ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 50016-001
August 2017

Proposed Results-Based Loan
Perusahaan Listrik Negara
Sustainable Energy Access in Eastern Indonesia—Electricity Grid Development Program
(Guaranteed by the Republic of Indonesia)

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 22 August 2017)

Currency unit	–	rupiah (Rp)
Rp1.00	=	$0.0000748
$1.00	=	Rp13,352.00

ABBREVIATIONS

ADB	–	Asian Development Bank
ckm	–	circuit-kilometer
DLI	–	disbursement-linked indicator
GWh	–	gigawatt-hour
IVA	–	independent verification agent
km	–	kilometer
M&E	–	monitoring and evaluation
PAP	–	program action plan
PLN	–	Perusahaan Listrik Negara (State Electricity Corporation)
RBL	–	results-based lending
RPJMN	–	Rencana Pembangunan Jangka Menengah Nasional (National Medium-Term Development Plan)
RUPTL	–	Rencana Usaha Penyediaan Tenaga Listrik (Electricity Power Supply Business Plan)
SILM	–	Sistem Informasi Laporan Manajemen (Management Reporting Information System)
SNT	–	Sulawesi and Nusa Tenggara

NOTE

In this report, "$" refers to US dollars.

Vice-President	S. Groff, Operations 2
Director General	R. Subramaniam, Southeast Asia Department (SERD)
Directors	A. Jeffries, Energy Division, SERD W. Wicklein, Indonesia Resident Mission, SERD
Team leader	T. Kubo, Principal Climate Change Specialist, SERD
Team members	R. Kausar, Principal Portfolio Management Specialist, SERD M. Kiefer, Energy Specialist, SERD N. Mardiniah, Safeguards Officer (Resettlement), SERD M. Paterno, Senior Finance Specialist, SERD J. Pedersen, Senior Procurement Specialist, Operations Services and Financial Management Department C. Samaniego, Associate Project Analyst, SERD P. Tharakan, Senior Climate Change Specialist, SERD K. Uematsu, Safeguards Specialist, SERD N. Yamin, Safeguards Specialist, SERD S. Zaidansyah, Principal Counsel, Office of the General Counsel
Peer reviewer	Y. Zhai, Technical Advisor (Energy), Sustainable Development and Climate Change Department

CONTENTS

RESULTS BASED PROGRAM AT A GLANCE

1. Basic Data

Project Number: 50016-001

Project Name	Sustainable Energy Access in Eastern Indonesia-Electricity Grid Development Program	**Department /Division**	SERD/SEEN
Country	Indonesia	**Executing Agency**	P.T. Perusahaan Listrik Negara
Borrower	PT. Perusahaan Listrik Negara		

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ **Energy**	Electricity transmission and distribution	600.00
	Total	**600.00**

3. Strategic Agenda

	Subcomponents
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns

Climate Change Information

Mitigation ($ million)	72.35
CO_2 reduction (tons per annum)	51,490
Climate Change impact on the Project	Low

4. Drivers of Change

	Components
Governance and capacity development (GCD)	Client relations, network, and partnership development to partnership driver of change
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas
Private sector development (PSD)	Public sector goods and services essential for private sector development

Gender Equity and Mainstreaming

No gender elements (NGE) ✓

5. Poverty and SDG Targeting

Geographic Targeting	Yes
Household Targeting	No
SDG Targeting	Yes
SDG Goals	SDG7, SDG13

Location Impact

Rural	High
Urban	Medium

6. Risk Categorization: Complex

7. Safeguard Categorization

Environment: B **Involuntary Resettlement:** B **Indigenous Peoples:** B

8. Financing

Modality and Sources	Amount ($ million)
ADB	**600.00**
Sovereign Results Based Lending (Regular Loan): Ordinary capital resources	600.00
Cofinancing	**0.00**
None	0.00
Counterpart	**1,230.00**
Others	1,230.00
Total	**1,830.00**

9. Effective Development Cooperation

Use of country procurement systems	Yes
Use of country public financial management systems	Yes

Source: Asian Development Bank

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed results-based loan to the State Electricity Corporation (*Perusahaan Listrik Negara* [PLN]), to be guaranteed by the Republic of Indonesia, for the Sustainable Energy Access in Eastern Indonesia—Electricity Grid Development Program.[1]

2. The proposed loan is part of a series of investment programs that aim to enhance access to sustainable and modern energy services in Indonesia as envisioned in PLN's Electricity Power Supply Business Plan (*Rencana Usaha Penyediaan Tenaga Listrik* [RUPTL]), 2017–2026. The program also addresses a key priority of the Government of Indonesia's National Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional* [RPJMN]), 2015–2019 to stimulate more inclusive growth, with a particular focus on Eastern Indonesia.[2]

II. THE PROGRAM

A. Strategic Context

3. The role of the energy sector as a key enabler of inclusive growth has become more important as the Government of Indonesia is faced with the challenge of expanding its economy. The annual rate of growth declined from 6.4% in 2010 to 5.0% in 2016 and is expected to remain at 5.1% in 2017. Improved access to affordable and sustainable forms of energy is critical to enhance competitiveness, not only in the country's manufacturing and commercial centers, but also in remote areas. Lack of access to energy constrains efforts to transform the eastern part of Indonesia into a new growth engine with a focus on high-value agriculture, fisheries, small and medium-sized enterprises, and tourism, all of which rely on a stable energy supply. Uneven development across provinces has contributed toward widening income disparities, with several provinces in Eastern Indonesia lagging significantly behind Java and Bali.[3]

4. To address this, the government has prioritized accelerating investment in infrastructure under the RPJMN, which explicitly includes the "outer" and eastern regions as geographical priorities. One of its pillars is to improve access to electricity services significantly by adding 35 gigawatts of generation capacity and expanding power grids to raise the national electrification ratio from 84% in 2014 to 97% by the end of 2019. Eastern Indonesia, where power grids across the islands are isolated, of poor quality, and underdeveloped, presents the greatest challenge to the achievement of these targets. The electrification ratios in some eastern provinces are particularly low—74% in West Sulawesi, 67% in Southeast Sulawesi, 68% in West Nusa Tenggara, 59% in East Nusa Tenggara, and 44% in Papua.[4]

5. The results-based lending (RBL) program aims to support the development of electricity distribution networks to connect businesses and households and enhance the quality of life in Eastern Indonesia, while promoting the sustainable use of electricity as a key driver of increased economic activity. The program will complement a proposed sector loan for small to medium-

---

[1] The design and monitoring framework is in Appendix 1.

[2] The government uses the term "Eastern Indonesia" to cover all the provinces in Kalimantan, Maluku, Nusa Tenggara, Papua, and Sulawesi.

[3] For example, Jakarta's 2015 nominal annual per capita income ($14,727) was 13 times higher than that of East Nusa Tenggara ($1,147). The income gap between the poorest and richest regions has widened since 2010.

[4] PLN Management Reporting Information System (*Sistem Informasi Laporan Manajemen* [SILM]).

sized natural gas-fired power stations across Eastern Indonesia.[5] Natural gas is a much cleaner fuel than diesel, and the quick-responding nature of gas-fired engines and turbines makes them a good match for intermittent, renewable energy sources such as solar and wind.[6] It is an appropriate transition fuel to move toward a low-carbon energy system. The two loans will help enhance access to sustainable energy services, consistent with the Sustainable Development Goals (goal 7: affordable and clean energy), and the Paris Agreement on climate change.[7]

B. Program Rationale

6. Overall, the government's generation, transmission, and distribution program under the RPJMN will require $83.5 billion in investments; of this, $43.5 billion is to come from the private sector (independent power producers), and the remaining $40.0 billion from PLN.[8] PLN is unable to provide the entirety of this investment; an estimated funding gap of $30.3 billion will have to be borne by other financing sources, including development partners. In Eastern Indonesia, where there are many isolated grids, PLN is already using its own resources to establish 70- and 150-kilovolt backbone transmission systems while seeking support from the Asian Development Bank (ADB) and other partners to strengthen and expand local distribution networks.[9]

7. The government has taken several measures to strengthen PLN's financial ability to undertake this planned expansion, and to improve the investment climate for the private sector. The government increased electricity tariffs in 2014, and instituted automatic price adjustments on tariffs for all but the poorest households in 2015. Further, the government infused nearly $500 million in equity to PLN in 2015 and $1.8 billion in 2016. It is also piloting a new subsidy setting approach that will rely on performance and incentivize PLN to operate more efficiently in order to capture additional savings. In 2015, the government passed regulations allowing PLN to borrow directly from bilateral and multilateral agencies against a sovereign-backed guarantee.

8. The RBL program will finance a portion of the overall broader program needs as identified in PLN's RUPTL, 2017–2026 for strengthening and expanding the power distribution network in Eastern Indonesia. It builds on the experience and lessons learned from the ongoing RBL program for grid strengthening in Sumatra.[10] The RBL is a suitable modality as (i) it uses PLN's own systems, such that the agreed program actions will directly contribute to institutional strengthening beyond the RBL program's geographical coverage; (ii) its focus on results rather than expenditures will help establish a stronger evaluation culture complementary to the government's intent to provide incentives based on corporate performance; (iii) it helps lower the transaction costs involved in managing thousands of small-scale activities and expenditures to

---

[5] ADB. 2016. *Country Operations Business Plan: Indonesia, 2017–2019.* Manila.

[6] Eastern Indonesia is considered to have significant wind and solar resources. ADB is supporting the government on policies and procurement approaches to help spur wind and solar project development.

[7] United Nations General Assembly. 2015. *Transforming Our World: The 2030 Agenda for Sustainable Development.* New York; The Paris Agreement under the United Nations Framework Convention on Climate Change.

[8] The breakdown of PLN's $40.0 billion is (i) $15.5 billion for generation, (ii) $17.0 billion for transmission, and (iii) $7.5 billion for distribution.

[9] The government is keen to increase renewable energy use in Eastern Indonesia where fuel transport costs are high, and PLN is seeking technical support from partners to enable these small grids to handle intermittency issues.

[10] ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Results-Based Loan to Perusahaan Listrik Negara for Electricity Grid Strengthening—Sumatra Program.* Manila. The World Bank provides a $500 million program-for-results (PforR) loan in parallel to ADB's $600 million program. PLN has fully achieved both the ADB and World Bank 2016 annual disbursement-linked indicators and making progress on all items under the program action plan.

develop the distribution network;[11] and (iv) it will enable PLN, government stakeholders, and development partners to convene around achieving the results and outcomes of the program to enhance collaboration.[12]

9. ADB's value addition to this program's design include (i) strengthening institutional capacity and addressing bottlenecks to help make PLN's operations safer and more sustainable, (ii) keeping technical power losses low by emphasizing the number of distribution transformers,[13] (iii) introducing technological innovations that can optimize resources and contribute to climate change mitigation, and (iv) supporting PLN's efforts to scale up the adoption of new energy meters while educating consumers on their energy expenditures. In particular, the program's incentives for improved waste management will achieve a breakthrough for all regions where PLN operates, and the smart grid pilot projects will allow for a higher mix of renewable energy to support the country's transition toward more environmentally sustainable growth.[14]

10. This operation is consistent with the priorities outlined in ADB's country partnership strategy, 2016–2019 for Indonesia [15] which has a strong focus on the energy sector (approximately $1 billion per year), and is part of an overall programmatic approach embedded within a policy reform framework supported by the Sustainable and Inclusive Energy Program policy-based loan.[16] It will complement the proposed loan for power generation and a further loan to develop the power distribution network in Eastern Indonesia. It has been coordinated with the key development partners supporting Indonesia's energy sector.[17]

C. Program Scope

11. PLN and ADB have agreed on a RBL program size of $1,830 million dedicated to the eight provinces across Nusa Tenggara and Sulawesi,[18] of which the proposed loan will finance $600 million. Table 1 summarizes the RBL program scope.

Table 1: Program Scope

Item	Broader PLN Program	Results-Based Lending Program
Outcome	Enhanced energy security	Enhanced access to more reliable electricity services for residential, commercial, and industrial customers

[11] The most recent loan for power distribution (Loan 2619-INO: Java–Bali Electricity Distribution Performance Improvement Project) experienced significant delays due to rebidding and contractor underperformance. It applied a "ring-fenced" procurement approach typical for ADB loans, and consolidated contracts into large packages to ease administration. However, the approach effectively excluded the smaller contractors that normally carry out distribution contracts and did not take advantage of PLN's own system for mid- and low-voltage grid development.

[12] Additional development partners are currently considering possible parallel cofinancing for this RBL program.

[13] The RUPTL targets are based on total transformer capacity which allows the regional operational teams to use larger transformers at longer intervals, leading to higher losses from extended low-voltage lines.

[14] In line with the government's Intended Nationally Determined Contributions submitted to the United Nations Framework Convention on Climate Change.

[15] ADB. 2016. *Country Partnership Strategy: Indonesia, 2016–2019.* Manila.

[16] ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Programmatic Approach and Policy-Based Loans for Subprogram 1 to the Republic of Indonesia for the Sustainable and Inclusive Energy Program.* Manila. Subprogram 2 is proposed for 2017.

[17] Development Coordination (accessible from the list of linked documents in Appendix 2). Agence Francaise de Developpement, the Islamic Development Bank, and KfW are currently considering support for power distribution systems in Eastern Indonesia.

[18] The eight provinces include East Nusa Tenggara, West Nusa Tenggara, and six provinces in Sulawesi (North Sulawesi, Central Sulawesi, West Sulawesi, South Sulawesi, Southeast Sulawesi, and Gorontalo).

Item	Broader PLN Program	Results-Based Lending Program
Key outputs	Transmission backbone system developed and distribution system strengthened and expanded	Distribution system strengthened and expanded; innovation and institutional capacity enhanced
Expenditure size	$5,057 million (including $3,385 million for base costs)	$1,830 million (including $1,214 million for base costs), of which: ADB: $600 million (32.8%) PLN and others (67.2%)
Geographic coverage	Sulawesi and Nusa Tenggara	Sulawesi and Nusa Tenggara
Implementation period	2017–2021	2017–2021

ADB = Asian Development Bank, PLN = State Electricity Corporation (*Perusahaan Listrik Negara*).
Sources: ADB and PLN estimates.

D. Program Results

12. The RBL program's impact, which is aligned with the RUPTL goal, will be the quality of life in Indonesian society enhanced by the sustainable use of electricity as a key driver of increased economic activity. The outcome will be expanded access to more reliable electricity services for residential, commercial, and industrial customers in the Eastern Indonesian provinces across Sulawesi and Nusa Tenggara. This will be achieved through the following two outputs:

(i) **Output 1. Distribution system strengthened and expanded**. This output will help address the need for an expanded and strengthened distribution system, and consequently improve electrification rates, reduce overloading, and address reliability issues for the local population and businesses.

(ii) **Output 2. Innovation and institutional capacity enhanced**. This output will support PLN's efforts to innovate and strengthen institutional capacity for environmental management and increased efficiency. The program will (a) support innovation through pilot-scale smart grid projects, which will integrate the expanded use of intermittent, renewable energy sources and better manage demand fluctuation;[19] (b) expand the use of digital prepaid meters to reduce nontechnical losses, payment defaults, and servicing costs in remote areas; (c) improve PLN's asset and waste management with the safe disposal of several years' backlog of used equipment, including hazardous waste; and (d) track the timely implementation of distribution system contracts.

13. The conclusions of the results chain analysis and the disbursement-linked indicators (DLIs)[20] show that these two outputs are sufficient to achieve the outcome. The outcome is measured by three DLIs: DLI 1 and DLI 2 measure the expanded access to electricity (customers [DLI 1] and energy sales [DLI 2]), while DLI 3 measures the reliability of the electricity supply. To achieve this outcome, physical components (output 1) as well as institutional improvements (output 2) are needed. Thus, progress toward output 1 is tracked by DLI 4 (distribution transformer units installed) and DLI 5 (mid-voltage lines installed). Progress toward output 2 is measured by DLI 6 (pilot smart grid projects implemented), DLI 7 (use of digital prepaid meters increased), and DLI 8 (asset and waste management improved).

14. Overall, the DLIs and other performance indicators provide ambitious yet achievable measures of progress toward the program outputs and outcome. The DLI targets have been developed in consultation with experienced system planners in PLN and are as close as possible

[19] The smart grid pilot projects will be aligned to support planned investments in solar and wind energy by both PLN and the private sector. Some of these renewable energy investments may be financed by KfW (1,000 Islands Renewable Energy for Electrification Program) and ADB's Private Sector Operations Department.
[20] Program Results Framework (accessible from the list of linked documents in Appendix 2).

to the government-driven RUPTL targets, while carefully considering PLN's actual performance during 2010–2016.

15. All indicators are in the design and monitoring framework (Appendix 1) and the program results framework. Table 2 summarizes the disbursement allocations. The largest allocation is for DLI 1, as this program's main objective is to enhance people's access to electricity services. DLIs 2 and 5 include subtargets for commercial customers and specific PLN service areas to ensure synergy between the RBL program and the government's tourism development program in Eastern Indonesia.[21] The results chain also includes some targets articulating the RBL program's outcome, which are difficult to link to disbursements and are therefore included in the program action plan (PAP),[22] which will be monitored regularly.

Table 2: Disbursement-Linked Indicators

Indicator	Disbursement Allocated ($ million)	Share of Total ADB Financing (%)
Outcome		
DLI 1 Expanded access to electricity services: Number of total customers in Sulawesi and Nusa Tenggara increased by an average annual rate of at least 5.6% (at least 1.37 million more customers by 2020 from the 2016 baseline)	120.0	20.0
DLI 2 Growth in delivered electricity services: Total annual electricity sales increased by an average annual rate of at least 8.5% (an increase of at least 4,374 gigawatt-hours by 2020 from the 2016 baseline), with an equal or higher growth rate for commercial customers	96.0	16.0
DLI 3 Improved reliability of services: Feeder line permanent interruptions[a] in the distribution system reduced by an average annual rate of at least 5% (a reduction of more than 3.61 interruptions per 100 circuit-kilometers by 2020 from the 2016 baseline)	48.0	8.0
Outputs		
Distribution system strengthened and expanded		
DLI 4 Number of distribution transformer units installed increased by an average annual rate of at least 5.6% (at least 9,933 more units by 2020 from the 2016 baseline)	96.0	16.0
DLI 5 The length of medium-voltage distribution lines installed increased by an average annual rate of at least 5.6% (at least 11,508 circuit-kilometer increase by 2020 from the 2016 baseline), with an equal or higher growth rate in Lombok and Flores	96.0	16.0
Innovation and institutional capacity enhanced		
DLI 6 Pilot-scale smart grid projects implemented in at least four areas by 2021	48.0	8.0
DLI 7 Operational efficiency and resource optimization enhanced, with at least 75% of total customers using digital prepaid meters or smart meters by 2021 (from 48% in 2016)	48.0	8.0
DLI 8 Asset and waste management improved, with 90% of used PLN-owned equipment from the 2016 disposal inventory safely disposed of by 2021	48.0	8.0
Total	**600.0**	**100.0**

DLI = disbursement-linked indicator, PLN = State Electricity Corporation (*Perusahaan Listrik Negara*).

[a] PLN defines permanent interruptions as those over 5 minutes in duration.

Sources: Asian Development Bank estimates, PLN management reporting information system, and Electricity Power Supply Business Plan (*Rencana Usaha Penyediaan Tenaga Listrik*), 2017–2026.

E. Expenditure Framework and Financing Plan

16. **Program expenditure**. PLN's broader program expenditure for strengthening and developing the power transmission and distribution systems in Nusa Tenggara and Sulawesi during 2017–2021 is estimated at $5,057 million, of which $3,385 million is capital expenditure needs. The RBL program, which covers the distribution systems from 2017 to 2021, is estimated

[21] DLI 2 includes growth subtargets for electricity sales to commercial customers (e.g., hotels and restaurants), and DLI 5 includes medium-voltage line extensions in Lombok (West Nusa Tenggara) and Flores (East Nusa Tenggara).

[22] Program Action Plan (accessible from the list of linked documents in Appendix 2).

at $1,830 million, of which $1,214 million represents capital expenditure needs. Table 3 summarizes the broader program and RBL program expenditures.

Table 3: Summary of Program Expenditure Framework, 2017–2021

	PLN Broader Program		RBL Program	
Item	**Amount** ($ million)	**Share of Total** (%)	**Amount** ($ million)	**Share of Total** (%)
Civil works	846	16.7	304	16.6
Equipment	2,539	50.2	911	49.8
Taxes and duties	406	8.0	146	8.0
Land acquisition	23	0.5	12	0.7
Project management	34	0.7	12	0.7
Monitoring and supervision	169	3.3	61	3.3
Environmental management	17	0.3	6	0.3
Interest	364	7.2	79	4.3
Physical contingencies[a]	403	8.0	145	7.9
Price contingencies[b]	255	5.1	155	8.5
Total	**5,057**	**100.0**	**1,830**	**100.0**

PLN = State Electricity Corporation (*Perusahaan Listrik Negara*), RBL = results-based lending.
Note: Numbers may not sum precisely because of rounding.
[a] Based on 10% estimated physical contingencies (typical for this type of project).
[b] Based on Asian Development Bank forecast domestic and international cost escalation factors.
Sources: Asian Development Bank and PLN estimates.

17. **Program financing.** PLN will finance at least 59.5% of the cost of the broader program from internal cash flows and the government's equity injection. PLN has requested a loan, to be guaranteed by the Republic of Indonesia, for $600 million from ADB's ordinary capital resources for the program. The financing plan for the broader program and the RBL program is in Table 4.

Table 4: Program Financing Plan

	PLN Broader Program		RBL Program	
Source	**Amount** ($ million)	**Share of Total** (%)	**Amount** ($ million)	**Share of Total** (%)
PLN[a]	3,008	59.5	915	50.0
Asian Development Bank	600	11.9	600	32.8
Others[b]	1,449	28.7	315	17.2
Total	**5,057**	**100.0**	**1,830**	**100.0**

PLN = State Electricity Corporation (*Perusahaan Listrik Negara*), RBL = results-based lending.
Note: Numbers may not sum precisely because of rounding.
[a] From PLN's internal cash flows and equity injections from the Government of Indonesia.
[b] Includes possible funding from other multilateral and bilateral financial institutions. If partner funding is insufficient, PLN is expected to secure the necessary funding from its internal cash flows or additional equity injections from the government.
Sources: Asian Development Bank and PLN estimates.

18. **Disbursement arrangements.** The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed upon between the borrower and ADB. Up to 25% of the loan will be made available for advance financing upon loan effectiveness. PLN will submit a withdrawal application reporting on the achievement of the DLIs, and disbursement will be made subject to verification by an independent verification agent (IVA) in accordance with the agreed DLIs and verification protocols (Appendix 3).[23]

[23] The IVA arrangement for Sumatra RBL is supported by *TA 9113-INO: Strengthening Verification in Results-Based Programs in Indonesia's Power Sector* under the cluster technical assistance *C-TA0013-INO: Sustainable Infrastructure Assistance Program* financed by the Government of Australia through the Department of Foreign Affairs and Trade and administered by ADB. Additional financing of the technical assistance has been approved to

19. If progress toward the DLI target has been made, but the target has not yet been fully achieved, and partial disbursement has been agreed for that DLI, ADB will determine the amount to be disbursed based on the level of achievement. Verification mechanisms and protocols have been established depending on the nature of the DLIs (Appendix 3). Loan proceeds will be disbursed to PLN's account with a commercial bank. Further, advance financing will also be allowed to address financing requirements as needed within the RBL policy limits.[24] PLN will refund any advance financing amount outstanding if the DLIs are not achieved.

F. Capacity Development and Program Action Plan

20. Various assessments have identified capacity gaps for implementing the RBL program (section III). Based on these assessments, a PAP was developed to enhance PLN's capacity in addition to the three output-level institutional strengthening DLIs. The PAP includes actions in specific technical areas, monitoring and evaluation (M&E), fiduciary management, and safeguards to ensure that the achievement of key program results strengthens PLN systems, thus making the program results more sustainable. The PAP will focus on implementation capacity, which will complement physical investments under the program and contribute to its overall efforts to increase staff resources and improve institutional monitoring and reporting systems.

G. Implementation Arrangements

21. The executing agency will be PLN. PLN's regional offices (*wilayahs)* in Nusa Tenggara and Sulawesi will implement the program, with overall oversight by PLN headquarters.[25] The program will be implemented from October 2017 to December 2021.

III. SUMMARY OF ASSESSMENTS

A. Program Technical Assessments

22. A review of the technical soundness of the program found that the distribution design is simple and straightforward, and generally follows international practice. Overall, PLN's plan to develop the power systems in Nusa Tenggara and Sulawesi is operationally viable and can be expected to increase service coverage and reliability.[26] These conclusions underpin the results areas, key actions to be taken, and performance indicators for the sector overall, and the RBL program in particular.

23. The primary program beneficiaries will be the 1.3 million additional households connected to the distribution grid. Children will be able to read and study in the evenings, and air quality will improve once fuel lamps are eliminated. People will be able to communicate better and access information via phones and other devices, and village schools and health centers can benefit from lighting and refrigeration for vaccines and health supplies. The program will also expand electricity access to small and medium-sized businesses including in tourism, fisheries, and agro-industry, and can contribute to substantial job growth.

---

extend the regional coverage to Nusa Tenggara and Sulawesi subject to the Board's approval of the proposed loan. As is the case between ADB and the World Bank for the Sumatra program, the IVA arrangement for Nusa Tenggara and Sulawesi may be shared with other development partners when and where similar verifications are required.

[24] Ceilings are 25% for advance financing and 20% for financing for prior results. The combined outstanding balance of advance financing and the amount of financing for prior results should not exceed 30%.

[25] Key PLN divisions in headquarters have developed a good capacity to plan and manage RBL programs due to their experience during 2015–2016 with both ADB's RBL program and the World Bank's Program-for-Results for Sumatra.

[26] Program Soundness Assessment (accessible from the list of linked documents in Appendix 2).

24. Although expanding and strengthening the electricity grid has no gender-specific actions, women will benefit substantially from the program. A reliable and affordable electricity supply will reduce the amount of effort spent by women to obtain other fuels. It will also enable women to run income-generating activities from their own homes. Communities will be able to pump and store water, and having well-lit streets will deter crime and enhance safety for girls and women.

25. The program will generate incremental benefits that accrue from the additional electricity supply. The program's economic viability is evaluated using a system approach for the entire PLN program in Nusa Tenggara and Sulawesi, as the benefits are dependent on interlinked investments in generation, transmission, and distribution. Following ADB's Guidelines for the Economic Analysis of Projects, the economic analysis of the program yields an economic internal rate of return of 14.6%, confirming the program's economic viability (footnote 26).

B. Program Systems Assessments

26. **Monitoring and evaluation systems.** PLN's corporate M&E system is handled and managed by its Corporate Performance Control Unit using its Management Reporting Information System (*Sistem Informasi Laporan Manajemen* [SILM]), which will also be used to track the progress of the DLIs.[27] SILM provides accurate, real-time, critical data online, such as electricity-generation, sales, transmission and distribution, and the project development status. Each department also operates other information technology applications which generate data that feeds into SILM and provide additional information on current activities for PLN's management.

27. A monthly report provides comprehensive data on customer service quality, project performance, corporate performance, and electricity conditions. The Corporate Performance Control Unit, together with the supervising regional division in PLN's headquarters, holds monthly videoconferences with each *wilayah* to verify the numbers in SILM. To complement PLN's internal M&E procedures, ADB will engage an IVA to verify information related to DLIs (footnote 23).

28. **Fiduciary systems.** The program will use PLN's fiduciary systems for financial management, procurement, and audit. These systems were assessed to determine their ability to manage fiduciary risks and provide assurance that RBL program funds will be used as intended, with due consideration for economy and efficiency.[28] The assessments found that planning and budgeting improvements are needed, and that further computerization is required for accounting and financial reporting. This will be covered by activities under the PAP.

29. A procurement assessment covered the following areas: (i) procurement profile; (ii) procurement regulations, rules, and procedures; (iii) procurement organizational arrangements and capacity; and (iv) procurement system performance.[29] The RBL program will rely on PLN's systems and will exclude high-value contracts in accordance with ADB's RBL policy.[30] PLN has established a well-defined and accountable procurement process, and has implemented various e-procurement and backend systems. Procurement under the RBL program scope will include materials for distribution lines; works and service contracts for distribution lines; and engineering,

[27] Program Monitoring and Evaluation System Assessment (accessible from the list of linked documents in Appendix 2).
[28] Program Fiduciary Systems Assessment (accessible from the list of linked documents in Appendix 2).
[29] Procurement Assessment of Indonesia's State Electricity Corporation (*Perusahaan Listrik Negara*) (accessible from the list of linked documents in Appendix 2).
[30] ADB. 2013. *Piloting Results-Based Lending for Programs*. Manila. High value contracts are those with estimated value over $50 million for works, turnkey and supply, and installation contracts; $30 million for goods; $20 million for information technology systems and non-consulting services; and $15 million for consulting services.

procurement, and construction of the pilot smart grid systems. PLN will procure the materials for distribution centrally through limited bidding and framework contracts. The procurement of works and installation services will be carried out by PLN *wilayahs,* including the sub-regional offices (*areas*) under them. Experience from the ongoing RBL in Sumatra shows that this procurement process is appropriate for power distribution network development. The procurement under the pilot smart grid projects will be carried out following PLN's open competitive bidding procedures allowing international bidders to participate.

30. PLN's overall procurement risk is assessed as moderate. The main deficiencies and risks in PLN's procurement system are (i) limitations on international bidders who wish to participate, due to requirements for local content; (ii) the use of noncompetitive procurement methods, including several direct contracting methods and limited bidding for certain procurement categories; (iii) insufficient procurement capacity or capacity of local contractors to scale up procurement under the program, especially in PLN *wilayahs* and *areas*; and (iv) insufficient procurement planning, which may lead to implementation delays. The key procurement risks will be addressed through activities under the PAP.

31. The Guidelines to Prevent or Mitigate Fraud, Corruption, and Other Prohibited Activities in Results-Based Lending for Programs were explained to and discussed with PLN.

32. **Safeguard systems.** A program safeguard system assessment assessed the safeguards system of the government and PLN, and confirmed the safeguards categorizations of B for environment, involuntary resettlement, and indigenous peoples.[31] All environment policy principles, 7 out of 12 involuntary resettlement principles, and 6 out of 9 indigenous peoples principles of ADB's Safeguard Policy Statement (2009) are triggered. Potential construction-related impacts include soil erosion, noise, dust, and waste generation. Potential impacts during operation include the trimming of trees within the right-of-way of distribution lines. The program impacts are site-specific and, in most cases, mitigation measures can be readily designed. The expansion of the distribution network usually requires (i) the use of no more than 0.2 square meters of land for each concrete pole, (ii) possible removal of non-land assets (primarily trees) for the stringing of conductors, and (iii) about 4.5 square meters of land for each pole-mounted transformer installed on two utility poles. Some of the land used for the program may be owned by indigenous peoples groups.

33. Identified weakness in safeguard systems include (i) safeguards screening (of projects in protected areas and key biodiversity areas), (ii) institutional capacity, (iii) monitoring and reporting, (iv) guidance on environmental mitigation measures, (v) asset and waste management, (vi) consultations, and (vii) written agreements for land use (for distribution transformers). These will be addressed by program actions, including a screening mechanism to ensure that the RBL program excludes activities that would be classified as category A. DLI 8 addresses asset and waste management.

C. Integrated Risk Assessment and Mitigating Measures

34. Major risks and mitigating measures are summarized in Table 5.[32] The overall benefits and impacts are expected to outweigh the risks and costs.

[31] Program Safeguard Systems Assessment (accessible from the list of linked documents in Appendix 2). The draft program safeguard system assessment has been disclosed on the ADB website. It is used as one of the inputs for the agency-level country safeguards system assessment ongoing for PLN.

[32] Integrated Risk Assessment and Mitigating Measures (accessible from the list of linked documents in Appendix 2).

Table 5: Summary of Integrated Risk Assessment and Mitigating Measures

Risks	Ratings	Key Mitigating Measures
Results. Customer demand declines due to slower economic growth.	Substantial	The program will monitor the impact of macroeconomic factors on energy sales and consider adjustment of disbursement allocations if necessary and justified.
Results. Large investments in the sector stretch existing institutional capacity to undertake innovation particularly at the regional level.	Moderate	PLN will strengthen the mandate of its regional directorates to undertake pilot projects and develop staff capacity through its training programs.
Expenditures and financing. PLN's funding targets for required investments in power generation, transmission, and distribution are not met.	Moderate	The government is providing guarantee of tariff subsidies and equity injections to enable PLN to finance its capital expansion program while meeting financial covenants. ADB and other development partners are supporting tariff reform through a coordinated policy-based loan.
Monitoring and evaluation. Institutional pressure to achieve established targets lead to inconsistent reporting.	Substantial	ADB will mobilize an independent verification agent to crosscheck the reported results, such as by comparing them with tariff collection data.
Procurement. Market capacity and supply risk issues cause price fluctuations.	Moderate	ADB and PLN will develop a procurement monitoring and spending profile to identify a lack of competition or above-normal contract prices due to market failure.
Safeguards. The issuance of government approval for the disposal of assets and waste is delayed.	Substantial	PLN and ADB will have close coordination with the Ministry of State-Owned Enterprises during program implementation.
Fraud and corruption. PLN struggles with initiatives to strengthen internal controls.	Substantial	The procurement monitoring system will be used to track contract awards and detect any red flags. Any issues identified will be discussed with PLN's management team, and relevant government authorities as appropriate.
Overall RBL program risk	**Moderate**	

ADB = Asian Development Bank, PLN = State Electricity Corporation (*Perusahaan Listrik Negara*), RBL = results-based lending.
Note: Risk factors are assessed against two dimensions: (i) the likelihood that the risk will occur, and (ii) the impact of the risk on the outcome. Rating scale: low = low likelihood and low impact; moderate = substantial to high likelihood, but low to moderate impact; substantial = low to moderate likelihood, but substantial to high impact; high = high likelihood and high impact.
Source: ADB.

IV. ASSURANCES

35. The government and PLN have agreed with ADB on certain covenants for the RBL program, which are set forth in the loan agreement and guarantee agreement.

V. RECOMMENDATION

36. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $600,000,000 to the State Electricity Corporation (*Perusahaan Listrik Negara*) to be guaranteed by the Republic of Indonesia for the Sustainable Energy Access in Eastern Indonesia—Electricity Grid Development Program from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 20 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and guarantee agreements presented to the Board.

Takehiko Nakao
President

23 August 2017

DESIGN AND MONITORING FRAMEWORK

Impact the RBL Program is Aligned With: Quality of life in Indonesian society enhanced by the sustainable use of electricity as a key driver of increased economic activity (RUPTL, 2017–2026)			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting Mechanisms**	**Risks**
Outcome Access to more reliable electricity services for residential, commercial, and industrial customers in the Eastern Indonesian provinces in Sulawesi and Nusa Tenggara expanded	a. Expanded access to electricity services: Number of total customers in Sulawesi and Nusa Tenggara increased by an average annual rate of at least 5.6% to reach at least 6.99 million customers by 2020 (2016 baseline: 5.62 million customers). DLI 1 b. Growth in delivered electricity services: Total annual electricity sales increased by an average annual rate of at least 8.5% to reach at least 15,710 GWh by 2020 (2016 baseline: 11,336 GWh), with an equal or higher growth rate for commercial customers, to reach at least 3,234 GWh in annual sales by 2020 (2016 baseline: 2,334 GWh). DLI 2 c. Improved reliability of services: Feeder line permanent interruptions in the distribution system reduced by an average annual rate of at least 5%, to reach less than 15.82/100 ckm by 2020 (2016 baseline: 19.43/100 ckm). DLI 3	a. PLN annual statistics, PLN SILM, RBL program reports, and IVA reports b. PLN annual statistics, PLN SILM, RBL program reports, and IVA reports c. PLN annual statistics, PLN SILM, RBL program reports, and IVA reports	PLN funding targets for required investments in power generation, transmission, and distribution are not met. Customer demand declines due to slower economic growth.
Outputs 1. Distribution system strengthened and expanded	1a. Number of distribution transformer units installed increased by an average annual rate of at least 5.6%, to reach at least 50,721 by 2020 (2016 baseline: 40,788 units). DLI 4 1b. Length of medium-voltage distribution lines installed increased by an average annual rate of at least 5.6% to reach at least 58,764 ckm by 2020 (2016 baseline: 47,256 ckm), with an equal or higher growth rate in Lombok and Flores to reach at least 7,388 ckm combined by 2020 (2016 baseline: 5,941 ckm). DLI 5	1a. PLN SILM, PLN *wilayah* records, and IVA reports 1b. PLN annual statistics reports, PLN SILM, and IVA reports	Market capacity and supply risk issues cause price fluctuations.
2. Innovation and institutional capacity enhanced	2a. New pilot-scale smart grid projects implemented in at least four PLN areas by 2021 (2016 baseline: no projects that are in line with corporate smart grid roadmap). DLI 6 2b. Operational efficiency and resource optimization enhanced and the use of digital prepaid meters or smart meters increased to at least 75% of total	2a. PLN *wilayah* records, Smart Grid Task Force reports, and IVA reports 2b. PLN annual statistics, PLN SILM, and IVA reports	Large investments in the sector stretch existing institutional capacity to undertake innovation particularly at the regional level. The issuance of government approval for the disposal of

	customers by 2021 (2016 baseline: 48%). DLI 7 2c. Asset and waste management improved, with 90% of used PLN-owned equipment from the 2016 disposal inventory safely disposed of by 2021 (2016 baseline: 0%). DLI 8 2d. More than 75% of distribution system contracts fully implemented in a timely fashion by 2021 (2016 baseline: 45%).	 2c. RBL program reports and IVA reports 2d. PLN SILM, PLN *wilayah* records, and IVA reports	assets and waste is delayed.

Key Program Actions

1. Distribution system strengthened and expanded

1.1 Screen and select target distribution network investment sites, and ensure synergy with government programs to develop tourism to create jobs and stimulate economic growth.
1.2 Expand and reinforce the medium- and low-voltage distribution network.
1.3 Install distribution transformers.
1.4 Install service connections and feeders.
1.5 Install customer meter boxes and circuit breakers.

2. Innovation and institutional capacity enhanced

2.1 Smart grid
- 2.1.1 Issue Corporate Smart Grid Road Map.
- 2.1.2 Issue Smart Grid Guidelines.
- 2.1.3 Select pilot projects with success indicators adopted.
- 2.1.4 Implement pilot projects.

2.2 Digital prepaid meters and smart meters
- 2.2.1 Train PLN operational staff on consumer benefits of digital prepaid meters and smart meters.
- 2.2.2 Organize workshops for households and business customers to promote the use of digital prepaid meters and smart meters for better management of energy expenditures.
- 2.2.3 Convert analog meters to digital prepaid meters and smart meters.

2.3 Manage assets and waste
- 2.3.1 Inventory of used equipment for disposal as of the end of 2016 prepared and approved by PLN DIV AKT
- 2.3.2 Approval of the disposal inventory by the Ministry of State-Owned Enterprises.
- 2.3.3 Revise PLN Guidance for Asset Management (1998) to accelerate the disposal of hazardous waste.
- 2.3.4 Clean up existing oil spills in accordance with national regulations.
- 2.3.5 Equip all warehouses with oil containment and/or protection measures.
- 2.3.6 Dispose of PLN-owned used equipment in the inventory (as of the end of 2016).

2.4 Analyze and resolve bottlenecks in contract implementation processes.

Financing Plan

PLN: $915.0 million
Asian Development Bank: $600.0 million (ordinary capital resources)
Others: $315.0 million

Assumptions for Partner Financing

"Others" include possible collaborative funding from KfW and other bilateral and multilateral financial institutions. If partner funding is insufficient, PLN is expected to secure the necessary funding from its internal cash flows or additional equity injections from the government.

ckm = circuit kilometer, DIV AKT = Accounting Division, DLI = disbursement-linked indicator, GWh = gigawatt-hour, IVA = independent verification agent, km = kilometer, PLN = State Electricity Corporation (*Perusahaan Listrik Negara*), RBL = results-based lending, RUPTL = Electricity Power Supply Business Plan (*Rencana Usaha Penyediaan Tenaga Listrik*), SILM = Management Reporting Information System (*Sistem Informasi Laporan Manajemen*).
Sources: Asian Development Bank; PLN.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=50016-001-3

1. Loan Agreement: Ordinary Operations
2. Guarantee Agreement
3. Country Economic Indicators
4. Sector Assessment (Summary): Energy
5. Program Soundness Assessment
6. Program Results Assessment
7. Program Results Framework
8. Program Expenditure and Financing Assessment
9. Program Monitoring and Evaluation System Assessment
10. Program Fiduciary Systems Assessment
11. Program Safeguard Systems Assessment
12. Integrated Risk Assessment and Mitigating Measures
13. Program Action Plan
14. Contribution to the ADB Results Framework
15. Development Coordination
16. Summary Poverty Reduction and Social Strategy
17. Program Implementation Document

Supplementary Documents

18. Program Scope of Work
19. Monitoring and Evaluation Framework
20. Procurement Monitoring Framework
21. Additional Information to Program Safeguard Systems Assessment
22. Procurement Assessment of Indonesia's State Electricity Corporation (Perusahaan Listrik Negara)

DISBURSEMENT-LINKED INDICATORS, VERIFICATION PROTOCOLS, AND DISBURSMENT SCHEDULE

Table A3.1: Disbursement-Linked Indicators

Disbursement-Linked Indicator	Baseline: 2016	2017	2018	2019	2020	2021
DLI 1: Expanded access to electricity services: number of total customers increased by an average annual rate of at least 5.6% to reach at least 6.99 million customers by 2020	5.62 million customers	At least 5.90 million customers	At least 6.27 million customers	At least 6.62 million customers	At least 6.99 million customers	
DLI 2: Growth in delivered electricity services: total annual electricity sales increased by an average annual rate of at least 8.5% to reach at least 15,710 GWh by 2020, with an equal or higher growth rate for commercial customers to reach at least 3,234 GWh annual sales by 2020	Energy sales 11,336 GWh (2,334 GWh to commercial customers)	At least 12,300 GWh or more of energy sales to customers (at least 2,532 GWh to commercial customers)	At least 13,345 GWh or more of energy sales to customers (at least 2,747 GWh to commercial customers)	At least 14,480 GWh or more of energy sales to customers (at least 2,981 GWh to commercial customers)	At least 15,710 GWh or more of energy sales to customers (at least 3,234 GWh to commercial customers)	
DLI 3: Improved reliability of services: Feeder line permanent interruptions in the distribution system reduced by an average annual rate of at least 5% each year to reach less than 15.82/100 ckm by 2020[a]	MV feeder permanent interruptions 19.43/100 ckm	MV feeder permanent interruptions less than 18.45/100 ckm	MV feeder permanent interruptions less than 17.53/100 ckm	MV feeder permanent interruptions less than 16.66/100 ckm	MV feeder permanent interruptions less than 15.82/100 ckm	
DLI 4: Number of distribution transformer units installed increased by an average annual rate of at least 5.6% each year to reach at least 50,721 by 2020	40,788 units installed	At least 43,072 distribution transformer units installed	At least 45,484 distribution transformer units installed	At least 48,031 distribution transformer units installed	At least 50,721 distribution transformer units installed	
DLI 5: Additional length of MV[b] distribution lines installed increased by an average annual rate of at least 5.6% each year to reach at least 58,764 ckm by 2020, with an equal or higher growth rate in Lombok and Flores combined to reach at least 7,388 ckm by 2020	47,256 ckm of MV distribution lines installed (5,941 ckm in Lombok and Flores combined)	At least 49,902 ckm of MV distribution lines installed (at least 6,274 ckm in Lombok and Flores combined)	At least 52,697 ckm of MV distribution lines installed (at least 6,626 ckm in Lombok and Flores combined)	At least 55,648 ckm of MV distribution lines installed (at least 6,997 ckm in Lombok and Flores combined)	At least 58,764 ckm of MV distribution lines installed (at least 7,388 ckm in Lombok and Flores combined)	

Disbursement-Linked Indicator	Baseline: 2016	2017	2018	2019	2020	2021
DLI 6: Pilot-scale smart grid projects implemented in at least 4 areas by 2021.	0 SG projects in SNT that are in line with Corporate SG Roadmap	SG Guidelines based on Corporate SG Roadmap issued, pilot projects in 4 PLN Areas selected	Project design developed, 2 pilot SG projects start procurement	At least 2 more pilot SG projects start procurement	At least 2 pilot SG projects operational	At least 4 pilot SG projects operational
DLI 7: Operational efficiency and resource optimization enhanced with digital pre-paid meter or smart meter use increased to at least 75% of total customers by 2021	48% of total customers use digital pre-paid meters or smart meters	At least 55% of total customers use digital pre-paid meters or smart meters	At least 60% of total customers use digital pre-paid meters or smart meters	At least 65% of total customers use digital pre-paid meters or smart meters	At least 70% of total customers use digital pre-paid meters or smart meters	At least 75% of total customers use digital pre-paid meters or smart meters
DLI 8: Asset and waste management improved with at least 90% of used PLN equipment from the 2016 disposal inventory safely disposed by 2021	2016 baseline: 0 disposal rate. Years of accumulated used equipment, including hazardous waste and slow procedures for review, approval and disposal	(i) 2016 inventory of used equipment for disposal prepared and approved by PLN & MSOE. (ii) PLN Guidance for Asset Management (1998) revised to accelerate disposal of hazardous waste	(i) Existing oil spills cleaned in accordance with MOEF No.33/2009. (ii) at least 20% of PLN's used equipment in the 2016 inventory safely disposed	(i) All warehouses equipped with oil containment/ protection measures (ii) At least 50% of PLN's used equipment in the 2016 inventory safely disposed	At least 80% of PLN's used equipment in the 2016 inventory safely disposed	At least 90% of PLN's used equipment in the 2016 inventory safely disposed

ckm = circuit kilometer, DLI = disbursement-linked indicator; GWh = gigawatt hour, km = kilometer, MOEF= Ministry of Environment and Forestry, MSOE = Ministry of State Owned Enterprises, MV = medium-voltage, PLN = State Electricity Corporation, SG = smart grid, SNT = Sulawesi and Nusa Tenggara.

[a] PLN defines "*Permanent interruptions*" as any interruption to the system longer than 5 minutes. The interruptions related to generation and transmission faults are excluded for this indicator.

[b] PLN generally defines medium-voltage as 20 kV.

Sources: Asian Development Bank estimates, PLN management information systems, and Electricity Power Supply Business Plan (RUPTL), 2017–2026.

Table A3.2: Verification Protocols

Disbursement-Linked Indicator	Definition and Description of Achievement and Verification	Information Source and Frequency	Verification Agency and Procedure
DLI 1: Expanded access to electricity services: number of total customers in Sulawesi and Nusa Tenggara increased by an average annual rate of at least 5.6% to reach at least 6.99 million customers by 2020			
Baseline (2016): 5.62 million customers in Sulawesi and Nusa Tenggara 2017: At least 5.90 million customers (cumulative) connected 2018: At least 6.27 million customers (cumulative) connected 2019: At least 6.62 million customers (cumulative) connected 2020: At least 6.99 million customers (cumulative) connected	**Definition** of DLI 1 is the number of customers served by PLN in Sulawesi and Nusa Tenggara, as recorded in PLN distribution systems for a given year. Customers include residential, commercial, industrial, social, and government customers. **Conditions for disbursement** are met if the number of cumulative PLN customers for a given year reaches or exceeds the target number specified for that year (first column). **Partial disbursement**. The DLI is scalable and partial disbursement is allowed. If the target is not fully achieved, then disbursement can be proportional to the increase made from the previous year's targeted achievement. The following formula will be applied: Partial DLI disbursement = planned DLI disbursement for the period* (actual achievement of the current period–targeted achievement of the previous period)/(targeted achievement of the current period–targeted achievement of the previous period). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is late, as long as the achievement is during the program's duration.	PLN databases and annual statistics. Required frequency for reporting will be annual, and PLN and ADB may agree each year on interim reporting arrangements as appropriate Monitoring may be as frequent as PLN wishes.	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results each year in SPKK and DIR REG SNT. The IVA will also verify the results by spot checks of the system at district and province level. The IVA will refer to the verification protocols and other relevant guidelines prepared for the program. The IVA report is then attached to the PLN report. Within one month of receiving the validated report, ADB will confirm that the target has been met.
DLI 2: Growth in delivered electricity services: total annual electricity sales increased by an average annual rate of at least 8.5% to reach at least 15,710 GWh by 2020, with equal or higher growth for commercial customers to reach at least 3,234 GWh annual sales by 2020			
Baseline (2016): 11,336 GWh total electricity sales with 2,334 GWh sales to commercial customers 2017: At least 12,300 GWh of total electricity sales with at least 2,532	**Definition** of DLI 2 is annual electricity sales by PLN in GWh for the whole of Sulawesi and Nusa Tenggara, which is the electricity sold to all customers (residential, commercial, industrial, social, and government customers) by PLN. Each year this is obtained by the total electricity sales for that year. Annual sub-targets are established for electricity sold to commercial customers. **Conditions for disbursement** are met if, for a given year, the cumulative total electricity sales reaches or exceeds the sales target specified for that year (first column). 25% of the total	PLN databases and annual statistics. Required frequency for reporting will be annual, and PLN and ADB may agree each year on interim reporting	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results each year in SPKK and DIR REG SNT. The IVA will also verify the

Disbursement-Linked Indicator	Definition and Description of Achievement and Verification	Information Source and Frequency	Verification Agency and Procedure
GWh sales to commercial customers 2018: At least 13,345 GWh of total electricity sales with at least 2,747 GWh sales to commercial customers 2019: At least 14,480 GWh of total electricity sales with at least 2,981 GWh sales to commercial customers 2020: At least 15,710 GWh of total electricity sales with at least 3,234 GWh sales to commercial customers	allocated loan amount for this DLI is allocated to annual sub-targets for electricity sales to commercial customers. **Partial disbursement**. The DLI is scalable and partial disbursement is allowed. If the target is not fully achieved, then disbursement can be proportional to the increase made from the previous year's targeted achievement. The following formula will be applied: Partial DLI disbursement = planned DLI disbursement for the period* (actual achievement of the current period–targeted achievement of the previous period)/(targeted achievement of the current period–targeted achievement of the previous period). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is late as long as the achievement is during the program's duration.	arrangements as appropriate. Monitoring may be as frequent as PLN wishes.	results by spot checks of the system at district and province level. The IVA will refer to the verification protocols and other relevant guidelines prepared for the program. The IVA report is then attached to the PLN report. Within one month of receiving the validated report, ADB will confirm that the target has been met.
DLI 3: Improved reliability of services: Feeder line permanent interruptions in the distribution system reduced by an average annual rate of at least 5% to reach less than 15.82/100 ckm by 2020			
Medium-voltage feeder line permanent interruptions within the distribution system are: Baseline (2016): 19.43/100 ckm in 2016 2017: less than18.45/100 ckm 2018: less than 17.53/100 ckm 2019: less than 16.66/100 ckm 2020: less than 15.82/100 ckm	**Definition**. This is defined as the number of 20 kV feeder permanent interruptions per 100 ckm of lines within the distribution system. Permanent interruptions are defined by PLN as those longer than 5 minutes. The interruptions related to generation and transmission faults are excluded. **Conditions for disbursement** are met for a given year, if the yearly permanent interruptions are below the target value specified for that year (first column). **Partial disbursement**. The DLI is scalable and partial disbursement is allowed. If the target is not fully achieved, then disbursement can be proportional to the *reduction* made from the previous year's targeted achievement. The following formula will be applied: Partial DLI disbursement = planned DLI disbursement for the period* (actual reduction achieved of the current period–targeted reduction of the previous period)/(targeted reduction of the current period–targeted reduction of the previous period).	The number of permanent interruptions on each feeder is available from the trip counter and is recorded at the substations. These figures are already being retrieved and computed, along with feeder lengths, by SPKK. Required frequency for reporting will be annual. Monitoring may be as frequent as PLN wishes.	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results each year in SPKK and DIR REG SNT. The IVA will also verify the results by spot checks of the system at district and province level. The IVA will refer to the verification protocols and other relevant guidelines prepared for the program. The IVA report is then attached to the PLN

Disbursement-Linked Indicator	Definition and Description of Achievement and Verification	Information Source and Frequency	Verification Agency and Procedure
			report. Within one month of receiving the validated report, ADB will confirm that the target has been met.
DLI 4: Number of distribution transformer units installed increased by an average annual rate of at least 5.6% to reach at least 50,721 by 2020			
Baseline (2065): 40,788 distribution transformer units installed 2017: cumulative total installed: at least 43,072 units 2018: cumulative total installed: at least 45,484 units 2019: cumulative total installed: at least 48,031 units 2020: cumulative total installed: least 50,721 units	**Definition.** Distribution transformer means transformers in PLN's medium-voltage (20 kV) and low-voltage distribution network in SNT. Each year, the newly installed units are added onto the existing installed units to obtain the cumulative total for that year. **Conditions for disbursement** are met for a given year when the number of distribution transformer units installed equals or surpasses the target specified for that year (first column). **Partial disbursement**. The DLI is scalable and partial disbursement is allowed. If the target is not fully achieved, then disbursement can be proportional to the increase made from the previous year's targeted achievement. The following formula will be applied: Partial DLI disbursement = planned DLI disbursement for the period* (actual achievement of the current period–targeted achievement of the previous period)/(targeted achievement of the current period–targeted achievement of the previous period). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is late, as long as the achievement is during the program's duration.	PLN databases and annual statistics. Required frequency for reporting will be annual, and PLN and ADB may agree each year on interim reporting arrangements as appropriate. Monitoring may be as frequent as PLN wishes.	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results each year in SPKK and DIR REG SNT. The IVA will also verify the results by spot checks of the system at district and province level. The IVA will refer to the verification protocols and other relevant guidelines prepared for the program. The IVA report is then attached to the PLN report. Within one month of receiving the validated report, ADB will confirm that the target has been met.
DLI 5: Length of medium-voltage (MV) distribution lines installed increased by an average annual rate of at least 5.6% to reach at least 58,764 ckm by 2020, with equal or higher growth in Lombok and Flores to reach at least 7,388 ckm combined length by 2020			
Baseline (2016): 47,256 ckm of MV distribution lines installed, with	**Definition.** Lombok and Flores mean the PLN Areas of Lombok and Flores. [33] Medium-voltage lines are the 20 kV lines transferring electricity from electrical substations to distribution transformers.	PLN databases and annual statistics.	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is

[33] "PLN Areas of Lombok and Flores" are PLN's administrative terms and includes smaller islands served by those PLN Area offices.

Disbursement-Linked Indicator	Definition and Description of Achievement and Verification	Information Source and Frequency	Verification Agency and Procedure
5,941 ckm in Lombok and Flores combined 2017: cumulative total installed: at least 49,902 ckm of MV distribution lines, with at least 6,274 ckm in Lombok and Flores combined 2018: cumulative total installed: at least 52,697 ckm of MV distribution lines, with at least 6,626 ckm in Lombok and Flores combined 2019: cumulative total installed: at least 55,648 ckm of MV distribution lines, with at least 6,997 ckm in Lombok and Flores combined 2020: cumulative total installed: at least 58,764 ckm of MV distribution lines, with at least 7,388 ckm in Lombok and Flores combined	This is calculated by adding each year's additional lines installed (in ckm) to the previous year's installed lines, to obtain the cumulative total. Annual sub-targets are established for installed MV distribution line length in the PLN Areas of Lombok and Flores (combined). **Conditions for disbursement** are met for a specific year when the cumulative total of PLN's medium-voltage distribution lines installed meets or exceeds the given target specified for that year (first column). 25% of the total allocated loan amount for this DLI is allocated to annual sub-targets for PLN Areas of Lombok and Flores (combined). **Partial disbursement.** The DLI is scalable and partial disbursement is allowed. If the target is not fully achieved, then disbursement can be proportional to the increase made from the previous year's targeted achievement. The following formula will be applied: Partial DLI disbursement = planned DLI disbursement for the period* (actual achievement of the current period–targeted achievement of the previous period)/(targeted achievement of the current period–targeted achievement of the previous period). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is late, as long as the achievement is during the program's duration.	Required frequency for reporting will be annual, and PLN and ADB may agree each year on interim reporting arrangements as appropriate. Monitoring may be as frequent as PLN wishes.	met and attaches the relevant report. The IVA will verify the results each year in SPKK and DIR REG SNT . The IVA will also verify the results by spot checks of the system at district and province level. The IVA will refer to the verification protocols and other relevant guidelines prepared for the program. The IVA report is then attached to the PLN report. Within one month of receiving the validated report, ADB will confirm that the target has been met.
DLI 6: Pilot-scale smart grid projects implemented in at least 4 areas by 2021			
Baseline (2016): no SG projects in Sulawesi and Nusa Tenggara that are in line with corporate SG roadmap 2017: (i) SG Guidelines	**Definition.** Smart Grid (SG) projects are those that meet the criteria defined by PLN. The criteria include, but are not necessarily limited to, demand response mechanisms to help balance electrical consumption with supply, inter-operability with solar and other renewables, and ICT systems that provide two-way information between the electricity supply source and user.	PLN Wilayah records. Required frequency for reporting will be annual, and PLN and ADB may agree	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the

Disbursement-Linked Indicator	Definition and Description of Achievement and Verification	Information Source and Frequency	Verification Agency and Procedure
based on Corporate SG Roadmap issued, (ii) project sites in at least 4 areas selected 2018: (i) Project design developed, (ii) Two pilot SG projects start procurement 2019: At least two more pilot SG projects start procurement 2020: At least two pilot SG projects operational 2021: At least four pilot SG projects operational	**Conditions for disbursement** are met for a specific year when the institutional actions and numeric targets set for that year (first column) are achieved, with the criteria for achievement as detailed in the guidelines developed in 2017, including performance indicators for the pilots. **Partial disbursement**. Partial disbursements are allowed as follows. For the same year, where there are two or three institutional actions, partial disbursement is possible proportional to the number of actions completed. However, partial disbursement is not possible within a single institutional action. The specified action has to be completed for disbursement. Partial disbursement is possible for all years: 2017 (2 actions, 50% of that year's allocation each) 2018 (project design for 4 projects – 12.5% each, procurement start for 2 projects – 25% each), 2019 (2 projects, 50% each), 2020 (2 projects with 50% each, 2021 (2 more projects with 50% each). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is late, as long as the achievement is during the program's duration.	each year on interim reporting arrangements as appropriate. Monitoring may be as frequent as PLN wishes.	results each year including through field checks of the pilot projects as needed. The IVA will refer to the 2017 SG guidelines, performance indicators and the verification protocols and other relevant guidelines prepared for the program. The IVA report is then attached to the PLN report. Within one month of receiving the validated report, ADB will confirm that the target has been met.
DLI 7: Operational efficiency and resource optimization enhanced with digital pre-paid meter or smart meter use increased to at least 75% of total customers by 2021			
Percentage of total customers using digital prepaid meters or smart meters is: Baseline (2016): 48% of total customers 2017: At least 55% 2018: At least 60% 2019: At least 65% 2020: At least 70% 2021: At least 75%	**Definition**. Digital pre-paid meters and smart meters are those that meet national standards, as defined by PLN, and are installed by PLN. The total number of customers (denominator) are as defined in DLI 1: the residential, commercial, and industrial customers served by PLN in SNT, as recorded in PLN distribution systems for a given year. The numerator is the number of customers using digital pre-paid meters, whether new customers or those having converted from an existing conventional meter. **Conditions for disbursement** are met for a given year when the percentage of PLN customers using digital pre-paid meters or smart meters installed meets or exceeds the criteria each year as specified in the first column. **Partial disbursement**. The DLI is scalable and partial disbursement is allowed. If the target is not fully achieved, then disbursement can be proportional to the increase made from the previous year's targeted achievement. The following formula will be	PLN Wilayah records. Required frequency for reporting will be annual, and PLN and ADB may agree each year on interim reporting arrangements as appropriate. Monitoring may be as frequent as PLN wishes.	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results each year in SPKK and DIR REG SNT. The IVA will also verify the results by spot checks of the system at district and province level. The IVA will refer to the verification protocols and other relevant guidelines prepared for the program.

Disbursement-Linked Indicator	Definition and Description of Achievement and Verification	Information Source and Frequency	Verification Agency and Procedure
	applied: Partial DLI disbursement = planned DLI disbursement for the period* (actual achievement of the current period–targeted achievement of the previous period)/(targeted achievement of the current period–targeted achievement of the previous period). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is late, as long as the achievement is during the program's duration.		The IVA report is then attached to the PLN report. Within one month of receiving the validated report, ADB will confirm that the target has been met.
DLI 8: Asset and waste management improved with at least 90% of used PLN equipment from the 2016 disposal inventory safely disposed by 2021			
Baseline (2016): Accumulated used equipment, including hazardous waste; no updated inventory; slow procedures for review, approval and disposal 2017: (i) inventory of used equipment for disposal as of end-2016 prepared and approved by PLN, (ii) PLN Guidance for Asset Management (1998) revised to accelerate disposal of hazardous waste 2018: (i) inventory of used equipment for disposal as of end-2016 approved by MSOE, (ii) existing oil spills in SNT cleaned in accordance with MOEF Regulation No.33/2009, (iii) at least 20% of PLN's used equipment in the 2016	**Definitions:** The percentage of "the used equipment safely disposed" will be calculated on the basis of the original value of assets which are stocked at PLN warehouse sites in Sulawesi and Nusa Tenggara. The "disposal inventory" is a nationwide inventory of all PLN used equipment that are intended for disposal. "Used PLN equipment" means PLN's assets and wastes (such as poles, cables, transformers and meters) that are out of use, which have been discharged from distribution operations. "Assets" and "wastes" are the same in nature, but "assets" become "wastes" once these are approved as "waste" by the relevant authorities through the following process. *Used equipment,* still considered as Government assets, are required to go through internal audit and verification within PLN involving the Ministry of State Owned Enterprises (MSOE) and the Directorate-General of National Wealth under the Ministry of Finance. *Broken materials less than 5 years old and still with economic value* can be disposed through auction at the discretion of PLN headquarters, but this would need agreement of the Board of Commissioners. *Used assets more than 5 years old with low economic value* are disposed through the MSOE. The long process of inventory, review, audit, and verification by different units is further subject to legal requirements for the relevant authority to sign accountability statements. "Oil containment" is where spills of oil are contained within a barrier or drainage system rather than being absorbed at the surface, contaminating the soil and water. Where it is not practical to provide	PLN Wilayah records and PLN central records. Required frequency for reporting will be annual, and PLN and ADB may agree each year on interim reporting arrangements as appropriate. Monitoring may be as frequent as PLN wishes.	Each year, the focal unit(s) in PLN prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results each year including through field checks of the warehouse sites. The IVA will refer to the revised government guidance for asset management and the verification protocols and other relevant guidelines prepared for the program. The IVA report is then attached to the PLN report. Within one month of receiving the validated report, ADB will confirm that the target has been met.

Disbursement-Linked Indicator	Definition and Description of Achievement and Verification	Information Source and Frequency	Verification Agency and Procedure
inventory safely disposed 2019: (i) all warehouses in SNT equipped with oil containment and/or protection measures, (ii) at least 50% of PLN's used equipment in the 2016 inventory safely disposed 2020: At least 80% of PLN's used equipment in the 2016 inventory for SNT safely disposed 2021: At least 90% of PLN's used equipment in the 2016 inventory for SNT safely disposed	permanent, dedicated containment structures, one or more alternative forms of spill containment may be provided as "oil protection measures," such as automatic shut-off valves on storm water basins, or shut-off valves in drainage or sewer facilities, combined with oil-water separators. **Conditions for disbursement** are met for a specific year when the institutional actions and/or percentage targets set for that year (first column) are achieved. **Partial disbursement**. Partial disbursements are allowed as follows. For the same year, where there are two or three institutional actions, partial disbursement is possible proportional to the number of actions completed. Partial disbursement is also permitted within a single institutional action. Within the component relating to percentage of waste disposal, partial disbursement can be made following the formula. Partial DLI disbursement = planned DLI disbursement for the period* (actual achievement of the current period–targeted achievement of the previous period)/(targeted achievement of the current period–targeted achievement of the previous period). Under 2018 action (i), if PLN obtains approval from MSOE for X% of the 2016 inventory, then the same portion from the allocated amount for this action can be disbursed. Similarly, for 2018 action (ii) and 2019 action (i), if PLN completes the specified actions for Y% of all warehouses, then the same portion from the allocated amount for these actions can be disbursed. Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is late, as long as the achievement is during the program's duration.		

ADB = Asian Development Bank, ckm = circuit kilometer, DIR REG SNT = Regional Directorate of Sulawesi and Nusa Tenggara, DLI = disbursement-linked indicator; GWh = gigawatt hour, IVA = independent verification agency, km = kilometer, MOEF = Ministry of Environment and Forestry, MSOE = Ministry of State Owned Enterprises, MV = medium voltage, PLN = State Electricity Corporation, SG = smart grid, SNT = Sulawesi and Nusa Tenggara, SPKK = Corporate Performance Control Unit.

Sources: Asian Development Bank estimates, PLN management information systems, and Electricity Power Supply Business Plan (RUPTL), 2017–2026.

Table A3.3: Disbursement Schedule
($ million)

Disbursement-Linked Indicator	Total ADB Financing Allocation	Share of ADB Financing (%)	Advance Financing	2017	2018	2019	2020	2021
Outcome								
DLI 1: Expanded access to electricity services: number of total customers increased by an average annual rate of at least 5.6%	120.0	20.0	0.0	30.0	30.0	30.0	30.0	-
DLI 2: Growth in delivered electricity services: total electricity sales increased by an average annual rate of at least 8.5%	96.0	16.0	0.0	24.0	24.0	24.0	24.0	-
Sub-allocation for commercial customers	*24.0*	*4.0*	*0.0*	*6.0*	*6.0*	*6.0*	*6.0*	-
Sub-allocation for all other customers	*72.0*	*12.0*	*0.0*	*18.0*	*18.0*	*18.0*	*18.0*	-
DLI 3: Improved reliability of services: Feeder line permanent interruptions in the distribution system reduced by an average annual rate of at least 5%	48.0	8.0	0.0	12.0	12.0	12.0	12.0	-
Outputs								
DLI 4: Number of distribution transformer units installed increased by an average annual rate of at least 5.6%	96.0	16.0	48.0	12.0	12.0	12.0	12.0	-
DLI 5: Length of medium-voltagea distribution lines installed increased by an average annual rate of at least 5.6%	96.0	16.0	48.0	12.0	12.0	12.0	12.0	-
Sub-allocation for Lombok and Flores (combined)	*24.0*	*4.0*	*12.0*	*3.0*	*3.0*	*3.0*	*3.0*	-
Sub allocation for all other PLN services areas	*72.0*	*12.0*	*36.0*	*9.0*	*9.0*	*9.0*	*9.0*	-
DLI 6: Pilot-scale smart grid projects implemented in at least 4 areas by 2020	48.0	8.0	18.0	6.0	6.0	6.0	6.0	6.0
DLI 7: Use of digital pre-paid meters or smart meters among existing customers increased to enhance operational efficiency and resource optimization; use of digital pre-paid meters or smart meters to reach 70% of total customers by 2020	48.0	8.0	18.0	6.0	6.0	6.0	6.0	6.0
DLI 8: Asset and waste management improved with at least 80% of used PLN equipment from the 2016 disposal inventory safely disposed by 2020	48.0	8.0	18.0	6.0	6.0	6.0	6.0	6.0
TOTAL	**600.0**	**100.0**	**150.0**	**108.0**	**108.0**	**108.0**	**108.0**	**18.0**

ADB = Asian Development Bank, DLI = disbursement-linked indicator, ckm = circuit-kilometer, kV = kilovolt, PLN = Perusahaan Listrik Negara (State Electricity Corporation).
Source: ADB estimates.