PROJECT FEASIBILITY STUDY AT WASTE MANAGEMENT PROJECT: A CASE STUDY OF NAMBO TPPAS

Fany Yulinda and Erman Sumirat
School of Business and Management
Institute Teknologi Bandung, Indonesia
fany.yulinda@sbm-itb.ac.id

Abstract—The Government of the West Java Province (represented by West Java Waste Management Agency – Badan Pengelola Sampah Regional (BPSR) Jawa Barat) has been overtaken such waste problem by arranging development plan of the Nambo recycling and final processing landfill - Tempat Pengolahan dan Pemrosesan Akhir Sampah Nambo (NAMBO TPPAS). This project is involved into the sanitation priority project in the Private-Public Partnership (PPP) – Kerjasama Pemerintah dan Swasta (KPS) scheme implemented altogether with BAPPENAS. Waste on Nambo TPPAS will be processed into useful products 1. Recycle Material 2. RDF (refuse derived fuel) 3. Compost. These projects are expected to be the solution to the waste problem in the city of Bogor and Depok. This Final Project is to analyze the project feasibility study of development projects nambo TPPAS based on Regulation of Minister of national development planning No. 3 2012. Feasibility study perform by using various indicators of financial feasibility including IRR, NPV and PBP, combined with Sensitivity Analysis, Risk Analysis, and ABMS (analisa manfaat sosial – Social cost benefit Analysis). Based on the analysis of financial and risk positions suggests that development projects can be assessed Nambo TPPAS feasible to be implemented with the assumption that the government provide support in the form of government funding in the beginning of the project. However, the project can’t be assessed only in terms of financial side but must be assessed in terms of the resulting social benefits. These projects generate substantial EIRR. This prompted the government to immediately implement the construction of this project.


1. Introduction

A. Background

Waste has been one of major problems in big cities in Indonesia requiring immediate solution from its government. Nevertheless the capability of city’s official in overtaking waste phenomenon has been decreasing due to the insufficiency of the landfills, insufficient fund and many other problems. Beside that the Constitution of the Republic of Indonesia 2008 Number 18 about Waste Management stated that waste management process must change from the open dumping method to environmentally friendly waste management methods most late in 2013. So the government needs to cooperate with the private sector to helping develop this project. As one of the requirements needed to be made cooperation is project feasibility study document that will assess the feasibility of the project to be implemented.
B. Company Profile

BALAI PENGELOLAAN SAMPAH REGIONAL (BPSR) JAWA BARAT
West Java the Regional Waste Management Center (BPSR) task is the government agency responsible for regional solid waste management especially in West Java Province.

Vision "The realization of final processing Waste Implementation Regional West Java eco-friendly, sustainable and self-sufficient by 2015".

2. Business Issue Exploration

A. Conceptual Framework

B. Method of Data Collection and Analysis

Primary Data
Primary data is data which collected and processed directly from the respondents.

Interview
Interview was conducted with Mr. Dartoyo as a Head of Nambo TPPAS Project, Mr. Asep Winara from BAPPENAS and Team Expert as a team to making feasibility study Nambo TPPAS

Observation
Observation conducted from 15 August 2012 until 20 April 2013. Author become financial consultant member in BPSR in order to find out all data for making feasibility study document. The rest of data are collected as primary and secondary data from related-references such as journals, theses, books, BPSR documents and website.

C. Business Situation Analysis

PESTLE
Political
Regulation and Policies of waste in Indonesia directed by Act of the Republic of Indonesia No. 18 Year 2008 regarding waste management in 2008

Economical
Market demand for waste processing product is high enough for both private consumers and industry

Social
The dynamic and rapidly developing condition of nowadays society contributes directly to waste generation phenomenon

Technological
Many advanced technologies for waste problems handling are available and applied in many developed countries such as composting, RDF, biogas, sanitary landfill, incineration, gasification, and anaerobic digestion technology

Legal
the importance of a clear contractual agreement because this PPP scheme

**Environmental**
Many environmental contamination issues in Indonesia caused by waste piling

### Waste Value Chain

#### D. Project Description

1. **Development Plan**

2. **Technical Aspect**

   Proposed waste treatment technology is a system MBT (Mechanical Biological Treatment) because waste characteristic in Bogor is wet waste.

   ![Diagram showing waste treatment process]

   **Analysis of output**

<table>
<thead>
<tr>
<th>Name of Product</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compost</td>
<td>45.4 ton</td>
</tr>
<tr>
<td>RDF</td>
<td>408.6 ton</td>
</tr>
<tr>
<td>Recycle Material</td>
<td>125 ton</td>
</tr>
<tr>
<td>Landfill</td>
<td>21 ton</td>
</tr>
</tbody>
</table>

3. **Form of Partnership**

   The Build, Operate, and Transfer (BOT) contract is the most appropriate form for these projects because applied for private investment participation in infrastructure development and returned to government ownership after a certain period

**E. Project Feasibility Study**

This Project Feasibility Study based on Regulation of the Ministry of National Development Planning No. 3 Year 2012 which consist of

1. ABMS (Analisa Biaya Manfaat Sosial)
2. Marketing Analysis-with marketing mix
3. Financial Analysis (IRR,NPV,PBP)
4. Tariff Analysis
5. Risk Analysis (Risk Mgt ISO:31000)
3. Business Solution

A. Alternative of Business solution

Investment Planning

![Investment Table]

1. Feasibility Analysis without Government Support
If the government does not provide government support (0%) in the initial investment, the results obtained from the calculation is
The calculation results are
- NPV = -$17,500,680.87 Due to figures obtained NPV is negative, then the project is not feasible.
- IRR = 4.05%. Due IRR lower than the cost of capital (10.67%) then this project is not feasible.
- Payback Period = 17 year 5 month

2. Feasibility Analysis with Government Support
If the support of the government are set in proportion to the planned 60% from total investment. The amount of government support needs to be issued is $25,420,606.97 then the NPV, IRR become greater and payback period become faster.

The calculation results are
- NPV = 25,420,606.97. Due to figures obtained NPV is positive, then the project is feasible.
- IRR = 14.37 Due IRR greater than the cost of capital (10.15%) then this project feasible.
- Payback Period = 6 years 8 months, if compared with the payback period of similar PPP projects that are in the range of 10 years. The payback period is achieved in this project shows that the project can still be said to be feasible to build.

B. Analysis of Business Solution

Financial Feasibility

Project without government support
Conclusions from the results of the calculation of the feasibility study of this project as a whole without government support stated that this project is not feasible to build. This suggests that without the assistance of government is better then the project is not implemented because it would give harm to the private sector will invest

Project with government support
Conclusions from the results of the calculation of the feasibility study of this project in accordance with the prescribed assumptions indicate that the project is feasible. But need financial support from the government with the right amount.

Sensitivity Analysis

Sensit Spider to NPV
Change in Government Support
By making changes in the percentage of government support in the beginning we can draw the conclusion that the greater the percentage of support from the government NPV and IRR generated becomes greater. PBP projects as well as the resulting value becomes significantly faster. Minimal initial investment is expected from the government for its NPV is still positive is 25% or $11,998,291.34 then it will remain the resulting NPV of $ 427,288.26. The change of government support impact to NPV and IRR result can

Sensit Tornado to IRR

From the calculation of sensitivity analysis on NPV and IRR can be concluded that the points tipping fee and government support are the most sensitive points that influence changes in the value of NPV and IRR. Both of these points are determined by the government. Therefore need to know exactly how exact value of affordable government that the project can going concern

Marketing Analysis with “Marketing Mix (4P)”
- Product (Compost, RDF, Recycle Material) with MBT technology
- Price (Compost $27.78, RDF $38.89, Recycle Material $131)
- Promotion – cooperation with various company/institution.
- Place-Store or online

Economic Feasibility Analysis (ABMS) \(\Rightarrow\) This Nambo TPPAS positive effects / benefits of 546.48 billion Rupiah. With EIRR of 18.09% ,ENPV $67,651,872,897.71 and a lot of socio-economic benefits to be gained

Tariff Analysis
After seeing the results of the calculation of tipping fee sensitivity analysis can be inferred that the minimum tipping fee for this project is $ 7.5 / Rp.72,840 (minimum) remains higher than the usual regular tipping fee paid by the government ($5) but the value of the resulting NPV and IRR are too small. The government must have the courage to pay a higher tipping fee. Value tipping fee of $ 12 is quite suitable to be used as the official tariff because the resulting financial indicator value is quite good.
Risk Analysis

<table>
<thead>
<tr>
<th>Risk Identification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal and Regulatory</td>
<td>Change regulation, Sue</td>
</tr>
<tr>
<td>Political &amp; Social</td>
<td>Change government</td>
</tr>
<tr>
<td>Financial</td>
<td>Financing, debt, revenue</td>
</tr>
<tr>
<td>HRM</td>
<td>Accident, scandals</td>
</tr>
<tr>
<td>Technology</td>
<td>Technology change, specification not fit</td>
</tr>
<tr>
<td>Product</td>
<td>Failure product, quality &amp; quantity</td>
</tr>
<tr>
<td>Economy</td>
<td>Economic Crisis</td>
</tr>
<tr>
<td>Operational</td>
<td>Delay in construction</td>
</tr>
<tr>
<td>Market</td>
<td>Change Int. rate, market demand inflation,</td>
</tr>
<tr>
<td>Environment</td>
<td>Pollution</td>
</tr>
</tbody>
</table>

Analysis of Risk Mapping we have done suggests that the position of the risks in this Nambo TPPAS still in the position of "medium risk" even though there are some risks that are in high positions such as market risks, financial and legal / regulatory. Therefore important to perform risk mitigation plan in more depth. Because if the implementation of risk control is not executed as it should be entered into this project with a high risk project.

Risk Mitigation

Divide and clearly specify the role of the contractual agreement between the government and the private sector related to responsibility if there is risk of loss arising from violations of laws and regulations. Beside that we can mitigate with various tools such as Insurance, payment penalty hedging, warranty, management control, assurance from PT.PII, etc

4. Implementation Plan

Conclusion

This project can be assessed feasible if the government is willing to provide government support, but returns profits generated is not large. But NAMBO TPPAS development cannot be seen in terms just from financial side but must be seen also from the socio-economic side. Many social benefits that could be obtained if the project is executed.

Implementation Plan

- Selection PPP Partner
- Construction Management
References

Regulation of the Ministry of National Development Planning No. 3 Year 2012 “General guidelines for the implementation of the government’s cooperation with private sector in the provision of infrastructure “.
Law of Republic of Indonesia No.18 Year 2008 about waste management
Damodaran Website. 2013. Country Default Spread and Risk Premium. Available at: www.stern.nyu.edu/~adamodar/ [Accesed on 20April 2013]
Bank Indonesia Website. 2013. SBI rste,Interest Rate. Available at: www.bi.go.id [accesed on 20April 2013]