Document of the Inter-American Development Bank

**Suriname**

**SUPPORT FOR THE IMPLEMENTATION OF THE EBS INVESTMENT PLAN**

**Investment Loan**

**(SU-L1039)**

**MONITORING AND EVALUATION PLAN**

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**ABBREVIATIONS**

CBA Cost Benefit Analysis

EA Executing Agency

EBS Energiebedrijven Suriname

EE Energy Efficiency

GoS Government of the Republic of Suriname

IDB Inter-American Development Bank

MF Ministry of Finance

MNH Ministry of Natural Resources

MW MegaWatt

MWh MegaWatt hour

PCR Project Completion Report

PBP Policy-Based Programmatic

PBL Policy-Based Loan

RE Renewable Energy

1. **Introduction**

The Project’s general objective is to contribute to the sustainability of the power sector in Suriname by: (i) strengthening EBS’s operational procedures and corporate performance; and (ii) upgrading critical infrastructure in the National Power System. The specific objectives are to: (i) support the strengthening of EBS’s institutional and operational processes by financing improvements in information technology management; and (ii) contribute to the upgrade and retrofitting of the National Power System’s critical infrastructure, with the aim of improving the reliability of the EPAR sub-system. The Project consists of the following components:

* **Component I. Improvement of EBS’s Operations.** Component I will support EBS’s institutional and operational strengthening by: (i) implementing a Distribution/Outage Management System (DMS/OMS) and training activities; (ii) financing the implementation of an Enterprise Resource Planning (ERP) platform and training activities; (iii) assisting EBS during the transition to the new unbundled corporate model; and (iv) implementing a program to promote RE and EE; and
* **Component II. Critical Infrastructure.** Component II will contribute to the upgrade and retrofitting of the National Power System’s critical infrastructure, with aim of improving the reliability of the EPAR sub-system. Activities to be financed include: (i) upgrade of two existing S/S in the EPAR network (J and F); and (ii) construction of a new S/S in the EPAR network (Boma).

This monitoring and evaluation (M&E) plan presents: (i) monitoring indicators (ii) main indicators to follow-up on outcome achievements (described in Table 1: Impact and Outcome Indicators), and (iii) the evaluation methodology chosen for assessing medium and long term impacts, an ex-post cost benefit analysis (CBA) for components I, II and III.

1. **Monitoring**

The purpose of this section is to describe the monitoring process.

## *Indicators:*

Project’s outputs and their annual costs are described in tables 1 and 2 as follows::

**Table 1. Project Outputs**

| **Output Indicators** | **Baseline (2013)** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Target** | **Means of Verification** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Component 1 – Improvement of EBS’ Operations.** | | | | | | | | |
| Distribution/outage Management System (DMS/OMS) fully functional | 0 | - | 1 | - | - | - | 1 | System’s procurement documents provided by EBS; Inspection visits |
| Enterprise Resource Planning (ERP) platform procured and implemented | 0 | - | - | - | - | 1 | 1 | System’s procurement documents provided by EBS; Inspection visits |
| Energy Efficiency Framework plan implemented | 0 | - | 1 | - | - | - | 1 | Project reports, EBS statements, contracts, inspection visits |
| Guidelines for the EBS transition to a new corporate structure designed | 0 | - | 1 | - | - | - | 1 | Project reports, EBS statements, contracts, inspection visits |
| **Component 2 – Critical Infrastructure.** | | | | | | | | |
| Upgraded Substation J procured and commissioned. | 0 | 1 | - | - | - | - | 1 | Progress reports and project final reports prepared by EBS |
| Upgraded Substation F procured and commissioned. | 0 | - | 1 | - | - | - | 1 | Progress reports and project final reports prepared by EBS |
| New Substation Boma procured and commissioned. | 0 | - | - | 1 | - | - | 1 | Progress reports and project final reports prepared by EBS |
| Km of new 33-kV transmission line between Substation Boma and Substation HL procured and installed. | 0 | - | 11 | - | - | - | 11 | Progress reports and project final reports prepared by EBS |
| Km of new 33-kV transmission line between Substation Boma and Substation E procured and installed. | 0 | - | 15 | - | - | - | 15 | Progress reports and project final reports prepared by EBS |

**Table 2. Annual costs by output**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Outputs** | **2015** | **2016** | **2017** | **2018** | **2019** | **Total costs** |
| Component I – Improvement of EBS’ Operations | | | | | | |
| Distribution/Outage Management System (DMS/OMS) | $67,000 | $1,273,000 |  |  |  | $1,340,000 |
| Enterprise Resource Planning (ERP) platform |  |  | $2,921,000 | $2,921,000 | $2,921,000 | $8,763,000 |
| Energy Efficiency Framework Plan |  | $2,000,000 |  |  |  | $2,000,000 |
| Guidelines for the EBS transition to a new corporate structure | $200,000 | $550,000 |  |  |  | $750,000 |
| **Component II – Critical Infrastructure** | | | | | | |
| Upgrade Substation J | $4,000,000 |  |  |  |  | $4,000,000 |
| Upgrade Substation F | $1,500,000 | $2,500,000 |  |  |  | $4,000,000 |
| Development of Substation Boma | $2,500,000 | $7,500,000 |  |  |  | $10,000,000 |
| **Other costs** | | | | | | |
| Administration | $80,000 | $80,000 | $80,000 | $80,000 | $80,000 | $400,000 |
| Technical auditing, monitoring and evaluation | $60,000 | $60,000 | $60,000 | $60,000 | $60,000 | $300,000 |
| Contingencies |  | $361,750 | $361,750 | $361,750 | $361,750 | $1,447,000 |
| **Total** | **$8,407,000** | **$14,324,750** | **$3,422,750** | **$3,422,750** | **$3,422,750** | **$33,000,000** |

## *Data Collection and Instruments*

EBS will be the Executing Agency (EA). EBS is the sole concessionary responsible for transmission and distribution of electric energy in Suriname under the supervision of MNH. The EA will be responsible of reporting the results of the Project, using information collected with the support of an external consultant. The sources of information will be mainly the MNH’s administrative records of the Project, PEU reports and the Banks’s field inspections.

The EA shall collect, store and retain all necessary information, technical and social performance reviews, indicators and parameters, including the technical reports, the mid-term review, and final evaluation, in order to assist: i) the Bank in the monitoring of the Project performance; and ii) the Bank’s Oversight Evaluation Office (OVE), if it so wishes, to evaluate the impact of this operation.

## *Reporting Monitoring Results*

The result matrix will be the basic instrument for monitoring the Project’s outputs and outcomes according to the established indicators. The Executing Agency will submit semi-annual reports following the requirements established in the Bank’s Progress Monitoring Report system (PMR)[[1]](#footnote-2). The semi-annual report will include: (i) an updated timeline and a description of the Project’s progress, actual expenditures per output and disbursements; (ii) a description of procurement processes carried out during the reported period; (iii) an updated Results Matrix, including the Project’s outputs and outcomes and compliance with the established indicators on a per product basis; (iv) disbursements progress and projections; (v) monitoring and progress in the implementation of environmental, social management, and occupational health and safety measures as per the Environmental and Social Management Plan, including details pertaining environmental and social indicators, monitoring frequency, reviews and audits, responsibility and associated costs, and the need to improve operational management, education and training; (vi) a description of the performance of all contractors and consultants; (vii) status of risks identified in the Risk Matrix of the Project, as well as proposed actions or mitigation measures, and identification of new issues/ risks / events that may potentially affect the future implementation of the Project; and (viii) lessons learned, and/or any other information required to ensure the successful implementation of the Project. The semi-annual reports will monitor risks identified, as well as proposed actions of mitigation measures (see Risk Matrix of the Project).

## *Monitoring Coordination Work Plan and Budget*

EBS will be responsible for the fulfillment of technical, administrative and financial procedures related to the execution of the Project, as well as the planning, monitoring, supervision and evaluation. The EA will be responsible for, *inter alia*: (i) technical execution of the Project; (ii) procurement of goods, related services, works and consulting services; (iii) reviewing consulting products; (iv) registering accounting information of Project funds; (v) managing contracts; (vi) reporting periodically to the IDB on the technical and administrative activities of the Project; and (vii) monitoring of Project progress and presenting progress reports. EBS’s management will lead decision making at the executive level and ensure overall coordination of its technical components.

The existing PEU within EBS currently supporting the execution of SU-L1009 will be expanded to incorporate the following full-time positions: (a) a Project Manager (PM), (b) a procurement assistant to support the existing procurement specialist, (c) a financial assistant to support the existing financial specialist, and (d) an individual coordinator for each component of the Project.[[2]](#footnote-3)

The Project Manager (PM) will be responsible for the following activities, among others: (i) preparing the Annual Operations Plans (AOPs) and delivering the anticipated results outlined in each AOP; (ii) preparing the Terms of Reference; (iii) supporting the selection process for contracting consultants of goods and/or services; (iv) reviewing products delivered by consultancy firms; (v) budget administration; and (vi) logistics, local support and coordinating among stakeholders, including with the project manager for SU-L1009, in order to achieve the expected overall results from EBS’s Strategic Business Plan.The PM will report to the EA and the Bank for the entire project. IDB will provide technical and fiduciary support through INE/ENE and the IDB Country Office in Suriname.

The IDB will be monitoring the Project both from INE/ENE and the IDB Country Office in Suriname, with ad-hoc visits to the EA and the Project sites. The EA will also be responsible for the preparation of financial documentation needed for the annual financial audits of Project statements. The monitoring work plan and budget are described in Table 3.

**Table 3. Monitoring work plan and budget**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Key Monitoring Activities** | **Year 1** | | | | **Year 2** | | | | **Year 3** | | | | **Year 4** | | | | **Year 5** | | | | **Responsible** | **Costs** | **Source** |
| **Component 1 – Improvement of EBS’ Operations.** | | | | | | | | | | | | | | | | | | | | | | | |
| *Data collecting and reporting (semiannual monitoring reports)* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | EBS | $20,000 | Project |
| Design of the System (DMS/OMS) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Implementation of the Distribution/Outage Management System (DMS/DMS) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Procurement of the Enterprise Resource Planning (ERP) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Implementation of the Enterprise Resource Planning (ERP) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Implementation of the Energy Efficiency Framework |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guidelines for the EBS transition to a new corporate structure |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Component – Critical Infrastructure.** | | | | | | | | | | | | | | | | | | | | | | | |
| *Data collecting and reporting (semiannual monitoring reports)* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | EBS | $20,000 | Project |
| Upgraded Substation J procured and commissioned. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Upgraded Substation F procured and commissioned. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Substation Boma, procured and commissioned. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Supervision visits** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | IDB | $100,000 | IDB |
| Total | **$140,000** | | | | | | | | | | | | | | | | | | | | | | |

1. **Evaluation**

The purpose of this section is to detail the evaluation methodology, the outputs and impact indicators, the data collection process, the work plan and the budget and the implementation of the evaluation.

## *Main Evaluation Questions*

The evaluation purpose is to assess the outcomes of the Project. The main evaluation questions are as follows:

1. Has EBS strengthened its operational capacity procedures and corporate performance?
2. Have electricity supply disruption from transmission system failures been maintained or reduced?

## *Existing Knowledge (previous evaluations, ex ante economic analysis)*

An ex ante Cost Benefit Analysis (CBA) was prepared for the Project. The main conclusions of the economic analyses are described below:

**Component I.** The benefits of the reduction in outages were obtained by valuing the reduction in unserved energy UE at the maximum Willingness to Pay of the users. This is normally the “Rationing Cost” and consists of a multiple of the price paid by customers in the system. In planning studies this cost is on the order of US$0.6 to US$1 per kWh. Table 4 provides an estimate of the OMS/DMS benefits.

Table 4—Estimation of OMS/DMS Benefits





These costs consist of investment costs and O&M costs, as shown in Table 5.

Table 5–OMS/DMS Costs

|  |  |  |  |
| --- | --- | --- | --- |
|  | 2015 | 2016 | 2017-2030 |
| Investment $ | 200,000 | 1,140,000 | 0 |
| O&M cost $ | 0 | 0 | 20,000 |
| Total Cost $ | 200,000 | 1,140,000 | 20,000 |

The following economic indicators were obtained for this component:

* 1. NPV benefits @12%: US$1.16 million
  2. NPV costs @12%: US$1.16 million
  3. B/C ratio 1.0
  4. IRR 12%

**Component II.** Benefits are summarized as follows (based on a price of US$60MWh in 2014 increased to US$80/MWh in 2015):

**Substation J.**

Table 6—Gross Benefit Estimation for S/S J



Costs include the investment costs and the upstream costs necessary to produce and transport the additional energy being delivered. A cost calculation prepared in the context of SU-L1009 estimated upstream costs on the order of 120$/MWh. The following results are obtained:

Table 7—Cost Estimation for S/S J



Net benefits were obtained as the difference between the two cash flows, as shown in Table 8.

Table 8—Net Benefits from SS/J Upgrade



The following economic results were characterized:

* 1. NPV of Benefits @12% discount rate 73.0 MUS$
  2. NPV of Costs @ 12% discount rate 56.3 MUS$
  3. B/C ratio 1.3
  4. IRR 29%

**Substation F.**

Table 10—Gross Benefits Estimation for S/S F



Costs include the investment costs and the upstream costs necessary to produce and transport the additional energy being delivered. Investment costs for S/S F are summarized in Table 11.

Table 11—Cost Estimation for S/S F



Net benefits are obtained as the difference between the two cash flows, as shown in Table 12.

Table 12—Net Benefits from SS/F Upgrade



Economic results can be characterized as follows:

NPV of Benefits @12% discount rate 16.0 MUS$

NPV of Costs @ 12% discount rate 15.3 MUS$

B/C ratio 1.04

IRR 13%

**Substation Boma.**

Table 13—Estimation of Boma Benefits



Total costs for S/S Boma, including upstream costs, are shown in Table 14:

Table 14—Cost Estimation for S/S Boma



Economic benefits. Net benefits are obtained as the difference between the two cash flows, as shown in Table 15.

Table 15—Net Benefits from S/S Boma Investment



Economic results can be characterized as follows:

NPV of Benefits @12% discount rate 50.2 MUS$

NPV of Costs @ 12% discount rate 43.1 MUS$

B/C ratio 1.16

IRR 12%

## *Key Outcome Indicators*

The key outcome indicators as well as their frequency of measurement and source are described in the table below. These key indicators will be assessed and presented to the IDB through annual monitoring reports.

Table 9: Impact and Outcome Indicators

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Impact** | **Impact Indicators** | **Base**  **(2013)** | **Target** | **Means of Verification** |
| A more reliable energy supply system | System Average Interruption Duration  Index (SAIDI) for the EPAR system.  (Unit: *hours/client*) | 18.5 | 16.2 | EPAR operator (EBS) data and reports |

| **Outcome** | **Indicator** | **Baseline**  **(2013)** | **Target** | **Means of Verification** |
| --- | --- | --- | --- | --- |
| **Component 1 – Improvement of EBS’ Operations.** | | | | |
| Strengthening in EBS's operational  procedures and corporate performance | EBS’ business units trained on the operation, maintenance and updating of the new DMS/OMS and ERP. | 0 | 3 | EBS technical reports; Inspection visits |
| **Component 2 – Critical Infrastructure.** | | | | |
| Increased power delivery capacity | Substation F capacity (Unit: MVA) | 7 | 25 | EPAR operator (EBS) data and reports |
| Substation Boma capacity (Unit: MVA) | 0 | 25 |

## *Evaluation Methodology*

The IDB will prepare a Project Completion Report (PCR) six months after the last phase of the Project has been fully disbursed and will be done through a before and after methodology. The PCR will evaluate results obtained by the Project and will include the results from an ex-post cost benefit analysis (CBA) for the Project. The economic evaluation will follow the methodology used for the preparation the economic analysis of the operation[[3]](#footnote-4).

The PCR shall further assess the “likelihood of sustainability of outcomes at project termination”. The assessment will give special attention to the analysis of risks that are likely to affect the persistence of project outcomes. It will include both exogenous and endogenous risks. The following four dimensions or aspects of risks to sustainability will be addressed: (a) financial risks; (b) sociopolitical risks; (c) institutional framework and governance risks; and (d) environmental risks. The PCR shall further consider the following issues affecting project implementation and the attainment of project results: (a) project preparation, country readiness, local implementation capacities; (ii) country ownership and drivenness; (c) stakeholder involvement; (d) financial planning, including parallel financing commitments, due diligence and audits; (e) IDB supervision and backstopping; (f) project outcomes and sustainability; and (g) delays and effects thereof on project outcomes.

The results and reports form the Project Completion Report (PCR) and the ex post CBA will be post on the IDB website, while progress reports will be post confidentially in IDBDOCSs.

## *Data Collection and Instruments*

The analysis proposed in this section will replicate the ex-ante cost benefit analysis presented in Economic Analysis prepared for the Project. The information to be used for the CBA and PCR will be updated from the semiannual and annual reports prepared by EBS, as well as the midterm evaluation. The IDB will prepare Terms of Reference (ToRs) for the development of the ex-post CBA and a check list with the basic information needed for the ex-post CBA and that must be included in the EBS’s annual and semiannual reports. Furthermore, the annual reports prepared for Executing Agency will include a summary of the status of the electricity sector related to the contribution of the Projects outputs. That summary will consider the following information:

1. System Average Interruption Duration Index (SAIDI). SAIDI is defined as the average duration of interruptions for customers served during a specified time period. The formula used to determine SAIDI is:

*SAIDI = sum of customer-minutes off for all interruptions / Total # of customers served*

And independent consultant will be hired by the IDB for the period from January 2020 to March 2020, who will prepare the ex-post CBA. ToRs for the ex-post CBA will be prepared at the end of the last year of the Project. ToR reference for the ex post CBA will follow the requirements established for the ex ante CBA (IDBDOCS# 38962850).

## Evaluation Coordination, Work Plan and Budget

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activity** | **2015** | | **2016** | | **2017** | | **2018** | | **2019** | | **Responsable** | **Funding** | **Costs** |
| **Jun** | **Dec** | **Jun** | **Dec** | **Jun** | **Dec** | **Jun** | **Dec** | **Jun** | **Dec** |
| Progress Reports |  |  |  |  |  |  |  |  |  |  | IDB//EBS | Project | 80,000 |
| Mid-term Evaluation |  |  |  |  |  |  |  |  |  |  | EBS | Project | 20,000 |
| Ex-post CBA |  |  |  |  |  |  |  |  |  |  | IDB | Project | 20,000 |
| Final evaluation |  |  |  |  |  |  |  |  |  |  | EBS | Project | 20,000 |
| PCR |  |  |  |  |  |  |  |  |  |  | BID | BID | 20,000 |
|  | | | | | | | | | | | | | |
| **Total** | **$ 160,000** | | | | | | | | | | | | |

The total cost of the evaluation plan is US$160.000. EBS will hire independent consultants for preparing the mid-term evaluation at the end of 36 months from the date of the signature of the loan contract or after 60% of the resources have been committed, whichever occurs first; and a final evaluations of the Project, after 90% of loan resources have been committed. Both evaluations will be financed with Project’s resources. The final evaluation will include the results from an ex-post Economic Analysis for the Project that will be prepared and financed by the Bank. The IDB will hire an independent and experienced consultant or firm for preparing the Project Completion Report (PCR).

The borrower is responsible for supporting IDB team and consultant(s) in all the matters related with the Monitoring and Evaluation of this project.

The IDB Project Team will be based in IDB office located in Washington, DC (INE/ENE), Country Office Guyana (CCB/CGY), and the Country Office in Suriname (CCB/CSU), which will be responsible for the follow-up of the Project.

1. See PMR draft IDBDOCS#38054923 [↑](#footnote-ref-2)
2. Considering that under the SU-L1009 loan, a Project Executing Unit (PEU) was established and is currently dedicated to the implementation of activities with similar scope as of the proposed Project. [↑](#footnote-ref-3)
3. <http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=39055539> [↑](#footnote-ref-4)