Public Disclosure Authorized

Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 20-Dec-2019 | Report No: PIDC27786

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
Indonesia	P172256		Development of Pumped Storage Hydropower in Java Bali System Project (P172256)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
EAST ASIA AND PACIFIC	Jun 08, 2020	Dec 10, 2020	Energy & Extractives
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	PT Perusahaan Listrik Negara (PLN)	PT Perusahaan Listrik Negara (PLN)	

Proposed Development Objective(s)

The main objectives of the project are (i) to increase Java-Bali power system's peaking capacity and (ii) ability to absorb variable renewable power generation and (iii) to strengthen PLN's capacity in hydro-power development.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	800.00
Total Financing	800.00
of which IBRD/IDA	650.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	650.00

Non-World Bank Group Financing

Counterpart Funding	150.00
Borrower/Recipient	150.00

Environmental and Social Risk Classification	Concept Review Decision
High	Track II-The review did authorize the preparation to continue

B. Introduction and Context

Country Context

1. Indonesia is the largest economy in Southeast Asia, the world's 10th largest economy in terms of purchasing power parity, and a member of the G-20. The Indonesian economy is underpinned by strong fundamentals with a prudent macroeconomic policy framework amid global volatility and uncertainties. The country's gross domestic product (GDP) has surpassed US$1 trillion and its GDP per capita has steadily risen – from US$823 in 2000 to US$3,932 in 2018. Economic growth is expected to maintain a stable and positive outlook with a forecasted 5.2 percent in 2020.[1]

2. Indonesia has also made enormous gains in poverty reduction, cutting the poverty rate by more than half since 1999 to 9.8% in 2018. While over one-fifth of the population is at risk of falling into poverty, the economically secure population is expanding. Sustaining the high growth rate and improving the competitiveness of the Indonesian economy requires further expansion of infrastructure development.

3. Seventy percent of Indonesia's population of 270 million people reside on Java-Bali islands. These islands together account for over 60 percent of the national GDP and 80 percent of the country's electricity consumption. Java is the most populous and industrialized region in the country, and Bali accounts for a third of Indonesia's revenues from tourism. Providing adequate infrastructure, including reliable electricity services, is crucial to maintaining the Java and Bali economies.

4. Indonesia's robust economic development, increasing urbanization and steady population increase have been driving its rapid energy consumption growth. In 2018, per capita energy consumption was 1,064 kWh, and the total energy consumption in Indonesia is also set to grow by 80 percent from the current level by 2030.[2]

Sectoral and Institutional Context

5. Indonesia has primarily relied on fossil fuels to meet its fast-growing energy needs. In 2018, the total power generation installed capacity was 57 gigawatts (GW)3, of which 88 percent from fossil fuels4 and 12 percent renewable sources, to meet a peak demand of 40 GW.5 Meanwhile, the Government of Indonesia (GoI) has set the renewable energy target of 23 percent by 2025.[6] Increasing the share of VRE in the energy mix necessitates additional measures to ensure system stability, security and reliability.

[1] World Bank. *Indonesia Economic Quarterly*, June 2019.
[2] International Renewable Energy Agency (IRENA). *Renewable Energy Prospects: Indonesia*, March 2017.
[3] Ministry of Energy and Mineral Resources (MEMR) presentation, January 2019
[4] This consists of 58% coal, 23% gas, and 6% diesel.
[5] PLN RUPTL 2018-2027
[6] MEMR's Roadmap for Accelerated Development of New and Renewable Energy 2015-2025

6. Pumped storage hydropower, also known as pumped-hydro energy storage, is one of several storage technologies that can be deployed to support instantaneous balancing of electricity supply and demand, thereby maintaining power system stability, security and reliability.[7] A pumped storage scheme provides a number of other ancillary services to the grid, such as frequency control, network control, system restart and outage insurance.

7. Improvements in system stability, security and reliability delivered by pumped storage schemes and their associated benefits have often been classed as economic externalities. The nature of these externalities means that some of their benefits are spread across the system and / or captured by other plants.

8. For these reasons, most pumped storage schemes have been developed by system operators or vertically integrated utilities like PLN, rather than being on a merchant basis as an Independent Power Producer (IPP). The ancillary services provided to the grid by a pumped storage scheme is particularly valuable to integration of variable renewables at large scale because of its storage capacity.

Relationship to CPF

9. The proposed Project aligns with the 2016-2020 World Bank Group Country Partnership Framework (CPF)[8], specifically the Sustainable Energy and Universal Access Engagement Area, the renewable energy and low-carbon development focus area and its linked outcome of hydropower installed capacity (MW) developed. The Project would support strengthening of PLN's capacity to implement large-scale pumped storage projects in an environmentally sustainable manner and enable the expansion of renewable energy, particularly VRE, in Indonesia. The Project is part of a broader menu of support to GoI in meeting its ever-increasing electricity demand and mitigating the risk of long-term over-reliance on fossil fuels for power generation.

C. Proposed Development Objective(s)

10. The main development objectives of the project are (i) to increase Java-Bali power system's peaking capacity and (ii) ability to absorb variable renewable power generation and (iii) to strengthen PLN's capacity in hydropower development.

Key Results (From PCN)

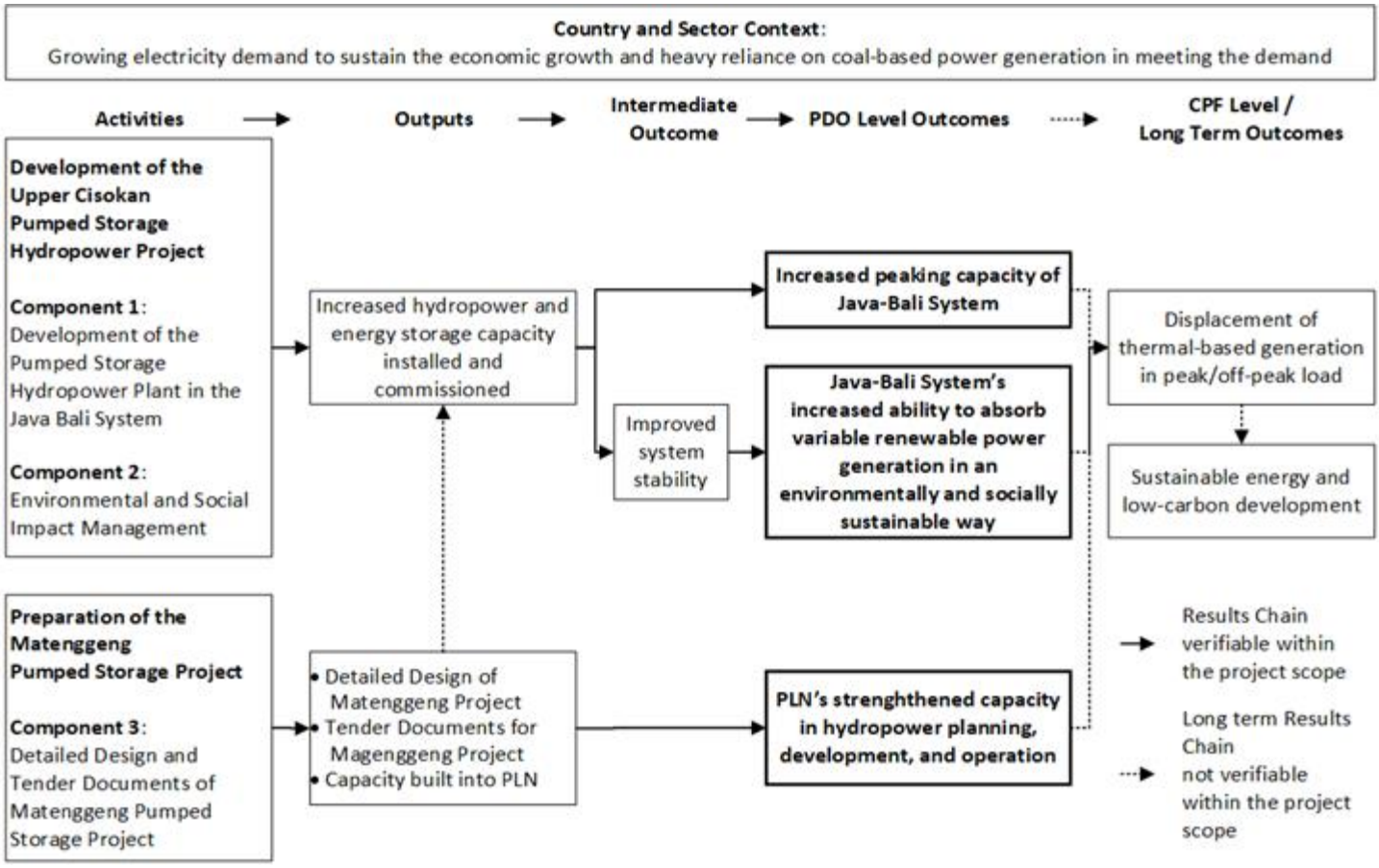
11. The Government of Indonesia aims to reduce GHG emissions by 41 percent by 2030 as its Nationally Determined Contribution to the Paris Agreement, and to reach 23 percent renewable energy in the national energy mix by 2025. The key challenge that the proposed Project is addressing is the displacement of thermal-based generation capacity in peak load and enabling VRE integration in a sustainable manner.

12. Achievement of the Project Development Objective will be measured by: (i) increased peaking capacity, (ii) power generation capacity from variable renewable energy resources enabled, and (iii) improved capability of PLN in planning, development and operation of pumped storage projects. Successful implementation of Environmental and Social Management Plans will also be monitored during project implementation.

13. Figure 1 below visualizes the Theory of Change for this operation.

[7] The other storage technologies include batteries, flywheels, capacitors, compressed air systems, superconducting magnetic systems and hydrogen.
[8] World Bank Report 99172, November 3, 2015.

Figure 1: Theory of Change



D. Concept Description

14. The proposed Project will support the development of the Upper Cisokan Pumped Storage Hydropower Project, including environmental and social impact management, and the preparation of the Matenggeng Pumped Storage Project. The Project will have three components.

Component 1: Development of the Pumped Storage Hydropower Plant in the Java Bali System (IBRD: USD625 million)

15. This Component covers the development, construction, and commissioning of the Upper Cisokan Pumped Storage (UCPS) Project. The UCPS Project will be the first pumped storage project in Indonesia with an expected total generating capacity of 1,040 MW. It will be located about 150 km southeast of Jakarta at the upstream end of Cisokan River Basin in West Java Province. During off-peak hours, UCPS uses electric energy from the grid to pump stored water from the lower reservoir to the upper reservoir. During peak hours, the Project generates electric energy, to cover the peak demand in the Java-Bali grid system, by conveying the stored water in the upper reservoir to the lower reservoir through hydraulic turbines. The generated power is evacuated by double circuit 500 kilovolts (kV) transmission lines connecting to the existing 500 kV transmission grid.

16. *Implementation Support and Independent Supervision Consultant*: This covers provision of support for implementation of the above activities, assistance in independent construction management, and supervision through an engineering consultant. This would include decision processing for Financial Management, Procurement and Contract Management, Safeguards, Technical Supervision and Quality Control.

17. *Project Review Panel (PRP) and Environmental and Social Panel (ESP):* The proposed Project will support PLN's hiring of an independent project review panel (PRP) to undertake periodic, comprehensive and independent reviews of the design, construction, and initial reservoir filling of the project works.

18. *Project Administration*: Provision of support for project administrative activities to be conducted by the Project Implementation Unit (PIU).

Component 2: Environmental and Social Impact Management (PLN: USD 150 million)

19. This component will be 100 percent financed by PLN and will include implementation of the various environmental and social (E&S) safeguards management plans to mitigate adverse E&S impacts under the Project. A number of plans have been developed under the previous loan in line with relevant government policies and World Bank operational policies. These plans will be updated, and some additional plans will be prepared in line with the latest relevant government policies and the World Bank Environmental Social Framework (ESF).

20. *Contractor ESMP*. Contractors will be required to develop and implement their own ESMPs to address their construction-related environment and social issues in full compliance with the Project ESMP.

Component 3: Detailed Design and Tender Documents of Matenggeng Pumped Storage Project (IBRD USD 25 million)

21. Matenggeng Pumped Storage Project (MPSP) is located in Cijolang River Basin (a tributary to Citanduy River) in West Java near the border with Central Java, about 300 km southeast of Jakarta. The main objective of the Project is to supply peaking power to the Java-Bali grid, where the electricity demand is growing by around 5.7 percent per year. In addition, the Project will also enhance the stability of the grid including frequency control, voltage regulation, spinning reserve and black-start capability. According to Indonesia's Electricity Supply Business Plan (RUPTL), the Project is designated to be in operation in 2025 as the second pumped storage power plant in Indonesia after the Upper Cisokan Pumped Storage Project.

Legal Operational Policies	**Triggered?**
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

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APPROVAL

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