DSIF Investment Proposal
Danida Programme Committee

Lombok Biomass Energy Project
Indonesia
Date:7 February, 2023

UDENRIGSMINISTERIET
Danida

INVESTMENT FUND FOR DEVELOPING COUNTRIES

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Udenrigsministeriet / GDK

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Project summary

Nusa Tenggara Barat Province Government has requested Danida Sustainable Infrastructure Finance (DSIF) to consider funding a biomass energy plant on Lombok. The project builds on the Strategic Sector Cooperation (SSC) programme for the Energy Sector between Indonesia and Denmark, where the partners chose Lombok as a pilot area to study how the increase in electricity demand can be met in a cost-efficient and sustainable way. Denmark has earlier supported the Government of West Nusa Tenggara Province (NTB), of which Lombok belongs, in energy planning and in the elaboration of a pre-feasiblity study for investments in different types of renewable energy (RE) in Lombok.

A preliminary Biomass Assessment Report commissioned by DSIF covering availability of biomass in Lombok concluded that there is sufficient agricultural waste available for a 20-40 MW powerplant ("the Project"). Currently, readily available biomass is used by local farmers and industry. The planned feasibility study (FS) will focus on 1) impact on local farming communities, 2) climate impact, 3) institutional strength of implementing institutions, 4) biomass supply chain, 5) alternative technical solutions and 6) electricity prices and sales rights. In addition, synergy with a potential waste management project for Mataram City supported by the Danish Environmental Protection Agency will be explored. The FS is anticipated to take place during 2023/24. The full FS terms of refence is attached too.

The overall objective of the Project is to ensure access to affordable, reliable and sustainable energy (SDG 7) for the people of Lombok, taking action to combat climate change and its impact (SDG 13) and to create income and improve the life of the local smallholder farming communities delivering the biomass (SDG 8).

The Project is well aligned with Denmark's development strategy "The World we Share" and DSIF's 2022 strategy to address climate change by increasing renewable energy production. It also supports Danish initiatives in the energy sector, complementing other initiatives (SSC) within an area where Denmark has key competences and advanced technology positions. The Project is also one of Denmark's announced contributions to the Just Energy Transition Partnership (JETP) with Indonesia. If successful, this project could serve as a demonstration of the energy potential of other agricultural waste products, which could then be replicated elsewhere in Indonesia.

In line with the recommendations made in the preliminary biomass report and based on the information and justification laid out in this document, DSIF seeks approval from the Danida Programme Committee for the continuation of preparation of the Project.

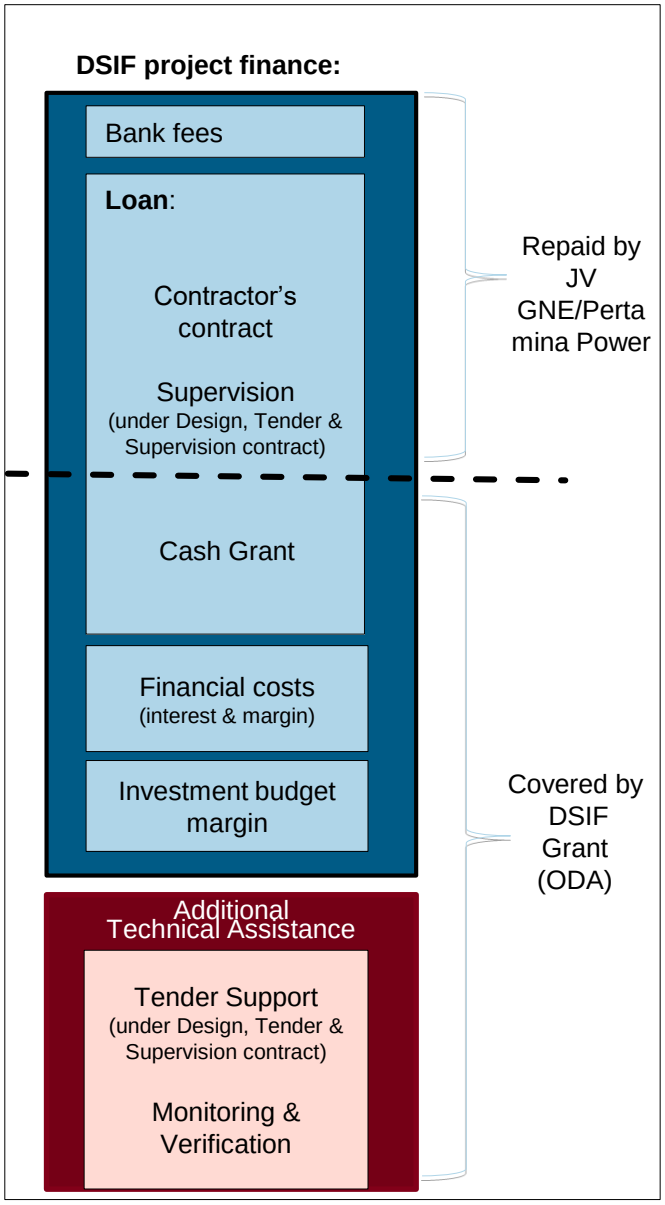
Abbreviations

AT	Assessment Team
BUMD	Badan Usaha Milik Daerah – a regionally owned enterprise
Danida	Danish International Development Assistance
DEA	Danish Energy Agency (Energistyrelsen)
DKK	Danish Kroner
DSIF	Danida Sustainable Infrastructure Finance (*formerly known as* Danida Business Finance / "DBF")
ESIA	Environmental and Social Impact Assessment
EPC	Engineering, procurement, and construction
EUR	European single currency *(exchange rate applied: 1 EUR = DKK 7.438)*
FIDIC	International Federation of Consulting Engineers
FS	Feasibility Study
GHG	Greenhouse Gas
GNI	Gross National Income
GNE	Provincially Owned Company, Lombok
GoI	Government of Indonesia
IDR	Indonesian Rupiah
JETP	Just Energy Transition Partnership
JV	Joint Venture
kWh	Kilowatt-hour
NEC	National Energy Council
NTB	Nusa Tenggara Barat (West Nusa Tenggara Province, which includes Lombok)
MEMR	Ministry of Energy and Mineral Resources
MW	Mega Watt (thousand kilowatt)
O&M	Operation and maintenance
PLN	State-Owned Electricity Company
PPA	Power Purchase Agreement
RE	Renewable Energy
RUPTL	General Plan for the Provision of Electricity
O&M	Operation and maintenance
SDG	Sustainable Development Goals
SSC	Strategic Sector Cooperation
TA	Technical Assistance
ToR	Terms of Reference
USD	United States Dollars (exchange rate applied: 1 USD = DKK 7.0)

1. KEY DATA

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Project name
Lombok Biomass Energy Project
Country
Indonesia
Gross National Income (GNI) per capita: USD 3,870 *(World Bank, Atlas Method, 2020)*
Product
• A 20 MW Biomass Energy Plant (combustion or biogas generation/gasification) • System for collection of agricultural waste biomass set up • Possible co-production with use of municipal solid waste
Implementing partner
GNE (Provincial Government-owned company) in a planned JV with Pertamina Power Indonesia, Renewable Energy Subsidiary
Implementing period
24 months
Sustainable development goals to be targeted
Primary: SDGs 7 and 13; Secondary: SDGs 8, 11 & 17
Investment budget (Preliminary Cost Estimate)
DKK 460.1 million (EUR 62 million)
ODA budget (Preliminary Cost Estimate)
DKK 166.8 Million
Type of financing
Concessional loan (35%)
Financial net IRR
Financially non-viable with a commercial loan



2. PROJECT CONTEXT

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

• Country Context

- Indonesia is a diverse archipelago nation with a population of around 277 million people (2021) and consisting of more than 300 ethnic groups. It is the largest economy in South-east Asia and is a lower middle-income country with a Gross National Income (GNI) per capita of USD 3,870 in 2020.
- The country has experienced sustained, high growth after overcoming the Asian Financial Crisis in 1998, and has made important gains in poverty reduction, cutting the poverty rate by more than half since 1999, to 9.8% in 2018.
- West Nusa Tenggara Province (NTB) consists of two major islands Lombok and Sumbawa. Lombok has a total land area of 4,738 km^2 and a population of around 3.8 million people. Farming of rice and maize plus poultry production are the major industries together with shrimp farming and tourism. The ambition is to grow the tourism industry, inspired by the neighbouring Bali.
- Power generation in Lombok is almost entirely based on fossil fuels. As of 2018, 87.8% of the island was electrified. The system is powered by a total installed capacity of 306 MW, consisting of 3 coal-fired power plants and 7 diesel-fired power plants. Unlike Bali, Lombok is not connected to the Java electricity grid and has no local fossil energy resources.
- The Government of Indonesia (GoI) has made a commitment to address climate change. It has signed and ratified the Paris Agreement and has reiterated its commitment to a low-carbon, climate-resilient future, committing to (i) Reducing unconditionally GHG emissions by 29% against a 2030 business-as-usual scenario.
- At COP26, Indonesia maintained its commitment to becoming net-zero in 2060, and specifically for Lombok the NTB Governor committed the province to become net-zero by 2050 and to achieve 60% renewable energy (RE) in the electricity generation mix by 2030.

• Documentation

- *The World We Share: Denmark's Strategy for Development Cooperation'*, Ministry of Foreign Affairs of Denmark / Danida, Aug. 2021.
- *'Udenrigs- og sikkerhedspolitisk strategi'*, Ministry of Foreign Affairs of Denmark, Jan. 2022.
- *"The joint Danish-Indonesian cooperation on climate and energy',* Danish Energy Agency
- *'Updated Nationally Determined Contribution Republic of Indonesia',* Government of Indonesia. 2021
- '*Project Description Biomass Power Plant 20-40 MW Project in Lombok, NTB (Nusa Tenggara Barat), Indonesia.*' , Power point presentation 2021.
- 'Assessment of biomass resources in Lombok', IREEM/Pemconsult 2021
- 'Lombok. Prefeasibility studies on RE solutions', KPMG for DEA and the Danish Embassy, December 2018
- 'Lombok Energy Outlook 2030', Danish Energy Agency (DEA) and Ea Energy Analyses. January 2019
- 'Cross-Sectorial Technology Catalogue for Solid Waste Management and Waste to Energy, Lombok & Batam/Kepri', COWI for the Danish Embassy, DEA and the Danish Ministry of the Environment, June 2021

2. PROJECT CONTEXT, continued revised

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Institutional and Sector Context

- The Indonesian Ministry of Energy and Mineral Resources (MEMR), has laid out the goals for the electricity sector in a General Plan for the Provision of Electricity (RUPTL) 2021-2030.
- The main planned expansion of the generation capacity on Lombok is the commissioning of 2x50 MW coal-fired power plants by 2022/2023, a planned 2x50 MW gas-fired plant by 2024/2025 and 4x50MW unspecified baseload RE plants by 2026-2029.
- The present Project is not in the RUPTL 2021-30, but the Project's target is to be included in the 200 MW RE allocation. All projects should in principle be tendered, before being accepted into the RUPTL. The FS will include a mapping of the expected process regarding 1) including the Project in the RUPTL 2021-30 without a tender and 2) choice of procurement regime (tied/untied).
- The state-owned company PLN is the owner of both the transmission network and most of the distribution networks. PLN buys all renewable energy through long-term Power Purchasing Agreements (PPA). The power generated by RE power plants is sold at around 10 cents of USD per kWh.
- The Danish Energy Agency and the National Energy Council (NEC) have agreed to choose Lombok as a pilot area to study how the expected increase in electricity demand can be met in a cost-efficient and sustainable way. DEA carried out a Prefeasibility Study for investment in RE technologies in Lombok in 2018, and in 2019 a '*Lombok Energy Outlook. 2030*'.

Institutional and Sector Context (continued)

- Gerbang NTB ("GNE") is 100% owned by the NTB government and operates several businesses in Lombok including production of cement tiles, distribution of LPG bottles and trading of agricultural products. GNE's main purpose is to support the economic development of the farming communities on Lombok. GNE has in total around 100 employees and has been appointed as project owner by the NTB government. GNE has no track record in development and management of energy projects, which is why a JV with Pertamina will be established.
- Pertamina is large state-owned oil and gas company, with extensive experience in project development, construction and operation. Pertamina will form a JV with GNE and dedicate a team to support project development and later be the operator of the Biomass plant. The FS will include an assessment of institutional capacity.
- Ministry of Finance has proposed that PT-SMI, a 100% state-owned development fund, with a mandate to invest in social- and energy infrastructure within Indonesia, acts as the guarantor. By end of 2021 PT-SMI had total assets of DKK 55 billion and an equity of DKK 19 billion. PT-SMI has a credit rating of BBB which is the same as the sovereign. IFU has signed a letter of intent with PT-SMI to support future cooperation.
- The local farming communities are organized in Badan usaha milik daerah (BUMD – a regionally owned enterprise), with one BUMD for each village's area. The BUMD's representatives will be included in the Project's preparation, as the active support and buy-in by the BUMDs is a key parameter for the successful outcome of the FS and potential project.

2. INVESTMENT CASE: Preliminary Theory of Change

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Outputs

Core to Project:

Output 1: 20-40 MW biomass energy plant constructed and operational.

Output 2: Biomass supply chain based on agricultural waste not presently used by local industry or local communities set up and operational.

Output 3: Experience from generation of energy based on agricultural waste documented and disseminated.

To be scoped under FS:

Output 4: Possible co-generation of electricity or gas based on municipal solid waste from Mataram City.

Output 5: Action plan for the involvement of women and youth in the collection, construction and operation of the Project.

Outcomes

Core to Project:

Outcome 1: Avoidance of the emission of 200,000 tons CO2 annually from coal-fired plants.

Outcome 2: Use of agricultural waste products generates additional income for local communities.

Outcome 3: Increased use of agricultural waste as a basis for production of electricity in Indonesia, supporting the country's climate goals.

To be scoped under FS:

Outcome 4: Possible avoidance of accumulation of waste at the Kebon Kongok Landfill (in case of biogas generation around half of the daily reception of 350 tons).

Outcome 5:Short-term job creation in the construction period, and long-term job creation from the collection and transport of agricultural waste and for operating the plant.

Impact

Primary:

SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all

SDG 13: Take urgent action to combat climate change and its impacts.

Secondary:

SDG 8: Decent jobs and economic growth

SDG 11: Sustainable Cities and Communities

SDG17: Partnerships for the goals

3. INVESTMENT CASE

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Project Description

- The proposed project will contribute to a shift away from fossil fuels, by constructing a 20-40 MW biomass power plant to be fueled by agricultural waste, and if possible complemented by biomass from municipal solid waste.
- The 2021 DSIF biomass study confirmed that there are large quantities of rice straw and corn stoves, which are presently not used and either burnt on the field or ploughed down. No supply chain for this biomass presently exists.
- The Project will create income to local farming communities by increasing the use of agricultural residue, mainly rice straw and corn stoves stems. The 2021 biomass study showed that most of the easily available biomass resources, rice husk and corn cobs, are already used for other purposes (poultry farms, feedstock for cattle, fuel for tobacco drying, etc.).
- The next step in terms of project development is to prepare a detailed FS (see annex B for main tasks and annex E for draft TOR). The FS is split in two phases where phase 1 will asses: 1) The impact on the local community including the situation of women and youth; 2) if it is possible to establish the necessary biomass supply chain for the proposed biomass power plant; 3) the partners' capacity and commitment; and 4) if the Project can be included in the RUPTL and obtain a PPA. Based on the outcome of phase 1, the TOR for phase 2 will be adjusted, if needed, and further detailed studies related to 1) choice of technology, 2) detailed environmental and social impact and 3) planning of tender process to prepare the Project for DSIF approval and possible future tendering.
- DSIF will, in parallel with the FS, engage with the PT-SMI to assess the proposed guarantee structure.

Justification

- The Project supports GoI's commitment to gradually phase out fossil energy and reach climate neutrality in 2050.
- The Project is well aligned with DSIF's 2021 strategy and Denmark's development priorities by supporting the green transition and by being just and inclusive with its focus on creating decent jobs and income for local farming communities,
- The Project is a direct result of the Strategic Sector Cooperation between Denmark and Indonesia in the Energy Sector, which has given priority to Lombok. In addition, the Project may also benefit from the Strategic Sector Cooperation for waste management with the Danish Environmental Protection Agency.
- The Project could potentially also support the proposed Waste-to-Energy project, developed as part of the Environmental Strategic Sector Cooperation.
- The Project is one of Denmark's announced contributions to the JETP with Indonesia.
- The Project is within an area where Denmark has key competences and advanced technology positions. If successful, this project could serve as a demonstration of the energy potential in other agricultural waste products, which potentially could be replicated elsewhere in Indonesia.
- At the presently established maximum price for Lombok (9.6 cents of USD per kWh) for biomass generated electricity as set by PLN, a preliminary calculation shows that the Project would only be financially viable if financed with concessional debt.

4. SUSTAINABILITY

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Development impact

- SDG 7: The Project contributes directly to SDG 7.1.1 and 7.1.2 (Access to Clean and Affordable Energy) as it increases the electricity generation capacity on Lombok with renewable energy.
- SDG 13: The Project contributes directly to SDG 13 (Climate Action) as the biomass energy plant can generate sustainable energy, which will substitute the present dependence on coal. The Project is in this case expected to reduce CO_2 emission with 200,000 tons annually.
- SDG 8: The Project will contribute to SDG 8 (Decent Work and Economic Growth) by creating employment during construction and operation and additional income for local farming communities by the sale of agricultural residue presently not used.
- If the Project is successful, it will serve as a demonstration, which can be replicated elsewhere in Indonesia.

Corporate Governance

- IFU/DSIF's anti corruption measures will be put in place, e.g. close monitoring of the tender processes, use of an independent Construction Supervision Consultant, buyer/borrower's and exporter's declaration where DSIF may require support repaid in case of misuse.
- The planned Joint Venture (JV) between GNE and Pertamina Power will have both the local anchoring through the NTB government and the expertise within electricity generation provided by the renewable energy subsidiary of Pertamina Power. The FS will look into the governance, leadership and organisational setup in more detail and in particular the possible need for technical assistance and capacity building.

Environmental and social risks

- An Environmental and Social Impact Assessment (ESIA) will be carried out as part of the feasibility study, which will analyse the impact on local agriculture and farmers and local farming practices. Special attention will be given to the current use of the biomass and its value in the existing economy and the development of an action plan to ensure that the Project benefits the local communities and if possible, especially women and youth. Likewise, it must be ensured that sourcing and production of biomass is done in an environmentally sustainable way that does not harm local ecological systems, local farming or lead to a greater conversion of untouched forests and grasslands into farmed land.
- With the proposed location of the plant, no resettlement is expected. It is the present estimate that only few people will be negatively affected, in terms of noise and traffic, by the Project. It is a condition for DSIF support that compensations are paid according to IFC Performance Standards. The Construction Supervision Consultant will be tasked with monitoring the implementation of the ESIA.

Management of environmental and social risks

- The feasibility study will propose measures to mitigate any possible negative impacts if necessary. It is a precondition for the DSIF loan that the compensations and any possible resettlements follow IFC Performance Standard 5.
- IFC performance standards and the UN Guiding Principles for Business and Human Rights (UNGPs) will be applied during design and construction of the works to ensure appropriate labour and working conditions, resource efficiency and pollution prevention.

5. BUDGET

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	DKK Million		
	Loan and grant	Own financing	Total
Total Investment			
Output 1: 20 MW biomass energy plant constructed and operational.	364.0	-	**364.0**
Output 2: Biomass supply chain based on agricultural waste set up and operational (storing sites, compacting equipment, truck etc.).	20.0	-	**20.0**
Output 3: Experience from generation of energy based on agricultural waste documented and disseminated.	1.0	-	**1.0**
Output 4: Possible co-generation with municipal solid waste	-	-	**-**
Compensation / Land acquisition (if needed)	-	5.0	**5.0**
Supervision (FIDIC engineer - 3%)	11.6	-	**11.6**
Contingencies (15%)	57.8	0.8	**58.6**
	454.3	**5.8**	**460.1**

Budget for DSIF Grant	
	DKK Million
Cash grant element of loan	117.53
Interest subsidy	5.91
Technical assistance	10.00
Budget margin (25%)	33.36
DSIF appropriation	166.8

Pre-Investment Budget	
Financed by DSIF Project Development Facility	DKK million
Feasibility Study + ESIA	5.5
Appraisal	1.0
Budget margin (20%)	1.3
Total estimated cost (incl. Budget Margin)	**7.8**

25% own financing: Local partners will provide transport, office space and engage intensively in relation to securing PPA and RUPTL acceptance. Likewise PT-SMI will contribute resources as potential lender to developed an operative on-lending scheme.

Note:

1. The budget is a preliminary estimate and will likely change when the Project is more defined in terms om choice of technology and location.
2. DSIF financing includes a loan guarantee towards lender covered by the aid budget, which is not included in the appropriation. The value of the guarantee (based on commercial export credit premiums) is included in the concessionality calculations of the DSIF grant.

6. OVERALL ASSESSMENT

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Investment attractiveness/concluding remarks

- The Project is well aligned with Denmark's development strategy "The World we Share" in addressing climate change by increasing renewable energy production.
- The Project is well aligned with the DSIF 2022 strategy for Indonesia as a Strategic Cooperation Country, as the Project:
  - Is a result of the Danish Strategic Sector Cooperation with Indonesia within renewable energy and will benefit from the strong presence and active engagement of the Danish Embassy in Indonesia.
  - Supports SDG 13 and SDG 7 by reducing GHG emissions with estimated 200,000 tons per year compared to coal-fired power plants.
  - Supports SDG 8 by providing additional income streams and job opportunities in low-income farming communities.
  - If successful, will serve as a point of reference for Danish biomass technology.
  - Contribute to the Government of Indonesia's goal of becoming net-zero in 2060, and specifically to the commitment of the Governor of NTB at COP26 for the province to become net-zero by 2050 and to achieve 60% renewable energy in the electricity generation mix by 2030.
- The Project will furthermore potentially have a synergy with the Danish Strategic Environmental Sector Cooperation in the country related to municipal waste management.
- The Project is one of Denmark's announced contributions to the JETP with Indonesia.
- By engaging very early in the Project development focusing on sustainability and life cycle costing and by providing concessional financing, DSIF contributes with non-financial additionality as well as financial additionality.

Major risks and development challenges

The initial assessment of the major risks are:

Biomass supply risk – High. The main risk is the challenges related to setting up a supply chain for agricultural waste from multiple sources, without disrupting the present biomass use. The FS phase 1 will focus on ensuring the availability of biomass to site.

Partner risk – High. The proposed partners have no experience constructing and operating a biomass plant or managing the supply chain. Ways of ensuring adequate governance and institutional support to be explored in the FS.

Social and economic risk – Medium. The main risk relates to the social and economic impacts of the buying up of considerable amounts of biomass, which could lead to some present users not being able to obtain the biomass the needed and the risks related to transport of the same, like e.g. noise and traffic accidents.

RUPTL and PPA risk – Medium. As the Project is donor financed the assumption, based on information received, is that the Project will very likely be accepted into the RUPTL and receive a direct PPA with PLN.

The institutional risks – Low. The possible risk of corruption during tender and implementation, or the risk of insufficient compensation paid to people affected by the Project are both considered low due to DSIF's monitoring and guidelines. For more details, see enclosure C and D.

ENCLOSURES

A: Overall Process Action Plan

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Action	By date	Responsible	Comments
Presentation to IFU Investment Committee & Danida Programme Committee	February 2023	DSIF	
DSIF contracts Feasibility Study Team	February 2023 – April 2023	DSIF	
Feasibility Study and Project Document	March 2024	FS Consultant / DSIF	
Independent Danida Appraisal	May 2024 – June 2024	Danida / Appraisal Consultant	
Project Approval / Appropriation by Minister [of Development Cooperation]	August 2024	Danida (UPR)	
Tender for "Design, Tender and Supervision Consultant" (FIDIC Engineer)	October 2024 – December 2024	GNE / DSIF	
Prequalification of Contractors and Tender for Construction	May 2025 – September 2025	GNE / FIDIC Engineer	
Contract Negotiations and Signing of Contract	December 2025	GNE / EPC Contractor	
Loan Agreement and Conditions Precedent	March 2023 - March 2025	DSIF / PT. Sarana Multi Infrastructure / DK Bank	Initial discussions until FS is complete and detailed loan negotiations once project is approved
Construction	February 2026- May 2028	EPC Contractor	
Project Liability Period	May 2028 - April 2030	EPC Contractor	24 months has been assumed
O&M support	May 2028 - April 2031	EPC Contractor	36 months assumed, including the liability period.

B. Main points for the Feasibility Study

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Objective: The Feasibility Study ("FS") is to ensure that all relevant options are analysed and presented to GNE/JV and DSIF for decision making. It will include all available information and analysis necessary for appraisal and approval of the Project by DSIF/Danida and to form the basis for a tender. The FS will be based on projections for a 20-year period. Full FS TOR is enclosed as Annex E.

The FS will be carried out in two phases. The **first phase** analyses the basic foundation for the Project being the environmental and socio-economic impact, climate impact, security of supply of biomass, the partners abilities and the ability to get the Project approved by MEMR and PLN, as a negative outcome of phase 1 severely impacts the viability of the Project. Main topics in the first phase are:

- Base-line for the present situation for the local farming communities in relation to income, farming practice, social structure and the job opportunities of especially women and youth. The expected positive and negative impacts of the Project including action plans and mitigation actions to be undertaken.
- The preliminary environmental and climate impact of the Project including the effect of transport used in the biomass supply chain.
- Type of feedstock available and how this is utilized today. Identification of residual biomass available for the Project and specific plans covering, collection, transport and storage at site of the biomass. The envisioned split of responsibility in the biomass supply chain and the major assumptions behind the supply chain will have to be reviewed and ratified.
- Analysis of the governance and institutional capacity and engagement of all the major shareholders including local BUMDs, GNE, Pertamina, the NTB government, PLN and MEMR. This part will include a review of 1) political support for the Project and 2) ability and skills to implement and operate the Project, 3) need for technical assistance and 4) a roadmap for how the Project will be included in the RUPTL and obtain a PPA with PLN.
- Possible synergy with a WtE project at the Kebon Kongok Landfill, in particular if both projects opt for biogas generation, but also in case Refuse Derived Fuel from Kebon Kongok can be used in a thermal biomass plant.
- The phase 1 findings and key assumptions to be presented at a workshop, with major stakeholders, after which DSIF and the NTB government will have to decide if the findings in phase 1 can support going to the next phase of the FS.

The second phase will focus on the technical alternatives available based on the amount and type of biomass available and further expand on the climate, environmental and socio-economic findings from phase 1, once the technology is chosen. Phase 2 will cover:

- An evaluation of the possible technologies (biomass combustion and steam turbine or anaerobic digestion and engine or gas turbine) and the match between these technologies and the available biomass resources and site. In case biogas is opted for, analyse whether electricity generation in a gas generator or production of bottled gas would be the recommended solution.
- A full Environmental and Social Impact Assessment (ESIA) based on findings in phase 1 and the choice of technology.
- An evaluation of the financial viability of the Project compared to alternative power production options supporting the involvement of DSIF.

C. ASSESSMENT OF PARTNER

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Partner name	Core business	Importance	Influence	Contribution	Capacity	Exit strategy
What is the name of the partner?	What is the main business, interest and goal of the partner?	How important is the Project for the partner's activity-level (Low, medium high)?	How much influence does the partner have over the Project (low, medium, high)?	What will be the partner's main contribution?	What are the main issues emerging from the assessment of the partner's capacity?	What is the strategy for exiting the partnership?
GNE is a company owned by the Provincial Government. GNE will form a JV with Pertamina Power Indonesia, which has a branch for Renewable Energy.	GNE manages several provincial companies in Lombok on behalf of the Provincial Government. Pertamina Power is a subsidiary of Pertamina, a state-owned oil and gas company (based on the nationalisation of Royal Dutch Shell's activities in the country in 1957). Pertamina Power manages Pertamina's projects within renewable energy.	Medium GNE confirmed that the Project has high priority and that the company will engage actively in the setting up of the supply chain for biomass. Medium Pertamina Power confirmed its interest in forming a Joint Venture with GNE to operate the biomass project. It is tasked with identifying viable projects within RE, find financing for them and operate them afterwards, so the Project falls squarely within their mandate.	Medium during the Project implementation, where the JV will set up a Project Implementation Unit, which will manage the Project with support from the International Supervision Consultant. High after commissioning, where the JV will be responsible for operation.	GNE/JV will be responsible for securing permits, land acquisition and compensation. GNE/JV will ensure negotiation and communication with the affected persons/parties. GNE/JV will be assisted by the International Construction Supervision Consultant. The JV will be responsible for O&M of the facilities when taking over from the EPC contractor.	GNE has no prior knowledge of managing energy projects, but it has managerial experience from managing other Provincial Companies, and it is very closely related to the Provincial government. Pertamina Power has extensive experience in managing renewable energy projects, but no prior experience in Lombok. It has to be secured that there is a transfer for capacities to the JV from the two companies. Technical assistance has to be provided by the contractor and/or the Construction Supervision Consultant. The FS will test the partners' ability to execute the Project and work together.	The Project is limited to the period of construction, commissioning and (potential, limited) O&M support. There is no further commitment.

D. PROJECT RISKS & RISK RESPONSE (1/3)

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Contextual risks

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
The main risk for the biomass energy project is the challenges related to the setting up of a supply chain for agricultural waste from thousands of small farmers.	High	High	The FS Study will be tasked with concluding who and how the supply chain will be established and operated and if the biomass potentially collected and transported will be enough to sustain a power plant	High	No supply chain exists as of now and no similar project has been implemented in Indonesia.
As the JV is a new organisation, it may not have the leadership and administrative capacity necessary to carry out and operate the Project.	Medium	High	Training and coaching of the new organisation shall be included as tasks for the contractor. It can be considered to include a separate contract with a consultant to help build organisational capacity in the new company. FS to consider need for capacity building in the form of TA.	High	Even if the two companies separately have capacities which complement each other, the task of creating a new well-functioning company should not be underestimated.
Indonesia has in the initial dialogue related to the Project indicated that the DSIF loan will not be secured by a sovereign guaranty. DSIF will as part of the Project development work to ensure that adequate security is made available.	High	High	The state-owned development fund PT SMI has been suggested by the Indonesian Ministry of Finance as the guarantor or potentially also the lender of record. DSIF has engaged with PT SMI to develop an acceptable and workable funding mechanism. DSIF and PT-SMI signed a Letter of Intent in 2018.	Medium	PT-SMI has affirmed initial interest to be involved in the Project and is well funded and well managed. PT-SMI will use the DSIF FS as part of the internal DD. If PT-SMI or an institution of similar quality does not agree to act as guarantor or lender of record, DSIF will not be able to fund the Project.
The main risk is related to the social and economic impacts of the buying up of considerable amounts of biomass and the transport of the same.	Medium	Medium	The FS includes an Environmental and Social Impact Assessment (ESIA), which in particular will analyse the impact the Project will have on local communities and local farming practices. Special attention will be given to the current uses of the biomass and its value in the existing economy, so that vital economic functions are not harmed or destroyed. Likewise an action plan to improve the situation of especially women and youth will be part of the FS.	Medium	Land acquisitions are expected to be limited with the present site. Support from local farming association has to be secured as part of the FS in order to ensure ongoing support and involvement during the preparation and operation of the Project.

D. PROJECT RISKS & RISK RESPONSE (2/3)

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Project risks					
Risk Factor	**Likelihood**	**Impact**	**Risk response**	**Residual risk**	**Background to assessment**
Indonesia economic growth might breach the OECD threshold (2020) of (USD 3,995 per capita) for tied aid before the construction contract is signed. In this event the Project cannot be tied to a Danish contractor and the subsidy level can be reduced.	Medium	High	The OECD rules allow for signing of the EPC contract up to 24 months after a country reaches the GDP threshold for tied aid. With the present time-table this indicates that the present GDP per capita of USD 3,870 (2020) will breach the threshold in 2023. Main mitigation is to provide un-tied financing	Medium	The present global economic uncertainty will very likely impact growth also in Indonesia.
The main contextual risk is related the Project being included in the RUPTL and obtaining the right to dispatch energy by obtaining a PPA, as the regulations have been constantly evolving, and there is a strong political pressure to maintain an affordable electricity price.	Medium	High	Close dialogue between the Danish Embassy and the Ministry of Energy and Mines and PLN is vital. The assumption based on information received, is that the Project, due to donor financing, should be eligible for direct contracting with PLN without a tender, but this needs to be verified. Once a PPA has been signed, it is likely that it will be respected.	Medium	A concessional loan from DSIF can make the Project viable, even with a reduced tariff which should make the Project attractive for PLN. The embassy has not yet been able to obtain a clear answer in relation to how the Project will enter into the RUPTL and obtain a PPA with PLN.
The interest among Danish companies to bid for the Project may be insufficient leading to lack of competition and hence higher prices	Medium	Medium	If the tender for the Project is opened to all OECD countries, this risk will be much reduced.	Low	As Indonesia's GNI per capita is close to the ceiling for concessional loans, it may not be possible for DSIF to restrict the tender to companies based in Denmark.
Local ecosystem damage risk	Medium	Medium	Sourcing of biomass is done in a traceably environmentally sustainable way that does not harm local ecological systems or lead to a greater conversion of untouched forests and grasslands into farmed land. If some of these issues are identified as likely outcomes, actions to mitigate them should be suggested.	Low	The biomass will be sources from existing farmland and will be agricultural residue presently not utilized. It is not envisioned that farmers will grow biomass crops dedicated for use by the Project.

D. PROJECT RISKS & RISK RESPONSE (3/3)

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

Institutional risks					
Risk Factor	**Likelihood**	**Impact**	**Risk response**	**Residual risk**	**Background to assessment**
Possible corruption during tender and implementation	High	High	DSIF and GNE/JV will be supported by a “Design, Tender, and Supervision Consultant” (FIDIC Engineer) during tendering, and DSIF will be required to provide non-objections to tender documents, the evaluation and the final contract. During implementation the FIDIC Engineer will be required to approve invoices from the contractor before onward transmission to the client.	Low	Unless otherwise decided, the funds will be transferred directly from the Danish lending bank to the contractor once invoices have been approved by the client, and so there will be no flow of funds within Indonesia.