.398	Rp13.968	Rp14.560		

Process	OPEX Sources	in million								
		2046	2047	2048	2049	2050	2051	2052	2053	2054
	Bottom Ash Management Expense	Rp3.900	Rp4.070	Rp4.246	Rp4.430	Rp4.620	Rp4.818	Rp5.024	Rp5.238	Rp5.460
	Total OPEX/Year	Rp826.140	Rp861.030	Rp897.269	Rp934.908	Rp973.997	Rp1.014.591	Rp1.056.743	Rp1.100.512	Rp1.145.955

BPS 3 (PT X) – Total OPEX/Year (in IDR, million) (2055-2063)

Process	OPEX Sources	in million								
		2055	2056	2057	2058	2059	2060	2061	2062	2063
Operating Expense - General	Communication Expense	Rp34	Rp35	Rp36	Rp37	Rp38	Rp39	Rp40	Rp41	Rp43
	General and Administrative Expense	Rp151.067	Rp157.268	Rp163.706	Rp170.388	Rp177.324	Rp184.522	Rp191.993	Rp199.747	Rp207.792
	Maintenance Expense	Rp132.167	Rp137.593	Rp143.225	Rp149.072	Rp155.140	Rp161.438	Rp167.974	Rp174.758	Rp181.797
	Indirect Labor Expense	Rp54.070	Rp56.290	Rp58.594	Rp60.986	Rp63.468	Rp66.045	Rp68.719	Rp71.494	Rp74.374
	Risk Management Expense	Rp27.881	Rp29.025	Rp30.213	Rp31.446	Rp32.727	Rp34.055	Rp35.434	Rp36.865	Rp38.350
Cost of Operation	Direct Material									
	Sodium Bicarbonate	Rp211.281	Rp220.175	Rp229.413	Rp239.007	Rp248.970	Rp259.316	Rp270.059	Rp281.213	Rp292.793
	Ammonia	Rp84.809	Rp88.380	Rp92.088	Rp95.939	Rp99.938	Rp104.091	Rp108.403	Rp112.881	Rp117.529
	Active Carbon	Rp241.060	Rp251.209	Rp261.749	Rp272.695	Rp284.063	Rp295.867	Rp308.124	Rp320.850	Rp334.062
	Water	Rp700	Rp729	Rp760	Rp791	Rp824	Rp859	Rp894	Rp931	Rp970
	Direct Labor	Rp216.281	Rp225.159	Rp234.376	Rp243.943	Rp253.873	Rp264.179	Rp274.875	Rp285.975	Rp297.494
	Overhead									
	Transportation Expense									
	Bulldozer Fuel Expense	Rp20.967	Rp21.596	Rp22.244	Rp22.911	Rp23.599	Rp24.307	Rp25.036	Rp25.787	Rp26.561
	Excavator Fuel Expense	Rp31.953	Rp32.912	Rp33.899	Rp34.916	Rp35.963	Rp37.042	Rp38.154	Rp39.298	Rp40.477
	Waste Management Expense									
	Fly Ash Management Expense	Rp15.175	Rp15.814	Rp16.477	Rp17.166	Rp17.882	Rp18.625	Rp19.396	Rp20.197	Rp21.029
	Bottom Ash Management Expense	Rp5.691	Rp5.930	Rp6.179	Rp6.437	Rp6.706	Rp6.984	Rp7.274	Rp7.574	Rp7.886
	Total OPEX/Year	Rp1.193.135	Rp1.242.114	Rp1.292.958	Rp1.345.735	Rp1.400.514	Rp1.457.370	Rp1.516.376	Rp1.577.611	Rp1.641.155

BPS 3 (PT X) – Total OPEX/Year (in IDR, million) (2064-2069)

Process	OPEX Sources	in million					
		2064	2065	2066	2067	2068	2069
Operating Expense - General	Communication Expense	Rp44	Rp45	Rp47	Rp48	Rp50	Rp51
	General and Administrative Expense	Rp216.141	Rp224.803	Rp233.791	Rp243.115	Rp252.789	Rp262.824
	Maintenance Expense	Rp189.101	Rp196.680	Rp204.543	Rp212.701	Rp221.164	Rp229.944
	Indirect Labor Expense	Rp77.362	Rp80.462	Rp83.679	Rp87.017	Rp90.479	Rp94.071
	Risk Management Expense	Rp39.891	Rp41.489	Rp43.148	Rp44.869	Rp46.654	Rp48.507
	Direct Material						

Process	OPEX Sources	in million					
		2064	2065	2066	2067	2068	2069
Cost of Operation	Sodium Bicarbonate	Rp304.815	Rp317.294	Rp330.248	Rp343.694	Rp357.649	Rp372.132
	Ammonia	Rp122.355	Rp127.364	Rp132.564	Rp137.961	Rp143.563	Rp149.376
	Active Carbon	Rp347.778	Rp362.016	Rp376.796	Rp392.137	Rp408.059	Rp424.583
	Water	Rp1.009	Rp1.051	Rp1.094	Rp1.138	Rp1.184	Rp1.232
	Direct Labor	Rp309.447	Rp321.849	Rp334.717	Rp348.067	Rp361.916	Rp376.284
	Overhead						
	Transportation Expense						
	Bulldozer Fuel Expense	Rp27.357	Rp28.178	Rp29.024	Rp29.894	Rp30.791	Rp31.715
	Excavator Fuel Expense	Rp41.691	Rp42.942	Rp44.230	Rp45.557	Rp46.924	Rp48.332
	Waste Management Expense						
	Fly Ash Management Expense	Rp21.893	Rp22.789	Rp23.719	Rp24.685	Rp25.687	Rp26.727
	Bottom Ash Management Expense	Rp8.210	Rp8.546	Rp8.895	Rp9.257	Rp9.633	Rp10.023
Total OPEX/Year	Rp1.707.092	Rp1.775.509	Rp1.846.493	Rp1.920.139	Rp1.996.542	Rp2.075.801	

BPS 3 (PT X) – Total OPEX/Year (in IDR, million) (2070-2075)

Process	OPEX Sources	in million					
		2070	2071	2072	2073	2074	2075
Operating Expense - General	Communication Expense	Rp53	Rp54	Rp56	Rp57	Rp59	Rp61
	General and Administrative Expense	Rp273.234	Rp284.032	Rp295.232	Rp306.848	Rp318.895	Rp331.390
	Maintenance Expense	Rp239.052	Rp248.499	Rp258.298	Rp268.461	Rp279.001	Rp289.933
	Indirect Labor Expense	Rp97.797	Rp101.662	Rp105.670	Rp109.828	Rp114.140	Rp118.612
	Risk Management Expense	Rp50.428	Rp52.421	Rp54.488	Rp56.632	Rp58.855	Rp61.161
Cost of Operation	Direct Material						
	Sodium Bicarbonate	Rp387.162	Rp402.759	Rp418.944	Rp435.737	Rp453.160	Rp471.237
	Ammonia	Rp155.409	Rp161.670	Rp168.167	Rp174.908	Rp181.901	Rp189.158
	Active Carbon	Rp441.732	Rp459.528	Rp477.993	Rp497.153	Rp517.033	Rp537.657
	Water	Rp1.282	Rp1.334	Rp1.387	Rp1.443	Rp1.501	Rp1.560
	Direct Labor	Rp391.188	Rp406.647	Rp422.682	Rp439.313	Rp456.561	Rp474.449
	Overhead						
	Transportation Expense						
	Bulldozer Fuel Expense	Rp32.666	Rp33.646	Rp34.656	Rp35.695	Rp36.766	Rp37.869
	Excavator Fuel Expense	Rp49.782	Rp51.275	Rp52.813	Rp54.398	Rp56.030	Rp57.711
	Waste Management Expense						
	Fly Ash Management Expense	Rp27.807	Rp28.927	Rp30.090	Rp31.296	Rp32.547	Rp33.845
Bottom Ash Management Expense	Rp10.428	Rp10.848	Rp11.284	Rp11.736	Rp12.205	Rp12.692	
Total OPEX/Year	Rp2.158.019	Rp2.243.301	Rp2.331.759	Rp2.423.504	Rp2.518.656	Rp2.617.336	

BPS 3 (PT X) – Debt Schedule Repayment (in IDR, million) (2026-2034)

Description	Years during Tenor								
	2026	2027	2028	2029	2030	2031	2032	2033	2034
Initial Loan Balance	Rp4.536.804	Rp4.514.165	Rp4.446.251	Rp4.287.784	Rp4.083.826	Rp3.856.986	Rp3.630.146	Rp3.403.306	Rp3.176.465
Installment for loan drawdown Year 0 (2021)	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638
Installment for loan drawdown Year 1 (2022)	Rp0	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276
Installment for loan drawdown Year 2 (2023)	Rp0	Rp0	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553
Installment for loan drawdown Year 3 (2024)	Rp0	Rp0	Rp0	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490
Installment for loan drawdown Year 4 (2025)	Rp0	Rp0	Rp0	Rp0	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883
Total Installment	Rp22.638	Rp67.915	Rp158.467	Rp203.957	Rp226.840	Rp226.840	Rp226.840	Rp226.840	Rp226.840
Ending Loan Balance	Rp4.514.165	Rp4.446.251	Rp4.287.784	Rp4.083.826	Rp3.856.986	Rp3.630.146	Rp3.403.306	Rp3.176.465	Rp2.949.625

BPS 3 (PT X) – Debt Schedule Repayment (in IDR, million) (2035-2042)

Description	Years during Tenor								
	2035	2036	2037	2038	2039	2040	2041	2042	
Initial Loan Balance	Rp2.949.625	Rp2.722.785	Rp2.495.945	Rp2.269.105	Rp2.042.265	Rp1.815.424	Rp1.588.584	Rp1.361.744	
Installment for loan drawdown Year 0 (2021)	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	Rp22.638	
Installment for loan drawdown Year 1 (2022)	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp45.276	
Installment for loan drawdown Year 2 (2023)	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553	
Installment for loan drawdown Year 3 (2024)	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490	
Installment for loan drawdown Year 4 (2025)	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883	
Total Installment	Rp226.840	Rp226.840	Rp226.840	Rp226.840	Rp226.840	Rp226.840	Rp226.840	Rp226.840	
Ending Loan Balance	Rp2.722.785	Rp2.495.945	Rp2.269.105	Rp2.042.265	Rp1.815.424	Rp1.588.584	Rp1.361.744	Rp1.134.904	

BPS 3 (PT X) – Debt Schedule Repayment (in IDR, million) (2043-2049)

Description	Years During Tenor							
	2043	2044	2045	2046	2047	2048	2049	
Initial Loan Balance	Rp1.134.904	Rp908.064	Rp681.224	Rp454.383	Rp250.181	Rp91.256	Rp22.883	
Installment for loan drawdown Year 0 (2021)	Rp22.638	Rp22.638	Rp22.638	Rp0	Rp0	Rp0	Rp0	
Installment for loan drawdown Year 1 (2022)	Rp45.276	Rp45.276	Rp45.276	Rp45.276	Rp0	Rp0	Rp0	
Installment for loan drawdown Year 2 (2023)	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp90.553	Rp0	Rp0	
Installment for loan drawdown Year 3 (2024)	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp45.490	Rp0	
Installment for loan drawdown Year 4 (2025)	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883	Rp22.883	
Total Installment	Rp226.840	Rp226.840	Rp226.840	Rp204.202	Rp158.926	Rp68.373	Rp22.883	
Ending Loan Balance	Rp908.064	Rp681.224	Rp454.383	Rp250.181	Rp91.256	Rp22.883	Rp0	

BPS 3 (PT X) – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2026-2035)

Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Asset's Acquisition Cost	Rp8.013.457	Rp8.013.457	Rp8.014.647	Rp8.017.576	Rp8.017.576	Rp8.017.609	Rp8.018.240	Rp8.018.244	Rp8.018.244	Rp8.018.933
D&A Expense	Rp203.520	Rp203.520	Rp203.599	Rp203.776	Rp203.776	Rp203.777	Rp203.802	Rp203.802	Rp203.802	Rp203.821
Accumulative D&A Expense	Rp203.520	Rp407.040	Rp610.640	Rp814.415	Rp1.018.191	Rp1.221.968	Rp1.425.769	Rp1.629.571	Rp1.833.373	Rp2.037.194
Remaining Assets Book Value	Rp7.809.937	Rp7.607.607	Rp7.406.936	Rp7.203.161	Rp6.999.418	Rp6.796.272	Rp6.592.475	Rp6.388.673	Rp6.185.560	Rp5.981.860

BPS 3 (PT X) – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2036-2045)

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Asset's Acquisition Cost	Rp8.019.054	Rp8.019.054	Rp8.019.807	Rp8.019.807	Rp8.019.813	Rp8.038.145	Rp8.038.145	Rp8.040.000	Rp8.044.563	Rp8.044.563
D&A Expense	Rp203.825	Rp203.825	Rp203.846	Rp203.846	Rp203.846	Rp204.280	Rp204.280	Rp204.325	Rp204.439	Rp204.439
Accumulative D&A Expense	Rp2.241.019	Rp2.444.844	Rp2.648.690	Rp2.852.536	Rp3.056.382	Rp3.260.663	Rp3.464.943	Rp3.669.267	Rp3.873.707	Rp4.078.146
Remaining Assets Book Value	Rp5.778.035	Rp5.574.963	Rp5.371.117	Rp5.167.276	Rp4.981.762	Rp4.777.482	Rp4.575.057	Rp4.375.295	Rp4.170.856	Rp3.966.579

BPS 3 (PT X) – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2046-2055)

Description	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Asset's Acquisition Cost	Rp8.044.726	Rp8.045.715	Rp8.045.715	Rp8.045.715	Rp8.046.788	Rp8.046.847	Rp8.046.847	Rp8.048.020	Rp8.048.029	Rp8.048.029
D&A Expense	Rp127.829	Rp127.868	Rp127.868	Rp127.868	Rp127.898	Rp127.899	Rp127.899	Rp127.933	Rp127.933	Rp127.933
Accumulative D&A Expense	Rp4.205.975	Rp4.333.842	Rp4.461.710	Rp4.589.577	Rp4.717.475	Rp4.845.375	Rp4.973.274	Rp5.101.207	Rp5.229.140	Rp5.357.073
Remaining Assets Book Value	Rp3.839.740	Rp3.711.872	Rp3.584.005	Rp3.457.211	Rp3.329.372	Rp3.201.473	Rp3.074.746	Rp2.946.822	Rp2.818.889	Rp2.719.667

BPS 3 (PT X) – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2056-2065)

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Asset's Acquisition Cost	Rp8.076.739	Rp8.076.739	Rp8.079.629	Rp8.086.738	Rp8.086.738	Rp8.086.829	Rp8.088.359	Rp8.088.359	Rp8.088.359	Rp8.090.031
D&A Expense	Rp128.606	Rp128.606	Rp128.675	Rp128.854	Rp128.854	Rp128.857	Rp128.918	Rp128.918	Rp128.918	Rp128.965
Accumulative D&A Expense	Rp5.485.679	Rp5.614.285	Rp5.742.961	Rp5.871.815	Rp6.000.669	Rp6.129.526	Rp6.258.444	Rp6.387.362	Rp6.516.279	Rp6.645.244
Remaining Assets Book Value	Rp2.591.060	Rp2.465.344	Rp2.343.777	Rp2.214.923	Rp2.086.160	Rp1.958.832	Rp1.829.915	Rp1.700.997	Rp1.573.751	Rp1.445.081

BPS 3 (PT X) – Depreciation and Amortization (D&A) Expense Projection (in IDR, million) (2066-2075)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Asset's Acquisition Cost	Rp8.090.325	Rp8.090.325	Rp8.092.165	Rp8.092.165	Rp8.092.165	Rp8.136.662	Rp8.136.662	Rp8.141.165	Rp8.152.240	Rp8.152.256
D&A Expense	Rp128.973	Rp128.973	Rp129.025	Rp129.025	Rp129.025	Rp130.068	Rp130.068	Rp130.176	Rp130.455	Rp130.455

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Accumulative D&A Expense	Rp6.774.218	Rp6.903.191	Rp7.032.216	Rp7.161.241	Rp7.290.267	Rp7.420.335	Rp7.550.404	Rp7.680.580	Rp7.811.034	Rp7.941.489
Remaining Assets Book Value	Rp1.316.108	Rp1.188.974	Rp1.059.949	Rp930.924	Rp846.395	Rp716.327	Rp590.761	Rp471.660	Rp341.222	Rp211.162

BPS 3 (PT X) – Income Statement Projection (in IDR, million) (2026-2035)

Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Sales	Rp1.109.760	Rp1.204.675	Rp1.308.592	Rp1.111.080	Rp1.115.589	Rp1.128.368	Rp1.147.929	Rp1.168.271	Rp1.189.423	Rp1.211.417
Cost of Goods Sold	(Rp289.494)	(Rp355.357)	(Rp427.467)	(Rp290.408)	(Rp293.537)	(Rp302.404)	(Rp315.978)	(Rp330.093)	(Rp344.771)	(Rp360.032)
Gross Profit	Rp820.267	Rp849.318	Rp881.125	Rp820.671	Rp822.052	Rp825.964	Rp831.951	Rp838.178	Rp844.653	Rp851.385
Operating Expenses										
Communication Expenses	(Rp14)	(Rp15)	(Rp15)	(Rp16)	(Rp16)	(Rp17)	(Rp17)	(Rp18)	(Rp18)	(Rp19)
General & Administrative Expenses	(Rp52.823)	(Rp64.841)	(Rp77.998)	(Rp52.990)	(Rp53.561)	(Rp55.179)	(Rp57.656)	(Rp60.231)	(Rp62.910)	(Rp65.694)
Maintenance Expense	(Rp46.214)	(Rp56.729)	(Rp68.240)	(Rp46.360)	(Rp46.860)	(Rp48.275)	(Rp50.442)	(Rp52.696)	(Rp55.039)	(Rp57.475)
Indirect Labour Expense	(Rp18.906)	(Rp23.208)	(Rp27.917)	(Rp18.966)	(Rp19.171)	(Rp19.750)	(Rp20.636)	(Rp21.558)	(Rp22.517)	(Rp23.513)
Risk Management Expense	(Rp9.749)	(Rp11.967)	(Rp14.395)	(Rp9.780)	(Rp9.885)	(Rp10.184)	(Rp10.641)	(Rp11.116)	(Rp11.610)	(Rp12.124)
Total Operating Expenses	(Rp127.707)	(Rp156.759)	(Rp188.566)	(Rp128.112)	(Rp129.493)	(Rp133.405)	(Rp139.392)	(Rp145.619)	(Rp152.093)	(Rp158.826)
EBITDA	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559
Depreciation Expenses	(Rp203.520)	(Rp203.520)	(Rp203.599)	(Rp203.776)	(Rp203.776)	(Rp203.777)	(Rp203.802)	(Rp203.802)	(Rp203.802)	(Rp203.821)
Operating Profit (EBIT)	Rp489.039	Rp489.039	Rp488.960	Rp488.784	Rp488.784	Rp488.782	Rp488.758	Rp488.757	Rp488.757	Rp488.738
Other Revenue & Expenses										
Interest Expenses	(Rp511.298)	(Rp508.746)	(Rp501.092)	(Rp483.233)	(Rp460.247)	(Rp434.682)	(Rp409.117)	(Rp383.553)	(Rp357.988)	(Rp332.423)
Total Other Revenue & Expenses	(Rp511.298)	(Rp508.746)	(Rp501.092)	(Rp483.233)	(Rp460.247)	(Rp434.682)	(Rp409.117)	(Rp383.553)	(Rp357.988)	(Rp332.423)
Earning Before Tax (EBT)	(Rp22.259)	(Rp19.707)	(Rp12.133)	Rp5.550	Rp28.536	Rp54.100	Rp79.640	Rp105.205	Rp130.770	Rp156.315
Tax (25%)	Rp0	Rp0	Rp0	(Rp1.388)	(Rp7.134)	(Rp13.525)	(Rp19.910)	(Rp26.301)	(Rp32.692)	(Rp39.079)
EAT	(Rp22.259)	(Rp19.707)	(Rp12.133)	Rp4.163	Rp21.402	Rp40.575	Rp59.730	Rp78.904	Rp98.077	Rp117.236

BPS 3 (PT X) – Income Statement Projection (in IDR, million) (2036-2045)

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Sales	Rp1.234.283	Rp1.258.054	Rp1.282.763	Rp1.308.447	Rp1.335.140	Rp1.362.880	Rp1.391.707	Rp1.421.659	Rp1.452.780	Rp1.485.112
Cost of Goods Sold	(Rp375.899)	(Rp392.393)	(Rp409.540)	(Rp427.361)	(Rp445.884)	(Rp465.133)	(Rp485.136)	(Rp505.920)	(Rp527.515)	(Rp549.950)
Gross Profit	Rp858.384	Rp865.660	Rp873.224	Rp881.085	Rp889.256	Rp897.747	Rp906.571	Rp915.739	Rp925.265	Rp935.162
Operating Expenses										
Communication Expenses	(Rp19)	(Rp20)	(Rp20)	(Rp21)	(Rp22)	(Rp22)	(Rp23)	(Rp24)	(Rp24)	(Rp25)
General & Administrative Expenses	(Rp68.589)	(Rp71.599)	(Rp74.728)	(Rp77.980)	(Rp81.359)	(Rp84.872)	(Rp88.521)	(Rp92.314)	(Rp96.254)	(Rp100.348)
Maintenance Expense	(Rp60.008)	(Rp62.641)	(Rp65.378)	(Rp68.223)	(Rp71.180)	(Rp74.253)	(Rp77.446)	(Rp80.764)	(Rp84.212)	(Rp87.793)
Indirect Labour Expense	(Rp24.549)	(Rp25.627)	(Rp26.747)	(Rp27.910)	(Rp29.120)	(Rp30.377)	(Rp31.684)	(Rp33.041)	(Rp34.451)	(Rp35.917)

Description	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Risk Management Expense	(Rp12.659)	(Rp13.214)	(Rp13.791)	(Rp14.392)	(Rp15.015)	(Rp15.664)	(Rp16.337)	(Rp17.037)	(Rp17.764)	(Rp18.520)
Total Operating Expenses	(Rp165.825)	(Rp173.101)	(Rp180.664)	(Rp188.526)	(Rp196.697)	(Rp205.188)	(Rp214.012)	(Rp223.180)	(Rp232.706)	(Rp242.603)
EBITDA	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559
Depreciation Expenses	(Rp203.825)	(Rp203.825)	(Rp203.846)	(Rp203.846)	(Rp203.846)	(Rp204.280)	(Rp204.280)	(Rp204.325)	(Rp204.439)	(Rp204.439)
Operating Profit (EBIT)	Rp488.734	Rp488.734	Rp488.713	Rp488.713	Rp488.713	Rp488.279	Rp488.279	Rp488.235	Rp488.120	Rp488.120
Other Revenue & Expenses										
Interest Expenses	(Rp306.858)	(Rp281.293)	(Rp255.728)	(Rp230.163)	(Rp204.598)	(Rp179.033)	(Rp153.469)	(Rp127.904)	(Rp102.339)	(Rp76.774)
Total Other Revenue & Expenses	(Rp306.858)	(Rp281.293)	(Rp255.728)	(Rp230.163)	(Rp204.598)	(Rp179.033)	(Rp153.469)	(Rp127.904)	(Rp102.339)	(Rp76.774)
Earning Before Tax (EBT)	Rp181.877	Rp207.441	Rp232.985	Rp258.550	Rp284.115	Rp309.246	Rp334.810	Rp360.331	Rp385.781	Rp411.346
Tax (25%)	(Rp45.469)	(Rp51.860)	(Rp58.246)	(Rp64.637)	(Rp71.029)	(Rp77.311)	(Rp83.703)	(Rp90.083)	(Rp96.445)	(Rp102.836)
EAT	Rp136.407	Rp155.581	Rp174.739	Rp193.912	Rp213.086	Rp231.934	Rp251.108	Rp270.248	Rp289.336	Rp308.509

BPS 3 (PT X) – Income Statement Projection (in IDR, million) (2046-2055)

Description	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Sales	Rp1.518.699	Rp1.553.589	Rp1.589.828	Rp1.627.467	Rp1.666.556	Rp1.707.150	Rp1.749.302	Rp1.793.071	Rp1.838.514	Rp1.885.694
Cost of Goods Sold	(Rp573.257)	(Rp597.467)	(Rp622.613)	(Rp648.731)	(Rp675.855)	(Rp704.023)	(Rp733.273)	(Rp763.644)	(Rp795.178)	(Rp827.916)
Gross Profit	Rp945.443	Rp956.122	Rp967.215	Rp978.736	Rp990.701	Rp1.003.127	Rp1.016.029	Rp1.029.427	Rp1.043.337	Rp1.057.778
Operating Expenses										
Communication Expenses	(Rp26)	(Rp27)	(Rp27)	(Rp28)	(Rp29)	(Rp30)	(Rp31)	(Rp32)	(Rp33)	(Rp34)
General & Administrative Expenses	(Rp104.600)	(Rp109.018)	(Rp113.606)	(Rp118.372)	(Rp123.321)	(Rp128.461)	(Rp133.798)	(Rp139.339)	(Rp145.093)	(Rp151.067)
Maintenance Expense	(Rp91.514)	(Rp95.379)	(Rp99.393)	(Rp103.563)	(Rp107.893)	(Rp112.389)	(Rp117.059)	(Rp121.907)	(Rp126.941)	(Rp132.167)
Indirect Labour Expense	(Rp37.439)	(Rp39.020)	(Rp40.662)	(Rp42.368)	(Rp44.139)	(Rp45.979)	(Rp47.889)	(Rp49.873)	(Rp51.932)	(Rp54.070)
Risk Management Expense	(Rp19.305)	(Rp20.120)	(Rp20.967)	(Rp21.846)	(Rp22.760)	(Rp23.708)	(Rp24.693)	(Rp25.716)	(Rp26.778)	(Rp27.881)
Total Operating Expenses	(Rp252.884)	(Rp263.563)	(Rp274.656)	(Rp286.177)	(Rp298.142)	(Rp310.567)	(Rp323.470)	(Rp336.867)	(Rp350.777)	(Rp365.219)
EBITDA	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559
Depreciation Expenses	(Rp127.829)	(Rp127.868)	(Rp127.868)	(Rp127.868)	(Rp127.898)	(Rp127.899)	(Rp127.899)	(Rp127.933)	(Rp127.933)	(Rp127.933)
Operating Profit (EBIT)	Rp564.731	Rp564.692	Rp564.692	Rp564.692	Rp564.661	Rp564.660	Rp564.660	Rp564.627	Rp564.626	Rp564.626
Other Revenue & Expenses										
Interest Expenses	(Rp51.209)	(Rp28.195)	(Rp10.285)	(Rp2.579)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp51.209)	(Rp28.195)	(Rp10.285)	(Rp2.579)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp513.522	Rp536.496	Rp554.407	Rp562.113	Rp564.661	Rp564.660	Rp564.660	Rp564.627	Rp564.626	Rp564.626
Tax (25%)	(Rp128.380)	(Rp134.124)	(Rp138.602)	(Rp140.528)	(Rp141.165)	(Rp141.165)	(Rp141.165)	(Rp141.157)	(Rp141.157)	(Rp141.157)
EAT	Rp385.141	Rp402.372	Rp415.805	Rp421.585	Rp423.496	Rp423.495	Rp423.495	Rp423.470	Rp423.470	Rp423.470

BPS 3 (PT X) – Income Statement Projection (in IDR, million) (2056-2065)

Description	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Sales	Rp1.934.673	Rp1.985.517	Rp2.038.294	Rp2.093.074	Rp2.149.929	Rp2.208.935	Rp2.270.170	Rp2.333.714	Rp2.399.651	Rp2.468.068
Cost of Goods Sold	(Rp861.903)	(Rp897.184)	(Rp933.806)	(Rp971.818)	(Rp1.011.270)	(Rp1.052.215)	(Rp1.094.706)	(Rp1.138.800)	(Rp1.184.555)	(Rp1.232.029)
Gross Profit	Rp1.072.770	Rp1.088.333	Rp1.104.488	Rp1.121.256	Rp1.138.659	Rp1.156.720	Rp1.175.464	Rp1.194.914	Rp1.215.097	Rp1.236.039
Operating Expenses										
Communication Expenses	(Rp35)	(Rp36)	(Rp37)	(Rp38)	(Rp39)	(Rp40)	(Rp41)	(Rp43)	(Rp44)	(Rp45)
General & Administrative Expenses	(Rp157.268)	(Rp163.706)	(Rp170.388)	(Rp177.324)	(Rp184.522)	(Rp191.993)	(Rp199.747)	(Rp207.792)	(Rp216.141)	(Rp224.803)
Maintenance Expense	(Rp137.593)	(Rp143.225)	(Rp149.072)	(Rp155.140)	(Rp161.438)	(Rp167.974)	(Rp174.758)	(Rp181.797)	(Rp189.101)	(Rp196.680)
Indirect Labour Expense	(Rp56.290)	(Rp58.594)	(Rp60.986)	(Rp63.468)	(Rp66.045)	(Rp68.719)	(Rp71.494)	(Rp74.374)	(Rp77.362)	(Rp80.462)
Risk Management Expense	(Rp29.025)	(Rp30.213)	(Rp31.446)	(Rp32.727)	(Rp34.055)	(Rp35.434)	(Rp36.865)	(Rp38.350)	(Rp39.891)	(Rp41.489)
Total Operating Expenses	(Rp380.211)	(Rp395.774)	(Rp411.929)	(Rp428.696)	(Rp446.099)	(Rp464.161)	(Rp482.904)	(Rp502.355)	(Rp522.538)	(Rp543.479)
EBITDA	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559
Depreciation Expenses	(Rp128.606)	(Rp128.606)	(Rp128.675)	(Rp128.854)	(Rp128.854)	(Rp128.857)	(Rp128.918)	(Rp128.918)	(Rp128.918)	(Rp128.965)
Operating Profit (EBIT)	Rp563.953	Rp563.953	Rp563.884	Rp563.705	Rp563.705	Rp563.702	Rp563.642	Rp563.642	Rp563.642	Rp563.594
Other Revenue & Expenses										
Interest Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp563.953	Rp563.953	Rp563.884	Rp563.705	Rp563.705	Rp563.702	Rp563.642	Rp563.642	Rp563.642	Rp563.594
Tax (25%)	(Rp140.988)	(Rp140.988)	(Rp140.971)	(Rp140.926)	(Rp140.926)	(Rp140.925)	(Rp140.910)	(Rp140.910)	(Rp140.910)	(Rp140.899)
EAT	Rp422.965	Rp422.965	Rp422.913	Rp422.779	Rp422.779	Rp422.776	Rp422.731	Rp422.731	Rp422.731	Rp422.696

BPS 3 (PT X) – Income Statement Projection (in IDR, million) (2066-2075)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Sales	Rp2.539.053	Rp2.612.699	Rp2.689.102	Rp2.768.361	Rp2.850.578	Rp2.935.861	Rp3.024.318	Rp3.116.063	Rp3.211.215	Rp3.309.895
Cost of Goods Sold	(Rp1.281.286)	(Rp1.332.389)	(Rp1.385.406)	(Rp1.440.404)	(Rp1.497.456)	(Rp1.556.634)	(Rp1.618.015)	(Rp1.681.678)	(Rp1.747.705)	(Rp1.816.179)
Gross Profit	Rp1.257.767	Rp1.280.309	Rp1.303.696	Rp1.327.956	Rp1.353.122	Rp1.379.227	Rp1.406.303	Rp1.434.385	Rp1.463.511	Rp1.493.716
Operating Expenses										
Communication Expenses	(Rp47)	(Rp48)	(Rp50)	(Rp51)	(Rp53)	(Rp54)	(Rp56)	(Rp57)	(Rp59)	(Rp61)
General & Administrative Expenses	(Rp233.791)	(Rp243.115)	(Rp252.789)	(Rp262.824)	(Rp273.234)	(Rp284.032)	(Rp295.232)	(Rp306.848)	(Rp318.895)	(Rp331.390)
Maintenance Expense	(Rp204.543)	(Rp212.701)	(Rp221.164)	(Rp229.944)	(Rp239.052)	(Rp248.499)	(Rp258.298)	(Rp268.461)	(Rp279.001)	(Rp289.933)
Indirect Labour Expense	(Rp83.679)	(Rp87.017)	(Rp90.479)	(Rp94.071)	(Rp97.797)	(Rp101.662)	(Rp105.670)	(Rp109.828)	(Rp114.140)	(Rp118.612)

Description	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Risk Management Expense	(Rp43.148)	(Rp44.869)	(Rp46.654)	(Rp48.507)	(Rp50.428)	(Rp52.421)	(Rp54.488)	(Rp56.632)	(Rp58.855)	(Rp61.161)
Total Operating Expenses	(Rp565.207)	(Rp587.750)	(Rp611.136)	(Rp635.397)	(Rp660.563)	(Rp686.667)	(Rp713.743)	(Rp741.826)	(Rp770.951)	(Rp801.156)
EBITDA	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559	Rp692.559
Depreciation Expenses	(Rp128.973)	(Rp128.973)	(Rp129.025)	(Rp129.025)	(Rp129.025)	(Rp130.068)	(Rp130.068)	(Rp130.176)	(Rp130.455)	(Rp130.455)
Operating Profit (EBIT)	Rp563.586	Rp563.586	Rp563.534	Rp563.534	Rp563.534	Rp562.491	Rp562.491	Rp562.383	Rp562.105	Rp562.104
Other Revenue & Expenses										
Interest Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Total Other Revenue & Expenses	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Earning Before Tax (EBT)	Rp563.586	Rp563.586	Rp563.534	Rp563.534	Rp563.534	Rp562.491	Rp562.491	Rp562.383	Rp562.105	Rp562.104
Tax (25%)	(Rp140.896)	(Rp140.896)	(Rp140.883)	(Rp140.883)	(Rp140.883)	(Rp140.623)	(Rp140.623)	(Rp140.596)	(Rp140.526)	(Rp140.526)
EAT	Rp422.689	Rp422.689	Rp422.650	Rp422.650	Rp422.650	Rp421.868	Rp421.868	Rp421.787	Rp421.578	Rp421.578

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2021-2028)

Description	2021	2022	2023	2024	2025	2026	2027	2028
Operational Cash Flow								
Sales	Rp0	Rp0	Rp0	Rp0	Rp0	Rp1.109.760	Rp1.297.155	Rp1.408.982
Account Receivable	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp92.480)	(Rp100.390)	(Rp109.049)
Cost of Operation	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp289.494)	(Rp355.357)	(Rp427.467)
Operating Expense	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp127.707)	(Rp156.759)	(Rp188.566)
Interest Expense	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp511.298)	(Rp508.746)	(Rp501.092)
Tax (25%)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Operational Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp88.781	Rp175.903	Rp182.807
Investment Cash Flow								
Project Cost	(Rp702.359)	(Rp1.455.745)	(Rp2.962.517)	(Rp1.768.532)	(Rp1.169.671)	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp1.191)	(Rp2.929)
Total Investment Cash Flow	(Rp702.359)	(Rp1.455.745)	(Rp2.962.517)	(Rp1.768.532)	(Rp1.169.671)	Rp0	(Rp1.191)	(Rp2.929)
Financing Cash Flow								
Shareholder's Equity	Rp249.596	Rp550.218	Rp1.151.462	Rp858.732	Rp712.013	Rp0	Rp0	Rp0
Loan Drawdown	Rp452.764	Rp905.527	Rp1.811.055	Rp909.800	Rp457.657	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp22.638)	(Rp67.915)	(Rp158.467)

Description	2021	2022	2023	2024	2025	2026	2027	2028
Total Financing Cash Flow	Rp702.359	Rp1.455.745	Rp2.962.517	Rp1.768.532	Rp1.169.671	(Rp22.638)	(Rp67.915)	(Rp158.467)
Net Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp66.143	Rp106.798	Rp21.411
Cash – Beginning Balance	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp66.143	Rp172.941
Cash – Ending Balance	Rp0	Rp0	Rp0	Rp0	Rp0	Rp66.143	Rp172.941	Rp194.352

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2029-2036)

Description	2029	2030	2031	2032	2033	2034	2035	2036
Operational Cash Flow								
Sales	Rp1.220.129	Rp1.208.179	Rp1.221.334	Rp1.241.959	Rp1.263.931	Rp1.286.779	Rp1.310.535	Rp1.335.234
Account Receivable	(Rp92.590)	(Rp92.966)	(Rp94.031)	(Rp95.661)	(Rp97.356)	(Rp99.119)	(Rp100.951)	(Rp102.857)
Cost of Operation	(Rp290.408)	(Rp293.537)	(Rp302.404)	(Rp315.978)	(Rp330.093)	(Rp344.771)	(Rp360.032)	(Rp375.899)
Operating Expense	(Rp128.112)	(Rp129.493)	(Rp133.405)	(Rp139.392)	(Rp145.619)	(Rp152.093)	(Rp158.826)	(Rp165.825)
Interest Expense	(Rp483.233)	(Rp460.247)	(Rp434.682)	(Rp409.117)	(Rp383.553)	(Rp357.988)	(Rp332.423)	(Rp306.858)
Tax (25%)	(Rp1.388)	(Rp7.134)	(Rp13.525)	(Rp19.910)	(Rp26.301)	(Rp32.692)	(Rp39.079)	(Rp45.469)
Total Operational Cash Flow	Rp224.398	Rp224.802	Rp243.287	Rp261.902	Rp281.010	Rp300.116	Rp319.225	Rp338.327
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	(Rp33)	(Rp630)	(Rp5)	Rp0	(Rp689)	(Rp121)	Rp0
Total Investment Cash Flow	Rp0	(Rp33)	(Rp630)	(Rp5)	Rp0	(Rp689)	(Rp121)	Rp0
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp203.957)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)
Total Financing Cash Flow	(Rp203.957)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)
Net Cash Flow	Rp20.440	(Rp2.071)	Rp15.816	Rp35.057	Rp54.170	Rp72.587	Rp92.263	Rp111.487
Cash – Beginning Balance	Rp194.352	Rp214.793	Rp212.722	Rp228.538	Rp263.595	Rp317.765	Rp390.353	Rp482.616
Cash – Ending Balance	Rp214.793	Rp212.722	Rp228.538	Rp263.595	Rp317.765	Rp390.353	Rp482.616	Rp594.103

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2037-2044)

Description	2037	2038	2039	2040	2041	2042	2043	2044
Operational Cash Flow								
Sales	Rp1.360.911	Rp1.387.601	Rp1.415.344	Rp1.444.177	Rp1.474.142	Rp1.505.280	Rp1.537.635	Rp1.571.252

Description	2037	2038	2039	2040	2041	2042	2043	2044
Account Receivable	(Rp104.838)	(Rp106.897)	(Rp109.037)	(Rp111.262)	(Rp113.573)	(Rp115.976)	(Rp118.472)	(Rp121.065)
Cost of Operation	(Rp392.393)	(Rp409.540)	(Rp427.361)	(Rp445.884)	(Rp465.133)	(Rp485.136)	(Rp505.920)	(Rp527.515)
Operating Expense	(Rp173.101)	(Rp180.664)	(Rp188.526)	(Rp196.697)	(Rp205.188)	(Rp214.012)	(Rp223.180)	(Rp232.706)
Interest Expense	(Rp281.293)	(Rp255.728)	(Rp230.163)	(Rp204.598)	(Rp179.033)	(Rp153.469)	(Rp127.904)	(Rp102.339)
Tax (25%)	(Rp51.860)	(Rp58.246)	(Rp64.637)	(Rp71.029)	(Rp77.311)	(Rp83.703)	(Rp90.083)	(Rp96.445)
Total Operational Cash Flow	Rp357.425	Rp376.526	Rp395.618	Rp414.708	Rp433.903	Rp452.986	Rp472.077	Rp491.182
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp753)	Rp0	(Rp6)	(Rp18.332)	Rp0	(Rp1.855)	(Rp4.563)	Rp0
Total Investment Cash Flow	(Rp753)	Rp0	(Rp6)	(Rp18.332)	Rp0	(Rp1.855)	(Rp4.563)	Rp0
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)
Total Financing Cash Flow	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)	(Rp226.840)
Net Cash Flow	Rp129.832	Rp149.686	Rp168.772	Rp169.536	Rp207.063	Rp224.291	Rp240.674	Rp264.342
Cash – Beginning Balance	Rp594.103	Rp723.935	Rp873.620	Rp1.042.393	Rp1.211.928	Rp1.418.991	Rp1.643.281	Rp1.883.955
Cash – Ending Balance	Rp723.935	Rp873.620	Rp1.042.393	Rp1.211.928	Rp1.418.991	Rp1.643.281	Rp1.883.955	Rp2.148.297

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2045-2052)

Description	2045	2046	2047	2048	2049	2050	2051	2052
Operational Cash Flow								
Sales	Rp1.606.177	Rp1.642.459	Rp1.680.147	Rp1.719.294	Rp1.759.953	Rp1.802.179	Rp1.846.030	Rp1.891.565
Account Receivable	(Rp123.759)	(Rp126.558)	(Rp129.466)	(Rp132.486)	(Rp135.622)	(Rp138.880)	(Rp142.262)	(Rp145.775)
Cost of Operation	(Rp549.950)	(Rp573.257)	(Rp597.467)	(Rp622.613)	(Rp648.731)	(Rp675.855)	(Rp704.023)	(Rp733.273)
Operating Expense	(Rp242.603)	(Rp252.884)	(Rp263.563)	(Rp274.656)	(Rp286.177)	(Rp298.142)	(Rp310.567)	(Rp323.470)
Interest Expense	(Rp76.774)	(Rp51.209)	(Rp28.195)	(Rp10.285)	(Rp2.579)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp102.836)	(Rp128.380)	(Rp134.124)	(Rp138.602)	(Rp140.528)	(Rp141.165)	(Rp141.165)	(Rp141.165)
Total Operational Cash Flow	Rp510.255	Rp510.171	Rp527.332	Rp540.653	Rp546.316	Rp548.136	Rp548.012	Rp547.882
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp163)	(Rp989)	Rp0	Rp0	(Rp1.073)	(Rp60)	Rp0	(Rp1.173)
Total Investment Cash Flow	(Rp163)	(Rp989)	Rp0	Rp0	(Rp1.073)	(Rp60)	Rp0	(Rp1.173)

Description	2045	2046	2047	2048	2049	2050	2051	2052
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	(Rp226.840)	(Rp204.202)	(Rp158.926)	(Rp68.373)	(Rp22.883)	Rp0	Rp0	Rp0
Total Financing Cash Flow	(Rp226.840)	(Rp204.202)	(Rp158.926)	(Rp68.373)	(Rp22.883)	Rp0	Rp0	Rp0
Net Cash Flow	Rp283.251	Rp304.980	Rp368.407	Rp472.280	Rp522.360	Rp548.077	Rp548.012	Rp546.709
Cash – Beginning Balance	Rp2.148.297	Rp2.431.548	Rp2.736.528	Rp3.104.935	Rp3.577.215	Rp4.099.574	Rp4.647.651	Rp5.195.663
Cash – Ending Balance	Rp2.431.548	Rp2.736.528	Rp3.104.935	Rp3.577.215	Rp4.099.574	Rp4.647.651	Rp5.195.663	Rp5.742.372

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2053-2060)

Description	2053	2054	2055	2056	2057	2058	2059	2060
Operational Cash Flow								
Sales	Rp1.938.846	Rp1.987.937	Rp2.038.904	Rp2.091.814	Rp2.146.740	Rp2.203.754	Rp2.262.932	Rp2.324.352
Account Receivable	(Rp149.423)	(Rp153.210)	(Rp157.141)	(Rp161.223)	(Rp165.460)	(Rp169.858)	(Rp174.423)	(Rp179.161)
Cost of Operation	(Rp763.644)	(Rp795.178)	(Rp827.916)	(Rp861.903)	(Rp897.184)	(Rp933.806)	(Rp971.818)	(Rp1.011.270)
Operating Expense	(Rp336.867)	(Rp350.777)	(Rp365.219)	(Rp380.211)	(Rp395.774)	(Rp411.929)	(Rp428.696)	(Rp446.099)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp141.157)	(Rp141.157)	(Rp141.157)	(Rp140.988)	(Rp140.988)	(Rp140.971)	(Rp140.926)	(Rp140.926)
Total Operational Cash Flow	Rp547.755	Rp547.616	Rp547.471	Rp547.489	Rp547.334	Rp547.190	Rp547.068	Rp546.895
Investment Cash Flow								
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp8)	Rp0	(Rp28.711)	Rp0	(Rp2.890)	(Rp7.109)	Rp0	(Rp91)
Total Investment Cash Flow	(Rp8)	Rp0	(Rp28.711)	Rp0	(Rp2.890)	(Rp7.109)	Rp0	(Rp91)
Financing Cash Flow								
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp547.747	Rp547.616	Rp518.760	Rp547.489	Rp544.444	Rp540.081	Rp547.068	Rp546.804
Cash – Beginning Balance	Rp5.742.372	Rp6.290.118	Rp6.837.734	Rp7.356.494	Rp7.903.984	Rp8.448.427	Rp8.988.509	Rp9.535.577
Cash – Ending Balance	Rp6.290.118	Rp6.837.734	Rp7.356.494	Rp7.903.984	Rp8.448.427	Rp8.988.509	Rp9.535.577	Rp10.082.381

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2061-2065)

Description	2061	2062	2063	2064	2065
Operational Cash Flow					
Sales	Rp2.388.096	Rp2.454.248	Rp2.522.895	Rp2.594.128	Rp2.668.039
Account Receivable	(Rp184.078)	(Rp189.181)	(Rp194.476)	(Rp199.971)	(Rp205.672)
Cost of Operation	(Rp1.052.215)	(Rp1.094.706)	(Rp1.138.800)	(Rp1.184.555)	(Rp1.232.029)
Operating Expense	(Rp464.161)	(Rp482.904)	(Rp502.355)	(Rp522.538)	(Rp543.479)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp140.925)	(Rp140.910)	(Rp140.910)	(Rp140.910)	(Rp140.899)
Total Operational Cash Flow	Rp546.717	Rp546.546	Rp546.353	Rp546.154	Rp545.959
Investment Cash Flow					
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	(Rp1.530)	Rp0	Rp0	(Rp1.672)	(Rp295)
Total Investment Cash Flow	(Rp1.530)	Rp0	Rp0	(Rp1.672)	(Rp295)
Financing Cash Flow					
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp545.187	Rp546.546	Rp546.353	Rp544.482	Rp545.665
Cash – Beginning Balance	Rp10.082.381	Rp10.627.568	Rp11.174.114	Rp11.720.467	Rp12.264.949
Cash – Ending Balance	Rp10.627.568	Rp11.174.114	Rp11.720.467	Rp12.264.949	Rp12.810.614

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2066-2070)

Description	2066	2067	2068	2069	2070
Operational Cash Flow					
Sales	Rp2.744.725	Rp2.824.286	Rp2.906.826	Rp2.992.452	Rp3.081.275
Account Receivable	(Rp211.588)	(Rp217.725)	(Rp224.092)	(Rp230.697)	(Rp237.548)
Cost of Operation	(Rp1.281.286)	(Rp1.332.389)	(Rp1.385.406)	(Rp1.440.404)	(Rp1.497.456)
Operating Expense	(Rp565.207)	(Rp587.750)	(Rp611.136)	(Rp635.397)	(Rp660.563)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp140.896)	(Rp140.896)	(Rp140.883)	(Rp140.883)	(Rp140.883)
Total Operational Cash Flow	Rp545.747	Rp545.526	Rp545.309	Rp545.071	Rp544.824
Investment Cash Flow					
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2066	2067	2068	2069	2070
Routine CAPEX	Rp0	(Rp1.840)	Rp0	Rp0	(Rp44.497)
Total Investment Cash Flow	Rp0	(Rp1.840)	Rp0	Rp0	(Rp44.497)
Financing Cash Flow					
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp545.747	Rp543.686	Rp545.309	Rp545.071	Rp500.328
Cash – Beginning Balance	Rp12.810.614	Rp13.356.362	Rp13.900.047	Rp14.445.356	Rp14.990.427
Cash – Ending Balance	Rp13.356.362	Rp13.900.047	Rp14.445.356	Rp14.990.427	Rp15.490.755

BPS 3 (PT X) – Cash Flow Statement Projection (in IDR, million) (2071-2075)

Description	2071	2072	2073	2074	2075
Operational Cash Flow					
Sales	Rp3.173.409	Rp3.268.973	Rp3.368.090	Rp3.470.887	Rp3.577.496
Account Receivable	(Rp244.655)	(Rp252.026)	(Rp259.672)	(Rp267.601)	(Rp275.825)
Cost of Operation	(Rp1.556.634)	(Rp1.618.015)	(Rp1.681.678)	(Rp1.747.705)	(Rp1.816.179)
Operating Expense	(Rp686.667)	(Rp713.743)	(Rp741.826)	(Rp770.951)	(Rp801.156)
Interest Expense	(Rp0)	(Rp0)	(Rp0)	(Rp0)	(Rp0)
Tax (25%)	(Rp140.623)	(Rp140.623)	(Rp140.596)	(Rp140.526)	(Rp140.526)
Total Operational Cash Flow	Rp544.830	Rp544.565	Rp544.318	Rp544.104	Rp543.810
Investment Cash Flow					
Project Cost	Rp0	Rp0	Rp0	Rp0	Rp0
Routine CAPEX	Rp0	(Rp4.503)	(Rp11.075)	(Rp16)	(Rp396)
Total Investment Cash Flow	Rp0	(Rp4.503)	(Rp11.075)	(Rp16)	(Rp396)
Financing Cash Flow					
Shareholder's Equity	Rp0	Rp0	Rp0	Rp0	Rp0
Loan Drawdown	Rp0	Rp0	Rp0	Rp0	Rp0
Bank Loan Main Instalment	Rp0	Rp0	Rp0	Rp0	Rp0
Total Financing Cash Flow	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp544.830	Rp540.062	Rp533.243	Rp544.088	Rp543.414
Cash – Beginning Balance	Rp15.490.755	Rp16.035.584	Rp16.575.647	Rp17.108.889	Rp17.652.977

Description	2071	2072	2073	2074	2075
Cash – Ending Balance	Rp16.035.584	Rp16.575.647	Rp17.108.889	Rp17.652.977	Rp18.196.391

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2021-2026)

Description	2021	2022	2023	2024	2025	2026
ASSETS						
Current Assets						
Cash	Rp0	Rp0	Rp0	Rp0	Rp0	Rp66.143
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp92.480
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp0	Rp0	Rp0	Rp0	Rp0	Rp158.623
Fixed Assets						
Net Plant and Equipment	Rp702.359	Rp2.158.105	Rp5.120.622	Rp6.889.154	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accumulated Depreciation	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp203.520)
Total Fixed Assets	Rp702.359	Rp2.158.105	Rp5.120.622	Rp6.889.154	Rp8.058.825	Rp7.855.305
TOTAL ASSETS	Rp702.359	Rp2.158.105	Rp5.120.622	Rp6.889.154	Rp8.058.825	Rp8.013.928
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp452.764	Rp1.358.291	Rp3.169.346	Rp4.079.146	Rp4.536.804	Rp4.514.165
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp452.764	Rp1.358.291	Rp3.169.346	Rp4.079.146	Rp4.536.804	Rp4.514.165
TOTAL LIABILITIES	Rp452.764	Rp1.358.291	Rp3.169.346	Rp4.079.146	Rp4.536.804	Rp4.514.165
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp249.596	Rp799.814	Rp1.951.276	Rp2.810.008	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2021	2022	2023	2024	2025	2026
Profit this Year	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp22.259)
TOTAL EQUITIES	Rp249.596	Rp799.814	Rp1.951.276	Rp2.810.008	Rp3.522.021	Rp3.499.763
TOTAL EQUITIES DAN LIABILITIES	Rp702.359	Rp2.158.105	Rp5.120.622	Rp6.889.154	Rp8.058.825	Rp8.013.928

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2027-2032)

Description	2027	2028	2029	2030	2031	2032
ASSETS						
Current Assets						
Cash	Rp172.941	Rp194.352	Rp214.793	Rp212.722	Rp228.538	Rp263.595
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp100.390	Rp109.049	Rp92.590	Rp92.966	Rp94.031	Rp95.661
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp273.331	Rp303.402	Rp307.383	Rp305.687	Rp322.569	Rp359.256
Fixed Assets						
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp1.191	Rp4.119	Rp4.119	Rp4.152	Rp4.783	Rp4.787
Accumulated Depreciation	(Rp407.040)	(Rp610.640)	(Rp814.415)	(Rp1.018.191)	(Rp1.221.968)	(Rp1.425.769)
Total Fixed Assets	Rp7.652.975	Rp7.452.305	Rp7.248.529	Rp7.044.786	Rp6.841.640	Rp6.637.843
TOTAL ASSETS	Rp7.926.306	Rp7.755.706	Rp7.555.912	Rp7.350.474	Rp7.164.209	Rp6.997.098
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp4.446.251	Rp4.287.784	Rp4.083.826	Rp3.856.986	Rp3.630.146	Rp3.403.306
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp4.446.251	Rp4.287.784	Rp4.083.826	Rp3.856.986	Rp3.630.146	Rp3.403.306
TOTAL LIABILITIES	Rp4.446.251	Rp4.287.784	Rp4.083.826	Rp3.856.986	Rp3.630.146	Rp3.403.306
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2027	2028	2029	2030	2031	2032
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	(Rp22.259)	(Rp41.966)	(Rp54.099)	(Rp49.936)	(Rp28.534)	Rp12.042
Profit this Year	(Rp19.707)	(Rp12.133)	Rp4.163	Rp21.402	Rp40.575	Rp59.730
TOTAL EQUITIES	Rp3.480.055	Rp3.467.923	Rp3.472.085	Rp3.493.488	Rp3.534.063	Rp3.593.793
TOTAL EQUITIES DAN LIABILITIES	Rp7.926.306	Rp7.755.706	Rp7.555.912	Rp7.350.474	Rp7.164.209	Rp6.997.098

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2033-2038)

Description	2033	2034	2035	2036	2037	2038
ASSETS						
Current Assets						
Cash	Rp317.765	Rp390.353	Rp482.616	Rp594.103	Rp723.935	Rp873.620
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp97.356	Rp99.119	Rp100.951	Rp102.857	Rp104.838	Rp106.897
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp415.121	Rp489.471	Rp583.567	Rp696.959	Rp828.772	Rp980.517
Fixed Assets						
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp4.787	Rp5.476	Rp5.598	Rp5.598	Rp6.350	Rp6.350
Accumulated Depreciation	(Rp1.629.571)	(Rp1.833.373)	(Rp2.037.194)	(Rp2.241.019)	(Rp2.444.844)	(Rp2.648.690)
Total Fixed Assets	Rp6.434.041	Rp6.230.928	Rp6.027.228	Rp5.823.403	Rp5.620.331	Rp5.416.485
TOTAL ASSETS	Rp6.849.162	Rp6.720.399	Rp6.610.795	Rp6.520.363	Rp6.449.103	Rp6.397.002
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp3.176.465	Rp2.949.625	Rp2.722.785	Rp2.495.945	Rp2.269.105	Rp2.042.265
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp3.176.465	Rp2.949.625	Rp2.722.785	Rp2.495.945	Rp2.269.105	Rp2.042.265
TOTAL LIABILITIES	Rp3.176.465	Rp2.949.625	Rp2.722.785	Rp2.495.945	Rp2.269.105	Rp2.042.265

Description	2033	2034	2035	2036	2037	2038
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp71.772	Rp150.675	Rp248.753	Rp365.989	Rp502.396	Rp657.978
Profit this Year	Rp78.904	Rp98.077	Rp117.236	Rp136.407	Rp155.581	Rp174.739
TOTAL EQUITIES	Rp3.672.696	Rp3.770.774	Rp3.888.010	Rp4.024.418	Rp4.179.999	Rp4.354.738
TOTAL EQUITIES DAN LIABILITIES	Rp6.849.162	Rp6.720.399	Rp6.610.795	Rp6.520.363	Rp6.449.103	Rp6.397.002

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2039-2044)

Description	2039	2040	2041	2042	2043	2044
ASSETS						
Current Assets						
Cash	Rp1.042.393	Rp1.211.928	Rp1.418.991	Rp1.643.281	Rp1.883.955	Rp2.148.297
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp109.037	Rp111.262	Rp113.573	Rp115.976	Rp118.472	Rp121.065
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp1.151.430	Rp1.323.190	Rp1.532.564	Rp1.759.257	Rp2.002.427	Rp2.269.362
Fixed Assets						
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp6.356	Rp24.688	Rp24.688	Rp26.543	Rp31.106	Rp31.106
Accumulated Depreciation	(Rp2.852.536)	(Rp3.056.382)	(Rp3.260.663)	(Rp3.464.943)	(Rp3.669.267)	(Rp3.873.707)
Total Fixed Assets	Rp5.212.644	Rp5.027.130	Rp4.822.850	Rp4.620.425	Rp4.420.663	Rp4.216.224
TOTAL ASSETS	Rp6.364.074	Rp6.350.320	Rp6.355.414	Rp6.379.682	Rp6.423.090	Rp6.485.586
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp1.815.424	Rp1.588.584	Rp1.361.744	Rp1.134.904	Rp908.064	Rp681.224
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2039	2040	2041	2042	2043	2044
Total Long Term Liabilities	Rp1.815.424	Rp1.588.584	Rp1.361.744	Rp1.134.904	Rp908.064	Rp681.224
TOTAL LIABILITIES	Rp1.815.424	Rp1.588.584	Rp1.361.744	Rp1.134.904	Rp908.064	Rp681.224
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp832.716	Rp1.026.629	Rp1.239.715	Rp1.471.649	Rp1.722.757	Rp1.993.005
Profit this Year	Rp193.912	Rp213.086	Rp231.934	Rp251.108	Rp270.248	Rp289.336
TOTAL EQUITIES	Rp4.548.650	Rp4.761.736	Rp4.993.670	Rp5.244.778	Rp5.515.026	Rp5.804.362
TOTAL EQUITIES DAN LIABILITIES	Rp6.364.074	Rp6.350.320	Rp6.355.414	Rp6.379.682	Rp6.423.090	Rp6.485.586

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2045-2050)

Description	2045	2046	2047	2048	2049	2050
ASSETS						
Current Assets						
Cash	Rp2.431.548	Rp2.736.528	Rp3.104.935	Rp3.577.215	Rp4.099.574	Rp4.647.651
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp123.759	Rp126.558	Rp129.466	Rp132.486	Rp135.622	Rp138.880
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp2.555.307	Rp2.863.086	Rp3.234.400	Rp3.709.700	Rp4.235.196	Rp4.786.531
Fixed Assets						
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp31.269	Rp32.258	Rp32.258	Rp32.258	Rp33.331	Rp33.391
Accumulated Depreciation	(Rp4.078.146)	(Rp4.205.975)	(Rp4.333.842)	(Rp4.461.710)	(Rp4.589.577)	(Rp4.717.475)
Total Fixed Assets	Rp4.011.948	Rp3.885.108	Rp3.757.240	Rp3.629.373	Rp3.502.579	Rp3.374.740
TOTAL ASSETS	Rp6.567.255	Rp6.748.194	Rp6.991.641	Rp7.339.073	Rp7.737.775	Rp8.161.271
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2045	2046	2047	2048	2049	2050
Long Term Liabilities						
Long Term Notes	Rp454.383	Rp250.181	Rp91.256	Rp22.883	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp454.383	Rp250.181	Rp91.256	Rp22.883	Rp0	Rp0
TOTAL LIABILITIES	Rp454.383	Rp250.181	Rp91.256	Rp22.883	Rp0	Rp0
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp2.282.341	Rp2.590.850	Rp2.975.992	Rp3.378.364	Rp3.794.169	Rp4.215.754
Profit this Year	Rp308.509	Rp385.141	Rp402.372	Rp415.805	Rp421.585	Rp423.496
TOTAL EQUITIES	Rp6.112.871	Rp6.498.013	Rp6.900.385	Rp7.316.190	Rp7.737.775	Rp8.161.271
TOTAL EQUITIES DAN LIABILITIES	Rp6.567.255	Rp6.748.194	Rp6.991.641	Rp7.339.073	Rp7.737.775	Rp8.161.271

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2051-2056)

Description	2051	2052	2053	2054	2055	2056
ASSETS						
Current Assets						
Cash	Rp5.195.663	Rp5.742.372	Rp6.290.118	Rp6.837.734	Rp7.356.494	Rp7.903.984
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp142.262	Rp145.775	Rp149.423	Rp153.210	Rp157.141	Rp161.223
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp5.337.925	Rp5.888.147	Rp6.439.541	Rp6.990.943	Rp7.513.635	Rp8.065.206
Fixed Assets						
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp33.391	Rp34.563	Rp34.572	Rp34.572	Rp63.283	Rp63.283
Accumulated Depreciation	(Rp4.845.375)	(Rp4.973.274)	(Rp5.101.207)	(Rp5.229.140)	(Rp5.357.073)	(Rp5.485.679)
Total Fixed Assets	Rp3.246.841	Rp3.120.114	Rp2.992.190	Rp2.864.257	Rp2.765.035	Rp2.636.428
TOTAL ASSETS	Rp8.584.766	Rp9.008.261	Rp9.431.731	Rp9.855.200	Rp10.278.670	Rp10.701.635
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2051	2052	2053	2054	2055	2056
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp4.639.250	Rp5.062.745	Rp5.486.240	Rp5.909.709	Rp6.333.179	Rp6.756.649
Profit this Year	Rp423.495	Rp423.495	Rp423.470	Rp423.470	Rp423.470	Rp422.965
TOTAL EQUITIES	Rp8.584.766	Rp9.008.261	Rp9.431.731	Rp9.855.200	Rp10.278.670	Rp10.701.635
TOTAL EQUITIES DAN LIABILITIES	Rp8.584.766	Rp9.008.261	Rp9.431.731	Rp9.855.200	Rp10.278.670	Rp10.701.635

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2057-2062)

Description	2057	2058	2059	2060	2061	2062
ASSETS						
Current Assets						
Cash	Rp8.448.427	Rp8.988.509	Rp9.535.577	Rp10.082.381	Rp10.627.568	Rp11.174.114
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp165.460	Rp169.858	Rp174.423	Rp179.161	Rp184.078	Rp189.181
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp8.613.887	Rp9.158.367	Rp9.710.000	Rp10.261.542	Rp10.811.646	Rp11.363.295
Fixed Assets						
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp66.173	Rp73.282	Rp73.282	Rp73.372	Rp74.902	Rp74.902
Accumulated Depreciation	(Rp5.614.285)	(Rp5.742.961)	(Rp5.871.815)	(Rp6.000.669)	(Rp6.129.526)	(Rp6.258.444)
Total Fixed Assets	Rp2.510.712	Rp2.389.145	Rp2.260.291	Rp2.131.528	Rp2.004.200	Rp1.875.283
TOTAL ASSETS	Rp11.124.599	Rp11.547.512	Rp11.970.291	Rp12.393.070	Rp12.815.846	Rp13.238.577

Description	2057	2058	2059	2060	2061	2062
LIABILITIES						
Current Liabilities						
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities						
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES						
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp7.179.614	Rp7.602.578	Rp8.025.491	Rp8.448.270	Rp8.871.049	Rp9.293.825
Profit this Year	Rp422.965	Rp422.913	Rp422.779	Rp422.779	Rp422.776	Rp422.731
TOTAL EQUITIES	Rp11.124.599	Rp11.547.512	Rp11.970.291	Rp12.393.070	Rp12.815.846	Rp13.238.577
TOTAL EQUITIES DAN LIABILITIES	Rp11.124.599	Rp11.547.512	Rp11.970.291	Rp12.393.070	Rp12.815.846	Rp13.238.577

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2063-2067)

Description	2063	2064	2065	2066	2067
ASSETS					
Current Assets					
Cash	Rp11.720.467	Rp12.264.949	Rp12.810.614	Rp13.356.362	Rp13.900.047
Marketable Securities	Rp0	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp194.476	Rp199.971	Rp205.672	Rp211.588	Rp217.725
Inventories	Rp0	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp11.914.943	Rp12.464.920	Rp13.016.286	Rp13.567.949	Rp14.117.772
Fixed Assets					
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp74.902	Rp76.574	Rp76.869	Rp76.869	Rp78.708
Accumulated Depreciation	(Rp6.387.362)	(Rp6.516.279)	(Rp6.645.244)	(Rp6.774.218)	(Rp6.903.191)
Total Fixed Assets	Rp1.746.365	Rp1.619.120	Rp1.490.449	Rp1.361.476	Rp1.234.342

Description	2063	2064	2065	2066	2067
TOTAL ASSETS	Rp13.661.309	Rp14.084.040	Rp14.506.736	Rp14.929.425	Rp15.352.115
LIABILITIES					
Current Liabilities					
Accounts Payable	Rp0	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities					
Long Term Notes	Rp0	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0	Rp0
EQUITIES					
Preferred Stock	Rp0	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp9.716.556	Rp10.139.288	Rp10.562.019	Rp10.984.715	Rp11.407.404
Profit this Year	Rp422.731	Rp422.731	Rp422.696	Rp422.689	Rp422.689
TOTAL EQUITIES	Rp13.661.309	Rp14.084.040	Rp14.506.736	Rp14.929.425	Rp15.352.115
TOTAL EQUITIES DAN LIABILITIES	Rp13.661.309	Rp14.084.040	Rp14.506.736	Rp14.929.425	Rp15.352.115

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2068-2071)

Description	2068	2069	2070	2071
ASSETS				
Current Assets				
Cash	Rp14.445.356	Rp14.990.427	Rp15.490.755	Rp16.035.584
Marketable Securities	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp224.092	Rp230.697	Rp237.548	Rp244.655
Inventories	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp14.669.448	Rp15.221.124	Rp15.728.303	Rp16.280.239
Fixed Assets				
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp78.708	Rp78.708	Rp123.205	Rp123.205
Accumulated Depreciation	(Rp7.032.216)	(Rp7.161.241)	(Rp7.290.267)	(Rp7.420.335)

Description	2068	2069	2070	2071
Total Fixed Assets	Rp1.105.317	Rp976.292	Rp891.763	Rp761.695
TOTAL ASSETS	Rp15.774.765	Rp16.197.416	Rp16.620.066	Rp17.041.934
LIABILITIES				
Current Liabilities				
Accounts Payable	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities				
Long Term Notes	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0
EQUITIES				
Preferred Stock	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp11.830.093	Rp12.252.744	Rp12.675.394	Rp13.098.045
Profit this Year	Rp422.650	Rp422.650	Rp422.650	Rp421.868
TOTAL EQUITIES	Rp15.774.765	Rp16.197.416	Rp16.620.066	Rp17.041.934
TOTAL EQUITIES DAN LIABILITIES	Rp15.774.765	Rp16.197.416	Rp16.620.066	Rp17.041.934

BPS 3 (PT X) – Balance Sheet Projection (in IDR, million) (2072-2075)

Description	2072	2073	2074	2075
ASSETS				
Current Assets				
Cash	Rp16.575.647	Rp17.108.889	Rp17.652.977	Rp18.196.391
Marketable Securities	Rp0	Rp0	Rp0	Rp0
Account Receivable	Rp252.026	Rp259.672	Rp267.601	Rp275.825
Inventories	Rp0	Rp0	Rp0	Rp0
Prepaid Expense	Rp0	Rp0	Rp0	Rp0
Total Current Assets	Rp16.827.673	Rp17.368.561	Rp17.920.579	Rp18.472.216
Fixed Assets				

Description	2072	2073	2074	2075
Net Plant and Equipment	Rp8.058.825	Rp8.058.825	Rp8.058.825	Rp8.058.825
Routine CAPEX	Rp127.708	Rp138.783	Rp138.799	Rp139.195
Accumulated Depreciation	(Rp7.550.404)	(Rp7.680.580)	(Rp7.811.034)	(Rp7.941.489)
Total Fixed Assets	Rp636.129	Rp517.028	Rp386.590	Rp256.530
TOTAL ASSETS	Rp17.463.802	Rp17.885.590	Rp18.307.168	Rp18.728.746
LIABILITIES				
Current Liabilities				
Accounts Payable	Rp0	Rp0	Rp0	Rp0
Accrued Expenses	Rp0	Rp0	Rp0	Rp0
Short-Term Notes	Rp0	Rp0	Rp0	Rp0
Total Current Liabilities	Rp0	Rp0	Rp0	Rp0
Long Term Liabilities				
Long Term Notes	Rp0	Rp0	Rp0	Rp0
Mortgages	Rp0	Rp0	Rp0	Rp0
Total Long Term Liabilities	Rp0	Rp0	Rp0	Rp0
TOTAL LIABILITIES	Rp0	Rp0	Rp0	Rp0
EQUITIES				
Preferred Stock	Rp0	Rp0	Rp0	Rp0
Common Stock (PAR Value)	Rp3.522.021	Rp3.522.021	Rp3.522.021	Rp3.522.021
Paid in Capital	Rp0	Rp0	Rp0	Rp0
Retained Earnings	Rp13.519.913	Rp13.941.781	Rp14.363.568	Rp14.785.147
Profit this Year	Rp421.868	Rp421.787	Rp421.578	Rp421.578
TOTAL EQUITIES	Rp17.463.802	Rp17.885.590	Rp18.307.168	Rp18.728.746
TOTAL EQUITIES DAN LIABILITIES	Rp17.463.802	Rp17.885.590	Rp18.307.168	Rp18.728.746

BPS 3 (PT X) – Free Cash Flow Projection (in IDR, million) (2021-2029)

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029
Net profit	Rp0	Rp0	Rp0	Rp0	Rp0	(Rp22.259)	(Rp19.707)	(Rp12.133)	Rp4.163
Depreciation Expense	Rp0	Rp0	Rp0	Rp0	Rp0	Rp203.520	Rp203.520	Rp203.599	Rp203.776
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp383.473	Rp381.560	Rp375.819	Rp362.425
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp564.735	Rp565.373	Rp567.286	Rp570.363

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029
Investment	(Rp702.359)	(Rp1.455.745)	(Rp2.962.517)	(Rp1.768.532)	(Rp1.169.671)	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	(Rp104.300)	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	(Rp702.359)	(Rp1.455.745)	(Rp2.962.517)	(Rp1.768.532)	(Rp1.273.971)	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	(Rp702.359)	(Rp1.455.745)	(Rp2.962.517)	(Rp1.768.532)	(Rp1.273.971)	Rp564.735	Rp565.373	Rp567.286	Rp570.363
Accumulated Net Cash Flow	(Rp702.359)	(Rp2.158.105)	(Rp5.120.622)	(Rp6.889.154)	(Rp8.163.125)	(Rp7.598.390)	(Rp7.033.018)	(Rp6.465.731)	(Rp5.895.368)
Discounted Cash Flow	Rp0	Rp0	Rp0	Rp0	(Rp8.163.125)	Rp520.850	Rp480.918	Rp445.047	Rp412.690
Accumulated Discounted Cash Flow	Rp0	Rp0	Rp0	Rp0	(Rp8.163.125)	(Rp7.642.275)	(Rp7.161.358)	(Rp6.716.310)	(Rp6.303.621)

BPS 3 (PT X) – Free Cash Flow Projection (in IDR, million) (2030-2028)

Description	2030	2031	2032	2033	2034	2035	2036	2037	2038
Net profit	Rp21.402	Rp40.575	Rp59.730	Rp78.904	Rp98.077	Rp117.236	Rp136.407	Rp155.581	Rp174.739
Depreciation Expense	Rp203.776	Rp203.777	Rp203.802	Rp203.802	Rp203.802	Rp203.821	Rp203.825	Rp203.825	Rp203.846
Interest Expense x (1 - Tax)	Rp345.185	Rp326.012	Rp306.838	Rp287.664	Rp268.491	Rp249.317	Rp230.143	Rp210.970	Rp191.796
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp570.363	Rp570.364	Rp570.370	Rp570.370	Rp570.370	Rp570.375	Rp570.376	Rp570.376	Rp570.381
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp570.363	Rp570.364	Rp570.370	Rp570.370	Rp570.370	Rp570.375	Rp570.376	Rp570.376	Rp570.381
Accumulated Net Cash Flow	(Rp5.325.005)	(Rp4.754.641)	(Rp4.184.271)	(Rp3.613.901)	(Rp3.043.532)	(Rp2.473.157)	(Rp1.902.781)	(Rp1.332.405)	(Rp762.025)
Discounted Cash Flow	Rp380.620	Rp351.042	Rp323.767	Rp298.607	Rp275.403	Rp254.004	Rp234.266	Rp216.061	Rp199.273
Accumulated Discounted Cash Flow	(Rp5.923.001)	(Rp5.571.958)	(Rp5.248.192)	(Rp4.949.584)	(Rp4.674.181)	(Rp4.420.178)	(Rp4.185.912)	(Rp3.969.851)	(Rp3.770.578)

BPS 3 (PT X) – Free Cash Flow Projection (in IDR, million) (2039-2047)

Description	2039	2040	2041	2042	2043	2044	2045	2046	2047
Net profit	Rp193.912	Rp213.086	Rp231.934	Rp251.108	Rp270.248	Rp289.336	Rp308.509	Rp385.141	Rp402.372
Depreciation Expense	Rp203.846	Rp203.846	Rp204.280	Rp204.280	Rp204.325	Rp204.439	Rp204.439	Rp127.829	Rp127.868
Interest Expense x (1 - Tax)	Rp172.622	Rp153.449	Rp134.275	Rp115.101	Rp95.928	Rp76.754	Rp57.580	Rp38.407	Rp21.147
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp570.381	Rp570.381	Rp570.490	Rp570.490	Rp570.501	Rp570.529	Rp570.529	Rp551.377	Rp551.386
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp570.381	Rp570.381	Rp570.490	Rp570.490	Rp570.501	Rp570.529	Rp570.529	Rp551.377	Rp551.386
Accumulated Net Cash Flow	(Rp191.644)	Rp378.737	Rp949.227	Rp1.519.716	Rp2.090.217	Rp2.660.746	Rp3.231.276	Rp3.782.652	Rp4.334.038
Discounted Cash Flow	Rp183.788	Rp169.506	Rp156.363	Rp144.213	Rp133.009	Rp122.679	Rp113.146	Rp100.850	Rp93.015
Accumulated Discounted Cash Flow	(Rp3.586.790)	(Rp3.417.284)	(Rp3.260.921)	(Rp3.116.708)	(Rp2.983.700)	(Rp2.861.021)	(Rp2.747.875)	(Rp2.647.025)	(Rp2.554.011)

BPS 3 (PT X) – Free Cash Flow Projection (in IDR, million) (2048-2056)

Description	2048	2049	2050	2051	2052	2053	2054	2055	2056
Net profit	Rp415.805	Rp421.585	Rp423.496	Rp423.495	Rp423.495	Rp423.470	Rp423.470	Rp423.470	Rp422.965
Depreciation Expense	Rp127.868	Rp127.868	Rp127.898	Rp127.899	Rp127.899	Rp127.933	Rp127.933	Rp127.933	Rp128.606
Interest Expense x (1 - Tax)	Rp7.713	Rp1.934	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp551.386	Rp551.386	Rp551.394	Rp551.394	Rp551.394	Rp551.403	Rp551.403	Rp551.403	Rp551.571
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp551.386	Rp551.386	Rp551.394	Rp551.394	Rp551.394	Rp551.403	Rp551.403	Rp551.403	Rp551.571
Accumulated Net Cash Flow	Rp4.885.425	Rp5.436.811	Rp5.988.205	Rp6.539.599	Rp7.090.994	Rp7.642.396	Rp8.193.799	Rp8.745.201	Rp9.296.772

Description	2048	2049	2050	2051	2052	2053	2054	2055	2056
Discounted Cash Flow	Rp85.787	Rp79.120	Rp72.973	Rp67.302	Rp62.072	Rp57.250	Rp52.801	Rp48.698	Rp44.927
Accumulated Discounted Cash Flow	(Rp2.468.224)	(Rp2.389.104)	(Rp2.316.131)	(Rp2.248.829)	(Rp2.186.757)	(Rp2.129.507)	(Rp2.076.706)	(Rp2.028.009)	(Rp1.983.082)

BPS 3 (PT X) – Free Cash Flow Projection (in IDR, million) (2057-2065)

Description	2057	2058	2059	2060	2061	2062	2063	2064	2065
Net profit	Rp422.965	Rp422.913	Rp422.779	Rp422.779	Rp422.776	Rp422.731	Rp422.731	Rp422.731	Rp422.696
Depreciation Expense	Rp128.606	Rp128.675	Rp128.854	Rp128.854	Rp128.857	Rp128.918	Rp128.918	Rp128.918	Rp128.965
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp551.571	Rp551.588	Rp551.633	Rp551.633	Rp551.634	Rp551.649	Rp551.649	Rp551.649	Rp551.661
Investment	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp551.571	Rp551.588	Rp551.633	Rp551.633	Rp551.634	Rp551.649	Rp551.649	Rp551.649	Rp551.661
Accumulated Net Cash Flow	Rp9.848.344	Rp10.399.932	Rp10.951.565	Rp11.503.198	Rp12.054.832	Rp12.606.480	Rp13.158.129	Rp13.709.778	Rp14.261.439
Discounted Cash Flow	Rp41.436	Rp38.217	Rp35.250	Rp32.511	Rp29.985	Rp27.655	Rp25.506	Rp23.524	Rp21.697
Accumulated Discounted Cash Flow	(Rp1.941.646)	(Rp1.903.429)	(Rp1.868.178)	(Rp1.835.667)	(Rp1.805.683)	(Rp1.778.028)	(Rp1.752.521)	(Rp1.728.997)	(Rp1.707.301)

BPS 3 (PT X) – Free Cash Flow Projection (in IDR, million) (2066-2070)

Description	2066	2067	2068	2069	2070
Net profit	Rp422.689	Rp422.689	Rp422.650	Rp422.650	Rp422.650
Depreciation Expense	Rp128.973	Rp128.973	Rp129.025	Rp129.025	Rp129.025
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Inflow	Rp551.663	Rp551.663	Rp551.676	Rp551.676	Rp551.676
Investment	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0

Description	2066	2067	2068	2069	2070
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp551.663	Rp551.663	Rp551.676	Rp551.676	Rp551.676
Accumulated Net Cash Flow	Rp14.813.101	Rp15.364.764	Rp15.916.440	Rp16.468.116	Rp17.019.791
Discounted Cash Flow	Rp20.011	Rp18.456	Rp17.022	Rp15.699	Rp14.479
Accumulated Discounted Cash Flow	(Rp1.687.290)	(Rp1.668.834)	(Rp1.651.813)	(Rp1.636.114)	(Rp1.621.634)

BPS 3 (PT X) – Free Cash Flow Projection (in IDR, million) (2071-2075)

Description	2071	2072	2073	2074	2075
Net profit	Rp421.868	Rp421.868	Rp421.787	Rp421.578	Rp421.578
Depreciation Expense	Rp130.068	Rp130.068	Rp130.176	Rp130.455	Rp130.455
Interest Expense x (1 - Tax)	Rp0	Rp0	Rp0	Rp0	Rp0
Terminal Value	Rp0	Rp0	Rp0	Rp0	Rp104.300
Total Cash Inflow	Rp551.937	Rp551.937	Rp551.963	Rp552.033	Rp656.333
Investment	Rp0	Rp0	Rp0	Rp0	Rp0
Changes in Working Capital	Rp0	Rp0	Rp0	Rp0	Rp0
Total Cash Outflow	Rp0	Rp0	Rp0	Rp0	Rp0
Net Cash Flow	Rp551.937	Rp551.937	Rp551.963	Rp552.033	Rp656.333
Accumulated Net Cash Flow	Rp17.571.728	Rp18.123.665	Rp18.675.628	Rp19.227.661	Rp19.883.995
Discounted Cash Flow	Rp13.360	Rp12.322	Rp11.365	Rp10.483	Rp11.495
Accumulated Discounted Cash Flow	(Rp1.608.274)	(Rp1.595.952)	(Rp1.584.587)	(Rp1.574.104)	(Rp1.562.608)

BPS 3 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2026-2035)

Benefits Factors	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
PT X Operating Revenue	Rp18.024	Rp22.278	Rp26.770	Rp17.421	Rp17.565	Rp18.097	Rp18.944	Rp19.827	Rp20.745	Rp21.700
PT X Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
PT Y Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-

Benefits Factors	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp24.704	Rp30.567	Rp36.771	Rp25.177	Rp25.851	Rp27.062	Rp28.330	Rp29.650	Rp31.023	Rp32.452
Avoided Land Acquisition Cost	Rp-	Rp40.771	Rp82.311	Rp126.360	Rp173.011	Rp222.358	Rp275.253	Rp331.888	Rp392.463	Rp457.187
Carbon Credit Savings Gained through WTE Operation	Rp156.531	Rp193.503	Rp232.562	Rp152.490	Rp154.181	Rp159.238	Rp166.698	Rp174.462	Rp182.542	Rp190.949
Total Benefits	Rp199.259	Rp287.119	Rp378.414	Rp321.448	Rp370.610	Rp426.755	Rp489.226	Rp555.827	Rp626.773	Rp702.288

BPS 3 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2036-2044)

Benefits Factors	2036	2037	2038	2039	2040	2041	2042	2043	2044
PT X Operating Revenue	Rp22.695	Rp23.729	Rp24.805	Rp25.924	Rp27.088	Rp28.298	Rp29.557	Rp30.866	Rp32.226
PT X Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
PT Y Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp33.938	Rp35.485	Rp37.094	Rp38.768	Rp40.508	Rp42.318	Rp44.200	Rp46.158	Rp48.192
Avoided Land Acquisition Cost	Rp526.278	Rp599.965	Rp678.488	Rp762.098	Rp851.055	Rp945.635	Rp1.046.124	Rp1.152.820	Rp1.266.038
Carbon Credit Savings Gained through WTE Operation	Rp199.697	Rp208.798	Rp218.265	Rp228.113	Rp238.354	Rp249.005	Rp260.081	Rp271.596	Rp283.569
Total Benefits	Rp782.608	Rp867.977	Rp958.652	Rp1.054.902	Rp1.157.006	Rp1.265.257	Rp1.379.962	Rp1.501.440	Rp1.630.025

BPS 3 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2045-2052)

Benefits Factors	2045	2046	2047	2048	2049	2050	2051	2052
PT X Operating Revenue	Rp33.641	Rp35.111	Rp36.639	Rp38.228	Rp39.879	Rp41.594	Rp43.376	Rp45.228
PT X Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
PT Y Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp50.308	Rp52.506	Rp54.792	Rp57.167	Rp59.636	Rp62.201	Rp64.867	Rp67.636
Avoided Land Acquisition Cost	Rp1.386.103	Rp1.513.358	Rp1.648.159	Rp1.790.881	Rp1.941.912	Rp2.101.659	Rp2.270.549	Rp2.449.023
Carbon Credit Savings Gained through WTE Operation	Rp296.016	Rp308.954	Rp322.402	Rp336.379	Rp350.904	Rp365.999	Rp381.683	Rp397.978
Total Benefits	Rp1.766.067	Rp1.909.929	Rp2.061.993	Rp2.222.655	Rp2.392.331	Rp2.571.453	Rp2.760.474	Rp2.959.866

BPS 3 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2053-2060)

Benefits Factors	2053	2054	2055	2056	2057	2058	2059	2060
PT X Operating Revenue	Rp47.152	Rp49.151	Rp51.227	Rp53.384	Rp55.624	Rp57.950	Rp60.365	Rp62.874
PT X Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
PT Y Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp70.513	Rp73.502	Rp76.607	Rp79.832	Rp83.182	Rp86.660	Rp90.273	Rp94.024
Avoided Land Acquisition Cost	Rp2.637.546	Rp2.836.602	Rp3.046.696	Rp3.268.354	Rp3.502.128	Rp3.748.590	Rp4.008.341	Rp4.282.006
Carbon Credit Savings Gained through WTE Operation	Rp414.908	Rp432.496	Rp450.765	Rp469.741	Rp489.450	Rp509.919	Rp531.176	Rp553.249
Total Benefits	Rp3.170.120	Rp3.391.751	Rp3.625.295	Rp3.871.311	Rp4.130.384	Rp4.403.120	Rp4.690.156	Rp4.992.153

BPS 3 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2061-2068)

Benefits Factors	2061	2062	2063	2064	2065	2066	2067	2068
PT X Operating Revenue	Rp65.479	Rp68.183	Rp70.991	Rp73.905	Rp76.931	Rp80.072	Rp83.332	Rp86.716
PT X Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
PT Y Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp97.919	Rp101.964	Rp106.162	Rp110.521	Rp115.046	Rp119.743	Rp124.618	Rp129.678
Avoided Land Acquisition Cost	Rp4.570.235	Rp4.873.710	Rp5.193.141	Rp5.529.266	Rp5.882.858	Rp6.254.722	Rp6.645.696	Rp7.056.655
Carbon Credit Savings Gained through WTE Operation	Rp576.168	Rp599.965	Rp624.671	Rp650.319	Rp676.944	Rp704.581	Rp733.267	Rp763.040
Total Benefits	Rp5.309.801	Rp5.643.822	Rp5.994.964	Rp6.364.011	Rp6.751.779	Rp7.159.117	Rp7.586.913	Rp8.036.088

BPS 3 – Projected Benefits per Period for DLHK of Sidoarjo District (in IDR, million) (2069-2075)

Benefits Factors	2069	2070	2071	2072	2073	2074	2075
PT X Operating Revenue	Rp90.227	Rp93.871	Rp97.653	Rp101.577	Rp105.649	Rp109.873	Rp114.256
PT X Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp211.162
PT Y Plant Acquisition in 2075	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp101.682
Avoided Operational Cost of MSW-MS in TPA Jabon	Rp134.929	Rp140.379	Rp146.034	Rp151.903	Rp157.991	Rp164.309	Rp170.863
Avoided Land Acquisition Cost	Rp7.488.511	Rp7.942.215	Rp8.418.757	Rp8.919.171	Rp9.444.532	Rp9.995.962	Rp10.574.629
Carbon Credit Savings Gained through WTE Operation	Rp793.939	Rp826.006	Rp859.282	Rp893.812	Rp929.640	Rp966.813	Rp1.005.380
Total Benefits	Rp8.507.607	Rp9.002.472	Rp9.521.727	Rp10.066.463	Rp10.637.812	Rp11.236.957	Rp12.177.972

BPS 3 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2026-2035)

Costs Factors	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp20.728	Rp13.278	Rp476	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp18.902	Rp19.816	Rp20.767	Rp21.758	Rp22.790	Rp23.864	Rp24.982	Rp26.145	Rp27.356	Rp28.616
AP to PT X	Rp1.109.760	Rp1.204.675	Rp1.308.592	Rp1.111.080	Rp1.115.589	Rp1.128.368	Rp1.147.929	Rp1.168.271	Rp1.189.423	Rp1.211.417
AP to PT Y	Rp17.756	Rp22.337	Rp27.312	Rp32.703	Rp38.535	Rp44.835	Rp46.935	Rp49.121	Rp51.396	Rp53.763
Tipping Fee to PT Y	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393
Total Costs	Rp1.178.539	Rp1.271.499	Rp1.368.539	Rp1.176.933	Rp1.188.307	Rp1.208.460	Rp1.231.238	Rp1.254.930	Rp1.279.568	Rp1.305.189

BPS 3 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2036-2045)

Costs Factors	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp29.927	Rp31.291	Rp32.710	Rp34.186	Rp35.721	Rp37.317	Rp38.977	Rp40.702	Rp42.497	Rp44.362

Costs Factors	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
AP to PT X	Rp1.234.283	Rp1.258.054	Rp1.282.763	Rp1.308.447	Rp1.335.140	Rp1.362.880	Rp1.391.707	Rp1.421.659	Rp1.452.780	Rp1.485.112
AP to PT Y	Rp56.226	Rp58.789	Rp61.454	Rp64.227	Rp67.111	Rp70.109	Rp73.228	Rp76.470	Rp79.841	Rp83.346
Tipping Fee to PT Y	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393
Total Costs	Rp1.331.829	Rp1.359.526	Rp1.388.320	Rp1.418.252	Rp1.449.363	Rp1.481.699	Rp1.515.304	Rp1.550.225	Rp1.586.511	Rp1.624.212

BPS 3 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2046-2055)

Costs Factors	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp46.301	Rp48.316	Rp50.411	Rp52.588	Rp54.850	Rp57.200	Rp59.642	Rp62.180	Rp64.815	Rp67.553
AP to PT X	Rp1.518.699	Rp1.553.589	Rp1.589.828	Rp1.627.467	Rp1.666.556	Rp1.707.150	Rp1.749.302	Rp1.793.071	Rp1.838.514	Rp1.885.694
AP to PT Y	Rp86.988	Rp90.775	Rp94.710	Rp98.800	Rp103.050	Rp107.466	Rp112.054	Rp116.821	Rp121.773	Rp126.917
Tipping Fee to PT Y	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393
Total Costs	Rp1.663.381	Rp1.704.073	Rp1.746.342	Rp1.790.247	Rp1.835.849	Rp1.883.209	Rp1.932.391	Rp1.983.464	Rp2.036.495	Rp2.091.556

BPS 3 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2056-2065)

Costs Factors	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp70.397	Rp73.351	Rp76.418	Rp79.604	Rp82.912	Rp86.347	Rp89.913	Rp93.615	Rp97.459	Rp101.449
AP to PT X	Rp1.934.673	Rp1.985.517	Rp2.038.294	Rp2.093.074	Rp2.149.929	Rp2.208.935	Rp2.270.170	Rp2.333.714	Rp2.399.651	Rp2.468.068
AP to PT Y	Rp132.259	Rp137.809	Rp143.572	Rp149.557	Rp155.772	Rp162.225	Rp168.925	Rp175.881	Rp183.102	Rp190.599
Tipping Fee to PT Y	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393
Total Costs	Rp2.148.722	Rp2.208.069	Rp2.269.677	Rp2.333.627	Rp2.400.005	Rp2.468.899	Rp2.540.400	Rp2.614.603	Rp2.691.606	Rp2.771.508

BPS 3 – Projected Costs per Period for DLHK of Sidoarjo District (in IDR, million) (2066-2075)

Costs Factors	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Operational Cost of Remaining MSW-MS in TPA Jabon	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-	Rp-
Transportation and General Sorting Cost of Generated MSW in Sidoarjo District	Rp105.591	Rp109.890	Rp114.352	Rp118.982	Rp123.788	Rp128.775	Rp133.950	Rp139.319	Rp144.890	Rp150.670
AP to PT X	Rp2.539.053	Rp2.612.699	Rp2.689.102	Rp2.768.361	Rp2.850.578	Rp2.935.861	Rp3.024.318	Rp3.116.063	Rp3.211.215	Rp3.309.895
AP to PT Y	Rp198.380	Rp206.457	Rp214.840	Rp223.540	Rp232.569	Rp241.938	Rp251.660	Rp261.747	Rp272.214	Rp283.073
Tipping Fee to PT Y	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393	Rp11.393

Costs Factors	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Total Costs	Rp2.854.416	Rp2.940.438	Rp3.029.686	Rp3.122.276	Rp3.218.328	Rp3.317.966	Rp3.421.320	Rp3.528.523	Rp3.639.712	Rp3.755.030

Attachment 4: Incremental BCR Analysis for Alternative Selection Detailed Information

Incremental BCR Analysis Input for BPS 1 and BPS 3 for Baseline Condition (in IDR, million) (2026-2035)

Baseline Condition	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
Benefits	BPS 1	Rp196.409	Rp293.047	Rp388.239	Rp411.066	Rp418.949	Rp486.667	Rp558.938	Rp635.998	Rp718.098	Rp805.497
	BPS 3	Rp199.259	Rp287.119	Rp378.414	Rp321.448	Rp370.610	Rp426.755	Rp489.226	Rp555.827	Rp626.773	Rp702.288
Costs	BPS 1	Rp1.360.658	Rp1.450.987	Rp1.545.485	Rp1.488.924	Rp1.402.389	Rp1.425.111	Rp1.448.747	Rp1.473.330	Rp1.498.896	Rp1.525.482
	BPS 3	Rp1.374.765	Rp1.464.747	Rp1.558.554	Rp1.363.444	Rp1.371.027	Rp1.387.085	Rp1.408.498	Rp1.430.769	Rp1.453.929	Rp1.478.011
Incremental Benefit	Rp(2.850)	Rp5.928	Rp9.825	Rp89.617	Rp48.339	Rp59.913	Rp69.712	Rp80.172	Rp91.325	Rp103.209	
Incremental Cost	Rp(14.106)	Rp(13.760)	Rp(13.069)	Rp125.480	Rp31.362	Rp38.026	Rp40.248	Rp42.561	Rp44.968	Rp47.472	

Incremental BCR Analysis Input for BPS 1 and BPS 3 for Baseline Condition (in IDR, million) (2036-2045)

Baseline Condition	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
Benefits	BPS 1	Rp898.469	Rp997.297	Rp1.102.281	Rp1.213.731	Rp1.331.973	Rp1.457.346	Rp1.590.207	Rp1.730.927	Rp1.879.893	Rp2.037.511
	BPS 3	Rp782.608	Rp867.977	Rp958.652	Rp1.054.902	Rp1.157.006	Rp1.265.257	Rp1.379.962	Rp1.501.440	Rp1.630.025	Rp1.766.067
Costs	BPS 1	Rp1.553.127	Rp1.581.870	Rp1.611.751	Rp1.642.814	Rp1.675.102	Rp1.708.660	Rp1.743.537	Rp1.779.781	Rp1.817.442	Rp1.856.573
	BPS 3	Rp1.503.050	Rp1.529.081	Rp1.556.143	Rp1.584.272	Rp1.613.509	Rp1.643.896	Rp1.675.473	Rp1.708.287	Rp1.742.382	Rp1.777.805
Incremental Benefit	Rp115.861	Rp129.320	Rp143.629	Rp158.829	Rp174.967	Rp192.090	Rp210.246	Rp229.487	Rp249.868	Rp271.444	
Incremental Cost	Rp50.078	Rp52.788	Rp55.608	Rp58.542	Rp61.592	Rp64.765	Rp68.064	Rp71.494	Rp75.060	Rp78.768	

Incremental BCR Analysis Input for BPS 1 and BPS 3 for Baseline Condition (in IDR, million) (2046-2055)

Baseline Condition	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	
Benefits	BPS 1	Rp2.204.203	Rp2.380.412	Rp2.566.600	Rp2.763.247	Rp2.970.858	Rp3.189.956	Rp3.421.091	Rp3.664.833	Rp3.921.780	Rp4.192.554
	BPS 3	Rp1.909.929	Rp2.061.993	Rp2.222.655	Rp2.392.331	Rp2.571.453	Rp2.760.474	Rp2.959.866	Rp3.170.120	Rp3.391.751	Rp3.625.295
Costs	BPS 1	Rp1.897.228	Rp1.939.464	Rp1.983.339	Rp2.028.912	Rp2.076.247	Rp2.125.409	Rp2.176.463	Rp2.229.480	Rp2.284.531	Rp2.341.691
	BPS 3	Rp1.814.607	Rp1.852.837	Rp1.892.548	Rp1.933.795	Rp1.976.634	Rp2.021.124	Rp2.067.324	Rp2.115.298	Rp2.165.110	Rp2.216.828
Incremental Benefit	Rp294.274	Rp318.419	Rp343.945	Rp370.916	Rp399.405	Rp429.482	Rp461.225	Rp494.713	Rp530.029	Rp567.259	
Incremental Cost	Rp82.622	Rp86.627	Rp90.791	Rp95.117	Rp99.613	Rp104.285	Rp109.139	Rp114.182	Rp119.421	Rp124.862	

Incremental BCR Analysis Input for BPS 1 and BPS 3 for Baseline Condition (in IDR, million) (2056-2065)

Baseline Condition	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	
Benefits	BPS 1	Rp4.477.805	Rp4.778.211	Rp5.094.479	Rp5.427.345	Rp5.777.580	Rp6.145.984	Rp6.533.395	Rp6.940.683	Rp7.368.758	Rp7.818.568
	BPS 3	Rp3.871.311	Rp4.130.384	Rp4.403.120	Rp4.690.156	Rp4.992.153	Rp5.309.801	Rp5.643.822	Rp5.994.964	Rp6.364.011	Rp6.751.779
Costs	BPS 1	Rp2.401.036	Rp2.462.647	Rp2.526.605	Rp2.592.997	Rp2.661.910	Rp2.733.437	Rp2.807.671	Rp2.884.711	Rp2.974.825	Rp3.058.091
	BPS 3	Rp2.270.521	Rp2.326.261	Rp2.384.123	Rp2.444.183	Rp2.506.521	Rp2.571.221	Rp2.638.367	Rp2.708.048	Rp2.780.357	Rp2.855.387

Baseline Condition	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Incremental Benefit	Rp606.494	Rp647.828	Rp691.359	Rp737.190	Rp785.427	Rp836.183	Rp889.573	Rp945.719	Rp1.004.747	Rp1.066.789
Incremental Cost	Rp130.515	Rp136.385	Rp142.482	Rp148.814	Rp155.389	Rp162.216	Rp169.304	Rp176.663	Rp194.469	Rp202.704

Incremental BCR Analysis Input for BPS 1 and BPS 3 for Baseline Condition (in IDR, million) (2066-2075)

Baseline Condition		2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Benefits	BPS 1	Rp8.291.100	Rp8.787.384	Rp9.308.492	Rp9.855.542	Rp10.429.701	Rp11.032.181	Rp11.664.247	Rp12.327.218	Rp13.022.466	Rp13.970.162
	BPS 3	Rp7.159.117	Rp7.586.913	Rp8.036.088	Rp8.507.607	Rp9.002.472	Rp9.521.727	Rp10.066.463	Rp10.637.812	Rp11.236.957	Rp12.076.290
Costs	BPS 1	Rp3.144.487	Rp3.234.127	Rp3.327.128	Rp3.435.983	Rp3.536.443	Rp3.640.649	Rp3.748.738	Rp3.860.848	Rp3.977.122	Rp4.097.710
	BPS 3	Rp2.933.237	Rp3.014.009	Rp3.097.808	Rp3.184.742	Rp3.274.926	Rp3.368.474	Rp3.465.509	Rp3.566.154	Rp3.670.540	Rp3.778.800
Incremental Benefit		Rp1.131.983	Rp1.200.471	Rp1.272.403	Rp1.347.935	Rp1.427.229	Rp1.510.453	Rp1.597.785	Rp1.689.406	Rp1.785.509	Rp1.893.872
Incremental Cost		Rp211.250	Rp220.119	Rp229.320	Rp251.240	Rp261.517	Rp272.175	Rp283.229	Rp294.693	Rp306.581	Rp318.909

Incremental BCR Analysis Input for BPS 1 and BPS 3 for UUK Condition (in IDR, million) (2026-2035)

UUK Condition		2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Benefits	BPS 1	Rp196.409	Rp293.047	Rp388.239	Rp411.066	Rp418.949	Rp486.667	Rp558.938	Rp635.998	Rp718.098	Rp 805.497
	BPS 3	Rp199.259	Rp287.119	Rp378.414	Rp321.448	Rp370.610	Rp426.755	Rp489.226	Rp555.827	Rp626.773	Rp 702.288
Costs	BPS 1	Rp1.568.885	Rp1.659.214	Rp1.753.712	Rp1.697.150	Rp1.610.615	Rp1.633.337	Rp1.656.973	Rp1.681.556	Rp1.707.122	Rp 1.733.709
	BPS 3	Rp1.585.196	Rp1.675.866	Rp1.770.419	Rp1.576.117	Rp1.584.575	Rp1.601.578	Rp1.623.306	Rp1.645.905	Rp1.669.406	Rp 1.693.843
Incremental Benefit		Rp(2.850)	Rp5.928	Rp9.825	Rp89.617	Rp48.339	Rp59.913	Rp69.712	Rp80.172	Rp91.325	Rp103.209
Incremental Cost		Rp(16.311)	Rp(16.652)	Rp(16.707)	Rp121.033	Rp26.040	Rp31.759	Rp33.666	Rp35.651	Rp37.717	Rp39.866

Incremental BCR Analysis Input for BPS 1 and BPS 3 for UUK Condition (in IDR, million) (2036-2045)

UUK Condition		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Benefits	BPS 1	Rp898.469	Rp997.297	Rp1.102.281	Rp1.213.731	Rp1.331.973	Rp1.457.346	Rp1.590.207	Rp1.730.927	Rp1.879.893	Rp2.037.511
	BPS 3	Rp782.608	Rp867.977	Rp958.652	Rp1.054.902	Rp1.157.006	Rp1.265.257	Rp1.379.962	Rp1.501.440	Rp1.630.025	Rp1.766.067
Costs	BPS 1	Rp1.761.353	Rp1.790.096	Rp1.819.977	Rp1.851.040	Rp1.883.328	Rp1.916.887	Rp1.951.763	Rp1.988.007	Rp2.025.668	Rp2.064.799
	BPS 3	Rp1.719.251	Rp1.745.667	Rp1.773.129	Rp1.801.674	Rp1.831.344	Rp1.862.180	Rp1.894.225	Rp1.927.525	Rp1.962.126	Rp1.998.075
Incremental Benefit		Rp115.861	Rp129.320	Rp143.629	Rp158.829	Rp174.967	Rp192.090	Rp210.246	Rp229.487	Rp249.868	Rp271.444
Incremental Cost		Rp42.102	Rp44.429	Rp46.849	Rp49.366	Rp51.984	Rp54.707	Rp57.538	Rp60.482	Rp63.543	Rp66.724

Incremental BCR Analysis Input for BPS 1 and BPS 3 for UUK Condition (in IDR, million) (2036-2045)

UUK Condition		2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Benefits	BPS 1	Rp2.204.203	Rp2.380.412	Rp2.566.600	Rp2.763.247	Rp2.970.858	Rp3.189.956	Rp3.421.091	Rp3.664.833	Rp3.921.780	Rp4.192.554
	BPS 3	Rp1.909.929	Rp2.061.993	Rp2.222.655	Rp2.392.331	Rp2.571.453	Rp2.760.474	Rp2.959.866	Rp3.170.120	Rp3.391.751	Rp3.625.295

UUJK Condition		2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
Costs	BPS 1	Rp2.105.455	Rp2.147.690	Rp2.191.565	Rp2.237.139	Rp2.284.474	Rp2.333.635	Rp2.384.689	Rp2.437.706	Rp2.492.757	Rp2.549.917
	BPS 3	Rp2.035.423	Rp2.074.221	Rp2.114.522	Rp2.156.383	Rp2.199.859	Rp2.245.011	Rp2.291.900	Rp2.340.589	Rp2.391.144	Rp2.443.634
Incremental Benefit		Rp294.274	Rp318.419	Rp343.945	Rp370.916	Rp399.405	Rp429.482	Rp461.225	Rp494.713	Rp530.029	Rp567.259
Incremental Cost		Rp70.032	Rp73.470	Rp77.043	Rp80.756	Rp84.614	Rp88.624	Rp92.789	Rp97.117	Rp101.613	Rp106.283

Incremental BCR Analysis Input for BPS 1 and BPS 3 for UUJK Condition (in IDR, million) (2056-2065)

UUJK Condition		2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
Benefits	BPS 1	Rp4.477.805	Rp4.778.211	Rp5.094.479	Rp5.427.345	Rp5.777.580	Rp6.145.984	Rp6.533.395	Rp6.940.683	Rp7.368.758	Rp7.818.568
	BPS 3	Rp3.871.311	Rp4.130.384	Rp4.403.120	Rp4.690.156	Rp4.992.153	Rp5.309.801	Rp5.643.822	Rp5.994.964	Rp6.364.011	Rp6.751.779
Costs	BPS 1	Rp2.609.262	Rp2.670.873	Rp2.734.832	Rp2.801.223	Rp2.870.136	Rp2.941.663	Rp3.015.897	Rp3.092.938	Rp3.183.052	Rp3.266.317
	BPS 3	Rp2.498.128	Rp2.554.700	Rp2.613.426	Rp2.674.384	Rp2.737.655	Rp2.803.322	Rp2.871.473	Rp2.942.198	Rp3.015.590	Rp3.091.744
Incremental Benefit		Rp606.494	Rp647.828	Rp691.359	Rp737.190	Rp785.427	Rp836.183	Rp889.573	Rp945.719	Rp1.004.747	Rp1.066.789
Incremental Cost		Rp111.134	Rp116.173	Rp121.405	Rp126.839	Rp132.482	Rp138.341	Rp144.424	Rp150.739	Rp167.462	Rp174.573

Incremental BCR Analysis Input for BPS 1 and BPS 3 for UUJK Condition (in IDR, million) (2066-2075)

UUJK Condition		2066	2067	2068	2069	2070	2071	2072	2073	2074	2075
Benefits	BPS 1	Rp8.291.100	Rp8.787.384	Rp9.308.492	Rp9.855.542	Rp10.429.701	Rp11.032.181	Rp11.664.247	Rp12.327.218	Rp13.022.466	Rp13.970.162
	BPS 3	Rp7.159.117	Rp7.586.913	Rp8.036.088	Rp8.507.607	Rp9.002.472	Rp9.521.727	Rp10.066.463	Rp10.637.812	Rp11.236.957	Rp12.076.290
Costs	BPS 1	Rp3.352.714	Rp3.442.354	Rp3.535.354	Rp3.644.209	Rp3.744.669	Rp3.848.876	Rp3.956.964	Rp4.069.074	Rp4.185.348	Rp4.305.936
	BPS 3	Rp3.170.762	Rp3.252.745	Rp3.337.801	Rp3.426.041	Rp3.517.579	Rp3.612.533	Rp3.711.026	Rp3.813.184	Rp3.919.140	Rp4.029.029
Incremental Benefit		Rp1.131.983	Rp1.200.471	Rp1.272.403	Rp1.347.935	Rp1.427.229	Rp1.510.453	Rp1.597.785	Rp1.689.406	Rp1.785.509	Rp1.893.872
Incremental Cost		Rp181.952	Rp189.609	Rp197.553	Rp218.168	Rp227.090	Rp236.343	Rp245.939	Rp255.890	Rp266.208	Rp276.907

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AUTHOR'S BIOGRAPHY



Author, named Matheus Bimo Aryo Prakoso, was born in Malang, 21st of September 1998. Author is the last child of two siblings. Author formal education background started from SD Katolik Cor Jesu Malang, SMP Negeri 5 Malang, and SMA Negeri 3 Malang, up to this point, where the author able to finished author's Undergraduate (S1) Degree in Department of Industrial System and Engineering of Institut Teknologi Sepuluh Nopember (ITS). During author's study in Department of Industrial System and Engineering of ITS, author has contributed to several organization, committee, and project activities. Authors has contributed as a Staff of Art Enthusiast Community of UMTI ITS called Akatara in 2017/2018, Vice Chairman of Akatara in 2018/2019, ITS International Office (IO) Volunteer Season 9 in 2018/2019, and Laboratory Assistant of Laboratorium Perancangan Sistem dan Manajemen Industri (PSMI) ITS from 2018 until 2020. As a part of ITS IO Volunteer, author contributed becoming committee of many different cross-cultural project, and become the project leader of Study Excursion: ITS Goes Beyond in 2019 program. As a Laboratory Assistant in PSMI Laboratory, author had the opportunity to implement knowledge and skills especially from PSMI laboratory in campus academic activities such as assisting Lecturer in conducting certain course, teaching and assisting fellow students. Moreover, authors also had the opportunity to implement these knowledge and skill in practical use for non-academic activities in form of project related work with external parties. In 2018, author did an internship program in PT. Industri Kereta Api (INKA) Production Planning and Control Division for 1 month. Author can be reached via email at matheusbimoap@gmail.com