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Introduction to Energy Efficiency Project Financing for Industry

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Author's Introduction

Indonesia's economic growth in the past decade grew at a rate that is quite impressive. As a result, the national energy consumption also increase doubled in this decade. However, the increasing in the level of energy consumption is not balanced by the rate of energy resources owned by Indonesia. Currently the energy sources that we use comes mostly from fossil resources such as petroleum, natural gas, and coal can not renewable and are very limited in the country. The need for very high energy consumption causes Indonesia to import fuel.

The highest energy consumption is due to the in efficiency in energy consumption, especially in the industrial sector as the largest sector in consuming energy. Thus, the energy costs incurred by the industry to be very high which resulted in financial efficiency and declining competitiveness. For these reasons, the use of energy waste problem became the attention of the government in recent times. Many policies have been issued by the government to promote energy efficiency, especially for industry. Energy efficiency programs mostly take advantage of new or additional technologies that require large investments and the industry may not be able to finance all investment its own costs. Therefore, the participation of investors or creditors of banks / financial institutions play a very significant to finance energy efficiency projects in the industrial sector.

So that, this book is arranged in such a way to provide insight to the staff of the industry about the potential energy efficiency project financing from banks or financial institutions. In this book we provide introductory training necessary to be observed before the book was used in training, also training guidance of each session, along with worksheets and exercise sheets are required.

We would like to thank some of those who support the realization of this book both of the United Nations Industrial Development Organization (UNIDO), the Directorate General of Renewable Energy and Energy Conservation (EBTKE) Ministry of Energy and Mineral Resources, Financial Services Authority (FSA), and Fabby Tumiwadari Institute for Essential Reform (IESR).

This book is certainly still far from perfect, critiques and suggestions are welcome to improve in the next revised edition. Finally, I hope this book is useful for the development of energy efficiency projects in Indonesia.

Jakarta, February 2015.

Dr. Muhammad Ery Wijaya

Introduction of Training

Generally, the book 'Introduction to Project Financing Energy Efficiency for Industry' can be used as training material intended for the finance department staff and staff to understand the technical part of the project financing of energy efficiency in the industrial sector. As training material, this book is specifically aimed at developing energy efficiency project financing proposals that will be submitted to the bank or financial institution.

The content of this book can be presented in a series of training sessions. Each session of this training using a variety of methods, ranging from lectures methods, reading literature, group discussions, case studies, to complete the worksheet. In addition to aspects of knowledge (knowledge), this book also studies aspects of skills (skills) for participants to prepare a project feasibility analysis of energy efficiency both in terms of technical, legal and financial. Finally, it is expected that participants can prepare energy efficiency project financing proposals that can convince a bank or financial institution.

Through the reading material that is presented, this book can also be used by readers and the general public without going through a training or training. . Reading material which is presented in this session intentionally delivered in stages,, starting from the understanding of energy efficiency opportunities and markets in general as an introduction to the principles of conservation and energy efficiency, the basic approach in energy efficiency projects, preparation of the implementation of energy efficiency projects, anatomy efficiency financing proposals energy, and financial modeling introduction of energy efficiency projects.

Notes for the Facilitator

Facilitators who will use this book for a training is expected to have the following criteria: have the educational background or work experience in the field of energy economics, understand the principles of energy conservation, energy policy and policy understanding of banking / financial institutions associated with the environmental aspect, and has the ability and experience in facilitating a training.

Before facilitate the training, some things that should be considered by a facilitator are:

1. Read the whole training materials thoroughly
2. Consider the goals and methods of each session as well as reading materials and exercise sheets which is used
3. Prepare the materials needed for each session
4. Pay attention to the background and the composition of the trainee
5. Adjust the training methods that will be used to condition the participants
6. Do not forget to evaluate training at certain periods as needed (per session or per day)

Notes for the Participants

In training, some technical instructions that must be considered by the trainees are:

1. Follow the instructions given by the facilitator in each session
2. Read the reading material in accordance with the session which is given by the facilitator
3. Follow any case studies, group discussions and workmanship sheet exercise conscientious
4. Ask about things that have not been clearly associated with the material, reading materials, and methods of training that was delivered by the facilitator
5. Provide input to the materials, reading materials and methods are presented at each session for future improvements to the training materials.

Submission Schedule Matter in Training

Overall, the material in this book can be trained optimally within two(2) days of effective training, the training agenda as follows:

Day	Session	Material
First	1st Session	Energy Policy and Regulation and Banking 1. Policy and Regulation of Energy Conservation, delivered by DJEBTKE - MEMR 2. Policies and Regulations "Sustainable Finance", delivered by the FSA
	2nd Session	Opportunities and Energy Efficiency Market in ASEAN and Indonesia
	3rd Session	Principles of Conservation and Energy Efficiency
	4th Session	Basic Approach to Energy Efficiency Projects Preparation Implementation of Energy Efficiency Projects
Second	1st Session	Energy Efficiency Financing Proposal and Financing Analysis Memorandum
	2nd Session	Introduction to Financial Modeling of Energy Efficiency Projects
	3rd Session	Evaluation of Training Results (Post - Test)

List of Abbreviations

ADB	:	*Asia Development Bank*
EIA	:	Environmental Impact Analysis
ASEAN	:	*Association of Southeast Asian Nations*
ASHRAE	:	*American Society of Heating, Refrigeration, and Air-Conditioning Engineers*
ECM	:	*Energy Conservation Measures*
EEM	:	*Energy Efficiency Measures*
ENCON	:	*Energy Conservation Promotion Fund*
ESCO	:	*Energy Services Company*
ESPC	:	*Energy Saving Performance Contract*
HNWI	:	*High Net Worth Individuals*
IEA	:	*International Energy Agency*
IFC	:	*International Finance Corporation*
IGEA	:	*Investment Grade Energy Audit*
ISO	:	*International Organization for Standardization*
MEMR	:	Ministry of Energy and Mineral Resources
MDB	:	*Multilateral Development Bank*
M & V		*Measurement and Verification*
OECD	:	*Organization for Economic Co-operation and Development*
PACE	:	*Property Assessed Clean Energy Program*
GDP	:	Gross Domestic Product
PROPER	:	Performance Rating Program in Environmental Management
INC	:	Indonesian National Competence
INS	:	Indonesian National Standard
UNIDO	:	*United Nations Industrial Development Organization*
VSD	:	*Variable Speed Drive*

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Introduction of Chapter 1

Opportunities and Energy Efficiency Market in ASEAN and Indonesia

The Aim	1. Knowing the growth of projections in energy consumption trends in ASEAN 2. Knowing the energy efficiency programs in ASEAN and its investment potential 3. Studying the energy efficiency investments in one of the ASEAN countries 4. Energy consumption and energy efficiency investment potential in Indonesia
Time	90 minutes
Methods	1. Lectures by speakers / facilitators 2. Questions & Answers forum
Tools and materials	Stationery, Projectors, Pointer, Paper Plano and Laptops

Stages Facilitation of Training:

1. Introduction
   The facilitator explains the general purpose, the flow and the time allocation of the session. Then the facilitator invites participants to ask questions and provide input if it is needed. (Time: 5 minutes)
2. Speakers lecture / Facilitator
   The session was followed by a lecture from speaker about energy efficiency opportunities and markets in ASEAN and Indonesia. (Time: 55 minutes)
3. Questions & Answers Forum
   Followed by a question and answer session and a discussion forum between the participants with speakers / facilitators. (Time: 30 minutes)

Chapter I

Opportunities and Energy Efficiency Market in ASEAN and Indonesia

I. Introduction

Now a days, Southeast Asia has become a major pillar of the new economic growth in Asia, joining China and India. With a population in 2011 nearly 600 million people, This Gross Domestic Product (GDP) merge of the ten-member Association of Southeast Asian Nations or ASEAN has grown significantly since 2000. Those ten countries are Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam, China and India. **Table 1.1** shows the economic growth in some countries in Southeast Asia. The rapid economic causes urbanization and industrialization. It encourages high growth in energy use in ASEAN since the Asian financial crisis occurred in 1997-1998. This time the center of gravity of the global energy system is shifting to Asia and the growth of energy demand in the ASEAN continues even during the global economic crisis that occurred recently in 2008-2009. This is caused the financial fundamentals and strong domestic macroeconomic that has protected many developed countries in the world of the problems encountered.

Table 1.1 GDP growth rate in some ASEAN countries

	1990 – 2011	2011 – 2020	2020 – 2035	2011 – 2035
Indonesia	4,7%	6,2%	4,2%	4,9%
Malaysia	5,8%	5,0%	3,4%	4,0%
Filipina	3,8%	5,6%	4,1%	4,6%
Thailand	4,2%	4,9%	3,8%	4,2%
ASEAN lainnya	6,7%	4,9%	4,4%	4,6%
ASEAN	**5,0%**	**5,5%**	**4,1%**	**4,6%**

Source: IEA, 2013

Electricity demand in Southeast Asia increased about five-fold between 1990 and 2011 became 712 TWh. As in most areas of the world, the mix primary energy in Southeast Asia is more than three-quarters dominated by fossil fuels such as oil (25%), natural gas (44%) and coal (31%). But over the last few decades fossil fuel consumption occured much shift towards coal and natural gas to replace oil consumption in power generation and industry, and traditional biomass in the household sector.

However, oil remains the dominant fuel in the current demand of 4.4 million barrels per day, or approximately 37% share in the mix primary energy. The portion of the mix natural gas is in the second position, which amounted to 21% with the demand of about 141 billion cubic

meters. As one of the fastest growing regions in the world during 1980-2011, ASEAN economic growth is not accompanied by a significant reduction in intensity of energy. The decline in intensity of energy in Southeast Asia that is slow to happen, by 12% overall, due to transform towards a more energy-intensive industries. The decline is relatively low if it is compared with that has happened in the world as a whole sebesar26%, The member countries of the Organisation for Economic Co-operation and Development (OECD) by 38%, in China by 74% and in India by 44% (see **Figure 1.1**).

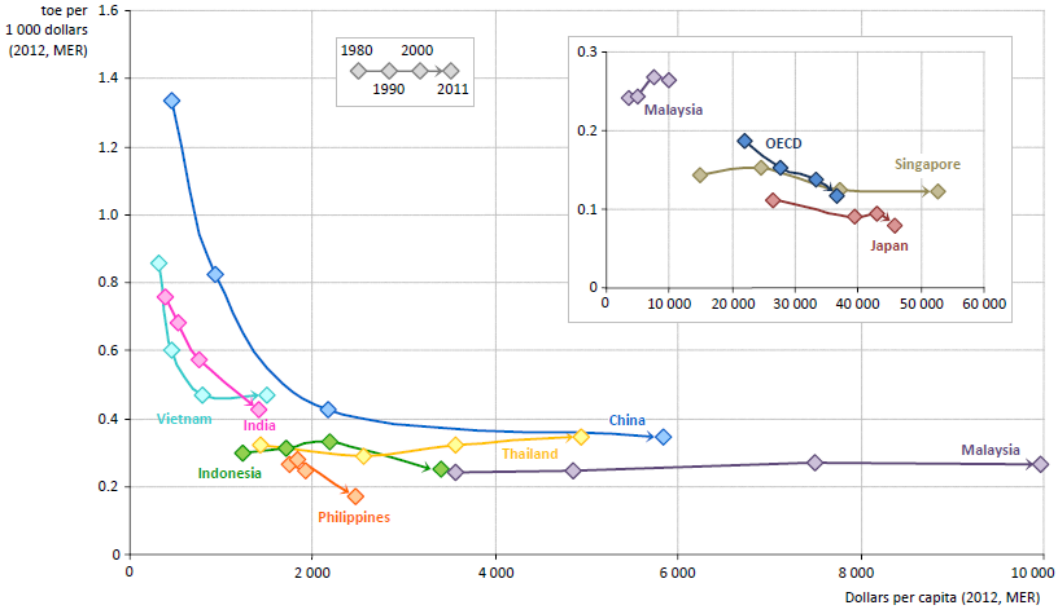
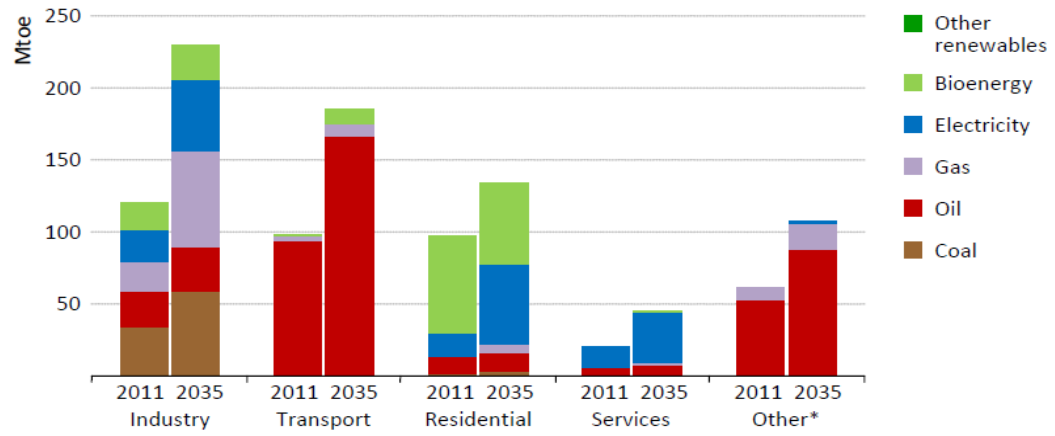


Figure 1.1: The intensity of energy and GDP per capita in ASEAN countries, 1980-2011
(**Source**: IEA, 2013)

Energy demand in Southeast Asia dominated by industry, transport and households in 2011. The industrial sector has shown rapid growth in energy consumption in line with the increase in energy-intensive manufacturing activities. According to the International Energy Agency (IEA), the average total energy consumption every year to grow at a rate of 2.4%, increase from 398 Mtoe in 2011 to more than 700 Mtoe in 2035 (see Figure 1.2). Industrial sector energy average demand grew more than 2.7% per year from 2011 to 2035. It is driven by a shift in the type of industry growth of labor-intensive activities into the energy-intensive industries.

It is estimated that the growth of energy demand in the industrial sector will slow down over time due to the existence of measures for the implementation of the energy efficiency of energy-intensive users. Transport sector energy demand grows almost doubled over the years 2011 to 2035, or grew by 2.7% per year. While the demand for energy in the household sector increased by 1.8% per year.



* Other includes agriculture and non-energy use (and, in the case of ASEAN, is primarily oil and gas feedstocks for the petrochemicals industry).

Figure 1.2: Projection of growth in energy consumption in ASEAN
(**Source:** IEA, 2013)

2. Energy Efficiency Program in ASEAN and Its Investment Potential

Seeing the growth potential in consumption of energy is very significant, some ASEAN countries have made a strategy or action plan and forecast investment to reduce energy intensity through a variety of energy efficiency programs (see **Table 1.2**). Policies that have been planned will encourage significant investment in the future through the deployment and adoption of efficient technologies in energy consumption. Aggressive national policy in reducing the intensity of energy consumption will encourage the growth of investment in the ASEAN region.

To fulfill government's targets in energy efficiency programs in several ASEAN countries in 2020, the Asian Development Bank (ADB) has estimated the investment required, for Vietnam is amounted to 649 million $, Malaysia is amounted to 901 million $, Indonesia is amounted to 6 billion $, Thailand is amounted for 2 billion $ and Singapore is amounted to 97 million $. Total investment required in all ASEAN countries, including Cambodia, the Philippines, Laos, Myanmar, and Brunei is $ 11 billion $.

Potential investment required in Indonesia for more than half of the potential energy efficiency investments in Southeast Asia, in the amount of 57%, followed by Thailand at 19%, Malaysia 8%, 6% in Vietnam, and the Philippines by 5%.

Table 1.2 Strategies / action plans and the investment required to fulfill national energy efficiency targets in various ASEAN countries

Country	Strategies / Action Plans	Investment (million $)
Vietnam	Reducing energy consumption by 3-5% (2010) and 5-8% (2010-2015)	649
Malaysia	Reducing energy consumption by 10% from the year 2011 to 2030	901
Indonesia	Reducing energy intensity by 1% per year and reducing elasticity of energy less than 1 in 2025	6.019
Thailand	Reducing energy intensity by 25% in 2030	2.006
Singapore	Reduce energy intensity by 20% (2020) and 8% (2030)	97

Source: ADB, 2013

The impact of investments in energy efficiency for energy needs in 2030 can be seen in **Table 1.3.** In Indonesia, Malaysia, Thailand, and Vietnam, the share of energy efficiency investments only 1% to 4% of the overall energy investments to meet at least 8% to 25% of the projected increase in primary energy consumption in the future. This dynamic reinforces the relevance of energy efficiency as the cheapest solution to fulfill the growing energy demand in Southeast Asia.

Table 1.3 Projection of energy efficiency investments and consumption of primary energy in Southeast Asia in 2030.

	Energy Efficiency Investments Worldwide Investment in Energy Sector (%)	Projections of Primary Energy Consumption by Energy Efficiency (%)
Vietnam	1%	8%
Malaysia	1%	21%
Indonesia	4%	25%
Thailand	4%	22%

Source: ADB, 2013

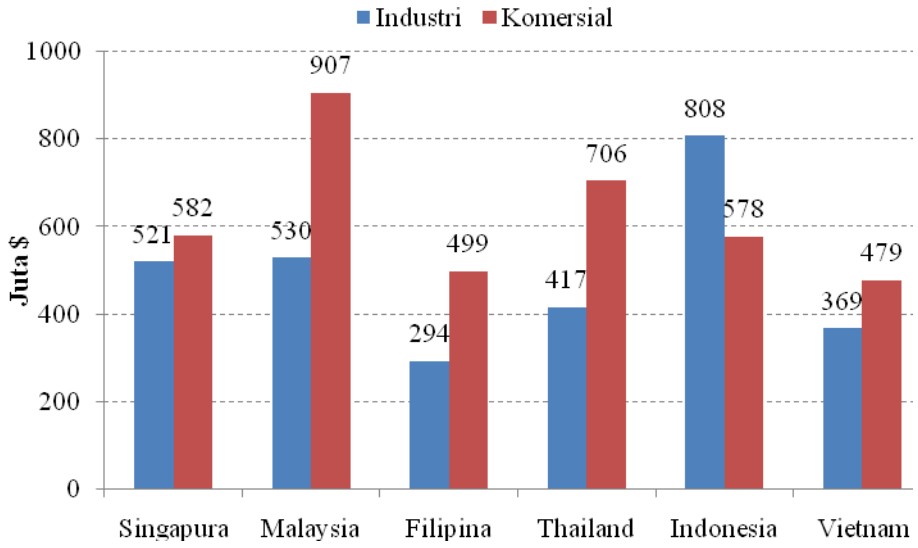


Figure 1.3: The potential for energy efficiency investments in the industrial and commercial sectors in ASEAN
(**Source**: ReEx Capital Asia, 2010)

The potential of energy efficiency investments in the industrial and commercial sector holds the largest share than in other sectors. In 2010, according to ReEx Capital Asia, the potential for energy efficiency investments in the industrial sector amounted to 808 million $ Indonesia, as the highest in Southeast Asia. While the potential for energy efficiency investments in Malaysia's largest commercial sector in Southeast Asia, in the amount of $ 907 million (see **Figure 1.3**). These opportunities will continue to increase in line with economic growth in Southeast Asia.

3. Case Study of Energy Efficiency Investment in Thailand

Between 1990 and 2010, Thailand's GDP grew up by an average of 4.5 percent per year, and the demand for energy is growing almost as fast as 4.4 percent per year. The rapid growth in energy causes the increasing of CO_2 emissions to 278 million metric tons in 2010. Besides the growth of greenhouse gas emissions, the issue of energy security in the country is also a concern of government of Thailand. To fulfill the rapid growth in energy demand, in 2009 Thailand imported 60 percent of the total energy supply. So the government of Thailand puts the issue of energy management as a top priority. The government of Thailand develops financial mechanisms to support the growth of program efficiency and developing renewable energy to reduce greenhouse gas emissions resulting from the energy sector. They found that the project financing is one of the main obstacles to run those program. So that it is developed a strategy to improve and disseminate the necessary funds through a public-private partnership.

Thailand Energy Conservation Program was started in 1992, since the Energy Conservation Promotion Act (Energy Conservation Promotion Act) was legalizied. The law implements

any obligation conduct efficiency measures and energy conservation in large commercial and industrial facilities. The master plan program efficiency and development of renewable energy development is conducted in three stages: Ist stage held on 1995-1999, IInd stage was conducted in 2000-2004, and IIIrd stage was conducted in 2005-2011.

For Special, The law creates the Energy Conservation Promotion Fund (ENCON Fund) which is derived from the beginning output modal of the Oil Fund, which has been there and followed by a levy or tax proceeds from the sale of fossil fuels amounted to 0.04 THB / liter or $ 0001 / liter. Funds collected continues to increase by 50 million $ / year since 1992. These funds have been supplied through a number of different mechanisms, including grants, subsidies, tax incentives, feed-in tariff for renewable energy, revolving funds for energy efficiency program (Energy Efficiency Revolving Fund) and funding for the Energy Services Company (ESCO Fund).

3.1 Energy Efficiency Revolving Fund (EERF)

EERF was launched in 2003 to stimulate investment in projects of large-scale industry by increasing the availability of debt financing for energy efficiency projects and renewable energy, as well as minimizing the cost of borrowing for the project developer. In the beginning EERF funded with a $ 2 miliarTHB (approximately 50 million $) of ENCON Fund and administered by the Department of Alternative Energy Development and Energy Efficiency (DEDE), Ministry of Energy of Thailand. During the trial stage of the program, both the Global Environment Facility (GEF) and the Danish government provide technical assistance in program design. In the beginning Funding was available for energy-intensive facilities such as large industry, but over time expanded to finance energy efficiency projects in commercial buildings, industrial facilities, and ESCOs.

In the beginning EERF provided soft loans with interest at 0% at local banks that participate with funding of $ 2.5 million to $ 10 million to finance energy efficiency projects. Along with the growth in the volume of financing, the bank began to co-finance their own energy efficiency projects, then EERFnaik lending rate to 0.5% to cover administrative costs. Local banks are required to pay the principal and interest to EERF within 10 years. EERF scheme can be seen in **Figure 1.4.**

Local banks are able to provide low-interest loans covering up to 100% of the project costs, but limited to 50 million THB (approximately $ 1.4 million) per project. Loans granted to the developer of energy efficiency projects and ESCOs at a fixed interest rate between 0% and 4% (lower than the market interest rate of 9%), until the period of the loan for seven years. Loan has been repaid then used to finance energy efficiency projects that the new. That is the design of a revolving fund work. Projects that require funding of less than 50 million THB to access loans up to 100% of EERF. While projects that require more than 50 million THB can use additional loan funds from local banks.

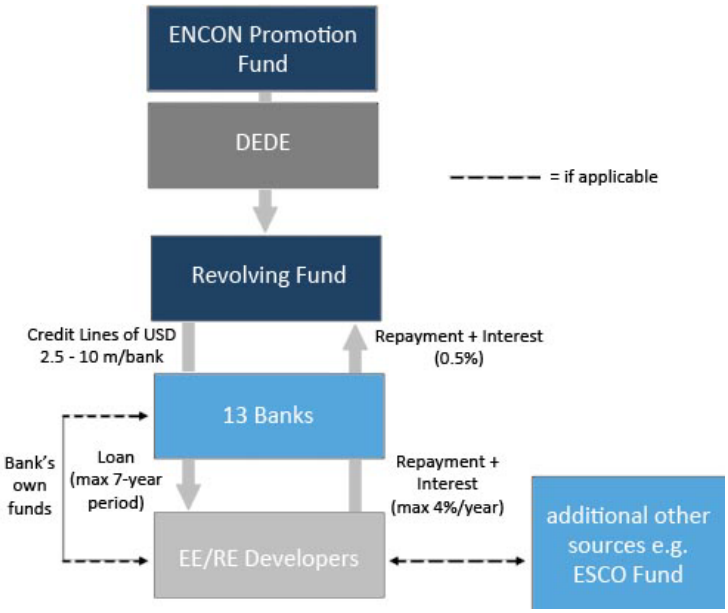


Figure 1.4: Energy Efficiency Revolving Fund Scheme

(**Source:**Frankfurt School – UNEP, 2012)

Loan for the project feasibility is determined by local banks through the loan application and assessed by evaluating the balance sheet and asset quality than the future cash flows and the savings gained from the implementation of energy efficiency projects. As collateral for the loan, the bank will require greater over land, buildings or equipment owned by the applicant. Because the project proponents are required to submit a feasibility study at the time of applying for a loan, very few applications were rejected during this program. Additionally, EERF is designed to eliminate the credit risk of the government, because the banks are required to pay back the line of credit to EERF in case of default. Thus, banks are also free to terminate the loan period before falling tempodan restructure the loan with the requirement that they set themselves to reduce losses.

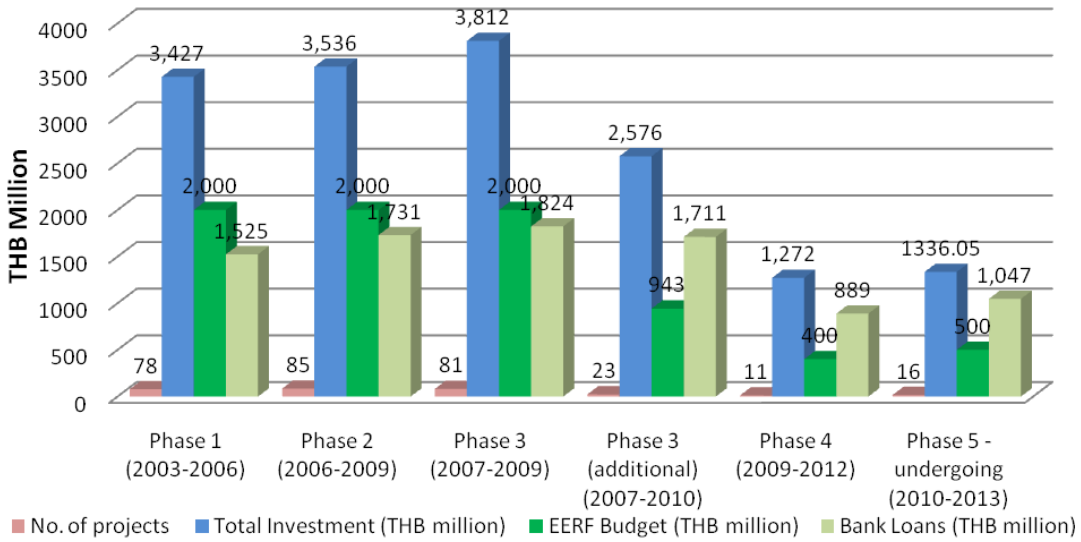


Figure 1.5: Financing of energy efficiency projects under the scheme EERF
(**Source:** Frankfurt School - UNEP, 2012)

Totally there are 13 banks participating in the program and managed to finance 294 projects. The total investment is 15 959 million THB ($ 521.5 million), which consists of 7232 jutaTHB ($ 236.34 million) from EERF and 8727 million THB ($ 285.2 million) in debt financing from local banks. **Figure 1.5** shows the development of the project loan Thailand.Pengurangan energy efficiency in greenhouse gas emissions by 0.98 million tonnes of CO2-eq and the total savings from the implementation of energy efficiency is estimated at 5.394 million THB / year (169 million $ / year). Contribution of banks in financing energy efficiency projects steadily increased over time.

3.2Energy Service Company (ESCO) Fund

ESCO Fund began in 2008 with an initial budget of 500 million THB ($ 15.7 million) and is targeted at small and medium-sized companies ESCO. The Fund is sponsored by DEDE and managed by two non-profit organizations designated by the government, Thailand Energy Conservation Foundation (Energy Conservation Foundation of Thailand / ECFT) and the Foundation for Environmental Energy (Energy for Environment Foundation / E for E). With a fixed budget from the government, the fund manager has the ability to co-invest in energy efficiency projects or renewable energy and / or ESCO, and also can provide assistance in securing co-funding from other investors.

ESCO Fund provides a variety of financing mechanisms and projects or ESCOs can use it to gain access to capital and raise capital includes six instruments mereka.ESCO Fund grants, including: equity, venture capital, equipment leasing, partial credit guarantees, carbon credit trading, and technical assistance.

3.2.1 Equity Investments

Equity investment mechanism provides co-investment in energy efficiency projects or renewable energy. Equity investment allows project developers to sell a specific amount of a project to investors (in this case to ECFT or E for E danatau private investors), in return for certain stocks in the future benefits of the projects. **Figure 1.6** explains the concept of this equity investment. This mechanism increases the opportunities to raise capital in energy efficiency projects and renewable energy, so it is able to increase the capacity of their projects. The main purpose of the ESCO Fund is to support and promote investment in energy efficiency projects and renewable energy, and not to get maximum results in these projects, which usually occurs in the ordinary equity financing.

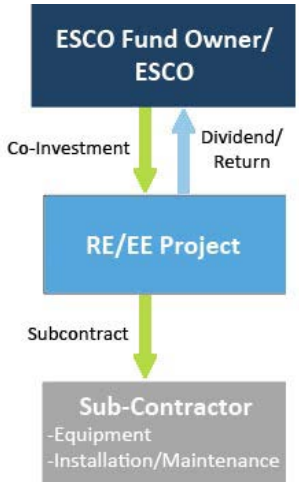


Figure 1.6: Flow of equity funds
(**Source:** Frankfurt School - UNEP, 2012)

3.2.2 Venture Capital (VC) for ESCO

ESCO in Thailand historically have experienced barriers to accessing financing for small businesses and they are more focused on technology (instead of focusing on capital), because it has a low capital value capabilities. VC is a mechanism for collective investment in existing ESCO in order to increase the capital of the company for new investment, and is intended to encourage growth in the ESCO sector (see **Figure 1.7**).

Figure 1.7: Flow of funds ESCO Venture Capital and system contract
(**Source**: Frankfurt School - UNEP, 2012)

3.2.3 Credit Guarantee Facility

Credit guarantee facility modeled on the shape of SOEs owned SME credit guarantee Ministry of Finance of Thailand or the Small Business Credit Guarantee Corporation (SBCG) are supervised and run by the Ministry of Finance. SBCG provides partial credit guarantees to commercial banks for lending to small businesses that are eligible for financing utang.SBCG will work with financial institutions and / or credit guarantee agencies to assist project developers or ESCOs in accessing long-term loans from banks by providing credit guarantee amount depends on the project's risks. **Figure 1.8** describes the flow of credit guarantee facility mechanisms.

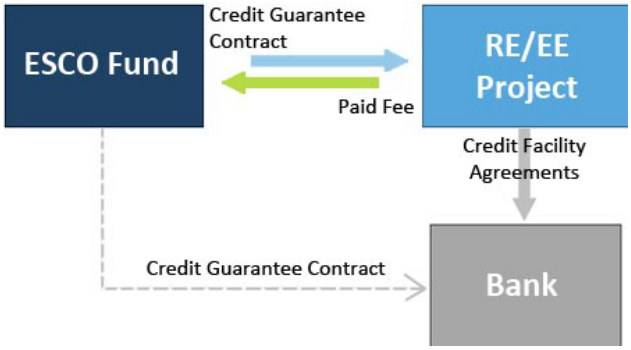


Figure 1.8: Flow of funds guarantor facility kreditdan contract system
(**Source**: Frankfurt School - UNEP, 2012)

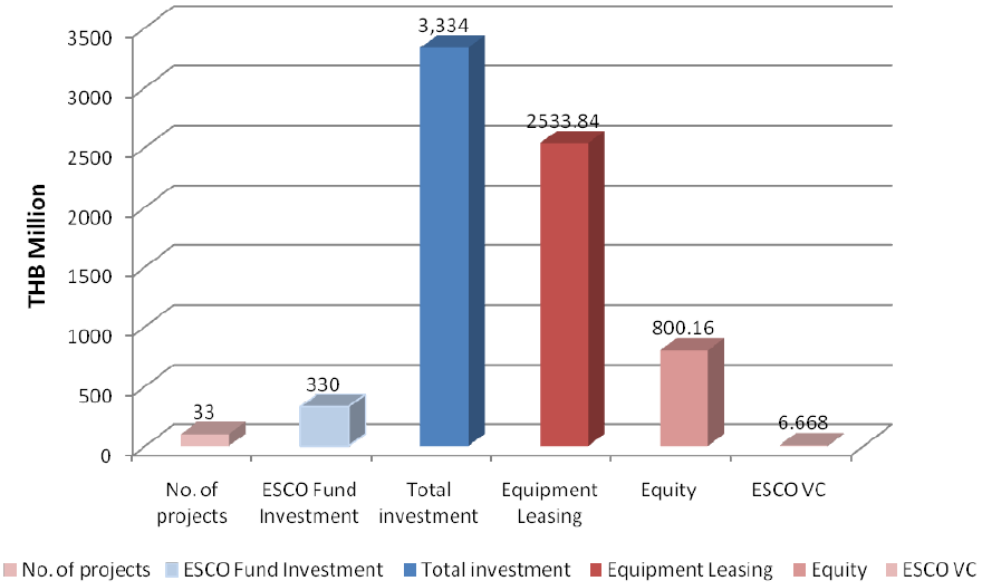


Figure 1.9: Results of I[st]Phase ESCO Fund distribution (2008-2010)
(**Source:** Chiang Mai University, 2012)

At the close of I[st] Phase in 2010, total of 330 jutaTHB ($ 10.8 million) has been supplied by the ESCO Fund (see **Figure 1.9**), and managed to stimulate a total investment of THB 3,334 million (109 million $). During I[st] Phase the majority of investments in the form of equity investments (76%), while the equipment leasing project (24%), and venture capital (0.2%).Over all funds flowed amount to 33 projects, mostly in the form of project equipmentrental (23), followed by equity investments (9), and then venture capital ESCO (1).

4. Energy Consumption and Energy Efficiency Investment Potential in Indonesia

Along with the economic recovery in the region, and especially in Indonesia after the monetary crisis in 1998, the growth of energy consumption in Indonesia is very high. This growth was mainly driven from industrial and transport sectors. Table 1.4 shows the growth in energy consumption in Indonesia from 2000 to 2012. By the year of 2000 the industrial sector consumes by 193 million BOE, an increase of nearly 70% in 2012. While the energy consumption in the transport sector increased by more than doubled from 2000 to 2012. The

rate of increase in energy consumption is at an average rate of 2.3 % / year over the last decade from 2000.

Table 1.4 Energy consumption in Indonesia, not including the use of biomass

(In million BOE)

Sector	2000	2005	2010	2012
Industry	193	219	253	305
Household	88	89	81	92
Commercial	19	25	32	34
Transportation	139	178	256	311
Other Sectors	29	29	29	26
The use of non-energy	40	54	84	110
Total	**509**	**595**	**794**	**878**

Source: MEMR, 2013

But the rapid growth of energy consumption was not followed by efforts to increase energy efficiency in various sectors. Good energy savings opportunities in the industrial sector and commercial building sector and in Indonesia is quite large, which is an average of 10-30%. Government of Indonesia in 2025 has a target to save energy in the industrial sector by 17%, whereas in the transport sector by 20%. **Table 1.5** shows the energy savings targets in various sectors in 2025.

Tabel1.5 target energy savings in 2025

Sector	Potential Energy Savings	Target Energy Savings in 2025	% Of Total Energy Consumption
Industry	10 – 30%	17%	41%
Commercial	10 – 30%	15%	5%
Transportation	15 – 35%	20%	5%
Household	15 – 30%	15%	37%
Other sectors (Construction, Agriculture and Mining)	15 – 30%	0%	4%

Source: Draft RIKEN

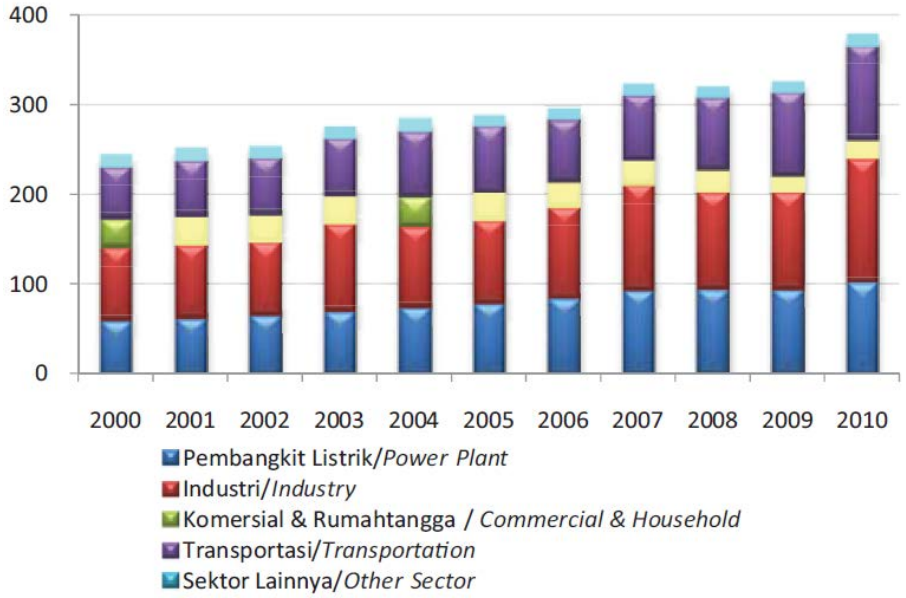


Figure 1.10: CO2 emissions resulting from the energy sector (**Source**: Energy and Mineral Resources, 2011)

Along with an average economic growth of 5.3% during the last decade, the growth of the national energy demand is also increasing rapidly. The increase in energy consumption has resulted in an increase in greenhouse gas emissions are evident in Figure 1.10, where the CO2 emissions in 2000 to reach 244.31 million tons increased to 379.47 million tons in 2010. Improved emission occurs not only from the electricity sector, but also from industry and transport. The implementation of energy efficiency programs need to be applied in addition in order to reduce their energy consumption and costs of energy consumption, as well as to reduce emissions from the energy sector in Indonesia, which is currently listed as one of the major contributors in addition to the forestry sector and land use change.

4.1 Industrial Sector Energy Consumption

Energy in the industrial sector are used for two types, namely as a fuel and as a raw material (feedstrock). Some of the energy sector in Indonesia, according to the Ministry of Industry (2012) classified as energy-intensive industries are iron and steel industry, textile industry, fertilizer and petrochemical industry, pulp and paper, palm oil processing industry, cement industry, and industrial ceramics. **Table 1.6** The Comparison of energy consumption in the industrial sector of Indonesia, Japan and India

Industry	Countries	Energy Consumption	Unit
Steel Industry			
Iron and Steel	Indonesia	650	KWh/ton
	India	600	KWh/ton
	Jepang	350	KWh/ton
Arc Furnace Steel	Indonesia	464	KWh/ton

Technology	Jepang	300	KWh/ton
Steel Reheating Furnace Technology	Indonesia	550	KWh/ton
	Jepang	264	KWh/ton
Cement Industry			
Cement	Indonesia	800	Kcal/Kg clinker
	Jepang	773	Kcal/Kg clinker
Glass and Ceramic Industries			
Ceramics	Indonesia	16,6	GJ/Ton
	Jepang	12,9	GJ/Ton
Glass	Indonesia	12	MJ/Ton
	Jepang	10	MJ/Ton
Textile			
Spinning	Indonesia	9,59	GJ/Ton
	India	3,2	GJ/Ton
Weaving	Indonesia	33	GJ/Ton
	India	31	GJ/Ton

Source: MEMR, 2013

Generally, the intensity of the energy / unit of industrial products produced in Indonesia is still considered wasteful. The steel industry and the textile sector is very inefficient use of energy when compared with the same energy in India and Japan. However, some industries in Indonesia, which is affiliated with international companies has increased interest in the intensity of energy consumption / unit of product. It can be seen in Table 1.6, the industry sectors such as cement, ceramics and glass are controlled by multinational corporations. So the global policy on reducing energy intensity set by the parent company is also applied in Indonesia.

The high intensity of energy / unit of industrial products in Indonesia shows that there is a great potential in implementing energy efficiency to reduce energy costs and improve the competitiveness of Indonesian products. Energy conservation potential is shown in **Table 1.7**. The steel industry and textile industry have the potential for energy conservation are highest between 10% to 35%.

Table 1.7 Potential energy savings industry sector in Indonesia

Industry	Potential Energy Conservation (%)
Cement	15 – 22%
Glassware and Ceramics	10 – 20%
Steel	11 – 32%
Pulp and Paper	10 – 20%
Petrochemicals	12 – 17%
Textile	20 – 35%

Food and drink	13 – 15%

Source: Rosenberg, 2009

4.2 Potential Energy Efficiency Investment in Industry

Investments in energy efficiency are basically very favorably with the rate of payback period is very short, it is supported by technologies that have proven performance in saving energy consumption. Based on the study that was conducted by the Asian Capital ReEx in 2010 in Indonesia (see Figure 1.11), energy efficiency investments required in the food and beverage industry at $ 271 million with an average payback period of 2.5 years. While the textile industry, required investment of $ 63 million with a long return on investment for 3 years. With an average payback time of less than 5 years, the financing of energy efficiency projects can be a new attraction for financial institutions / financial to participate in financing the project.

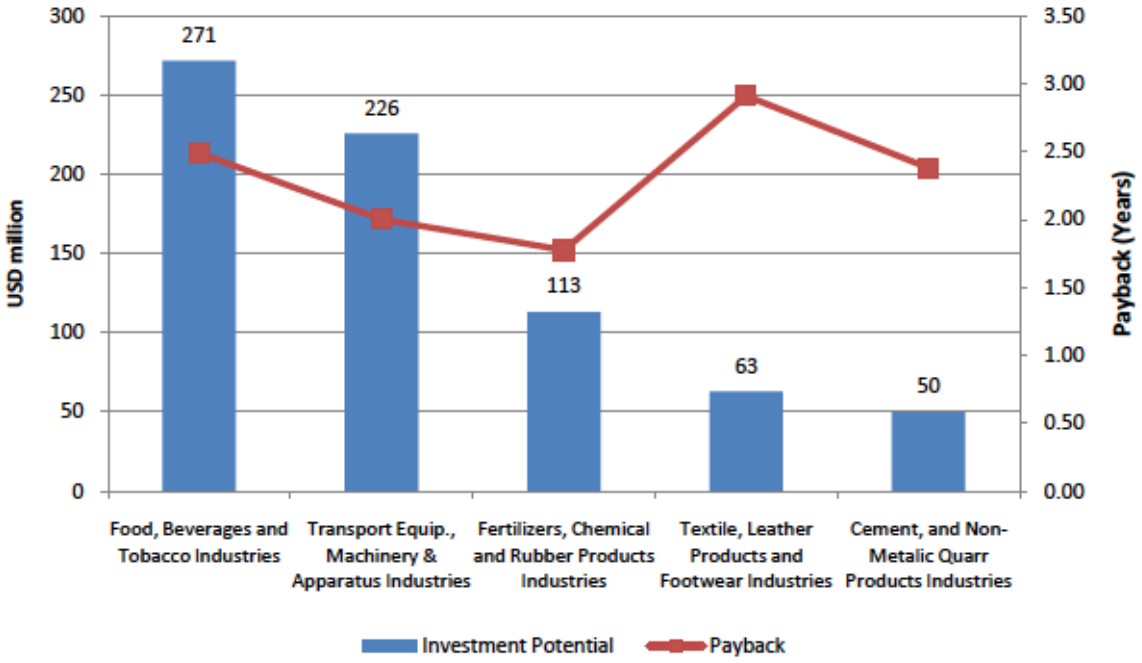


Figure 1.11: The potential for energy efficiency investments in various sectors of industry in Indonesia

(**Source:** ReExCapital Asia, 2010)

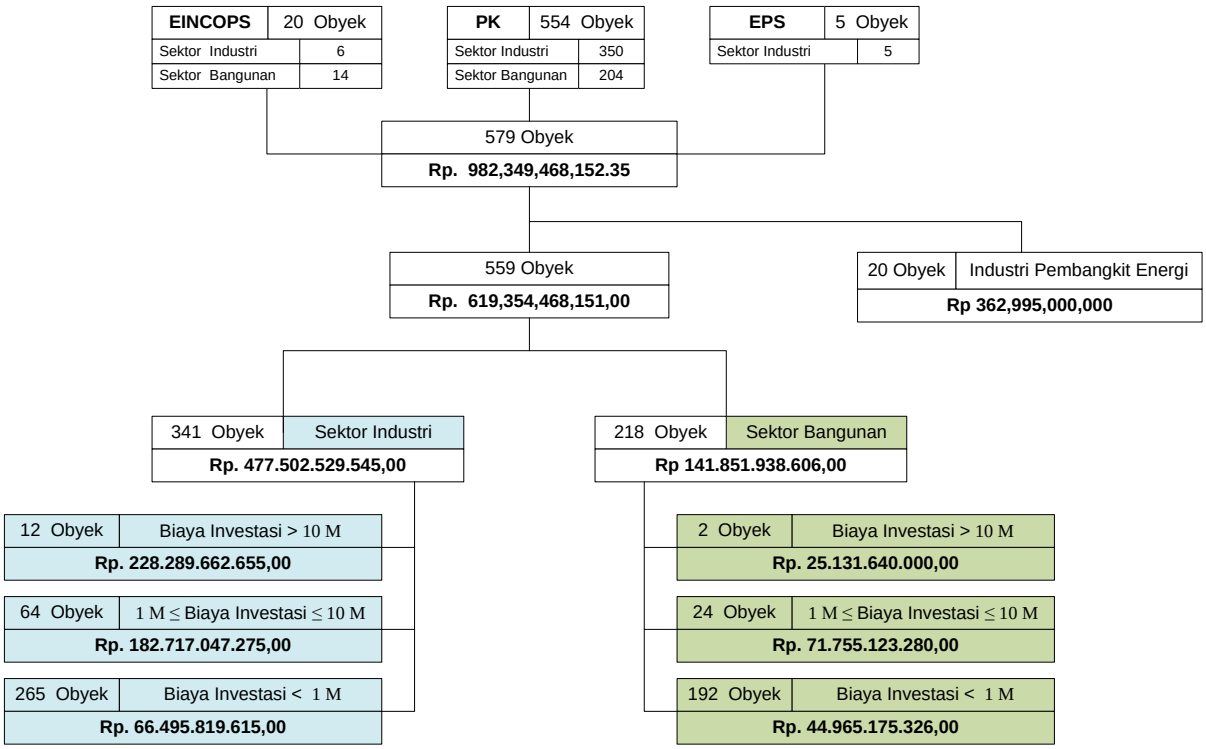


Figure 1.12: Investment energy efficiency of the results of the energy audit program in 2009-2012

(**Source**: MEMR, 2013)

Based on the results of the study of the various activities of energy audit conducted by EMR and donors in the range of 2009 to 2012, approximately 559 objects obtained directly related to the need to be an increase in energy efficiency which consists of 341 objects 218 objects industrial sector and the construction sector (**see Figure 1.12**). The total investment required energy efficiency in the industrial sector amounted to 448 billion dollars consists of 12 objects with the investment needs of over 10 billion dollars, 64 objects with the investment needs of between 1 and 10 billion dollars, and 265 objects with investment needs under one billion dollars. From the results of an energy audit, suggesting that the market opportunities in energy efficiency investment in Indonesia is very wide open with a potential return on average loan under 5 years.

Introduction of Chapter 2
Principles of Conservation and Energy Efficiency

The Aim	1. Understanding the process of energy conversion and energy systems 2. Knowing the steps of energy conservation and energy conservation in industry 3. Knowing how to identify the potential for energy savings through energy management, energy audits and benchmarking 4. The introduction of Measurement and Verification (M & V) methods to ensure the achievement of energy savings from energy efficiency project
Time	90 minutes
Methods	1. Lectures by speakers / facilitators 2. Questions & Answers forum
Tools and materials	Stationery, Projectors, Pointer, Paper Plano and Laptops

Stages Facilitation of Training:

1. Introduction
   The facilitator explains the general purpose, the flow and time allocation of the session. Then the facilitator invites participants to ask questions and provide input if it is needed. (Time: 5 minutes)
2. Speakers lecture / Facilitator
   The session was followed by a lecture from speaker about the principles of conservation and energy efficiency in the industrial sector, including through the process of identification of potential energy savings through various levels of energy audits and measurement and verification of energy savings. (Time: 55 minutes)
3. Questions & Answers Forum
   Followed by a question and answer session and a discussion forum between the participants with speakers / facilitators. (Time: 30 minutes)

Chapter 2
Principles of Energy Conservation and Energy Efficiency

According to Law No. 30 Year 2007 on energy, energy is the ability to do work or moving objects that can be heat, light, mechanical, chemical and electromagnetic. While the source of energy is defined as something that can produce energy either directly or through conversion or transformation process. To be able to utilize the energy from the energy source through the various stages of a process called conversion process from one form of energy into other forms of energy, for example from the chemical energy stored in coal is converted into electrical energy in a steam power plant (power plant). This is happened because according to the law of conservation of energy (or referred to as the Law of Thermodynamics 1) reads "*Energy can not be created, but the energy can be transformed from one form of energy into other forms of energy*". In **Table 2.1** shows the various processes of energy conversion processes of energy sources to the services that are enjoyed from the use of energy.

Table 2.1 Examples of various energy conversion processes

Source	Oil	Coal	Natural Gas	Sunlight	Biomass
Extraction Treatment	Oil well	Coal mines	Gas cleaning	-	Agriculture / Horticulture
Conversion Technology	Refinery	Power plant	-	Solar cells	-
Energy Shape feasible to use	Gasoline, diesel, aviation fuel, etc.	Electricity	Methane	Electricity	Ethane, Methane, charcoal
Distribution	Oil distribution system	Grid	Gas pipelines	Grid	Truck / tank / pipeline
End Technology Usage	Motor vehicle	Light	Gas stove	Light	Motor vehicles, cooking stoves
The shape of the Energy Services	Transportation	Lighting	Cooking	Lighting	Transportation , and cooking

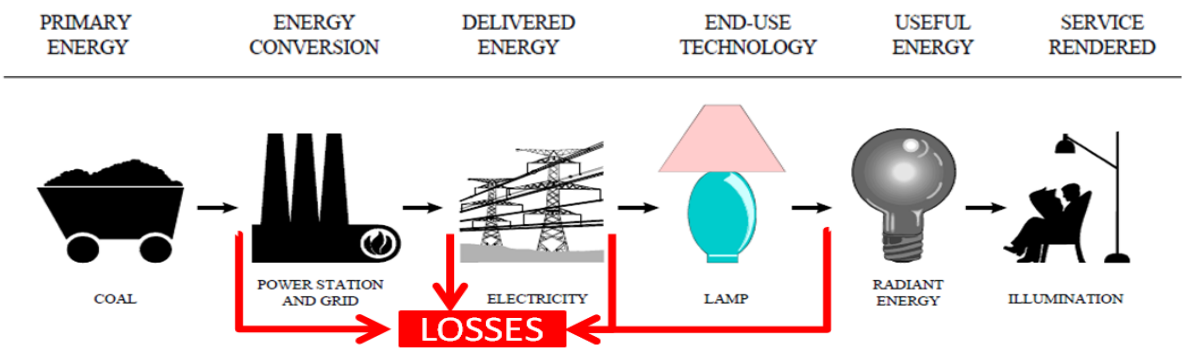


Figure 2.1: The process of energy conversion and losses that occur

In the energy system, a simple system can be classified into three levels, those are: 1) the production and conversion of energy from an energy source (primary energy) into usable forms of energy (secondary energy); 2) distribution and energy storage, and; 3) energy consumption. However, in any change in the form of energy always happen to lose some energy, known as loss of energy (loses), in other words, energy can not be converted with 100% efficiency. **Figure 2.1** shows the energy conversion process and losses that occur during the conversion process.

To determine the losses that occur during the process of energy conversion, it is necessary to measure the energy efficiency of the equipment or media converters energy. Energy efficiency is the maximum value of the ratio between the output (output) and the energy input (input) in the process of energy utilization. Losses that occur can be reduced by energy conservation efforts. Conservation of energy in the form of a systematic attempt, planned and integrated in order to conserve energy resources and improve the efficiency of utilization.

2. Steps of Energy Conservation

Efforts to conserve energy consists of three stages, each stage has different consequences depending costs. The first stage in the form of prevention to eliminate the waste of energy. It can be a change in the habit of turning off lights or air conditioning in the room that is not used, these efforts hardly use biaya.Tahap both an effort to reduce the loss of energy, in the form of wasted energy recovery or recovery. Examples of the second phase of the effort is wasted heat recovery boiler chimney for use as heating (pre-heater) new water to be fed into the boiler, which saves fuel to heat the water in the boiler. Investment costs required in the second phase of the effort is usually low to medium.

Table 2.2 Stages of energy conservation efforts and costs required

Stages	Efforts	The Costs
First	**Prevention;** eliminate energy waste	No cost or low cost
Second	**Recovery;** reducing energy losses	Low Cost to medium
Third	**Efficiency Innovation;** improve the efficiency of energy utilization	Medium to high costs

Energy conservation efforts in the third stage is to increase the energy utilization efficiency through technological innovation. This form of replacement of old equipment to new equipment which uses more advanced technology and energy-saving. For example is the replacement of neon or fluorescent lamps into light Light Emitting Diode (LED), or the replacement of sub-critical boiler technology for supercritical boiler technology. Investment required for energy conservation efforts at this stage are usually medium to high, due to solid

innovation. **Table 2.2** shows the compilation stage energy conservation efforts and investments are needed.

3. Energy Conservation in Industry

As showed in Chapter 1, that the energy savings opportunities in the industrial sector in Indonesia is still very large. These opportunities can be achieved through several approaches such as that shown in **Table 2.2**. However, the energy savings opportunities in most major industries are usually achieved through the use of more efficient technologies. Various technologies are applied that are Variable Speed Drive (VSD), capacitor bank motors with high efficiency, high COP chiller, heat recovery technology and sensor technology and control. In the industrial sector, the equipment is often inefficient boilers, cooling system or chiller, pumps, compressors and electric motors. To improve energy efficiency in the industry it is necessary to so-called Energy Conservation Measures (ECM), which is an activity or application / modification technology that aims to make energy savings, and ultimately to reduce operational costs. Identification of the ECM can be done through an energy audit performed by an internal party through energy manager, auditor or firm certified Energy Service Company (ESCO) appointed by the industry to conduct energy audits.

3.1 Boiler

The boiler is a closed vessel to produce pressurized steam from the water (see **Figure 2.2**). The process of changing water into steam occurs by heating water that is inside the pipes by utilizing the heat from the burning fuel. Combustion is performed continuously in the combustion chamber with fuel and air flow from the outside. The fuel is used to boil water in the boiler can be coal, diesel oil, gas and electricity. The steam is used for heating and propulsion equipment, and making the boiler as heart activator activity in most industries.

Figure 2.2: Boiler to produce steam pressure in the industry

In the boiler, the main source of energy loss comes from the loss of heat from the boiler through the chimney flue, blowdown and radiation. According to research from the Carbon Trust (2011), In general, losses are losses of energy into the chimney (~ 18%), loss of energy convection (~ 2%), loss of radiation energy (~ 2%), and loss of energy blowdown (~ 3%). **Figure 2.3** illustrates the various energy losses that occur in the boiler.

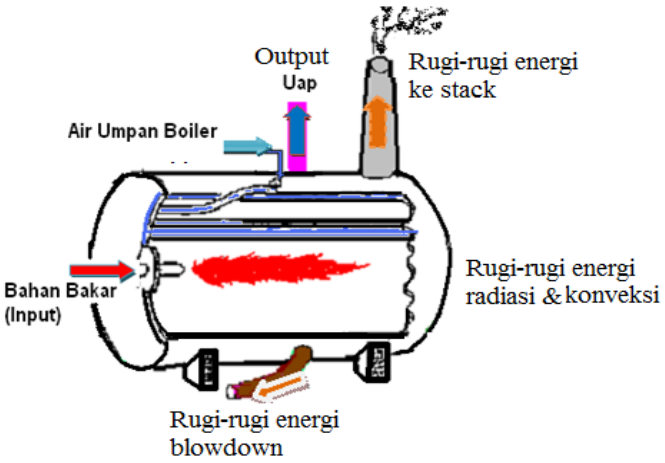


Figure 2.3: Loss of energy loss that occurs in the boiler

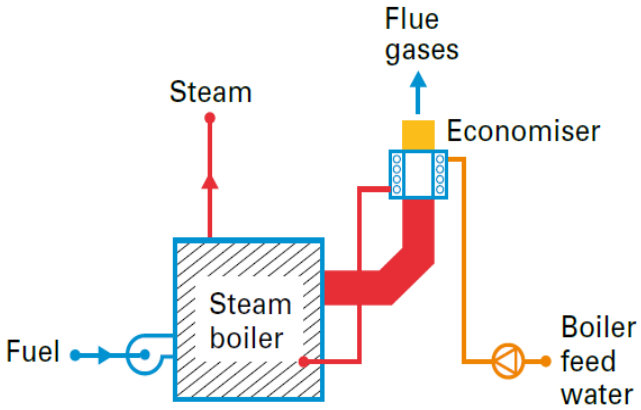


Figure 2.4: How to work on the chimney boiler economiser
(**Source**: Carbon Trust, 2011)

The technology can be used to reduce energy losses in the boiler one of which is heat recovery. According to research from the Carbon Trust (2011) on a system usually can increase efficiency up to 65%. To reduce the loss of energy in the exhaust stack (stack), one heat recovery technology is economiser mounted on the chimney. Input water temperature is relatively cool boiler is pumped through the economiser, where the water will absorb heat from the hot flue gas before it is pumped into the boiler (**see Figure 2.4**).

3.2 Electric Motors

The electric motor is an electromechanical device that converts electrical energy into mechanical energy. The electric motor is used to drive the industry utilities such as pumps, compressors, air conditioning, conveyor belts, roll mills and others. Of the entire load of electricity consumption in the industry, estimated electric motors consume approximately 70% of the total electrical load. The results showed that approximately 20% of the energy saving electric motor drive system related to the motor. The rest, about 80% associated with the approach of the entire system including the load factor and the related processes.

Figure 2.5: The electric motor to drive the various utilities in the industry

Potential savings in electric motors can be done using a variable speed drive / Variable Speed Drive (VSD) either in variable torque applications as well as for a constant torque load. Empirically VSD can save up to 20% on motor dipasang.Pada varying loads, VSD can often reduce electrical energy consumption in centrifugal pump and fan applications by 50% or more.

3.3 Compressor

Air compressor is a power transmission system that provides pressurized air and distribute it to users through a pipe, controlled and adjusted by using multiple control valve (**see Figure 2.6).** Air or gas pressure is increased from a low level to be higher or slightly above the pressure required by the user / consumer. Output can be supplied mechanical energy coinciding with the needs of the load side. Compressors are used in systems that require more than 20 psi pressure.

Figure 2.6: The compressor in the industry to produce compressed air

Generally, approximately 10% of electricity in industry is usually used to produce compressed air (compressed air). According to UNIDO, from the calculation of life cycle cost of a compressor, approximately 75% is required for the cost of energy consumption, 10% to the cost of care, and only 15% is the cost to buy the compressor itself. Thus,

compressed air is a costly resource. Therefore, efforts to improve the efficiency greatly diperlukan.Rata average earned savings can reach 30% with little cost or even no cost. Thus, compressed air is a costly resource. Therefore, efforts to improve its efficiency is indispensable. On average the savings can reach 30% with little cost or even no cost.

Based on the results of the study of UNIDO, the energy losses that occur in the compressor is most prevalent in various industries is a leak in the tube compressor. Almost 100% of the entire industry has the potential to increase energy efficiency by reducing leakage (leakage reduction). Handling leak in the compressor can save energy up to 15%. **Figure 2.7** shows the potential energy savings with various efforts / application of technology. Potential energy savings derived from the use of the largest compressor motor VSD compressor, which amounted to 17% and the chance to implement the use of technology is very large VSD, ie in 33% of the entire industry. Replacement with newer compressor might provide opportunities for up to 15% energy savings, but it is only economical to apply in 6% of the entire industry.

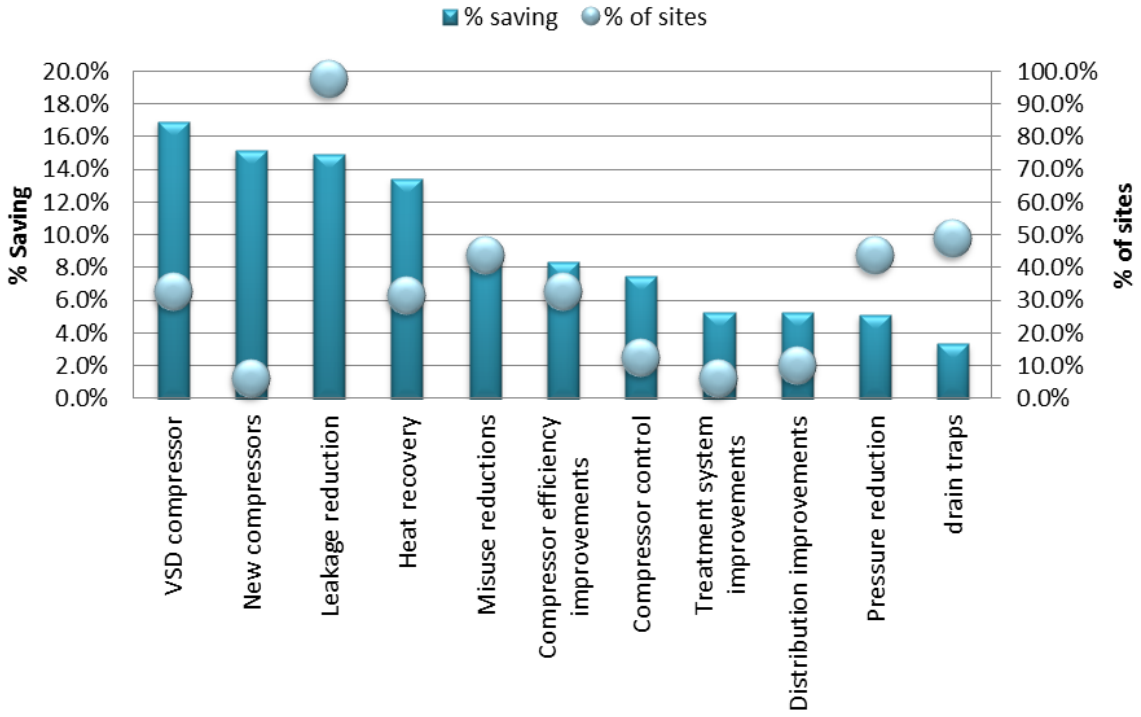


Figure 2.7: Potential energy saving efforts in the compressor

3.4 Chiller

Chiller is a refrigeration machine that serves to cool the water in a system of air (**see Figure 2.8**). The water then flows to the AHU (Air HandlingUnit) to take the chill and cold air produced is blown into the room. Chiller almost used in all industries and buildings. Potential energy savings in Chiller one through the heat recovery technology (**see Figure 2.9**). A refrigerant-to-water heat exchanger can be installed in a hot air pipe to recover heat for heating purposes such as pre-heating alternative water supply to the boiler or other heating

purposes. This is according to research from the Carbon Trust (2011) can provide energy savings of 5% to 10%.

Figure 2.8: Chiller as refrigeration machine

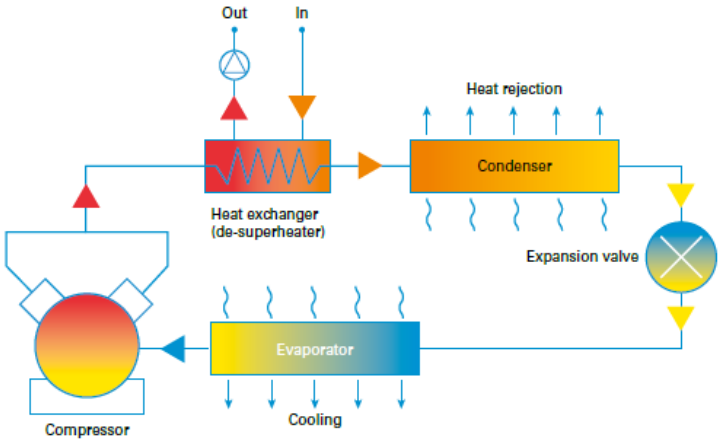


Figure 2.9: Application of heat exchanger on the chiller to save energy

There are a wide variety of technology and effort that can be implemented in an effort to conserve energy in the industrial sector. The technology is applied to adjust the utilities that became the object of increasing energy efficiency. Some of the technologies and energy conservation efforts are summarized in **Table 2.3**.

Table 2.3 Potential use of technology to improve energy efficiency in utility

No	Action	Average Saving % of Energy Consumption
BOILERS		
1.	Boiler Tune Up	2 - 3%
2.	Reduce Operating Pressure	1 - 5%
3.	Install Preheater	4 - 7%
4.	Install Economizer	4 - 7%
5.	Recover Heat from Condensate	3 - 15%
6.	Minimize Radiation Heat Loss	1%
7.	Select Optimum Steam Pressure	1%
8.	Control Heat Using Instrument	1%
9.	Clean Heating Surface	1%
WASTE HEAT GENERATOR		
1.	Waste Heat Recovery	5 - 25%
2.	Fuel Additive	1 - 3%
3.	Fuel Preheating	1%
ELECTRICAL POWER SYSTEMS		
1.	Raise Power Factor	5 – 6%
2.	Electrical Balance Loads	1 – 5%
3.	Lower Excess Transformer Capacity	3 – 3.5%
AIR CONDITIONING SYSTEM		
1.	Install VAV Controls	12.6%
2.	Install Heat Exchanger for Incoming Air	12%
3.	Install High Efficiency Chillers	9.6%
4.	Maintain Clean AHU Filters, Cooling Coils	7.2%
5.	Minimize Outdoor Air Intake	6%
6.	Optimize Multiple Chiller Operation	4.9%
7.	Raise A/C Condenser Temperature	4.1%
8.	Replace Over-Sized Electrical Motor	3.8%
9.	Raise Set Point to 25.5 C	3.6%
10.	Relocate Office to Lower Cooling Load	3%
11.	Modify Airflow to Condenser	2.8%

12.	Reduce A/C Equipment Run Time	2.3%
13.	Install Variable Speed Pumps	1.6%
14.	Install Small A/C for Separate Space	1.3%
15.	Install High Efficiency Pumps	1.3%

4. Identification of Potential Energy Savings

Energy conservation efforts can be made after the identification of potential energy savings. With the identification of this, it will be easier for the manager or owner of the facility or energy managers to know the energy conservation measures that need to be done, how much investment is needed, how much savings and returns to be earned on the investment. Identification of potential energy savings can be done through several options, those are:

1. The benchmark or reference value is one way to find out the status of a facility energy consumption compared to the energy consumption in other similar facilities. If the energy consumption at a similar facility has the intensity of energy consumption per production output is higher than the reference value, it can be presumed that there are opportunities for energy conservation at the facility. **Table 1.6** in the previous chapter is one example of energy intensity in the industry benchmark.
2. The energy audit is the process of evaluating energy use and identify energy savings opportunities. Recommendations resulting from such an energy audit energy conservation measures that need to be done to save on energy consumption in a facility.
3. Energy management is an activity to obtain and maintain the supply of energy and optimum utilization with the aim of minimizing the cost of energy / waste without disturbing the production and quality. It is a system that is built to identify the potential for energy savings and conservation efforts are planned on an ongoing basis.

4.1 Energy Management System

Through PP 70 of 2009 on the Conservation of Energy, the government has required the energy consuming industries is greater than or equal to 6.000setara tons of barrels of oil (BOE) per year are required to conserve energy through energy management. Energy management referred done by: 1) appoint energy managers, 2) developing energy conservation programs, 3) carry out energy audits on a regular basis, 4) implement energy audit recommendations, and 5) the implementation of energy conservation report annually to the Minister, the governor, regent / mayor in accordance with their respective authorities.

In the international world has compiled an international standard by the International Organization for Standardization (ISO) in practice an energy management system. ISO50001 about Energy Management System Standards provide a market-based framework and best practices for integrating energy efficiency into industrial corporate culture and management practices of everyday. Energy management is not only used as a tool for the identification of potential energy savings, but also more than that is applied as a culture within the company

that is involved, supported and implemented solutions, ranging from top management to staff executing the company in the field.

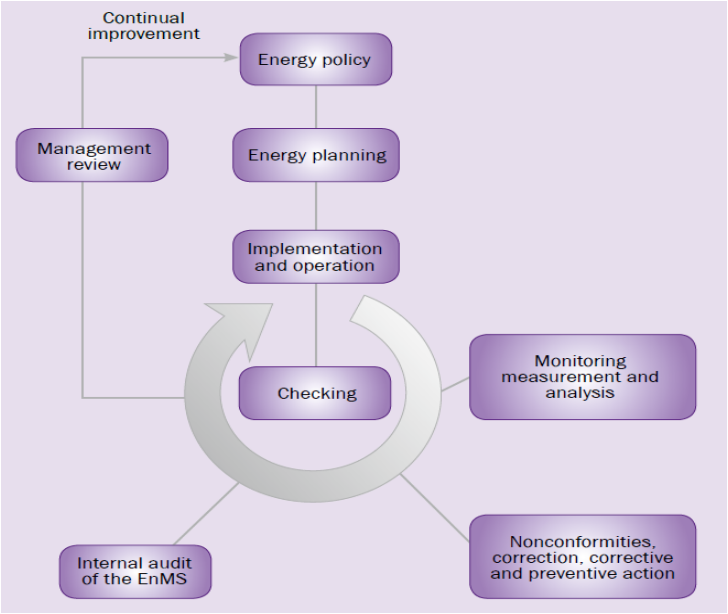


Figure 2.10: Standard ISO 50001 energy management system

In the ISO 50001, energy policy issued by the top management of the company, and then conducted energy planning as a form of implementation of energy policies that have been implemented (**see Figure 2.10**). Energy plan is then implemented thoroughly, monitored and measured execution and then carried out a thorough audit of the implementation of the energy plan. The results of the audit to be considered top management on the results of the evaluation of energy policies that have been implemented.

The role of energy managers in the energy management system has been established in the National Competence Indonesia (SKKNI) of the energy manager profession includes seven units of competency are:

1. Applying the principles of conservation of energy
2. Describing the system supply and use of sustainable energy
3. Setting up the energy audit process
4. Conducting an energy audit
5. Developing an action program implementation of energy conservation
6. Implementing program to improve energy efficiency

4.2 Energy Audit

One component of the energy management systems are energy audit activities. Energy audit activities in Indonesia have been standardized in ISO 6196 in 2011. In the SNI energy audit is defined as a process of evaluating energy use and identify energy savings opportunities and recommendations on penggunaa energy efficiency improvements and users of energy sources in order to conserve energy. Audit process can be an inspection, survey and analysis of

energy flows for energy conservation in buildings, process or system to reduce the amount of energy input into the system without negatively affecting the productivity.

The purpose of the energy audit activities are:

1. To identify the types of energy use and costs used in energy consumption.
2. To identify potential waste in energy use.
3. To identify opportunities for reduction of energy waste and energy consumption costs, either through prevention, improvement of technical / operational, or new equipment investments.
4. To analyze the economic feasibility of energy waste reduction opportunities and provide recommendations to be implemented.

Energy audits can generally be carried out by the internal company through energy managers, but also can be done by a third party consultant or team that is a leading provider of energy audits. The composition of the audit team recommended energy consists of four areas of expertise are, expert electrical system, engineers and heat transfer, management experts and financial experts.

Energy auditors in Indonesia has SKKNI, namely: implementing health and safety (K3), prepare an energy audit process, conduct field surveys, field data analysis, and report energy audit. There are several types of energy audits election depends on the function, size and type of the object to be audited, the depth of the type of audit is required, and the amount of potential energy savings and also the magnitude of the desired reduction in energy costs. For international standards used in energy audits based on standards created by the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE). As for the national standard used in the energy audit is referring to ISO 6196: 2011. Energy audit which refers to the ISO 6196: 2011 is basically a locally adoption of ASHRAE standards. Both international standards and international standards is a standard for the implementation of an energy audit for the building sector, but can be used also as a standard energy audit activity in the industrial sector. This causes the principles of the implementation of an energy audit is the same and the only object are different.

In the international standards published by ASHRAE, there are three types of audit levels can be based on differences in the depth of the type of audit, and the magnitude of the potential energy savings, namely:

1. ASHRAE Level 1: Walk-through Analysis/Preliminary Audit
2. ASHRAE Level 2 : Energy Survey and Analysis
3. ASHRAE Level 3: Detailed Analysis of Capital Intensive Modifications/ Investment Grade Energy Audit (IGEA)

ASHRAE Level 1: Walk-through Analysis/Preliminary Audit

Involves a brief interview with the operating personnel of the object of the audit, review energy bills and other operating data, and observations in the facility audit object. This audit is directed to identify potential energy savings, and to understand the energy system on the object. Audit resulted in a variety of energy efficiency measures in the object that is low cost / no cost. Usually the report recommendations are not presented in detail.

ASHRAE Level 2: *Energy Survey and Analysis*

Audit Level 2 data collection conducted more detailed, comprehensive and takes a longer time. Inspection and measurement directly conducted to the object. Audit level 2 should produce clear and concise reports and describe the various potential Energy Efficiency Measures (EEM), as well as potential operational changes. This potential should be further analyzed based on the potential energy savings, Life Cycle Cost (LCC) analysis and the impact of its implementation. From this analysis, obtained by assessing the feasibility of the project capital for the audit level 3.

ASHRAE Level 3: *Detailed Analysis of Capital Intensive Modifications*

Some of the results of the audit report submitted to the level-2 audits sometimes require a large capital investment, personnel, and other resources. Before making further investments, project owners usually want to have a more thorough understanding and detailed on the benefits, costs, and performance expectations of investment returns. It is the purpose of the audit level 3 or often called "investment grade-audit". In most cases, recommendations for the definition and scope of the audit Level-3 is usually the result of the Level-2.

Investment Grade Energy Audit (IGEA) is the process of calculation and analysis of energy consumption to identify potential possibilities for energy savings through the implementation and application of EEM, and technology. IGEA is a detailed report defines various energy conservation measures, energy cost savings, investment required, and the payback on the investment. Analysis performed at the audit level 3 are:

1. **Techniques Analysis**
   Conducted specifically on capital-intensive measures, and reports generated made very detailed.
2. **Financial Analysis**
   Analysis of the cost of capital and cost savings are expected to include the cost of implementation of the contractors and vendors, contingency fees, the cost of the project and construction management, commissioning costs, taxes, cost of initial training and annual costs. (M & V, O & M).
3. **Risk Analysis**
   Risk analysis considers the risk of design and construction, performance risk, financial, economic and regulatory, market risk, environmental risk, legal risk, and *force majeure*.

Table 2.4 Form of reporting of energy audit activities at various levels

Level 1	Level 2	Level 3 (IGEA)
• *Executive Summary* • A brief description of the object / facility audit targets • The scope of the audit / methodology • *Preliminary analysis* formed *benchmark analysis* • *List no-cost* and *low-cost* implementation of EEM • The potential savings that could be considered in the future	• All of the items that exist in the audit Level 1 • more comprehensive analysis of the use of energy • Description of all types of energy-consuming equipment and energy systems description • Economic analysis of EEM • Description EEM recommended / not economically viable • The calculation of the cost of installation, energy savings, and the savings of O & M • *Capital intensive* that needs auditing level 3. • a detailed analysis of energy calculation • *Measurement and Verification* (M&V)	• All items on the audit level 2 • Details of information on steps of capital intensive, including the scheme, the type of equipment, specifications, and cost • Economic evaluation of the implementation of highly detailed EEM.

4.3 Measurement and Verification of Energy Savings

To ensure that the implementation of energy audit recommendations have fulfilled the criteria of energy saving and energy consumption costs in accordance with what has been analyzed in the energy audit, it is necessary to measure and verify or measurement and verification (M & V). M & V also to ensure that the investments made in energy efficiency projects as expected or to minimize losses in the investment. In general, M & V needs to be done in an energy efficiency project with the aim to:

1. Accurately assessing the success of the energy savings for a project,
2. Allocating risk to the right,
3. Reducing uncertainty over the success of the project to a reasonable level,
4. Monitoring the performance of the equipment / technology installed.
5. Looking for new energy saving opportunities.
6. Improving the operational and maintenance (O & M),
7. Verifying the above guarantee energy cost savings
8. Allowing for the necessary adjustments in the future.

To perform M & V of energy savings from energy efficiency projects require special planning and technical activities. So, we need experts who master the specialized technical areas.
This power can be internal as well as of the eksternal.Ada some standard protokolM & V internationally, such as the International Performance Measurement & Verification Protocol

(IPMVP 2001), FEMP M & V Guidelines: Measurement and Verification for Federal Energy Projects Version 2.2 (2000), and ASHRAE Guideline 14: Measurement of Energy and Demand Savings (2002). But in general, the M & V protocol can be explained as follows:

Before the implementation of the project:

Step 1: Define the conditions of the current energy consumption and projected / baseline. Aiming to estimate the savings by comparing energy use basis with post-installation energy use.

Step 2: Make a detailed plan of the M & V. The method chosen has a significant influence on how the baseline is defined and what activities are carried out during the audit.

After implementation of the project:

Step 3: Commissioning of the system to ensure that the equipment is installed to work in accordance with the specifications prior to acceptance of the project.

Step 4: Post-installation verification ensures that the equipment / system continues to operate correctly and have the potential to generate savings as predicted.

Step 5: Regular verification of the performance of the equipment during the agreed period. To ensure that the installed equipment has been properly maintained, continue to operate correctly, and continue to have the potential to generate predicted savings. The data collected can also be used to determine the actual savings achieved.

Prokol M & V is to be included in the energy efficiency project financing proposals to be material check and approval by the owners or investors, and or financing institutions such as banks and insurance. For company owners or investors, by knowing and approving M & V is very useful to ensure that the investments made will go well. For financial institutions, by knowing and approving M & V is very useful to ensure that loans to finance the project will be able to return in accordance with the approved tenor.

Introduction of Chapter 3
Basic Approach to Energy Efficiency Projects

The Aim	1. Understanding the function of the Energy Services Company (ESCO) 2. Knowing the different types of energy efficiency projects of cooperation contracts.
Time	90 minutes
Methods	1. Lectures by speakers / facilitators 2. Questions & Answers forum
Tools and Materials	Stationery, Projectors, Pointer, Paper Plano and Laptops

Stages Facilitation of Training:

1. Introduction
   The facilitator explains the general purpose, the flow and time allocation of the session. Then the facilitator invites participants to ask questions and provide input if it is needed. (Time: 5 minutes)
2. Speakers lecture / Facilitator
   The session was followed by a lecture from speaker about Basic Approach to Energy Efficiency Projects. (Time: 55 minutes)
3. Questions & Answers Forum
   Followed by a question and answer session and a discussion forum between the participants with speakers / facilitators. (Time: 30 minutes)

Chapter 3
Basic Approach in Energy Efficiency Projects

Energy Services Company or ESCO has important role in successing the implementation of energy efficiency projects. ESCO is essentially a business entity that serves as: 1) provider of technical advisory services, 2) investors, and 3) the Guarantor's performance on services that was given. As a provider of technical advisory services, ESCO is able to do energy audits, determine the potential for energy conservation, conduct a feasibility study of an energy efficiency project, working on energy efficiency projects and docommissioning on those results of work.

As investors, ESCO can act as funders well as investors, co-investors or through shares. Then, as the guarantor of energy efficiency performance, ESCO can guarantee risk and do maintenance on equipment that is invested.

1. Energy Performance Contracting (EPC)

There are various forms of employment contract can be made between the project owner or entrepreneur in the scheme of Energy Performance Contracting (EPC). EPC is a form of "creative financing" to increase the capacity of capital that can be used to finance energy efficiency projects and obtain savings on energy costs. By mechanisms such as EPC, external parties such as ESCO can implement an energy efficiency project and earn revenue from energy cost savings generated. The revenue can be used to pay the cost of the project, including the cost of investment returns Basically ESCO will not be paid unless the project has been done for energy savings as expected. **Figure 3.1** illustrates the concept of EPC.

EPC approach is based on the method of transfer of technical risks of the project owner to the ESCO client based performance guarantees given by the ESCO. In EPC ESCO's income obtained in the energy savigs performance that is produced. EPC is a scheme to improve the energy consumption in a variety of equipment in the industry. Usually industries have limited related to energy savings both from the technical aspects, labor or time management, capital, understanding risk, or information technology.

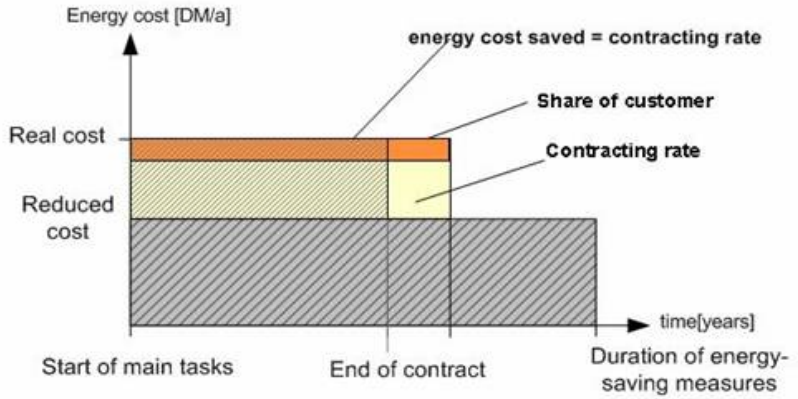


Figure 3.1: Concept of Energy Performance Contracting (EPC)

(**Source**: Berliner Energie GmbH tour agency)

There are two forms of EPC schemes, namely 1) the guaranteed savings, and 2) shared savings. Guaranteed savings mean that the investment is provided by the employer or the owner of the project, while the energy savings will be guaranteed by the ESCO **(see Figure 3.2**). Entrepreneur or owner project get direct funding from banks or financial institutions (**see Figure 3.3**).

The results of the energy savings from the project will be divided between the ESCO and the owner of the project within the agreed proportion. ESCO will guarantee energy savings to cover the results of the investments made for the cost of the project. If the result is less than the amount of energy savings are guaranteed, then the ESCO will pay damages to the owner of the project. However, if the result is greater than the energy savings are guaranteed, the customer pays a percentage of surplus of those energy savings to the ESCO.

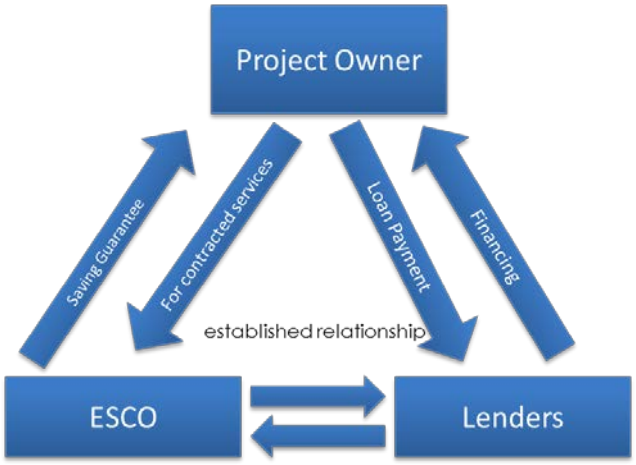


Figure 3.2: Cash flow of guaranteed savings

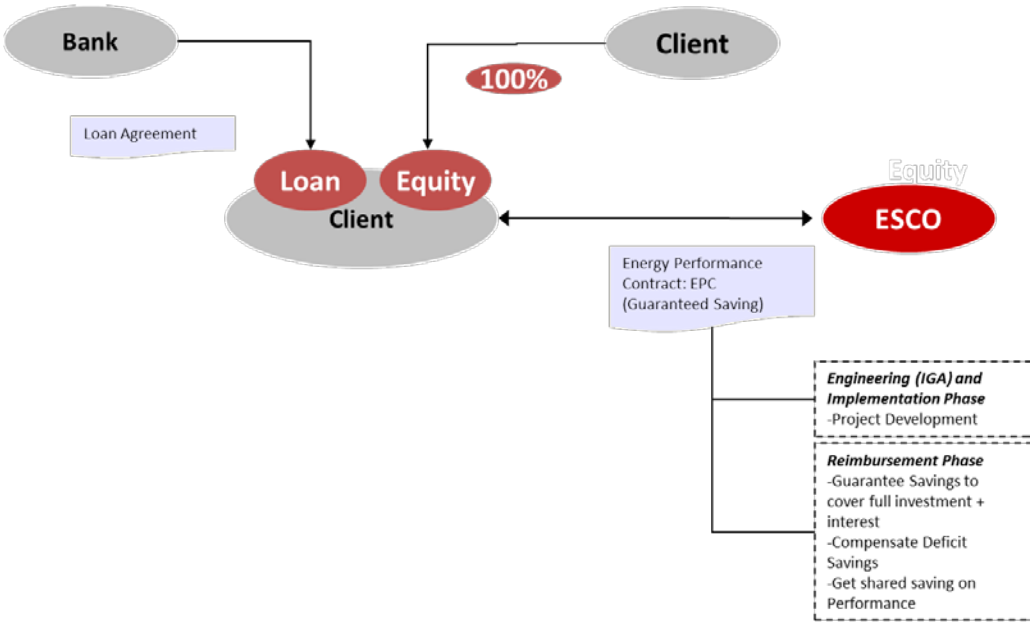


Figure 3.3: Structure of financing energy efficiency projects in EPC guaranteed savings scheme

Guaranteed savings scheme perhaps will only work well in developed countries that have the following requirements: 1) have an established banking structure, 2) familiar with project financing schemes, and 3) have sufficient technical expertise. Usually, the banking sector has also been understood and have considerable experience in energy efficiency projects.

Shared savings scheme means good investment of energy efficiency projects and energy savings provided and guaranteed by the ESCO. While the results of the energy savings will be divided in proportion to the agreed between the ESCO and the project owner or entrepreneur (**see Figures 3.4 and 3.5**). After the period of the contract expires, the employer will have the project fully.

The concept of shared savings is a good introductory models for emerging markets because the project owner assumes no financial risks that should become their responsibilities. By the point of view of ESCO this scheme has the added value of their financial services. However, these models tend to create obstacles for small ESCO companies because of their limited capital, so it is only able to handle only one type of project.

Therefore, this concept can limit the growth of the market and the competition between the ESCO and also between financial institutions in the long run. Generally , the difference between the guaranteed savings scheme and shared savings can be seen in **Table 3.1.**

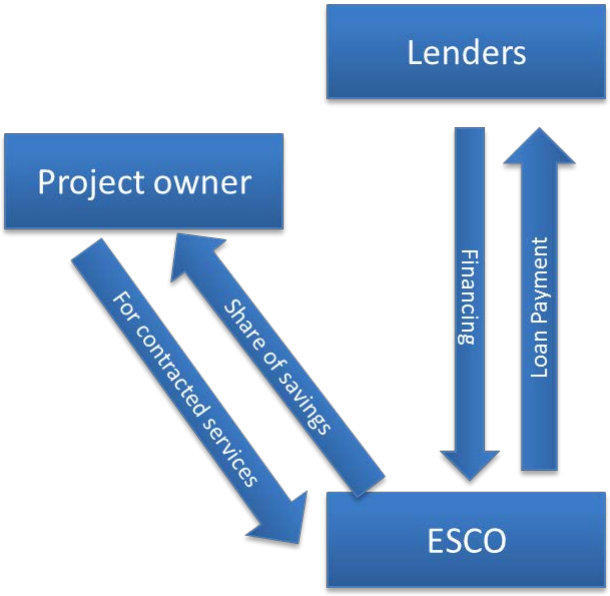


Figure 3.4: Cash flow of shared savings

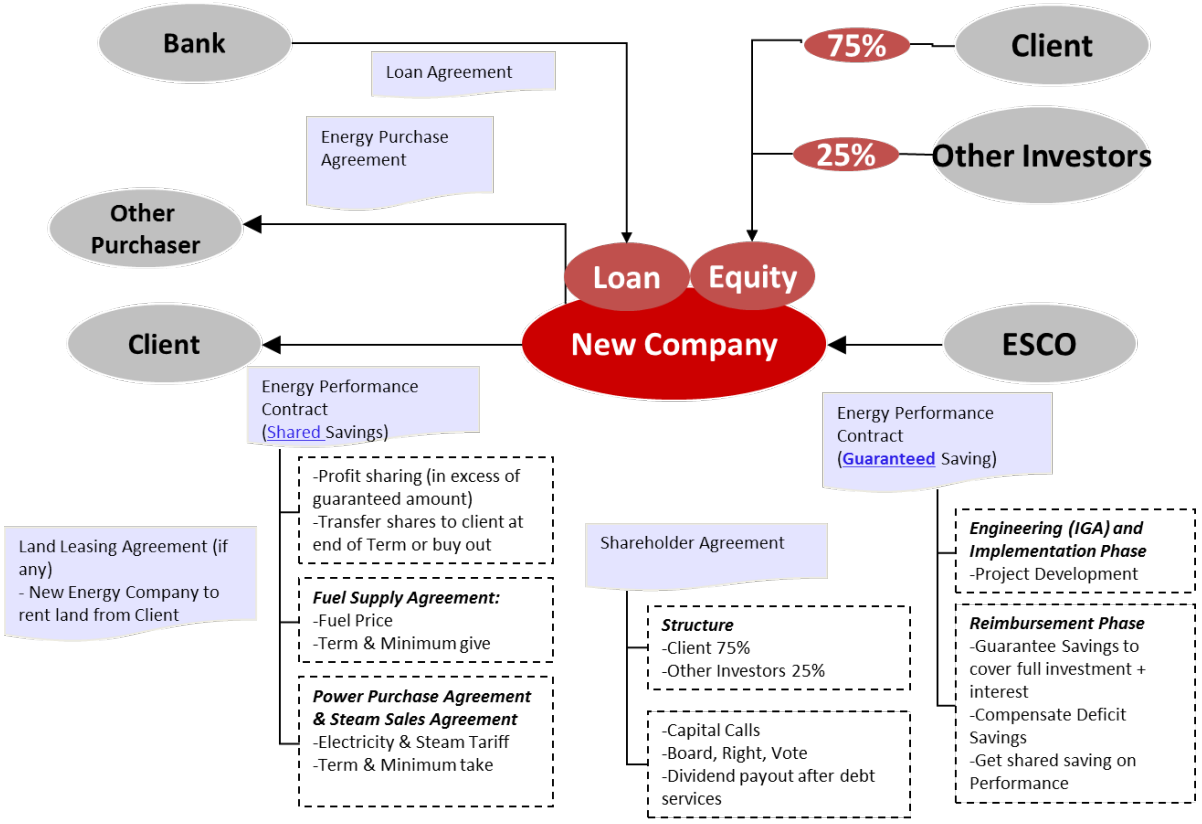


Figure 3.5: Structure of financing energy efficiency projects in the EPC scheme shared savings

Table 3.1 The Comparison between the guaranteed savings and shared savings

Guaranteed Savings	Shared Savings
Work performance depends on the level of energy consumption that successfully saved	Work performance depends on the energy costs that successfully saved
The level of energy savings are guaranteed to fulfill debt obligations on capital investment	Total payments to the ESCO related to energy prices; betting on the price of energy can be risky.
ESCO bear the risk for energy savings performance. Project owners or employers bear the credit risk on bank	ESCO bear the risk of performance on energy savings and credit risks in the bank at the same time.
The project owner or entrepreneur must be worthy of credit on bank ratings	ESCO may be an intermediary in accessing credit for project owners or entrepreneurs who do not have access to financing sources.
ESCO can do more projects without worrying about their working capital.	Only large ESCO developed well. Small ESCO can not do more than one project because of working capital constraints
All types of energy efficiency projects can be done by ESCO, without worry about payback periods.	Only energy efficiency projects with short payback periods that will be done by the ESCO.
Total energy savings are likely to be large, this is because the invested too big.	The energy savings obtained by small, because energy efficiency projects undertaken small scale.

2. Alternative Forms of Employment Contract in Energy Efficiency Projects

There are many types of alternative employment contracts in addition to energy efficiency projects EPC models that can be used. Among them is the *'chauffage'* contract, Build-Own-Operate-Transfer (BOOT) contract and a lease (leasing contract).

2.1 *'Chauffage'* contract

This kind of employment contract is very familiar used in Europe, where the ESCO to take over full responsibility for a series of services to provide energy in accordance with the agreed (eg heating, air conditioning, lighting, etc.). This kind of employment contract is a form of total solutions on energy management to a third party. ESCO also fully responsible for the purchase of fuel / electricity. Fees paid by the employer

to the ESCO is calculated based on the energy bill that emerged reduced the percentage of energy savings usually predictable amount. ESCO is responsible for providing lower energy costs than the previous bill. The more efficient and cheaper energy services provided by the ESCO, the greater of benefits ESCO will get.

'Chauffage' Contract usually takes place very long (20-30 years) and the ESCO is responsible for all maintenance and operational during the contract lasts. This contract is very useful for entrepreneurs who want to outsource services and facilities related to energy investments.

2.2 Build-Own-Operate-Transfer Contract (BOOT)

BOOT contract model might involve ESCO in the design stage, construction, financing, ownership and operation of equipment for a certain period and then transfer ownership to the employer or project owner. Employers do long-term deal with the BOOT operator and will be charged according to the services provided. The service costs include capital and operating cost recovery (operating cost recovery) and project advantages. BOOT schemes become an increasingly popular form of contract for financing energy efficiency projects in Europe. **Figure 3.6** shows the relationship between the parties in a BOOT contract.

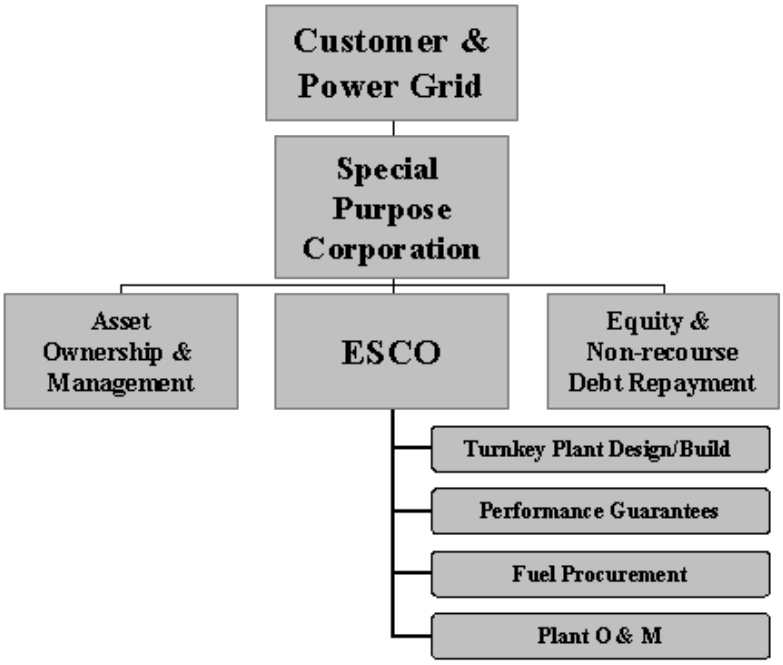


Figure 3.6: The relationship between the parties in a BOOT contract.
(**Source**: Dreessen, 2003)

2.3 Leasing Contract

Leasing can be an attractive alternative for payment of rental systems tend to be lower than the payment of debt / credit and are usually used for industrial equipment which can be costly.

Borrowers to make payments of principal and interest payment frequency depends on the contract to financial institutions. While ESCO bid and arrange a lease-purchase agreement with the equipment financing institutions. There are two main types of this rental system: 1) Capital and 2) Operations. Rental capital equipment purchases that can be paid in installments and tenants have the equipment. While in operating leases, asset owners are ESCO who have the equipment and basically just rent out to employers by providing a fixed monthly charges.

Introduction of Chapter 4
Preparation to Implement Energy Efficiency Projects

The Aims	1. Understanding the factors driving energy efficiency investment 2. Knowing the stage of the implementation of energy efficiency projects 3. Knowing the procedures for implementing energy efficiency projects by ESCO 4. Understanding the key success factors in energy efficiency projects
Time	90 minutes
Methods	1. Lectures by speakers / facilitators 2. Questions & Answers forum
Tools and Materials	Stationery, Projectors, Pointer, Paper Plano and Laptops

Stages Facilitation of Training:

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   The session was followed by by a lecture from speaker about the preparation of the energy efficiency project. (Time: 55 minutes)
3. Questions & Answers Forum
   Followed by a question and answer session and a discussion forum between the participants with speakers / facilitators. (Time: 30 minutes)

Chapter 4
Preparation to Implement Energy Efficiency Projects

1. Energy Efficiency Investment Driving Factors

The decision to invest in energy efficiency is driven by various factors both internal and external, are:

a) Policies and government regulations

Various policies have been issued by the relevant government efforts to encourage energy efficiency projects. Article 25 paragraph 1 of Law No. 30 of 2007 on Energy states that the national energy conservation is the responsibility of the central government, local governments, employers and society. Then, through the Minister of Energy and Mineral Resources Regulation No. 14 Year 2012 on the Management of the industrial and commercial sector Energimewajibkan energy yangmengkonsumsi more than 6,000 BOE per year to implement energy management, energy management team formed, and implementing energy saving efforts.

Policies and regulations are also followed by a mechanism providing incentives for industry players, namely energy berupaaudit in partnership funded by the government and / or recommended priority energy supply. The Government also provides a disincentive for industry players who comply with the provisions in the ESDM No. 14 In 2012, which is a form of written warnings, announcements in the media, fines and or reduction of energy supply, depending on the energy conservation efforts are not made through energy management.

In addition, in accordance with Bank Indonesia Regulation No. 14/15 / PBI / 2012 on Asset Quality Rating for Commercial Banks, one of the components in the assessment factors prospects debtor usahaadalah efforts made large-scale and / or high risk in order to preserve the environment, which evidenced by the Environmental Impact Assessment (EIA). This is in line with Article 8 UUNo explanation. 7 Year 1992tentang Banking as amended by Act No. 10 of 1998, UUNo. 32 of 2009 on the Protection and Management of the Environment, and Government Regulation No. 27 of 2012 on Environmental Permits. The EIA is required by the Bank for projects financed memastikanbahwa been preserving the environment.

While in assessing credit quality, especially the debtor's business prospects, the Bank must consider the results of the assessment Performance Rating Program in Environmental Management (PROPER) issued by the Ministry of Environment. Thus, for an industry that did not perform well energy conservation efforts possible to get a RED or BLACK assessment in PROPER. This assessment will inhibit the industry to access funding from the banking world.

b) Energy prices or costs on energy consumption

In recent years, the government is committed to reducing fuel subsidies and electricity to be allocated to productive sectors such as education, health and infrastructure. As a result of the reduction in energy subsidies, the rise in energy prices can not be avoided. For example, the price of electricity for industrial sectors (**see Figure 3.1**) increased by 275% for 11 years, or an average increase of 25% per year.

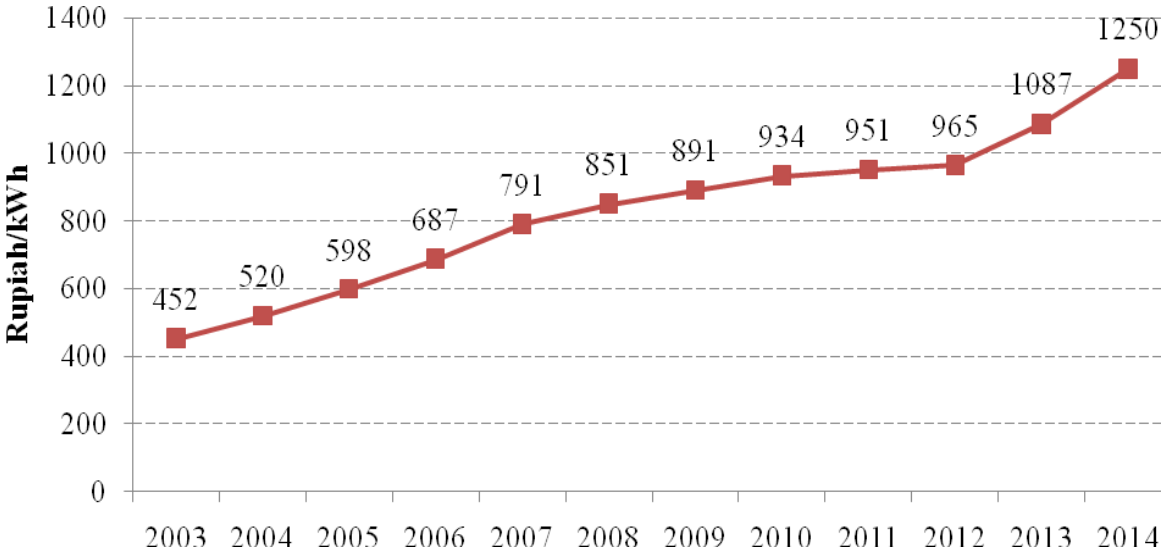

Figure 3.1: Trends in electricity price increases for the industrial sector from 2003 to 2014

The impact of rising energy prices make a significant portion of the allocation of energy costs in the production process increases. This can result in increased selling prices of the products produced. In order to reduce the rise in prices of products and in the end to win the competition in the market, many industries consider various energy efficiency measures in the production process.

c) Competition or the business environment

Implementation of energy efficiency is not only due to achieve a competitive product prices to win market competition, but usually also associated with running a business environment. Many companies are now implementing green principles in the production process, including the efficient use of energy sources that are environmentally friendly. The application of the principles of green is part of a new culture in the industrial world.

In some international markets, has implemented certain standards that must be met by a product related to the environment, such as ISO 14000 (Environmental Management System) and ISO 50000 (Energy Management System). Requirements of the market

to encourage industry to meet environmental standards so that products can be marketed internationally.

d) Access to technology

The support for energy efficiency investments are sometimes not performed due to the lack of information on energy-saving technologies yangditerima by industry sector. Moreover, introducing new technology is not easily accepted if not proven its effectiveness in saving energy and generating profits for the company. This happens because the majority of industrial technology, energy saving comes from abroad, so it takes time and effort to introduce it in Indonesia. Lack of access to both information and the availability of energy-saving technologies lead to low motivation to undertake energy saving measures in the industrial sector.

e) Access to capital or funding

Some energy-saving technology investments in the industrial sector requires a huge cost, so we need access to funding from third parties, ie financial institutions such as banks or insurance. However, this time the loan fund for energy efficiency projects is still treated the same as the loan funds to other projects. Ease to obtain financing with mild interest rates will increase the willingness of industry to implement energy efficiency projects.

f) Availability of human resources both internally and externally

To realize energy efficiency projects, needed competent experts. These experts must be available either from the company's internal and external side as ESCO (Energy Services Company). The existence of internal expertise required in the early stages of identifying sources of energy waste through energy audits. While the availability of external experts are usually required for planning energy efficiency investments that require huge costs. Through ESCO, can be done Investment Grade Energy Audit (IGEA) that specifies the type of technology, the amount of investment required, return on investment and also to gain access to funding from third parties.

2. Stages of Implementation of Energy Efficiency Projects

Before you start to commit investments in energy efficiency, it is necessary to first understand the stages that need to be done on energy waste identification process and the implementation of energy efficiency projects. **Figure 3.2**

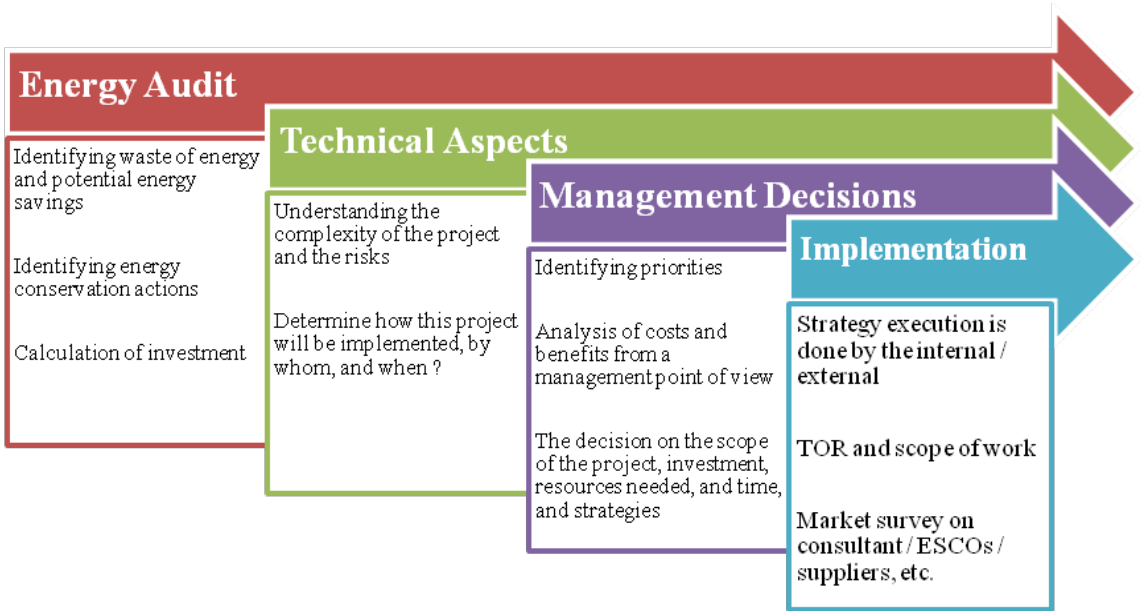

Figure 3.2: Stages towards implementation of energy efficiency projects

At the earliest stage is an Energy Audit. This stage in the form of the energy-intensive equipment identification and steps what can be done to save energy. Calculation of investment also needs to be done in this phase. The results of the energy audit process was then taken for further investigation into the Technical Aspects. At this stage of the technical aspects, are reviewed in depth the complexity of the implementation of the project the following risks to be borne by both technical risk and financial risk. After all risks are well understood, and determined how the work, time and implementers of the energy efficiency project.

A review of the technical aspects and then brought to the company's management to determine the priority of various energy saving opportunities were identified and their financing and risk estimates. In the end, **Management Decision** which determines the calculation and analysis of the cost benefits of energy efficiency project proposals submitted by the results of an energy audit. If the project is deemed feasible based on cost-benefit studies, it will be determined which projects will be implemented in accordance with the allocation of resources both human and financial resources. **Implementation** of energy efficiency projects resulting from the decision of the management.

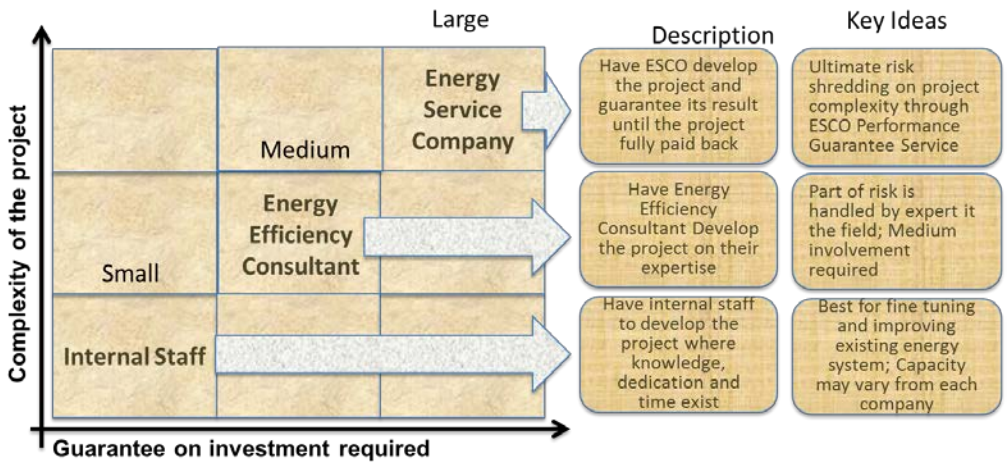

Figure 3.3: The Comparison of the level of complexity and guarantees in energy efficiency projects

Determining who should be appointed to implement energy efficiency projects can be done with melihan two factors: 1) the complexity of the project and 2) guarantees the required investment. Standards and criteria in determining these two factors can vary from company to company. **Figure 3.3** shows a comparison of the level of complexity of the project and guarantees required to achieve success in energy efficiency projects. For a small investment usually level of complexity is also small, therefore the implementation is done by internal staff. Examples of such a small investment is of compact fluorescent lamp replacement lamp (CFL) bulbs to more energy efficient, the lamp light-emitting diode (LED). The greater the value of the investment, then the complexity of energy efficiency projects will be higher, so it takes expertise implementing better resource investments initiated in order to obtain good results. Resource implementing energy efficiency projects can be obtained from the consultant or ESCO.

3. Energy Efficiency Project Implementation Procedures by ESCO (Energy Services Company)

If based on an energy audit performed by an internal party find that there is potential for energy savings which requires a large investment and implementation of complex projects, it is necessary to invite external parties competent to deal with them, the ESCO. **Figure 3.4** shows the process undertaken in the implementation of energy efficiency projects using ESCO services.

Contract work performed between companies with ESCO project owners usually contains estimates IRR of the project approved by both parties and the guarantees given by the ESCO during the implementation phase of the project up in care. In the contract also specified that the project owner may refuse to make payments to the ESCO if the project is not in accordance with the agreements.

The second phase, ESCO will conduct Investment Grade Energy Audit (IGEA) to recommend energy efficiency projects anywhere diprooritaskan, along with the feasibility study of the project technical, financial, commercial and legal. In addition, IGEA also determines the method measurementandverification well during the project as well as during operation and maintenance (operation and maintenance). Implementation IGEA usually lasts for 1 to 3 months.

Figure 3.4: Stages of implementation of energy efficiency projects using ESCO services

The third stage is the supply and procurement of goods and equipment for the implementation of the project. In this stage ESCO will be organizing the process and the selection of various proposals offers. ESCO also will attempt to negotiate for the procurement of goods and equipment. Having selected the desired vendor, then the ESCO will make a contract for the procurement of goods and equipment energy efficiency projects.

In the fourth stage in the form of implementation of the energy efficiency project comprises the construction and installation management, and integration with the system. After the construction, installation and integration is complete, then proceed with commissioning. The total time required for implementation of the project is 3 to 24 months, depending on the complexity of the project tersebut.Dari second to fourth stage, the project owner shall pay to the ESCO in the form of consulting fees (consulting fees).

The fifth stage is the post-commissioning, at this stage of ESCO duty to ensure that the energy savings resulting from the project fits or even greater than the initial technical design. Therefore, when there is excess energy savings, the ESCO will get the result of the excess of

the promised energy savings. Whereas if the energy savings under the expected performance, the ESCO is responsible for fixing it.

4. Key Success Factors in Energy Efficiency Projects

The success in the implementation of energy efficiency projects is measured from the amount of energy savings achieved and of course the payback period of the invested in the project. So that success can be achieved with good, there are some key factors that must be considered:

1. **The efficiency of the overall system**
   Energy efficiency occurs not only in certain specific equipment, this is because there is in a system composed of a variety of equipment and mutual support to each other. When one system is not working efficiently, then the possibility of overall system efficiency will also inefficient. An example is the use of pressurized air generated by the compressor. Sometimes the energy waste is not due to leakage in the tube compressor, but due to the use of pressurized air to the given, so that the compressor will continue to work.
2. **Control of emissions under environmental regulations**
   Regulations are asking the industry to reduce emissions generated will encourage the use of energy-efficient technologies and produce lower emissions.
3. **Optimizing the design of the corner of the client**
   Selection of the technology that used in the project must be adjusted to the efficiency of the profile of the industry, not based on the technology offered by the only vendor. Every industry has unique characteristics in energy consumption. So that the technical design must be optimized in accordance with these characteristics.
4. **Study the feasibility of the project as a whole**
   Before the energy efficiency project is done, there should be a thorough feasibility study which includes the technical feasibility, financial feasibility, commercial viability, and legal feasibility. The results of the above studies will determine the success of the energy savings.
5. **Evaluation of the performance of the long-term costs**
   Some contracts energy efficiency projects undertaken jointly with the ESCO is long term, therefore it is necessary to evaluate the cost benefits generated during the contract period compared with guaranteed savings promised by the ESCO.
6. **The process of procurement of goods and equipment at competitive and transparent**
   Invite as many vendors in the procurement process and equipment will generate a price quote and the best selection of goods. Transparent process is also to ensure that items purchased through the procurement process is in accordance with the project requirements. This in turn will maintain the quality of the project in accordance with a predetermined design.
7. **Measurement and Verification System quality**

As explained in Chapter 2, the M & V aims to ensure that the implementation of energy efficiency has met the criteria for the expected energy savings, and also to ensure that the investments made in energy efficiency projects run as expected or may minimize losses in investments.

8. **The process of commissioning a standard according to the procedure**
   Commissioning the system is designed to ensure that work equipment is installed in accordance with the specifications prior to the handover of the project.
9. **Good contract management**
   Regular contract management neatly define the smooth process of implementation of energy efficiency projects.
10. **The right investment choice**
    By the various recommendations arising from the IGEA, need to be selected and sorted what kind of investments that need to be followed up. Of course taking into account the rate of return on investment.

Introduction of Chapter 5
Energy Efficiency Financing Proposal and Financing Analysis Memorandum

The Aims	1. Understanding the essence of the energy efficiency project proposals 2. Knowing the anatomy of the energy efficiency project proposals 3. Knowing the anatomy of a memorandum analyzes the financing of energy efficiency proposals. 4. Understanding how to make energy efficiency project financing propos
Time	90 minutes
Methods	1. Lectures by speakers / facilitators 2. Questions & Answers forum
Tools and Materials	Stationery, Projectors, Pointer, Paper Plano and Laptops

Stages Facilitation of Training:

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2. Speakers lecture / Facilitator
   The session was followed by a lecture from speaker about financing proposals anatomy essence and energy efficiency projects and teach participants how to prepare a funding proposal to the bank or financial institution. (Time: 55 minutes)
3. Questions & Answers Forum
   Followed by a question and answer session and a discussion forum between the participants with speakers / facilitators. (Time: 30 minutes)

Chapter 5
Energy Efficiency Financing Proposal and Financing Analysis Memorandum

1. Introduction

Economic development has prompted industrialization. Growth in industry sector, then encourage more energy consumption to fuel manufacturing activities which mostly run by machine. Indeed, energy demand are steadily increased in recent decade. Other contributors of energy demand increasing are urbanization which has led the increase of household demand againts energy and the development of transportation. On the other hand, there is a "hot issue" regarding to the availability of energy resources. Oil, gas, and coal has become the primary energy resources and now they are shrinking. Environmental issues such as CO_2 emision and greenhouse effect are negative impact of massive energy usage.

Awareness about energy security and environmental issue has encouraged government of countries to prioritize energy management. Many regulations or policies are initiated to push down the energy consumption, especially for industries as the largest energy vacuum. Incentive-disincentive policy has pushed the industries to shift the technology, however, financing is still the main cramp.

In order to raise financing for energy efficiency investment, industries/ companies are required to establish and to submit project proposal. **Energy Efficiency Financing (EEF) Proposal** is a structured document established by debtors (industries/ companies) and verified by the creditors (bank) to evaluate the feasibility of financing scheme toward the energy efficiency (EE) project. It becomes the determinant for the creditors to grant the financing. By this reason, project must be defined clearly. The explanation must involves background, purpose, and the impact of the project for macro and microeconomic. How to efficient the energy, the advantage of the project, what risks which may arise, and how to minimize the risks are the main important. Financial issues about cost of the investment, value of the project, potential return, payback period, and projection of financial performance are also crucial. Collateral provided by debtors is a must in financing proposal. By all, debtors must state why this is feasible to get financed and why they are qualified to execute the project. In addition, debtors have to possess competence to construct a good proposal as required by the creditors in term of form and structure and have to be able to convince the creditors.

The creditors have to be able to verify the information stated in the proposal, analyze it, and do benchmarking in relevant industry so that they are certain that they finance prospective projects. Creditor's analysis of EEF proposed by the debtor is typically called Financing Analysis. It is aimed to evaluate debtor's ability to meet its obligation to creditor. The analysis will be contained into **Financing Analysis Memorandum** (FAM) which will result a recommendation to grant financing to debtor. It is also a kind of proposal, however different form

ENERGY EFFICIENCY FINANCING (EEF) PROPOSAL is a structured document established by debtors (industries/ companies) and verified by the creditors (bank) to evaluate the feasibility of financing scheme toward the energy eficiency project.

FINANCING ANALYSIS MEMORANDUM (FAM) is a financing recommendation as the result of financing analysis againts EEF Proposal, prepared by a credit analyst and proposed to credit division of the bank.

EEF Proposal by debtor, it is proposed by a credit analyst to financing divison of the bank.

2. Proposal Essentials

An EEF Proposal contains the details on how the debtors intend to achieve their Energy Efficiency (EE) project plan. It should be noted that it will be the summary of what the project is, where the project is intended to be taken, and how to get the project done. An FAM contains analysis about EEF Proposal and recommendation whether debtor's proposal will be granted. Although both may be different in the presentation, in general those two kinds of proposal have some **Essentials**, as follows:

a) Executive Summary

This is a short document at the beginning of proposal that highlights the most important things inside the proposal. In EEF Proposal, it highlights the company's identity, company's financial position, finacial capacity and source of loan payment, collateral, and industry and business overview. Other than those, FAM also highlights debtor's internal credit rating, creditor's policy, and recommendation of financing.

b) Project Objective

Proposal should explain EE project objective, along with its impact toward macro and microeconomic regarding to EE effort. The proposal background should describe:

1. The objective of EE project.
2. What efforts the industries are willing to do, to reduce the energy consumption.
3. What is expected after the execution of the project.
4. How the project is addressed in national development strategies and policies, in terms of specific programs and how the proposed project will relate to these strategies and policies.
5. How the project contibutes to improve well being/ civilization.
6. Whether there are other programs and activities which will complement the energy efficiency project or other parties involved in the project.
7. What kind of assistance the government office will provide.

c) Project Advantage

Proposal should describe who and how people are expected to benefit from the EE project.

1. How the company's performance and productivity are increased after the execution of energy efficiency project.
2. How the creditors get benefit from the energy efficiency.
3. How the government get benefit from the energy efficiency.
4. How people can take advantage from the energy efficiency.
5. How stakeholder may involve in project design, implementation, and evaluation.

Point 2 and 3 are typically comprised into Proposal Background.

d) Company Identity

Both EEF Proposal and FAM describes the company's/ debtor's identity.

1. Company name.
2. What industry in which the company operates.
3. Company location.
4. Board of management.
5. Shareholders and stakeholders.
6. Subsidiaries involved in company's group.

e) Customer Facility

Customer Facility Analysis is only stated in FAM. It is an analysis by a credit analyst to evaluate whether there has been any credit facility granted to the company and if there is existing credit facility, a credit analyst should decribe this following criteria:

1. How much the amount of credit facility.
2. How much the credit facility which has been disbursed.
3. Does company's subsidiary use the credit facility.
4. Has the credit facility exceeded the limit.

When it has already exceeded the limit, the creditor may not grant the proposal.

f) Company Business Overview

Proposal should explain company's business environment and operation.

1. Establishment of the company and company track record.
2. Management's experience.
3. Business Environment Overview which consists of economic, industry, and competition overview.
4. Marketing Overview which consists of product or services sold, market share, historical sales, marketing strategy, and sales plan for following years.
5. Production Overview which consists of production capacity and realization, production process, production material, production plan for following years, and social and environmental impact assessment.

In FAM, credit analyst typically use term Qualitative Analysis in evaluating company's business.

g) Historical Financial Statement

Proposal should provide information of historical financial performance. Balance Sheet and Income Statement for minimum two consecutive years should be prepared. It is aimed to evaluate the financial growth and how good the financial performance is. Financial ratios such as profitability, liquidity, solvability, and activity will more represent company's financial performance.

h) Pro Forma Financial Statement

Proposal should describe the projection of company's financial performance which is called Pro Forma Financial Statement. Balance Sheet and Income Statement projection for the next five years will provide an information of company's performance prospect after the EE investment.

1. How EE investment can boost company growth by the signal of increasing in net sales, net profit, return on equity (ROE), or return on investment (ROI).
2. How EE investment can improve company's liquidity and decrease leverage.
3. How EE investment can improve company's activity by the increase of working capital needs.

i) Configuration of Energy Efficiency

Proposal should describe how the energy efficiency are configured. For instance, machine shifting into more energy-efficient machine, machine replenishment, or source of alternative energy development. Besides, this section also describes the potential efficiency the company could create.

j) Cost Estimation and Source of Fund

Proposal should describe the calculation of investment cost estimation and source of funds to finance the project.

1. How much the investment costs the company has been calculated. Investment costs may involve procurement cost for assets (land, building, machines, etc), project-related cost, start-up cost, on-going cost, and maintenance cost.
2. How much funds come from company's earning and its shareholder.
3. How much funds proposed to creditor/ bank.

k) Project Risk and Mitigation

This section explains Measurement and Verification (M&V) procedure to ensure that energy efficiency indicated in Investment Great Audit (IGA) report can be achieved. Measurement and Verification system is carried out into two steps:

(1) **Commisioning**, which is inspection conducting in the beginning and ending of installation to confirm that energy efficiency performance is suitable.
(2) **Risk mitigation**, which is monitoring of energy efficiency product during financing period as approved in "M&V Plan".

l) Capital Budgeting

Proposal should describe the project viability whether it should be financed. Three criteria are mostly used.

1. Net Present Value (NPV) should be positive.
2. Internal Rate of Return (IRR) should be grater than the Discount Factor.
3. Payback Period, which is a period to reach break-event point should be short, therefore company can raise cash inflow far above the investment cost in a short period.

In the EEF Proposal, Point 7 up to 12 are comprised into Financial Performance, or a credit analyst typically use term Quantitative Analysis in FAM.

m) Collateral

Proposal should describe the collateral provided by the company in the form of property or other assets to secure a loan along with the size and market value of the assets.

n) Project Schedule

Proposal should describe the schedule of the project development, from the initiation up to completion in a specific time.

o) Financing Risk and Mitigation

Different from risk analysis and mitigation of EE project, this part describes more about risk analysis and mitigation toward the financing, for instance: financing misuse where the money is used to finance other project/ investment, business risk that will influence debtor's revenue and financial condition, default risk where debtor is unable to meet its obligation, and output risk where the efficiency result is not as expected. Bank may use policies to mitigate the risks. This analysis is provided by a credit analyst and contained in FAM.

p) Proposed Credit Facility Structure

The credit facility will be granted after a thourough analysis. Proposed Credit Facility Structure is prepared by a credit analyst to state financing recommendation againts EEF Proposal by the company.

This section provides detail information about the creditor/ bank and debtor/ company, type of credit facility, credit limit, purpose of the credit, credit time period, withdrawal period, administration cost, margin, other cost, withdrawal instrument, late penalty cost, and collateral. Term and condition is also stated in this section, for instance: contract signing prerequisite, disbursement prerequisite, positive covenant, negative covenant, applicable law, and other prerequisite.

3. Proposal Anatomy

The proposal essentials, then will be incorporated into **Proposal Anatomy,** which is a structured framework as a guidance to construct a proposal. The EEF Proposal and FAM have their own anatomy, different in some points, however both refer to the same essentials.

PROPOSAL ANATOMY ia a structured framework as a guidance to construct a proposal.

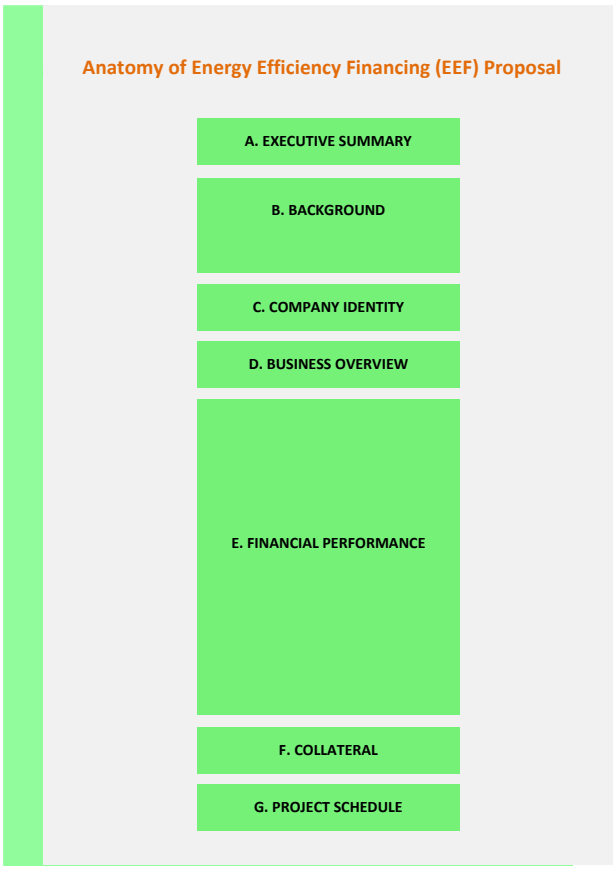
Anatomy of EEF Proposal is following:

A. Executive Summary

Taking Point 1 of Proposal Essentials, this section highlights the company's identity, company's financial position, financial capacity and source of loan payment, collateral, and industry and business overview.

B. Background

This section refers to Point 2 and 3 of Proposal Essentials where company has to describe EE project background and objective.



C. Company Identity

As Point 4 of Proposal Essentials, this section describe company name, what industry in which the company operates, company location, board of management, shareholders and stakeholders, and subsidiaries involved in company's group.

D. Business Overview

This section refers to Point 6 of Proposal Essential in which the debtor should explain company's track record, management's qualification and experience, business environment overview and operation overview which includes production and marketing.

E. Financial Performance

This section may become the most complex. This is

the composite of Point 7 up to 12 of Proposal Essentials. The company should describe historical financial performance, calculate Pro Forma Financial Statement, describe the EE Project Configuration, calculate the Investment Cost Estimation and describe the Source of Fund, asses the EE Project Risks and design the Risk Mitigation, and construct Capital Budgeting. This section is the important part that the *numbers* will show how prospective the EE project is and it will determine whether the project is viable to get financed.

F. Collateral

This section refers to Point 13 of Proposal Essentials that the company should describe the collateral in the form of property or other assets to secure a loan, along with its specification.

G. Project Schedule

This section refers to Point 14 of Proposal Essentials in which the company should describe the schedule of the project development, from the initiation up to completion in a specific time.

After the EEF Proposal has been proposed by company/ debtor to the bank/ creditor, the credit analyst construct his own analysis and recommend the financing through FAM to bank's credit division. As EEF proposal, the FAM content also refers to Proposal Essentials.

The anatomy of FAM is following:

A. Executive Summary

It refers to Point 1 of Proposal Essentials. Executive Summary highlights the company's/ debtor's identity, financial position, finacial capacity and source of loan payment, collateral, company's business overview, company's internal credit rating, creditor's policy, and recommendation of financing.

B. Background

This section refers to Point 2 and 3 of Proposal Essentials. However unlike EEF Proposal which details EE project objective and advantage, the credit analyst summarize debtor's EE project objective and highlights the debtor's statement of financing proposal.

C. Company Identity

As Point 4 of Proposal Essentials, this section describe debtor's identity which consists of company name, what industry in which the company operates, company location, board of management, shareholders and stakeholders, and subsidiaries involved in company's group.

D. Customer Facility Analysis

This section refers to Point 5 of Proposal Essentials. A credit analyst evaluates whether there has been any credit facility granted to the debtor/ company and if there is existing credit facility, a credit analyst should decribe the amount of credit facility, the amount which has been disbursed, and wheter the credit facility has been over limit or not.

E. Company Analysis

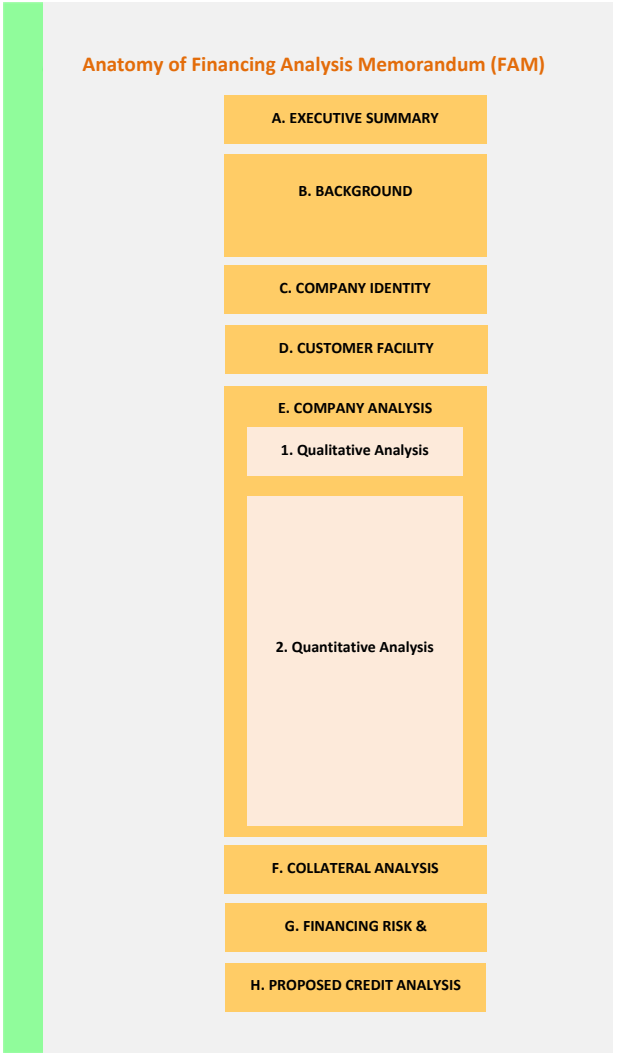
A credit analyst evaluates debtor's performance through a Company Analysis. The analysis typically is divided into two, which are:

1. Qualitative Analysis

   This section refers to Point 6 of Proposal Essentials in which a credit analyst analyze debtor's track record, management's qualification and experience, business environment overview and operation overview which includes production and marketing.

2. Quantitative Analysis

   It refers to the Point 7 up to 12 of Proposal Essentials. A credit analyst make his own analysis about debtor's financial performance which includes analysis of historical financial performance, Pro Forma Financial Statement, EE Project Configuration, Investment Cost Estimation and Source of Fund, EE Project Risks and Mitigation, and Capital Budgeting. Through this analysis, a credit analyst can come up with the conclusion of how feasible the project is to be financed.



F. Collateral Analysis

This section refers to Point 13 of Proposal Essentials that the credit analyst evaluates collateral provided by the debtor, wheter it is appropriate to guarantee the loan. The credit analyst evaluates the collateral specification including assets' size and market value.

G. Financing Risk And Mitigation

It refers to Point 15 of Proposal Essentials. Different from risk analysis and mitigation of EE project, in this section a credit analyst describes Risks and Mitigation againts financing, for instance financing misuse and debtor default risk.

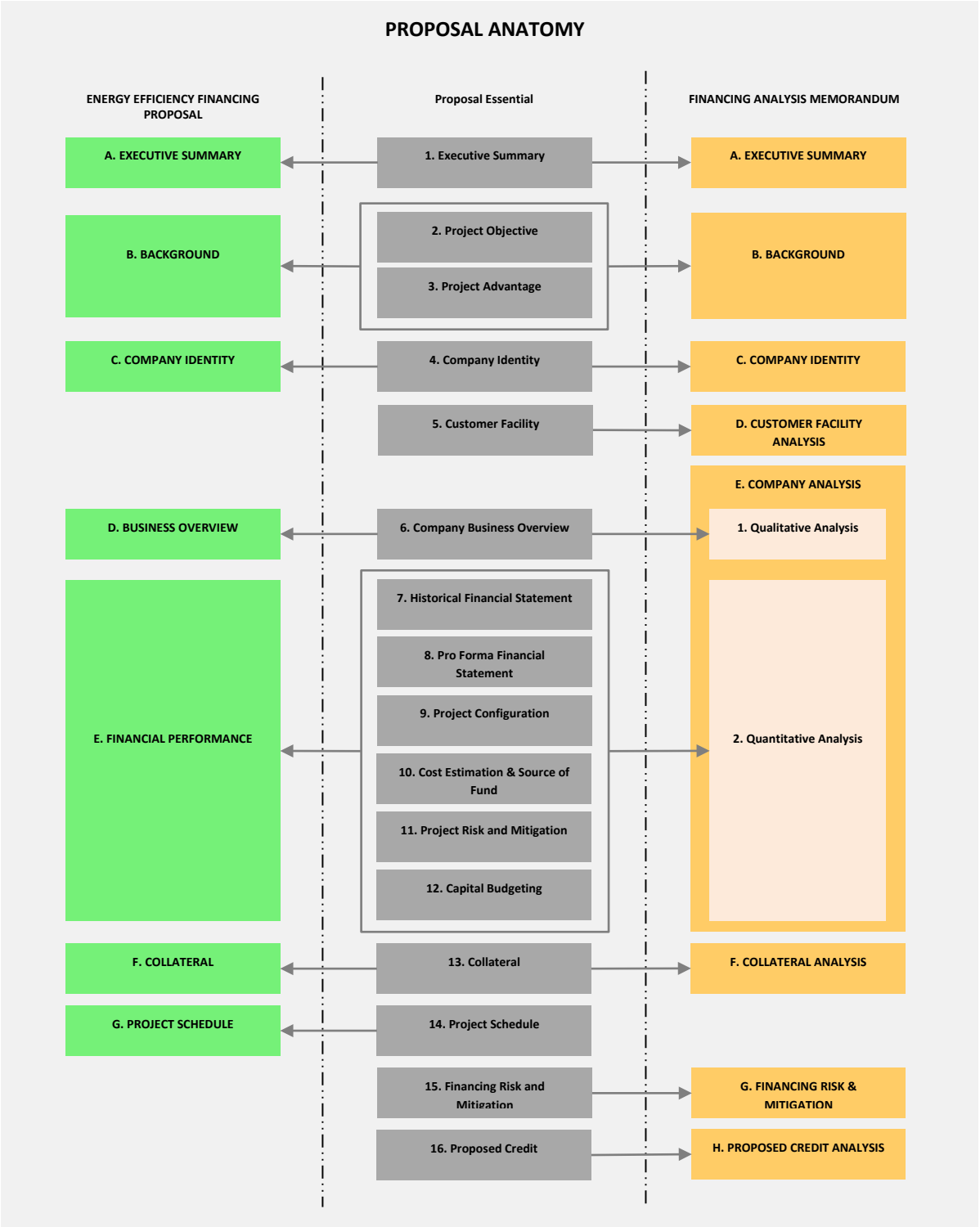
H. Proposed Credit Analysis

This section refers to Point 16 of Proposal Essentials where the credit analyst state financing recommendation along with term and condition regarding to financing contract.

The following figure shows how Proposal Essentials are related to both EEF Proposal and FAM Anatomy.

Other than the analysis contained in the FAM there are SELECTION CRITERIA that mostly used by the credit analyst to consider the financing approval. It deals with the sponsor of the project, the person or entity which initiates, owns, and promotes the project and has decision making power on borrowing or equity distribution. The *criteria* may be as follows:

a. **How does the track record in doing business and handle projects.**
b. **Does the project owner is able to develop and implement a proper management plan to ensure sustainable operation of the proposed project.**
c. **How much the equity contribution to the project.**
d. **Is the project owner creditworthy.**


PROPOSAL ANATOMY
ENERGY EFFICIENCY FINANCING PROPOSAL
Proposal Essential
FINANCING ANALYSIS MEMORANDUM
A. EXECUTIVE SUMMARY
1. Executive Summary
A. EXECUTIVE SUMMARY
B. BACKGROUND
2. Project Objective
3. Project Advantage
B. BACKGROUND
C. COMPANY IDENTITY
4. Company Identity
C. COMPANY IDENTITY
5. Customer Facility
D. CUSTOMER FACILITY ANALYSIS
E. COMPANY ANALYSIS
D. BUSINESS OVERVIEW
6. Company Business Overview
1. Qualitative Analysis
E. FINANCIAL PERFORMANCE
7. Historical Financial Statement
8. Pro Forma Financial Statement
9. Project Configuration
10. Cost Estimation & Source of Fund
11. Project Risk and Mitigation
12. Capital Budgeting
2. Quantitative Analysis
F. COLLATERAL
13. Collateral
F. COLLATERAL ANALYSIS
G. PROJECT SCHEDULE
14. Project Schedule
15. Financing Risk and Mitigation
G. FINANCING RISK & MITIGATION
16. Proposed Credit
H. PROPOSED CREDIT ANALYSIS

TEMPLATE VIRTUAL CASE

ENERGY EFFICIENCY PROJECT FUNDING PROPOSAL

MEMORANDUM SUMMARY ANALYSIS OF FINANCING - LONG FORM MAP No. 054/MAP/SYR/06/2013 dated 06/26/2013 *Filled by the Bank / Financial Institution*		
1. Name of the Customer	:	
2. Line of Business	:	
3. Bussiness Group	:	
4. Total Facilities	:	
5. Terminate Authority	:	
6. Financial Condition	:	
7. The financial ability and sources of credit repayment	:	
8. Warranty	:	
9. Obligor Rating	:	
10. Industry and Business	:	
11. Export Justification	:	
12. Account Strategy Group	:	Growth with consideration: - Companies' Performance all this time is good - Track Record both credit facilities and collectibility is always smooth
13. Islamic Development Bank Policy	:	
14. Recommendation	:	

I. MEMORANDUM ANALYSIS OF FINANCING *Filled by the Bank / Financial Institution*		
About	:	Request New Facilities
Name of Applicant	:	
Basic Proposal	:	Application letter

Finance Committee	Name	Position
Proposer :		
Reviewer		
Finance Committee II :		
Terminate Authority :		

File Data

A. PURPOSE OF PROPOSAL
Filled by Bank/Financial Institution

B. INTERNAL CREDIT RATING SUMMARY
Filled by Bank/Financial Institution

C. INFORMATION CUSTOMERS / PROSPECTIVE CUSTOMERS & GROUP
Filled by Prospective Customers / Company

- **General Information**

• Name of the customer	:	
• Year of establishment	:	
• Line of Bussiness	:	
• Group of Customer	:	
• Economic Sector Code of Islamic Development Bank	:	***Filled by Bank/Financial Institution***
• Office Address	:	
• Factory Location	:	
• Key Person	:	

• Year in connection with the Bank	:	
• Capital	:	

Name of Shareholders	Number of shares	Value of Shares (IDR)	%
• •			

• Composition of the Board	
Board Of Commissioners	
The Main Commissioner	
Commissioner	
Board of Directors	
President Director	
Director	
Director	

- **Customer Information Group**
- **Relationship with Customers (*Filled by Bank / Financial Institution*)**
  a. **Export Activity:**
  b. **Resume OTS Results / Call Report**

D. FACILITIES CUSTOMERS & GROUP (*Filled by the customer / company*)

1. **Faciclities in Islamic Development Bank (position data is dated 06/30/2013)**

2. **Review of Investment Financing Facility a.n PT. Airlangga Sawit Jaya dan PT. Charindo Palma Oetama**

3. **Facilities in the Bank/Other Financial Institutions**
4. **Proposed Facilities**

5. **Calculation of BMPP**

E. ANALYSIS OF COMPANY (*Filled by the customer / company*)

1. Quality of Qualitative

a. Establishment, Licensing, Authority and Track Record Company

b. Character and Management

c. Industry and Customers' Business

1. Macroeconomic Analysis - General Conditions

2. Industry Analysis Food & Beverage Indonesia 2013

3. Competition Analysis of Industrial Sector

a) Barrier to Entry

b) The bargaining position of buyers (buyer)

c) The bargaining position of supplier (supplier).

d) Goods Substitution

e) Conditions of Competition

d. Marketing

1. The products / Services that are marketed.
2. Market Share
3. Actual Sales
4. Marketing Target
5. Marketing Strategy
6. Sales Plan

e. Technical Production

1. Location of Project / Business
2. Production Capacity and Actual Production
3. Production Process
4. Raw and Auxiliary Materials
5. Sales Plan

6. Social Aspects and EIA

2. Quality of Quantitative

a. Analysis of Historical Financial Reports

AKTIVA

PASSIVA

PROFIT AND LOSS

ASSET EFFICIENCY

LIQUIDITY & LEVERAGE

DEBT SERVICING ABILITY

b. Analysis Financial Projections

Assumptions

- AKTIVA
- PASSIVA
- NET SALES
- COST STRUCTURE
- NET OPERATING PROFIT
- NPAUI
- RETURN ON EQUITY (ROE)

Liquidity and Leverage Ratio Projection

Asset Efficiency Ratio Projection

Projection of Repayment Capacity

c.Investment Financing Needs Analysis (Filled by the Manager of Energy companies)

1) **Purpose Financing Facility**
2) **Calculation of Investment Financing Facility**
3) **Risk Mitigation and Energy Efficiency Financing (contains methods M & V)**

d. Viability Analysis of Investment Financing

Sensitivity Analysis calculated by Corporate Cash Flow and cash flow of energy efficiency projects

Viability by Corporate Cash Flow

EE Project of Viability Project (Filled by the Manager of Energy)

a. Financing Margin /Loan Rate

F. OTHERS
(Justification or explanation to convince financial institutions, filled by the customer / manager of energy companies)

G. COLLATERAL AND COVERAGE (*Filled by Customers / Companies)*

1. **Submitted Collateral**
2. **Security Coverage of Financing Facility**

Facility	**Limit**		
PIE - ESS	16,067		
Total facilities	**16,067**		
Ratios (% on the base of)	**Market Value**	**Liquidation Value**	**Binding Value**
	Ad. Limit	**Ad. Limit**	**Ad. Limit**
Fixed Asset / Total PIE	53%	37%	53%
PIE Engine / Total PIE	143%	100%	143%
Total of Collateral / Total PIE	196%	137%	196%

H.	RISK AND MITIGATION *(Filled by Customers / Companies)*

No	Risks Identification	Mitigation
1	**Deviations Purpose Use of Credit Risk**	
2	**Risk of Marketing Business**	
3	**Returns / Payments**	.
4	**Unsuitable Risk Project Output**	

Chapter 5
Virtual Case Material:
Proposal of Energy Efficiency Projects Financing

MEMORANDUM SUMMARY ANALYSIS OF FINANCING - LONG FORM

MAP No. 054 / MAP / SYR / 06/2013 dated 06/26/2013

1. Name of the Customer : **PT. Empat Sekawan Sejahtera**

2. Line of Business : Other Drinks Food Industries (Sector Code 3190)

3. Group Business : PT. Empat Sekawan Sejahtera Food Tbk.

4. Total Facilities :

Type	Limit (Rp. Million)	Time Period	Margin
PIE sublimit Financing L / C / SKBDN	16.067,00	60 months from the date of opening of L / C or SKBDN first.	9.50%
Total (IDR)	**16.067,00**		

Existing facilities Enterprises Group a.n PT. Airasia Rice Jaya (ASJ) and PT.Cantika Primary Oetama (CPO), a subsidiary of PT. Four Gang Sejahtera Food Tbk position 07.08.2013:

Type	Limit (Rp. Million)	Debit balance (Rp.Juta)	Due Date	Margin	Kol
PIE – ASJ	20.599,09	20.599,09	25/11/15	11%	1
PIE – CPO	41.093,32	41.093,32	25/11/15	11%	1
Total Facility Existing Group	**61.692,41**	**61.692,41**			
Total Facilities Group including New Facility ESS	**77.759,41**	**61.692,41**			

5. Terminate Authority : Pointing PDD No.0003 / EDP / 02/2013 for new customers with a limit of Rp. S.d 50 Billion USD. 250 billion is on the committee the authority to decide Financing III

6. Financial Condition : Historical Financial Condition in 3 (three) last period is as follows

Ratios	2010	2011	2012	% 2012 -2011	Q1 2013
ROE	9%	26%	24%	-7%	8%
ROA	2%	6%	7%	11%	2%
A/R DOH	88	141	148	5%	148
INV DOH	194	100	126	26%	138
A/P DOH	41	34	78	127%	82
A/E DOH	2	1	1	3%	2
Net Trade Cycle	239	205	196	-5%	202
Selling (Million USD)	556,782	853,729	809,473	-5%	193,933
Sales Growth		53.33%	-5.18%	N/A	-4.17%
HPP/Selling	71.17%	71.03%	67.87%	-4%	69.31%
GPM	22.99%	25.68%	28.95%	13%	27.86%
SGA/Selling	6.87%	6.93%	7.45%	7%	4.16%
NOP (Million USD)	87,176	157,013	170,807	9%	45,141
Interest Cost/Selling	11%	8%	8%	-4%	6%
NPAUI (Million USD)	16,612	62,622	72,470	16%	24,116
NPAUI / Selling	2.98%	7.34%	8.95%	22%	12.44%
Current Asset (Million USD)	352,067	515,472	537,129	4%	562,252
Net Fixed Asset (Million USD)	309,904	281,288	253,635	-10%	248,460
Liabilities Total (Million USD)	681,438	743,310	727,931	-2%	667,667
Equity Total (Million USD)	175,212	237,834	297,154	25%	321,270
Current Ratio	0.96	1.13	0.96	-15%	1.24
DER	3.48	2.42	1.74	-28%	1.40
Leverage	3.98	3.17	2.47	-22%	2.09

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7. The financial ability and sources of credit repayment : Customer's financial condition positions in 2010 - 2012 is quite good and the fulfillment of the obligations derived from the results of its operations, which during this period COPAT / FP> 1.

Based on the projected financial statements for 2013 - 2018, Projection NOPAT / FP and COPAT / FP during the financing> 1.

DEBT SERVICING ABILITY	2013	2014	2015	2016	2017	2018
FP	(81,576)	(5,653)	(5,248)	(4,325)	(3,928)	(1,835)
NOPAT – FP	47,041	125,578	132,276	139,574	145,373	149,664
NOPAT / FP	1.58	23.22	26.20	33.27	38.00	82.55
COPAT – FP	79,213	161,923	170,309	179,315	186,565	191,457
COPAT / FP	1.97	29.65	33.45	42.46	48.49	105.32

8. Warranty : Security Collateral Value Ratio as follows:

Facilities	Limit

PIE - ESS	16,067		
Total Facilities	**16,067**		
Ratios (% above baseline)	**Market Value**	**Liquidation Value**	**Value Binding**
	Ad. Limit	**Ad. Limit**	**Ad. Limit**
Fixed Asset / Total PIE	53%	37%	53%
PIE Engine / Total PIE	143%	100%	143%
Collateral Total / Total PIE	196%	137%	196%

9. Obligor Rating : Internal rating based on the audited financial statements:

- The year 2010 is BBB –
- The year 2011 is A-
- The year 2012 is A-

10. Industry and Business : Population of Indonesia reached about 200 million people and Indonesia's rapid economic growth provides opportunities for further development of business ESS and ESSF Group in the future. In line with the economic growth, income Indonesian society has also increased. This is evident from the trend of increase in income per capita Indonesia from year to year. With the increase in per capita income, the demand for consumer goods, especially food is expected to increase as well.

Judging from the performance of exports, non-traditional markets of Asia is an emerging market that can be used to increase the export of Indonesian exports. Processed food and beverage products is one of the products of the food and beverage industry that has a significant contribution to the Indonesian non-oil exports. In order to a product

food and beverage Indonesia still contribute to the non-oil exports, the food and beverage industry needs to develop export to non-traditional markets of Asia. In 2012, the value of exports of food products and beverages Indonesia is 4:49 Billion US Dollars with the trend of the years from 2008 to 2012 increased by 15%.

11. Justification Export : Destination country of export marketing food processing products ESSF Group for sweets is USA, UK, Australia, Korea and Japan. For instant noodle product, product marketing destination ESSF Group is Australia. For products Biscuits, ESS has signed a sales contract in 2005 with the World Food Programme to produce and supply the Fortified Biscuit (biscuits fortified vitamins and minerals) to be sent to countries that need food assistance, such as Iraq, Pakistan, Bangladesh, Myanmar and also exported to Italy and Malaysia. Based on customer information, exports contributed to 25% of total sales.

12. Account Strategy Group : Growth with consideration:

- Performance / Performance companies for this good
- Track Record both credit facilities and collectibility is always smooth

13. Development Bank Syariah Policy	:	- Board and shareholders of the company are not included in the company including bad credit and blacklisted companies. - Top of the total financing facilities obtained by PT. ESS and the group has not exceeded BMPP.
14. Recommendation	:	1. 1. Investment Financing Facility sublimit Export Financing L / C / SKBDN for Energy Efficiency financing worth USD 16.067 billion. 2. Tenor Financing Facility 60 months from the date of opening of LC or SKBDN. 3. Opening Tenor of LC / SKBDN a maximum of 180 days from the date of opening of the LC / SKBDN. 4.Financing Facility denominated in USD with a margin of 9.5% financing (ALCO Base).

I. MEMORANDUM I. ANALYSIS OF FINANCING SAP No. 057 / SAP / SYR / 06/2013 dated 06/30/2013			
About	:	Request New Facilities	
Name of Applicant	:	**PT. Empat Sekawan Sejahtera**	
Basic Proposal	:	Application Letter	
Finance Committee		Name	Office
Proposer	:	1. Eko Wijaya 2. JokoSantoso 3. Intan Mutiara	Sdaysah Finance Relationship Manager Head of the Department of Islamic Financing Head of Islamic Finance Division
Reviewer		1. Gama Wisata 2. Irawan Priambodo 3. ArifBudiman	Risk Analyst Divisi Ct. Head of the Department of Business Risk Analysis Head of Business Risk Analysis Division
Financing Committee II	:	1. TrioWahyudi 2. Omar Hamzah	Managing Director I Managing Director IV
Terminate Privileges	:	Financing Committee level II	

File Data	
✓ Application Letter 212 / EMS / V / 2013 tgl.17 August 2013	✓ Lap spreadsheet Keu last 3 years
✓ Audited Financial Statements December 31, 2010.2011 period and December 31, 2012 ✓ Inhouse Financial Statements period March 31, 2013	✓ SID BI reports per date. 06/17/2013 ✓ Appraisal Report KJPP Rizki Djunaedy & Partners No. 073 / D / LP.FR / RDR / X / 2011 date. 13/10/2011 ✓ Investment Grade Audit Report ("IGA") of

	Econoler

A. PURPOSE OF PROPOSAL

By letter No. 212 / EMS / V / 2013 dated August 17, 2013, PT. Four Gang Prosperous apply for financing Energy Efficiency Project (EEP) with an investment of Rp 22.016 billion, - and with financing amounting to 80% of Project Cost.

B. INTERNAL CREDIT RATING SUMMARY

Historical Internal Rating companies are as follows:

Date of Rating : 31/05/2013			
Year	Rating Position	Score	Outlook
2010	BBB-	48.72	Average
2011	A-	59.77	Good
2012	A	68.63	Good

C. INFORMATION CUSTOMER / PROSPECTIVE CUSTOMERS GROUP

- **General Information:**

• Customer Name	:	PT. Empat Sekawan Sejahtera (“ESS”)
• Year of establishment	:	1995
• Line of Business	:	Food Processing Industry
• Group of Customer	:	PT. Empat Sekawan Sejahtera Food Tbk. (“ESSF”)
• Economic Sector Code of Islamic Development Bank	:	3190
• Office Address	:	Square Building, Jl. Bundaran Jaya Kav. 51, South Jakarta
• Factory Location	:	Semarang, Central Java.
• Key Person	:	Budi Luhur, President Director
• Relationship of year with the Bank	:	2009
• Capital	:	Based on 19 Deed dated June 24, 2008 before Notary Wimar Wijoyo, SH located in Semarang, the authorized capital of the company is Rp.150 billion and paid up capital is Rp.110 billion with the details as follows:

Name of Shareholders	Number of shares	Shares Value (USD)	%
• PT Empat Sekawan Sejahtera Food Tbk	109.890	109.890.000.000	99.9
• Susilo Bambang	110	110.000.000	0.10
Total	**110.000**	**110.000.000.000**	**100**

• Composition of the Board	Member of the Board of PT. Four Gang Welfare Act 20 was recorded on June 24, 2008 before Notary Wimar Wijoyo, SH located in Semarang as follows:
Board Of Commissioners	
The Main Commissioner	Susilo Bambang
Commissioner	Herry Bengkoestanto
Board of Directors	
President Director	Budi Luhur
Director	Budhi Istanto Suwito
Director	Herry Koeswoyo

- **Customer Information Group**

Companies that joining to the PT. Empat Sekawan Sejahtera Food Tbk

PT. Empat Sekawan Sejahtera Food, Tbk.

PT Empat Sekawan Sejahtera Food Tbk ("ESSF") has been registered as a public company in Indonesia Stock Exchange since 2003. ESSF Group Company is a company engaged in food and food-related through its subsidiaries. Company's current business activities are in the areas of food processing, processing of rice and palm oil.

The Company was initially run the business in the form of a family company by the name of Asian Noodle Factory which started in 1959 in the Snake, Sukoharjo, Central Java and only producing one type of product, namely dried vermicelli. Up to 2012, the ESSF has 5 locations with 174 food processing plant distribution network, 2 rice processing plant locations and one location consisting of two new rice processing plants are still under construction, as well as well as 7 palm oil plantations.

For the processed food sector, the Company has operations through Subsidiaries PT Empat Sekawan Sejahtera (ESS), PT Putra Medan Indonesia (PMI), PT Bumi Biru Pancaran (BBP) with its subsidiaries PT PutriTaniPancaran (PTP) and PT Sejahtera Pantas Jaya (SPJ).

Some of the company in the Group ESSF can be delivered as follows:

PT Empat Sekawan Sejahtera (ESS)
owned by PT Four Sekawan Sejahtera Food at 99.9%, and established since 1992 in Magelang. PT ESS specifically for Basic Food with main products customers are noodles and vermicelli. Total turnover PT ESS per March 2013 to contribute up to 22% of the total turnover of the group PT ESSF.

PT. Putra Medan Indonesia (PMI)

Established since 1994 in Jakarta and was acquired by ESSF in 2008. PMI industry engaged in the manufacture and sale of snacks. Its products including biscuits, wafers and candy stick with trademark Gulas, Gulas Plus and Growie.

PT. PutraTenaga Nusantara (PTN)

Established since 2006 in Magelang and was acquired by the company in 2008. VAT is engaged in the business of power plants with a capacity of 3 MW energy production is used to supply electricity and steam to the facilities - facilities ESSF. PTN is also an opportunity for the ESSF to play in the national energy market.

PT. Berjaya Investasi (BI)
Established since 1993 and acquired ESSF in 2008. Engaged in the field of oil palm plantations are located in Tanjung Seloka and Kebun Lontar, district Sea Island West and South Sea Island, Kota Baru regency, South Kalimantan. In 2010, the ESSF via BI acquired five companies engaged in oil palm, namely PT. Medan Jaya Argo Palm is located in Central Kalimantan, PT. Astana Success Jaya (ASJ) and PT. Cantika Pratama Oetama (CPO) which is located in West Kalimantan, PT. Mesti Bisa Pantas located in South Sumatra and PT. Tiga Putra Sekawan located in Riau.

PT. Dunia Pangan (DP)

Established since 2006 and was acquired ESSF in 2010. Engaged in trade and industry area. Have three entities, namely yaitu PT. IndonesiaBerjaya Ungul (IBU) which is engaged in the production and trade of rice and rice mill PT. JakartaSukses Raya (JSR) and PT. Sukses AmanahKerjaIndonesia (SAKTI). IBU was established in 2008 and started operation since June 2010. JSR acquired at the end of 2010. Since the end of November 2012 SAKTI become an indirect subsidiary of the company.

PT. Bumi BiruPancaran (BBP)

Established in 2011 and it is a manufacturer of processed foods with an installed capacity per year for an estimated 27,000 tons of biscuits. BBP has subsidiaries namely PT. Putri Tani Pancaran (PTP) and PT. Sejahtera Pantas Jaya (SPJ). PTP produces snacks KORO acquired from PT. Unimas Indonesia Tbk with production facilities located in Bogor, Medan and Kalimantan with a capacity of 7,500 tons per year.

• Relationship with Customers

a. Export activity:

Destination country of export marketing food processing products ESSF Group for candies are USA, UK, Australia, Korea and Japan. For instant noodle product, product marketing destination ESSF Group is Australia. For products Biscuits, ESS has signed a sales contract in 2005 with the World Food Programme to produce and supply the Fortified Biscuit (biscuits fortified vitamins and minerals) to be

sent to countries that need food assistance, such as Iraq, Pakistan, Bangladesh, Myanma and also exported to Italy and Malaysia. Based on customer information, exports contributed to 25% of total sales.

b. OTS Resume Result/ Call Report :

- The meeting between the ESSF, the ADB is represented Econoler and the Development Bank Syariah which represented the Division of International and Islamic Financing Division has been underway for some time with details of progress as follows:

- February 3, 2012 : The first presentation of the project and financing programs EEP.
- February 7, 2012 : Industry survey has been sent and completed by the management of energy ESSF
- March & April 2012 : The first factory visit to investigate opportunities EEP.
- July 2012 : The signing of the MOU between the ESSF and Development Bank Syariah.
- August & September 2012: Visit the factory to obtain detailed information and data IGA.
- September, 30 2012 : IGA presentation in front of the financial and technical division ESS.
- December 2012 : The Executive Board approved the IGA ESSF and continue the process of loan.
- January, 14 2013 : Meeting with Relationship Managers and Business Risk Analyst to discuss conditions of the loan EEP.

D. CUSTOMERS FACILITIES & GROUP

1. Facilities in Islamic Development Bank (Position data is dated 06/30/2013)

ESS is not currently a customer of Islamic Development Bank, Development Bank Financing Sdaysa to ESSF Group currently given to PT. Cantika Pratama Oetama (CPO) and PT. Airasia Sawah Jaya (ASJ).

No.	Type	Limit (Rp. Million)	Debit balance (Rp. Million)	Due Date	Margin	Kol
1.	PT. Empat Sekawan Sejahtera					
	NIHIL					
2.	PT. AirasiaSawah Jaya (ASJ)					
	PIE – ASJ	20.599,09	20.599,09	25/11/15	11%	1
3.	PT. CantikaPratama Oetama (CPO)					
	PIE – CPO	41.093,32	41.093,32	25/11/15	11%	1
	Total Facility of Existing Group	**61.692,41**	**61.692,41**			

2. Review of Investment Financing Facility a.n PT. Airlangga Sawit Jaya and PT. Cdaysndo Palma Oetama

- ESSF export investment financing facility with a limit of IDR100.000.000.000 facility, - Syariah Development Bank documented in PK No. 83 th. May 26, 2010, made before Yualita, SH, Notary in Jakarta. The purpose of the funding is to refinance the construction of oil palm plantations owned by PT AirasiaSawah Jaya (ASJ) and PT CantikaPratama Oetama (CPO).

- In connection with the restructuring of the business group ESSF at the end of 2010 where several companies in the business group engaged in oil palm plantations, including ASJ and CPO transferred its ownership of PT Tugu Palma Sejahtera (ESS) to PT Bumiraya Investindo (BRI) and the entry New investors are Bunge Agribusiness Singapore Pte Ltd, the ESSF filed diversion PIE facilities that have been received to the ASJ and CPO.

- The transfer of the facility has been approved by Islamic Development Bank namely PT Airlangga Sawit Jaya vide MKP No. No.065 / MKP / ARB / 03/2012 Date March 15, 2012 and the late PT Cdaysndo Palma Oetama vide No.066 MKP / MKP / ARB / 03/2012 on 15th March 2012.

- Until now, both principal and payment obligations for the current result as scheduled installments.

3. Facility in the Bank / Other Financial Institutions

Based on the search BI Checking the name of PT. Four Gang Prosperous and PT.Empat Sekawan Sejahtera Food Tbk (Master of Business) and ASJ and CPO for position data is dated June 30, 2013 as follows:

- Financing Facility to PT. Empat Sekawan Sejahtera (No. 15/77202596 / DPIP / PIK and 15 / 77,202,627 / DPIP / PIK dated 18.07.2013)

No	Type Facilities	Limit (Rp. Million)	Debit balance (Rp. Million)	Currency	Due Date	Interest Rate%	Kol
BCA							
1	KI	186	186	$	02/06/2014	7.8%	1
2	Kend	19	19	$	09/10/2013	10.5%	1
3	Kend	16	16	$	13/10/2013	10.5%	1
4	Kend	19	19	$	09/10/2013	10.5%	1
9	Kend	19	19	$	09/10/2013	10.5%	1
10	Kend	16	16	$	13/10/2013	10.5%	1
Total		**275**	**275**				

Note:

- Based on customer information, as at 8 April 2013 ESS pay off the entire debt of banking services including LC and SKBDN of Mandiri Bank Rp 530.972.652.225 and Muamalat Bank Rp 8.550.232.210.
- The funds used for repayment comes from ESSF recorded as Shareholder Subordinated Debt.

- Financing Facility to PT. Empat Sekawan Sejahtera Food Tbk (No.15/77202595/DPIP/PIK, No.15/77202629/DPIP/PIK and No.15/77202528/DPIP/PIK dated 06/17/2013)

No	Type Facilities	Limit (Rp. Million)	Debit balance (Rp. Million)	Currency	Due Date	Interest Rate%	Kol
Rabobank							
1	KMK	10.795	10.795	IDR	21/09/2013	10.83%	1
Sub Total		**10.795**	**10.795**				
Pan Indonesia Bank							
1	Obligation - SBPM	64.000	64.000	IDR	21/09/2013	10.83%	1
Sub Total		**64.000**	**64.000**				
Total		**74.795**	**74.795**				

- Financing Facility to PT. Cantika Pratama Oetama (CPO) (No.15/77204780/DPIP/PIK and No.15/77204836/DPIP/PIK dated.07/18/2013)

No	Type Facilities	Limit (Rp Million)	Debit Balance (Rp Million)	Currency	Due Date	Interest Rate %	Kol
ORIX Indonesia Finance							
1	KI	317	256	IDR	26/10/2015	13,61%	1
2	KI	279	202	IDR	31/07/2015	10,34%	1
3	KI	4.626	3.039	IDR	13/10/2013	13,61%	1
4	KI	913	574	IDR	09/10/2013	13,61%	1
5	KI	665	289	IDR	03/06/2013	13,61%	1
6	KI	294	144	IDR	03/06/2013	13,62%	1
Sub Total		**7.094**	**4.503**				
Islamic Development Bank							
1	KI	61.280	41.093	IDR	25/11/2015	11,00%	1
Sub Total		**61.280**	**41.093**				
Total		**68.374**	**45.596**				

- Financing Facility to PT. Airasia Sawah Jaya (ASJ) (No.15/77204745/DPIP/PIK dated.07/18/2013)

No	Type Facilities	Limit (Rp Million)	Debit Balance (Rp Million)	Currency	Due Date	Interest Rate %	Kol
Islamic Development Bank							

1	KI	30.721	20.599	IDR	25/11/2015	11,00%	1
Total		**30.721**	**20.599**				

4. Proposed Facilities

Type Facilities	Financing Limit			Interest Rate	Time Period	Specification
	Existing	+/-	Total			
PIE sublimit Financing L / C / SKBDN	0	16.067	16.067	9.50 % p.a	60 months from the opening of date of L / C / first SKBDN.	New
TOTAL	0	**16.067**	**16.067**			

5. Calculation of BMPP

Details	Value ($ Million)
Capital of Islamic Development Bank by June 2013BMPP o Parties of BMPP are not related to individual borrowers amounted to o Parties of BMPP are not related to a group of borrowers amounted to	7.946.810 1.430.426 1.788.032
Limit total financing facilities on Group PT Empat Sekawan Sejahtera Food Tbk	
Investment Financing Export - ESS	16.067

Details	Value ($ Million)
PIE Existing facilities a.n ASJ	20.599
PIE Existing facilities a.n CPO	41.093
Total Financing Facilities	**77.759**
% Towards Capital	1%
Conclusion: financing facilities to the Subsidiary Group PT Empat Sekawan Sejahtera Food YET beyond internal BMPP Islamic Development Bank (Inhouse Limit or BMPP according FMD applicable).	

E. ANALYSIS OF COMPANY

1. Quality of Qualitative

a. Establishment, Licensing, Authority and Track Record Company

PT. Empat Sekawan Sejahtera (ESS) was established on August 2, 1990 by deed no. 10 made before a notary Tjondro Santoso SH with the initial name of PT. Empat Sekawan Sejati. Then on January 29, 1992 changed its name to PT. EmpatSekawanSejahtera contained in a deed No. 72

dated January 29, 1992. This deed was approved by Decree of the Minister of Justice of the Republic of Indonesia dated January 23, 1993 No. C2-436 HT.01.01.Th93.

Legality of the Company as follows:

1.	Company Domicile Certificate	:	474/25/II/2012
2.	TIN	:	01.545.452.3-528.001
3.	License	:	517/722/29/2011 valid till 02.13.2014
4.	TDP	:	11 14 115 00046 valid till 02.13.2014
5.	Disturbance Permit / HO	:	530/1942/35/2008 valid till 08.29.2013

b. Character and Management

ESS is managed by a team consisting of professionals and experienced management in the food industry.

1. Budi Luhur, President Director
   Although ESS established in 1990, the company's business has been running almost one century. In this regard Mr. Budi Luhur is one of the next generation 3rd predecessors and continued efforts to expand and diversify its business in accordance with the existing business opportunities. Graduated from the University of Gajah Mada, Yogyakarta, Department of Food Technology in 1991. Career began by establishing PT Empat Sekawan Sejahtera in 1992. In 2003, was appointed as Director of PT Empat Sekawan Sejahtera and has led the company until now. In addition, at this time also held various other positions include: Director of PT Empat Sekawan Sejahtera Food, Tbk since 1992 and President Commissioner of PT Bumi Raya Investindo since 2006.
2. Budhi Istanto, Director
   S1 Graduated from the University of Sebelas Maret, Surakarta, in 1995. Some positions are held until 2010 was Director of Empat Sekawan Sejahtera Food, Tbk, PT Poly Meditra Indonesia Director since 2006, Director of PT Sriwijaya Panganindo Prima Lestari since 2002, and the Commissioner of PT Borneo Panganindo Prima Lestari since 2001, Commissioner of PT Poly Meditra Indonesia in 2003 to 2006.
3. Herry Koeswoyo, Director
   Graduated in *University of Minnesota Twin Cities di bidang Science in Bio-system and Agricultural Engineering* in 1998. Starting his career as a *Business Development Manager* PT Empat Sekawan Sejahtera in 1999. Then served as Operational Director of PT Empat Sekawan Food, Tbk since 2007 and in 2011 was appointed a Commissioner of PT Empat Sekawan Food, Tbk. In addition, at this time also held various other positions include: Director of Poly Meditra Indonesia since 2006. Previously served as commissioner of PT Poly Meditra Indonesia from 2003 to 2006.

c. Industry and Customers' Business

1. Macroeconomic Analysis - General Conditions (www.bi.go.id)

The Indonesian economy in 2012 grew quite high at 6.3% and is expected to rise in 2013 and 2014. The durability of the economy is supported by macroeconomic stability and financial system that is maintained so as to strengthen domestic demand base. Household consumption and investment that increased able to hold the impact of the decrease in export growth primarily began the second half of 2012. On the production side, economic growth was mainly sustained by the performance of sectors of Manufacturing, Trade sector, hotel, and restaurant, as well as transport and

communications sectors. From the region, economic growth gap between regions on the wane, reflected in the contribution of economic growth in Eastern Indonesia (KTI) is getting better. In 2013-2014, the Indonesian economy is expected to reach around 6.3% respectively - 6.8% and 6.7% - 7.2%. It is supported by an ever-increasing consumption and investment remain strong, while exports are expected to be improved.

Indonesian balance of payments (BOP) in 2012 remained in surplus, despite the pressure of the current account deficit. Weakening demand from countries trading partner and export commodity prices decrease the export performance. On the other hand, imports are still growing quite high, especially in the form of capital goods and raw materials, in line with the increase in investment activity. Higher imports are also recorded in the oil and gas commodities due to soaring fuel consumption, so the impact on the deficit of oil and gas continues to rise and increase pressure on the current account deficit. Meanwhile, the capital and financial account recorded a sizeable increase in the surplus was mainly supported by direct investment (FDI) and portfolio capital inflows, both in the stock market and bond market, which is higher than the previous year. With these developments, international reserves at the end of December 2012 reached 112.78 billion US dollars, equivalent to 6.1 months of imports and foreign debt payments. In the future, the central bank should be aware of the development of the current account deficit and will continue to strengthen policy coordination with the Government that the deficit down to a sustainable level so that the external balance is maintained. The rupiah in 2012 to depreciate with lower volatility. Rupiah in point-to-point fell 5.91% (yoy) during the year 2012 to the level of Rp9.638 per US dollar. Downward pressure mainly in the second and third quarters of 2012 related to the worsening global economic conditions, particularly in Europe, which contributed to the decrease in foreign portfolio inflows to Indonesia. On the domestic front, the pressure comes from the high amount of foreign currency for the purposes of import demand amid a slowdown in export performance. Rupiah exchange rate moves back stable in the fourth quarter of 2012 due to increased inflows of foreign capital that is large enough, either in the form of capital inflows of portfolio and direct investment.

2. **Industry Analysis Food & Beverage Indonesia 2013 (Industry Updates Mandiri Bank)**

A large number of Indonesian population, backed by purchasing power index increasing every year as well as increased revenues from the middle class into the main thing that encourages the growth of demand for food and beverage products industry. According to the association of Indonesian Food and Beverage Businessman (GAPMMI) predicts the value of the sale of all food and beverage industry in 2013 reached Rp 770 trillion. The size of the potential market, especially from middle-class community groups are expected to encourage consumer spending on food and beverage products. Based on the research of Mc Kinsey predicts that annual public expenditure related to food and beverage products in Indonesia will increase from USD 73 billion in 2011 to USD 194 billion in the year 2030. The increase in the population of middle class income has a very significant effect on the development of food processing industry and drinks where the products that offer the health, comfort and lifestyle is expected to grow significantly with the increase in well-being and lifestyle changes. Lifestyle of middle class society and also the expansion of F & B firms have encouraged consumption of bread, canned food, instant noodles, and so forth. Recorded sales of bread and pastry industry in 2012 amounted to Rp 18 trillion, whereas for canned food products is estimated to reach Rp 4.4 trillion. Instant noodle processing industry in 2012 recorded sales of Rp 20 trillion in which the volume of sales of instant noodles for the year 2013 increased by 10% diekspektasikan. Meanwhile, industry sales reached Rp 11.5 trillion biscuits in 2012, where the chocolate-coated biscuits recorded sales growth of 12% during the year 2012. An increasing number of middle-class community income, changes in lifestyle and the level of awareness of health is getting better, has increased its market milk and yogurt products were estimated in 2012

had sales of Rp 2.4 trillion.

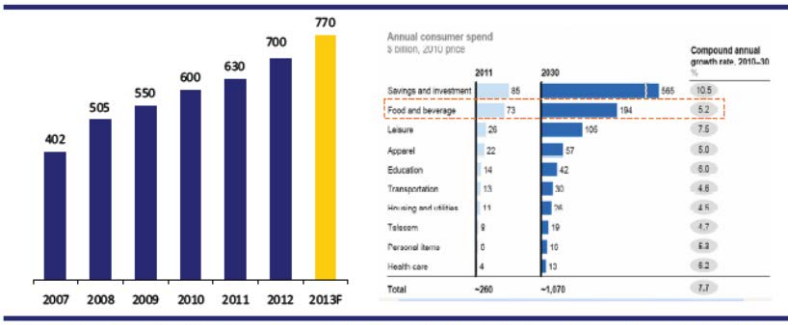


Figure 9. Value of food and beverage sales in IDR tn (left figure). Annual expenditure for food and beverage in USD bn (right figure). (Source: GAPMMI, McKinsey)

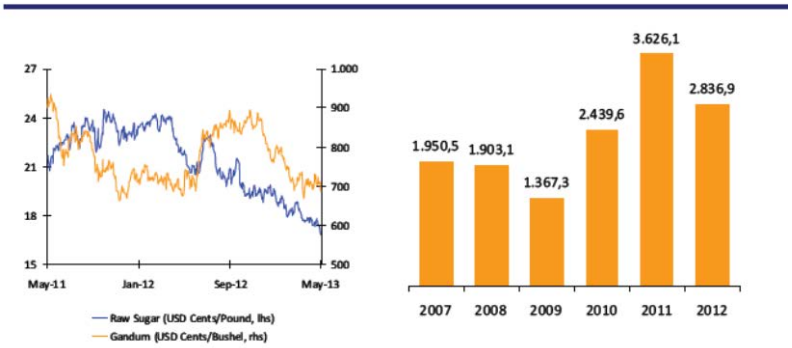


Figure 11. Worldwide raw sugar and wheat prices (left figure). Consumer goods import value of domestic processed food and beverage in USD mn (right figure). (Source: Bloomberg, Ministry of Commerce)

On the production side, industrial F & B was the largest contributor to GDP beyond the oil and gas industry with the share increased from 28.6% in 2005 to 36.3% in 2012. The growth of food and beverage industry in 2013 is targeted at 8%, relatively similar to the realization in 2012 amounted to 7.7%. The number of players in the F & B industry is relatively large, where the number of players with a medium scale company reached 5297 in 2011. Some of the major players in the F & B industry is Indofood, Mayora, Nippon Indosari Corporindo, Ultrajaya, Siantar Top and Empat Sekawan. The raw material cost structure dominates from the F & B industry by 60% -80%. The price of food commodities such as sugar, flour and palm oil in the year 2013 predicted stable and even tends to decrease. In addition, the exchange rate is now likely to depreciate throughout the year 2013. Another challenge faced by the F & B industry is an increase in the minimum wage and the cost structure of the TDL although relatively small (<10%), poor quality of infrastructure still cause disruption in the distribution of raw materials as well as competition from imported food products. GAPMMI estimated import value of F & B in 2013 could reach USD 66 Triyun. Meanwhile, data from the Ministry of Commerce shows that imports of the product F & B throughout the 2007 - 2011 grew about 17% per year.

3. Competition Analysis Industrial Sector

a) Barrier to Entry

To compete in the food and beverage industry in Indonesia, ESS and ESSF Group will face a variety of challenges or obstacles that can be seen as a barrier-to-entry, for example:

- To become a major player in the field of consumer goods it needed a strong business chain from supply of raw materials, production to distribution networks. ESS through ESSF has been experienced for more than 20 years in developing the chain to have such a large-scale effort today.

- ESSF is a company that has a good reputation in the industry consumable food and has supported the World Food Programme ESSF began to expand its business further with wrestle Palm Oil.
- ESSF aware of the potential and profitable industry will attract many investors and attract new players to enter in this industry. Therefore, the ESSF has conducted various research already underway to develop and improve the lot of quality products and menperbaiki production processes to more efficiently and effectively. ESSF also plan to do a lot of improvements to facilities and infrastructure to do a lot of improvements to facilities and production infrastructure in anticipation of an increase in production capacity target and preparation for entry into several new food products.

b) The Bargaining Position of Buyers (buyer)

To support its marketing strategy, ESS has a reliable distribution network. Currently ESS has approximately 60 major distributors, outside outlets, which are spread throughout the archipelago. While ESS Food has 174 distributors and more than 62 thousand outlets to market their products. ESS has a long track record of relationships with distributors, and the bargaining power of buyers (buyer) of the ESS has been relatively restrained in view of the ESS has a reputation for providing quality products with increasingly inadequate and implement high quality standards at competitive prices. To support its marketing strategy, ESS also plans to increase the number of distributors.

c) The Bargaining Position of suppliers (suppliers)

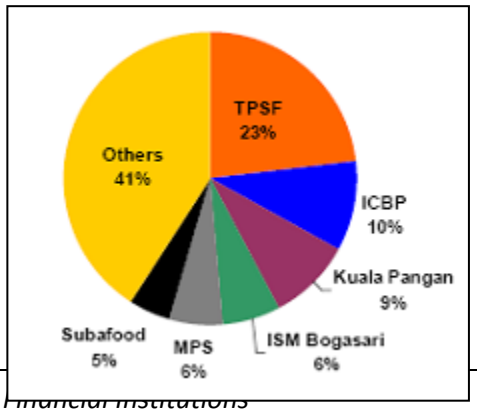
More than 60% of turnover comes from products ESS dried noodles and instant with the main raw material for production is wheat flour. Most of the wheat needs are supplied by national companies, such as Sriboga and Bogasari. ESS has been cooperating for a long time with our suppliers so that relatively no difficulty in maintaining the availability of raw material supply.

d) Goods Substitution

ESS focus on producing basic food, that food products must be processed before consumption. The basic food products manufactured in the form of dried noodles and dried rice noodles and instant noodles and instant rice noodles. Product substitution of dried noodles and dried noodles in the form of food substitutes such as rice-based foods, potato or spagetii produced by other manufacturers. However, especially for dry noodles and dried noodles, ESS has a sizeable market share of 23% so that the possibility of customers switching to other products is relatively small due to the dry noodle brand ESS like chicken noodle stamp 2 egg has become the primary choice of restaurants and food vendors .

e) Conditions of Competition

Especially for kategory basic food produced by the ESS is the market leader in the control of the market share of basic food products in Indonesia. Recorded at the end of 2011, specifically for dry noodles and dried noodles ESS has a market share of 23%. ESS products such as Dried Noodles stamp 2 eggs chicken and dried vermicelli superior has a solid market share among traders processed foods and become the brand of choice for traders to



meet the needs of dried noodles and dried rice noodles. In addition to ESS, there are some large companies that entered into the basic food industry particularly dry noodles and dried noodles, such as Indofood through egg noodles stamp 3 chicken, PT. Kuala Pangan through atomic noodles stamp months and PT. Wijaya Panca Sentosa through egg noodles horse deer. As for instant noodles and instant noodles, the market share of the ESS is relatively very small because they have not been able to compete optimally with the brand - a brand of instant noodles from Indofood, Wings Group, ABC, Nissin, etc.

d. Marketing

1. The products / services that are marketed.

ESS itself produces Basic Food like dried noodles and dried noodles and instant noodles and instant noodles.

The brands produced ESS as follows:

- Dried Noodles: Chicken Noodle stamp 2 doves, Superior, Filtra, Dates, Spider, New Bossmi
- Instant Noodles: Hahamie
- Dried rice noodles : Superior (Putri Agung), Superior (Yumi), Superior (Raja), Tanam Jagung
- Instant rice noodles : Bihunku

In 2005, ESS signed a contract with WFP for the provision of biscuits, but the company that manufactured is PT. Poly Meditra Indonesia (related party - Children ESSF company that specialized in producing Consumer Food) that ESS income from WFP contracts actually is income for PT. Poly Meditra Indonesia. In component ESS sales are sales of other products - but not limited to the sale of raw materials unfit for consumption but does not meet the quality standards of the ESS to a third party.

2. Market Share

Indonesia's population reached about 200 million people and the growth of the Indonesian economy fast enough to provide opportunities for further development of business in group ESSF. In line with the economic growth of the community and eating income disposable income also increased, as seen from the trend of increasing per capita opinion of the Indonesian population from year to year. It is expected to rise in per capita income, the demand for consumer goods, especially food will increase as well. For basic food products especially dried noodles and dried rice noodles of ESS are the market leader with 23% market share. As for instant noodles and instant noodles is still under major manufacturers such as Indofood, Wings Food, ABC Food, etc., so it is still a follower.

3. Actual Sales

ESS sales during the period 2010 - 2012 as follows:

Net Sales	2010	2011	Δ	2012	Δ
Dried and Instant Noodles	312.824	490.500	57%	514.032	4,80%
Dried and instant rice noodles	92.130	119.487	30%	183.512	53,58%
WFP biscuits	135.687	159.449	18%	93.407	-41,42%
Others	36.689	110.241	200%	38.385	-65,18%

Net Sales	2010	2011	Δ	2012	Δ
Subtotal	**577.330**	**879.677**	**52%**	**829.336**	**-5,72%**
Reduced Returns & Pieces Sales	20.549	25.948	26%	19.863	-23,45%
Net Sales	**556.781**	**853.729**	**53%**	**809.473**	**-5,18%**
Proportion	**%**	**%**		**%**	**Avg**
Dried and Instant Noodles	54%	56%		62%	57%
Dried and instant rice noodles	16%	14%		22%	17%
Biscuits	24%	18%		11%	18%
Others	6%	13%		5%	8%
Subtotal	100%	100%		100%	**100%**

Sales in 2012 decreased by 5:18%. This decrease caused by a decrease in sales of 41% of WFP biscuits and other products -Other by 65%. While the core product ESS ie Dried and Instant Noodles and Dried and instant rice noodles and increased by 4.8% and 53%. WFP biscuits decrease due to changes in schedule delivery of goods to Iraq in accordance supply contract with the UN, some delivery schedule is supposed to do in 2012 pushed back to the year of 2013.

4. Marketing Target

Products sold by ESS in the form of Basic Food and biscuits for the contract to the WFP. Basic Food is the kind of products that must be processed before consumption, usually used by traders as a cooking ingredient that they will present to the end consumer. ESSF through ESS has been become the market leader in the field of dried rice noodles and dried noodles in Indonesia with a market share of 28%. Dried Noodles Consumers generally restaurants, catering companies, housewives and street vendors. While dried rice noodles products generally have a target consumers, especially housewives and merchants processed foods.

ESSF through ESS trusted as a supplier of food for a variety of humanitarian programs by the World Food Programme (WFP) since 2005. This has been achieved with full confidence because the company has won the tender which followed the company worldwide to supply products - the food product. The distribution of WFP contract products including Myanmar, Bangladesh, the Philippines, Pakistan and Iraq.

5. Marketing Strategy

Marketing of ESS products distributed through the ESSF as a holding company. The food industry is a dynamic industry in terms of both taste and in terms of demand. In an effort to increase sales of products produced, ESS through ESSF seeks to strengthen the positioning of each product and to differentiate through a strategy of quality and value strategy.

Quality strategy is to provide products with better quality than competitor products resulting in the satisfaction and loyalty of customers. Value strategy adopted is to provide more value for customers through better service and by maintaining an affordable price. In addition ESSF also actively perform various invasions well for products produced or promotion and distribution process. In doing promotion agenda, ESSF kept up trade activity promo and consumer promo. Trade promotion is given in the form of incentives to distribution channels and retail stores. While consumer promotion through marketing campaigns through TV ads, billboards and promos customers.

6. Sales Plan

ESS sales plan for the year 2013 - 2014 is projected quite conservative only by 5% per year, for 2015 of 2.75% per year and for the years 2016 to 2018 there was no growth with the following assumptions:

• Economic growth for the year 2013 based on the assumption of macro state budget in 2013 amounted to 6.3%.
• The composition of the product using the composition in 2012.
• Sales growth in 2010 - 2011 amounted to 53% and for the years 2011 to 2012 decreased by -5%. As mentioned earlier, the decrease in sales is derived from sales decrease biscuits (-41%) and other products (-65%). But for the core product of the ESS dried noodles and dried rice noodles during the years 2011 - 2012 increases respectively 5% and 53%.
• Production of dried and instant noodles are assumed to reach peak production capacity (utilization has reached 90%) in 2015, so that the sale of dried instant noodles years 2016-2018 is assumed to be stagnant.
• Dried and instant rice noodles production are assumed to reach peak production capacity in 2014 so that the sale of instant dry vermicelli years 2015-2018 is assumed to be stagnant.
• No additional production capacity.

With these assumptions, the projected sales 2013 - 2019 as follows:

Items	%	2013	2014	2015	2016	2017	2018
Sales Value		849.946	892.443	937.065	982.201	1.020.511	1.036.384
%		5,0%	5,0%	5,0%	4,8%	3,9%	1,6%
Dried and Instan Noodles	62%	526.806	553.146	580.804	609.844	640.336	648.000
Dried and Instan Rice Noodles	22%	188.072	197.476	207.350	216.000	216.000	216.000
Biscuits	11%	95.728	100.515	105.540	110.817	116.358	122.176
Others	5%	39.339	41.306	43.371	45.540	47.817	50.208

e. Technical Production

1. Location of Project / Business

The location of the factory is located in Jalan ESS Solo - Magelang Km. 7.7, Dagen village, Jaten district., Karanganyar Regency - Central Java Province. While the office center of Empat Sekawan Group / PT. Empat Sekawan Sejahtera Food Tbk is located at Plaza Mutiara 9th floor, CBD Kuningan, Jakarta.

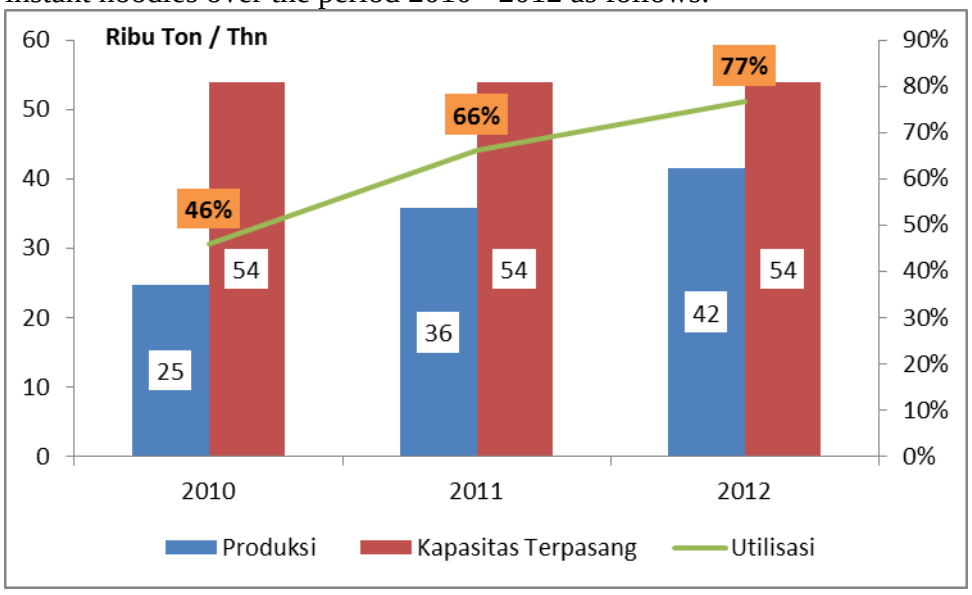
2. Production Capacity and Actual Production

Currently ESS produces 4 types of products namely Dried noodles, instant noodles, dried rice noodles and instant rice noodles. As for the manufacture of such products into four types, ESS has 4 factories which are in one complex, namely:

- Dried Noodles : 8 Line
- Instant Noodles : 4 Line
- Dried Rice Noodles : 7 line
- Instant Rice Noodles and Dried Noodles: 4 line

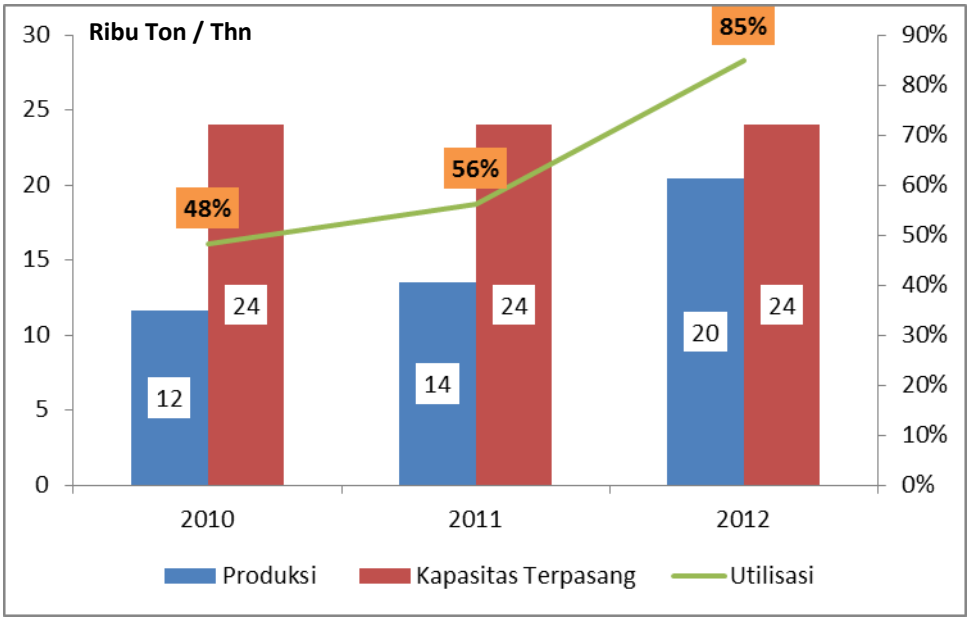
Total Line : 28 line

For Dried noodles and instant noodles, the total capacity of the ESS is by 54 million tons per year. Here is a comparison between the level of production, installed capacity and utilization of dried noodles and instant noodles over the period 2010 - 2012 as follows:



ITEM	2010	2011	2012	CGAR
Sale	312	490	514	28%
% Δ		57%	5%	
Production	25	36	42	29%
% Δ		44%	16%	
Installed Capacity	54	54	54	
Utilization	**46%**	**66%**	**77%**	**29%**

While for dried rice noodles and instant rice noodles, the total capacity of the ESS is of 24 million tons per year. Here is a comparison between the level of production, installed capacity and utilization of products dried rice noodles and instant rice noodles and during the period 2010 - 2012 as follows:

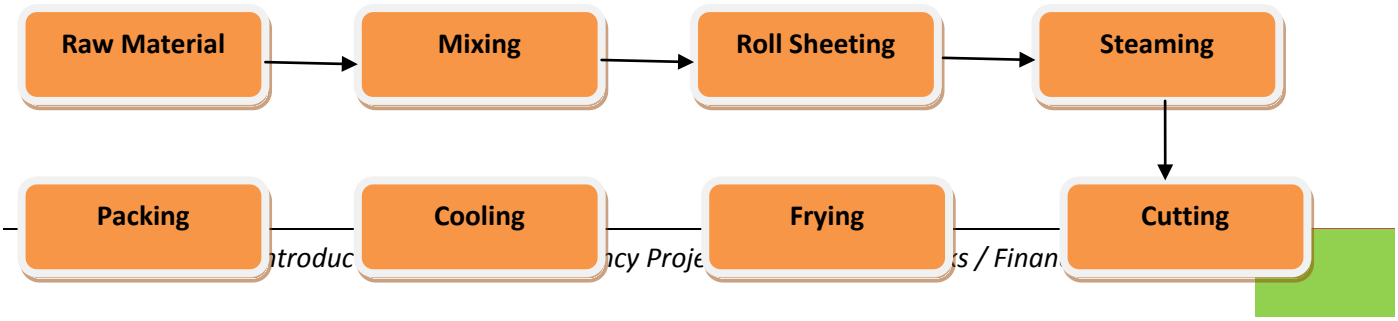


ITEM	2010	2011	2012	CGAR
Sale	92	119	183	41%
% Δ		29%	54%	
Production	12	14	20	33%
% Δ		16%	51%	
Installed Capacity	24	24	24	
Utilization	**48%**	**56%**	**85%**	**33%**

As for products biscuit for WFP, produced by PT. Poly Meditra Indonesia, a sister company under the ESSF Group. Based on customer information, sales of products which is received by ESS Biscuits for WFP transferred to PT. Poly Meditra Indonesia. So that the products are actually manufactured by ESS is just basic food such as dried noodles-instant and dried rice noodles-instant.

3.Production Process

The production process of dry noodles and instant noodles as follows:



Process for the manufacture of noodles and rice noodles in general are the same. The production line can be preceded by pouring ingredients into secrew conveyor flour, mixing (mixing), forming the dough into sheets (roll-sheeting), splitting the sheet into noodle strands (slitting), steam (steaming), cutting and folding (cutting and folding), frying (frying), cooling (cooling) and packing (packing).

4. Raw and Auxiliary Materials

The main raw material for the production of food ESS is wheat flour. Most of the flour needs are supplied by national companies. Other raw material is corn flour, rice, tapioca flour, cooking oil and wheat starch which mainly supplied from domestic and imported fraction among others from Australia, Malaysia and Pakistan. ESS has been cooperating for a long time with our suppliers so that relatively no difficulty in maintaining the availability of raw materials. In addition to the high quality of raw materials, raw materials used also meet the standard requirements of food from the Department of Health and obtain halal certification from the Indonesian Ulema Council.

5. Production Plan

Assuming the sales plan by 5%, then the projection of production during the period 2013-2018 as follows:

Dried and Instant Noodles	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Average Prices	12	12	12	12	12	12
Production	43,901	46,096	48,400	48,400	48,400	48,400
Capacity	54,000	54,000	54,000	54,000	54,000	54,000
Utilization	**81%**	**85%**	**90%**	**90%**	**90%**	**90%**
Dried and Instant Rice Noodles	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Average Prices	9	9	9	9	9	9
Production	20,897	21,600	21,600	21,600	21,600	21,600
Capacity	24,000	24,000	24,000	24,000	24,000	24,000
Utilization	87%	90%	90%	90%	90%	90%

Notes:

- Dried and instant noodles production in 2013 are projected at 43.901 tonnes, increase by 6% compared to the year 2012 amounted to 41.503 tonnes.

- The utilization rate of production of dried instant noodles is projected to reach its top in 2015 in which the utilization rate reached 90% or equal to 48.400 tons per year.
- Dried and Instant Rice Noodles Production in 2013 are projected at 20.897 tonnes, increase of 2% compared to the year 2012 amounted to 20.457 tonnes.
- The utilization rate of production of dried instant rice noodles is projected to reach its top in 2014 in which the utilization rate reached 90% or equal to 21.600 tons per year.

6.Social Aspects and EIA

Most of the raw materials used and processed ESSF derived from agricultural products and other raw materials that are natural. In the production process only slightly waste products produced. Used cooking oil that has been filtered by filtering engine that can be used again, crumb crusts processed food waste from the production process is collected and resold to small traders. Liquid waste from washing process raw materials will be collected prior to processing the UPL.

Based Certificate No. 660.1 / 623-19 / 2007, issued by the Environment Agency dated December 13, 2007 ESS has been doing maintenance on Liquid Waste Disposal Permit. It also has obtained the Certificate of Registration No. LTIPB-SRACCP-020-2006 dated June 12, 2006 on Hazard Analysis and Critical Control Point Food Safety with the scope of the biscuit and wafer stick rank level 1 (one).

2. Quality of Quantitative

a. Analysis of Historical Financial Reports

The financial statements are used to perform quantitative analysis is as follows:

- The financial reports of the position in March 2013 using an inhouse report.
- The financial reports of the year 2012 - 2011 audited by KAP Aryanto, Amir Yusuf, Increase & Saptoto (KAP listed as Partner Bapepam and associates Islamic Development Bank) through reports No.R / 265.AGA / dwd.2 / 2013 dated March 28, 2013 with unqualified opinion.
- The financial reports of the year 2010 - 2011 audited by KAP Aryanto, Amir Yusuf, Increase & Saptoto (KAP listed as Partner Bapepam and associates Islamic Development Bank) through reports No.R / 339.AGA / dwd.1 / 2012 dated April 11, 2012 with unqualified opinion.

(Million Rupiah)

Balance Sheet	Year of 2010	Year of 2011	Year of 2012	Q1 2013
	Audited	Audited	Audited	Inhouse
AKTIVA				
· Current Asset	352.064	515.471	537.129	552.297

Balance Sheet	Year of 2010	Year of 2011	Year of 2012	Q1 2013
	Audited	Audited	Audited	Inhouse
· Net Fixed Asset	309.904	281.288	253.634	248.460
· Non Current Asset	194.682	184.385	234.322	178.180
Total Asset	**856.650**	**981.144**	**1.025.085**	**988.937**
PASIVA				
· Current Liabilities	368.959	455.648	558.564	443.733
· Long Term Liabilities	312.479	287.662	169.368	213.933
· Net Worth	175.212	237.834	297.153	321.271
Total Liabilities + Net Worth	**856.650**	**981.144**	**1.025.085**	**978.937**

ASSETS

• Comparison of Asset Value 2010 – 2011

Total Assets for the year 2011 increased by 15% compared to 2010. The increase was due to significant growth in the current assets by 46%. Where the Current Asset growth was driven by third parties Trade receivables increased by 145% to come from increased AR to PT. Semar Kencana Sejati of Rp 30 billion (2010) to Rp 104 billion (2011) and PT. Tata Makmur Sejahtera (2010) to Rp 65 billion (2011). Although AR increases but AR DOH relatively stable. Increased Trade receivables very signifikant also cause changes in the composition of the previous AR of 16% of assets amounting to 34% of assets. While the Net Fixed Assets decreased by 9% due to no additional assets and diminishing with the increase in accumulated depreciation. Of Non-Current Assets contained a significant increase of the advance on purchases of USD 16 M to USD 41 M in the form of an increase in advances for the purchase of wheat flour and other auxiliary materials as a result of an increase in the purchase of raw materials, where in 2010 the purchase of raw materials amounted to USD 272 billion while in 2011 increased to Rp 360 billion.

• Comparison of Asset Value 2011 - 2012

Total Assets for the year 2012 increased by 4% compared to 2011. The increase was due to significant growth in the current assets amounted to 4%. Where the Current Asset growth was driven by an increase in inventory by 16%, which contributed to the increase in raw material inventory of Rp 140 billion to Rp 160 billion. A significant increase was also due to take place in the affiliated of Rp 135 billion to Rp 185 billion.

• Comparison of Asset Value 2012 - Q1 2013

Total Assets for Q1 2013 decreased by 5%. This decrease is caused due to related parties decreased from Rp 185 billion to Rp 113 billion. There was also a decrease of AR by 5% despite of the total current assets increased by 3%.

LIABILITIES

• Comparison of Value Liabilities 2010 – 2011

Total Liabilities during 2011 increased by 15% compared to 2010. The increase is due to growth both in terms of the total liabilities and net worth. Recorded Total Liabilities increased by 9%, which is sourced from current liabilities increased by 23%, while from the Long Term Liabilities decreased by 8%. Improved Current Liabilities due to the increase of STDs by 14%, 27% and CPLTD tax payable by 175%. Short-term bank loans used for working capital in the form of cash loan, LC for the purchase of raw materials and other Non-Cash Loan, while the company's long-term bank facilities used to finance the factory complex located in the Sepat village, Magelang. Increased Net Worth stood at 36% caused by an increase in retained earnings of the company.

• Comparison of Value Liabilities 2011 - 2012

Total Liabilities during 2012 increased by 4% compared to 2011. This increase is caused by the growth of the Net Worth increased by 25%. In terms of total liabilities decreased by 2%. Although from the Current Liabilities increased by 23%, then from side LTD decreased by 41%. The increase is caused by the AP Current Assets increased by 108% and the tax payable by 83%. While STD only increased by 6%.

• Comparison of Value Liabilities 2012 - Q1 2013

Total Liabilities during Q1 2013 decreased by 5% compared to 2012. This decrease is caused by total liabilities decreased by 10% due to a decrease of 22% Current Liabilities. Of the Net Worth an increase of 6% from the accumulated retained earnings. Here are the details of bank loans during the period Q1 2013 to 2012 as follows:

Details	Limit Q1 2013	O/S		Δ
		2012	Q1 2013	
STD				
Mandiri				
KMK Revolving	120.000	120.000		
KMK Fixed Loan	110.000	110.000	252.200	
LC	170.000	65.798		
Total STD	**400.000**	**295.798**	**252.200**	**-15%**

CPLTD				
Mandiri	280.000	50.000		-100%
Muamalat	100.000	18.559		-100%
Total CPLTD	**380.000**	**68.559**	**-**	**-100%**
LTD				
Mandiri		149.546	187.047	
Muamalat		-	8.423	
LTD Total	**-**	**149.546**	**195.470**	**31%**
Loan Bank Total	**780.000**	**513.903**	**447.670**	**-13%**

PROFIT AND LOSS

(Million Rupiah)

INCOME STATEMENT	Year of 2010	Year of 2011	Year of 2012	Q1 2013
NET SALES	**556,782**	**853,729**	**809,473**	**193,817**
Cost of Goods Sold (COGS)	396,274	606,386	549,388	134,420
Depreciation Expense	32,523	28,129	25,761	5,484
GROSS PROFIT	**127,985**	**219,214**	**234,324**	**53,913**
Sales General & Adm. Expense (SGA)	38,236	59,195	60,303	7,954
Depreciation Expense	2,573	3,006	3,214	818
NET OPERATING PROFIT (NOP)	**87,176**	**157,013**	**170,807**	**45,141**
Other Expense / (Income)				
· Interest Expense	62,341	69,013	62,988	11,393
· Interest Income	(294)	(150)	(209)	(22)
· FX Losses (Gains)	73	43	(25)	(137)
· Sundry Expense (Income)	2,267	11,968	10,889	14,868
NPBT	**22,789**	**76,139**	**97,164**	**19,039**
· Income Tax - Current	6,150	17,349	25,905	4,923

INCOME STATEMENT	Year of 2010	Year of 2011	Year of 2012	Q1 2013
· Income Tax - Deferred				
NPBUI	**16,612**	**62,622**	**72,470**	**14,116**
NPAUI	**16,612**	**62,622**	**72,470**	**14,116**

RATIO	Year of 2010	Year of 2011	Year of 2012	Q1 2013
ROE	9.48%	26.33%	24.39%	4.36%
ROS (RETURN ON SALES)	2.98%	7.34%	8.95%	7.25%
ATO (ASSET TURN OVER)	0.65	0.87	0.79	0.20
ALEV (ASSET LEVERAGE)	4.89	4.13	3.45	3.08
PROFITABILITAS				
· **SALES**	556,782	853,729	809,473	193,933
· **% CHANGE**		53%	-5%	-4%
· **CGS / SALES**	71.17%	71.03%	67.87%	69.31%
· **SGA / SALES**	6.87%	6.93%	7.45%	4.16%
· **NOP**	87,176	157,013	170,807	45,141
· **NOP / SALES**	15.66%	18.39%	21.10%	23.28%
· **NPBUI / SALES**	2.98%	7.34%	8.95%	12.44%
· **NPBUI**	16,612	62,622	72,470	24,116
· **NPBT / SALES**	4.09%	8.92%	12.00%	14.97%
· **NPAUI**	16,612	62,622	72,470	24,116
· **NPAUI / SALES**	2.98%	7.34%	8.95%	12.44%

Notes:

• Sales of customers grew by 53.33% in 2011 but decreased by 5:18% in 2012, primarily due to a reduction in biscuit production line and other production. Biscuit products decreased produced by PT. Poly Meditra Indonesia (afiliated company) which is part of a contract with the World Food Programme.

• Here are the details of sales in 2011-2012 (in millions of Rupiah):

	Sales (Million of Rp)		Growth	Composition	
	2012	2011	%	% 2012	% 2011
Dried and Instant Noodles	514.032	490.500	4,80%	63,50%	57,45%
Dried and Instant Rice Noodles	183.512	119.487	53,58%	22,67%	14,00%
Biscuits	93.407	159.449	-41,42%	11,54%	18,68%
\Others	38.385	110.241	-65,18%	4,74%	12,91%
Subtotal	829.336	879.677	-5,72%	102,45%	103,04%
Reduced return and discount of sales	19.863	25.948	-23,45%	2,45%	3,04%
Net sales	809.473	853.729	-5,18%	100,00%	100,00%

• The decrease in sales is also due to a decrease in sales to the United Nations to the World Food Programme which fell by as much as 63.58% over the previous year. The decrease in sales is due to the change of schedule delivery of goods to Iraq in accordance supply contract with the UN, some delivery schedule is supposed to do in 2012 pushed back to the year 2013. The decrease in sales in 2012 purely because WFP request to change the schedule and promised by ESS because WFP is one of the prime customers of the ESS and to maintain good relations with WFP. According to information from the ESS that this resignation contract only happens for the year 2012, but for the years 2013 to 2014 are still normal.

• The main buyer of customers with net sales value exceeds 10% of total net sales are as follows:

	Sales (in million of Rp)		% towards Net Sales	
	2012	2011	% 2012	% 2011
PT Semar Kencana Sejati	240.086	205.429	29,7%	24,1%
PT Tata Makmur Sejahtera	166.619	132.868	20,6%	15,6%
PT Kereta Kencana Mulia	78.052	58.814	9,6%	6,9%
United Nations for World Food Programme	51.463	141.301	6,4%	16,6%
Total	536.220	538.412	66,2%	63,1%

• The ratio of COGS / Sales in 2010 and 2011 in the range of 71%, down to the size of 67.87% in 2012, while the ratio of SGA / Sales increased to at 8:47% from the previous at 7:45%. Generally cost structure both COGS and SGA relatively stable during the years 2010 - 2012. For Q1 2013 COGS / Sales stood at 69% and SGA / Sales only by 4%.

• ROE in 2012 stood at 24.39% decrease from the year 2011 amounted to 26.33%. This decrease is due NPAUI growth in 2012 of 16% was lower than the growth of net worth by 25%.

• Customer-run business over the last three years is still profitable seen from NPAUI / Sales (ROS) are positive and show an increase over the last three years, ranging from 2.98% to 8.95%.

ASSET EFFICIENCY

ASSET EFFICIENCY	Year of 2010	Year of 2011	Year of 2012	Q1 2013

ASSETS TURNOVER	0,65	0,87	0,79	0,20
A/R DOH	88	141	148	148
INV DOH	194	100	126	138
A/P DOH	41	34	78	82
A/E DOH	3	1	1	2
TRADE CYCLE	239	205	196	202
WORKING INVESTMENT	297.458	435.214	405.317	400.095

Notes:

• Over the past three years, a trade cycle where TC customers tend to decrease in 2010 amounted to 239 days, while in 2012 amounted to 196 days, with asset turnover ranging between 0.65 sd 0.87 times.

• In 2012, A / R and inventory DOH tend to be longer than the previous year, due to the position of accounts receivable and inventory increased, while the value of sales and cost of goods sold were slightly decreased. This is also caused in rotation of A / R and inventory becomes slower.

• While the A / P DOH becomes longer because the position of customer accounts payable increased to two-fold, and the value of goods sold decreased. A / E DOH Value decreased, but not significantly.

• The need for working capital is seen from the value of the Working Investment recorded a slight decline in 2012, due to a decrease in sales and the value of accounts payable and accrued expenses of the customer.

LIQUIDITY & LEVERAGE

LIQUIDITY & LEVERAGE	Year of 2010	Year of 2011	Year of 2012	Q1 2013
CURRENT RATIO	0,95	1,01	0,96	1,20
QUICK RATIO	0,38	0,68	0,62	0,78
DEBT TO EQUITY RATIO	3,48	2,42	1,74	1,40
LEVERAGE	3,98	3,17	2,47	2,09

Notes:

• Liquidity customers in terms of Current Ratio in the range 1, but few showed a decrease in the year 2012 amounted to 0.96 due to the increase in current assets of the company amounted to 4% is still below the growth in current liabilities by 23%, mostly due to an increase in trade payables customers.

• The ratio of DER customers tend to decline over the past three years. In 2012, the ratio of customer DER of 1.74, decrease from a year ago at 2.42 caused a decrease in long-term debt Bank and CPLTD, while increasing customer capital. Decrease DER showed increased customer capital structure and increase the ability of customers to be able to pay its bank debt. Generally, customers leverage position also showed a decrease which represents an increase of capital ability of customers to cover the total liabilities of the company.

DEBT SERVICING ABILITY

DEBT SERVICING ABILITY	Thn 2010	Thn 2011	Thn 2012	Q1 2013
TOTAL FINANCING PAYMENT	-62.341	-130.795	-141.364	-81.359
NOPAT – FP	32.508	36.977	36.421	-47.232
NOPAT / FP	1,52	1,28	1,26	0,54
COPAT – FP	67.603	68.111	65.401	-40.930
COPAT / FP	2,08	1,52	1,46	0,62

NOTES:

• The company's ability to generate cash flow is relatively good. This is reflected from NOPAT produced greater than the Financing Payment to be paid. NOPAT / FP in the year 2012 decreased slightly compared to the size of 1.46 in 2011 at 1.52.

• COPAT / FP during the period 2009 - 2011 always be above 1. This shows the ability of the customer for payment of obligations relatively good banking.

b. Analysis Financial Projections

- **Assumptions**

Post	Realization 2012	2013 -2018	Notes
Sales	Rp. 809 billion	2013 : Rp. 849 Billion 2014 : Rp. 892 Billion 2015 : Rp.917 Billion 2016 : Rp.917 Billion 2017 : Rp.917 Billion 2018 : Rp.917 Billion	Years 2013 - 2014 is projected to increase by 5% per year, then in 2015 increase 2.75%, 2016-2018 stagnant growth assuming full capacity without any increase capacity and relatively fixed price.

Post	Realization 2012	2013 -2018	Notes
INV DOH	148 Days	126 Days	Average of the last 3 years, Special COGS / Sales have incorporated elements of Savings From Energy Efficiency of Rp.6.515 Billion per year.
AR DOH	126 Days	140 Days	
AP DOH	78 Days	51 Days	
AE DOH	1Days	1Days	
Trade Cycle	196 days	213 days	
COGS/Sales	67.87%	69.31% - 70.02%	
SGA/Sales	7.45%	7.08%	
Kurs	USD → Rp 9.800 / USD		

(IDR Million)

BALANCE SHEET	2013	2014	2015	2016	2017	2018
AKTIVA						
· Current Asset	723,932	889,198	1,058,351	1,225,859	1,393,676	1,563,510
· Net Fixed Asset	244,306	207,962	170,687	133,412	96,137	58,863
· Non Current Asset	178,223	178,223	178,223	178,223	178,223	178,223
Total Aktiva	**1,146,461**	**1,275,382**	**1,407,260**	**1,537,494**	**1,668,036**	**1,800,595**
PASIVA						
· Current Liabilities	165,155	168,499	170,428	170,379	168,593	166,808
· Long Term Liabilities	31,054	26,889	23,269	19,698	17,913	17,913
· Net Worth	410,252	539,995	673,564	807,417	941,530	1,075,874
Total Passiva	**1,146,461**	**1,275,382**	**1,407,260**	**1,537,494**	**1,668,036**	**1,800,595**

- AKTIVA
  Total assets from year 2013 to 2019 is likely to increase. Position current assets showed an increase from growth assumptions Trade Receivables and Inventory as a result of the increase in the value of the company's sales (sales in 2013 are projected to grow by 10% compared to the year 2012). In terms of Net Fixed Assets tend to decrease due to the effect of accumulated depreciation of fixed assets.
- PASSIVA

Based on information from the ESS, associated with the publishing of bonds amounting to Rp 900 billion ESSF on April 4, 2013, then on 8 April 2013 ESS repaid all bank debt. The bank loans are repaid a total of Rp 539 522 884 465, - with the details as follows:

- Mandiri Bank amount to Rp 530.972.652.255,-
- Muamalat Bank amount to Rp 8.550.232.210,-

The funds from the ESSF listed as a shareholder subordinated debt.
Whereas in 2013 assumed ESSF get banking facilities of Islamic Development Bank amounting to Rp 15.9 billion facility that is used for Energy Efficiency Project. While Liabilities growth comes from an increase in net worth derived from accumulated retained earnings of the company.

(Million Rupiah)

INCOME STATEMENT	2013	2014	2015	2016	2017	2018
NET SALES	**849,947**	**892,444**	**917,025**	**917,025**	**917,025**	**917,025**
Cost of Goods Sold (COGS)	595,161	618,404	635,617	635,617	635,617	635,617
Depreciation Expense	27,907	31,866	32,673	32,673	32,673	32,673
GROSS PROFIT	**226,878**	**242,173**	**248,735**	**248,735**	**248,735**	**248,735**
SGA	60,206	63,217	64,958	64,958	64,958	64,958
Depreciation Expense	4,265	4,478	4,601	4,601	4,601	4,601
NET OPERATING PROFIT	**162,407**	**174,478**	**179,175**	**179,175**	**179,175**	**179,175**
· Interest Expense	11,610	1,488	1,083	705	358	50
NPBT	**150,797**	**172,991**	**178,092**	**178,471**	**178,817**	**179,125**
· Income Tax - Current	37,699	43,248	44,523	44,618	44,704	44,781
NPAUI	**113,098**	**129,743**	**133,569**	**133,853**	**134,113**	**134,344**

- NET SALES
  Sales for the year 2013 - 2014 is projected to grow by 5% per year. In 2014 projected production capacity of dried rice noodles + instant rice noodles lines peaked so that the projected sales for dried rice noodles + instant rice noodles become stagnant. This is caused sales for 2014 projected to increase by 2.75%. For the 2015 projected production capacity of dried noodles + instant noodles lines reach the top so that the projected sales for dried noodles + instant noodles become stagnant. This is caused sales for the year 2016-2018 is projected no growth.

- COST STRUCTURE
  Cost Structure both COGS / Sales and SGA / Sales for the past three years is relatively stable. COGS / Sales during the period 2010 - 2012 in the range of 68% -71%, the average projection

using COGS / Sales last three years is 70.02%. While SGA / Sales in the range of 7% -an average projection using SGA / Sales last three years that is equal to 7.08%.

- NET OPERATING PROFIT
  Net Operating Profit is projected to continue to increase along with the ability of the ESS to increase sales and keep the cost structure of the company.

- NPAUI
  Along with the increase in the NOP, NPAUI customers also showed an increase from year to year

RATIO	2013	2014	2015	2016	2017	2018
ROE	27.57%	24.03%	19.83%	16.58%	14.24%	12.49%
ROS (RETURN ON SALES)	13.31%	14.54%	14.57%	14.60%	14.62%	14.65%
ATO (ASSET TURN OVER)	0.74	0.70	0.65	0.60	0.55	0.51
ALEV (ASSET LEVERAGE)	2.79	2.36	2.09	1.90	1.77	1.67
PROFITABILITAS						
· **SALES**	849,947	892,444	917,025	917,025	917,025	917,025
· **% CHANGE**	5.00%	5.00%	2.75%	0.00%	0.00%	0.00%
· **CGS / SALES**	70.0%	69.3%	69.3%	69.3%	69.3%	69.3%
· **SGA / SALES**	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%
· **NOP**	162,407	174,478	179,175	179,175	179,175	179,175
· **NOP / SALES**	19.11%	19.55%	19.54%	19.54%	19.54%	19.54%
· **NPBUI**	113,098	129,743	133,569	133,853	134,113	134,344
· **NPBUI / SALES**	13.31%	14.54%	14.57%	14.60%	14.62%	14.65%
· **NPBT / SALES**	17.74%	19.38%	19.42%	19.46%	19.50%	19.53%
· **NPAUI**	113,098	129,743	133,569	133,853	134,113	134,344
· **NPAUI / SALES**	**13%**	**15%**	**15%**	**15%**	**15%**	**15%**

- RETURN ON EQUITY (ROE)
  ROE is projected to decrease caused net worth growth rate over the projection period by an average of 20% per annum greater than the growth rate NPAUI by an average of 14% per year.
- NPAUI / Sales relatively stable at around 15%.

Liquidity and Leverage Ratio Projection

LIQUIDITY & LEVERAGE	2013	2014	2015	2016	2017	2018
CURRENT RATIO	4.38	5.28	6.21	7.19	8.27	9.37
QUICK RATIO	3.00	3.87	4.78	5.76	6.82	7.91
DEBT TO EQUITY RATIO	0.04	0.02	0.01	0.01	0.00	0.00
LEVERAGE	0.48	0.36	0.29	0.24	0.20	0.17

• Current Ration (CR) during the forecast period are projected> 1 and the relative will increase each year.
• DER is projected low, far under the 3 times.

ESS Efficiency Asset Ratio Projection

ASSET EFFICIENCY	2013	2014	2015	2016	2017	2018
TRADE CYCLE	213	213	213	213	213	213
A/R DOH	126	126	126	126	126	126
INV DOH	140	140	140	140	140	140
A/P DOH	51	51	51	51	51	51
A/E DOH	1	1	1	1	1	1
WORKING INVESTMENT	**435,437**	**455,643**	**468,236**	**468,236**	**468,236**	**468,236**

- TRADE CYCLE
  Trade Cycle during the years 2013 - 2019 is projected at 213 days, with the composition of the A / R DOH for 126 days, INV DOH for 140 days, A / P DOH for 51 days and the A / E DOH 1 day.
- WORKING INVESTMENT
  Projection of working capital requirements represented clients from Investment Working relative value continues to increase along with the increase in the customer's business activity.

Repayment Capacity of ESS Projection

DEBT SERVICING ABILITY	2013	2014	2015	2016	2017	2018
NPAUI	113,098	129,743	133,569	133,853	134,113	134,344
NOPAT	128,617	131,231	134,652	134,558	134,471	134,394
COPAT	160,789	167,575	171,927	171,832	171,746	171,669
FINANCING PAYMENT	(81,576)	(5,653)	(5,248)	(4,325)	(3,928)	(1,835)
NOPAT – FP	47,041	125,578	129,404	130,233	130,543	132,559

DEBT SERVICING ABILITY	2013	2014	2015	2016	2017	2018
NOPAT / FP	1.58	23.22	25.66	31.11	34.23	73.23
COPAT – FP	79,213	161,923	166,679	167,508	167,817	169,834
COPAT / FP	1.97	29.65	32.76	39.73	43.72	93.54

- Repayment Capacity

  Repayment capacity of the ESS in terms of value NOPAT / FP and COPAT / FP relatively increasing. During the projection period both NOPAT / FP and COPAT / FP projected> 1.

c. Investment Financing Needs Analysis

1) Purpose Financing Facility

Submission of investment financing is for the purpose of the addition or replacement of equipment at the plant that will produce energy savings for the company. Based on the Investment Grade Audit (IGA) on November 23, 2012 which was conducted by Econoler (ADB Consultant for Energy Efficiency financed using funds from ADB's Technical Assistance) there are six potential savings that can be made in the company, which are as follows:

a. Lighting Retrofit in the production area and office (replacing the lighting system 65)
b. Installation of new insulation for steam pipes, taps steam, boiler feed water tanks and dryer for noodles in Plant 14
c. Temperature control system (temperature controller) that controls the faucet installation of two new steam dryer for 14, aims to improve production control, and reduce the use of steam in the drying process
d. Installation of Variable Speed Drives (VSD) on the motor in the individual fan zone on 14 noodles drying machine
e. Installation of condensing economizers on two main boiler, to boil *make up water* and *condensate return*
f. Repair Condensate Return System to increase the amount of water treated and then returned to the boiler. Aiming to reduce steam production and use of coal

2) Calculation of Investment Financing Facility

		IDR (Million)				USD ($000) @ 9,800			
#	Energy Savings Measure	SAVINGS			Capital	SAVINGS			Capital
	("ESM")	Electric	Thermal	TOTAL	Cost	Electric	Thermal	TOTAL	Cost
1	Lighting Retrofit	73		**73**	**249**	$ 7		**$ 7**	**$ 25**
2	Insulation on Steam System & Dryers		2.917	**2.917**	**12.348**		298	**298**	**1.260**
3	Temperature Control for Dryers		1.555	**1.555**	**4.312**		159	**159**	**440**
4	VSDs on Fans for Dryers	401		**401**	**1.389**	41		**41**	**142**
5	Condensing Economizers		1.231	**1.231**	**3.871**		126	**126**	**395**
6	Condensate Return on Building #3	(49)	454	**405**	**784**	(5)	46	**41**	**80**
	TOTAL	**425**	**6.157**	**6.582**	**22.953**	**$ 43**	**$ 628**	**$ 672**	**$ 2.342**

PROJECT FUNDING:			
Project Construction Cost			22.953
Development Fees			-
Legal and Due Diligence Costs			-
Interest During Construction @		9,5%	545
Guarantee Fees to 3rd Parties			-
Loan Commitment Fee		1,0%	230
Total Financed Amount			23.728
Less Deposits:			-
Total Project Financed Amount			23.728
FINANCED AMOUNT:	Interest Rate	% of Capital	Capital Cost
EIB Debt	9,5%	70%	16.067
Shareholder Loan	0,0%	0%	-
Equity Investment		30%	7.661
TOTAL PROJECT		100%	23.728

• The total investment cost is estimated at USD 2.3 million or equivalent to Rp 22.9 billion, assuming the exchange rate of Rp 9800. Customers planning to make loans denominated in Rupiah. The cost of interest during construction (interest during construction) for 6 months amounting to Rp 545 million will be capitalized into the project cost, bringing the total investment necessary financing to Rp 23.728miliar. On this matter, issue a PIE project cost IDC calculations.
• The portion of Financing Bank planned by 70% of project construction cost, or Rp 16,067 billion, while the remaining Rp 7661 billion, or 30% of the total investment required will be funded by the company (self-financing portion). Interest During Construction facilities are not offered to customers since the amount is not significant as well as the financial condition, cash flow projected ESS very able to pay for the needs of Interest During Construction.
• The proposed facility in the form of investment financing facility financing facilities sub limit LC / SKBDN. Tenor opening LC or proposed SKBDN maximum of 180 days (6 months) and term financing for 60 months from the date of opening LC / SKBDN first.
• Financing proposed in currency IDR at margin level in accordance with the ALCO amount to 9.5%.

3) Risk Mitigation and Energy Efficiency Financing

- In doing financing energy efficiency, conducted Measurement and Verification (M&V) procedures to ensure that energy savings are indicated in the report of the IGA can be achieved, because ideally the energy savings that will be used by the company to pay its obligations to the Bank.
- M&V System to ESS Energy Efficiency Project conducted in 2 steps:

1. **Commissioning** **:** Initial inspection at the end of installation to confirm the performance specifications suitable EE
2. **Mitigation Risks and M & V:** Monitor the performance of EEP during the loan period agreed in the 'Plan for the M & V'.

- Risks in achieving energy savings targets vary depending on the equipment and can be categorized as High, Medium, Low depending on the type of technology and its application.
- Procedures for the specific M & V Energy Efficiency ESS project as follows:

1. Lighting Retrofit

• Initial Testing (Commissioning) - Consultant Team to check a sample of the new lighting system for large confirm watt generated.

• Mitigation Risks and Monitoring (M & V) - The savings gained from the reduced amount of watts of light per hour production. Three possible risks:

	RISK	POSSIBILITIES & MITIGATION		MONITORING
1	Watt savings are not reached	LOW	Watt savings will be in check during comissionging with the possibility of very small changes after commissioning	None
2	Short lamp life	MEDIUM	Risks addressed by the warranty from the vendor	Visual inspection by plant managers
3	Lamp operation time is not accurate	LOW	The risk is responsibled by the client because the client is in full control of the decision	Internally by company

2. INSULATION

• Initial Testing (Commissioning) - Consultant Team will take samples to measure the reduced heat off (heat generated before and after insulation is installed) which led to a reduction of heating equipment and heat that must be generated from coal-fired boilers.

- Mitigation Risks and Monitoring (M & V) - The savings gained from reduced heat off and steam are used per kg of production and impact on expenditure reduction of coal. Three risk among.

RISK	POSSIBILITIES & MITIGATION		MONITORING
1. Reduction of heat that comes out is not reached	LOW	Reduction of heat coming out in the area of the sample will be checked during commissioning	None
2. Physical insulation torn or damaged prematurely	MEDIUM	The risk is borne by the vendor unless the damaged caused by the three pillars which are the responsibility of the Three Pillars	Visual inspection by plant managers
3. Time operation of the equipment is not accurate	LOW	The risk is responsibled by the client because the client is in full control of the decision	Internally by company

3. TEMPERATURE CONTROLLER

• Initial Testing (Commissioning) - Meter for the steam will be installed for each dryer for some time, BEFORE installation, to get a baseline of energy per unit of product in which AFTER installation, the steam temperature will be measured again.

- Mitigation Risks and Monitoring (M & V) - The savings gained from the reduction of steam per kg of production impact on expenditure reduction of coal. Two possible risks are:

RISK	POSSIBILITIES & MITIGATION		MONITORING
1. Thermostat or steam taps are not working	MEDIUM	In the early stages, reduced steam that comes out will be measured during commissioning. If the steam tap (or steam temperature	Checking steam meters

		control sensor performance) and / or the controller does not work, they can be adjusted or replaced by a guarantee from the vendor.	
2. Assumptions kg dryer production inaccurate	MEDIUM	The risk is responsibled by the client because the client is in full control of the decision. The possibility of reducing production affecting small energy savings.	Internally by company

4. VARIABLE SPEED DRIVES

- Initial Testing (Commissioning) - KWH meter recording device is used for one week after the installation of the VSD to measure reduction (kwh) of electricity in the motor based on the baseline (electricity usage per motor current as calculated in IGA).
- Mitigation Risks and Monitoring (M & V) - The savings gained from reduced electricity use per time production recorded. Two possible risks are:

RISK	POSSIBILITIES & MITIGATION		MONITORING
1. VSD and VSD control are not working properly	MEDIUM	After commissioning, the plant staff can determine if the VSD is not working with to see if the fan motor is still continue to work or not. If the VSD does not work it will be repaired / replaced by the supplier with a guarantee.	Staff check intermediate mill motors
2. Dryer operating time is not accurate	MEDIUM	The risk is responsibled by the client because the client is in full control of the decision. The possibility of reducing production affecting small energy savings.	Internally by company

5. CONDENSING ECONOMIZERS

- Initial Testing (Commissioning) - To measure energy savings, Consultant Team will measure the difference of water temperature entering the boiler (make-up water) BEFORE and AFTER installation of equipment.
- Mitigation Risks and Monitoring (M & V) - The savings gained from reduced fuel usage per tonne steam boiler produced. Two possible risks are:

RISK	LIKELIHOOD & MITIGATION		MONITORING
1. Economizer is not working properly	LOW	If the economizer is not working properly, the vendor will repair / replace under warranty.	Measurement of water temperature

2. Boiler steam production estimates are not accurate	LOW	Clients three pillars has a long history in producing steam, it is considered quite reasonable for the consultant team.	Internally by company

6. CONDENSATE RETURN SYSTEM

- Initial Testing (Commissioning) - Consultant Team measure condensate from the flow of water that is returned to the boiler using a flow rate meter is installed for one week - which is used to calculate the reduction of coal by steam from the boiler due to condensate return.
- Mitigation Risks and Monitoring (M & V) - The savings derived from a reduction in coal consumption by the boiler to produce steam. Two possible risks are:

RISK	LIKELIHOOD & MITIGATION		MONITORING
Condensate return system does not work well	LOW	If not working, system will be fixed under warranty by the applicable vendor.	Visual check that no water is dumped down drain at Building #3
Time operation and production of steam from the boiler are not accurate	LOW	Clients three pillars has a long history in producing steam, it is considered quite reasonable for the consultant team.	Internally by company

d. Viability Analysis of Investment Financing

Sensitivity Analysis calculated from Corporate Cashflow (Projected financial reports of PT. Empat Sekawan Sejahtera) as well as from project cash flow of energy efficiency (Discount Factor = 9.5%)

Viability of corporate cashflow ESS

Description	Proj 2013	Proj 2014	Proj 2015	Proj 2016	Proj 2017	Proj 2018
Net Income(1-tax)		97.308	102.331	107.396	111.708	113.588
Interest of bank		1.488	1.083	705	358	50
Depreciation & Amortization Expense		32.172	36.344	38.033	39.742	41.192
Investment Cost	(22.953)					
Proceed (EBITDA)	-	130.967	139.759	146.133	151.808	154.829
Free Cash Flow	(22.953)	130.967	139.759	146.133	151.808	154.829
Accumulation of FCF	(22.953)	108.014	247.773	393.907	545.715	700.544

Description	Proj 2013	Proj 2014	Proj 2015	Proj 2016	Proj 2017	Proj 2018
Year	0	1	2	3	4	5
DF	1,00	0,91	0,83	0,76	0,70	0,64
PV Accumulated FCF	(22.953)	98.643	206.646	300.021	379.585	445.005
PV Proceed	-	119.605	116.560	111.303	105.594	98.352

NPV	**440.742**			
IRR	**576,89%**			
BCR / PI	**24,02**			
Payback Period	**1**	**year**	**2,10**	**months**

Viability Project EEP (USD Thousands)

Based on the calculation of the EEP project viability rate adjustment S (EEP assumption Rp 9,400 / USD to Rp 9,800 / USD) and the adjustment period IRR calculation (EEP Assumptions for 10 years during the 5-year adjusted to suit the tenor of financing), the following is a saving of project EEP project as follows:

	Year	0	1	2	3	4	5	Total
PROJECT SAVINGS			672	678	685	692	699	3.426
Interest Expense of Debt			-149	-122	-91	-58	-21	(441)
Depreciation Expense - Years @	8		-303	-303	-303	-303	-303	(1.515)
Earnings Before Taxes (EBT)			220	254	291	331	375	1.471
Corporate Income Taxes @	25%		-55	-64	-73	-83	-94	(369)
NET PROFIT			165	191	218	249	281	1.104
Depreciation Expense			303	303	303	303	303	1.515
Principal Repayment of EIB Debt			-278	-306	-336	-369	-406	(1.695)
IRR on Equity Investment	14%		190	188	185	182	178	
Investment Cost		(2.342)						
Proceed			672	678	685	692	699	

Free Cash Flow		(2.342)	672	678	685	692	699
Akumulasi FCF		(2.342)	(1.670)	(992)	(307)	385	1.084
DF		1,00	0,91	0,83	0,76	0,70	0,64
PV Akumulasi DF		(2.342)	(1.525)	(827)	(234)	268	689
PV Proceed		-	614	565	522	481	444

NPV	**260**			
BCR/PI	**1,12**			
Payback Period	**3**	**years**	**5,3**	**months**

Notes:

• Based on the viability calculations, this project deserves to be financed as:
  - The resulting NPV of USD 260 thousand or positive
  - BCR / PI> 1
  - IRR is 14% greater than Dicsount factor used by 9.5%

• From this project, ESS could generate a total savings over five years of USD 3.426 million, -, greater than the investment cost only USD 2.342 million, -.

e. Financing Margin

• Application of margin financing to companies with ratings adengan financing period 3 <Year ≤5 years based Minuta ALCO Meeting month June 2013 No.MR.0023 / CEO / 06/2013 dated June 14, 2013 was 9.5% pa

F. OTHERS

Energi Efficiency Financing programs motivated by Non Sovereign Loan Facilities from Asian Development Bank with a total facility of USD 200 million. From USD 200 million, USD 30 million dedicated to financing Energy Efficiency, where ADB also provides funding in the form of a Technical Assistance grant of $ 1.1 million to fund a consultant to assist in the implementation of the IEB of the Energy Efficiency program. Fund of USD 30 million has been withdrawn by the IEB since March 31, 2012 and has been appointed as a consultant Econoler Energy Efficiency ADB since November, 21 2011. Manual for Energy Efficiency was approved in March 2012. The main character of financing Energy Efficiency which distinguishes it from the Corporate Financing in general is that the savings (savings) of the Energy Efficiency Project that will be taken into account as the primary source of financing, regardless of the cash flow of the company in general. The other characters are their stages of Investment Grade Audit (IGA) which is a process to ensure the potential savings that can be made in the company and the investment to be made by the company to produce the savings. IGA process itself is done by EE consultant of ADB, which for the first 5-10 proposed project, the IGA can be financed by a grant from ADB's Technical Assistance.

The advantages that can be obtained by performing financing Energy Efficiency are as follows:

• Capital Energy Efficiency project cost can be paid from savings (savings) is resulted.

• From the resulting savings, will get positive cash flow, which is only used for installment payment obligations, it can also be an additional cash flow for the company.

• The Technical Assistance of ADB assistance to finance the Investment Grade Audit (IGA) which is conducted by consultants EE.
• With the energy savings made in the company will be able to reduce the cost to be incurred by the company on an ongoing basis from year to year, resulting in more production activities efficiently.
• With a more efficient production process, is expected to increase competition in the global level.

While the advantages to be gained IEB in EE financing channel are:
• As a commitment Management on borrowed funds of USD 200 million was disbursed by ADB.
• As one alternative to new products that can be offered to customers IEB.
• IEB is a pilot project financing Energy Efficiency in Indonesia, and it is hoped this step can be followed by other banks.
• It is one of the sources of funds with long tenor and quite competitive interest.
• A growing number of multilateral and donor agencies that offer loans or grant for the purpose of energy efficiency, with success in channeling financing EE IEB is expected to attract more donors and multilateral institutions to channel loans to fund competitive by IEB.

G. COLLATERAL AND COVERAGE

1. Submitted Collateral

No	Guarantee	Location	Certificate		On Behalf Of The	Large	Market Value	Liquidation Value	Binding Value
1	Land Plant	Jl. Solo - Magelang, Desa Dagen, Kec. Jaten	SHM	450&415	Priyo Hadi Sutanto	6,477	8,492	5,944	8,492
2	Machine	Desa Dagen, Jateng			PT.ESS	-	22,953	16,067	22,953
Total Value of Collateral							**31,445**	**22,011**	**31,445**

Notes:

• Fixed Asset Assurance submitted in the form of land plant and machinery / equipment financed by the Islamic Development Bank.

• Land Plant is used as collateral has been assessed by Rizki KJPP Djunaedy & Partners (partner KJJP Development Bank Syariah and Bapepam) No. Report 039 / D / LP.FR / RDR / VI / 2013 dated June 27, 2013.

• land plant that is guaranteed consists of 2 pieces 450 and 415 SHM on be half of the Hadisutanto. Wide each - each SHM is 3,496 m2 (SHM 450) and 2.981m2 (SHM 415) with a total building area of 4,081 m2, located on a street Solo - Magelang 7.7 KM Dagen Village, Jaten District, Karanganyar Regency, Central Java Province.

• Br. Priyo Hadisutanto recorded as an uncle of Br. Stephen Joko Mokoginta as CEO of PT.Empat Sekawan Sejahtera Food Tbk.

• Collateral Land Plant has a market value of 8.492 million rupiah liquidation value of 5.944 million rupiah Binding by using the right mortgage at market value of the collateral.

• Collateral in the form of machine machine / equipment of Islamic Development Bank-financed with a market value of 22 953 million rupiah to the liquidation value of 16,067 million rupiah. Binding of using Fiducia at market value of the collateral.

2. Security Coverage of Financing Facility

Facilities	**Limit**		
PIE - ESS	16,067		
Total Facilities	**16,067**		
Ratios (% on the base of)	**Market Value**	**Liquidation Value**	**Binding Value**
	Ad. Limit	**Ad. Limit**	**Ad. Limit**
Fixed Asset / Total PIE	53%	37%	53%
PIE Engine / Total PIE	143%	100%	143%
Total of Collateral / Total PIE	196%	137%	196%

H. RISKS AND MITIGATIONS

No	Risks Identification	Mitigation
1	**Deviations Purpose Use of Credit Risk**	
	Risk deviation is the intended use of the financing risk arising from financing drawn is not supported by the underlying clear and used for other financing.	Purchases of goods will be done through the opening of LC / SKBDN to the Islamic Development Bank. While financing disbursed by the underlying LC / SKBDN due date. This facilitates ISLAMIC DEVELOPMENT BANK controls to monitor the use of funds.
2	**Risk of Marketing Business**	
	Business risk is the risk arising from the business situation and business conditions that are not conducive among other possibilities to the buyer does not fit the bill scedule and uncollected due to deteriorating financial conditions buyer or project that was stopped by the buyer as a result of global	Although sales in 2012 decreased, but the portion of sales that comes from the ESS core business those are rice noodles and noodles sales continue to rise. This is supported by an extensive distribution network as well as the

	economic conditions are less conducive to will ultimately affect the financial condition of the Customer.	concept of a well-planned marketing.
3	**Returns / Payments**	.
	Business risk resulting from the inability of customers to fulfill their obligations to the Islamic Development Bank.	DER of ESS is considered very low, due in April 2013 ESS pay off the entire debt to Mandiri Bank and Muamalat Bank. Bank charges to be borne only of bank charges of ISLAMIC DEVELOPMENT BANK
4	**Unsuitable Risk Project Output**	
	Risks arising where the savings from the implementation of energy efficiency projects are not as hoped / expected.	There have been reports of Investment Grade Audit (IGA) for energy efficiency projects to the ESS from Econoler as consultants energy efficiency projects funded by ADB. In the IGA report identifies and quantifies the value generated pengehematan ESS when implementing energy efficiency projects and the value of these savings can be used as a way to pay liabilities to ISLAMIC DEVELOPMENT BANK.

WORKSHEET

After reading the proposal of the energy efficiency project financing, discussed in the group the following questions:

1. The condition of the company's current and future growth projections, whether the project is feasible / infeasible?

2.Is the project feasible proposal / bankable to obtain financing from banks / financial institutions?

3. The concept of financing schemes such as whether that is suitable to be applied to the project proposal?

Introduction of Chapter 6
Introduction to Financial Modeling of Energy Efficiency Projects

The Aims	1. Understanding the capital budgeting criteria in a project 2. Able to doing financial modeling on an energy efficiency project.
Time	180 minutes
Methods	1. Lectures by speakers / facilitators 2. Completing the Worksheet through group work 3. Discussion forum and sessions of recommendations
Tools and Materials	Stationery, Projectors, Pointer, Paper Plano and Laptops

Stages Facilitation of Training:

1. Introduction
   The facilitator explains the general purpose, flow and time allocation in this session and provide an explanation for the basis of a checklist of questions that should be asked during the visit of the industry. Then the facilitator invites participants to ask questions and provide input if it is needed. The facilitator divides the discussion groups in proportion to the number of participants (time: 15 minutes)

2. Speakers lecture / Facilitator
   Before participants work in groups, will be conducted a lecture from speaker about capital budgeting criteria in energy efficiency projects, followed by an explanation of the financial modeling of energy efficiency projects. (time: 60 minutes)

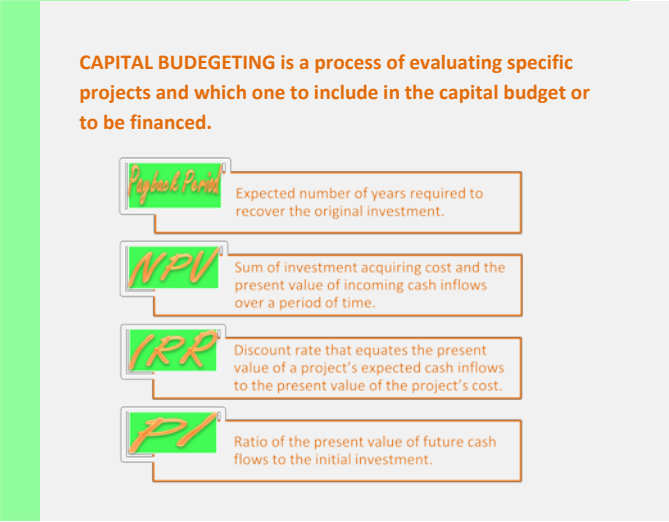
3. Complete the Worksheet in Group
   The facilitator divides the worksheet to each group, and then invite each group to complete the task of financial modeling energy efficiency projects in accordance with the instructions on the existing worksheet (time: 30 minutes)
   The facilitator invites each group to make a presentation on the final results of the discussion groups based on the worksheets provided. (time: 15 minutes)

4. Discussion Forum
   The facilitator guides forum to discuss the work of each group. The facilitator also guides the forum to summarize and find important things and a key point of discussion themes. (time: 60 minutes)

Chapter 6
Introduction to Financial Modeling of Energy Efficiency Projects

1. Capital Budgeting Criteria

Conducting investment needs a thorough analysis in order we can come up with the best investment decision in which the assests we have been invested in, will generate a good cash inflows and a high return on investment. Criteria of feasible investment are subject to master. Capital Budgeting will help the investors to decide the most potential investment or in the case of Energy Efficiency (EE) investments, it helps the investors to decide the most feasible project. Generally, it is a process of evaluating specific projects and which one to include in the capital budget or to be financed. Note that only project which gives more value to the investors will win the financing. Several criteria involved in capital budgeting are Payback Period, Net Present Value (NPV), Internal Rate of Return (IRR), and Profitability Index (PI).



a) Payback Period

The Payback Period is defined as the expected number of years required to recover the original investment. On the other words, Payback Period is the number of years needed to reach break-even point (BEP). Payback Period is formulated as follows:

$$Payback = Year\ before\ full\ recovery + \frac{Unrecovered\ cost\ at\ start\ of\ year}{Cash\ flow\ during\ year}$$

Example: Suppose an investment of $10,000 has following project cash inflows:

Year	Project A	Project B
1	5.000	1.500
2	5.000	2.000
3	2.000	2.500
4	-	5.000
5	-	5.000

How long is the Payback Period?

	Project A		Project B	
Year	Net Cash Flow	Cum Net Cash Flow	Net Cash Flow	Cum Net Cash Flow
0	-10000	-10000	-10000	-10000
1	5000	-5000	1500	-8500
2	5000	**0**	2000	-6500
3	**2000**	2000	2500	**-4000**
4	-	-	**5000**	1000
5	-	-	5000	6000

Payback Period of Project A = **2** + $\frac{\mathbf{0}}{\mathbf{2000}}$ = **2 years**

Payback Period of Project B = **3** + $\frac{\mathbf{4000}}{\mathbf{5000}}$ = **3,8 years**

The shorter the Payback Period, the better the project is. If the project has shorter Payback Period than required, therefore the project should be accepted. The drawbacks attached to this method are:

a. Payback Period method ignores cash flows received after the Payback Period.

   For instance: The $2000 in the third year of Project A is ignored. The $5000 in fifth year of Project B is also ignored and it looks worse than Project A because it has longer Payback Period. Eventhough $5000 is replaced by $50000, it does not influence the decision under Payback Period method.

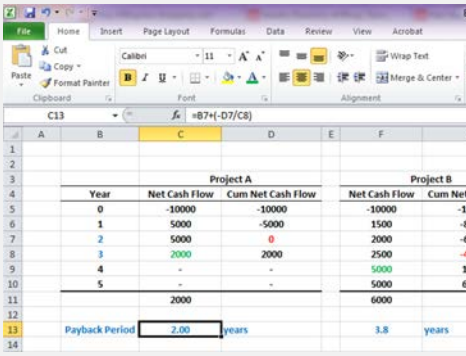
b. Payback Period method ignores time value of money.

Cash inflows of $10.000 investment		
Year	**Project A**	**Project B**
1	9.000	1.000
2	1.000	9.000
3	1.000	1.000

Project A is ranked over B because it generates $9000 in the early return.

Regardless the drawbacks, Payback Period provides information for investor on how long funds will be tied up in a project. It means the shorter the Payback Period, the greater the project's liquidity. This method also provide information of the project's riskiness if the cash flows

Using Excel



1. Insert the data of Net Cash Flow into the table.
2. Calculate the Cummulative Net Cash Flow by addi
   previous year Cummulative Net Cash Flow with th
   current Net Cash Flow. For example:
   Project A Cummulative Net Cash Flow
   Year 0 = -10,000
   Year 1 = -10,000+5000 = -5000
   Year 2 = -5000+5000 = 0
   Year 3 = 0+2000 = 2000
   The year before the first positive amount means t
   the investment is paid back.
3. Select the output cell for the solution. (For
   example, use cell C13.
4. Type "=", klik cell B7, type "(", type "-", klik cell
   type "/", klik cell C8, tipe ")", and press Enter. It
   result 2 which means two years.
   - Cell B7 contains the *year before full recovery*.
     D7 contains *unrecovered cost at start of year*.
     C8 contains *cash flow during the year*.
   - Minus sign is compulsary to eliminate the negat

received in the distant future are riskier than the near cash flows.

b) Net Present Value

Net Present Value (NPV) is the sum of investment acquiring cost and the present value of incoming cash inflows over a period of time. Under this method, all cash flows are estimated and dicounted by the cost of capital. Then, the discounted cash flows are summarized. If the NPV is positive, the project should be accepted, while if it is negative, the project should be rejected.

In practice, managers increase shareholders' wealth by accepting all projects that are worth more than they cost. Therefore, they should accept all projects with a positive net present value. The NPV is formulated as follows:

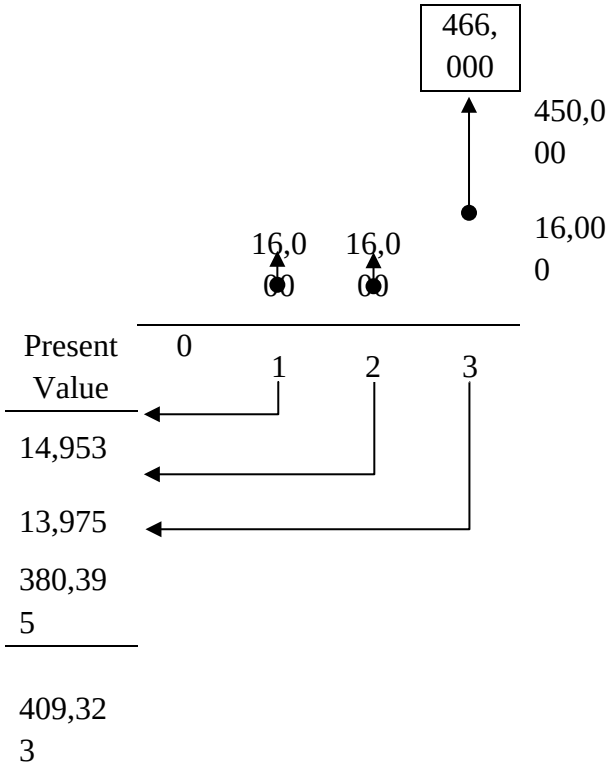
$$NPV = C_0 + \frac{C_t}{(1+r)^t}$$

$$NPV = C_0 + \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \cdots + \frac{C_t}{(1+r)^t}$$

Where:

NPV = Net Present Value
PV = Present Value
C = Cash flows
t = time period of the investment
r = "opportunity cost of capital"

Example:
Suppose you have an opportunity to buy a new building. You will have a lessee who are agree to pay $ 16,000 anually for three years. At the end of third year, you expect to sell the building for $ 450,000. How much you are willing to pay for the building? (expected rete of return = 7%)



The Present Value of the building is $409,323,000

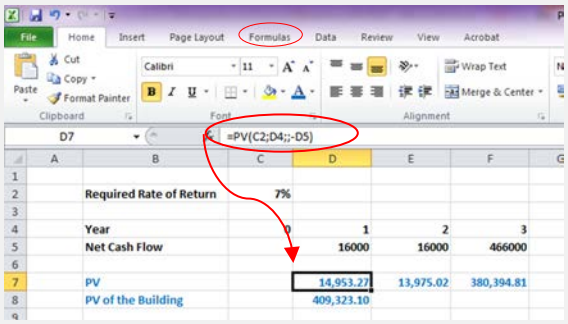
If the building is sold for $350,000 would you pay for that? And how much the added value of your financing?

$$NPV = -350{,}000 + \frac{16{,}000}{(1+07)^1} + \frac{16{,}000}{(1+07)^2} + \frac{466{,}000}{(1+07)^3}$$

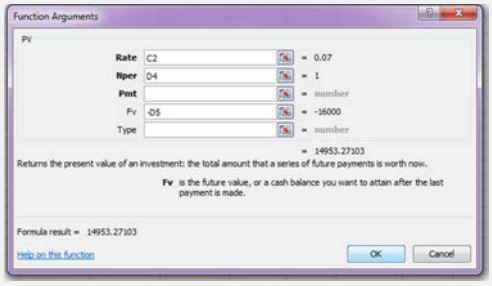
NPV = $ 59, 323.10

Since the number of NPV is positive, then it is better to you to pay for the building.

Using Excel

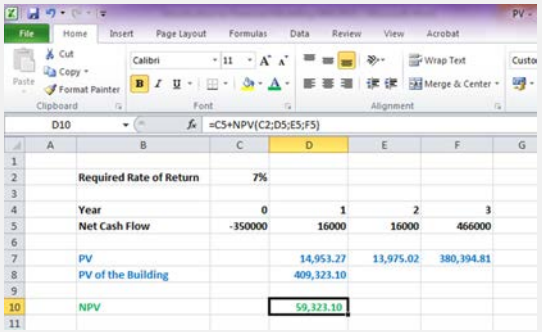


1. Insert the data of Required Rate of Return (7%), Year (1;2; and 3), and Net Cash Flow (16,000; 16,000; and 466,000)
2. Select the output cell for the solution. (For this example, use cell D7.
3. Fine PV formula through tab "Formula". It will appear *Function Argument.*



4. Fill "Rate" with data of Required Rate of Return (7%), "Nper" with data of Year 1 (1), and "Fv" with data of Net Cash Flows of Year 1 (16,000) by minus sign. It will result 14,953.27.
5. Repeat step 4 for Year 2 and 3.
6. Summirize all PV from Year 1 up to 3. It will result PV of the Building which is amounted 409,323.10

When determining the NPV, we can simply substract the PV with the initial investment.
NPV = 409,323.10-350,000=59,323.10,
Or we can also use available NPV formula in the Excel.



c) Internal Rate of Return

The Internal Rate of Return (IRR) is defined as the discount rate that equates the present value of a project's expected cash inflows to the present value of the project's cost.

PV (inflows) = PV (investment cost)

The IRR will make NPV of all cash flow of the project is equal to zero.

IRR – Discount rate at which NPV = 0

The IRR value cannot be derived analytically. Instead, IRR must be found by using *mathematical trial-and-error* to derive the appropriate rate. However, most business calculators and spreadsheet programs will automatically perform this function.

Example:

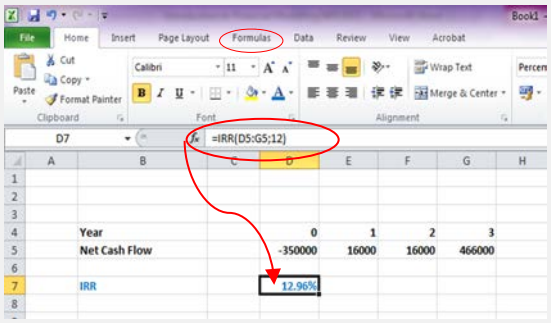
You can purchase a building for $350,000. The investment will generate $16,000 in cash flows (i.e. rent) during the first three years. At the end of three years you will sell the building for $450,000. What is the IRR on this investment?

$$0 = -350{,}000 + \frac{16{,}000}{(1+IRR)^1} + \frac{16{,}000}{(1+IRR)^2} + \frac{466{,}000}{(1+IRR)^3}$$

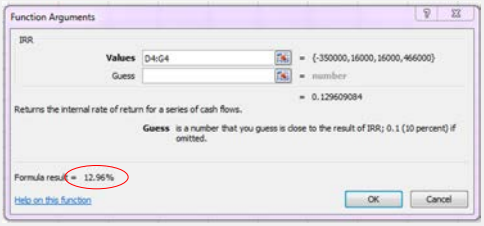
IRR = 12.96%

The IRR reflects the attractiveness of the project. When it exceeds the cost of capital to finance the project, means the surplus is occurred and taking the project in which the IRR is over the cost of capital will increase shareholders' wealth. When it falls below the cost of capital, the project should be rejected.

Using Excel



1. **Insert the data of Net Cash Flow (-350,000; 16,000; 16,000; and 466,000)**
2. **Select the output cell for the solution. (For this example, use cell D7.**
3. **Fine PV formula through tab "Formula". It will appear *Function Argument.***



4. **Fill "Value" with Net cash Flow Data. In this example is D4:G4. It will appear *Formula result* which is 12.96%.**

NPV vs IRR

Understanding of classification of capital budgeting projects plays a crucial role while analyzing viability of projects. In capital budgeting, there are two types of project, which are Independent and Mutually Exclusive Project. Understanding those two is very crucial because it influences the feasibility of the projects under NPV and IRR method.

Independent Project is the one whose cash flows have no impact on the acceptance or rejection of other projects, while Mutually Exclusive Project is a set of projects from which at most one will be accepted. The NPV and IRR will give the same acceptance or rejection decision regarding Independent Projects; however conflict may arises if the project is Mutually Exclusive. The NPV and IRR can be contrary due to:

a. Project size difference. One is larger than another.
b. Time differences of cash flows. One flows at the beginning of the project, while another flows at the end.

If conflicts arise while making decision regarding mutually exclusive projects, the Net Present Value method should be given priority due to its more conservative or realistic reinvestment rate assumption.

d) Profitability Index

Profitability Index (PI) is useful to identify the relationship between the costs and benefits of a proposed project. It allows investors to quantify the amount of value created per unit of investment; therefore it becomes the simple way to rank projects. Profitability Index is formulated as follows:

$$PI = \frac{Present\ Value\ of\ future\ cash\ flows}{Initial\ investment}$$

The rule of thumb is a ratio of 1.0 is the lowest acceptable measure of index. Any value lower than 1.0 indicate that the project's PV is less than the initial investment, means that investors may suffer loss. The higher the PI, the more attractive the project will be.

Project	PV	Investment	Profitability Index
L	4	3	4/3=1.33
M	6	5	6/5=1.20
N	10	7	10/7=1.43
O	8	6	8/6=1.33
P	5	4	5/4=1.25

That is clear that project N should be accepted due to the highest PI.

2. Financial Modelling For Project Evaluation

Financial modelling is a process of constructing mathematical model which represents the real world financial situation. Financial model can be applied to evaluate financial performance of assets, businesses, projects, or any other investments. In addition, the criteria of capital budgeting which have been discribed above are also the basis financial modelling to evaluate the project viability.

The aim of financial modelling in Energy Efficiency (EE) projects is to synchronize perception between creditor and debtor, especially regarding to the project cash flow evaluation. In project financing proposal, debtor uses this financial modelling to describe project's financial performance in order to show the prospect of the project and feasibility level to be financed. The creditor typically uses financial modelling in quantitative analysis to evaluate project financing proposal by the debtor.

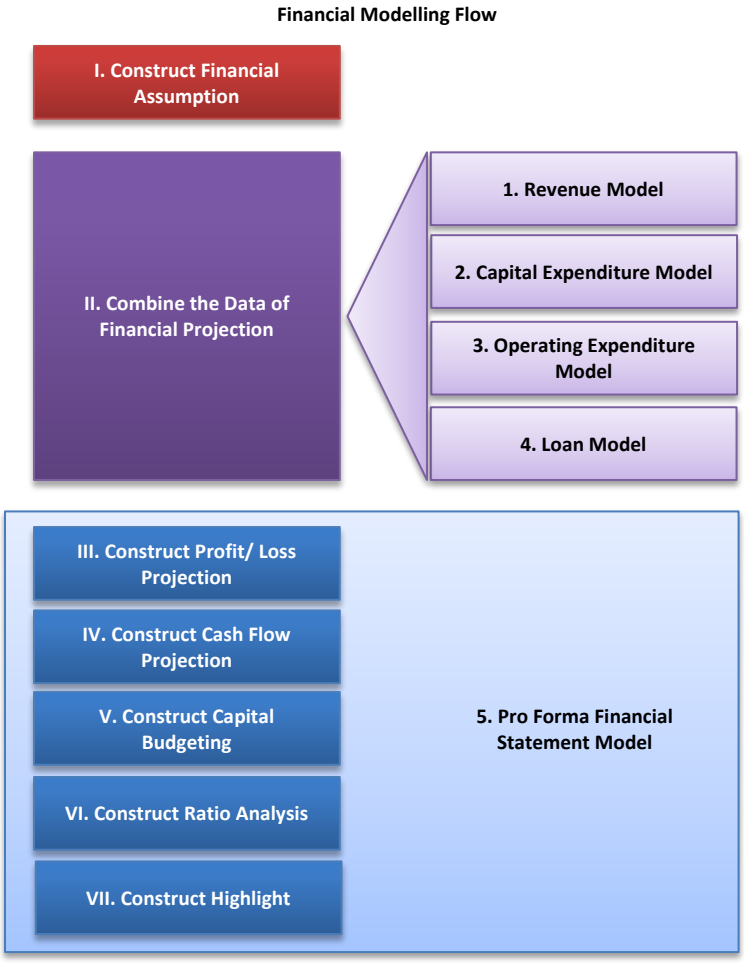


Figure above show Financial Modelling Flow. The first step is generally constructing Financial Assumption, for instance macroeconomic assumption such as foreign exchange, interest rate, and tax; and also company financial assumption such as revenue growth, cost structure, capital expenditure, operating expenditure, etc.

The following step is combining the data of financial projection. The data are the input from:

a) Revenue Model
   Revenue Model describes the projection of revenues, which are cash inflows generated by the project within the investment period.
b) Capital Expenditure (Capex) Model
   Capital Expenditure (Capex) Model describes spending of money to buy fixed assets and other costs to acquire the investments.
c) Operating Expenditure (Opex) Model
   Operation Expenditure (Opex) Model describes spending of money on ongoing basis, which is money used to finance project's operation.
d) Loan Model
   Loan Model describes the annual Loan Repayment amount. It breaks down how much the amount goes to Interest and the amount to pay off the Loan itself.

The following step of financial modelling are constructing Profit/ Loss Projection and Cash Flow Projection which describe planned transaction in the future. Capital Budgeting construction describes the feasibility of the project to be financed and executed. Ratio Analysis informs how good and prospective the financial performance is. Highlight shows the most important number as the result of project evaluation. The results of those processess are contained in Pro Forma Financial Statement Model. On the other words, we can say that Pro Forma Financial Statement is the firth of Revenue Model, Capex Model, Opex Model, and Loan Model. The description of each model will be in the following section through a Case Analysis.

3. Case Analysis

Suppose that a manufacturer is willing to execute 10 years energy efficiency project. This following are information about the project, amount of capital needed, and expected annual cash flow generated from the project.

Project Name	Capital (Rp)	Annual Cash Flow (Rp)
Lighting Retrofit	6,890,000,000	2,785,000,000
Insulation on Steam System	4,760,000,000	687,000,000
Temperature Control	4,570,000,000	2,247,000,000
VSDs on Fans	4,820,000,000	975,000,000
Condensing Economizers	3,760,000,000	2,833,000,000
Condensate Return	7,150,000,000	3,666,000,000

The project will be financed by Loan with 70% of Debt Ratio. The Loan period will be 10 years with 12% of annual Loan Rate and 2% of Loan Provision. The annual cash flow will remain constant and there is no revenue fees and revenue taxes.

Value Added Tax (VAT) is 10% of the Capital Expenditure/ Investment. The manufacturer does not incure land acquisition cost and contingency cost. The assets will be depreciated for 20 years.

Some expenses incured before the project, which are Feasibility Study (0.1% of Investment), Legal Expense (0.1% of Investment), and Launching Expenses (0.2% of Investment). The Commisioning Period is 6 months.

During the project operation, there are operating expenditures incured by the manufacturer. Maintenance Cost is 0.5% of Investment and will increment for 5% every year. There is no Insurance Cost. Those costs are directly attributed to the project.

Indirect costs are Annual Salary (Rp 1,010,648,520), Bonuses, (Rp 84,220,710), Internet (Rp 12,000,000), water (Rp 24,000,000), telephone (Rp 12,000,000), and GA&Admin (1.5% of Indirect Cost). No electricity and contingency cost is incured.

Hurdle Rate of this project is 10% and Income Tax is 25%. By using those information, evaluate the financial performance and the feasibility of the energy efficiency project.

1. Revenue Model

Revenue Model shows an estimated money a project will generate during a specific period. It details each revenue generated by each asset. The amount will be summarized into Total Revenue and will be the input for Profit/ Loss Statement in Pro Forma Financial Statement Model.

The revenue is constant during 10 years. Therefore, finding the amount of Total Revenue is simply by summarizing the Annual Cash Flow of the projects.

Lighting Retrofit	2,785,000,000
Insulation on Steam System	687,000,000
Temperature Control	2,247,000,000
VSDs on Fans	975,000,000
Condensing Economizers	2,833,000,000
Condensate Return	3,666,000,000
TOTAL REVENUE	**13,193,000,000**

Year	1	2	3	4	5	6	7	8	9	10
Lighting Retrofit	2,785,000,000	2,785,000,000	2,785,000,000	2,785,000,000	2,785,000,000	2,785,000,000	2,785,000,000	2,785,000,000	2,785,000,000	2,785,000,000
Insulation on Steam System	687,000,000	687,000,000	687,000,000	687,000,000	687,000,000	687,000,000	687,000,000	687,000,000	687,000,000	687,000,000
Temperature Control	2,247,000,000	2,247,000,000	2,247,000,000	2,247,000,000	2,247,000,000	2,247,000,000	2,247,000,000	2,247,000,000	2,247,000,000	2,247,000,000
VSDs on Fans	975,000,000	975,000,000	975,000,000	975,000,000	975,000,000	975,000,000	975,000,000	975,000,000	975,000,000	975,000,000
Condensing Economizers	2,833,000,000	2,833,000,000	2,833,000,000	2,833,000,000	2,833,000,000	2,833,000,000	2,833,000,000	2,833,000,000	2,833,000,000	2,833,000,000
Condensate Return	3,666,000,000	3,666,000,000	3,666,000,000	3,666,000,000	3,666,000,000	3,666,000,000	3,666,000,000	3,666,000,000	3,666,000,000	3,666,000,000
Revenue Fees	0	0	0	0	0	0	0	0	0	0
Revenue Taxes	0	0	0	0	0	0	0	0	0	0
Total Revenue (Rp)	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**	**13,193,000,000**

Goes to Profit/ Loss Statement in Pro Forma Financial

2. Capital Expenditure Model

Capital Expenditure (Capex) Model describes spending of money to buy fixed assets and other costs to acquire the investments. It details the the amount of specific asset acquired and the amount of other costs, for instance Value Added Tax (VAT), land aquisition cost, contingency cost, etc. The Total Capex is treated as Investment and will be the input for Cash Flow Statement in Pro Forma Financial Statement Model. The total Capex will be constant up to the ending period of investment. In this case we have Capex as follow:

Investment Cost:	
Lighting Retrofit	6,890,000,000
Insulation on Steam System	4,760,000,000
Temperature Control	4,570,000,000
VSDs on Fans	4,820,000,000
Condensing Economizers	3,760,000,000
Condensate Return	7,150,000,000
	31,950,000,000
VAT (10%*31,950,000,000)	3,195,000,000
Land Acquisition Cost	0
Contingency (0%)	0
TOTAL CAPITAL EXPENDITURE	**35,145,000,000** ← **INVESTMENT**

	%	Nominal (Rp))	0	1	2	3	4	5	6	7	8	9	10
Lighting Retrofit		6,890,000,000	6,890,000,000										
Insulation on Steam System		4,760,000,000	4,760,000,000										
Temperature Control		4,570,000,000	4,570,000,000										
VSDs on Fans		4,820,000,000	4,820,000,000										
Condensing Economizers		3,760,000,000	3,760,000,000										
Condensate Return		7,150,000,000	7,150,000,000										
VAT	10%	3,195,000,000	3,195,000,000										
Land Acquisition Cost		0	0										
Contigency	0.00%	0	0										
Total Capital Expenditure			35,145,000,000										
Cummulative Capital Expenditure (Rp)			35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000	35,145,000,000

Goes to Cash Flow Statement in Pro Forma Financial

In pre operation of the project, company may incure several costs for instance feasibility study, legal expenses, commisioning, launching, and other expenses. Those costs are comprised in Pre-Operating Expenses. Beside, there is also Loan Provision if the investment is financed by loan. Pre-Operating Expenses and Loan Provision are comprised into Pre-Operating Expenditure Model, and the amount will remain constant for 10 years. The amount will be the input for Cash Flow Statement in Pro Forma Financial Statement Model.

Debt Ratio = 70%, means that the proportion of Equity and Loan is 30:70 of the Investment.
Equity = 30% x 35,145,000,000 = 10,543,500,000
Loan = 70% x 35,145,000,000 = 24,601,500,000

Pre-Operating Expenses		
Feasibility Study (0.1% x 35,145,000,000)	35,145,000	← 0.1% of Investment
Legal Expenses (0.1% x 35,145,000,000)	35,145,000	← 0.1% of Investment
Commissioning (6/12 x 1,335,737,268)	667,868,634	← 6 months of First Year Operating Expenditure
Launching (0.2% x 35,145,000,000)	70,290,000	← 0.2% of Investment
Other Expenses	0	
Contigency (0%)	0	
Pre-Operating Expenses	**808,448,634**	
Loan Provision (2%x24,601,500,000)	**492,030,000**	← 2% of Loan
TOTAL PRE-OPERATING EXPENDITURE	**1,300,478,634**	

Direct Cost:		
Maintenance Cost (0.5% x 35,145,000,000)	175,725,000	
Insurance Cost	0	
Total Direct Cost		175,725,000
Indirect Cost:		
Salary	1,010,648,520	
Bonuses	84,220,710	
Internet	12,000,000	
Electricity	0	
Water	24,000,000	
Telephone	12,000,000	
Total	1,142,869,230	
GA & Admin (1.50%x1,142,869,230)	17,143,038	
Contingency	0	
Total Indirect Cost		1,160,012,268
Total First Year Operating Expenditure		1,335,737,268

	%	Nominal (Rp)	0	1	2	3	4	5	6	7	8	9	10
Pre-Operating Expenses		808,448,634	808,448,634										
Loan Provision	2.00%	492,030,000	492,030,000										
Total Pre-Operating Expenditure			1,300,478,634										
Cummulative Pre-Operating Expenditure			1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634	1,300,478,634

Goes to Cash Flow Statement in Pro Forma Financial

Once capitalized, assets should be depreciated/ amortized to allocate the costs of fixed assets over the period in which the assets are useable to project. Therefore, the Capital Expenditure and Pre-Operating Expenditure are subject to depreciate and amortize. The Depreciation and Amortization will be the input for Profit/ Loss Statement in Pro Forma Financial Statement Model. In this case, the depreciation period is 20 years. Therefore, each year the Capex and Pre-Operating Expenditure will be depreciated as follow:

Annual depreciation percentage = 100% : 20 years = 5%

The Depreciation and Amortization expenses are:

Capex Depreciation (5% x 35,145,000,000)	1,757,250,000	← 5% of Investment
Pre-Operating Expenditure Amortization (5% x 1,300,478,634)	65,023,932	← 5% of Pre-Operating Expenditure
TOTAL DEPRECIATION AND AMORTIZATION	**1,822,273,932**	

Depreciation/Amortization Period	20	years									
Depreciation/Amortization Schedule	% Depr	1	2	3	4	5	6	7	8	9	10
Capex Depreciation	5.00%	1,757,250,000	1,757,250,000	1,757,250,000	1,757,250,000	1,757,250,000	1,757,250,000	1,757,250,000	1,757,250,000	1,757,250,000	1,757,250,000
Pre-Operating Expenditure Amortization	5.00%	65,023,932	65,023,932	65,023,932	65,023,932	65,023,932	65,023,932	65,023,932	65,023,932	65,023,932	65,023,932
Total Depreciation & Amortization		1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932

Goes to Profit/ Loss Statement in Pro Forma Financial

3. Operating Expenditure Model

Operating Expenditure (Opex) Model describes spending of money on ongoing basis, which is money used to finance project's operation. It may provide information about daily operation efficiency. This model contains:

a. Direct Costs

In the project, Direct Costs are all expenditures directly attributed to the machines/ systems/ intallation. Direct Costs of the project contain of Maintenance and Insurance cost of the assets. In this case, the Maintenance cost is 0.5% of the Investment and and there is no Insurance costs incured.

Direct Cost:

Maintenance Cost (0.5% x 35,145,000,000)	1,757,250,000	← 0.5% of Investment
Insurance Cost	0	
TOTAL DIRECT COST	**1,757,250,000**	← First Year

When the Maintenace Cost increments for 5% in the following years, the Direct Cost structure is following:

1.05 x 1757,250,000 1.05 x 184,511,250 1.05 x 259,262,858

Year	1	2	3	4	5	6	7	8	9	10
Maintenace Cost	**175,725,000**	**184,511,250**	**193,736,813**	**203,423,653**	**213,594,836**	**224,274,578**	**235,488,306**	**247,262,722**	**259,625,858**	**272,607,151**
Insurance Cost	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Direct Cost	**175,725,000**	**184,511,250**	**193,736,813**	**203,423,653**	**213,594,836**	**224,274,578**	**235,488,306**	**247,262,722**	**259,625,858**	**272,607,151**

b. Indirect Costs

In this case, the Indirect Costs comprise of salary, bonuses, internet, electricity, water, telephone, GA&admin, and contingency. The salary expenses may be incured for Plant Head, Supervisor, Engineer, Operator, and Security. This following are Salary Expense table:

Rank	Number of Employee	SALARY COMPONENT				Salary	BPJS	Take Home Pay	PPh 21 (Income Tax)	Gross Salary	Total
		Basic Salary	Managerial Allowance	Phone Allowance	Overtime						
		(Rp.)	(Rp.)	(Rp)	10.00%	(Rp)	2.00%	(Rp)	15.00%		
Plant Head	1	3,000,000	7,000,000	500,000	0	10,500,000	210,000	**10,290,000**	1,543,500	11,833,500	**11,833,500**
Supervisor	3	3,000,000	3,000,000	200,000	0	6,200,000	124,000	**6,076,000**	911,400	6,987,400	**20,962,200**
Engineer	3	5,000,000		100,000	510,000	5,610,000	112,200	**5,497,800**	824,670	6,322,470	**18,967,410**
Operator	6	3,000,000			300,000	3,300,000	66,000	**3,234,000**	485,100	3,719,100	**22,314,600**
Security	3	3,000,000	0		0	3,000,000	60,000	**2,940,000**	441,000	3,381,000	**10,143,000**
Total	16								**Total Salary Expense (per Month)**		**84,220,710** ← Included in Inderect Costs

Indirect Costs:

Annual Salary Expenses (12 x 84,220,710)	1,010,648,520	← 12 x Monthly Salary Expenses
Bonuses	84,220,710	
Internet	12,000,000	
Electricity	0	
Water	24,000,000	
Telephone	12,000,000	
Total	1,142,869,230	
GA & Admin (1.50%x1,142,869,230)	17,143,038	← 1.50% of Total
Contigency	0	
Total Indirect Cost	**1,160,012,268**	

The Indirect Costs is constant during 10 years.

The Direct Costs and Indirect Costs are summarized as Total Operating Expenditure and it will be the input for Profit/ Loss Statement in Pro Froma Financial Statement Model.

Total Operating Expenditure = Direct Costs + Indirect Costs

Year		1	2	3	4	5	6	7	8	9	10
Direct Cost											
Maintenance	0.50%	175,725,000	184,511,250	193,736,813	203,423,653	213,594,836	224,274,578	235,488,306	247,262,722	259,625,858	272,607,151
Insurance	0.00%	0	0	0	0	0	0	0	0	0	0
Total Direct Cost		**175,725,000**	**184,511,250**	**193,736,813**	**203,423,653**	**213,594,836**	**224,274,578**	**235,488,306**	**247,262,722**	**259,625,858**	**272,607,151**
Indirect Cost											
Salary	12	1,010,648,520	1,010,648,520	1,010,648,520	1,010,648,520	1,010,648,520	1,010,648,520	1,010,648,520	1,010,648,520	1,010,648,520	1,010,648,520
Bonuses	1	84,220,710	84,220,710	84,220,710	84,220,710	84,220,710	84,220,710	84,220,710	84,220,710	84,220,710	84,220,710
Internet	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000
Electricity	0	0	0	0	0	0	0	0	0	0	0
Water	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000
Telephone	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000
GA & Admin	1.50%	17,143,038	17,143,038	17,143,038	17,143,038	17,143,038	17,143,038	17,143,038	17,143,038	17,143,038	17,143,038
Contigency	0.00%	0	0	0	0	0	0	0	0	0	0
Total Indirect Cost		**1,160,012,268**	**1,160,012,268**	**1,160,012,268**	**1,160,012,268**	**1,160,012,268**	**1,160,012,268**	**1,160,012,268**	**1,160,012,268**	**1,160,012,268**	**1,160,012,268**

Total Operating Expenditure

Year		1	2	3	4	5	6	7	8	9	10
Annual Operating Expenditure		**1,335,737,268**	**1,344,523,518**	**1,353,749,081**	**1,363,435,922**	**1,373,607,104**	**1,384,286,846**	**1,395,500,575**	**1,407,274,990**	**1,419,638,126**	**1,432,619,419**

Goes to Profit/ Loss Statement in Pro Forma Financial

4. Loan Model

Loan Model is aimed to describe annual Loan Repayment amount. This amount consists of principal loan repaymet and interest. The Loan Repayment will be the input for Cash flow Projection in the Pro Forma Financial Statement Model. We have information that Debt Ratio is 70%, which means that 70% of the Investment is financed by Loan.

Equity (30%x35,145,000,000)	10,543,500,000	← 30% of Investment
Loan (70%x35,145,000,000)	24,601,500,000	← 70% of Investment

Loan Repayment Period	10 years
Loan Rate	12% per year

Loan Provision (2%x24,601,500,000)	492,030,000	← 2% of Loan

Loan Repayment can be formulated as follows:

$$\boldsymbol{PMT = P\frac{r(1+r)^n}{(1+r)^n - 1}}$$

where

PMT= payment amount per period
P = initial principal (loan amount)
r = interest rate per period
n = total number of payments or periods

By using the formula, the annual Loan Repayment:

$$= 24{,}601{,}500{,}000 \frac{12\%(1+12\%)^{10}}{(1+12\%)^{10}-1} = 4{,}354{,}075{,}919$$

The Loan Repayment will be breakdown into Principal Loan Repayment, which will go to Cash Flow Statement in Pro Forma Financial Statement Model and Interest which will go to Profit/ Loss Statement in Pro Forma Financial Statement Model. Eventhough the annual payment is fixed, the amount of money paid to Interest varies each year. The remaining amount is used to pay off the loan itself.

For the first payment, we already know the annual Loan Repayment amount is 4,354,075,915. To determine how much that goes toward Interest, we mulitply the Loan by annual interest rate.

First Year Interest = 12% x 24,601,500,000 = 2,952,180,000

The amount goes to Principal Loan Repayment is the Loan Repayment minus Interest.

First Year Principal Loan Repayment = 4,354,075,915 - 2,952,180,000 = 1,401,895,915

So, after the first repayment, the remaining Loan is decreased by 4,354,075,915 and amounted 23,199,604,085.

Outstanding Loan = 24,601,500,000 – 4,354,075,915 = 23,199,604,085

Interest = Loan Rate x Previous Year Ending Balance of Outsatanding Loan

Principal Loan Repayment = Annual Loan Repayment - Interest

Outstanding Loan = Previous Year Ending Balance of Outstanding Loan – Annual Loan Repayment

The second repayment's breakdown is similar except the Loan balance has been decreased.

Second Year Interest = 12% x 23,199,604,085 = 2,783,952,490

Second Year Principal Loan Repayment = 4,354,075,915 - 2,783,952,490 = 1,570,123,424

Outstanding Loan = 23,199,604,085 – 4,354,075,915 = 21,629,480,661

Months	0	1	2	3	4	5	6	7	8	9	10
Disbursed Loan	24,601,500,000										
Loan Provision	492,030,000										
Outstanding	24,601,500,000	24,601,500,000	23,199,604,085	21,629,480,661	19,870,942,426	17,901,379,602	15,695,469,240	13,224,849,634	10,457,755,676	7,358,610,442	3,887,567,781
Interest	**0**	**2,952,180,000**	**2,783,952,490**	**2,595,537,679**	**2,384,513,091**	**2,148,165,552**	**1,883,456,309**	**1,586,981,956**	**1,254,930,681**	**883,033,253**	**466,508,134**
Principal Loan Repayment	**0**	**1,401,895,915**	**1,570,123,424**	**1,758,538,235**	**1,969,562,823**	**2,205,910,362**	**2,470,619,606**	**2,767,093,958**	**3,099,145,233**	**3,471,042,661**	**3,887,567,781**
Accumulated Loan Repayment	0	1,401,895,915	2,972,019,339	4,730,557,574	6,700,120,398	8,906,030,760	11,376,650,366	14,143,744,324	17,242,889,558	20,713,932,219	24,601,500,000

Goes to Profit/ Loss Statement in Pro Forma Financial

Goes to Cash Flow Statement in Pro Forma Financial

5. Pro Forma Financial Statement Model

Company constructs Pro Forma Financial Statement to provide information of planned transaction in the future. It summarizes the projected company's financial condition. It consists of Profit/ Loss Statement, Cash Flow Statement, Project Valuation, Financial Ratios, and Summary of Feasibility Study. Data from Revenue Model, Capex Model, Opex Model, and Loan Model become the input for Pro Forma Financial Statement. Pro Forma provides better understanding of operating results for the investors.

a. Profit/ Loss Statement

This model is aimed to evaluate Net Income generated from the investment. It provides information for the investor regarding to the profit that the investor may earn during the investment period.

Net Income = Revenue – Total Operating Expense + Financial Income – Income Tax

where:

- Revenue is simply the Total Revenue.
- Total Operating Expense consists of Operating Expenditure added by Depreciation & Amortization.
- Financial Income consist of Interest Income minus Interest Expense. When there is no Interest Income or the amount is less than Interest Expense, it will result negative amount of Financial Income and it will reduce Operating Income.
- Income Tax is tax rate multiplied by Earning Before Tax (EBT).

The Total Revenue minus Total Operating Expense results Operating Income. Total Revenue is taken from Revenue Model. Operating Expenditure is taken from Opex Model. Depreciation & Amortization is taken from Capex Model.

Operating Income = Total Revenue – Total Operating Expense

The Total Operating Expense is the amount of Operating Expenditure added by Depreciation & Amortization.

First Year Operating Income = 13,193,000,000 – (1,335,737,268 + 1,822,273,268) = 10,034,988,800, and so forth.

Year	0	1	2	3	4	5	6	7	8	9	10
Revenue											
Total Revenue		13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000
Operating Expense											
Operating Expenditure		1,335,737,268	1,344,523,518	1,353,749,081	1,363,435,922	1,373,607,104	1,384,286,846	1,395,500,575	1,407,274,990	1,419,638,126	1,432,619,419
Depreciation & Amortization		1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932
Total Operating Expense		3,158,011,200	3,166,797,450	3,176,023,013	3,185,709,853	3,195,881,036	3,206,560,778	3,217,774,507	3,229,548,922	3,241,912,058	3,254,893,351
Operating Income		**10,034,988,800**	**10,026,202,550**	**10,016,976,987**	**10,007,290,147**	**9,997,118,964**	**9,986,439,222**	**9,975,225,493**	**9,963,451,078**	**9,951,087,942**	**9,938,106,649**

Taken from Revenue Model

Taken from Opex Model

Taken from Capex Model

The Operating Income minus Financial Income results Earning Before Tax (EBT). The Financial Income is Interest Income minus Interest Expense. In this case, Financial Income is negative since there is no Interest Income generating from the project. The Interest Expense is taken from Loan Model.

Earning Before Tax = Operating Income + Financial Income

The Financial Income is the amount of Interest Income – Interest Expense.

The First Year EBT = 10,034,988,00 – 2,952,180,000 = 7,082,808,800, and so forth.

Year	0	1	2	3	4	5	6	7	8	9	10
Operating Income		**10,034,988,800**	**10,026,202,550**	**10,016,976,987**	**10,007,290,147**	**9,997,118,964**	**9,986,439,222**	**9,975,225,493**	**9,963,451,078**	**9,951,087,942**	**9,938,106,649**
Financial Income / Expense											
Interest Income											
Interest expense		2,952,180,000	2,783,952,490	2,595,537,679	2,384,513,091	2,148,165,552	1,883,456,309	1,586,981,956	1,254,930,681	883,033,253	466,508,134
Financial Income		**(2,952,180,000)**	**(2,783,952,490)**	**(2,595,537,679)**	**(2,384,513,091)**	**(2,148,165,552)**	**(1,883,456,309)**	**(1,586,981,956)**	**(1,254,930,681)**	**(883,033,253)**	**(466,508,134)**
Earnings Before Taxes (EBT)	0	7,082,808,800	7,242,250,060	7,421,439,308	7,622,777,056	7,848,953,412	8,102,982,913	8,388,243,537	8,708,520,397	9,068,054,689	9,471,598,515

Taken from Loan Model

Earning Before Tax (EBT) minus Income tax results Net Income. In this case, Income Tax is 25% of the EBT.
Income Tax = 25% x EBT
For example, First Year Income Tax = 25% x 7,082,808,800 = 1,770,702,200, and so forth.

Net Income = Earning Before Tax – Income Tax

First Year Net Income = 7,082,808,800 - 1,770,702,200 = 5,312,106,600, and so forth,

Year	0	1	2	3	4	5	6	7	8	9	10
Earnings Before Taxes (EBT)	0	7,082,808,800	7,242,250,060	7,421,439,308	7,622,777,056	7,848,953,412	8,102,982,913	8,388,243,537	8,708,520,397	9,068,054,689	9,471,598,515
Income tax		1,770,702,200	1,810,562,515	1,855,359,827	1,905,694,264	1,962,238,353	2,025,745,728	2,097,060,884	2,177,130,099	2,267,013,672	2,367,899,629
Deffered tax											
Net Income	**0**	**5,312,106,600**	**5,431,687,545**	**5,566,079,481**	**5,717,082,792**	**5,886,715,059**	**6,077,237,185**	**6,291,182,653**	**6,531,390,298**	**6,801,041,017**	**7,103,698,887**

This following is Profit/ Loss Statement table.

PROFIT & LOSS											
Year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Revenue											
Total Revenue		13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000	13,193,000,000
Operating Expense											
Operating Expenditure		1,335,737,268	1,344,523,518	1,353,749,081	1,363,435,922	1,373,607,104	1,384,286,846	1,395,500,575	1,407,274,990	1,419,638,126	1,432,619,419
Depreciation and amortization		1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932
Total Operating Expense		3,158,011,200	3,166,797,450	3,176,023,013	3,185,709,853	3,195,881,036	3,206,560,778	3,217,774,507	3,229,548,922	3,241,912,058	3,254,893,351
Operating Income		**10,034,988,800**	**10,026,202,550**	**10,016,976,987**	**10,007,290,147**	**9,997,118,964**	**9,986,439,222**	**9,975,225,493**	**9,963,451,078**	**9,951,087,942**	**9,938,106,649**
Financial Income / Expense											
Interest Income											
Interest expense		2,952,180,000	2,783,952,490	2,595,537,679	2,384,513,091	2,148,165,552	1,883,456,309	1,586,981,956	1,254,930,681	883,033,253	466,508,134
Financial Income		**(2,952,180,000)**	**(2,783,952,490)**	**(2,595,537,679)**	**(2,384,513,091)**	**(2,148,165,552)**	**(1,883,456,309)**	**(1,586,981,956)**	**(1,254,930,681)**	**(883,033,253)**	**(466,508,134)**
Earnings Before Taxes (EBT)	0	7,082,808,800	7,242,250,060	7,421,439,308	7,622,777,056	7,848,953,412	8,102,982,913	8,388,243,537	8,708,520,397	9,068,054,689	9,471,598,515
Income tax		1,770,702,200	1,810,562,515	1,855,359,827	1,905,694,264	1,962,238,353	2,025,745,728	2,097,060,884	2,177,130,099	2,267,013,672	2,367,899,629
Deffered tax											
Net Income	**0**	**5,312,106,600**	**5,431,687,545**	**5,566,079,481**	**5,717,082,792**	**5,886,715,059**	**6,077,237,185**	**6,291,182,653**	**6,531,390,298**	**6,801,041,017**	**7,103,698,887**

Taken from Revenue Model

Taken from Opex Model

Taken from Capex Model

Taken from Loan Model

b. Cash Flow Statement

This model is aimed to evaluate Net Cash Flow each year and Cummulative Net Cash Flows during the investment period. It provides information to the investor regarding the total cash may be earned during the investment period.

Net Cash Flow = Net Income + Depreciation & Amortization + Changes – Principal Loan Repayment

Changes is typically caused by Working Capital change or Investment addition during the investment period. In this case, several items which may cause changes are Cash In From Loan, Proceed from Equity, Investment, Pre-Operating Expenses, and Loan Provision. There are also Cash In from Shareholder or Cash Out to Shareholder. Since there is no Changes, the Net cash Flow is simply the amount of Net Income added by Depreciation & Amortization minus Principal Loan Repayment.

Net Cash Flow = Net Income + Depreciation & Amortization – Principal Loan Repayment

Net Income is taken from Profit/ Loss Statement. Depreciation & Amortization is taken from Capex Model. Principal Loan Repayment is taken from Loan Model. The Cummulative Net Cash Flow is simply the total of previous year Net Cash Flows added by the current year Net Cash Flow.

First Year Net Cash Flow = 5,312,106,600 + 1,822,273,932 – 1,401,895,915 = 5,732,484,617, and so forth.
First Year Cummulative Net Cash Flow = 5,732,484,617
Second Year Cummulative Net Cash Flow = 5,732,484,617 + 5,683,484,617 = 11,416,322,669, and so forth.

This following is Cash Flow Statement table.

CASHFLOW											
Year	0	1	2	3	4	5	6	7	8	9	10
Net Income	0	5,312,106,600	5,431,687,545	5,566,079,481	5,717,082,792	5,886,715,059	6,077,237,185	6,291,182,653	6,531,390,298	6,801,041,017	7,103,698,887
Add Depreciation & Amortization		1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932
Cash In from Loan	24,601,500,000	0	0	0	0	0	0	0	0	0	0
Proceed from Equity	11,843,978,634	0	0	0	0	0	0	0	0	0	0
Investment	(35,145,000,000)	0	0	0	0	0	0	0	0	0	0
Pre-Operating Expenses	(808,448,634)										
Loan Provision	(492,030,000)										
Cash In from Shareholder		0	0	0	0	0	0	0	0	0	0
Cash Out to Shareholder		0	0	0	0	0	0	0	0	0	0
Principal Loan Repayment	0	(1,401,895,915)	(1,570,123,424)	(1,758,538,235)	(1,969,562,823)	(2,205,910,362)	(2,470,619,606)	(2,767,093,958)	(3,099,145,233)	(3,471,042,661)	(3,887,567,781)
Net Cash Flow	0	5,732,484,617	5,683,838,052	5,629,815,177	5,569,793,900	5,503,078,628	5,428,891,511	5,346,362,626	5,254,518,996	5,152,272,287	5,038,405,037
Cummulative Cash Flow	**0**	**5,732,484,617**	**11,416,322,669**	**17,046,137,847**	**22,615,931,746**	**28,119,010,375**	**33,547,901,886**	**38,894,264,512**	**44,148,783,508**	**49,301,055,795**	**54,339,460,832**

Taken from Profit/ Loss Stament

Taken from Capex Model

Taken from Loan Model

c. Project Valuation

The Project Valuation is aimed to evaluate the feasibility of the project whether it should be executed or not, moreover to be financed or not. This model will use Capital Budgeting criteria as discussed in the beginning of this chapter. The Net Cash Outflow is simply the sum of Investment, Pre-Operating Expense, and Loan Provision. The Net Cash Inflow is the sum of Net Income and Depreciation & Amortization during the year.

Net Cash Outflow = 35,145,000,0

Net Cash Outflow = Investment + Pre-Operating Expense + Loan Provision

Net Cash Inflow = Net Income + Depreciation & Amortization

First Year Net Cash Inflow = 5,312,106,600 + 1,882,273,932 = 7,134,380,532, and so forth.

VALUATION											
Year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Net Income		5,312,106,600	5,431,687,545	5,566,079,481	5,717,082,792	5,886,715,059	6,077,237,185	6,291,182,653	6,531,390,298	6,801,041,017	7,103,698,887
Add depreciation		1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932	1,822,273,932
Total		7,134,380,532	7,253,961,476	7,388,353,413	7,539,356,723	7,708,988,991	7,899,511,117	8,113,456,585	8,353,664,229	8,623,314,948	8,925,972,818
Cash In	0	0	0	0	0	0	0	0	0	0	0
Cash Out	(36,445,478,634)	0									
Total	(36,445,478,634)	0	0	0	0	0	0	0	0	0	0
Net Cash Flow	**(36,445,478,634)**	**7,134,380,532**	**7,253,961,476**	**7,388,353,413**	**7,539,356,723**	**7,708,988,991**	**7,899,511,117**	**8,113,456,585**	**8,353,664,229**	**8,623,314,948**	**8,925,972,818**

In order to evaluate the project, we are going to use Capital Budgeting Criteria as discussed in the beginning of this chaper.

- **The Net Present Value (NPV)**

  The NPV is the sum of Net Cash Outflow and Present Value of the 10 years Net Cash Inflows. The hurdle rate for the project is 10%, therefore the NPV can be calculated as follows:

$$NPV = -36{,}445{,}478{,}634 + \frac{7{,}134{,}380{,}532}{(1+10\%)^1} + \frac{7{,}253{,}961{,}476}{(1+10\%)^2} + \cdots + \frac{8{,}925{,}975{,}972{,}818}{(1+10\%)^{10}}$$

  Simply by using *Excel* application, we can find the NPV which is amounted 11,140,544,805. Since the project results a positive NPV, it is feasible to be financed and executed.

- **Internal Rate of Return (IRR)**

  The IRR is the discount rate that equates the present value of a project's expected cash inflows to the present value of the project's cost. The project IRR can be calculated as follows:

$$0 = -36{,}445{,}478{,}634 + \frac{7{,}134{,}380{,}532}{(1+10\%)^1} + \frac{7{,}253{,}961{,}476}{(1+10\%)^2} + \cdots + \frac{8{,}925{,}975{,}972{,}818}{(1+10\%)^{10}}$$

  Simply by using *Excel* application, we can find the IRR which is amounted 16.43%. Since the project results IRR which higher than the hurdle rate, it is feasible to be financed and executed.

- **Profitability Index (PI)**

  The PI allows investors to quantify the amount of value created per unit of investment. The project PI can be calculated as follows:

$$PI = \frac{47{,}586{,}023{,}429}{36{,}445{,}478{,}634} = 1.31$$

We can find the PI which is amounted 130.57% or 1.31. A high amount of PI makes the project is attractive to be financed and executed.

d. Financial Ratios

Financial ratios is aimed to evaluate financial statement. In this case, the Profit/ Loss Statement and Cash flow Statement. It will show us whether the project financial position will be improved or deterioreted. By the ratios, the financial performance will be easy to compare. The ratios used in this evaluation are:

- Debt Service Coverage Ratio, which measures how effectively the project's operation-generated income is able to cover outstanding loan payment. It is formulated as follows: *Operating Income/ (Principal Loan Repayment+Interest Expense).* The higher, the better.
- Interest Coverage Ratio, which measures project's ability to meet interest payments. It is formulated as follows: *Operating Income/ Interest Expense.* The higher, the better.
- Debt Service Ratio, which measures total required loan payment to total operating income. It is formulated as follows: *(Loan Repayment+Interest Expense)/ Operating Income.* The smaller, the better.
- Profit Margin, which measures the amount of net income earned with each dollar of revenue or sales generated. It is formulated as follows: *Net Income/ Total Revenue.* The higher, the better.
- Total Asset Turnover, which measures the efficiency in which the project is deploying the assets. It is formulated as follows: *Total Revenue/ Investments.* The higher, the better.
- Return on Asset, which measures how profitable the project's assets in generating revenue. It is formulated as follows: *Net Income/ Total Assets*, or in this case it can be found by *Net Income/ Investments.* The higher, the better.
- Asset Multiplier, which measures the amount of project's investments which are financed by debtholder relative to shareholder. It is formulated as follows: *Investment/ Proceed from Equity.* The smaller, the better.
- Return on Equity, which measure the ability of the project to generate profits from shareholder investments. Therefore, Investor pays more attention to this ratio. It is formulated as follows: *Net Income/ Proceed from Equity.* The higher, the better.

First Year Debt Service Coverage Ratio = 10,034,988,800/ (1,401,895,915 + 2,952,180,000) = 2.30, and so forth.
First Year Interest Coverage Ratio = 10,034,988,800/ 2,952,180,000 = 3,40, and so forth.

First Year Debt Service Ratio = (1,401,895,915 + 2,952,180,000)/ 10,034,988,800 =43.39%, and so forth.
First Year Profit Margin = 5,312,106,600/ 13,193,000,000 = 40.26%, and so forth.
First Year Total Asset Turnover = 13,193,000,000/ 35,145,000,000 = 37.54%, and so forth.
First Year Return On Asset = 5,312,106,600/ 35,145,000,000 = 15.11%, and so forth.
First Year Asset Multiplier = 35,145,000,000/ 11,843,978,634 = 2.97. and so forth.
First Year Return On Equity = 5,312,106,600/ 11,843,978,634 = 44.85%. and so forth.

This followinng is Financial Ratios table.

FINANCIAL RATIOS											
Year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Debt Service Coverage Ratio		2.30	2.30	2.30	2.30	2.30	2.29	2.29	2.29	2.29	2.28
Interest Coverage Ratio		3.40	3.60	3.86	4.20	4.65	5.30	6.29	7.94	11.27	21.30
Debt Service Ratio		43.39%	43.43%	43.47%	43.51%	43.55%	43.60%	43.65%	43.70%	43.75%	43.81%
Profit Margin		40.26%	41.17%	42.19%	43.33%	44.62%	46.06%	47.69%	49.51%	51.55%	53.84%
Total Asset Turn Over		37.54%	37.54%	37.54%	37.54%	37.54%	37.54%	37.54%	37.54%	37.54%	37.54%
Return On Asset		15.11%	15.46%	15.84%	16.27%	16.75%	17.29%	17.90%	18.58%	19.35%	20.21%
Asset Multiplier		2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97	2.97
Return on Equity		**44.85%**	**45.86%**	**47.00%**	**48.27%**	**49.70%**	**51.31%**	**53.12%**	**55.15%**	**57.42%**	**59.98%**

e. Highlight

The Highlight informs the most important numbers of project financial performance evaluation. This summary helps investors to do quick review of the project feasibility before they go to deeper analysis by evaluating each number insides the models. It lists Hurdle Rate, Income Tax Rate, Total 10 Year Income, Total 10 Year Cash Flow, 10 Year ROE, Internal Rate of Return, Net Present Value, and Profitability Index. Hurdle Rate and Tax Rate is a determined amount. Analyst determines Hurdle Rate by analysis, while Income Tax refers to government regulation.

Hurdle Rate	**10.00%**	← Determined amount from analysis
Income Tax Rate	**25.00%**	← Determined amount and refers to government regulation
Total 10 Year Income	**60,718,221,515**	← The summary of 10 years Net Income
Total 10 Year Cash Flow	**54,339,460,832**	← Cummulative Cash Flow at the end of 10th year
10 Year ROE	**512.65%**	← Total 10 Year Income/ Proceed from Equity = 60,718,221,515/ 11,843,978,634
Internal Rate of Return	**16.43%**	← Capital Budgeting criteria
Net Present Value	**11,140,544,805**	← Capital Budgeting criteria
Profitability Index	**1.31**	← Capital Budgeting criteria

6. Executive Summary

Executive Summary provides general information about the project investment. It shows important numbers from the project's financial performance evaluation. It is typically in the form of Metrics as follows:

a. Project Metric, which lists the project name, type, and annual cash flow which is generated by the project.
b. Investment Metric, which states the Total Investment and the proportion of financing between Equity and Loan.

c. Financial Statement Metric, whichs list project's financial performance during the investment period for instance Profit Margin, Total Asset Turnover, Return on Assets, and Asset Multiplier. It also state expenses such as Income Tax and VAT.
d. Shareholder Metric, which lists important information for shareholder such as Hurdle Rate, Debt Ratio, Average Yearly Income, ROI, IRR, NPV, and PI
e. Loanholder Metric, which lists the important information for loanholder such as Loan Rate, Loan Provision, Annual Payment, Annual Operating Income, Annual Cash Flows, Debt Service Ratio, and Interest Coverage Ratio.
f. Capex Metric, which lists all investment costs and pre-operating cost.
g. Opex Metric, which lists all ongoing cost in the project operation.

This following is Executive Summary table.

PROPOSAL OR ANALYSIS PRESENTATION

When constructing the financial modelling, it starts with calculating the items which will be used in the Pro Forma Financial Statment. It means we construct Loan Model, Capex Model, Opex Model, and Revenue Model before constructing Pro Forma Financial Statment. After all, we pick several important numbers to be included in Executive Summary.

The Presentation will be conversely. It is better to put Executive Summary at the beginning of Presentation to show the big picture and to help the reader to do quick review about the project investment and financial performance. The following is the Pro Forma Financial Statement to show the project feasibility. The other four models are presented at the following.

I. Executive Summary
II. Pro Forma Financial Statement
III. Revenue Model
IV. Capex Model
V. Opex Model
VI. Loan Model

Executive Summary

Project Name	Type	Annual CF	
Lighting Retrofit	Retrofit	2,785,000,000	IDR
Insulation on Steam System	Retrofit	687,000,000	IDR
Temperature Control	Capacity	2,247,000,000	IDR
VSDs on Fans	Retrofit	975,000,000	IDR
Condensing Economizers	Capacity	2,833,000,000	IDR
Condensate Return	Capacity	3,666,000,000	IDR

Shareholder Metric		
Hurdle Rate	10%	per year
Debt Ratio	70%	of Asset
Average Yearly Income	6,071,882,152	IDR
Average Yearly ROI	51.27%	
Internal Rate of Return	16.43%	
Net Present Value	11,140,544,805	IDR
Profitability Index	1.31	

Capex		
Lighting Retrofit	6,890,000,000	IDR
Insulation on Steam System	4,760,000,000	IDR
Temperature Control	4,570,000,000	IDR
VSDs on Fans	4,820,000,000	IDR
Condensing Economizers	3,760,000,000	IDR
Condensate Return	7,150,000,000	IDR
0		
Depreciation Period	20	years
D&A Expenses	1,822,273,932	IDR Annualy
Commisioning Period	6	Months
Feasibility Study	0.10%	of Investments
Legal Expenses	0.10%	of Investments
Launching Expenses	0.20%	of Investments
Pre-op Expenses	808,448,634	IDR

Investment Metric		
Capital Expenditure	35,145,000,000	IDR
Pre-Op Expenditure	1,300,478,634	IDR
Total Investments	36,445,478,634	IDR
Equity	11,843,978,634	IDR
Loan	24,601,500,000	IDR

Loanholder Metric		
Loan Rate	12%	
Loan Provision	2%	upfront
Annual Payment	4,354,075,915	IDR
Annual Operating Income	9,998,688,7683	IDR
Annual Cash Flow	5,433,946,083	IDR
Debt Service Ratio	0.44	
Interest Coverage Ratio	7.18	

Opex		
Maintenance	0.50%	of Investments
Insurance	0.00%	of Investments
Maintenance Increments	5%	annualy
Expenses Increments	0%	annualy
Annual Opex	1,381,037,285	IDR

Financial Statements Metric		
Income Tax Rate	25%	of NI
VAT	10%	
Contigency	0%	
Profit Margin	0.46	
Total Asset Turnover	0.38	
Return on Asset	0.17	
Asset Multiplier	2.97	

***Legend:**

Green Cell	Variable Parameter that can be adjusted
White Cell	Fixed / Calculated Parameter

Worksheet

Analys the project proposal by using financial modeling, as below :

A company will carry out the project of Energy Efficiency (EE) for 10 years . Here is information on the project, the amount of capital required, and the estimated annual cash flow generated by the project .

Project Name	Annual Cash Flow (Rp)	Capital (Rp)
VSDs on pumps	400,000,000	900,000,000
Condensing Economizer	1,200,000,000	3,500,000,000
Compressor Replacement	1,000,000,000	3,000,000,0000
Insulations on Steam System	700,000,000	2,400,000,000

The project will be funded by a loan with a debt ratio of 80 %. The period of the loan is 10 years with an interest rate of 11% per year and loan provision of 2%. The annual cash flow will amount to remain for 10 years and no fee income .

Value Added Tax (VAT) is 10 % of the Cost of Capital. The Company has not issued land acquisition costs and contingency costs. The asset will be depreciated over 20 years .

Some costs incurred prior to the project, namely: Feasibility Study (0.2 % of the investment), Legal Fees (0.1 % of the investment), and Cost of Launching (0.1 % of the investment). Commissioning period is 6 months.

During operation of the project, some of the operating costs incurred by the company. Maintenance costs (maintenance) amounted to 0.4 % of the investment and will increase by 5 % per year. No expense for insurance. These costs are costs attached to the project.

Indirect costs include the Annual Salary (Rp 1,010,648,520), Fees (USD 84,220,710), Internet (Rp 12,000,000), Water (USD 24,000,000), Telephone (USD 12,000,000), and GA & Admin (2 % of indirect costs). There is no electricity and Contingent Fees. Hurdle Rate of the project is 15 % and the income tax is 20 %. Using these information, evaluate financial performance and feasibility of this project!

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