GPOBA

The Global Partnership on Output-Based Aid

INDIA
PROJECT COMMITMENT DOCUMENT

Project Name: **Mumbai Improved Electricity Access for Indian Slum Dwellers Project (P104649)**

Scope: Making new electricity connections to slum dwellers in the city of Mumbai, India. It is estimated that a total of 27,500 connections will be taken up.

- The focus will be on new connections for customers that at present have no service or have a form of illegal service. It is expected that out of the total of 27,500 connections, 22,500 will be such new connections.
- The remaining 5,000 connections will for customers that have previously had legal but substandard connections (the later was described as "regularization" in the eligibility PCN)[1].
- The cost of a new connection will be $213/connection, of which $110 will be incurred by Reliance as part of its upstream network investment and $103 is borne by the customer.
- These upfront costs to the end user for receiving a connection are typically greater than the monthly household income of the slum residents. Surveys carried out for the preparation of this project found that 32% of households earn up to $56 per month and 54% earn between $56-$113.
- Of the $103, it is proposed that, on average, GPOBA would be paying out $56 per household for a new connection and $47 per household for a regularization. This subsidy will consist of $23 for internal wiring, $24 for the connection between the Reliance point of service and the house[2] and $9 towards the connection service fee due to Reliance (this last portion will not apply for regularizations).
- The $24 subsidy between the point of service and the house will actually be determined by distance, and will be paid out at $1.60 per metre (average distance was found to be 15 metres by ICPCI). This is to ensure that there are no skewed incentives for the scheme to focus on customers living a short distance from the point of service.

Grant Recipient: Reliance Energy Limited (REL)

Total Project Costs: $6,500,000

- GPOBA subsidies = $1,500,000
- Reliance Energy Limited (REL) will be investing over $1 million on network upgrading for the first 7,000 new connections and up to c. $3.8 million for 27,500 connections.
- Slum dweller contribution = $1,200,000

Total GPOBA Funding Requested: **Window 3: $1,570,000**

- Subsidy funding = $1,500,000
- Independent Verification Agent = $70,000

[1] Regularizations are included in this scheme so that legal but sub-standard connections can be improved at the same time that new connections are fitted. The intention is that previously illegal users should not end-up better off than legal customers as a result of the scheme. Previous good behavior should not be penalized.
[2] Assuming that this distance is 15 metres.

- Bank/GPOBA supervision = $150,000

GPOBA Funding:

- DFID = 100%

Outputs: Electricity connections

- Working connections comprising of (a) connections from REL point of service to the house using technical specifications that meet Indian government standards (payment is on a per metre basis) and (b) internal wiring within the home using technical specifications that meet Indian government standards and with 4.5 supply points[3] (i.e. which meet the basic needs of the customer).
- Evidence of electricity supply to the connection and sustained delivery of electricity via the connection after 6 months
- Evidence of electricity supply to the connection and sustained delivery of electricity via the connection after 12 months.

Expected Beneficiaries: 27,500 slum households (hhs), or c. 110,000 slum people in two targeted slum areas in Mumbai: Shivaji Nagar and Golibar (on average, assuming 4 people per household).

GPOBA subsidy "efficiency":

- New connection cost = $213 (subsidy forms 26% or US$56 per household on average).

Key characteristics of the design

- A community awareness program run by REL jointly with CBOs and NGOs will increase customer interest in the scheme.
- Customers will individually contract their licensed electricity contractors (LECs) and thus drive the competitive procurement of connection and wiring services. As part of this program, LECs will be able to avail of materials at lower prices due to pre-negotiation carried out by Reliance and the International Copper Promotion Council (India).
- REL will provide a customer installment payment program to consumers whereby the connection costs (including utility fees and wiring) would be allowed to be paid in monthly installments recovered through the utility bill over a six month period (subject to regulatory approval). It has been proposed that the financing cost of providing this installment scheme be met by GPOBA. Panel of expert input is sought.
- The LEC is paid the GPOBA subsidy portion of the costs by Reliance after independent verification of the works. Reliance is in turn paid by GPOBA after independent verification is provided that the connection is working (including the internal wiring).
- Final payments to Reliance take place after independent verification of 6 months and 12 months of supply and billing.

Disbursement: Subsidy disbursements for the defined outputs will be made as follows:
Signing of grant agreement between GPOBA and REL – 10% of entire grant agreement i.e. $150,000. This will be provided against a Bank guarantee and the guarantee's beneficiary will be GPOBA. The guarantee will specify the conditions under which it will be called. Subsequent to this initial payment, further payments will be based on performance and verified outputs and will be according to the following schedule:

[3] enough to run two lights, one fan, one TV and one spare plug.

- 50% of the cost of each connection (based on unit costs) upon receipt of independent verification that connection and internal wiring has been carried out and that connection has been made by REL and is operational;
- 20% of the cost of connection (based on unit costs) for internal wiring and/or connection after independent verification of 6 months of service delivery to appropriate quality levels; and
- 20% of the cost of connection (based on unit costs) for internal wiring and/or connection after independent verification of 12 months of service delivery to appropriate quality levels.

Financial and economic rate of return

The project was found to have a financial internal rate of return of 8% and a net present value of -$106,421 if REL pays the value of the "gap" that needs to be subsidized by GPOBA. If GPOBA provides the subsidy, then the **financial internal rate of return** increases to **16%** and the **net present value** up to c. **$250,000**. Please see section C for details.

The economic rate of return of the project is found to rise from the F-IRR of **16% to 18%**. NPV rises to c. $335,000 if the overall lower costs to the slum dwellers of being a legal customer are taken into account. When health benefits are added in the project calculations the economic rate of return of the project rises from 18% to 24%. NPV rises c. $630,000. Please see section C for details.

Financial Management: Approval has been received in draft form.

Procurement: Pending. REL will not be carrying out any procurement (except for the independent verification agent, which will be carried out on a competitive basis). Procurement of contractors and materials to be carried out by individual customers and LECs.

Environmental Clearance: Yes

Government Endorsement: Received the project support letter from Maharashtra Electricity Regulatory Commission (MERC) on 6/22/2006. Department for Economic Affairs has been provided with project information and have confirmed receipt of the information.

CURRENCY EQUIVALENTS
(Exchange Rate Effective January 10, 2007)

Currency Unit	=	Indian Rupees (Rs)
Rs. 44.42	=	US$1
US$0.023	=	Rs.1

ABBREVIATIONS AND ACRONYMS

ARR	Annual revenue requirement
CAS	Country Assistance Strategy
CBO	Community Based Organization
DfID	United Kingdom Department for International Development
DSM	Demand-side Management
DU	Dwelling Units
EC	Electrical Contractors
FTL	Fluorescent Tube Lights
GPOBA	Global Partnership for Output-Based Aid
GOI	Government of India
(hh)	Households
ICA	International Copper Association
ICPCI	International Copper Promotion Council (India)
IIEC	International Institute for Energy Conservation
IIT-B	Indian Institute of Technology – Bombay
IVC	Independent Verification Contractor
LECs	Licensed electricity contractors
MERC	Maharashtra Electricity Regulatory Commission
M&V	Monitoring & Verification
NGO	Non-Government Organization
OBA	Output Based Aid
REL	Reliance Energy Limited
SELR	Slum Electrification and Loss Reduction
SRS	Slum Rehabilitation Society
USAID	United States Agency for International Development

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A. STRATEGIC CONTEXT AND RATIONALE

A.1. Country and sector issues

India is a low-income country with a gross national income (GNI) per capita of $720 in 2005 while the world average is $6,987[4]. It is rated as a low income (DAC II) country by ODA and a Frontier country by IFC. India's population is 1,079 million, of which 71% or 766 million resides in rural areas and the rest in urban areas[5]. The rapid trend of urbanization has led to the large migration of poor people to the cities, where they live in urban slums with very limited access to basic services. According to the 2001 Census of India[6], 42.6 million people or 22.6% of the urban population lived in slums. Among over 25 States and Union Territories, the State of Maharashtra has the highest number of slum dwellers (11.2 million). Nearly 55% of the total population (6.5 million people) in Mumbai, the capital of Maharashtra, has been reported to be slum dwellers, and the National Statistical Survey Organization recorded 52,000 slums in Mumbai in 2002. Only 15% of slum households have drinking water, electricity and latrines in their premises; less that 25% have sanitation systems.

According to a recent study conducted by UK Department for International Development (DfID),[7] nearly half of the slum households in India have some form of illegal electricity connections - mainly stealing electricity through unauthorized wiring. The priority uses of electricity included lighting, cooking, and cooling fans to control mosquitoes. The mean proportion of household expenditure (legal or not) spent on energy is 14%. An illegal connection is not necessarily a free connection – in fact, it often costs higher than a legal connection[8].

There has been a policy improvement to increase electricity connection. The Indian Electricity Act of 2003 states that any customer who can provide proof of residency is entitled to have a legal electric connection, and the local electric utility is obligated to provide the point of connection. The customer is required to secure wiring to the household and internal wiring and obtain a certification prior to the connection being made.

The proposed project implementer, Reliance Energy Limited[9] (REL), is India's largest private electric utility that serves a large portion of Northern Mumbai. REL purchases power from the State Electricity Board and distributes over 2.2 million customers in urban and suburban areas. REL is regulated by Maharashtra Electricity Regulatory Commission (MERC), and under the current concession contract, REL is obliged to provide an electricity point of service to all slum dwellers upon their request, regardless of their land tenure. Thus, REL is responsible for connection costs associated with supplying a "point of service", including upgrading the distribution network/substations, providing drop down cables and installing meters for individual households. Users are responsible for paying a regulated connection fee (service connection charge) for costs up to the point of service and are then responsible for carrying out and paying for their own wiring from the point of service to the house and for internal wiring in the house.

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[4] World Development Indicators Database, World Bank, 1 July 2006.

[5] 2006 World Development Indicators, the data in 2004.

[6] Latest census data available - Census of India, 2001 Census Results - Slum Data, Office of the Registrar general, India, December 2005 (http://www.censusindia.net/results/slum/slum_index.html).

[7] Gamos Ltd., Energy in Low-Income Urban Communities, (Contract Number R8146 – Barriers to Access to Modern Energy in Slums), Final Technical Report, February 2005.

[8] Data suggests that many dwellers purchasing resold electricity from neighbors or slum lords may be paying 2-5 times higher than what they would pay for a legal connection.

[9] Reliance Energy is into generation, transmission, distribution and trading of power. It distributes over 5,000 MW of power - the largest in the country. REL is part of the Reliance industries-India's private sector company ranked among the world's 175 largest companies in terms of net profit and the 500 largest companies in terms of sales. Reliance Energy and its affiliate companies power 2 out of 3 homes in Mumbai and 1 out of 2 in Delhi and have a consumer base of 5 million catering to an estimated population of 25 million in Mumbai, Delhi and Orissa.

REL engages in a process to calculate its annual revenue requirement (ARR) to recover its cost of O&M and upstream investment. Agreement of the ARR with MERC leads to the calculation of the tariffs. Its tariffs are a stepped structure based on usage. Reliance's costs of providing service to the point of service via a drop down cable are charged through the end-user connection fee which is set by MERC.

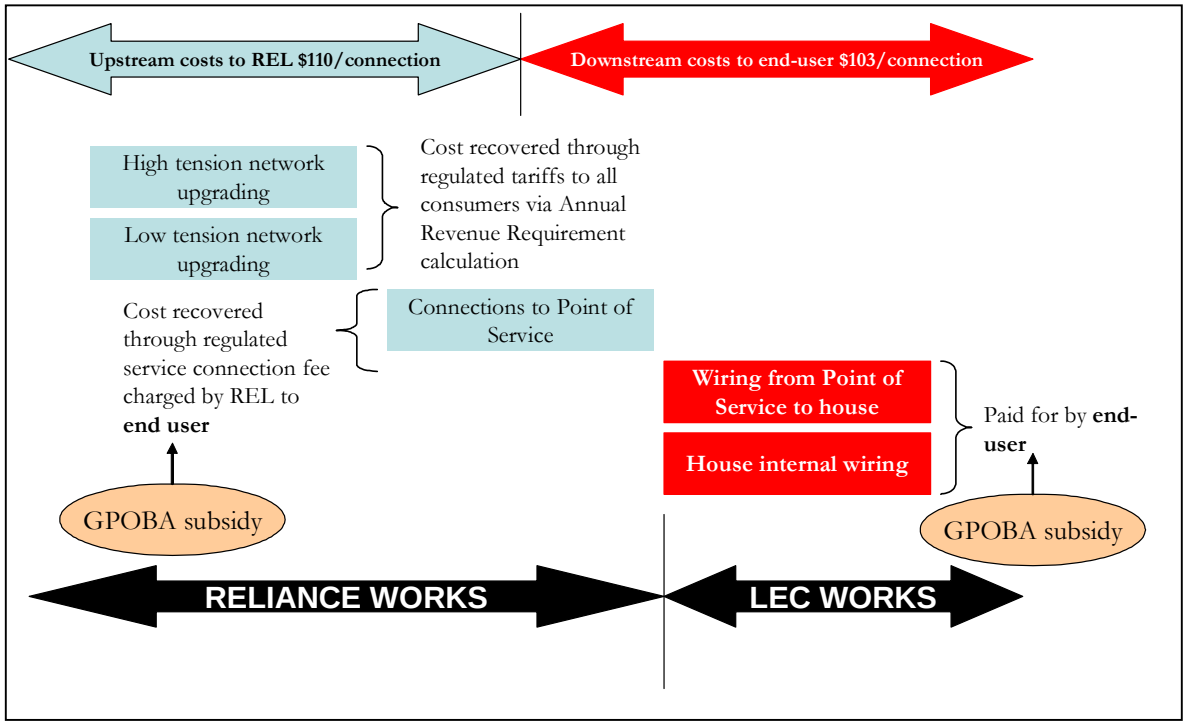
To test and evaluate various strategies to improve electricity access and normalize services in slum areas for large-scale implementation, REL is working with the United States Agency for International Development (USAID) program and the International Copper Association (ICA) on a program known as "Slum electrification and loss reduction (SELR) project". This intervention focuses on community based education about the importance of legal and safe electricity use. The proposed GPOBA connection project would form part of this program and would be the only element that would actually subsidize connections.

A.2. Rationale for GPOBA involvement

Rationale for the use of subsidies

There are considerable costs to providing legal new connections to slum dwellers. These consist of the following. For Reliance Energy they include upgrading the high tension network to increasing the capacity of transformers. Upgrading the low tension network to improve the capacity and interconnectivity of cabling, providing drop-lines from the substation to the meter, and providing metering and connection to the point of service. End users pay a regulated service connection charge which is meant to allow REL to recover its costs of providing individual connections. End-users then have to pay licensed electricity contractors (LECs) to carry out wiring between the point of service and the house, and for internal wiring. These costs are set out below.

Figure 1 Breakdown of works and sources of payment in carrying out new connections



REL currently recovers all costs

REL submits an annual revenue requirement petition to the regulator as part of the process by which the regulator determines the tariffs that it is allowed to charge. Via this process, REL recovers generation, transmission and distribution costs considered to be legitimate expenses by the regulator. This includes costs for generation that may be used by illegal connections. REL is paid for its costs and therefore has little incentive to invest in reducing illegal connections in slums.

Similarly, the costs of providing the individual connections to metered points of service are recovered via the regulated service connection charged to end-users.

When end-users apply for new connections, REL has to invest and thus incurs increased costs. These higher costs can be recovered via higher regulated tariffs in future years. Similarly, regulated service connection charges can be increased in future years. Thus, although REL faces some degree of regulatory risk in all its cost recovery it would likely carry out the investments if it received sufficient demand for new connections. The following sets out the considerable costs of carrying out 22,500 **new connections** in the two slums being considered for this project[10].

	Total cost	Cost per hh
	US $	US $
Net amount paid by Reliance[11]	2,475,000	110
Amount paid by end-user	2,317,500	103
Total cost	**4,792,500**	**213**

Sources: Reliance Energy, Independent assessor of costs hired by USAID, MERC documentation, Nexant & IIEC India.

The investment costs faced by REL would be recoverable through the regulatory process (via higher tariffs in future years)[12]. The end-user contribution would have to be paid by the slum dwellers.

REL incentives to pay end user component of costs

By providing new connections, the costs incurred by REL as described above would help to convert some illegal users of electricity to legal users. REL would thus reduce some of its commercial losses. It may be argued that REL therefore has an incentive to carry out this investment to reduce these commercial losses – and therefore has an incentive to pay towards the end user costs of new connections (if end users are not prepared to pay). *The question to be addressed is whether Reliance Energy would have a commercial incentive to fund part or all of the end-user connection costs –thus not justifying a subsidy.*

REL would have a commercial incentive if the cost of paying for the end-user connections is lower than the cumulative revenue gain due to this investment that it *would be allowed to keep by the regulator.* However, as with the case where REL's investment costs would be reimbursed via higher tariffs, any additional revenues collected by REL due to the reductions in commercial losses would not all accrue to REL. REL's allowed rate of return from its business is determined by the regulator. Thus if current illegal users of electricity are legalized it would likely result in marginally lower tariffs for current legal users of electricity. This would lead to a better allocation of costs across the consumer base but not to greater returns for REL. Any costs that REL currently faces due to commercial losses from these slums (i.e. stealing of electricity) are currently compensated for via higher tariffs for other Mumbai residents

[10] the remaining 5,000 connections are planned to be regularizations of existing sub-standard legal connections for which the cost structure would be similar.

[11] After payment of regulated connection charge by end-user to REL to cover part of REL's costs.

[12] There is always some uncertainty as to how the regulator would choose to treat the investment.

with legal connections[13]. The effect of reduced losses would be lower average overall tariffs. The conclusion is therefore that REL *does not* have a commercial incentive to pay part of the costs of the end-user for connections.

End-user willingness and ability to pay

In determining whether a subsidy is required, the next question is whether customers are willing and able to pay their portion of the costs of getting a legal connection. End users in the slums being considered have been reluctant to apply for legal connections due to the high up front payments required for receiving a connection. These include the costs of the regulated service connection charge, the cost of wiring to the house and the cost of internal wiring. In addition, end users would also have to pay a deposit to REL and repay any arrears from previous legal connections. The total upfront payment they face for getting a new legal connection thus typically consists of the following:

Description of cost item to hh end-user	**Payment required**	**Payment required**
	Rs.	**US $**
Deposit based on expected monthly bill	100-300	2.30-6.80
Payment to Reliance as service connection fee	1,500	34
End-user connection to house[14]	1,330	30
End-user internal wiring (based on min. spec.)	1,720	39
Arrears owed to Reliance	0 – 2,000	0-45
Total	**4,650 – 6,850**	**105-155**

Sources: Reliance Energy, Independent assessor of costs hired by USAID, MERC documentation

These upfront costs to the end user for receiving a connection are typically greater than the monthly household income of the slum residents. Surveys carried out for the preparation of this project by the Slum Rehabilitation Society found that 32% of residents earn up to Rs 2,500 ($56) per month and 54% earn between Rs. 2,501-5,000 ($56-$113). It is therefore unlikely that end-users can pay the full cost of connection. ***There is therefore a gap where a one-off subsidy would help deliver access to a safe and efficient essential service.***

Rationale for GPOBA

GPOBA has a mandate to fund pro-poor output-based subsidies for delivering basic services and targeting the poorest tier of the people. In doing so, it aims to scale up the use of performance as a basis for providing subsidies (where subsidies are justified). The proposed Output-Based Aid (OBA) pilot project would help fulfill this mandate:

- it will provide access to basic (but adequate quality) electricity connections;
- it will be targeted at the poor; and
- due to the proliferation of slums across Mumbai (and India) and the renewed emphasis on improving livelihoods, irrespective of land ownership – there are excellent prospects for replication and scale-up.

The GPOBA project would effectively form a financing window in a larger program led by USAID[15]. By incorporating the OBA component targeted at wiring from the meter point of service to the home

[13] This is because REL is allowed to recover all its costs.

[14] assumes that the average house is 15 metres from the point of service.

[15] Since October 2005, USAID, in cooperation with ICA, has run the Slum Electrification and Loss Reduction (SELR) program, a three-year holistic approach to improving the conditions of slum dwellers in Mumbai via the improvement of availability and use of electricity. The pilot program is part of a wider energy assistance package totaling $13.5 million. The principal program activities include designing and implementing a pilot project in cooperation with REL to provide improved legal electricity connections to slum dwellers that are currently without a connection or have illegal connections and to improve the safety and reliability of wiring for

and internal wiring, the project would set in place a demonstrated working example of how subsidies can be delivered to low income users in a sustainable manner for the provision of basic services. Potential for uptake across India is high.

In summary, this project meets the following GPOBA eligibility criteria:

- Explicit use (i.e. targeting) of subsidies (section B4);
- Subsidies are (solely) investment subsidies (section B3);
- Requirement that tariffs cover at least O&M expenditure (via the regulatory framework);
- Subsidy payments made after output delivery, and some retention of subsidy payable after a period of operation;
- Incentives for innovation and efficiency through a combination of private Licensed Electrical Contractors to undertake hh connections, a customer installment payment program to help pay for connection costs as well as MFIs who will offer credit options to slum dwellers for the cost of the internal wiring.
- Enhanced sustainability through a structure that provides accountability, allocates risk to the service provider and is a model for scaling-up for energy.

A.3. Higher level objectives to which the project contributes

The proposed project is consistent with the Bank Group CAS for India and the country's 10th Five Year Plan (2002-2007), which recognizes that provision of adequate infrastructure, including access to electricity, is critical to sustaining economic growth and support for private sector participation in infrastructure sector program. The Plan sets ambitious targets for 100% household electrification by 2012. Government of India (GOI) is proposing a demand driven, market based approach where communities, Non-Government Organizations (NGOs) and private entities deliver electricity service. The 2003 Electricity Act, which deregulates electricity supply, has been supporting these efforts as well. The proposed project will assist GOI in the implementation of the initiatives by providing subsidy, business development assistance and operational support to demonstrate sustainable and scaleable OBA models of electricity service delivery.

B. PROJECT DESCRIPTION

B.1 Project development objectives and key indicators

The objective of the proposed project is to demonstrate the use of an OBA approach to make a significant difference to the level of access to safe and adequate electricity supply in the Indian slum context. Successful demonstration will lead to substantial potential for scale-up in slum communities in Mumbai and across India. This scheme benefits from considerable upfront support from USAID via a community outreach and education program.

Key performance indicators will be:

Take-up of connections

- The extent of take-up of connections within this scheme.

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newly connected and existing slum users. A large portion of the USAID contribution covers community based education on the importance of using legal, safe electricity.

- The extent to which REL carries out sufficient and appropriate investment in upstream to fulfill the need to provide reliable electricity supply to the new connections over a sustained period of time.

The benefits of the investment

- Economic benefits – the extent to which consumers pay less for electricity with new legalized electricity.
- Improved safety - quantification where possible.
- Improved health - for a number of reasons (increased use of fans to reduce indoor air pollution by kerosene cooking, keeping out mosquitoes and reducing electricity accidents).

B.2. Project design

The proposed project subsidizes the cost of connections from the point of service to the house and for internal wiring. Two specific slum areas have been targeted: the East Division of Shivajinagar and the South Division of Golibar #3. Further parts of Shivajinagar with characteristics similar to those already surveyed have been identified as being part of the scheme.

The project uses an innovative design to tie in all the key stakeholders. All stakeholders have to demonstrate performance before being paid (except for the 10% upfront payment which would be made against a Bank guarantee.

1. Customers will contract directly with licensed electricity contractors (LECs) to carryout out connection work from the point of service (where REL's responsibility ends) to the house and for internal wiring.
2. The customer will be free to choose any LEC. The chosen LEC will supply a customer application to REL. The LECs will receive some payment from the customer.
3. The customer will be able, at this stage, to apply for a 6-month installment payment scheme from REL (subject to regulatory approval). It has been proposed that the financing cost of providing this installment scheme be met by GPOBA. Panel of expert input is sought.
4. The LEC will buy materials from suppliers who have negotiated lower rates (with REL and ICPCI) for LECs that are carrying out work as part of the scheme.
5. LECs will receive payment from REL (as set out by the GPOBA subsidy amounts). REL will pay out once the independent verification contractor has reported that the work has been carried out satisfactorily.
6. In order to supply reliable electricity to the new connections, REL has estimated that it will need to carry out substantial investment including upgrading the utility network (LT and DT) and substations; putting in new drop lines from the substation to the meter; and installing/upgrading meter panel and meters.
7. REL has to submit an independent verifiers report to GPOBA showing that the new connection is operational before being paid by GPOBA. Payment would be 50% of cost of connection at this stage. Further payments of 20% of the cost of connection will be made 6 months and 1 year after the connection upon submission of the independent verifiers report to GPOBA with verification that supply and billing has taken place for the connection during that period.

The project payments to REL will occur in stages once the following *outputs* have been verified:

- Working connections from REL point of service to the home using technical specifications that meet Indian government standards and internal wiring within the home using technical specifications that meet Indian government standards and which meets the basic needs of the customer – i.e. 4.5 points or enough to run basic services (i.e. two lights, one fan, one TV and

one spare plug). The additional costs of moving to 5.5 or more points are to be fully met by the end-users.

- Evidence of sustained delivery of electricity via the connection for 6 months and 1 year.

Aspects of the project design to note are:

- The customer will make the application and select his licensed electricity contractor (LEC). This helps to keep the project community driven and allows the community on an individual basis to determine which licensed electricity contractors provide the business.
- Substantial proportions of the payment are withheld until sustained reliable operation is verified. Good performance over time requires that REL carries out much needed capital investment. REL has to ensure that its investment is adequate as it will receive payments on the basis of verification that adequate ongoing service delivery is being provided.
- GPOBA would be subsidizing a portion of the costs to the end user for connection, wiring to the house and internal wiring. It would not be subsidizing REL.
- Due to the timing and action required for flow of funds to take place, the incentives for all stakeholders are aligned towards carrying out connections as early as possible.

B.3. Unit costing and subsidy level

For a new connection, the regulated costs payable to REL and the unit costs payable to licensed contractors have been found to be as follows:

	Rs.	**US $**
Payment to Reliance as service connection fee	1,500	34
End-user connection to house[16]	1,330	30
End-user internal wiring (based on min. spec.)	1,720	39
Total	4550	103

Sources: Reliance Energy, Independent assessor of costs hired by USAID, MERC documentation, Nexant & IIEC India.

The scheme proposes the following financing for end-users:

Element of new connection	Total costs	End-user	GPOBA	End-user	GPOBA	End-user	GPOBA
	US $	% contributions by each		US $		% overall contributions	
Payment to Reliance as service connection fee	**34**	75%	25%	**25**	9		
End-user connection to house[17]	**30**	20%	80%	**6**	24		
Subtotal	*64*			*31*	*33*		
End-user internal wiring (based on min. spec.)	**39**	40%	60%	**16**	23		
Total	**103**			**47**	**56**	46%	54%

16 Assumes that average distance from point of service to the house is 15 metres.

17 Assumes that average distance from point of service to the house is 15 metres.

Under this subsidy arrangement, GPOBA would pay **$9 per connection** (regulated service connection fee) and **$1.60 per metre** of distance between the point of service and the house. GPOBA would also pay **$23 for internal wiring**. On average, GPOBA would be paying out $56 per household.

- For the average household, the user contribution for **cost of connection** after the subsidy is (regulated REL charge and connection to house) would be **$31** or **Rs.1,391**. The average GPOBA subsidy would be $33 or Rs. 1,439.
- For the average household, the user contribution for the cost of **internal wiring** after the subsidy is **$16** or **Rs. 688**. The GPOBA subsidy would be $23 or Rs. 1,032.

Willingness to pay

A consumer survey was instituted during the period October – December 2006 commissioned by USAID for the purposes of this GPOBA project. The consumer survey captured responses from two slum pockets where the project will be implemented (Shivajinagar and Golibar). For this study, 1,027 households were randomly surveyed, 761 household from the Shivajinagar area and 266 households in Golibar. Their willingness to pay for connections and internal wiring is as follows:

	Rs.	US$	%
Willingness to pay for installation (i.e. total of Service connection fee and connection to house Costing $64	1,800	41	6.6%
	1,500	34	15.2%
	1,200	27	78.2%
	Rs.	US$	%
Willingness to pay for internal wiring (costing $39)	1,200	27	4.1%
	1,000	23	11.8%
	800	18	22%
	600	14	62%

Source: Slum Rehabilitation Society

The study shows that the total installation and wiring cost is likely to be at the higher end of what the consumers are likely to be willing to pay. However, take-up should be adequate.

B.4. Outputs and subsidy disbursement

Subsidy payment will be made by GPOBA to REL upon submission of quarterly reports by the independent verification contractor hired by REL (having received no objection from the World Bank) setting out how many outputs have been delivered:

1. whether the connection has been activated by REL;
   - the number of legal connections;
   - the length of these connections from the point of service to the house (to determine how much subsidy needs to be provided for the line from the point of service to the house);
   - number of 4.5 point internal wirings carried out during that period;
2. for connections carried out over 6 months ago, whether regular billing and payment has taken place; and

3. for connections carried out over 12 months ago, whether further regular billing and payment has taken place in the second 6 month period.

GPOBA will disburse agreed amounts based on these outputs.
Signing of grant agreement between GPOBA and REL – 10% of entire grant agreement i.e. $150,000 against a Bank guarantee payable to GPOBA setting out performance requirements by REL.
Subsequent to this initial payment, further payments will be based on performance and verified outputs and will be according to the following schedule:

- 50% of the cost of each connection (based on unit costs) upon receipt of independent verification that connection and/or internal wiring has been carried out and that connection has been made by REL and is operational;
- 20% of the cost of connection (based on unit costs) for internal wiring and/or connection after independent verification of 6 months of service delivery to appropriate quality levels; and
- 20% of the cost of connection (based on unit costs) for internal wiring and/or connection after independent verification of 12 months of service delivery to appropriate quality levels.

B.5. Eligibility criteria

To be eligible, dwelling units will have to be located in the following geographic regions. The project will be carried out in the Golibar and Shivaji Nagar slum clusters in Mumbai. The characteristics of initially identified clusters are provided in the table below:

Characteristics of Selected Slum Areas

Characteristics	Golibar	Shivaji Nagar
Location	South Division	East Division
Area	10,000 sq. meters	810,000 sq. Meters
Number of Households	2,600	19,000
Monthly Income	64% earns between Rs. 2,501- 5,000 ($55-$110)	41% earns between Rs. 2,501- 5,000 ($55-$110)
Household size (# per family)	4.38	4.34
Average cost people spend on internal wiring	Rs.931.20 ($20.49)	Rs.872.15 ($19.19)
Average regular electricity bills people pay	Most pay Rs. 301 ($6.62)	Most pay between Rs. 101-200 ($2.22-4.40).

B.6. Lessons learned and reflected in the project design

USAID have provided significant assistance and consulting support during the design of the scheme. USAID has substantial experience of working in the improvement of conditions in slums. Their views are reflected below and in the design of the project.

Key lessons learned and included in the project design:

- *Engage all stakeholders.* For this project, a project advisory committee has been set up comprising of local government, the regulator, the Mumbai transformation project, local CBOs, microfinance institutions and the National slum development federation.
- *Design program based on prevailing slum conditions.* The project includes community based education on the importance of safe and legal wiring. Applications to take part in the GPOBA financed scheme will come from the community and with licensed electricity suppliers that understand the prevailing conditions well.
- *Partner with intermediaries.* This project is partnered with a number of intermediary CBOs.
- *Make illegal service provision more difficult.* This scheme makes access to legal service easier.

C. ECONOMIC AND FINANCIAL APPRAISAL

C.1 Project financial appraisal

The project was appraised from a REL perspective in isolation from the rest of the network activities. As has been explained in section A.2., REL's returns will depend on an overall regulatory treatment of its costs and revenues. Assessing the individual financial IRR of the project to REL is therefore interesting, but not necessarily relevant to how it will act. The next regulatory assessment would re-open the regulatory agreement to ensure that REL does not over or under recover substantially. The regulatory framework does help to ensure that REL is not commercially disadvantaged by carrying out the investment to help provide the connections under this project.
Assumptions:

- The costs of the project were assumed to be the upfront capital costs of upstream network enhancement (paid for by REL) and service connection costs (portion above regulated level paid for by REL). Some O&M costs are already being incurred (in supplying illegal connections). Marginal increase in O&M costs due to enhanced supply has not been incorporated to remain consistent with assumption that the wider regulated tariff is based on current levels that incorporate the effects of stealing (and not lower levels – as would result if there was no stealing). Cost assumptions are based on 7,000 new connections – as accurate cost figures are available for this number of connections. It is understood that costs would increase roughly proportionately for increased numbers of connections.
- The benefits of the project consist of the revenue stream from 7,000 new customers paying their bills. We assume that half the new customers pay Rs.30/month ($0.68/month) and the other half pay Rs. 100/month ($2.26/month).
- We assume a borrowing rate of 10% over 10 years (as set out by the regulator, MERC). We assume a long-term inflation rate of 6%.

With these assumptions, the project was found to have a financial internal rate of return of 8% and a net present value of -$106,421 if REL pays the value of the "gap" that needs to be subsidized by GPOBA. If GPOBA provides the subsidy, then the **financial internal rate of return** increases to **16%** and the **net present value** up to c. **$250,000**[18].

C.2 Project economic appraisal

There are a number of benefits to the project which, although identified[19], have not been included in the economic assessment due to the difficulty in reliably quantifying these benefits[20]. For the purpose

[18] F-IRR was found to be very sensitive to the assumptions for monthly bills. For example, the F-IRR rises to 27% with REL paying the portion of the subsidy if half the customers pay Rs. 90/month ($2.04/month) and the other half pay Rs. 165/month ($3.73/month). As explained in section A.2., REL would not capture these higher returns due to the regulatory framework.
[19] Source: taken from "Benefit-cost assessment report: Slum electrification and loss reduction (SELR) program", IIT Bombay, January 2007.

of economic appraisal two factors have been used in quantifying the economic benefits - cost savings due to lower monthly bills and health benefits.
If it is assumed that approximately 30% of the slum dwellers receiving new connections currently pay substantially higher than the legal tariff and and 20% pay on or around the current tariff. The rest pay nothing. The economic rate of return of the project is found to rise from the F-IRR of **16% to 18%**. NPV rises to c. $335,000. This assumes that half those that pay substantially higher pay Rs. 150/month ($3.39/month) and the other half pay Rs. 225/month ($5.09/month).

When health benefits are added in the project calculations[21] (conservatively assuming that approx. 25% of households experience an appreciable improvement in quantity and quality of electricity), the general economic rate of return of the project rises from 18% to 24%. NPV rises c. $630,000. This disregards the estimated savings made by the public sector on reduced demand for public hospitals[22].

D. DETAILED IMPLEMENTATION ARRANGEMENTS

D.1. Institutional and implementation arrangements

GPOBA will enter into a Grant Agreement (GA) with REL, the main implementing agency. USAID and ICPCI have an important role to play in the project as they will be organizing the community outreach and education programs that lead to efficient and safe use of electricity. These parties will enter into an MOU with REL and be included in the GA. Participating CBOs and NGOs will be coordinated by USAID and will serve as the primary interface between the slum dwellers and the key project implementing partners. As part of the USAID engagements, MFIs may offer wider credit options to slum dwellers for end user portions of the project. USAID, under its obligations of the MOU with REL, will enter into the necessary agreements to ensure that the project objectives are met.

REL will assume the responsibility to install the wiring and meters for the legal connection up to the point of service where its legal responsibility ends. Installing the wiring from point of service to the house and the internal wiring will be undertaken by certified contractors who will be hired by end-users. The following detailed institutional and contractual relationships are envisaged for this project[23]:

1. Preparation activities:

- REL will undertake all investments required to connect electricity to the slum areas, including upgrades to the distribution system and installation of meter panels and household meters.

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[20] Some of the benefits identified by the International Institute for Energy Conservation/Indian Institute of Technology, Bombay using the results of a survey of 1,027 households in the two slums carried out by the Slum Rehabilitation Society include reduced cost of electricity, continuous supply, improved quality of service and service reliability, reduced risk of fire hazard and accidents, improvement in quality of life, facilitating small scale income generation activities and better environment to pursue activities like studies. Further details are contained in Annex 3.

21 IIT Bombay found (based on discussions with survey respondents and medical practitioners in Mumbai) that discontinuous supply of electricity reduces the household's ability to ward off disease, especially malaria. IIT Bombay estimates that each household with an improved supply of electricity saves Rs. 300/year on the cost of treatment for malaria and Rs. 400/year on the cost of inactivity due to poor health.

[22] Including savings made by public sector, E-IRR rises to 27% and NPV to c. $778,000.

[23] These steps were jointly discussed and agreed by all the key stakeholders to the program as the most workable way of ensuring that the OBA scheme is sustainable.

- CBOs/NGOs, together with REL, will conduct outreach sessions in the communities to inform slum dwellers about the project and its components. Slum dwellers will be encouraged to participate and will be educated about the benefits of legalized electricity connections and upgraded wiring schemes.
- ICPCI will inform the association of Licensed Electrical Contractor Association about the program to inform their members about the program requirements and benefits. REL will support this process.
- REL and ICPCI negotiate with equipment suppliers to agree on bulk rates to be used by LECs

2. End-user application process and pre-financing:

- LECs will go out in the (targeted) field and inform the prospective consumers about the program, and recruit potential participants/customers. The CBOs can also provide lists of LECs to interested slum dwellers.
- Once prospective customers have been identified, LECs will work with them to prepare application forms, compile the pre-specified documentation and collect any down payment requirements.
- LECs, together with their customers, would then submit the application and payment to REL for approval. REL would simply ensure that the customers are within the project area and have no other arrears to REL. REL would then issue a receipt of the application which constitutes REL's consent for the LEC to proceed with the wiring.
- Customer installment payment program: In order to facilitate the uptake of legalization program, REL, upon receiving concurrence from MERC, shall offer a mechanism to consumers whereby the connection costs (including utility fees and wiring) would be allowed to be paid in monthly installments recovered through the utility bill over a six month period. This process would work in the following manner.
    - REL will create a separate account for accepting monthly installments under its master billing system
    - Customers would apply for the scheme via the application form that they fill in and which is submitted to REL by the LEC.
    - REL will issue formats to the consumers at the time of giving new connections
    - Consumers will sign the formats and undertake to pay the monthly installments as stipulated by REL in the formats
    - REL pays the upfront costs from the specific account to its capital expenditure account towards the upfront costs
    - Consumers pay the agreed number of installments (specific # of months)
    - Once the installments are paid, REL removes the additional charge from the monthly bills to the consumers

3. Connection activity

- Prior to hh installation work commencing, LECs would submit to the IVC the REL receipt to inform that work will be undertaken in that hh. Within 24 hours, LECs would begin the wiring from the meter box to the household and internal wiring. LECs would be given the option to purchase hardware from selected equipment suppliers for which the project (REL & IPCPI)has pre-negotiated bulk rates. LEC payments would be based on the household needs but be fixed per unit (point of service to house costs would be per metre, internal wiring would be per point).

4. Payment process

- Upon LEC completing an individual connection, LEC's would submit the "Work completion and test report" and the "invoice" to IVC for inspection. The IVC would then have up to 3 days to review the wiring, ensure costs are consistent with fixed rates, certify that the work meets pre-defined specifications and then submit the "Work completion and test report" and the "invoice" to REL.

- REL would proceed to pay the LECs within a period of two weeks on receipt of the IVC report. In case of delayed payments, REL will pay an additional interest of 0.25% per day to LECs.

5. REL connection activity

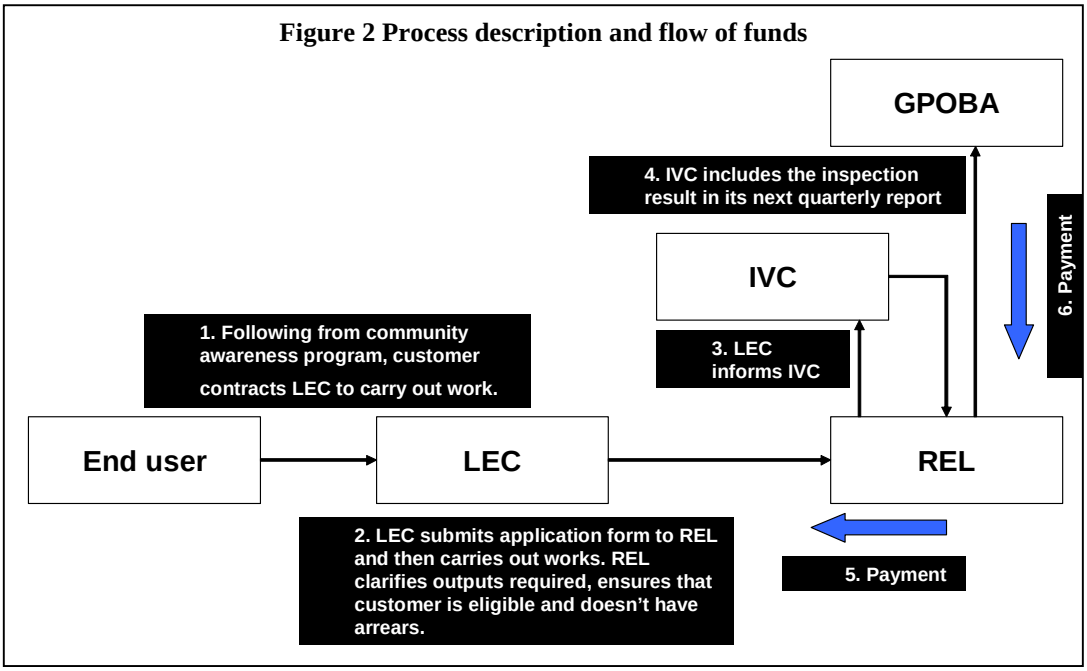
- Upon LEC completing an individual connection which has been certified by the IVC, REL proceeds to install the meter and complete the connections (within one week); REL and the CBOs also have the option to double check the wiring to ensure no collusion between EC and IVC.

6. GPOBA payments

- GPOBA will make an upfront payment of 10% on signing the grant agreement. This payment would be against a Bank guarantee.
- IVCs would independently verify the status of connections made by REL. This report would then be submitted by REL to GPOBA to trigger payments to REL.
- IVC would verify: (a) the quality of service after 6 months according to MERC service standards (see Annex) and submit a report to trigger GPOBA payment to REL; and (b) the quality of service after a 12 month period and submit a report for GPOBA payment to REL.

This process is summarized below:

Figure 2 Process description and flow of funds



D2. Institutions and responsibilities

Reliance Energy Limited (REL): REL would have primary responsibility for implementing the project. Working together with the community-based groups, REL would identify illegal connections and take actions to convert them to legal ones. REL would also prepare and implement an upgrade of their distribution network to support the new connections and ensure improved, reliable service.

United States Agency for International Development (USAID): USAID would have primary responsibility for overall project coordination as well as implementation of the demand-side and socio-economic aspects to the project. This would include preparation of the project, mobilizing community-based groups to facilitate legalization of connections and reduction in theft, promotion of end-use energy efficiency measures, development and implementation of productive use efforts (e.g., micro-

enterprise development, microfinance), outreach and training and discussions with key partners and government officials on policy implications for project implementation and future scale-up and replication. Details of USAID's responsibilities would be set out in an MOU with REL as part of the grant agreement.

International Copper Promotion Council (India): ICPCI would assume lead responsibility for technical issues surrounding the wiring upgrades. This would include development of technical specifications for wiring upgrade packages, technical support to assessing installation contractor qualifications and wiring schemes, training to contractors on safe wiring practices, and training to participating CBOs/NGOs on safe wiring. Details of ICPCI's responsibilities would be set out in an MOU with REL as part of the grant agreement.

Slum Dwellers: Dwelling units (DUs) represent the physical infrastructure of which slum dwellers are inhabitants. The slum dwellers would assume responsibility for agreeing to apply for legal connections and ensuring timely payment of utility bills in order to participate in the project. They would also provide reasonable cost share for the new connections and wiring upgrades.

Licensed electrical contractors (LECs): LECs are the registered and certified electrical contractors in India responsible for installing wiring from the utility electrical meters to the DUs and internal household wiring. Under the project, the LECs would work with REL and the CBOs to identify DUs requiring wiring upgrades and implementing these upgrades. LECs would be paid upon verified connections and upgrades by the independent verification contractor. LECs will be selected through a competitive bidding process.

Independent Verification Contractors (IVC): Independent Verification Contractors (IVCs) are the entities selected by REL (with the no objection of GPOBA) – based on a competitive selection process - to verify that proper connections have been made by REL and wiring upgrades by the selected LECs. The IVCs would be responsible for reporting these verified connections and upgrades to the appointed financial intermediary of the GPOBA grant in order to trigger payments to REL and the LECs. IVCs would also verify levels of service provided by REL after six months and one year in order to allow the final portion of the payments to REL to be made.

CBOs/NGOs: would be mobilized and appointed by USAID, in close consultation with REL, to work with the selected communities and slum dwellers to encourage those with illegal electricity connections to apply for legal services. These groups would also identify concerns raised by slum dwellers regarding legalized connections and service levels for discussion with REL in order to facilitate dialogue and negotiate acceptable solutions for all parties. These organizations will also convene periodic community meetings to allow external groups (such as REL, ICPCI, MFIs, etc.) to offer information and training to the slum dwellers on topics such as the importance of legal connections, wire safety, financial literacy training, energy efficiency and conservation, etc. The CBOs/NGOs would also facilitate parallel microenterprise development, lighting programs and other initiatives and help seek resolution to issues that arise during implementation.

D.3. Milestones for project implementation

The estimated project duration will be about 32 months from the time when GPOBA funds are available. Given the monsoon season, which makes such work very difficult, it is expected that about 5,000 households to be connected between April and June 2007 and the remaining by December 2008, with 12 months of follow-on verification of service. The table below summarizes the milestones and expected date for project completion/implementation.

Milestone	Expected completion
Approval by MERC on Customer installment payment program	March/April 2007
Signing GPOBA Grant Agreement	March/April 2007

Initiate project implementation	April 2007
Commencement of hiring of LECs	May 2007
REL connections of ~5,000	July 2007
Monitor project performance and outputs	Quarterly
OBA subsidy disbursement begins	May 2007
OBA subsidy disbursement ends	December 2009

D.4. Monitoring and evaluation of outcomes/results

SHORT TERM OR CONCURRENT OUTCOMES/RESULTS			
	Outcome/Result area	**Description of the Outcome Area**	**Proposed Means of Verification**
1	Registration of households	Represented as paid connection fees	Minimum -- hhs registered for paid usage of electricity.
2	Number of slum hhs accessed to safe electricity service	Prime objectives of GPOBA support is to provide 20,000 slum hhs for safe and reliable electricity service. Above this figure, the project may reach additional no. of hhs who are either slum or non-slum dwellers.	Registered number of slum hhs.
3	Number of illegal use of electricity	Most hhs with illegal conncections have shared meters; thus, higher the number of individual meters (or lower the number of shared meters), lower the illegal connection rate.	Comparison of the shared/individual meter numbers before and after the pilot project implementation.
4	Reduction in the number of electricity related accidents.		
LONG TERM OUTCOMES/RESULTS FOR MID-TERM OR END PROJECT EVALUATION			
5	Increase in better service qulaity and reliability		Report of community survey
6	Reduction in the expenditure on medical and health grounds		Report of community survey
7	Improved quality of life		Report of community survey

D.5. Sustainability

The involvement of GPOBA and USAID will assist REL in leveraging the achievements, know-how, and lessons learned from this pilot project for scale-up and replication elsewhere. It will also assist CBOs and NGOs to participate in designing the complimentary programs and work closely with REL. Furthermore, it will provide assistance for developing scale-up strategies and programs, including communication plans, case studies, training modules, and workshops to disseminate results and foster

policy dialogues for government officials. Therefore, this project will ultimately enhances the capacities of all stakeholders to ensure project sustainability. Sustainability will be further achieved through reinforcement of the benefits of legal connections and safe and quality wiring.

TECHNICAL ANNEXES

ANNEX 1. UNIT COST CALCULATIONS

All cost information was received from Reliance and was then independently audited in detail by an independently hired (by USAID) assessor of costs. The costs were also assessed by the International Copper Promotion Council (India).

REL network investment

The existing electricity network in the slum areas is inadequate due to the large number and unplanned growth of the unauthorized connections. The result of this is poor quality of service to all customers including the legal customers. REL is using this opportunity to develop a comprehensive plan that would upgrade the entire network to provide high quality service to all customers.

The costs of such upgrading include;

1. Revamping/re-conductoring the existing network at high-voltage from a 33 KV to 11 KV sub-station (HT Network upgrading)

2. Upgrade of the 11 KV subs-station transformers and upgrades to the existing distribution transformers, installation of new poles to mount the distribution transformers, and installation of digital meters at the transformers (LT network upgrading)

3. Installation of new meters and meter cabins for customers

All of these will help reduce network losses (both technical and commercial). The costs to be incurred by REL to enable 7,000 new connections are summarized in the following table.

Cost breakdown of Reliance investment – fully audited by independent consultant *Sources: Reliance Energy, Independent assessor of costs hired by USAID, MERC documentation, Nexant & IIEC India.*

New connections	Services	LT Net	DT Net	*Total*
Golibar (Rs.)	1,530,000	1,560,000	400,000	3,490,000
Shivaginagar (Rs)	28,200,000	9,710,000	3,180,000	41,090,000
Total (Rs.)	29,730,000	11,270,000	3,580,000	44,580,000
Costs per household (Rs.)	4,247	1,610	511	6,369
Costs per household ($)	**96.09**	**36.43**	**11.57**	**144.09**

Regularization	Services	LT Net	DT Net	*Total*
Golibar (Rs.)	2,670,000	720,000	400,000	3,790,000
Shivaginagar (Rs)	25,870,000	22,110,000	3,180,000	51,160,000
Total (Rs.)	28,540,000	22,830,000	3,580,000	54,950,000
Costs per household (Rs.)	4,077	3,261	511	7,850
Costs per household ($)	**92.24**	**73.79**	**11.57**	**177.60**

Wiring Installation

Current electricity use peaks between 6 pm to 9 pm (23%), followed during the duration 9 pm to 12 midnight (17%), and followed by during 6 to 9 am (16%). Current connected load in the two slum clusters will be revamped to the specs developed by ICPCI. Based on the survey results, three types of wiring configurations have been finalized. Proposed standards are higher than the current industry practice.

- Base-case - Case no.1 - 1-tubelight+1-Bulb/tubelight +1-fan+1-TV+1-spare plug
- Case no.2 - 1-tubelight+1-Bulb/tubelight +1-fan+1-TV+1-Fridge+1-spare plug
- Case no.3-1-tubelight+1-Bulb/tubelight +2-fans+1-TV+1-Fridge+1-Mixer/Iron+1-spare plug

General specifications for carrying out the wiring work shall comply to the following:

- Work shall be carried out by Licensed Electrical Contractor strictly in adherence to the I.E.Rule, Electricity Act 2003.
- Material used for electrical installation shall be as per I.S. Specifications.
- Material used for electrical installation should not be defective or of second sale.
- Earthing shall be carried out as per Electricity Act 2003.
- Sample I. S. specifications for reference
  - I.S.694 ;1990,1994 - PVC insulated cables for voltage up to 1100 V
  - I.S….. :1992 - Bare Copper wire for earthing
  - I.S. 1554:1988 - Multicore PVC insulated heavy-duty electric cable up to 1100 V
  - I.S. 3854:1993 - Switches, DP
  - I.S.2448: 1995- Insulated adhesive tape
  - I.S.2675:1983,1991- Enclosed distribution fuse board cutout up to 1000 V
  - I.S.1293: 1999 - Kit kat 5A, 15A switches (also called as 'piano'type switches).

A summary of the costs for internal and external wiring is shown on the following page.

Wiring Costs - Case 1: 4&1/2 Points							
Sr.No	**Description Of Material**	**Unit**	**Rate (Rs/unit)**	**Case No 1: 4&1/2 pt**			
				Internal Wiring	**Amount (Rs)**	**External Wiring**	**Amount (Rs)**
1	PVC board 200mm*150mm	No	80	1	80	0	0
2	PVC board 150mm*100mm	No	57	1	57	0	0
3	PVC board 100mm*100mm	No	37	0	0	0	0
4	Double pole main switch 32 A	No	60	1	60	1	60
5	Kit-Kat switch 5 A	No	16	3	48	0	0
6	Kit kat switch with Sockets 5 A	No	22	1	22	0	0
7	Kit-Kat switch with plug socket 15 A	No	70	1	70	0	0
8	Ceilings rose for fan	Kg	18	1	18	0	0
9	Holder 5 A	Mtr	20	2	40	0	0
10	PVC pipe 15mm	No	17	16	272	0	0
11	PVC pipe 20mm	No	19	0	0	0	0
12	Saddles for PVC pipe 15mm	No	0.5	32	16	30	15
13	saddles for PVC pipe 20mm	Mtr	0.6	0	0	0	0
14	Screw 20mm	Mtr	0.5	84	42	70	35
15	Copper wire 2.5sq.mm	Mtr	300	0.3	90	0	0
16	1.5mm square (3/22 gauge) PVC coppe	No	14	40	560	0	0
17	2.5mm square (3/20 gauge) PVC coppe	No	22	0	0	0	0
18	4mm square (7/20 gauge) PVC copper	No	34	0	0	0	0
19	2/c 2.5mm square Armoured PVC cable	Mtr	70	0	0	10	700
20	2/c 4 mm square Armoured PVC cable	Mtr	90	0	0	0	0
	Subtotal: Material				1375		810
	Labour	lo Of Point	50	4.5	225	0	0
	Cable pulling Charge	Mtr	5	0	0	15	75
	Indirect , Testing & incidental charges	%	7.50%	0	120		66
	Total internal/external wiring				1720		951
	Grand Total: Case 1						**2671**

Sources: Reliance Energy, Independent assessor of costs hired by USAID, MERC documentation, Nexant & IIEC India.

Note: the cost numbers for external wiring relate to 10 meter length of wiring between the point of service and house.

ANNEX 2. PROJECT SELECTION CRITERIA

The project will be carried out in two phases, - Phase 1 will cover the Golibar and Shivajinagar slum clusters and Phase 2 will cover new sites, which will be identified by REL in consultation with USAID and GPOBA. The characteristics of these clusters are provided in Tables 3.1 and 3.2.

Table 3.1 - Characteristics of Selected Slums

Characteristics	Golibar #3	Shivajinagar
Location	South Division	East Division
Area	10,000 sq. meters	810,000 sq. meters
No. of Dwellings	2,900	21,387

Note: REL to develop similar information for the third site in consultation with USAID and GPOBA

REL has been implementing loss reduction programs in different pockets of its service area. Two sites proposed under this effort have been selected with the following criteria:

- Both the slum pockets may not be taken up in the Slum Rehabilitation Program of Government of Maharashtra; resulting in status-quo of the utility distribution for at least the next 10 years
- Target areas are considered to be among the poorer slums in Mumbai
- Sub-distribution system report higher losses (more than 30%) of combined technical and commercial losses
- Investments made by REL in LT system upgrades can benefit from legalization program proposed under the USAID/GPOBA initiative

Table 3.2 – Socio-economic profile of the two slum pockets

Characteristics	Golibar #3	Shivajinagar
Household size (# per family)	4.38	4.34
Age profile	Below 10 yrs: 16.5% 11-20 yrs: 29.8% 21-30 yrs: 20.7% 31-50 yrs: 27.6% 51 and above: 5.5%	Below 10 yrs: 18.5% 11-20 yrs: 28.3% 21-30 yrs: 20.4% 31-50 yrs: 27.2% 51 and above: 5.6%
Education distribution	Till primary: 47% Till secondary: 34.3% SSC completed: 12.4% HSC completed: 3.8% Bachelor degree: 1.9% Masters: 0.1% Drop-outs: 0.5%	Till primary: 51.1% Till secondary: 32.5% SSC completed: 10.8% HSC completed: 4.2% Bachelor degree: 1.1% Diploma: 0.1 Drop-outs: 0.1%
Type of employment	None: 66.4% Govt. service: 1.2% Pvt. Service: 16.7% Self employment: 9.2% Casual labor: 0.4% Retired: 0.2% Family enterprise: 4.1% Others: 1.7%	None: 71.5% Govt. service: 0.5% Pvt. Service: 17.5% Self employment: 7.4% Casual labor: 0.5% Retired: 0.3% Family enterprise: 2.0% Others: 0.3%
Monthly income	0 – 3000: 38.3% 3001-6000: 52.6% 6001-9000: 7.5% 9001-12000: 1.5%	0 – 3000: 60.2% 3001-6000: 31.5% 6001-9000: 5.8% 9001-12000: 2.0% 12000 and above: 0.5%
Consumer durable index (socio-economic status)	0-100: 43.2% 101-300: 55.6% 300-above: 1.2%	0-100: 46.9% 101-300: 50.2% 300-above: 2.9%

Source: IIEC, SRS.

Procedure for contacting the slum dwellers

Under the project, two types of slum DUs would be eligible for support under the GPOBA grant:

- Those who require a new connection as they do not have a legal connection; and
- those who have legal connections, but have substandard wiring and thus require a new connection.

Both types of DUs would be identified by the CBOs/NGOs in close coordination with REL.

It is estimated that approximately 27,500 new connections will be taken up of which approx. 5,000 will have previously had legal but substandard connections (regularizations).

While REL has not formally selected all the target areas, the SELR program will be expanded to the rest of the Shivajinagar slum (beyond the existing Baiganwadi section) to pick up additional customers with similar characteristics as those surveyed by SRS (so no additional surveys may be needed).

ANNEX 3. ECONOMIC BENEFITS OF NEW CONNECTIONS

IIT Bombay identified the following benefits of the scheme. They were unable to credibly quantify all these benefits.

Stakeholders	Benefits	Direct / Indirect	Quantitative/ Qualitative
Overall	1. Reduced losses	Direct	Quantitative
	2. Reduced number of faults		Quantitative
	3. Improved safety		Qualitative
	4. Improved system operation		Qualitative
Users	1. Reduced cost of electricity	Direct	Quantitative
	2. Continuous supply		Quantitative
	3. Improved quality of service		Qualitative
	4. Improved service reliability		Qualitative
	5. Greater use of electricity		Quantitative
	1. Reduced risk of fire hazard	Indirect	Quantitative
	2. Reduced risk of accidents		Quantitative
	3. Improvement in quality of life		Qualitative
	4. Facilitating small scale income generation activities		Quantitative
	5. Potential health benefits		Quantitative
	6. Safer and hygienic home environment		Qualitative
	7. Better environment to pursue activities like studies, etc.		Qualitative
	8. Access to means of entertainment		Qualitative
Gender roles	1. Gender benefits in terms of facilitation of home industries	Indirect	Quantitative
	2. Women gaining better environment to do household chores		Qualitative
	3. Reduced dependence on unclean fuel for cooking (using electric stoves, etc.)		Quantitative
Society	1. Improved quality of life for the poor	Indirect	Qualitative
	2. Improved electricity access to the poor		Qualitative
	3. Reduced risk to life due to fire or accidents		Quantitative

A detailed survey of 1,027 households followed by more targeted discussions with 100 households found that households in general perceive benefits of the new legal and safe electricity connection for

the safety, health benefits, ease and the income generation opportunities that this connection can provide them with. Specifically,

- 32% have reported open wiring as one of the main problems followed by fluctuation, interruption and other problems like hanging wiring.
- households do identify benefits in terms of reduced health hazards, reduced use of unclean fuel, help with domestic activities and overall improvement in the quality of life.
- almost all the households have complained of mosquito bites and more than 55% of households have complained of malarial fever. Continuous electricity supply would give definite health benefits to these households by facilitating more use of fans and mosquito repellents on a regular basis.
- for the female members, there are definite perceived benefits in terms of ease in handling domestic chores, use of gadgets in households and engaging in traditional or modern income generation opportunities with the new connection made available in the two areas under this program.

ANNEX 4. PROJECT DISBURSEMENTS SCHEDULE

Disbursements are projected to take place in with the following schedule.

Date	New connections	Regularizations	Approx disbursement amount ($)
April 2007	**0**	**0**	**150,000**
June 2007	**5,000**	**0**	**290,000**
December 2008	**22,500**	**5,000**	**897,000**
June 2009	**22,500**	**5,000**	**1,196,000**
December 2009	**22,500**	**5,000**	**1,495,000**

ANNEX 5. FINANCIAL MANAGEMENT (OP/BP 10.02) AND DISBURSEMENT (OP/BP 12.00)

(This annex is a summary to the FM report provided by the WB FM specialist - TO BE FINALIZED)

Administrative Arrangements

Licensed electricity contractors together with their customers would submit the scheme application and payment to REL for work involving connection to the dwelling unit (DU) and/or internal wiring. REL would verify that the application is for work within the project area and that the customer has no arrears. Once the connection and wiring work has been verified by an independent verifier as having been carried out to sufficient standard, REL would then make payment to contractors. Payment would be made based on the previously agreed unit costs.

REL will make quarterly projections of the number of DUs carrying out wiring and inform GPOBA. Upon receipt of verification, GPOBA will make payments to REL.

Upon execution of the grant agreement with GPOBA, 10% of the total OBA award will be made. This will be provided to REL against a Bank Guarantee and the guarantee's beneficiary with be GPOBA / WB, with the costs being borne by the recipient. Since this payment is not performance based, the guarantee will specify the conditions under which it would be called i.e. that REL has not undertaken any regularized or new connections within a period not to exceed [90] days from contract effectiveness.

Subsequent to this initial payment, further payments will by based on performance and verified outputs and will be according to the following schedule:

- 50% of the cost of each connection (based on unit costs) upon receipt of independent verification that connection and/or internal wiring has been carried out and that connection has been made by REL and is operational;
- 20% of the cost of connection (based on unit costs) for internal wiring and/or connection after independent verification of 6 months of service delivery to appropriate quality levels; and
- 20% of the cost of connection (based on unit costs) for internal wiring and/or connection after independent verification of 12 months of service delivery to appropriate quality levels.
- Service delivery verification will constitute checking of billing information to ensure that customers are receiving service and making payments and checking with CBOs that service is appropriate.

-

REL will provide GPOBA on a quarterly basis with a schedule detailing the following:

- number of connections and/or internal wiring planned for the next quarter;
- number of connections actually made and independently verified during the preceding quarter (connections and/or internal wiring);
- number of connections and/or internal wiring for which 6 months of independently verified delivery has taken place; and
- number of connections and/or internal wiring for which 12 months of independently verified delivery has taken place.

-

Payments will be made by GPOBA based on number of connections and/or internal wiring on the unit cost basis – regardless of total number of connections and wiring made.

Financial Management and Disbursement arrangement

REL will maintain a separate foreign currency account in a commercial bank to receive OBA funds. This account will be designated as the Special Account (SA).

The Bank account will be opened in ICICI Bank which India's second-largest bank with total assets of about Rs. 2,513.89 bn. (US$ 56.3 bn.) at March 31, 2006 and profit after tax of Rs. 25.40 bn (US$ 569 mn) for the year ended March 31, 2006. ICICI Bank is listed on the Bombay Stock Exchange, the National Stock Exchange of India Limited and its American Depositary Receipts (ADRs) are listed on the New York Stock Exchange (NYSE). The Bank has a strong and committed Code of Business Conduct and Ethics for its Directors and employees. In June 2006, ICICI Bank, with free float market capitalization[24] of about Rs. 480.00 billion (US$ 10.8 billion) ranked third amongst all the companies listed on the Indian stock exchanges. It is important to mention that ICICI Bank is subject to the strong regulatory framework that is in place in India for all Banking Companies which implies that they have to comply with the relevant regulation of the RBI Act, Banking Regulation Act, Companies Act and Foreign Exchange Management Act.

It is the intent that REL will use the SA advance to make initial payments to the subcontractors. Thereafter, the SA will receive GPOBA funds according to the disbursement schedule to be submitted by REL every quarter.

All GPOBA disbursements on this project, except the initial SA advance will be on a per unit cost basis and predicated on the certified technical statements of agreed outputs. The initial SA advance, though not initially based on output, will be linked to subsequent performance targets (as set out in the Bank guarantee).

Financial Reporting

REL will maintain accounts related to the project. The project accounts will comprise details of the payments made to subcontractors on account of new connections and rewiring as per unit costs. These will be certified by the Technical Auditors as well by Financial Auditors. Interim un-audited financial statements will be submitted to the Bank on a six monthly basis. The purpose of these statements will be to provide an update to the task Team of the progress on the Grant.

Audit

The project envisages the audits specified in the Table below. Pricewaterhouse Coopers (PWC), the Statutory auditors of REL will be the auditors for both of the above purposes as well.

Audit Terms of reference will be agreed with REL before Grant effectiveness. For the SA, the auditors will verify that the Bank account is used for the purposes intended, ie. that of making project related payments to subcontractors. For project accounts, the auditors will verify that the payments as per the defined unit costs have been made to the subcontractors for the outputs certified by technical audit. It may be noted that audit of project accounts will be conducted as a good practice to encourage accountability and to inform the design and standard costs of future OBA projects, but the audited accounts will not be used as a basis for disbursements.

[24] Free float holding excludes all promoter holdings, strategic investments and cross holdings among public sector entities.

The audit reports will be:

Agency	**Audit Report**	**Audited by**
Subcontrators' claims	Project	Technical and Financial Auditors. Financial Auditors will be PWC. Technical auditors will be appointed by the Task Team.
ICICI Bank	Special Account	Pricewaterhouse Coopers

Risk Rating:

This grant is considered a low risk operation because of the small size of grant funds, the strong administering arrangements with REL and the due diligence done by the Task Team in independently establishing the standard costs of outputs under the project.

Conclusion:

Overall it may be concluded that the design of the project and due diligence done by the Task team to independently establish the standard cost of wiring for new connections and rewiring is adequate to support output based payments on the grant.

ANNEX 6. PROCUREMENT (OM, JULY 15, 2002)

A. General

Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, and the provisions stipulated in the Grant Agreement. The general description of various contracts under different expenditure categories is below.

B. Assessment of Implementing Agency's Capacity to Implement Procurement

[To be completed by WB procurement specialist]

C. Procurement Plan

The procurement plan and consultant selection methods, estimated costs, prior review requirements and timeframe have been discussed and agreed between REL and GPOBA. Should changes to the procurement plan be required during project implementation, REL will be required to submit an updated plan to the World Bank for approval. A summary of procurements to be undertaken in the project can be found in the table below.

Contract Description	Estimated Contract Amount	Method	Prior Review?	Estimated Contract Signing Date
Independent Verification Contractor	$70,000	Commercial Practice	Yes	April 15, 2007

D. Description of Consultant Services

Consulting services under the project will include services to be proved by firms and individual consultants. The independent verification contractor (IVC) would assume primary responsibility for verifying that the agreed outputs have been delivered. This would include verifying that the wiring has been installed per required specifications, ensuring that the connection is operational and assessing whether REL has provided acceptable service levels six months after the connection has been made. Reports would be submitted to the Fiduciary Agent, which would then trigger payments to REL. Commercial practices would be used to select the contractor, whereby the Fiduciary Agent would obtain at least three quotes and select the best combined technical and financial proposal.

E. Prior Review

The draft request for proposal (including the letter of invitation, scope of work, short list, evaluation criteria and draft contract), evaluation report and draft negotiated contract for both consulting service contracts would be subject to prior World Bank review and 'no objection'.

ANNEX 7. SAFEGUARD POLICIES TRIGGERED BY THE PROJECT

Safeguard Policies Triggered	Yes	No	TBD
Environmental Assessment (OP/BP 4.01)	X		
Natural Habitats (OP/BP 4.04)		X	
Forests (OP/BP 4.36)		X	
Pest Management (OP 4.09)		X	
Cultural Property (OPN 11.03)		X	
Indigenous Peoples (OP/BP 4.10)		X	
Involuntary Resettlement (OP/BP 4.12)		X	
Safety of Dams (OP/BP 4.37)		X	
Projects on International Waterways (OP/BP 7.50)		X	
Projects in Disputed Areas (OP/BP 7.60)		X	

ANNEX 8. ENVIRONMENT (OP/BP 4.01).

A World Bank mission visited Mumbai to have discussions with client counterpart with an objective to assess key environmental risks associated with the operations under Improved Electricity Access for Slum Dwellers in Mumbai. The project activities are expected to be located in the peri-urban areas of the city of Mumbai. It is also understood that the USAID will be taking responsibility of assessment of the target areas for the project including consultation with the local authority, beneficiary communities and the private concessionaire Reliance. The project aims to work to mobilize the communities and moderate negotiations between the slum dwellers and utilities for improved access to electricity through legal connection. The World Bank administered OBA subsidies will help address the steep cost barriers. Although the size of the project; scale of the Bank involvement and the inherent nature of distribution line laying indicate moderate level of anticipated environmental impacts. However, given the geographical and physical conditions of the slum areas and community context, including preliminary site visit, the mission feels that there are a number of environment risks that would be required to be addressed.

1. **Identifying key environmental issues**. The mission noted that a number of cottage industries are running within the slums, such as waste plastic palletizing units; thread weaving and dyeing; stitching and tailoring etc. Some of these cottage units operate in extremely confined space posing health and safety risks to inhabitants. The mission noted at several locations the free hanging live wire in the open where illegal connections were tapped. The project aims to improve overall electrical safety by securing these connections and junctions. However, it would need to consider restricting the use of electricity for non-domestic purposes within confined areas of slums.
2. **Developing an environmental baseline and an Environmental Management Plan**. The mission was informed that many slums lanes (with width between 1-2 meters wide at most locations) would be dug up to put underground electrical cables. This may lead to huge disruption of slum dwellers, and would require to be addressed through a community driven environmental management plan. The project proponent would also require to develop for each slum separately, based on consultation with local communities, an environmental baselines, particularly focusing on inventory of hazardous operations within slum areas; assessment of environment, health and safety risks due to prevalent unhygienic conditions of sanitation, sewage and garbage disposal. The mission recommends undertaking an environmental audit of proposed slum location leading to development an Environmental Management and Monitoring Plan that could be implemented. The draft scope of environmental audit is attached as annexure 1.
3. **Enhancing client capacity and establish an implementation arrangement for EMPs**. The mission noted with satisfaction that REL has developed a strong procedures and systems laid for planning and implementation of environmental measures in its business operations. This systems and procedures have been applied by REL to its large operations such as power generating facility near Mumbai. However, the mission recommended that the same environmental management systems and procedures including the environmental team of REL be assigned for implementation of environmental mitigation measures. The project implementing agency which will include members of REL, contractors as well as NGO groups will need to have an agreement with local communities in implementation of mitigation measures and monitoring.

ANNEX 9. RESULTS AND MONITORING

Monitoring Indicators

The monitoring and verification of actual outputs for certification and subsidy disbursement will be undertaken by ---, and supplied to --- and copied to --- (the Government Authority) for monitoring and tracking purposes. The Fiduciary Agent, ---, will also conduct audits of the project as designated in the Grant Agreement, and will provide the necessary information to complete the table below.

Verifiable Project Indicators					
Project Characteristics					
Project output(s)					
Poverty targeting (surveys, community decisions, geographic)					
OBA design period	months				
Planned implementation period for outputs	months				
Financing					
		GPOBA	Donors	Govt.	Local
Investment grants	USD ths				
Private sector investment finance, if any (own funds/loans)					
Private sector finance mobilized for investments	USD ths				
Guarantors (if any)					
Guarantee amount	USD ths				
Tender Procedures					
Public tender of contracts (Y/N)?					
Type of contract(s) tendered (if applicable)					
Number of prequalified firms (if shortlisting)	no.				
OBA bidding variable					
Use of incumbent providers (Y/N)?					
Contracting period for operations (if applicable)	years				
Project Outcome					
Investment cost per connection established	USD				
Subsidy per connection	USD				
Grant assistance per household connected	USD				
Outreach of OBA grant(s) to poor population	pct.				
GPOBA payments proceeding according to plan (Y/N)?					
Payments delay, if any	months				
Local co-funding supplied as planned (Y/N)?					
Tariff adjustment clauses respected					
OBA service provider before project (public/private)					
OBA service provider after project (public/private)					
User assessment of project (no/poor/fair/good/very good)					

Degree of local capacity building (none, low, medium, high)
Means of dissemination of lessons learned, if any

		2007	2008	2009	
No. of beneficiary households	no.				
Connection rate	pct.				
No. of new connections established	no.				
Kwh sales per year	Kwh				
Service availability (daily average)	h/day				
Unscheduled water supply failures lasting more than 30 min.	no./yr.				
Electricity tariff	Rps/kwh				
Affordability ratio [1)]	pct.				

Replicability

Pilot scheme or replication?
Scheme introduced to other potential financiers (Y/N)?
Scheme considered for replication/replicated (Y/N)?
Funding of replications if any (government, donors)

1) Average water bill per household per month divided by average monthly household expenditure

ANNEX 10. PROJECT PREPARATION AND SUPERVISION

GPOBA/World Bank Team:

Name	Title	Unit
Cledan Mandri-Perrott	Task Team Leader Infrastructure Specialist	GPOBA/FEU
Mustafa Zakir Hussain	Infrastructure Specialist	GPOBA/ FEU
Priyanka Sood	Consultant	GPOBA
Juri Sekiguchi	Consultant	GPOBA/ FEU
Sanjay Srivastava	Sr Environmental Spec.	SASES
Ramachandran R. Mohan	Senior Social Development Specialist	SASES
Kumaraswamy Sankaravadivelu	Procurement Analyst	SARPS
Priya Goel	Sr Financial Management Specialist	SARFM
Shellka Arora	Legal Associate	SARIM

Advisory team:

Name	Title	Role	Unit
Patricia Veevers-Carter	Program Manager	Peer Review/Advisory	GPOBA/IEF
Irving Kucynski	Panel of Experts	Advisory	GPOBA
Alejandro Jadresic	Panel of Experts	Advisory	GPOBA