ADB

Grant Assistance Report

Project Number: 41504-024
March 2012

Proposed Grant Assistance
Papua New Guinea: Improved Energy Access for Rural Communities
(Cofinanced by the Japan Fund for Poverty Reduction and the Government of New Zealand)

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 5 March 2012)

Currency Unit	–	kina (K)
K1.00	=	$0.48
$1.00	=	K2.05

ABBREVIATIONS

ADB	–	Asian Development Bank
DNPM	–	Department of National Planning and Monitoring
JFPR	–	Japan Fund for Poverty Reduction
JICA	–	Japan International Cooperation Agency
km	–	kilometer
kV	–	kilovolt
MW	–	megawatt
NGO	–	nongovernment organization
PMU	–	project management unit
PNG	–	Papua New Guinea
PPL	–	PNG Power Limited

NOTES

(i) The fiscal year (FY) of the government ends on 31 December.
(ii) In this report, "$" refers to US dollars.

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COFINANCED BY THE JAPAN FUND FOR POVERTY REDUCTION (JFPR)
AND THE GOVERNMENT OF NEW ZEALAND

Grant Proposal

I. Basic Data	
Name of proposed activity	Improved Energy Access for Rural Communities
Country	Papua New Guinea (PNG)
Grant amount requested	$2,500,000 JFPR; $2,500,000 Government of New Zealand
Project duration	3 years
Regional grant	○Yes / ● No
Grant type	● Project / ○ Capacity building

II. Grant Development Objective(s) and Expected Key Performance Indicators

Grant Development Objectives:

The impact of the Improved Energy Access for Rural Communities project will be better livelihoods for rural communities in PNG provinces. The outcome will be that PNG Power Limited (PPL) has increased access to power for rural communities. The outputs will be that (i) PPL extends the power distribution grid to rural communities, (ii) PPL trials community-based civil works contracts for power line construction, and (iii) community capacity building is undertaken to improve productive utilization of electricity. The JFPR funding will focus on financing activities in Northern Province and West New Britain, while the cofinancing will focus on financing activities in Autonomous Region of Bougainville.

Expected Key Performance Indicators:

(i) Implement community-based civil works contracts for all civil works in three target provinces by December 2014.

(ii) Reduce household expenditure for energy services in a sample group of rural households by 20% by December 2014 relative to June 2012 baseline data.

(iii) Establish 20% new businesses in communities newly connected to the power grid by December 2014 relative to June 2012 baseline data.

(iv) Connect 4,500 households (27,000 persons), 20 schools, and 20 medical facilities in rural communities to the power grid by December 2014. This will increase the access rate to electricity from 3% to 9% in Northern Province, from 4% to 8% in West New Britain, and from 1% to 5% in Autonomous Region of Bougainville by December 2014.

(v) Conduct community workshops with at least 50% female participation, including (a) workshops in all connected communities on electricity safety, operation of prepayment meters, energy efficiency, and household utility budgeting; and (b) workshops in five communities in three target provinces on increased opportunities for income generation by December 2014.

III. Grant Categories of Expenditure, Amounts, and Percentage of Expenditures

Category	Amount of Grant Allocated in $	Percentage of Expenditures
Japan Fund for Poverty Reduction		
1. Small civil works	290,000	11.60
2. Equipment and supplies	1,495,000	59.80
3. Training and workshops	20,000	0.80
4. Consulting services	343,000	13.70
5. Grant management	145,000	5.80
6. Contingency	207,000	8.30
Total JFPR	**2,500,000**	**100.00**

Category	Amount of Grant Allocated in $	Percentage of Expenditures
Government of New Zealand		
Category	**Amount of Grant Allocated in $**	**% of Expenditures**
1. Equipment and supplies	2,250,000	90.00
2. Grant management	125,000	5.00
3. Contingency	125,000	5.00
Total Government of New Zealand	**2,500,000**	**100.00**

JAPAN FUND FOR POVERTY REDUCTION AND GOVERNMENT OF NEW ZEALAND

Grant Proposal
Background Information

A. Other Data	
Date of submission of application	June 2011
Project officer	Anthony Maxwell, Energy Specialist
Project officer's division, e-mail, phone	Pacific Transport, Energy, and Natural Resources Division, amaxwell@adb.org,+61 2 8270 9444
Other staff who will need access to edit or review the report	Paul Hattle, James Roop, Sunhwa Lee, Nogendra Sapkota, Fred Ramos
Sector (subsector)	Energy (conventional energy)
Themes (subthemes)	Economic growth (promoting economic efficiency and enabling business environment), environmental sustainability (eco-efficiency), social development (human development)
Targeting classification	General intervention
Was JFPR seed money used to prepare this grant proposal?	Yes [ ] No [X]
Have staff review committee comments been reflected in the proposal?	Yes [X] No [ ]
Name of associated operation(s) financed by the Asian Development Bank (ADB)	Town Electrification Investment Program[1]
Executing agency	PNG Power Limited (PPL)
Grant implementing agency	PNG Power Limited Francis Uratun P.O. Box 1105, Boroko, NCD, Papua New Guinea furatun@pngpower.com.pg Phone No +675 324 3115 Fax No +675 325 0185

B. Details of the Proposed Grant

1. Description of the Components, Monitorable Deliverables and/or Outcomes, and Implementation Timetable

Component A	
Component name	Wider access to electricity for rural communities
Cost ($)	$4,795,000 grant (JFPR $2,295,000; Government of New Zealand $2,500,000)
Component description	Component A will trial approaches to address constraints currently limiting the extension of distribution power grids in

[1] ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to Papua New Guinea for the Town Electrification Investment Program.* Manila (Loans 2713-PNG and 2714-PNG).

Component A	
	rural areas of PNG. Approaches will include (i) trialing community-based civil works contracts to lower the high cost of attracting civil contractors to remote areas, and improve project sustainability through raising community ownership; and (ii) trialing installation of prepayment meters in rural areas. Component A will be implemented in three provinces[2] to magnify the demonstration impact. In PNG, approximately 10% of the population has access to electricity. Access is concentrated in the main urban centers and is even lower in the provinces. Access to power outside provincial centers is virtually non-existent. Current electrification rates in the target provinces are (i) 3% in Northern Province, (ii) 4% in West New Britain, and (iii) 1% in Autonomous Region of Bougainville. Lack of access to affordable, reliable power is limiting economic growth in provincial centers, and contributing to poverty in rural areas. Low levels of electrification contribute directly to poverty in rural areas through (i) high workloads (predominantly for women) in collection of biomass, (ii) limited opportunities for income-generating activities, (iii) impacts on health due to poor indoor air quality from burning of biomass and limited services at medical clinics, and (iv) limited educational opportunities. **Community assessment**. A survey will be undertaken of the proposed rural communities along the proposed transmission alignments to assess communities for connection.[3] Selection will be based on (i) distance to the transmission line (least cost); (ii) capacity of the community to utilize electricity in economic development (e.g., agricultural processing, home business, etc.); (iii) location of schools and medical clinics; (iv) willingness and ability to pay; and (v) location of households headed by single women. **Trialing of community-based civil works contracts**. The project will trial community-based civil works contracts where PPL will enter into a contract with communities to provide manual labor for construction activities supported by a core technical team from PPL. This will (i) reduce the high costs of bringing in civil works contractors from main urban centers, (ii) create employment and provide direct injections of income into rural communities, and (iii) improve community ownership.[4]

[2] Northern Province, West New Britain, and Autonomous Region of Bougainville.

[3] The project will be sufficient to connect an estimated 25%–50% of households along the transmission corridor. Based on the trial results, PPL is proposing to apply for government grant assistance to extend the power connections to the remaining households within the transmission corridor.

[4] 25%–50% of participants in the community civil works contracts will be women, based on the physical work required on a case-by-case basis.

Component A	
	Trialing of prepayment meters for rural communities. PPL currently operates a prepayment meter system for the main urban centers of PNG but has yet to extend this to rural customers, mainly because the aggregate number of rural customers in any province is relatively limited and the initial focus has been on establishing the prepayment meter system in urban areas. The project will involve installation of prepayment meters to rural communities in three provinces (about 4,500 prepayment meters). The prepayment meters will give rural households, particularly women, greater flexibility in managing their power use. Experience with prepayment meters in urban centers of PNG and other areas of the Pacific indicate significant potential savings for poor households through greater awareness of energy efficiency (and therefore lower consumption without impact on livelihoods). Also, households are able to manage household budgets more effectively by avoiding unexpectedly high power bills at the end of the month, when cash-flow constraints have flow-on impacts on other household expenditure items such as food, health, and education.
Monitorable deliverables and outputs	(i) Community-based civil works contracts trialed in Northern Province, West New Britain, and Autonomous Region of Bougainville for construction of distribution power lines by December 2014. (ii) New power connections to about 4,500 rural households (approximately 27,000 persons). (iii) Access rate to electricity increased from 3% to 9% in Northern Province, from 4% to 8% in West New Britain, and from 1% to 5% in Autonomous Region of Bougainville by December 2014.
Implementation of major activities: number of months for grant activities	36 months

Component B	
Component name	Greater capacity of rural communities to utilize electricity productively
Cost ($)	$205,000 JFPR grant
Component description	Component B will support rural communities in managing potential issues arising from connection to the power grid and assist them in maximizing the benefits from connection to power. Training on household management of power will include (i) basic electricity health and safety, (ii) operation of prepayment meters, (iii) household budgeting, and (iv) basic energy-efficiency measures. Additional training for target groups will raise awareness of (i) income-generating options, and (ii) options for accessing microfinance. At least 50% of the trainees will be women. **Electricity health and safety**. Training will be undertaken in all newly connected communities on basic safety issues

Component B	
	related to handling electricity. This will include issues such as risks of meter tampering, keeping children away from powerpoints, and caution regarding fallen power lines. **Operation of prepayment meters**. Basic training will be given to all newly connected communities in the management of prepayment meters, including purchasing credit, operating the meters, trouble-shooting problems, and accessing technical support. **Household power consumption budgeting**. Since communities are not currently managing any utility expenditure, basic training will be provided in management of household expenditures. **Household energy efficiency**. All newly connected households will be given a minimum supply kit that will allow them to access power immediately. The minimum supply kit will include energy-saving light bulbs. Training will be given to all newly connected communities on the costs of running certain appliances and simple methods for reducing expenditure, such as turning appliances off, purchasing energy-efficient appliances (including efficient light bulbs), and appliance maintenance. Information will also be imparted on more efficient appliances, e.g., efficient cooking stoves. **Income-generating options**. Targeted workshops will be held to increase community awareness of income-generating options arising from access to electricity. Workshops will be undertaken in five target communities in each province. Communities will be selected based on their potential for greater income generation, e.g., agribusiness processing, household garment production, and light industry. **Access to microfinance**. The targeted community workshops will also increase awareness of available microfinance opportunities and processes to apply for microfinance assistance. Microfinance groups will attend the workshops to discuss their products and make initial connections to potential customers.
Monitorable deliverables and outputs	(i) Conduct community workshops (with at least 50% female participation) for all newly connected communities to build capacity on electricity safety, operation of prepayment meters, energy efficiency measures, and household utility budgeting. (ii) Conduct five community workshops (with at least 50% female participation) in each of three target provinces on increased opportunities for income generation by December 2014.
Implementation of major activities: number of months for grant activities	24 months

2. Financing Plan for Proposed Grant to be Supported by JFPR

Funding Source	Amount ($)
JFPR	$2,500,000
Government of Papua New Guinea	$1,000,000
Other sources (Government of New Zealand)[5]	$2,500,000
Total	**$6,000,000**

Note: All expenditures on the project, including consulting services, will be exempt of tax and duties.

3. Background

1. In PNG, approximately 10% of the population has access to electricity. Lack of access to affordable, reliable power is limiting economic growth in provincial centers, and contributing to poverty in rural areas. Access to electricity is even lower in the provincial centers and virtually non-existent in rural areas. Low access rates in rural areas are primarily due to (i) difficult geographical conditions; (ii) lack of generation capacity in the provincial centers to allow grid extension; (iii) high cost of diesel power generation in the isolated provincial urban centers, which discourages PPL from connecting additional customers due to the uniform national tariff; (iv) high cost of extending distribution systems due to lack of suitable contractors in the provinces; and (v) low level of government grant funding of distribution connections.[6]

2. PPL is currently implementing tranche 1 of the Town Electrification Investment Program, which increases the supply of clean energy (predominantly hydropower) to three provincial centers (Popondetta in Northern Province, Kimbe in West New Britain, and Buka in Autonomous Region of Bougainville). This will (i) provide additional generation capacity to allow extension of supply to unserviced rural customers, and (ii) reduce the cost of power generation by replacing high-cost diesel generation with low-cost hydropower. The investment program will also construct transmission lines along main population corridors to connect the hydropower sites and the main urban areas, thereby substantially reducing costs required to connect rural communities along the alignment. Therefore, the investment program is supporting core power sector infrastructure in several provinces and provides the basis for increasing access to power for rural communities along the main transmission corridors.

3. However, although the investment program is constructing the core transmission network, power distribution construction (low-voltage connections to villages) in the provinces is still prohibitively expensive due to isolation of the power grids and lack of qualified local contractors. Additionally, sustainability of infrastructure development in rural PNG faces ongoing issues related to lack of community ownership from local landowners. Government budget allocation for grid extension has been inadequate to have a significant impact on the low rural access rate. During the initial design phase of the investment program, the government recognized the opportunity to expand access to energy among rural communities along the proposed transmission lines and, therefore, requested ADB to support trialing of implementation models such as community-based civil works contracts to lower the cost of implementation and improve community ownership. The government requested the trialing in three provinces to

[5] The cofinancing from the Government of New Zealand is proposed as untied grant to be administered by ADB on a parallel basis.

[6] Distribution connections to rural communities generally are not financially viable activities and should therefore be financed by government community service obligations, rather than through the corporatized PPL.

demonstrate the impact in a range of different geographical and cultural settings.[7] If successful, PPL and the government have proposed to replicate the model in other PNG provinces through upscaled grant financing. Project cost estimates have been based on preliminary community surveys. Preliminary estimates have indicated that rural communities will benefit financially from replacing expensive kerosene lighting and self-generation (small diesel generators) with higher-quality distributed electricity.[8] Initial surveys have indicated a high capacity and willingness to pay for power services; however, site surveys prior to community selection will confirm willingness to pay. The Design and Monitoring Framework is presented in Appendix 1.

4. Innovation and Knowledge Sharing

4. The project has the following innovative features:

(i) **Community-based civil works contracts**. Community-based contracts will be trialed to (a) reduce the currently high costs of bringing in civil works contractors from main urban centers, (b) create employment and provide direct injections of income into rural communities, and (c) improve community ownership. PPL will enter into a contract with communities to provide manual labor for construction activities supported by a core technical team from PPL to manage technical components.

(ii) **Prepayment meters for rural communities**. The introduction of prepayment meters will (a) reduce utility risk regarding revenue collection, thereby encouraging grid extension; (b) allow poor, rural household flexibility in their use of electricity; and (c) avoid the recurring issue of the poor being disconnected because of unreliable incomes or the inability to manage household expenditures to meet monthly lump sum payments. Prepayment cards (similar to phone cards) will also be trialed so that rural households will not have to travel to urban centers to pay their power bills. The poor, particularly women who predominantly manage household expenditure, benefit from better capacity to manage power consumption and reduce power bills, thereby freeing the household budget for alternative expenditures such as health care and education. Prepayment meters allow power utilities to rectify poor revenue collection, which damages financial performance and applies upward pressure on national power tariffs.

5. The results and benefits of the project will be monitored closely and results disseminated widely to Pacific island national energy departments, nongovernment organizations (NGOs), Pacific power utilities, the Pacific Power Association, and other development partners.

[7] The three target provinces are unique and represent varying levels of economic development and diverse cultural characteristics. Northern Province is a mountainous province with relatively low economic development, West New Britain is an island province, and Autonomous Region of Bougainville is a post-conflict province with a unique maternal-based culture.

[8] Vision RI. 2009. Power Sector Development Plan Final Report. Paper for Rural Community Focal Group Workshops. April, 2009.

5. Sustainability

6. PNG is experiencing considerable economic growth (7.1% growth in gross domestic product in 2010), and the government is under considerable pressure to ensure that the economic benefits are realized in the provinces. The government is proposing to rectify the low electricity access rates through budget allocation once the draft Electricity Industry Policy is approved. This funding may partially be used to grant finance distribution extensions, as the government recognizes that the financial nonviability of distribution extensions discourages the corporatized PPL from investing in these areas. The government also recognizes the lack of sustainable rollout mechanisms and has expressed interest in upscaling lessons learned to expand distribution extensions in rural areas.

7. **Technical sustainability**. The project is technically sustainable, as distribution systems are well-known technology. There is significant experience with prepayment meters, although not in the context of rural access. Maintenance of the distribution system will be sustainable, as PPL will manage the installation and the ongoing operation of the distribution system. The infrastructure will be incorporated into the PPL power grid asset management system to ensure ongoing system maintenance and tariff collection.

8. **Financial sustainability**. The financial sustainability of the extended distribution grid will be improved by utilizing prepayment meters. One of the main issues with rural connections to the power grid is high outstanding debt and high logistical expenses to collect small amounts of outstanding debt. The prepayment meter system minimizes this issue through upfront payment for power credit. This ensures cash flow for system maintenance.

9. **Environmental sustainability**. The project will improve environmental sustainability by (i) reducing collection of wood for household energy consumption, and (ii) replacing a number of household or village part-time diesel generators with hydropower-generated power, thereby reducing diesel consumption.

6. Participatory Approach

10. Project design has included extensive consultation with stakeholders, including government officials, power utility representatives, NGOs, and power customers. All components have been proposed by national counterparts.

11. The project will be implemented in consultation with, and with the participation of, consumers, communities, government officials, NGOs, and international development partners. Component A will include extensive community consultation regarding selection of communities to receive power distribution and development of community civil works contracts. The project management unit (PMU) will be located within PPL to ensure project ownership extends to system operation and maintenance. Component B will include considerable stakeholder consultation and awareness raising within the communities. Local entrepreneurs and microfinance bodies will participate in the community awareness-raising workshops. To ensure adequate government coordination and oversight, a steering committee will be established with representatives from the Department of National Planning and Monitoring (DNPM), the Department of Petroleum and Energy, the Department of Public Enterprises, and PPL to review project progress, coordinate interministerial activities, and guide the PMU. The steering committee may also include representatives from the Government of Japan and the Government of New Zealand.

Primary Beneficiaries and Other Affected Groups and Relevant Description	Other Key Stakeholders and Brief Description
Rural communities along the proposed transmission corridors adjacent to (i) Popondetta, Northern Province; (ii) Kimbe and Bialla, West New Britain; and (iii) Buka, Autonomous Region of Bougainville. The rural communities will benefit from wider access to electricity. Local suppliers of kerosene will be negatively impacted as communities will replace grid-connected power for kerosene lighting.	PNG Power Limited is the implementing agency for the project.

7. Coordination

12. Project preparation has included consultation with key development partners active in the PNG power sector, e.g., the European Investment Bank, the Japan International Cooperation Agency (JICA), the New Zealand Aid Program, and the World Bank. There is no overlap anticipated between the project and any other development partner activity.

13. Meetings were held at the JICA office in PNG to discuss the project with (i) Takahiro Yokota, assistant representative, and Hikari Miyahara, project formulation advisor, on 7 December 2011; and (ii) Hikari Miyahara, project formulation advisor, on 6 May 2011. The JICA representatives fully supported the proposed project and requested to be fully informed of its progress. The Embassy of Japan in PNG was consulted (Katsutoshi Ito, first secretary, 24 May 2011 via e-mail) and indicated support for the project. Options will be explored to incorporate Japanese volunteers in the project. Consultations confirmed that there is no overlap with bilateral activities of the Government of Japan.

8. Visibility

14. The project will promote the visibility of JFPR through the following:

(i) The community workshops will clearly indicate that the project has received funding from the Government of Japan.
(ii) The JFPR logo will be used in publications issued by the project.
(iii) All press releases issued by ADB with respect to the project will refer to the financial contribution from the Government of Japan.
(iv) Embassy of Japan officials will be invited to the grant signing ceremony, which will include representatives from the national press.
(v) All project billboards and signages will include the JFPR logo and/or fund name.
(vi) Consultation with JICA will continue during the project implementation.

9. Detailed Cost Table

15. Please refer to Appendix 2 for the detailed cost estimates, and Appendix 3 for the fund flow arrangement.

C. Link to ADB Strategy and ADB-Financed Operations

1. Link to ADB Strategy

Document	Date of Last Discussion	Objective(s)
Country Strategy and Program: Papua New Guinea, 2011–2015[9]	Approved August 2010	The country strategy and program identifies ADB support for infrastructure, including the power sector, as a priority area for ADB support.
Pacific Approach, 2010–2014[10]	Approved November 2009	The Pacific Approach goal of improved standards of living for the region is advanced by the improved delivery of utility services to rural communities.
Draft Electricity Industry Policy	Approval expected 2011	The Electricity Industry Policy recognizes the (i) low level of electricity access, (ii) unreliability of electricity supply and subsequent economic impacts, and (iii) difficulties faced by PPL from outstanding receivables and raising capital for infrastructure investments.
Papua New Guinea Development Strategic Plan, 2010–2030. Department of National Planning and Monitoring.[11]	Approved March 2010	Replacing diesel generation with hydropower and extending power to rural communities.

2. Link to Specific ADB-Financed Operation

Project name	Town Electrification Investment Program (tranche 1)
Project number	Loan 2713/2714-PNG
Date of board approval	6 December 2010
Loan amount ($ million)	$57.3 million

3. Development Objective of the Associated ADB-Financed Operation

16. The impact of the investment program will be better economic conditions in target provincial centers. The outcome of the investment program will be improved utilization of reliable, clean power by PPL to about six provincial urban centers. The outputs of the investment program will be (i) about six renewable energy projects, including hydropower plants, put into operation by PPL; (ii) transmission systems constructed and operated by PPL; (iii) capacity building undertaken for the implementing agency and project beneficiaries; and (iv) efficient project management services rendered by the PMU. Tranche 1 projects will support isolated provincial center grids, including (i) Divune Hydropower Plant in Northern Province, (ii) Lake Hargy Interconnection in West New Britain, and (iii) Ramazon Hydropower Plant in Autonomous Region of Bougainville. The investment program will improve access to energy in provincial urban centers through greater quality and reliability of power for urban residential, commercial and industrial customers.

[9] ADB. 2010. *Country Strategy and Program: Papua New Guinea, 2011–2015.* Manila.
[10] ADB. 2009. *Pacific Approach, 2010–2014.* Manila.
[11] Government of Papua New Guinea, Department of National Planning and Monitoring. 2010. *Papua New Guinea Development Strategic Plan, 2010–2030.*

17. Tranche 1 of the investment program will increase the supply of clean energy (predominantly hydropower) to three provincial centers (Buka, Kimbe, and Popondetta). This will (i) provide additional generation capacity to allow extension of supply to unserviced rural customers, and (ii) reduce the cost of power generation by replacing high-cost diesel generation with low-cost hydropower. The investment program will also construct transmission lines along main population corridors to connect the hydropower sites and the main urban areas, thereby substantially reducing costs required to connect rural communities.

4. Main Components of the Associated ADB-Financed Operation

No.	Component Name	Brief Description
1.	Divune Hydropower Project, Northern Province	1.1 3-megawatt (MW) run-of-river hydropower plant 1.2 3-meter-high concrete gravity diversion weir 1.3 2.6 kilometers (km) of buried low-pressure pipeline 1.4 a powerhouse 1.5 85 km, 22-kilovolt (kV) transmission line 1.6 6.1 km access road
2.	Kimbe-Bialla Interconnection, West New Britain	2.1 Approximately 150 km, 66 kV transmission line connecting Kimbe to Bialla, accessing approximately 1 MW of spare generation capacity from the Lake Hargy hydropower plant, and connecting about 3 MW of biomass power (methane recovery) from palm oil plantations along the alignment.
3.	Ramazon Hydropower, Autonomous Region of Bougainville	3.1 3 MW run-of-river hydropower plant 3.2 concrete weir 3.3 5 km buried pipeline 3.4 penstock 3.5 powerhouse 3.6 50 km, 33 kV transmission line 3.7 5.3 km access road

5. Rationale for Grant Funding versus ADB Lending

18. PPL is a corporatized entity and conducts business on a full cost-recovery basis. Tranche 1 of the investment program loan is being onlent by the government to PPL, which will repay the loan from operational revenue. PPL is utilizing the financing primarily to replace high-cost diesel generation with low-cost hydropower generation for delivery to existing power customers in provincial urban areas. Extension of distribution grids to rural households (low consumption and, therefore, low revenue) is not a financially viable activity for the corporatized PPL and has, therefore, not been included in the lending project.

D. Implementation of the Proposed Grant

1. Name of the Implementing Agency	PNG Power Limited

19. The implementing agency for the project will be PPL. PPL is a national, 100% corporatized state-owned enterprise responsible for generation and distribution of electricity within PNG, as defined under its regulatory contract. All procurements under the project will be conducted in accordance with ADB's Guidelines for Procurement (2010, as amended from time to time). Consultants will be recruited by ADB in accordance with its *Guidelines on the Use of Consultants* (2010, as amended from time to time) to provide the services for implementation, management, and progress monitoring of the JFPR grant. The implementation arrangements

are in Appendix 4. The implementation schedule is in Appendix 5. The procurement plan is in Appendix 6. The outline terms of reference for consultants are in Appendix 7. The Summary Poverty Reduction and Social Strategy is in Appendix 8.

2. Risks Affecting Grant Implementation

Type of Risk	Brief Description	Measure to Mitigate the Risk
Community objection	The project will not be sufficient to connect all communities within the transmission corridor. Unconnected villages may object to the project.	Extensive consultation will be undertaken to explain community selection criteria to all communities along the transmission corridor.
Political	Selection of communities for connection may be politically influenced.	Selection criteria will be independently established and selection of communities for connection will be conducted by independent consultants based on pre-established criteria.
Implementation schedule	The project will rely on the construction of the transmission lines under tranche 1 of the Town Electrification Investment Program. Delays in construction of any of the subprojects under tranche 1 will impact the project schedule.	Project implementation of the tranche 1 subprojects will be closely monitored.
Safety	Community civil works contracts will need to ensure adequate safety measures for community workers.	PNG Power Limited will establish and closely monitor implementation of safety standards for community-based civil works contracts.

3. Monitoring and Evaluation

Key Performance Indicator	Reporting Mechanism	Plan and Timetable for Monitoring and Evaluation
Implement community-based civil works contracts for all project civil works in each of the three provinces by December 2014.	Quarterly report showing status of community-based civil works contract implementation	Quarterly progress reports commence first quarter 2012
Reduce household expenditure for energy services in sample group of rural households by 20% by December 2014 relative to January 2012 baseline data.	Household survey data, as presented in the PMU's quarterly reports	Quarterly progress reports commence first quarter 2012
Connect 4,500 households (27,000 persons), 20 schools, and 20 medical facilities in rural communities to the power grid by December 2014. This will result in the access rate to electricity increased from 3% to 9% in Northern Province, from 4% to 8% in West New Britain, and from 1% to 5% in Autonomous Region of Bougainville by December 2014.	Quarterly report showing status of project implementation	Quarterly progress reports commence first quarter 2012

Key Performance Indicator	Reporting Mechanism	Plan and Timetable for Monitoring and Evaluation
Establish 20% new businesses in communities newly connected to power grid by December 2014 relative to January 2012 baseline data.	Community survey data, as presented in the PMU's quarterly reports	Quarterly progress reports commence first quarter 2012
Conduct community workshops (with at least 50% female participation) for all newly connected communities to build capacity on electricity safety, operation of prepayment meters, energy efficiency measures, and household utility budgeting.	Quarterly report showing status of project implementation	Quarterly progress reports commence first quarter 2012
Conduct five community workshops (with at least 50% female participation) in each of the three target provinces on increased opportunities for income generation by December 2014.	Quarterly report showing status of project implementation	Quarterly progress reports commence first quarter 2012

5. Estimated Disbursement Schedule

Fiscal Year (FY)	Amount ($)
FY2012	$1,000,000
FY2013	$3,000,000
FY2014	$2,000,000
Total Disbursements	**$6,000,000**

Appendixes

1. Design and Monitoring Framework
2. Summary and Detailed Cost Estimates
3. Fund Flow Arrangements
4. Implementation Arrangements
5. Implementation Schedule
6. Procurement Plan
7. Outline Terms of Reference for Consultants
8. Summary Poverty Reduction and Social Strategy
9. Detailed Cost Estimates by Cofinancier and Allocation Table

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Livelihoods of rural communities in selected PNG provinces have improved.	Disposable income in communities newly connected to power grid increased by 20% by December 2014 relative to June 2012 baseline data Income generation in communities newly connected to power grid increased by 20% by December 2014 relative to June 2012 baseline data	Household income and expenditure survey Household income and expenditure survey	**Assumption** Poor customers have access to sufficient income to afford electricity. **Risk** Communities fail to utilize access to power for income-generating activities.
Outcome PPL has provided wider access to electricity for rural communities.	Connect 4,500 households in rural communities to the power grid by December 2014[a] Access to electricity improved from 3% to 9% in Northern Province, from 4% to 8% in West New Britain, and from 1% to 5% in Autonomous Region of Bougainville by December 2014 relative to June 2012 baseline data Power supplied to 20 schools and 20 medical facilities by December 2014 relative to June 2012 baseline[b]	PPL customer database PPL customer database PPL customer database	**Assumption** PPL is able to allocate suitably qualified staff to manage projects. **Risk** Power supply remains poor due to breakdowns in base generation.
Outputs 1. PPL extends power distribution grid to rural communities.	129 km of low-voltage and 14.5 km of high-voltage power lines by December 2014 4,500 minimum power supply kits to households in rural communities by December 2014 360 transformers by December 2014	(i) Contractor's as-built drawings, (ii) PPL asset management system (i) PPL customer database, (ii) PPL asset management system PPL GIS database or asset register	**Risks** Landowner issues delay construction activities. Training is poorly attended.

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
2. PPL successfully completes trials of community-based civil works contracts for power line construction.	Implement community-based civil works contracts (80% on time and on budget) for all project civil works (25%–50% female participation, on a case-by-case basis) in each of the three target provinces by December 2014[c]	Design and supervision consultants' activity report	.
3. Conduct workshops for communities on how to use electricity productively and efficiently.	Conduct community workshops (with at least 50% female participation) for all newly connected communities to build capacity on electricity safety, operation of prepayment meters, energy efficiency measures, and household utility budgeting	Design and supervision consultants' activity report	
	Establish 20% new businesses in communities newly connected to power grid by December 2014 relative to June 2012 baseline data	Social specialist's final report	
	Reduce household expenditure for energy services in sample group of rural households by 20% by December 2014 relative to June 2012 baseline data	Social specialist's final report	

Activities with Milestones	**Inputs**
1. PPL extends power distribution grid to rural communities. 1.1 Undertake alignment survey to confirm design of distribution system and select priority communities for connection (first quarter 2013). 1.2 Prepare consultation plan (first quarter 2013). 1.3 Conduct community consultation to confirm technical design (first quarter 2013). 1.4 Undertake baseline social assessment, including household expenditure survey, of proposed communities for connection (first quarter 2013). 1.5 Prepare tender documents, advertise and select contractors and suppliers (second quarter 2013). 1.6 Install 4,500 minimum supply kits in households (fourth quarter 2014). 1.7 Install 360 transformers (fourth quarter 2014). 1.8 Construct 129 km of low-voltage and 14.5 km of high-voltage power lines (fourth quarter 2014). 1.9 Prepare and distribute impact analysis documentation to stakeholders (first quarter 2014–fourth quarter 2014). 1.10 Record data of distribution system for inclusion into the PPL asset management database and GIS database (fourth quarter 2014).	Japan Fund for Poverty Reduction: $2.5 million Government of New Zealand: $2.5 million Government of Papua New Guinea: $1.0 million

Activities with Milestones	Inputs
2. PPL successfully completes trials of community-based civil works contracts for power line construction. 2.1 Undertake community consultation to confirm design of community-based civil works contracts (fourth quarter 2012). 2.2 Establish community-based civil works contracts with communities (25%–50% women participation) (fourth quarter 2012). 2.3 Implement community-based civil works contracts (third quarter 2013–fourth quarter 2014). 2.4 Conduct survey to assess benefits from community-based civil works contracts (fourth quarter 2014) **3. Conduct workshops for communities on how to use electricity productively and efficiently.** 3.1 Conduct community consultation to prepare scope of work for community training on electricity safety, prepayment meter operation, household budgeting, and energy efficiency measures (fourth quarter 2012). 3.2 Conduct community training courses in all newly connected communities (fourth quarter 2014). 3.3 Conduct survey of communities and prioritize communities suitable for business development workshops (second quarter 2014). 3.4 Conduct community workshops (with at least 50% female participation) for all newly connected communities to build capacity on electricity safety, operation of prepayment meters, energy efficiency measures, and household utility budgeting. 3.5 Hold five community business development workshops (minimum 50% female participation) in each target province (by first quarter 2013).	

GIS = geographic information system, JFPR = Japan Fund for Poverty Reduction, km = kilometer, PNG = Papua New Guinea, PPL = PNG Power Limited.

[a] Community selection criteria will include (i) distance to the transmission line (least cost); (ii) capacity of the community to utilize electricity in economic development (e.g., agricultural processing, home business); (iii) location of schools and medical clinics; (iv) willingness and ability to pay; and (v) location of households headed by single women. Approximately 2,250 connections will be financed by JFPR and 2,500 connections will be financed by the Government of New Zealand.

[b] Connection of approximately 10 schools and 10 medical facilities will be financed by JFPR, and connection of approximately 10 schools and 10 medical facilities will be financed by the Government of New Zealand.

[c] 25%–50% of participants in the community civil works contracts will be women, based on the physical work required on a case-by-case basis.

Source: Asian Development Bank.

SUMMARY AND DETAILED COST ESTIMATES

Table A2.1: Summary Cost Estimates

($)

Inputs / Expenditure category \ Grant Components	Component A Wider access to electricity for rural communities	Component B Greater capacity of rural communities to utilize electricity productively	Total	%
Japan Fund for Poverty Reduction				
Focusing on Kimbe–Biala Interconnection, West New Britain, and Divune Hydropower Plant, Northern Province[a]				
1. Civil works	290,000	0	290,000	11.60
2. Equipment and supplies	1,495,000	0	1,495,000	59.80
3. Training, workshops, seminars, and public campaigns	0	20,000	20,000	0.80
4. Consulting services	175,000	168,000	343,000	13.70
5. Grant management	145,000	0	145,000	5.80
6. Other inputs	0	0	0	0.00
7. Contingencies	190,000	17,000	207,000	8.30
Subtotal JFPR grant financed	**2,295,000**	**205,000**	**2,500,000**	**100.00**
Government of Papua New Guinea contribution	500,000	0	500,000	
Government of New Zealand				
Focusing on Ramazon Hydropower Plant, Autonomous Region of Bougainville and Kimbe-Biala Interconnection, West New Britain[a]				
1. Civil works	0	0	0	0.00
2. Equipment and supplies	2,250,000	0	2,250,000	90.00
3. Training, workshops, seminars, and public campaigns	0	0	0	0.00
4. Consulting services	0	0	0	0.00
5. Grant management[b]	125,000	0	125,000	5.00
6. Other inputs	0	0	0	0.00
7. Contingencies	125,000	0	125,000	5.00
Subtotal Government of New Zealand grant financed	**2,500,000**	**0**	**2,500,000**	**100.00**
Government of Papua New Guinea contribution	500,000	0	500,000	
Total estimated costs	**5,795,000**	**205,000**	**6,000,000**	

JFPR = Japan Fund for Poverty Reduction.

[a] Financing of cost items by JFPR and the Government of New Zealand will be on a parallel basis.

[b] This amount also includes the Asian Development Bank's administration fee, audit costs, bank charges, and a provision fee for foreign exchange fluctuations (if any), to the extent that these items are not covered by the interest and investment income earned on this grant.

Source: Asian Development Bank estimates.

Table A2.2: DETAILED COST ESTIMATES
($)

Supplies and Services Rendered		Costs				Contributions		
		Unit	Quantity Units	Cost Per Unit	Total	JFPR Amount	Government	Other Donors (New Zealand)
Japan Fund for Poverty Reduction								
Component A. Improved Access to Electricity for Rural Communities				**Subtotal**	**2,557,500**	**2,105,000**	**452,500**	
1.1	**Civil works**							
1.1.1	Transformer installation costs - installation by PPL	900	kVA	100	90,000		90,000	
1.1.2	House connection installation costs (installation, inspect and test) - installation by PPL/community based contracts	2250	House	100	225,000		225,000	
1.1.3	High-voltage line cable installation costs - installation by PPL	7.5	km	5,000	37,500		37,500	
1.1.4	Low-voltage line cable installation costs - installation by PPL/community-based contracts	145	km	2,000	290,000	290,000		
1.2	**Equipment and supplies**							
1.2.1	Minimum supply kits	1750	Unit	160	280,000	280,000		
1.2.2	Low-voltage line	44	km	15,000	660,000	660,000		
1.2.3	High-voltage line	7.5	km	26,000	195,000	195,000		
1.2.4	Transformers 22/04 kV	900	kVA	400	360,000	360,000		
1.3	**Consulting services**							
1.3.1	International distribution engineer	6	Month	22,000	132,000	132,000		
1.3.2	International airfares	4	Airfare	3,000	12,000	12,000		
1.3.3	National airfares	8	Airfare	500	4,000	4,000		
1.3.4	Per diem	90	Daily	300	27,000	27,000		
1.4	**Management and coordination of this component**							
1.4.1	Staff salary and in-kind contribution from government/PPL				100,000		100,000	
1.4.2	External audits	4	Audits	5,000	20,000	20,000		
1.4.3	Project management				125,000	125,000		
Component B. Improved Capacity of Rural Communities to Productively Utilize Electricity				**Subtotal**	**235,500**	**188,000**	**47,500**	
2.1	**Training, workshops, and seminars**							
2.1.1	Workshops on safety, prepayment meters, budgeting, energy efficiency and income generation options (estimated 40 participants each workshop)	40	Workshop	500	20,000	20,000		
2.2	**Consulting services**							
2.2.1	International social/gender specialist	4	Month	20,000	80,000	80,000		

Supplies and Services Rendered		Costs				Contributions		
		Unit	Quantity Units	Cost Per Unit	Total	JFPR Amount	Government	Other Donors (New Zealand)
2.2.2	National social and environmental specialists	12	Month	4,000	48,000	48,000		
2.2.3	International airfares	3.0	Airfare	3,000	9,000	9,000		
2.2.4	National airfares	26	Airfare	500	13,000	13,000		
2.2.5	Per diem	60	Daily	300	18,000	18,000		
2.3	**Management and coordination of this component**							
2.3.1	Staff salary and in-kind contribution from government and PPL				47,500		47,500	
	Components A–B = Subtotal			**Subtotal**	**2,793,000**	**2,293,000**	**500,000**	
	Contingency maximum 10% of contribution				**207,000**	**207,000**	**0**	
	Subtotal Grant Costs			**Total**	**3,000,000**	**2,500,000**	**500,000**	
Note:								
Items 1.1.1, 1.1.2, 1.1.3, 1.4.1 and 2.3.1 will be provided in-kind by the executing agency								
Government of New Zealand								
Component A. Improved Access to Electricity for Rural Communities				**Subtotal**	**2,827,500**	**0**	**452,500**	**2,375,000**
1.1	**Civil works**							
1.1.1	Transformer installation costs - installation by PPL	900	kVA	100	90,000		90,000	
1.1.2	House connection installation costs (installation, inspect, and test) - installation by PPL/community based contracts	2250	House	100	225,000		225,000	
1.1.3	High-voltage line cable installation costs - installation by PPL	7.5	km	5,000	37,500		37,500	
1.2	**Equipment and supplies**							
1.2.1	Minimum supply kits	2750	Unit	160	440,000			440,000
1.2.2	Low-voltage line	84.5	km	15,000	1,267,500			1,267,500
1.2.3	High-voltage line	7	km	26,000	182,500			182,500
1.2.4	Transformers 22/04 kV	900	kVA	400	360,000			360,000
1.3	**Management and coordination of this component**							
1.4.1	Staff salary and in-kind contribution from government/PPL				100,000		100,000	
Component B. Improved Capacity of Rural Communities to Productively Utilize Electricity			**Subtotal**	**47,500**			**47,500**	**0**
2.1	**Management and coordination of this component**							
2.1.1	Staff salary and in-kind contribution from government and PPL				47,500		47,500	
	Components A–B = Subtotal			**Subtotal**	**2,875,000**	**0**	**500,000**	**2,375,000**
	Contingency maximum 10% of total JFPR contribution				**125,000**		**0**	**125,000**

Supplies and Services Rendered	Costs				Contributions		
	Unit	Quantity Units	Cost Per Unit	Total	JFPR Amount	Government	Other Donors (New Zealand)
Subtotal Grant Costs			**Total**	**3,000,000**	**0**	**500,000**	**2,500,000**
Total Grant Costs			**Total**	**6,000,000**	**2,500,000**	**1,000,000**	**2,500,000**

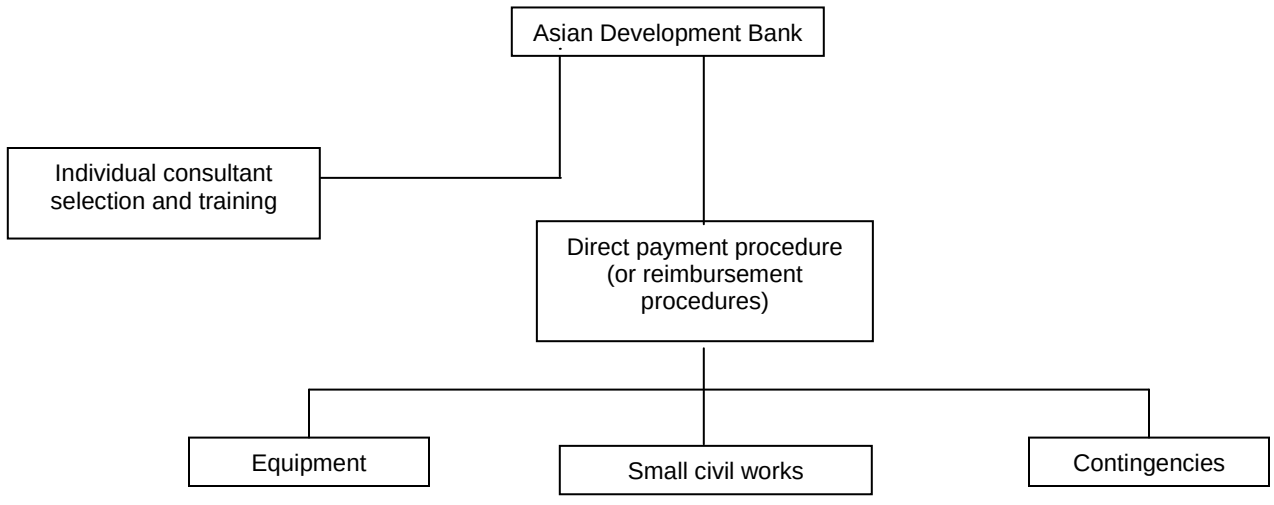
JFPR = Japan Fund for Poverty Reduction, kV= kilovolt, PPL = PNG Power Limited
The amount from New Zealand includes the Asian Development Bank administration fee, audit costs, bank charges, and a provision for foreign currency fluctuations (if any) to the extent that these items are not covered by the investment income earned on this grant, or any additional grant contribution by the Government of New Zealand.
Financing of cost items by JFPR and the Government of New Zealand will be on a parallel basis.
Items 1.1.1, 1.1.2, 1.1.3, 1.4.1 and 2.1.1 will be provided in-kind by the executing agency.
Source: Asian Development Bank estimates.

FUND FLOW ARRANGEMENTS

1. The Japan Fund for Poverty Reduction (JFPR) and the Government of New Zealand grant proceeds will be disbursed in accordance with the Loan Disbursement Handbook (2007, as amended from time to time) of the Asian Development Bank (ADB) and detailed arrangements agreed between the Government of Papua New Guinea and ADB. PNG Power Limited (PPL), as the executing agency, will adopt direct payment disbursement and reimbursement procedures for withdrawal of proceeds of the grant. PPL will be informed by the project management unit of all transactions, and receive copies of all financial statements and audit reports. Community-based civil works contracts will be established directly between PPL and the relevant communities. ADB will directly administer $363,000 of the JFPR grant financing, in accordance with ADB's Technical Assistance Disbursement Handbook (2010, as amended from time to time), including the procurement of consulting services (individual consultant selection), training, workshops, and seminars.

2. Implementation arrangements, such as the flow, and administration procedures will be detailed in the grant implementation memorandum, and will be established between ADB and the government through the JFPR letter of agreement. The schematic fund flow for the project is shown in Figure A3.

Figure A3: Fund Flow Arrangements



Source: Asian Development Bank.

IMPLEMENTATION ARRANGEMENTS

A. Grant Organization and Management

1. **Executing agency.** PNG Power Limited (PPL) will be the executing agency for the project and will be responsible for overall implementation of the project. A project management unit (PMU) will be established within PPL. The PMU will (i) monitor the progress of day-to-day project implementation, (ii) prepare withdrawal applications, (iii) prepare quarterly project progress reports and annual consolidated reports (for submission to the Asian Development Bank [ADB]), and (iv) maintain project accounts and complete grant financial records for auditing the project. PPL will appoint a PMU head acceptable to ADB. The PMU head will have adequate experience in project management and will be responsible for overall project management and supervising day-to-day implementation activities.

2. **Steering committee.** A steering committee, consisting of representatives from the Department of National Planning and Monitoring (DNPM), the Department of Petroleum and Energy, and PPL and others as nominated by the government, will be established to review project progress, coordinate interministerial activities, and guide PMU activities. The PMU will provide secretariat service to the committee. The committee will be chaired by DNPM. The committee will meet at least once every quarter to review project progress, or additionally if the need arises. The Embassy of Japan and the Embassy of New Zealand in Papua New Guinea, and community groups may be invited as observers.

B. Compliance

3. **Environmental safeguards**. All activities conducted under the project must be implemented in accordance with national environmental laws and regulations as well as ADB's Safeguard Policy Statement (2009). PPL and the implementing agency shall ensure that any adverse environmental impacts arising from the construction and operation of the project facilities will be minimized.

4. **Anticorruption**. The project shall (i) undertake necessary measures to create and sustain a corruption-free environment, and (ii) ensure that ADB's Anticorruption Policy (1998, as amended from time to time) is strictly enforced during project implementation. Project-specific anticorruption measures include (i) establishment of a steering committee to provide regular oversight to project activities, (ii) establishment of a multidepartment bid evaluation committee to ensure competition during procurement, and (iii) requirement of annual project audit reports.

C. Implementation Schedule

5. The project will be implemented from January 2012 to December 2014. The implementation schedule is in Appendix 5.

D. Procurement

6. **Equipment and civil works**. All procurement under the project will be conducted in accordance with ADB's Procurement Guidelines (2010, as amended from time to time). The procurement method for equipment will be international competitive bidding, national competitive bidding, and shopping procedures. The procurement method for community-based civil works contracts will be direct selection. The procurement plan is in Appendix 6. Procurement under the project will be exempt of taxes and duties.

7. **Consulting services**. The total input from international consultants will be 10 person-months and that from national consultants will be 12 person-months. The individual consultants (both national and international) will be recruited by ADB in accordance with its Guidelines on the Use of Consultants (2010, as amended from time to time) using the individual consultant selection system. Consulting services will be engaged to provide implementation, management, and monitoring services for the project. Individual consultant selection is considered a suitable procurement method given that few consultants are required (2 international, 2 national) and their discrete activities do not entail significant coordination.

Table A4: Consultants' Input, by Component

Consultant	Person-Months
International	
Electrical engineer (distribution)	6.00
Social and gender specialist	4.00
Total	**10.00**
National	
Social/gender specialist	10.00
Environment specialist	2.00
Total	**12.00**

Source: Asian Development Bank estimates.

8. **Bid evaluation committee**. A bid evaluation committee will be established to ensure that procurement methods are transparent and conform to ADB requirements. The bid evaluation committee will include, at a minimum, representatives from the implementation supervision consultants,[1] PPL, DNPM, and Treasury.

E. Disbursement Arrangements

9. The JFPR and the Government of New Zealand grant proceeds will be disbursed in accordance with ADB's Loan Disbursement Handbook (2007, as amended from time to time) and detailed arrangements agreed upon between the government and ADB. PPL, as the executing agency, will adopt direct payment disbursement and reimbursement procedures for withdrawal of proceeds of the grant. DNPM and PPL will be informed by the PMU of all transactions, and receive copies of all financial statements and audit reports. Funding from the JFPR and the Government of New Zealand will finance separate activities. As a result, separate withdrawal applications will be submitted for each of the funding sources. Bulk procurement may occur for goods and equipment to be used at sites financed by the JFPR and the Government of New Zealand. Therefore, separate withdrawal applications may be submitted for the JFPR and the Government of New Zealand financing of the same contract. Community-based civil works contracts will be established directly between PPL and the relevant communities. The procurement of consulting services (individual consultant selection), training, workshops, and seminars will be disbursed in accordance with ADB's Technical Assistance Disbursement Handbook (2010, as amended from time to time). ADB will directly administer $181,500 of the JFPR grant financing, and $306,500 of the Government of New Zealand grant financing, in accordance with its Technical Assistance Disbursement Handbook, including the procurement of consulting services (individual consultant selection), training, workshops, and seminars. ADB will administer all cofinancing funds from the Government of New Zealand ($2.5 million). The government will administer all government funds.

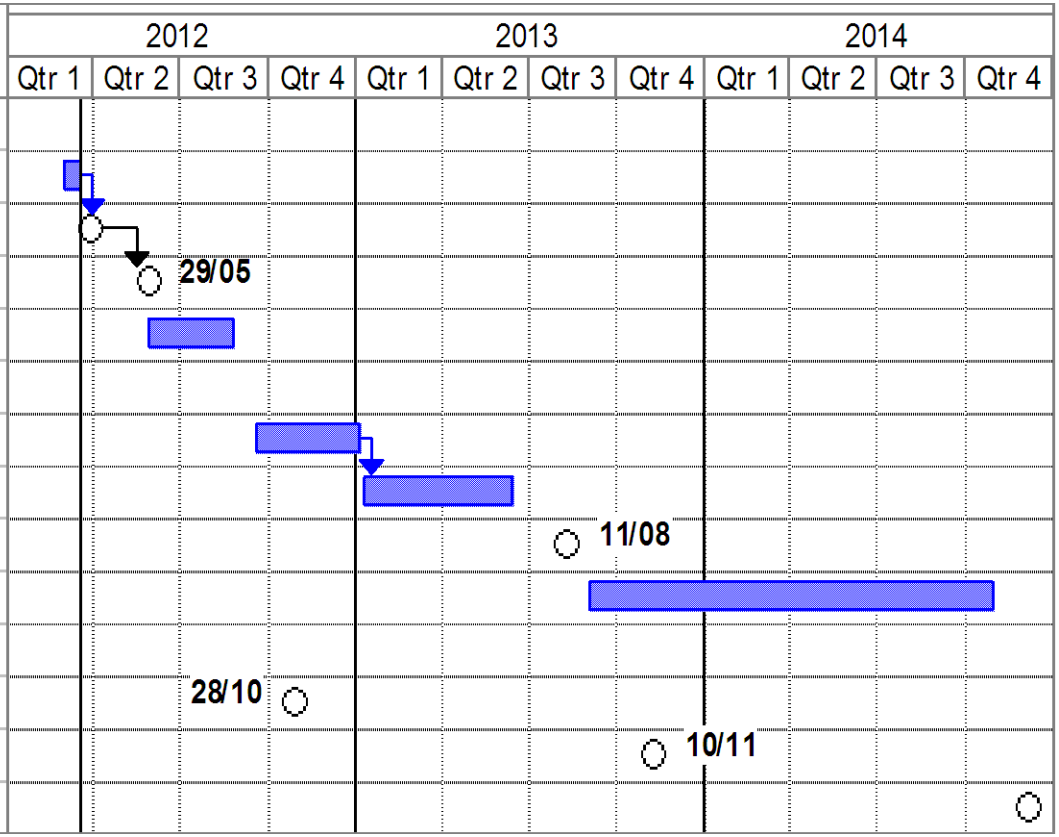
10. PPL will maintain separate project accounts and records by funding source for all expenditures incurred on the project. Project accounts will follow international accounting

[1] Confirmation will be documented that the representative from the consulting company does not have a conflict of interest with the specific procurement activity.

principles and practices. PPL will have the detailed consolidated project accounts audited in accordance with international standards on auditing by an auditor acceptable to ADB. PPL will submit the audited accounts, in English language, to ADB within 6 months of the end of the fiscal year. The government and PPL have been made aware of ADB's policy on delayed submission, and the requirements for satisfactory and acceptable quality of the audited accounts. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures. For revenue-generating projects only, ADB requires audited financial statements for each executing and/or implementation agency associated with the project. Quarterly progress reports will be submitted by PPL, as well as a project completion report within 3 months of project completion.

IMPLEMENTATION SCHEDULE

ID	Task Name
1	**Funding Approval**
2	Government of Japan approval
3	ADB Board of Directors clearance
4	Signing
5	Consultant recruitment
6	**Distribution Extension**
7	Prepare design
8	Advertise, evaluate and award contract
9	Delivery of equipment
10	Construction
11	**Reporting**
12	Inception report
13	Midterm report
14	Final report



ADB = Asian Development Bank, Qtr = quarter.
Source: Asian Development Bank estimates.

PROCUREMENT PLAN

Project name	Improved Energy Access for Rural Communities Project
Amount	$5,000,000
Project number	To be determined
Executing agency	Independent Public Business Corporation
Approval date of original procurement plan	
Approval of most recent procurement plan	

1. **Project procurement thresholds.** Unless the Asian Development Bank (ADB) agrees otherwise, the following process thresholds shall apply to procurement.

Table A6.1: Project Procurement Thresholds – Works and Goods

Procurement Method	Threshold
International competitive bidding (ICB) for works	Between $1,000,000 and $10,000,000
ICB for goods	Between $500,000 and $1,000,000
National competitive bidding (NCB) for works	<$1,000,000
NCB for goods	<$500,000
Shopping for works	<$100,000
Shopping for goods	<$100,000
Direct contracting	< $10,000

2. The following table provides an indicative list of all procurement (goods, works, and consulting services) over the life of the project. Contracts financed by the borrower and others should also be indicated, with an appropriate notation in the comments section.

Table A6.2: List of Contract Packages – Goods, Works, and Consulting Services

	Contract Description	Estimated Cost ($)	Procurement Method	Expected Date of Advertising	Prior Review
1.	Minimum supply kit components	720,000	NCB goods	June 2012	Yes
2.	Lines, poles, and accessories (HV and LV)	2,595,000	ICB goods	June 2012	Yes
3.	Transformers 22-0.4 kV	720,000	NCB goods	June 2012	Yes
4.	Community-based civil works contracts (multiple)	145,000	Direct contracting[b]	June 2012–June 2014	Yes
5.	Consulting services[a]	386,000	ICS	January 2012	ADB to recruit consultants using ICS

ADB = Asian Development Bank, ICB = international competitive bidding, ICS = individual consultant selection, HV = high voltage kV = kilovolt, LV = low voltage, NCB = national competitive bidding,

[a] Consulting recruitment will be undertaken by ADB.

[b] ADB's Procurement Guidelines (2010, as amended from time to time) Section 3.17 allows for suitably adapted procurement procedures where community participation is required in the interest of project sustainability. PAI 5.10 Section F, para. 9 indicates that 'Labor components of the subprojects can be extended to members of the community who should be reimbursed adequately for the services rendered'. Given that competition within a single village is not possible, and the contracts will be <$10,000, ADB. 2006. Local Procurement. *Project Administration Instructions*. PAI 3.04 Manila (para. 6) allows direct contracting. Labor for community-based civil works contracts will, therefore, be directly sourced from relevant communities at existing labor rates established by PNG Power Limited and acceptable to ADB.

Sources: PNG Power Limited and Asian Development Bank estimates.

3. All procurement under the project will be conducted in accordance with ADB's Procurement Guidelines (2010, as amended from time to time). Specifically, national

competitive bidding (NCB) will be undertaken in accordance with sections 3.3 and 3.4 of ADB's Procurement Guidelines.

C. National Competitive Bidding

1. General

4. NCB shall conform to the provisions set in the Public Financial Management Act as issued in 1995 and amended in 2003, and the specific procedures prescribed in the financial instructions issued in 2005, with the clarifications and modifications described in the following paragraphs required for compliance with the provisions of ADB's Procurement Guidelines.

2. Participation in Bidding

(i) Government-owned enterprises in Papua New Guinea shall be eligible to bid only if they can establish that they are legally and financially autonomous, operate under commercial law, and are not a dependent agency of the borrower, executing agency or implementing agency.
(ii) Foreign bidders shall be eligible to participate in bidding under the same conditions as national bidders.
(iii) Bidding shall not be restricted to preregistered firms and such registration shall not be stated in the bidding documents as a condition for the submission of bids. Where registration is required prior to award of contract, bidders (a) shall be allowed a reasonable time to complete the registration process; and (b) shall not be denied registration for reasons unrelated to their capability and resources to successfully perform the contract, which shall be verified through post-qualification.

3. Classification of Contractors, Qualification, Post-qualification

(i) Post-qualification shall be used unless prequalification is explicitly provided for in the loan agreement/procurement plan.
(ii) Bidding shall not be restricted to any particular class of contractors, and non-classified contractors shall also be eligible to bid. Qualification criteria (in case prequalification was not carried out) shall be stated in the bidding documents, and before contract award, the bidder having submitted the lowest evaluated responsive bid shall be subject to post-qualification.

4. Conflict of Interest

5. Bidders may be considered to be in conflict of interest with one or more parties in this bidding process if, including but not limited to:

(i) they have controlling shareholders in common; or
(ii) they receive or have received any direct or indirect subsidy from any of them; or
(iii) they have the same legal representative for purposes of this bid; or
(iv) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid or another bidder, or influence the decisions of the employer regarding this bidding process; or

(v) a bidder participates in more than one bid in this bidding process. (Participation by a bidder in more than one bid will result in the disqualification of all bids in which the party is involved. However, this does not limit the inclusion of the same subcontractor in more than one bid.); or

(vi) a bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract is the subject of the bid; or

(vii) a bidder or any of its affiliates has been hired (or is proposed to be hired) by the employer or borrower as engineer for the contract.

5. Preferences

6. No preference shall be given to domestic bidders and to domestically manufactured goods.

6. Advertising, Time for Bid Preparation

(i) Invitations to bid shall be advertised in at least one newspaper of national circulation or freely accessible and well-known website, allowing a minimum of 4 weeks for the preparation and submission of bids, with such 4-week period to begin with the availability of the bid documents or the advertisement, whichever is later.

(ii) Bidding of NCB contracts estimated at $500,000 or more for goods and related services, or $1,000,000 or more for civil works, shall be advertised on ADB's website via the posting of the procurement plan.

7. Standard Bidding Documents

7. Until national standard bidding documents approved by ADB are available, bidding documents acceptable to ADB should be used.

8. Bid Security

8. If required by the bidding documents, bid security shall be in the form of a bank guarantee from a reputable bank. A bidder's bid security shall apply only to a specific bid.

9. Bid Opening and Bid Evaluation

(i) Bidders may deliver bids, at their option, either in person or by courier service or by mail.

(ii) Bidders shall not be allowed to amend their tenders after the closing date and time for submission of bids.

(iii) Bids shall be opened in public, immediately after the deadline for submission of bids. No bid shall be rejected during bid opening. The name of the bidder, the total amount of each bid, and any discounts shall be read aloud and recorded in the minutes of the public bid opening.

(iv) Evaluation of bids shall be made in strict adherence to the qualifications and evaluation criteria stipulated in the bidding documents.

(v) No bidder shall be rejected merely on the basis of a comparison with the employer's estimate and budget ceiling without ADB's prior concurrence.

(vi) The contract shall be awarded to the technically responsive bidder that offers the lowest evaluated price, and meets the qualifying criteria. In determining the lowest evaluated price, the following are to be considered: (a) bid price, as offered; (b) arithmetical corrections on the bid price, if any; and (c) monetary value of the evaluation criteria that are stated in the bidding document.

10. Rejection of Bids

9. Bids shall not be rejected and new bids solicited without ADB's prior concurrence.

11. Extension of the Validity of Bids

10. In exceptional circumstances and with prior ADB approval, the procuring entity may, before the expiration of bid validity, request all bidders in writing to extend the validity of their bids. In such a case, bidders shall not be requested nor permitted to amend the price or any other condition of their bid. Bidders shall have the right to refuse to grant such an extension without forfeiting their bid security, but bidders granting such an extension shall be required to provide a corresponding extension of their bid security.

12. Disclosure on Contract Awards

11. At the same time that notification on award of contract is given, the borrower/executing agency/implementing agency shall publish the following information on contract award on a free and open-access website or other means of publication acceptable to ADB: (i) name of each bidder who submitted a bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated price of each bid that was evaluated; (iv) names of bidders whose bids were rejected and the reasons for the rejection; and (v) name of the winning bidder, price it offered as well as the duration and summary scope of the contract awarded. The executing/implementing agency shall respond in writing to unsuccessful bidders who seek explanations on the grounds on which their bids are not selected.

13. No Negotiations

12. There shall be no negotiations, even with the lowest evaluated bidder, without ADB's prior concurrence. A bidder shall not be required, as a condition of award, to undertake obligations not specified in the bidding documents, or otherwise, to modify the bid as originally submitted.

14. Inspection and Auditing

13. Each contract financed from the proceeds of a loan/grant shall provide that the contractor/supplier shall permit ADB, at its request, to inspect their accounts and records relating to the performance of the contract and to have said accounts and records audited by auditors appointed by ADB.

15. Member Country Restriction

14. Bidders must be nationals of member countries of ADB, and offered goods must be produced in and supplied from member countries of ADB.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The project implementation will require two international consultants (10 person-months) and two national consultants (12 person-months) to be hired through individual consultant selection. Consultants will be engaged by the Asian Development Bank (ADB) in accordance with its Guidelines on the Use of Consultants (2010, as amended from time to time).

Table A7: Summary of Consulting Services Requirement

Consultant	Person-Months
International	
Electrical engineer (distribution)	6.00
Social/gender specialist	4.00
Total	**10.00**
National	
Social and gender specialist	10.00
Environment specialist	2.00
Total	**12.00**

Source: Asian Development Bank estimates.

2. **Electrical engineer (distribution) and team leader** (international, 6 person-months). The electrical engineer will have at least 15 years of demonstrated experience in design, operation, and construction of distribution grids, preferably in developing countries and preferably including the Pacific. The team leader will be responsible for managing the consultant team and coordinating the overall reporting activities, and for liaison with stakeholders. The activities to be undertaken by the electrical engineer will include, but not be limited to:

(i) **Background data**. Collect and review existing background data and reports on the related power systems and proposed transmission projects.

(ii) **Design**. Prepare the design of the distribution projects, including design specifications and cost estimates. Design details will range from the transformers of the main transmission line to the installation of minimum supply kits in each household.

(iii) **Selection of communities for connection**. In coordination with PNG Power Limited (PPL) and the social specialists, undertake surveys of communities along the proposed transmission corridors to assess priority villages for connection to power under the project. Establish selection criteria that will include (a) distance to the transmission line (least cost); (b) capacity of the community to utilize electricity in economic development (e.g., agricultural processing, home business); (c) location of schools and medical clinics; (d) willingness and ability to pay; and (e) location of households headed by single women. The team leader will focus on technical and business issues while the social specialist will focus on social issues.

(iv) **Consultation and participation plan**. Prepare a consultation and participation plan, summarizing the proposed stakeholder consultation activities. Present the plan in the inception report. Coordinate and undertake consultation activities according to the consultation and participation plan. Liaise closely with the main stakeholders including, but not limited to, private sector, provincial government departments, landowner representatives. Liaise with the Embassy of Japan and the Embassy of New Zealand.

(v) **Schedule**. Prepare the detailed work program and implementation schedule for the project, and coordinate the work of the consultants on the team. Coordinate closely with the ADB team leader, including fortnightly progress debriefs. Prepare the project implementation schedule, a Gantt chart showing the schedule, and a procurement schedule.

(vi) **Development approvals**. Work closely with the implementing agency to obtain all relevant provincial and national development approvals for the project.

(vii) **Performance indicators**. For project monitoring purposes, develop a set of performance indicators (in coordination with other relevant technical experts) that can be verified and monitored (including operating, financial, environmental, socioeconomic, and poverty reduction parameters).

(viii) **Cost estimates**. Assess the project cost estimates, including unit costs and estimates of quantities for project components, identification of local and foreign cost components, and physical and price contingencies.

(ix) **Community-based civil works contracts**. Work with PPL to prepare a standard community-based civil works contract (based on existing PPL models) suitable for signing with communities. The contract will include core labor standards. Confirm that the contract is acceptable to ADB. Establish a fund flow mechanism to ensure that contract payment is transparent and auditable. Assess the impact of community-based civil works contracts and prepare an impact report. Ensure that 25%–50% of participants in the community civil works contracts will be women, based on the physical work required on a case-by-case basis.

(x) **Power access rates**. Calculate baseline access rates in each of the three target provinces. Calculate the impact on access rates after project completion. Undertake demographic profiling to estimate maximum household connections to the power grid (i.e., upper limit of access rates in target provinces from extension of the power grid).

(xi) **Community workshops**. Work closely with the social specialists to hold community workshops for (a) all newly connected communities for capacity building on electricity safety, operation of prepayment meters, energy efficiency measures, and household utility budgeting, and (b) five communities in each of the three target provinces on increased opportunities for income generation. Prepare standard presentation materials. Outreach to microfinance companies to join the workshops. The team leader and the international social specialist will attend a selection of workshops. However, the workshops will mainly be delivered by the national social specialist and PPL. Ensure that workshops are attended by a minimum of 50% women.

3. **Social and gender specialists** (international, 4 person-months; national, 10 person-months). The international social/gender specialist will have at least 10 years of demonstrated experience in social impact assessment, including gender, of infrastructure projects in developing countries, preferably including power sector projects and preferably in the Pacific. The international social/gender specialist will spend 100% of the time in-country. The national social/gender specialist will have at least 10 years of experience in social impact assessment, including gender, for development of infrastructure projects. The activities to be undertaken by the social/gender specialists will include, but not be limited to:

(i) **Background data**. Collect available reports and published statistics that are relevant to the project. Identify the project stakeholders and examine their existing rights and possible risks from the project.

(ii) Analyze indigenous peoples impacts according to ADB's Safeguard Policy Statement (2009), and prepare an indigenous peoples plan, if required.

(iii) **Baseline surveys**. Working closely with the implementing agency, organize and conduct surveys in the project area, and consult with the government and nongovernment organizations to supplement secondary data. Prepare poverty and social profiles of the project areas.

(iv) **Poverty and social assessment**. Prepare poverty and social assessment according to ADB guidelines based on the survey and consultations, including incidence and nature of poverty, demographic and economic profiles of households, current uses and shortcomings of electricity by gender and other demographic characteristics, and expected social and economic benefits of the project.

(v) **Willingness and capacity to pay**. Conduct surveys to assess the willingness and capacity of the proposed rural communities to pay for connection to power.

(vi) **Selection of communities for connection**. In coordination with PPL and the team leader, undertake surveys of communities along the proposed transmission corridors to assess priority villages for connection to power under the project. Establish selection criteria that will include (a) distance to the transmission line (least cost); (b) capacity of the community to utilize electricity in economic development (e.g., agricultural processing, home business); (c) location of schools and medical clinics; (d) willingness and ability to pay; and (e) location of households headed by single women.

(vii) **Household energy consumption baseline**. Conduct surveys on a representative sample group of households targeted for connection to the grid to establish household expenditure and consumption of energy services, suitable as baseline for comparison after connection of power. The survey will include all household energy consumption (e.g., kerosene, biomass)

(viii) **Baseline business activities**. Conduct surveys of all communities to (a) assess which communities have access to relevant resources to maximize productive use of electricity; (b) select five communities in each of the three target provinces for training on increased opportunities for income generation; and (c) assess baseline business activity for comparison after connection of the community to power.

(ix) **Baseline for schools and clinics**. Conduct surveys of medical and educational facilities to document baseline conditions regarding energy consumption for comparison after connection of power.

(x) **Impact monitoring**. Conduct impact surveys 6 months and 1 year after the sample communities have been connected to power to monitor (a) impact of household expenditure on energy, (b) household energy consumption patterns, (c) impact of prepayment meters, (d) benefits to and negative impacts on households from connection to power, (e) increase in business activity, and (f) impact on provision of medical and educational services. Include unconnected communities for comparison purposes. Assess community perceptions, and any real or proposed migration activities as a result of electricity supply.

(xi) **Gender analysis**. Assess the gender impact of the project, including current uses of electricity and expected benefits by gender in the project area. Assess gender-related issues in the project area and propose ways to make the project beneficial for women and men. Recommend measures to address gender issues and incorporate them into project design.

(xii) **Gender training**. Conduct gender awareness training for project management unit staff.

(xiii) **Gender impacts**. Conduct impact surveys 6 months and 1 year after sample communities have been connected to power to assess impacts on gender, including (a) reduction in time required for women to collect biomass; (b) changes

in household budgets for items such as food, medical, and educational expenses; (c) impacts on women's health; and (d) increase in women undertaking household income-generation activities.

(xiv) **Community workshops**. Work closely with the team leader to hold community workshops for (a) all newly connected communities to build capacity on electricity safety, operation of prepayment meters, energy efficiency measures, and household utility budgeting; and (b) five communities in each of the three target provinces on increased opportunities for income generation.

(xv) **Consultation plan**. Work closely with the implementing agency to develop a culturally appropriate stakeholder and community consultation plan that is inclusive of diverse social groups as well as equal representation of women and men in communities. Include the stakeholder consultation plan in the inception report.

(xvi) **HIV/AIDS**. Assess vulnerabilities and risks associated with HIV/AIDS and other possible health impacts. Incorporate into project design (including contracts).

(xvii) **Management plans**. Prepare socioeconomic monitoring and management plans to be implemented, including specific indicators to be monitored. The social and gender analysis, recommendations on project design to incorporate social and gender dimensions, analysis of indigenous peoples, and socioeconomic monitoring plans should be specified as separate outputs.

4. **National environment specialist** (national, 2 person-months). The environment specialist will have at least 10 years of experience in environmental assessment of infrastructure projects, including in the power sector. The environment specialist will be familiar with Papua New Guinea's environment approval procedures. The environment specialist's work will:

(i) Prepare the environmental assessment for the project ensuring that it conforms to all relevant regulatory requirements in Papua New Guinea and ADB's Safeguard Policy Statement. It is envisaged that the project will be classified as category C for environment.

(ii) Conduct site visits to all three sites to assess environmental conditions.

(iii) Consult with stakeholders, including environmental nongovernment organizations. Incorporate comments into project design. Prepare relevant environmental permitting application(s) for government approval.

(iv) Assist the design engineers in incorporating adequate mitigation measures into the project design.

(v) Quantify the environmental benefits from project implementation. Specify monitoring parameters suitable for incorporation into the project performance monitoring system.

(vi) Consult with government on their environmental compliance requirements for this project.

(vii) Develop a grievance redress mechanism, in cooperation with social safeguard specialists.

(viii) Submit the environmental report to ADB and PPL for review and comment. Prepare a matrix of comments received. Revise based on comments matrix, indicating paragraph numbers where revisions have been made.

(ix) Contribute to other project documents as required.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

Country: Papua New Guinea	Project Title: Improved Energy Access for Rural Communities Project

Lending/Financing Modality:	Japan Fund for Poverty Reduction Grant	Department/ Division:	Pacific Department/Transport, Energy and Natural Resources Division

I. POVERTY ANALYSIS AND STRATEGY

A. Links to the National Poverty Reduction Strategy and Country Partnership Strategy

Vision 2050 of the Government of Papua New Guinea (PNG) is a national development framework that focuses on seven pillars: (i) human capital development, gender, youth, and people's empowerment; (ii) wealth creation; (iii) institutional development and service delivery; (iv) security and international relations; (v) environmental sustainability and climate change; (vi) spiritual, cultural, and community development; and (vii) strategic planning, integration, and control. The government has also recently approved the PNG Development Strategic Plan (DSP), 2010–2030. The DSP provides the overarching policy oversight and guidance for all development agendas and sector strategies. In line with the government's Vision 2050 and DSP priorities, the Asian Development Bank's country strategy and program[a] for PNG aims to support more inclusive growth by creating livelihood opportunities and improving access to basic services, especially in rural areas where 87% of the population lives. The Improved Access to Energy for Rural Communities Project will support inclusive economic growth and poverty reduction by improving power supply to rural communities in PNG.

B. Poverty Analysis **Targeting Classification:** General intervention

1. **Key issues.** The project will support poverty reduction through:
   - (i) reduction of workloads (especially for women) in collection of biomass,
   - (ii) more opportunities for income-generating activities through productive use of electricity,
   - (iii) health improvement thanks to better indoor air quality from reduced burning of biomass,
   - (iv) improvement of medical and education facilities,
   - (v) better education through better evening lighting, and
   - (vi) increased household disposable incomes through replacement of expensive kerosene for lighting.

2. **Design features.** The project has the following pro-poor design features:

(i) **Trialing of community based civil works contracts**. The project will trial community-based civil works contracts where PNG Power Limited (PPL) will enter into a contract with communities to provide manual labor for construction activities supported by a core technical team from PPL. This will (a) create employment and provide direct injections of income into rural communities, and (b) improve community ownership.

(ii) **Trialing of prepayment meters for rural communities**. PPL currently operates a prepayment meter system for the main urban centers of PNG. However, it has yet to extend prepayment meters to rural customers, mainly because the aggregate number of rural customers in any province is relatively limited and the initial focus has been on establishing the prepayment meter system in urban areas. The project will involve installation of prepayment meters to rural communities in three provinces (approximately 4,500 prepayment meters). The prepayment meters will give rural households, particularly women, greater flexibility in managing their power use. Experience with prepayment meters in urban centers of PNG and other areas of the Pacific indicate significant potential savings for poor households through greater awareness of energy efficiency (and, therefore, lower consumption without impact on livelihoods). Additionally, households are able to manage household budgets more effectively by avoiding unexpectedly high power bills at the end of each month, when cash-flow constraints have flow-on impacts on other household expenditure items such as food, health, and education.

(iii) **Community workshops on management of electricity** for all newly connected communities, including (a) electricity health and safety, (b) operation of prepayment meters, (c) household power consumption budgeting, and (d) household energy efficiency. The workshops will target 50% participation by women.

(iv) **Targeted workshops on greater income generation from wider access to power**. Workshops will be undertaken in five target communities in each of the three target provinces. Communities will be selected based on their potential for greater income generation, e.g., agribusiness processing, household garment production, and light industry. The targeted community workshops will also increase awareness of available microfinance opportunities and processes to apply for microfinance assistance. Microfinance groups will attend the workshops to discuss their products and make initial connections to potential customers. The workshops will target 50% participation by women.

II. SOCIAL ANALYSIS AND STRATEGY

A. Findings of Social Analysis

Key issues. The primary beneficiaries of the project will be the rural communities who are currently not connected to the power grid and do not have access to modern forms of power. It is estimated that the project will connect 4,500 households, 20 medical clinics, and 20 schools to distributed power. Most households in the rural subproject sites have low incomes and limited access to basic social services. Project sites (i) are in remote areas, (ii) lack easy road access to town centers, (iii) rely

on springs and rivers for drinking water, and (iv) use kerosene lamps for lighting and firewood for cooking. Consultations indicate that communities in the affected areas expect access to development benefits such as distributed power. In addition to incomes from potential project employment, communities also expect to earn income from selling garden produce and cash crops during construction. Training for communities will increase their ability to effectively participate in the project. Community-based civil works contracts will provide additional employment to communities, provide direct injection of income to communities, and increase community ownership of infrastructure. Capacity development for PPL will include awareness training, and bidding documents will require contractors to comply with minimum labor standards; to undertake awareness on health, HIV/AIDS, and safety; and to employ local men and women in construction works.

Selection of communities. The project will not be sufficient to connect all communities within the transmission corridor. Some communities will remain unconnected to distributed power. This may cause tension between villages. The project will develop a clear rationale for selection of communities for connection, including (i) distance to the transmission line (least cost); (ii) capacity of the community to utilize electricity in economic development (e.g., agricultural processing, home business); (iii) location of schools and medical clinics; (iv) willingness and ability to pay; and (v) location of households headed by single women. The rationale will be clearly explained to all communities.

Willingness to pay. Household surveys in PNG have consistently indicated that connection to the power grid is the least-cost energy supply alternative for poor families since reticulated power costs less than alternative energy sources such as kerosene. Generally, the main barrier for accessing reticulated power is (i) lack of grid extension to rural areas, and (ii) the relatively high cost for connection fees. The project will support both extension of the grid and individual household connection fees. However, some poor families may still be unable to afford ongoing costs of reticulated power. A willingness-to-pay evaluation will assess which villages have capacity and willingness to pay for distributed power.

B. Consultation and Participation

1. Provide a summary of the consultation and participation process during the project preparation.

During the design and preparation of the associated loan (Town Electrification Investment Program, tranche 1)[b] consultations were held at various levels, including nationally, in villages, and on subproject sites, involving a broad range of stakeholder groups and over 600 individuals. The consultations were conducted in the form of (i) community meetings; (ii) key provincial, district, and village informant interviews; (iii) focus group discussions, particularly among women and youth; and (iv) socioeconomic surveys of rural and urban households. The distribution extensions are proposed for the same sites as for tranche 1 and the consultation for tranche 1 included discussions and awareness raising of issues related to distribution extension. Communities indicated strong support for extension of power to villages along the proposed transmission alignments, and recommendations received from stakeholders during the consultation were incorporated into project design.

For project preliminary design purposes, quantities were initially estimated using aerial photography and desk top reviews. The preliminary analysis was then ground-truthed through targeted site visits, which included community consultation and interviews with key stakeholders. The design will then be finalized by the design and supervision consultants. It will include (i) survey and social profiling of communities along the main transmission alignments, (ii) consultations with communities to explain selection criteria, and (iii) assessment of willingness to pay.

2. What level of consultation and participation (C&P) is envisaged during the project implementation and monitoring?

☒ Information sharing ☒ Consultation ☒ Collaborative decision making ☐ Empowerment

3. Was a C&P plan prepared? ☐ Yes ☒ No

If a C&P plan was prepared, describe key features and resources provided to implement the plan (including budget, consultant input, etc.). If no, explain why.

A C&P plan will be prepared by the design and supervision consultants. Appropriate resources (social/gender specialist, international, 4 person-months; and social/gender specialist, national, 10 person-months) have been allocated to prepare and implement the C&P plan.

C. Gender and Development **Gender Mainstreaming Category: Gender Mainstreaming**

1. **Key issues.** Most communities in PNG are patriarchal and women are disadvantaged due to limited access to economic and political resources. PNG's gender-related development index in 2005 was 0.529, placing it 124th out of 157 countries. Women have the highest maternal mortality in the Pacific region (733 per 100,000 live births), as well as being at risk from gender-based violence and HIV infection. Women are poorly represented in decision-making systems: only 1 of 109 seats in the national parliament is held by a woman, and only 1 of 27 national judicial positions is held by a woman. Women's participation in decision making in the project target provinces is similarly limited. All elected members of parliaments are men, and most managerial positions are held by men. Women hold positions only at the staff level, mostly in the roles traditionally held by women in government services (e.g., education and health). Access to primary education is low for girls, resulting in lower educational attainment by females than males. Females have much lower literacy rates in all three target provinces. Women are the primary providers and users of energy for household and family care. The lack of basic infrastructure services limits the time and opportunities women have to engage in other productive activities. Hardships specific to women include: (i) giving birth in poorly lit aid posts; (ii) collecting drinking water from creeks and springs; (iii) performing the strenuous and time-consuming task of collecting firewood; and (iv) cooking in poorly lit, smoky kitchens. Women also lack the necessary skills to earn their own incomes and manage businesses. The key gender issues identified during project preparation are:

(i) disproportional division of labor based on women's traditional role regarding collection of biomass;

(ii) negative impact on women's health due to exposure to biomass burning in the household;
(iii) negative impact on women's health, particularly during child birth, due to lack of electricity at medical clinics; and
(iv) lack of opportunities for women to generate income through home-based paid work due to lack of electricity.

The introduction of electricity in the household may impact the traditional division of labor in the household by reducing women's traditional workload related to biofuel collection and allowing women increased opportunities to generate income.

2. **Key actions.**

☐ Gender plan ☒ Other actions/measures ☐ No action/measure

By providing power connections to rural households, the project will include the following gender-related features that incorporate women's concerns, engage women in decision-making processes, and provide employment opportunities:

(i) reduction of women's time commitment to collection of biomass for household energy requirements;
(ii) improvement of women's health through improved indoor air quality by reducing indoor biomass burning;
(iii) improvement of women's access to household-based income generation opportunities;
(iv) reduction of expenditure on household energy (replacing kerosene with distributed power) will allow reallocation to other necessities such as food, medical expenses, and education; and
(v) improvement of women's access to modern medical facilities that rely on power for storage of vaccines and operation of electrical medical equipment;

Additionally, the project will incorporate the following specific gender-focused design features:

(i) By requiring 25%–50% participation by women in civil works contracts, the project will ensure that women access some of the monetary benefits from civil works expenditure on the project.
(vi) By requiring 50% women participation in the capacity building workshops, the project will ensure women have equal appreciation of the options for utilizing power for increased incomes, and also increased awareness of how to properly manage electricity consumption.

To adequately design pro-gender benefits into the project and monitor impacts, a consultancy budget has been allocated for a social/gender specialist (international, 4 person-months) and a social/gender specialist (national, 10 person-months).

III. SOCIAL SAFEGUARD ISSUES AND OTHER SOCIAL RISKS

Issue	Significant/Limited/ No Impact	Strategy to Address Issue	Plan or Other Measures Included in Design
Involuntary resettlement	No impact. The project will not require any land acquisition, restriction of access to lands, or displacement of people(s). The project will entail grid extension of distribution lines.	Placement of power poles is determined upon voluntary agreement with landowners.	☒ No action
Indigenous peoples	No impact. All land in the proposed project area is under customary tenure. Landowners may have power poles on their land. Placement is determined upon voluntary agreement with landowners.		☒ No action
Labor ☒ Employment opportunities ☐ Labor retrenchment ☒ Core labor standards	Significant positive benefits	The project will involve employment opportunities through community-based civil works contracts.	☒ Other action
Affordability	The project will improve affordability of energy supply to households. Initial willingness-to-pay surveys indicate high willingness and ability to pay.	Communities will be selected on capacity and willingness to pay survey.	☒ Action
Other risks and/or vulnerabilities ☒HIV/AIDS ☐Human trafficking	The project construction may carry the risk of HIV/AIDS infection.	HIV/AIDS awareness training will be provided for workers.	☒ Other action

IV. MONITORING AND EVALUATION

Are social indicators included in the design and monitoring framework to facilitate monitoring of social development activities and/or social impacts during project implementation? X Yes □ No

[a] Asian Development Bank. 2010. *Country Strategy and Program: Papua New Guinea, 2011–2015.* Manila.
[b] ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to Papua New Guinea for the Town Electrification Investment Program.* Manila (Loans 2713-PNG and 2714-PNG).

Source: Asian Development Bank.

DETAILED COST ESTIMATES BY FINANCIER

Item	JFPR	% of Cost Category	Government of New Zealand	% of Cost Category	Government of Papua New Guinea	% of Cost Category	Total
Japan Fund for Poverty Reduction							
Focusing on Kimbe–Biala Interconnection, West New Britain, and Divune Hydropower Plant, Northern Province							
A. Investment Costs							
1. Civil works (JFPR)	290,000	100	0	0	0	0	290,000
2. Civil works (government)	0	0	0	0	352,500	100	352,500
3. Goods and materials	1,495,000	100	0	0	0	0	1,495,000
4. Consulting services	343,000	100	0	0	0	0	343,000
5. Training, workshops, and seminars	20,000	100	0	0	0	0	20,000
6. Project management (JFPR)	145,000	100	0	0	0	0	145,000
7. Project management (government)	0	0	0	0	147,500	100	147,500
Subtotal (A)	**2,293,000**	**82**	**0**	**0**	**500,000**	**18**	**2,793,000**
B. Contingencies							
1. Physical	150,000	100	0	0	0	0	150,000
2. Price	57,000	100	0	0	0	0	57,000
Subtotal (B)	**207,000**	100	**0**	**0**	**0**	**0**	**207,000**
Total Project Cost (A+B)	**2,500,000**	**83**	**0**	**0**	**500,000**	**17**	**3,000,000**
Government of New Zealand							
Focusing on Ramazon Hydropower Plant, Autonomous Region of Bougainville, and Kimbe–Biala Interconnection, West New Britain							
A. Investment Costs							
1. Civil Works (NZL Government)	0	0	0	0	0	0	0
2. Civil Works (government)	0	0	0	0	352,500	0	352,500
3. Goods and materials	0	0	2,250,000	100	0	0	2,250,000
4. Consulting services	0	0	0	0	0	0	0
5. Training, workshops, and seminars	0	0	0	0	0	0	0
6. Project management (NZL Government)[a]	0	0	125,000	100	0	0	125,000
7. Project management (government)	0	0	0	0	147,500	100	147,500
Subtotal (A)	**0**	**0**	**2,375,000**	**83**	**500,000**	**17**	**2,875,000**
B. Contingencies[b]							
1. Physical	0	0	100,000	100	0	0	100,000
2. Price	0	0	25,000	100	0	0	25,000
Subtotal (B)	**0**	0	**125,000**	**100**	**0**	**0**	**125,000**
Total Project Cost (A+B)	**0**	**0**	**2,500,000**	**83**	**500,000**	**17**	**3,000,000**

JFPR = Japan Fund for Poverty Reduction, NZL = New Zealand, PNG = Papua New Guinea.

Note: All expenditures on the project, including consulting services, will be exempt of tax and duties. Items 1A2, 1A7, 2A2, and 2A7 will be provided in-kind by PNG Power Limited (the executing agency)

[a] Includes the Asian Development Bank's administration fee, audit costs, bank charges, and a provision for foreign exchange fluctuations (if any), to the extent that these items are not covered by the interest and investment income earned on this grant.

[b] Financing of cost items by JFPR and the Government of New Zealand will be on a parallel basis.

Source: Asian Development Bank estimates.

DETAILED COST ESTIMATES BY COFINANCIER AND ALLOCATION TABLE

Table A9.1: Allocation and Withdrawal of Grant Proceeds (Improved Energy Access for Rural Communities)

Category			Japan Fund for Poverty Reduction Grant Financing
Number	**Item**	**Total Amount Allocated** (USD)	**Percentage and Basis for Withdrawal from the Grant Account**
1	Works	$290,000	100% of total expenditure claimed[a]
2	Goods and materials	$1,495,000	100% of total expenditure claimed[a]
3	Project management and capacity development	$165,000	100% of total expenditure claimed[a]
4	Consulting services	$343,000	100% of total expenditure claimed[a]
5	Unallocated	$207,000	
	Total	**$2,500,000**	

[a] Exclusive of taxes and duties.

Table A9.2: Allocation and Withdrawal of Grant Proceeds (Improved Energy Access for Rural Communities)

Category			Government of New Zealand Grant Financing
Number	**Item**	**Total Amount Allocated** (USD)	**Percentage and Basis for Withdrawal from the Grant Account**
1	Goods and materials	$2,250,000	100% of total expenditure claimed[a]
2	Project management and capacity development	$125,000	100% of total expenditure claimed[a]
3	Unallocated[a]	$125,000	
	Total	**$2,500,000**	

[a] Exclusive of taxes and duties.

Note: Financing of cost items by the Japan Fund for Poverty Reduction and the Government of New Zealand will be on a parallel basis.