



# Global Environment Facility

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August 20, 2004


Dear Council Member:

The World Bank, as the Implementing Agency for the project, ***Senegal: Electricity Services for Rural Areas Project***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with the World Bank procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the Council in February 2001, and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by the World Bank satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at [www.gefweb.org](http://www.gefweb.org). If you do not have access to the Web, you may request the local field office of the World Bank or UNDP to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

  
for Leonard Good  
Chief Executive Officer and Chairman

cc: Alternate, Implementing Agencies, STAP

# OFFICE MEMORANDUM

DATE: August 17, 2004

TO: Mr. Leonard Good, CEO/Chairman, GEF

FROM: Steve Gorman, GEF Executive Coordinator 

EXTENSION: 35865

SUBJECT: **Senegal: Electricity Services for Rural Areas (P0 85708)**  
**Submission for Final CEO Endorsement**

1. Please find attached the electronic file of the GEF Project Document for the above-mentioned project for your final review and endorsement. This project was approved for Work Program entry at the February 2001 Intersessional meeting, under streamlined CEO endorsement procedures. The scheduled Board date for this project is September 9, 2004. We would appreciate receiving your response, so that we may finalize the Bank Board submission, by August 18.
2. The GEF Project Document is consistent with the objectives and scope of the proposal approved at the February 2001 Intersessional meeting. Adjustments have been made during final preparation concerning the project design, scope and components, though no modification has been made to the GEF grant amount. GEFSEC, STAP, and Council comments have also been addressed. The comments from the STAP reviewer were addressed at Work Program entry.

Modifications to the Project Document and how comments from GEFSEC and Council have been addressed are detailed below. See also Annex A attached at the end for greater details on changes between the project brief at work program entry and the final project document after appraisal.

## **A. Modifications made in the Project Document (See also Annex A)**

- i) Because of uncertainties regarding the future of SENELEC, the original project (Energy Sector Investment Project) has been split in 2, this one being exclusively focused on Rural Electrification out of the SENELEC territory and Biomass Energy.
- ii) The Bank support is now an Adaptative Programmatic Loan. The approved GEF grant will be used during the first 4-year phase of the APL.
- iii) A Biomass Energy component has been added (component 4): the first phase of the APL project will also support support a two year "transitional phase" of the "Sustainable

Energy Management and Interfuel Substitution Options Component of the Sustainable and Participatory Energy Management Project “ (“PROGEDE” / Project ID 46768 and 42056, which is coming to a successful close on December 31, 2004), until the proposed new CDD PRSC instrument is ready for implementation. No GEF support is claimed for this activity.

**B. Response to comments (in italics) in GEFSEC review sheet of January 23, 2001**

*Comment 1: How will GEF funds be actually spent ? The project document needs to elaborate on the “innovative financial mechanism”.*

Response: As described in detail in the Annex “Incremental cost and Global Environmental Benefits”, GEF funds will be spent :

- as first cost grant subsidy through a competitive mechanism to cover a fraction of the incremental cost, and
- for Technical Assistance and Capacity Building activities to address other barriers.

A specific study and consultative workshops with financial institutions and private sector representatives have been undertaken to elaborate the financial mechanisms and corresponding procedures manual. Financial mechanisms are described in the specific Annex on ‘Legal and Regulatory Framework and Financing Mechanisms’ (Annex 6 of the GEF project Document).

*Comment 2: Is there an estimation of what % of the funds would go to support solar home systems and other renewable energy as opposed to diesel generators? Would GEF fund be used for all types of technologies?*

Response: GEF funds for first cost subsidy will be used only for PV or renewable technologies. It is difficult to anticipate how much the GEF first cost subsidy mechanism will effectively displace the competition frontier in favor of renewable against grid extension, and thus what fraction of IDA and GOS counterpart will also be used to finance renewable.

*Comment 3: It looks like the subsidies will decline over time, but will not be phased out by the end of the project. How does the project ensure financial sustainability. What will happen when the project is over ? Will the subsidies continue? If so who will provide the funds ? What will happen to the REFM ? Or is the project expected to be fully commercial?*

Response: Systems installed will be sustainable on a commercial basis since payments by users will cover O&M costs and renewal at the end of lifetime. After concessions will be implemented with donors support, further densification will be financed by both private

concessionaire, GOS and commercial banks. Level of subsidy per marginal additional system required will decline as a result of both market enlargement and reduced fix costs of already implemented concessionaires and will be monitored through the results of the successive bids. Level of GOS financing will not need to exceed historical level of budget allocation observed for the last 5 years. For more details see also Section C.4 “Sustainability”- in the GEF Project Document and Annex 9. Though there is high level of commitment and agreement among stakeholders regarding the REFM, it may not be practical to set it up during the first phase of the program itself. However, it is likely to be set-up during later phases of this rural electrification program, which will span 12 years

- *Comment 4: Is there a replication strategy ?*

Response: This project is in fact supporting the implementation of a new rural electrification model in Senegal, for which have been developed a full institutional arrangement, innovative tariff structure, specific financing mechanism and adapted regulatory framework for a long term public-private partnership. As such the implementation of the 3 first concessions to be supported by IDA phase 1 will demonstrate that this new model has created the conditions for replicability to the 18 rural electrification concessions. Two others donors (ADB and KFW) have already funded studies for 3 more concessions, have performed their appraisal jointly with the World Bank team and have announced they will support the implementation of these 3 additional concessions in the next 4 years. Phase 2 and phase 3 of IDA project will also support 7 additional concessions, totaling already 13 out of 18. For more details see also Section on “Replicability and Sustainability”- in Annex 9 of the GEF Project Document.

*Comment 5: Stakeholders participation*

Response: In February 2003 an “Energy and Poverty” workshop funded by ESMAP has taken place in Dakar, which included the participation of private sector, rural NGOs, consumers representatives, Micro-finance institutions, etc. As a result of the recommendations of this workshop, a Intersectoral Committee has been set up and “multi-sectoral energy programs” (PREMs) have been integrated in component 1 of the project to maximize poverty alleviation impacts. During preparation phase, a consultant has carried on a consultative process together with the intersectoral committee to pre-identify the potential PREMs.

In February 2004 a workshop has been held in Dakar with representative of commercial banks and micro-finance institutions to discuss and improve the design of the financial mechanisms described in annex 4.

In April 2004 a workshop with international and local private sector and emigrants representative to discuss and improve the design of the Public Private Partnership.

In April 2004 a training session has been organized to introduce to future concessionaires operational schemes relying on close collaboration with villages organizations.

Local initiatives of rural electrification (ERILs) will also be supported by the project besides scaling up effort through large concession bidding process.

*Comment: How does the project incorporate lessons learned from similar projects undertaken by the WB or other GEF implementing Agencies in Senegal or in the region in general?*

Response: Project team has already an extended experience in the field of rural electrification in number of countries. All the eight consultants consortiums selected to do the eight preparatory studies achieved in 2003-2004 during the preparation phase had a high level experience in the field as a qualification criteria. New WB project cycle included a Quality Enhancement Report process that ensure in depth peer review and advices from experts from other regions in the Bank. Main lessons learned and reflected in the project design are detailed in section B.5. Additionally, Annex 2 of the GEF Project document provides information on linkages to major related projects and programs.

### **C. Response to Comments (in italics) from Council Members**

#### **Switzerland**

*Comment : The total abatement of 74,000 tCO<sub>2</sub> leads to relatively high abatement costs of 54 USD/tCO<sub>2</sub> .From the narrow viewpoint of cost-effective GHG abatement the project is rather costly.*

Response: New figures show that avoided emissions under the new project design will be amount 340,000 tCO<sub>2</sub> (cumulated emissions reduction deriving from both renewable energy and high efficiency lamps for new grid connection over the 25 years concession period), considering only equipment to be implemented during the first phase of the project, which will benefit from the GEF grant co-financing. As a result, the average emission reduction cost can be recalculated as of 14,71 dollars per tCO<sub>2</sub> (unitary cost of emissions avoided = total GEF grant /total volume of emissions avoided).

*Comment: First concern relates to the sustainability of project financing*

Response: During negotiations, the GOS has committed itself (i) to continue to finance ASER under the national budget (as it has constantly done since 1998), (ii) to contribute to investment financing of the investment plans in the concessions to be awarded internationally, and (iii) to finance further densification of connections and decentralized PV systems in already awarded concessions. Thus, after the concessions being awarded with the support of international donors, the mechanism is designed to ensure that the further expansion of the electrification program though densification will be sustained on the exclusive basis of financing from Senegal for the subsidy part. This financing from the GOS will not need to exceed historical level of budget allocation observed for the last 5 years. Regarding more

specifically the sustained expansion of the use of renewable energy, it is envisaged in phase 2 that (i) the need of targeted subsidy will lower as a result of the opening and scaling up of the Senegalese market, (ii) instead of being fully financed by GEF, part of remaining incremental cost will be financed under the GOS counterpart for phase 2 and, (iii) remaining fraction of incremental cost, if any, may be proposed for additional support from GEF in phase 2. The level of GEF cost subsidy in phase 2, if any is still required, will be determined on the basis of the monitoring of the evolution of PV prices as observed from the bids proposals for the concessions to be awarded during phase 1. See also Section C.4 "Sustainability"- in the GEF Project Document and Annex 9.

*Comment: The second concern relates to the co-financing figure of 115 million. The project Brief provides a distorted picture. It is strongly recommended to show the correct level of co-financing in the final document.*

Response: the initial project having been split in two, this project is now exclusively for rural electricity services (and a smaller biomass component), and as clearly stated in the Program Financing Data table, financing for IDA phase 1 is 50.3 million of USD, among which 29.9 from IDA, 5.0 from GEF, 6.8 from GOS et 8.6 (estimated) from private sector.

### **Germany:**

*Comment: Although the project description appears sound and well-founded, some important recent developments in the Senegalese energy sector have not been taken into account.*

Response: Because of uncertainties regarding the future of SENELEC, the original project has been split in 2, this one being exclusively focused on Rural Electrification and Biomass Energy out of the Senelec territory, in order to ensure that the implementation of the project cannot become hostage of unsolved issues related to SENELEC's reform. The Regulatory Commission (CRSE) has already officially defined a clear separation of SENELEC territory and future rural private concessionaires.

*Comment: In any case should the above mentioned points (unsuccessful privatization of SENELEC, financial rate of return and productivity criteria for rural electrification) be taken into account for further planning and during project implementation.*

Response:

- Unsuccessful privatization of SENELEC: see previous response above
- Financial rate of return: financial rate of return from a private concessionaire point of view has been estimated to be around 25.5% over the 25 years concession period (see details in annex 8)

- Productivity criteria for rural electrification: to maximize increase of productive uses of electricity specific multi-sectoral energy programs (PREMs) have been pre-identified (milk cooling centers, cold chain for fisheries, etc. see annex 4) and will be implemented during phase 1. Embedded in the bill micro-finance will also be tested to facilitate the purchase of individual productive equipment by beneficiaries.

**France:**

*Comment: Coordinate financing of AFD and WB in rural electrification in Senegal*

Response: AFD doesn't intend anymore to support rural electrification in Senegal for the time being. AFD and PROPARCO representatives have been kept informed and invited to workshops during preparation phase in Senegal.

3. Please let me know if you require any additional information to complete your review of the project document. We look forward to receiving your endorsement of the project for Bank Board approval.

Many thanks.

Attachments

GEF Project Document

Minutes of Negotiations

Outcomes of Negotiation

cc: Messrs./Mmes. King, GEF PROGRAM COORDINATION (GEFSEC); Y. Crookes, C. de Gouvello, S. F. Garnier, M. Layec (AFTEG); Christophe Crepin, Gayatri Kanungo (AFTS4); T. Johnson, C. Govindarajalu (ENVTS); Khanna, Wedderburn, Aryal (ENV); ENVGC ISC, AFTS4 Divisional Files, Regional Files

**Annex A - Matrix of changes reflecting changes between Project Brief and Final Project Document.**

<b>Project Brief approved at Work Program<sup>1</sup></b>	<b>New Project Design (finalized GEF Project Document/PAD)</b>
1. Sector Investment Loan - 5 years (p.1)	The Bank support is now an Adaptative Programmatic Loan. The approved GEF grant will be used during the first 4-year phase of the APL.
2. Project will finance SENELEC for grid extension in rural and peri-urban areas (p.4-5)	The project won't anymore provide finance to SENELEC. Because of uncertainties regarding the future of SENELEC, the original project has been split in 2, this one being exclusively focused on Rural Electrification out of the Senelec territory, in order to ensure that the implementation of the project cannot become hostage of unsolved issues related to SENELEC's reform. The Regulation Commission has officially defined a clear separation of SENELEC territory and future rural private concessionaires.
3. Direct financing of Senelec grid-extensions and separate funding through the Rural Electrification Financial Mechanism for renewable (p.4-5)	The Rural Electrification Concessions (fee for service) are now "technology neutral", that is the bidders can choose either grid or renewable decentralized technology, or even a combination of grid and renewable. Such a design will open a large room for renewable energy scaling up. However the GEF grant is used to level the playing field for renewable to ensure that the existing barriers that prevent use of renewable will be removed (see additional explanation in bullet 9 below)
4. Three different financial contributions: (i) short term commercial credit (ii) long term loan at nominal interest rate (iii) subsidy (p.7)	For project prompt start, only OBA type subsidy will be set up at the beginning of the project. However the project preparation has designed additional mechanisms to ensure a broader implication of local banks financial resources (refinancing line, guarantee mechanism and a mechanism to lower interest rates). These mechanisms will be implemented when local banks will have confirmed their interest through a formal framework convention to be prepared under subcomponent 2.6
5. Project Implementation Unit in Ministry of Energy and Mines (p.9)	As a result of the split of original project in two, there is no more need to have a PIU in MEMI for this Rural Electrification Program, since ASER is already an autonomous implementing agency that has been implemented by MEMI to implement its new rural electrification strategy. ASER has already been created in 1998 and is functioning quite satisfactorily. During preparation a diagnosis has been conducted to design appropriate TA and CB

<sup>1</sup> Page numbers in left column refer to Approved Project Brief pages numbers.

	support to be provided to ASER to perform its role (see subcomponent 2.1 and 3.2)
6. Environmental (p.14)	As a result of the split of original project in two, the requirement regarding this project is an Environmental and Social Management Framework and a Resettlement Policy Framework, which have been prepared and disclosed in country (in the different project areas) and in the Infoshops in Washington and Dakar as a condition of ASPEN clearance for appraisal
7. The project aims to install 640,000 Watt peak in solar PV systems and will avoid 74,110 tons of CO <sub>2</sub> emissions (p.27 and 32)	Under the new design of both project concept and GEF subsidy mechanism, the project aims at installing during IDA phase 1 at least 1,500,000 Wp in solar PV systems (or equivalent in other renewable energy based electricity like biomass fuelled generators), that is more than the double of Project Brief estimates, and will also ensure systematic diffusion of high efficient lamps, including for new grid connected households. As a result activities implemented under IDA Phase 1 will avoid 278,000 tons of CO <sub>2</sub> emissions, that is 3.7 times more than project brief estimates.
8. Ownership of PV systems by consumers. In exchange of monthly fee charged to consumers, the systems providers will contractually maintain systems, including replacement of spare parts and full systems at end of lifetime. These obligations are registered in the provider contract awarded through international bidding, and will be controlled by the regulator with the assistance of ASER (p.29)	As the new concession based project design relies on fee-for-service electricity delivery, either through grid extension or PV systems, ownership of the consumers will be restricted to installations internal to their houses.
9. GEF grant used to buy-down high cost of renewable energy technology is split in two windows : one for 20Wp systems (1.9 million dollars) and one for 50Wp systems (2.1 million dollars) (p.29-30)	<p>GEF grant used to buy-down high cost of renewable energy technology is no more split in two windows.</p> <p>The selection criteria of the bidding process to select future rural electrification concession operators is the following :</p> <ul style="list-style-type: none"> <li>- <u>a volume of subsidy coming from IDA loan</u> is targeted for each concession and announced in the Request of Proposals. Eligibility of proposals will include minima of connections to be achieved (minima may be detailed by sub-regions of the concession).</li> <li>- the winner will be the bidder who commits to serve the highest total number of individual users.</li> </ul> <p>The <u>GEF grant</u> will be used to ensure a level playing field for renewable energy in the following way:</p>

	<ul style="list-style-type: none"> <li>▪ <u>a certain amount of GEF grant</u> will be allocated to each concession, and announced in the Request of Proposals</li> <li>▪ the bidder who offers to use renewable energy may claim for an additional subsidy which will come from the allocated GEF grant</li> <li>▪ there will be a ceiling defining a limited maximum unitary amount of GEF subsidy for each renewable technology (for instance max \$ of GEF subsidy per Wp installed in case of photovoltaics). This ceiling will be defined according to both: <ul style="list-style-type: none"> <li>- values of subsidies observed in other WB projects for the same technologies,</li> <li>- incremental cost calculated in Brief document.</li> </ul> </li> </ul> <p>The ceiling retained is the less of both. The project document specifies a cap of 2.6 \$/Wp.</p> <p>The selection criterion to design the winning bid remains the maximum number of consumers served using both the non-targeted "IDA source" of subsidy and the targeted "GEF subsidy".</p> <p>This way the bidders will receive a double incentive:</p> <ol style="list-style-type: none"> <li>1) to increase the proportion of renewable in their proposal, because of the additional "GEF" subsidy they can get</li> <li>2) to claim for the lowest "GEF" subsidy per renewable energy based system, since they need to maximize the number of consumers served to win, using the global amount of subsidy (IDA+GEF) allocated for the considered concession.</li> </ol> <p>The bid documents will specify a minimum number of customers to be serviced in the concession area.</p>
10. New activity	<p>New activity (in component 1) : Multi Sectoral Energy Programs (PREMs). In order to maximize poverty alleviation, specific sub-programs have been identified and will finance the energy part of other sectoral programs currently suffering from limitations regarding energy access. An intersectoral committee has been set up to facilitate identification of new PREMs.</p>
11. New activity	<p>Biomass Energy (component 4): the first phase of the APL project will also support support a three year "transitional phase" of the "Sustainable Energy Management and Interfuel Substitution Options Component of the Sustainable and Participatory Energy Management Project " ("PROGEDE" / Project ID 46768 and 42056, which is coming to a successful close on December 31, 2004), until the proposed new CDD PRSC instrument is ready for implementation. No GEF support is claimed for this activity.</p>

Document of  
The World Bank

Report No: 29769-SN

GEF PROJECT DOCUMENT  
ON A  
PROPOSED GRANT FROM THE  
GLOBAL ENVIRONMENT FACILITY TRUST FUND  
IN THE AMOUNT OF USD 5 MILLION  
TO THE  
REPUBLIC OF SENEGAL  
FOR AN  
ELECTRICITY SERVICES FOR RURAL AREAS PROJECT  
IN SUPPORT OF THE FIRST PHASE OF THE  
ELECTRICITY SERVICES FOR RURAL AREAS

August 19, 2004

**Energy Unit  
Infrastructure Group  
Africa Regional Office**

## ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
APL	Adaptable Program Loan
ASER	<i>Agence Sénégalaise d'Électrification Rurale</i> (Rural Electrification Agency in Senegal)
BID	<i>Banque Islamique de Développement</i> (Islamic Development Bank)
BOAD	<i>Banque Ouest Africaine de Développement</i> (West African Development Bank)
CAS	Country Assistance Strategy
CDD	Community Driven Development
CDM	Clean Development Mechanism
CER	<i>Concession d'Électrification Rurale</i> (Rural Electrification Concession)
CET	<i>Construire, Exploiter et Transférer</i> (Build, Operate and Transfer)
CNH	<i>Commission Nationale des Hydrocarbures</i> (National Hydrocarbon Commission)
CO <sub>2</sub>	Carbon Dioxide
CPRSE	<i>Cellule de Préparation des Réformes du Secteur de l'Énergie</i> (Unit for the Preparation of Energy Sector Reforms)
CQ	Selection Based on Consultants' Qualifications
CRSE	<i>Commission de Régulation du Secteur de l'Électricité</i> (Electricity Regulatory Commission)
DAF	<i>Direction Administrative et Financière</i> (Administrative and Financial Division)
DDI	<i>Direction de la Dette et de l'Investissement</i> (Debt and Investment Directorate of Ministry of Finance)
DE	<i>Direction de l'Énergie</i> (Energy Directorate of Ministry of Energy and Mines)
DPD	<i>Demande de Paiement Direct</i> (Withdrawal for Direct Payment)
DFC	Demand-For-Concession
DFER	<i>Direction du Financement de l'Électrification Rurale</i> (Rural Electrification Financing Directorate)
DRF	<i>Demande de Remboursement de Fonds</i> (Withdrawal Application)
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ENR	Renewable Sources of Energy
ERIL	<i>Initiative Locale d'Électrification Rurale</i> (Local Rural Electrification Initiative)
FCFA	Franc CFA
FER	<i>Fonds d'Électrification Rurale</i> (Rural Electrification Fund)
FIRR	Financial Internal Rate of Return
GEF	Global Environment Facility
GOS	Government of Senegal
IDA	International Development Association
ICB	International Competitive Bidding
IFC	International Finance Corporation
IPP	Independent Power Producer
ISDS	Integrated Safeguards Data Sheet
KFW	German Cooperation Agency
LCS	Least-Cost Selection
MEM	Ministry of Energy and Mines
MEPT	Ministry of Environment and Protection of Nature
MW	Megawatt
N.B.F.	Not Bank-Financed
NCB	National Competitive Bidding
NGO	Non-Governmental Organization
NPV	Net Present Value
NWFD	National Water and Forest Directorate
OBA	Output-Based Aid
O&M	Operations and Maintenance
PAD	Project Appraisal Document
PIC	Public Information Center
PID	Project Identification Document

PLE	<i>Plan Local d'Electrification</i> (Local Electrification Master Plan)
PPER	<i>Programme Prioritaire d'Electrification Rurale</i> (Rural Electrification Priority Program)
PPF	Project Preparation Facility
PPP	Public -Private Partnership
PREM	<i>Programme Energétique Multisectoriel</i> (Multi-Sectoral Energy Program)
PRG	Partial Risk Guarantee
PROGEDE	<i>Projet de Gestion et de Substitution des Energies Renouvelables</i> (Sustainable and Participatory Energy Management Project)
PRSC	Poverty Reduction Strategy Credit
PRSP	Poverty Reduction Strategy Paper
PV	Photovoltaic
QBS	Quality-Based Selection
QCBS	Quality- and Cost-Based Selection
RAF	<i>Responsable Administratif et Financier</i> (Administrative and Financial Officer)
RE	Rural Electrification
RPF	Resettlement Policy Framework
SA	Special Account
SENELEC	<i>Société Nationale d'Electricité</i> (National Power Utility in Senegal)
SBD	Standard Bidding Document
SFD	<i>Société Financière Décentralisée</i> (Decentralized Financial Institution)
SHS	Solar Home System
SME	Small and Medium Enterprises
SMI	Small and Medium Industries
SOE	Statement of Expenditure
SYSCOA	<i>Système Comptabilité Ouest-Africaine</i> (West African Accounting System)
TA	Technical Assistance
TORs	Terms of Reference

Vice President:	Callisto E. Madavo
Acting Country Director:	Iradj Alikhani
Sector Manager:	Yusupha Crookes
Task Team Leader:	Michel E. Layec

**SENEGAL**  
**ELECTRICITY SERVICES FOR RURAL AREAS PROJECT**  
**GEF PROJECT DOCUMENT**  
**Africa Region**  
**Energy Unit (AFTEG)**

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MAP

IBRD 33326

**SENEGAL**  
ELECTRICITY SERVICES FOR RURAL AREAS PROJECT

**GEF PROJECT DOCUMENT**  
**Africa Regional**  
**Energy Unit (AFTEG)**

Date: August 17, 2004 Country Director: Madani M. Tall Sector Manager/Director: Yusupha B. Crookes Project ID: P085708 Lending Instrument: Adaptable Program Loan	Team Leader: Michel E. Layec Sectors: Power (50%);Renewable energy (30%);General energy sector (20%) Themes: Infrastructure services for private sector development (P);Rural services and infrastructure (P);Regulation and competition policy (S) Environmental screening category: Partial Assessment Safeguard screening category: Limited impact
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Global Supplemental ID: P070530 Lending Instrument: Specific Investment Loan Focal Area: C- Climate Change Supplement Fully Blended?: Yes	Team Leader: Michel E. Layec Sectors: Renewable energy (100%) Themes: Climate change (P)
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<b>Project Financing Data</b>			
<input type="checkbox"/> Loan <input checked="" type="checkbox"/> Credit <input checked="" type="checkbox"/> Grant <input type="checkbox"/> Guarantee <input type="checkbox"/> Other: For Loans/Credits/Others: Total Bank financing (US\$m.): 29.90 Proposed terms:			
<b>Financing Plan (US\$m)</b>			
Source	Local	Foreign	Total
BORROWER/RECIPIENT	10.3	0.0	10.3
INTERNATIONAL DEVELOPMENT ASSOCIATION	3.0	26.9	29.9
GLOBAL ENVIRONMENT FACILITY	0.5	4.5	5.0
AFRICAN DEVELOPMENT BANK	0.7	6.3	7.0
GERMANY: KREDITANSTALT FUR WIEDERAUFBAU (KFW)	0.6	5.1	5.7
PRIVATE COMMERCIAL SOURCES (UNIDENTIFIED)	4.0	9.8	13.8
Total:	19.1	52.6	71.7
<b>Borrower:</b> Republic of Senegal			
<b>Responsible Agencies</b> ASER - Contact : Mr. Aliou Niang Ex-Camp Lat Dior, B.P 11 131, Dakar, Senegal Tel: 221 849 47 17    Fax: 221 849 47 20    Email : aserdg@sento.sn			
Direction des Eaux et Forêts – Contact Mr. Youssou Lo Parc Forestier de Hann, B.P. 1831, Dakar, Senegal			

Tel: (221) 831 01 01 Fax: (221) 832 27 89 Email: [lo\\_youssou@yahoo.fr](mailto:lo_youssou@yahoo.fr)  
 Direction de l'Energie (The Energy Directorate) – Contact Mr. Youssou Lo  
 104 Rue Carnot, B.P. 4037, Dakar, Senegal  
 Tel: (221) 821 15 42 Fax: (221) 822 04 30 Email : [lo\\_youssou@yahoo.fr](mailto:lo_youssou@yahoo.fr)

Estimated disbursements (Bank FY/US\$m)									
FY	2005	2006	2007	2008	0	0	0	0	0
Annual	5.50	7.00	9.90	7.50	0.00	0.00	0.00	0.00	0.00
Cumulative	5.50	12.50	22.40	29.90	29.90	29.90	29.90	29.90	29.90

GEF Estimated disbursements (Bank FY/US\$m)									
FY	2005	2006	2007	2008	0	0	0	0	0
Annual	0.60	1.40	1.50	1.50	0.00	0.00	0.00	0.00	0.00
Cumulative	0.60	2.00	3.50	5.00	5.00	5.00	5.00	5.00	5.00

Project implementation period: Start January 3, 2005 End: December 31, 2008  
 Expected effectiveness date: December 6, 2004  
 Expected closing date: June 30, 2009

Does the project depart from the CAS in content or other significant respects? <b>Ref. PAD A.3</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does the project require any exceptions from Bank policies? <b>Ref. PAD D.7</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Have these been approved by Bank management?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is approval for any policy exception sought from the Board?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does the project include any critical risks rated “substantial” or “high”? <b>Ref. PAD C.5</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the project meet the Regional criteria for readiness for implementation? <b>Ref. PAD D.7</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Project development objective <b>Ref. PAD B.2</b> The project's development objective is to increase the access of Senegal's rural population to modern energy services and to ensure the environmental and social sustainability of woodfuels in urban and peri-urban areas.
Global Environmental objective <b>Ref. PAD B.3</b> The project and the program will have a positive environmental impact at the global and local levels. At the global level, it will help reduce net CO2 emissions. At the local level, it will promote conservation by encouraging the use of: (i) renewable sources of energy; (ii) efficient lamps and improved cooking stoves; (iii) improved carbonization methods and improved woodfuel stoves, and implement sustainable forest and natural resource management which will also reduce deforestation.
Project description <b>Ref. PAD B.4, Technical Annex 4</b> The proposed project, which corresponds to Phase I of the APL, consists of four components. The first component supports access to electricity services in rural areas. This component will help rural households meet basic electricity needs and uses of electricity for productive purposes and for the social sectors. The second component supports capacity building and institutional strengthening of institutions involved in managing the long-term electrification program that the project supports. The third component supports technical assistance, communication and monitoring of rural electrification projects. The fourth component supports sustainable and participatory woodfuels management and is a continuation of Bank financed PROGEDE.
Which safeguard policies are triggered, if any? <b>Ref. PAD D.6</b>

The biomass component (component 4) will be an extension of the PROGEDE project, which has only positive environmental impacts and is in compliance with the forests safeguard policy (OP/BP 4.36).

Significant, non-standard conditions, **if any**, for: *Ref. PAD C.7*

Board presentation: Standard conditions.

Loan/credit effectiveness: Standard conditions.

Covenants applicable to project implementation: Standard conditions.

## **A. STRATEGIC CONTEXT AND RATIONALE**

### **1. Country and sector issues**

#### **Country issues:**

1.1 Senegal is at a decisive point in its economic development. It nears the end of a successful period of economic adjustment that began with the devaluation of the CFA Franc in 1994. It achieved a historically high rate of growth in that period, 2.5 percent annually in real per capita terms.

1.2 Despite this recent good economic performance, Senegal still needs to meet economic and social challenges. While the economic growth that followed the currency devaluation had some small impacts on rural areas, income inequality and social indicators in rural areas- primary education, infant and maternal mortality, access to clean water, etc. - lag urban indicators. This is partly due to a slow development of rural infrastructure - water, electricity, transport – and inadequate incentives for private sector investment in rural areas.

#### **Sector issues:**

1.3 Energy Consumption and Resources Base: Energy consumption in Senegal is dominated by woodfuels, which accounts for 53percent of energy used. The country's hydroelectric potential, based on the Senegal and Gambia rivers, is estimated at 1,000 MW, which is just recently being tapped, with the completion of the Manantali hydroelectric project (installed capacity of 200 MW). Fossils fuels in the form of heavy petroleum was discovered offshore at Dome Flore (100 million tons), but its extraction may not be economical at this stage. Small amounts of natural gas, however, were discovered and produced onshore near Dakar (Diam Nadio and Thies) and are being used to generate electricity. Further exploration for gas and oil is underway or planned. For now, however, most of Senegal's commercial energy needs are met by imported petroleum products which totaled 950,000 tons and cost an estimated US\$250 million in 2002 and represented between 20 to 25percent of Senegal's export earnings.

1.4 Woodfuels Supply: Current commercial annual consumption of woodfuels in the principal urban (Dakar and Thies) and peri-urban markets is estimated at about 200,000 tons of charcoal and 300,000 tons of fuelwood. The supply of these woodfuels comes from the Kolda and Tambacounda regions, some 400 km away from Dakar. Historically, the supply of woodfuels was entirely based on highly concentrated and non-sustainable forest resource management practices (clear cutting), with an annual deforestation impact of about 80,000 ha (land clearing for agriculture, bush fires, production of charcoal and overgrazing). In order to address that situation the Government of Senegal launched in 1997 the "Sustainable and Participatory Energy Management Project – PROGEDE (IDA/GEF/Dutch Cooperation funded). PROGEDE sought to establish 300,000 ha of community-based managed forests systems in the Kolda and Tambacounda regions, equivalent to 50 percent of the country's woodfuel supply zone, with a view to establish a minimum permanent annual capacity to produce at least 300,000 tons of sustainable fuelwood for the urban household energy markets. PROGEDE has been successful and has developed an operationally proven intervention model ready for scale-up.

1.5 Electricity Sector Issues: Electricity services in Senegal are currently provided by the public utility (SENELEC). The installed capacity of the interconnected system is 489 MW which include 371 MW of SENELEC thermal plants, 66 MW from the regional hydroelectric plant of

Manantali (installed capacity of 200MW) and 52 MW from an Independent Power Producer (GTI Dakar). The 2003 peak demand was about 300 MW. Annex 1 presents the institutions of the electricity sector and past and on-going efforts to improve the performance of Senegal's electricity sector.

1.6 The electricity sector is characterized by relatively high costs largely due to high thermal generation costs and high transmission and distribution losses, poor quality of service, limited access to electricity services and the weak financial position of the utility. This is largely due to obsolete facilities, insufficient investment in generation, transmission and distribution over the last 10 years but also to SENELEC's weak technical and financial performance. Due to high costs, relatively weak performance and delays in commissioning new facilities SENELEC has been in a relatively weak financial position and cannot meet the rapidly growing demand for power, growing at a rate of 25-30 MWs a year.

1.7 To address those specific concerns, another APL program – the Electricity Sector Efficiency Enhancement Program – is under preparation by IDA. The first phase of that APL intends to support the Government (GOS)'s efforts to: (i) increase power generation capacity on the interconnected power grid through IPPs providing a decrease in generation costs; (ii) rehabilitate key electricity infrastructure; (iii) improve SENELEC technical and commercial performance and quality of services; (iv) select a strategic partner for SENELEC; (v) assess hydrocarbon potential resources- crude oil and natural gas -; and (vi) enhance GOS and SENELEC capacity for energy policy formulation and analysis and for investment planning. However, even with the implementation of the SENELEC APL, a major issue in the electricity sector will continue to be the slow growth in the number of connections and a low level of coverage (about 30%), with access to electricity largely confined to the capital city of Dakar (55%) and four urban centers: St. Louis, Kaolack, Ziguinchor and Tambacounda. Village electrification is limited to areas in the immediate vicinity of these large population centers and some tertiary centers.

1.8 Access to basic Electricity Services in Rural Areas : An important challenge is therefore that the majority of the people of Senegal do not have access to modern forms of energy, such as electricity and petroleum products. It is estimated that less than 4% of the villages in Senegal are electrified, and in these villages less than 30 % of the population have access to electricity. Most of social services (rural health centers, schools, etc.) lack electricity. For their basic energy needs (such as cooking, lighting, and primary transformation of crops mainly for alimentation), these populations depend on fuel-wood for cooking, on wicks, kerosene lamps and some small batteries for lighting, and on human force – frequently from women - for domestic and productive tasks. Traditional fuels are of poor quality, wicks, kerosene and batteries are expensive – financially and economically -, damage people's health and have a negative impact on the local and global environment.

1.9 In its effort to reduce poverty and redress imbalances in development, GOS has concluded that developing rural electrification (RE) is a critical objective. With the assistance of various donors, GOS has undertaken numerous initiatives aimed at bridging the rural/urban energy divide through the development of decentralized and renewable energy systems. Several pilot projects, using both renewable (solar, wind and biofuels) and conventional energies (extension from the grid, small diesels) and testing different technical and institutional arrangements have been implemented. These pilot projects have for most part produced positive results and have confirmed: (i) the interest of rural populations in such services and of local and foreign private entrepreneurs in the energy services delivery business; (ii) the technical and

commercial feasibility of some of the new technologies tested; and (iii) the level of affordability for electricity services in rural areas.

1.10 However, these pilot operations have not been replicated on a large scale in Senegal, have not been taken up by the private sector and/or have not been able to prove their sustainability. The main reasons for this are: (i) lack of a coherent strategy and of an institutional and legal set-up that enables Senegal to successfully implement large scale RE programs; (ii) heavy reliance on a monopoly public utility (SENELEC) to develop too wide a range of markets given its finance and implementation capacities; (iii) dependence on expensive conventional methods for generating and distributing electricity, rather than relying on new approaches and technologies; (iv) too high connection costs and fees for rural households; (v) limited availability of public financing and of Donors' interest; and, (vi) lack of sustained capacity to pay/co-pay for RE and other modern energy services by most rural households.

1.11 Moreover, projects and programs implemented for the social and productive sectors have very often been suffering from a lack of appropriate and timely delivery of energy inputs. As a result, the limited previous rural electrification operations have had relatively little impacts on increasing productive and income generating activities or improving the quality of social services (health centers, schools, water pumping, etc.).

1.12 Studies done during project preparation have also shown that to achieve and leverage effective impacts on poverty it is essential that in addition to providing electricity services to households, it is essential to also provide electricity services to productive uses and to social services.

1.13 Learning from sector issues and experiences in Senegal and from more advanced experiences in other countries, GOS has developed and adopted a new RE strategy which relies on two main strategic axes:

(i) Private-Public Partnership (PPP). An efficient scaling up of rural electrification requires private sector participation to both increase dramatically the implementation and managerial capacities and bring innovative ideas, skills and financing.

(ii) Multi-Sectoral Partnership to maximize impacts on rural development and poverty reduction impacts. Working on the premise that the advent of electricity in an unserved area does not spontaneously induce the use of electricity for social or productive uses, the ASER program will encompass specific activities to ensure that these highly beneficial uses of electricity for poverty alleviation will effectively occur and be optimized. Since the main barrier is that the development of social and productive uses of electricity requires coordinated multi-sectoral actions which seldom occur simultaneously, ASER will develop multi-sector energy sub-programs (PREMs). The PREMs are designed to serve as an effective interface between the development of rural concessions (PPERs and ERILs) and the productive and social programs and projects executed on the same territory by other actors. PREMs will provide the coordination, the technical assistance, and – when necessary – last resort financing for providing electricity services.

GOS also adopted other policies and approaches including :

**(i) establishment of an institutional, legal and regulatory framework, conducive to a truly successful Public/Private Partnership (PPP).** GOS removed the monopoly of SENELEC for providing electricity to rural areas, transferring this responsibility to private sector investors and

operators. This has created an environment for a variety of private agents to play an effective role in rural electrification and thus increase dramatically the implementation capacity. A new tariff schedule (monthly lump sum payment) that incorporates prefinancing of connection cost, internal installation and efficient lamps has been also created to (i) overcome the barrier of high up-front connection fees and installation costs, and (ii) ensure consistency with rural households ability to pay.

**(ii) establishment of rural electrification “concessions” as the main means for the implementing the Senegal’s rural electrification program.** For the purpose of implementing the RE program GOS has divided the country into 18 geographical areas (“concessions” or PPERs). These “concessions” have been designed to be compact and large enough to be viable and attract large private sector players. GOS plans to contract out these “concessions” to the private sector under a competitive and transparent international bidding process with selection criteria aiming at maximizing the number of beneficiaries. The bidding process seeks to create incentives to maximize the private equity brought by the investors, and to optimize the use of the public resources allocated as subsidy. The public subsidy will be disbursed under an Output Based Aid (OBA) mechanism (see Annex 6).

**(iii) allowing some parallel small scale electrification projects.** As it would take time to award the 18 concessions to private operators some villages or communities may want to have access to electricity immediately. To address such concerns and take advantage of opportunities smaller concessions (ERILs) will be awarded. Such small projects will be developed by capable local communities and stakeholders (Local Governments, Consumer or Emigrant Associations, Village Groups and other Community-based Associations and private entities). The ERIL projects will be: (a) locally initiated, i.e. its developer(s) is/are public or private operator(s) in the area targeted for electrification interested in operating and participate in the financing of a small electricity concession, (b) geographically limited, usually to a small area or a village, (c) not part of an area targeted for rural electrification in the short term (no PPER or SENELEC concession for this territory or the holder of the concession is planned for three years).

**(iv) “technology neutrality” for rural concessions.** Previous pilot experiences and international precedents have demonstrated the maturity of innovative off-grid solutions. As a consequence, to the extent that they respect the minimum service requirements set in the tender documents, bidders for the concessions will be free to choose the technology (either grid extension, mini-grids or off grid individual solutions) they will use to achieve the quantitative objectives set in the tender documentation. To reinforce incentives for optimal mix of technologies, a GEF grant will be used by the GOS to level the playing field for renewable technology by financing technical assistance and capacity building activities, and enabling the internalization of positive global environmental externalities through limited complementary targeted investment subsidies.

## **2. Rationale for Bank involvement**

2.1 One of the main Bank contributions regarding RE programs is its ability to disseminate successful approaches to resolve access issues, by building on its operational experience and analytic work in supporting rural energy and household energy programs in over 30 developing countries. A second factor is that the success of this project is dependent on the role of the private sector; the Bank’s presence would provide private sector investors and operators needed comfort to undertake investments in a new market. A third major contribution of the Bank would be in donor coordination. For the biomass component, the Bank, through the PROGEDE operation, has the intellectual leadership and proven operational experience to continue progressing the traditional fuels agenda.

2.2 The most recent CAS was presented and approved by the Board on April 17, 2003. The CAS derives directly from the PRSP of Senegal which pillars are: (i) wealth creation; (ii) capacity building and social services; (iii) assistance to vulnerable groups; and (iv) implementation of the PRSP strategy and monitoring of its outcomes.

2.3 IDA supports the achievement of the PRSP goals through its existing lending portfolio (especially in water, education, transport, and private sector), CAS lending program, advisory services, and capacity building for monitoring and evaluation. In support of the PRSP, the CAS proposes a base case lending program of US\$290 million, plus significant advisory services. The proposed project is envisaged in the base case scenario of the CAS.

### **3. Higher level objectives to which the project contributes**

3.1 A major objective of the Senegal CAS is to expand the supply of infrastructure services, most prominently among the poor, to lower service costs and to promote private sector development, as a way to support two pillars of the Government's PRSP: (i) wealth creation for growth; and (ii) capacity building/development of social services for equity. The CAS selected these two pillars because they have a strong impact on the third PRSP's pillar (iii) improvements in the living conditions of the poor.

3.2 The project will contribute to this objective by (i) supporting the sustainable provision of basic electricity infrastructure and services, and (ii) continuing to advance the development of the traditional biomass sub-sector, thereby ensuring the sustainability of the urban woodfuel supply chains, the protection of natural resources and rural ecosystems, and the generation of significant economic, social and environmental benefits in the rural areas.

## **B. PROJECT DESCRIPTION**

### **1. Lending instrument**

1.1 The proposed operation is an Adaptable Program Loan (APL). It will support the phased development of policies, institutions, and investments for increasing access of rural populations to electricity or to improved services resulting from electricity to 70 percent of the population by 2016 compared to less than 10 percent at the present time. Also the first phase of the program will include technical assistance support for expanding community-based woodfuels management programs in peri-urban and urban areas and support for developing renewable energies through GEF grant financing. This assistance will support the ongoing Sustainable Energy Management and Inter-Fuel Substitution Options Component of PROGEDE II.

The APL is appropriate for supporting Senegal's rural electrification program because the application of the proposed rural electrification model requires a substantial change in approach. It is based on developing effective partnerships between the public and private sector, whereas in the past rural electrification was mainly a program of the Government. Experience in other countries has shown that the policy and institutional framework necessary to achieve this partnership is likely to require time, adjustment and expanded resources. Therefore, the basic approach is to begin by strengthening the policy and institutional framework and testing it on selected representative investment projects (Phase 1 of the APL). This will allow the validation of the model with any necessary changes before its replication on a wider scale (Phases 2 and 3 of the APL). Furthermore, both the Government and the private sector operators want Bank Group

commitment to the entire program because of the long-term nature of the concession contracts that the program promotes.

## **2. Program objective and Phases**

### **Program Objective.**

2.1 The main development objective of the proposed rural electrification program is to support the progressive transformation and improvement in the living conditions of rural Senegal. It will achieve this objective by: (i) providing lighting and access to modern communication to rural households; (ii) improving delivery of social services by providing electricity to potable water delivery systems, health clinics, schools, etc.; and (iii) enhancing economic productivity through the provision of electricity for productive purposes.

### **Program Phases.**

2.2 The APL will span 12 years (2005 to 2016) with implementation in three phases. It will establish 18 primary concessions along with about 140 small local electrification initiatives (ERILs) and about 15 to 20 multi-sector energy projects (PREMs) to enhance the linkages between electrification and small business productivity and improved social service delivery. The first phase will concentrate on strengthening policy and institutional development while testing a few representative pilot projects. Given successful results in this phase, the second two phases will accelerate the level of investment in rural electrification, extending coverage to new areas and subsequently increasing the intensity of coverage. Assistance to the biomass sector will take place in the first phase only, serving as a bridge to extended efforts through a PRSC.

2.3 *Phase 1 (2005-2008)* will build capacity for rural electrification project management and implement some of the instruments designed during the project's preparation phase. This phase will include investment in and management of: (i) four concessions; (ii) some well-defined local initiative projects (ERILs); and (iii) the first generation of PREMs in three concessions.

2.4 *Phase 2 (2009-2012)* will complete the building of capacity and increase the investments in the large concessions, the ERILs and second generation of PREMs. This second phase will be initiated under three conditions. First, the concessions awarded in Phase I have to show evidence of economic and commercial viability. Second, GOS must continue to demonstrate its commitment to the overall program. Third, the institutions managing the project, particularly ASER, have to show that they are capable of managing Phase 2.

2.5 *Phase 3 (2013-2016)* will complete the development of the planned 18 concessions. It will focus particularly on increasing the density of the coverage and productive demand in the concessions awarded in the first two phases.

## **3. Project development objective and key indicators**

3.1 The project's development objective is to increase the access of the Senegal's rural population to modern energy services and to ensure the environmental and social sustainability of woodfuels in urban and peri-urban areas. The project has three indicators for achievement of the rural electrification objectives by end year 2016. First it will result in the direct or indirect benefits (such as improved educational and social services) of electricity services to 70 percent of Senegal's rural communities. Second, it will provide 30 percent of Senegal's rural communities with direct access to electricity. Third, it will contribute to multi-sector programs (PREMS) that support increased productivity of small and medium enterprises and enhance the quality and efficiency of programs in key sectors - such as in health, education, water and agriculture- in order to accelerate the improvement of living standards in rural areas.

3.2 Environmental impacts. The program will have a positive environmental impact at the global and local levels. At the global level, it will help reduce net CO2 emissions. At the local level, it will promote conservation by encouraging the use of: (i) renewable sources of energy; (ii) efficient lamps and improved cooking stoves; (iii) improved carbonization methods and improved woodfuel stoves, and implement sustainable forest and natural resource management which will also reduce deforestation.

**Key indicators**

3.3 For the RE program, the key output and outcomes indicators are presented below:

<b><u>Output indicators for RE</u></b>			<b><u>Phase 1</u></b>		<b><u>Phase 2</u></b>	<b><u>Phase 3</u></b>
			Year 2	Year 4	Year 8	Year 12
<b><u>Indicator 1</u></b>						
Awarding the 18 concessions over the 3 phases of the program	Number of concessions awarded	IDA-financed	2	3	6	9
		Other donors	2	3	7	9
		Total	4	6	13	18
<b><u>Indicator 2</u></b>						
Increase the number of local operators providing electricity through ERILs	Number of ERILs projects					
		All donors	20	40	90	140
<b><u>Indicator 3</u></b>						
Increase the number of PREMs implemented	Number of PREMs	IDA-financed	2 to 3	6 to 9	12 to 15	15 to 21
		Other donors	tbd	tbd	tbd	tbd

3.4 The main outcome indicator is the increase in the number of rural households benefiting directly from electricity, shown for each phase of the APL in the table below. In addition, the project will develop specific impact indicators for assessing the performance of the PREM component. The project will also provide technical assistance to support institutions involved in RE, during the first year of the project ( See paragraph C3) in designing and implementing procedures for evaluating the entire rural electrification program.

<b><u>Outcome indicators for RE</u></b>			<b><u>Phase 1</u></b>		<b><u>Phase 2</u></b>	<b><u>Phase 3</u></b>
			Year 2	Year 4	Year 8	Year 12
<b><u>Indicator 1</u></b>						
Increase the number of households benefiting directly from electricity	Number of households electrified	IDA-financed (PPER)	1,500	16,000	50,000	100,000
		Other donors (PPER)	1,000	14,000	60,000	100,000
		ERILs (all donors)	1,000	5,000	15,000	25,000

		<b>Total</b>	3,500	35,000	125,000	225,000
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3.5 For the biomass component, the following indicators/targets will be monitored:

<b>Outcome Indicators for the Biomass Component</b>	<b>LEVEL</b>
Volume of annual sustainable woodfuel production capacity for marketing in the urban and peri-urban energy markets.	60,000 tons/yr of charcoal (equivalent to 300,000 tons/yr of fuelwood)
Number of hectares brought under community-based sustainable management systems within the project implementation zone.	230,000 ha
Number of improved carbonization units installed.	150 Units
Number of improved woodfuel stoves disseminated as a result of the Component;	120,000 Units
Number of improved alternative fuel stoves disseminated as a result of the Component	30,000 Units
Total sustainable incremental revenue generation capacity among participating villages (US \$/yr)	US \$6 million/ yr

**4. Project components** (Annex 4: Detailed project description; Annex 5: Project Costs; Annexes 9 and 10 for the GEF Grant).

4.1 The proposed project, which corresponds to Phase I of the APL, consists of four components, three components support the electrification of rural areas and one component supports improved biomass management in peri-urban and urban areas. The first component supports access to electricity services in rural areas. This component will help rural households meet basic electricity needs. It will also support the multi-sectoral programs that will help to maximize the social and economic benefits electricity access. The second component supports capacity building and institutional strengthening of institutions involved in managing the long-term electrification program that the project supports. The third component supports technical assistance, communication and monitoring of rural electrification projects. The fourth component supports sustainable and participatory woodfuels management, part of PROGEDE II.

4.2 The estimated total cost of the program is US\$300 million, of which Phase 1 (the proposed project) will cost US\$50.0 million. For Phase 1, IDA will contribute US\$29.9 millions and GEF US\$5.0 million. The rest of the financing will come from the private sector, other Donors and the Government. The estimated contribution of IDA for the all three phases of the 12-year program is US\$100 million.

4.3 Component 1: Financing of Investment – Total Costs: US\$30.8 million of which IDA US\$16.25 millions & GEF US\$3.6 millions. (Details are provided in Annexes 4 and 5). Project component 1 comprised the following 2 subcomponents:

- (i) OBA (output-based-aid) type capital subsidies under a transparent and competitive concession bidding process to (a) ensure economic sustainability of rural electrification in priority concession areas (Concession PPER); (b) ensure adequate energy provision in other sectoral programs to be implemented in the primary concession areas; and (c) increase productive use of electricity of small and medium

enterprises (total costs: US\$26.7 millions of which IDA US\$15.0 millions & GEF US\$3.0 millions).

Investment costs would be funded by a mix of private equity, commercial bank loans, and grants for the subsidized portion of the capital expenditures, channeled through a Rural Electrification Fund (FER). New financing instruments (refinancing and guarantees) will be developed during project implementation so as to mobilize required additional financing from commercial banks.

In Phase 1 IDA financing will concentrate on three rural concessions (Dagana-Podor, Mbour, Kolda-Velingara). Those three concessions were surveyed during preparation of the local electrification plans (PLEs) and selected because they are a representative sample of the 18 concessions. In order to test the concept and practical modalities, only one or two PREMs per concession will be implemented.

- (ii) Financing under similar mechanisms for smaller concessions - the ERIL projects - (direct proposals for smaller specific areas). (Total costs:US\$ 4.1 millions of which IDA \$1.25 million & GEF \$0.6 million). Assistance for preparing ERIL projects will also be provided as potential sponsors of ERIL projects will not necessarily have the competence and expertise for preparing their business proposals.

4.4 Component 2 – Capacity Development and Institutional Strengthening. Total costs: US\$5.5 million (IDA US\$2.55 millions & GEF US\$0.4 million)- (Details are provided in Annexes 4 and 5). This would finance the following:

- (i) Operational support, training and technical assistance to the Rural Electrification Agency (ASER) to enable the agency to carry out the RE program (US\$3.65 millions – IDA US\$1.0 million & GEF US\$0.1 million). The project will finance four key new staff positions in ASER, capacity building, training and technical assistance programs. It will also finance some goods and equipment.
- (ii) Operational support, training and technical assistance to build capacity of the Regulatory Commission (CRSE) to enable the Commission to carry out effectively its responsibilities of contracts oversight, monitoring and compliance, in particular for rural concessions; (US\$0.25 million – IDA US\$0.25 million).
- (iii) Support for institutional strengthening of the Ministry of Energy to monitor program implementation progress, its consistency with the energy sector strategy and policy reform agenda (US\$0.20 million – IDA US\$0.20 million).
- (iv) Support for institutional strengthening of the multi-sectoral committee to enable it to formulate and monitor sustainable sectoral energy programs in targeted rural concessions (US\$0.1 million – IDA US\$0.10 million).
- (v) Assistance to enhance the participation of international and local private stakeholders in rural electrification concession bidding processes (PPERs and ERIL projects). This subcomponent will also focus on the implementation of a set of actions to maximize economic impact and job creation in rural areas (US\$1.05 million – IDA US\$0.75 million & GEF US\$0.3 million).
- (vi) Support for implementation, capacity development and institutional strengthening of the FER through the banking sector (US\$0.25 million – IDA US\$ 0.25 million).

4.5 Component 3 – Project implementation, communication, and monitoring & evaluation. Total costs: US\$2.8 million (IDA US\$2.25 millions & GEF US\$0.55 million). (Details are provided in Annexes 4 and 5). This would finance the following:

- (i) Technical assistance for Multi-Sectoral Energy Programs (PREMs) (US\$0.5 millions – IDA US\$ 0.5 million). This component will support: (a) the finalization of the organizational and legal aspects of the PREMs identified under the first three concessions; (b) effective implementation of these PREMs; (c) identification and preparation of PREMs in the three concessions to be implemented under phase 2; and (d) development of the specific “micro-finance” PREM.
- (ii) Technical assistance to ASER (US\$1.2 million – IDA US\$0.95 million & GEF US\$0.25 million). This will include resources for: (a) ERIL projects preparation; (b) drawing up the phase 2 Local Electrification Plans (PLEs); (c) update, harmonization and methodical capitalization from existing PLEs; and (d) pilot operations related to technological innovation.
- (iii) Information, Education and Communication subcomponent (US\$0.60 million – IDA US\$0.45 million & GEF US\$0.15 million). This subcomponent intends to support the transparency and the credibility of the RE program through a consultation process, while ensuring that the RE program objectives are publicized.
- (iv) Monitoring and Evaluation (US\$ 0.5 million – IDA US\$0.35 million & GEF US\$0.15 million). This subcomponent will focus on: (a) monitoring and impact assessment through formulation and implementation of a specific methodology; and (b) management of contracts signed with operators and entities responsible for the program (ASER, FER, etc.) through a series of audits and reporting (accounting, financial, organizational, procurement).

4.6 Component 4 – Biomass Component. US\$4.6 millions (IDA US\$4.1 millions). This would consist of two subcomponents: Sustainable Woodfuels Supply Management; and Demand Management and Inter-fuel Substitution.

Sustainable Woodfuels Supply Management subcomponent will entail the implementation of: (a) selected activities to consolidate the ongoing PROGEDE project interventions; and (b) sustainable community-managed forest management systems over an incremental area of 230,000 ha in the Sedhiou, Bakel and Kedougou Departments (Tambacounda and Kolda) within a period of three years, at the end of which a minimum of 60,000 tons of sustainable charcoal (equivalent to 300,000 tons of sustainable fuelwood) will be annually produced by the participating 100 villages. The component would further seek to expand the protective buffer zone around the Niokolo-Koba National Park (National and International Biodiversity Reserve).

This subcomponent would finance technical assistance; small tools and field equipment for the rural communities; office and field equipment for the regional offices of the Forest Service; forest fire control equipment; materials and tools for the implementation of rural community projects (carbonization units, energy service platforms, agro-forestry enterprises, marketing chains, etc.).

Demand Management and Inter-fuel Substitution subcomponent will entail the implementation of: (a) TA to villages participating in the Sustainable Woodfuel Management subcomponent to increase their access to modern energy services; (b) rural community and SME modern biomass energy development pilot/demonstration initiatives; (c) decentralized energy information and planning systems; (d) selected studies (household “indoor” air pollution”;

renewable energy inventory/potential; household energy pricing, etc.); and (e) continued supervision and technical support of the revolving fund mechanism for the promotion of private sector/NGO-based improved household cooking stoves and interfuel substitution initiative.

This subcomponent will finance technical assistance, office equipment for the *Direction de l'Energie and the Direction des Eaux et Forets*, computers for decentralized energy information systems, publicity/communication services for the promotion of improved household stoves and interfuel substitution, renewable energy equipment (briquetting and micro-distillation equipment, etc.); and technical studies (including household "indoor air pollution" measurement equipment).

## **5. Lessons learned and reflected in the project design**

5.1 The project's design has drawn lessons from recent experience with rural electrification programs in a number of countries, including Bangladesh, Cote d'Ivoire, Indonesia, Morocco, and Uganda. The following sections discuss the main lessons and how the project's design reflects them.

Lesson 1: Well-designed public/private sector partnerships are more effective in building and maintaining rural electrification than public sector programs alone.

5.2 In most developing countries, the rural electrification programs that the public sector has designed and managed have not resulted in large-scale extension of reliable electricity services to rural populations. The public sector often does not have the incentive or the skills in affordable design, commercial and financial management to build and maintain these services. The private sector is more likely to have these skills and find the least-cost solutions for meeting rural electricity demand. Therefore, the public sector's role should be limited to providing viable private incentives for private sector investment in and management of rural electricity services as well as regulatory authority to ensure fair pricing of electricity. Also, experience has shown that governments need to offer sufficiently large procurement packages (concessions) to attract private sector investment in and operation of electricity systems in rural areas.

5.3 *Reflection in Project Design.* The core of the project's design is a partnership in which the Government of Senegal sets the policy and designs the incentive structure. The country's new legal framework allows the private sector to play a key role in the investment, operation, and maintenance of rural electricity services. The Government has eliminated the monopoly of the public electricity authority SENELEC and private producers may now generate and distribute electricity. It also has established an independent regulatory authority and an agency (ASER) to provide technical and financial assistance in the design and implementation of rural electrification programs. ASER will receive support from the Ministry of Energy and the project will provide technical assistance to build the agency's capacity to manage the concessions that will result from the project. The project's preparation phase gave specific attention to the involvement of the private sector in project design. A large number of private companies attended the workshop on the project's design. These companies expressed their interest in the project and agreement with the general approach. The workshop indicated that a key element in the interest of the private sector is the project's offer of 18 sizeable concessions for a period of 25 years.

Lesson 2: Investment incentives in the form of subsidies to private sector developers/operators should be based on service output.

5.4 The traditional approach of providing the private sector subsidies for equipment to build rural electricity systems has not been effective due to weak efficiency incentives and lack of performance accountability. Subsidies based on the output of electricity services delivered are more likely to produce efficient, reliable and sustainable results.

5.5 *Reflection in Project Design.* The project will provide output-based subsidies under a transparent bidding process for concessions to build and operate electricity services. The funding for rural electrification investments under the project will come from private equity, commercial grants and subsidies for capital expenditures. The project, during its implementation, also will develop new instruments to mobilize commercial bank support, including guarantee mechanisms.

Lesson 3: Rural electrification programs need complementary multi-sector measures to meet poverty alleviation objectives.

5.6 The impact assessments of rural electrification programs have demonstrated that social and productive uses of electricity do not materialize automatically after the construction of rural electricity infrastructure. Concrete multi-sector measures are necessary to link electricity services to productivity improvements and social services that will help alleviate rural poverty.

5.7 *Reflection in Project Design.* ASER will receive support from the Government's Inter-Sectoral Committee to ensure the incorporation of multi-sector needs and interests into the design and management of the rural electrification program. Each phase of the electrification program's development will include projects (PREMs) linking electricity services to specific needs for improved small business productivity and social development programs.

Lesson 4: Electricity services in rural areas are fundamentally different from services in urban areas and require innovative approaches in design and management.

5.8 The extension of electricity services in urban areas usually involves household connections to an existing distribution line from a main power grid. However, in rural areas, connections often require new generation and distribution facilities. The creation of new infrastructure can be expensive, resulting in high connection costs. Furthermore, the electricity needs of rural consumers are often different than those of urban consumers with the latter likely to have access to more electrical appliances. Rural electricity consumers usually require subsidies to be able to afford the cost of connection to a power source. New technologies and decentralized approaches are needed to lower investment and operating costs to make service more affordable for rural communities and minimize subsidies.

5.9 *Reflection in Project Design.* The project's preparation phase included the evaluation of pilot projects to tailor electricity systems to meet rural needs and make them affordable to the rural community. These projects cover both conventional and renewable fuels. The bidding documents for private concessions under the project will allow bidders to choose the most appropriate technology for providing service to a given community. To encourage an optimal mix of technologies, the GEF grant portion of the project will help the Government build the technical capacity to evaluate the most promising renewable technologies and design an appropriate incentive framework.

## **6. Alternatives considered and reasons for rejection**

6.1 The project considered four options that it rejected in favor of an APL for rural electrification in Senegal. These are as follows:

6.1.1 Follow the conventional approach to rural electrification. This approach would extend the national grid to rural areas. However, such extensions to serve low demand centers in isolated areas would be very costly to operate and maintain. Under a regime of national tariffs, these extensions would require heavy implicit cross subsidies and the Government would not recover costs. This option was rejected because it would not be sustainable due to the need for continued long-term subsidies. It also would not allow Senegal to benefit from some of the low-cost rural electrification technology that has developed internationally.

6.1.2 Rely on the private sector to invest in rural electrification without supporting any program of investment incentives. A second option would be to reserve government actions and Bank support to improving the legal and regulatory framework with technical assistance and not provide any investment support. This option was rejected because experience in the Africa region has shown that private sector investment in rural electrification would not take place without targeted government measures to stimulate private sector interest. In particular, programs of output-based incentives and some form of political risk mitigation to the private sector have been very successful in expanding electricity access to rural areas.

6.1.3 Support a program of investment in rural electrification but limit the first operation to technical assistance. This option would focus the initial operation only on technical assistance to strengthen the overall investment framework and the related government capacity for policymaking and monitoring of a competitive power industry. Subsequently the Bank would provide financing for rural electrification investments as a catalyst for private sector involvement. The reason for rejecting this option is that the Government already has set up most of the necessary institutional, legal and regulatory framework for private sector participation in rural electrification. This framework has removed the monopoly of the public power authority and allows competitive awards of power development concessions. Furthermore, the Bank and the Government, recognizing the importance of rural electrification to the Government's poverty reduction goals, decided that it was important not to delay the investment program.

6.1.4 Support investment in rural electrification with a sector investment credit instead of an APL. The sector investment credit would provide both investment and technical assistance within the framework of an overall development program but without the APL's level of commitment or flexibility. This option was rejected because of the greater level of assurance an APL would provide in promoting private sector operators to take on long-term electricity concessions in rural areas and the need for flexibility in program implementation due to the introduction of new institutional approaches and technologies.

## **C. IMPLEMENTATION**

### **1. Partnership arrangements**

1.1 The Bank plans to finance 9 of the 18 concessions, three of which (Dagana-Podor, Mbour, Kolda-Velingara) are part of the proposed Project. So far five other donor agencies have expressed interest in providing financing for the program. The German Development Agency (KfW) and the African Development Bank (AfDB) have confirmed their interest in financing specific concessions and participated in the appraisal of the proposed World Bank operation. AfDB has selected two concessions (*Kébémér-Louga-Linguère* (2005) regrouping two concessions) for financing during Phase 1 of the program and another two concessions during Phase 2. KfW plans to finance two concessions during Phase I (*Fatick-Gossas and Kaolack-Nioro* concessions), the Spanish Cooperation has expressed interest in financing one concession

in the Saloum Delta Biosphere Reserve, where it is already supporting a major solar energy program. ASER is in the process of preparing procedures for awarding this concession following a process agreed with the Bank. In addition, during the project's "Workshop for Private Sector Participation", held in Dakar from 29 March to 1 April 2004, the West African Development Bank (BOAD), and the Islamic Development Bank (BID) also announced their interest in contributing to the rural electrification program.

## **2. Institutional and implementation arrangements (Annex 7)**

2.1 Rural Electrification Components ASER and Other Government Agencies. The Government has created a single, national, and autonomous entity - the *Agence Sénégalaise de l'Électrification Rurale* (ASER) to implement the planned rural electrification program. According to Senegal's Electricity Reform Law n° 98-029, ASER's principal mission is to provide technical and financial assistance to promote rural electrification in support of Senegal's energy policy. Decree no. 99-1254 of 30 December 1999 established ASER as an "autonomous service under the Ministry of Mines and Energy. It also defines the principal organs of ASER, which are the Management Board, the General Manager and Loans and Subsidy Committee. Annex 6 describes the institutional and regulatory framework that applies to ASER's responsibilities for rural electrification. ASER will have the technical and fiduciary responsibility for the project. However, ASER will require support from CRSE with respect to awarding concessions, licensing, contract monitoring, etc. and from the Inter-Sectoral Committee in the monitoring of the PREMs. Therefore the project will provide assistance to strengthen the capacity of all three of these agencies. Annex 4 (Detailed Project Description) provides the details of the project's institutional strengthening measures.

2.2 The Private Sector. As discussed earlier, the private sector has confirmed its interest in rural electrification concessions. It will play the key role in the development and operation of the rural electrification facilities to meet the electrification program's electricity access objectives by 2016. Given the importance of the private sector to the success of the electrification program, the project's preparation work gave special attention to maintaining close contacts with private sector stakeholders, assessing their perception of the project and their acceptance of its institutional, legal and regulatory framework. In particular, the project's preparatory phase included a "Workshop for Private Sector Participation" held in Dakar. Private sector participation at this workshop far exceeded expectations. During a three-day period over 200 people attended the workshop, representing more than 60 firms, including 14 international firms.

2.3 Biomass Component. The Ministry of Environment and Protection of Nature (MEPT) and the Ministry of Energy and Mines (MEM) will be jointly responsible for implementation of the PROGEDE II component. The supervision of this component will benefit from the existing management structure, systems and procedures that PROGEDE already has established. Specifically, the National Water and Forest Directorate (NWFD/MEPT) will be responsible for implementing the sub-component for the sustainable management of woodfuels supply. The Energy Directorate (DE/MEM) will be responsible for implementing the sub-component for demand management and inter-fuel substitution options.. The existing senior level Steering Committee of PROGEDE will oversee the implementation of the component and the existing *Cellule des Combustibles Domestiques* housed in the DE will serve as an institutional conduit for multi-agency coordination.

## **Financial Management (Annex 7.A)**

2.4 The main conclusion of the appraisal of ASER's financial management capabilities carried out during project preparation indicates that the agency needs to be strengthened. Such capacity building needs to be carried out as soon as possible, during the period preceding Credit Effectiveness. An Action Plan has therefore been agreed with the Government and ASER. (attachment 7.A.1)

2.5 The 1999 decree establishing ASER stipulates that the Agency must maintain its accounts according to the prevailing commercial rules and principles (SYSCOA). The Administrative and Financial Division (DAF) of ASER is responsible for the agency's financial management; it consists of a director and four staff. Under the proposed project, the DAF will also be responsible for management of the donors special accounts (SAs) and of ASER's project accounts. The project will provide assistance in reorganizing ASER's structure and strengthening the financial management capability of the DAF. In particular, the project will support the creation of the position of Chief Accountant and of an unit responsible for Debt Management. This unit will manage all donor funds received in support of rural electrification, including the IDA Credit for the project. The unit will inter alia be responsible for establishing Claims for Reimbursement (*Demandes de Remboursement de Fonds - DRF*) as well as Claims for Direct Payments (*Demandes de Paiements Directs - DPD*). The existing *Cellule de Préparation des Réformes du Secteur de l'Energie (CPRSE)* currently in DE/MEM has acquired a solid experience in managing finances under other World Bank Projects. The Administrative and Financial officer of that entity will join ASER to facilitate project implementation.

2.6 The 1999 Decree establishing ASER also specifies the agency's audit functions and requires ASER's submission to controls by the Audit Court. ASER's internal audit unit reports to the General Manager. This unit consists of one internal auditor who receives assistance from one staff in performing all of the agency's audit functions. The agency's internal auditing function will ensure that ASER meets the Credit's conditions for disbursement and financial management and maintains appropriate supporting documentation. In particular, ASER's financial management system should be capable of providing necessary information promptly on the sources and uses of all funds. The agency will also recruit an external auditor to audit the agency's accounts according to accepted international standards. A Chief Auditor appointed by the Supervisory Council is responsible for external auditing along with other external auditors selected by competitive bidding.

## **Disbursements (Annex 7.A)**

2.7 Rural Electrification Components. Disbursements on World Bank projects in Senegal are managed by the Debt and Investment Directorate (Direction de la Dette et de l'Investissement - DDI) in the Ministry of Finance. With respect to the Project Rural Electrification components, two Special Accounts (SAs) will be kept for the IDA financing and two for the GEF financing. One SA for IDA and one SA for GEF will be used for financing investment in rural areas (PPER concessions and ERILs projects) and the two other SAs will be used for other eligible expenditures (capacity building, technical assistance, etc.). The Ministry of the Economy and Finance (notably DDI) has decided that ASER will directly manage the all of the Special Accounts. ASER will provide DDI with all the information required to ensure adequate managements and prompt replenishment of the four SAs. Counterpart fund requirements will be made available by the Ministry of the Economy and Finance, in the form of an annual subsidy to ASER, to be paid in two equal tranches.

2.8 Biomass Component. For the implementation of this component, the Project will keep the current PROGEDE arrangements. However, a new Special Account will be opened as this is a new Credit. The disbursement procedures for this component will be the same as those for the existing PROGEDE I.

### **Procurement Activities and Arrangements (Annex 7.B)**

2.9 Rural Electrification Components. ASER will handle all procurement for the rural electrification components. The agency has a staff of 26 persons of which 15 are professional. The Procurement Unit of ASER has no staff. However, key ASER staff members have received training in procurement using World Bank procurement guidelines. They also have acquired some experience in the procurement of goods, works and services. The procurement assessment that took place during the project's preparation phase reviewed the organizational structure for implementing the project and the interaction between the project's staff in charge of procurement and the Ministry in charge of the sector. The procurement assessment concluded that ASER should hire two specialists: One specialist will focus on all procurement matters not directly related to the concessions. The second specialist will handle procurement processes and the award of the rural concessions. ASER will finance the procurement specialist with its own funds and the IDA Credit will finance the specialist in concession contracting and management.

2.10 The first procurement specialist that ASER will hire should be familiar with the World Bank's procurement procedures. This specialist will work closely with the local communities to ensure efficient and timely project execution through compliance with the procurement schedules agreed with the Bank. In addition the specialist will : (i) prepare and update the procurement plan for the project; (ii) monitor the progress of procurement; (iii) assist the bidders in the preparation of bidding documents and advertisements for goods and services and request for proposals for consulting assignments; (iv) be responsible for bid opening and evaluation; and (v) advise the implementing agencies on procedural matters.

2.11 With respect to the second specialist, the Bank's assessment is that ASER does not yet have expertise in the administration of concession contracts between the public sector and private operators. The awarding of concession contracts is a complex task that requires an in-depth knowledge of the field . In addition, the number of contracts to be handled simultaneously will by far exceed the number ASER has handled so far. Therefore ASER and IDA have agreed that ASER will hire a Concession Contract Administrator, which the project will finance during the first phase of the APL.

2.12 Biomass Component, Procurement capabilities have been developed under the PROGEDE I project and will be available for implementing the biomass component.

### **3. Monitoring and Evaluation of outcomes/results**

3.1 Rural Electrification Components. ASER will benefit from technical assistance to complete the design of a comprehensive and tailor-made project monitoring and evaluation system. Such system will evaluate progress in meeting development objectives, particularly impact on poverty reduction, and of indicators of implementation of project components, during supervision, at mid-term and at completion (Annex 3). The following table delineates the overall monitoring and evaluation framework.

### Project Monitoring and Evaluation Framework

<b>Development Objectives</b>	<b>Issue</b>	Specific problem that the project is trying to solve and how the problem relates to broader issues.
	<b>Project Dev. Objectives</b>	Expected economic and social benefits that a given project should provide to a community.
	<b>Strategy</b>	Tools and methods that the project will use to solve the problem.
	<b>Outcomes/Benefits</b>	Intended impact contributing to physical, financial, institutional, social, environmental or other benefits to a society, community, or group of people. Benefits are positive, long-term outcomes.
<b>Indicators</b>	<b>Indicators</b>	Quantitative or qualitative factor or variable to measure achievement of outcomes.
	<b>Baselines</b>	Reference point or standard against which performance or achievements can be assessed
	<b>Frequency</b>	The rate at which measurements of an indicator are taken.
	<b>Targets</b>	The expected result of an indicator that would indicate success.
<b>Institutional Arrangements</b>	<b>Allocation of Responsibility</b>	Assignment of responsibilities to some entity for monitoring and evaluation.
	<b>Funding</b>	Evidence that the arrangements are adequately funded, either through the project or other means
	<b>Data collection Instruments</b>	Surveys, quality assessments, studies
	<b>Use of data</b>	Dissemination, analysis, and other uses of the data after its collection

3.2 Biomass Component. The monitoring and evaluation of this component will take place at mid-term review and at completion. The MEPT and the MEM will apply to this component (PROGEDE II), the same internal monitoring systems and procedures that they developed for the PROGEDE I project.

#### **4. Sustainability**

4.1 Rural Electrification Components. The overall sustainability of the project's objectives for rural electrification and biomass management depends on economic, financial and institutional development factors (See Annex 8: Economic and Financial Analysis of the RE program).

4.2 Economic Factors. The economic sustainability of the rural electrification model that the project promotes will rely on: (i) successful public/private partnerships that receive an attractive, sustainable return on their investment, over a 25-year period, in providing rural electricity services; and (ii) tariffs for these services that are both economically viable and affordable for rural communities. The high level of private sector interest in the project seems to indicate a sizeable potential for private sector partnerships with the public sector in the delivery of rural electricity services. In order to meet affordability criteria, the tariffs for these services should be below or equal to the payment capacity of the beneficiaries as measured in a survey on their previous energy expenditure patterns for candles, paraffin lamps, batteries, etc. At the same time, they should be higher than the total return on capital put up by the private operators, plus the

costs of operating the electricity systems and maintaining them. Annex 1 discusses the principles for setting tariffs and related periodic adjustments to which IDA and the Government have agreed.

4.3 Institutional Factors. The project will rely on the performance of relatively new private and new institutions. These include the private electricity concessions, ASER and CRSE. A critical factor for successful institutional performance is the Government's commitment to maintaining the rural electrification model that the project has adopted. An important part of this commitment is making sure that the public partners have adequate capacity to execute their functions. The Government so far has shown evidence of this commitment by supporting government agencies involved in rural electrification and planning for financial sector policies to increase the availability of financial resources for continued rural electrification expansion. Since 1999, the Government had maintained its commitment to finance ASER's budget. In a letter dated July 23, 2004, the Government has reaffirmed its commitment to the agreed rural electrification policy. The Government also has made available counterpart funds in compliance with donor financing requirements. Furthermore, in support of sustainable investment flows, the Government, during Phase 1 of the project, will design and test incentives for inducing Senegal's banking system to finance medium-term investments in rural electrification, in order to enhance the sustainability of investment flows in the future.

4.4 Biomass Component. There are three key design factors in the project's biomass component that will support the sustainability of its achievements. The first is the transfer of responsibility for the management of the forest resources from the Government to the rural communities. The second is the opening of the woodfuels trading system to village participation. The third is the strengthening of the capacity of the rural communities to manage their own forest resources.

## 5. Critical risks and possible controversial aspects

5.1 Rural Electrification Components. The following table lists the main potential risks that may have an adverse impact on meeting the rural electrification program's objectives along with the proposed risk mitigation measures.

Risk	Risk Rating	Risk Mitigation Measure
(i) Government weakening of its commitment to the new rural electrification strategy and instruments for providing electricity services in rural areas.	M	The Government has confirmed its commitment to the energy sector policy framework and the strategy in an energy policy letter of April 2003 and in a rural electrification policy letter of July 2004. There is no indication so far of potential problems with Government commitment.
(ii) Failure to confirm interest from the international and Senegalese private sectors.	H	The project's preparation gave particular attention to maintaining a dialogue with the private sector and the demonstration of private sector interest during the project's stakeholder workshop was very favorable. The most important tool for mitigating against diminished private sector interest is a continued dialogue with potential private partners and full integration of lessons learned from the first bidding and contractual processes, regarding the incentives that the private sector requires for

		participation.
(iii) Limited ability of consumers to pay for the proposed services.	M	Several studies and pilot projects have demonstrated that consumers frequently rank electricity among the most desired quality-of-life improvements and that rural households are paying a significant portion of their income for energy services. However, the program will require significant subsidies to cover the initial investment.
(iv) Inability of the rural electrification program to sustain its financial viability.	M	The program will require significant subsidies from the Government and the sustained commitment of donor agencies. The phasing approach with specific triggers for moving from one phase to another will provide the necessary reconfirmation of commitments and viability of the process.
(v) Weak management capacity of ASER to implement the program and of CRSE to regulate.	H	The project's design will mitigate this risk by a gradual approach to investment in three phases, ensuring that the key institution-building elements for ASER and CRSE are in place during the first phase.

5.2 Biomass Component. The risks associated with the biomass component are the same as those that the PROGEDE project identified. This include: the potential lack of government commitment, interference with the project from the charcoal traders, the inability of villagers to achieve “resource sustainability.” None of these has materialized so far. Furthermore, the rapid ongoing decentralization of authority in Senegal is very much in line with PROGEDE's promotion of community management of biomass resources. As a result, it is unlikely that the Government will reverse the social, economic and political change that PROGEDE I and the biomass component of this project are promoting. As a result, the risks to the implementation of these components appear to be minimal.

## 6. Loan/credit conditions and covenants

### 6.1 Conditions of Credit effectiveness:

- Subsidiary Agreements (related to transfer of IDA Credit and of GEF Grant as subsidies to ASER ) signed by Republic of Senegal and ASER.
- ASER has recruited an expert (firm or individual) in organization and management under terms of reference and in accordance with procedures satisfactory to the IDA;
- ASER has (a) updated its accounting and finance manual; (b) recruited the following staff to strengthen finance and procurement functions, according to terms of reference and a process satisfactory to IDA: (i) a chief accountant; (ii) an external auditor (preparation of terms- of- reference and short list subject to IDA’s Non Objection); (iii) two qualified, experienced staff members for DFER (director and financial analyst); (iv) one qualified, experienced procurement specialist; and (v) one qualified specialist in concession contracts; and (c) the current CPRSE accountant has transferred to the DAF of ASER.
- ASER has modified its accounting system to enable adequate accounting and financial management of project resources and expenditures.

- ASER and the Government have prepared a project implementation manual satisfactory to IDA.

## 6.2 Covenants

- ASER will establish and maintain a financial management system acceptable to IDA.
- The rules for awarding concessions (PPER and ERILs) should not be modified without IDA prior agreement.
- Management of ASER. The key staff of ASER ( General Manager, Financial Manager, person in charge of competitive bidding, etc.) should at all time be acceptable to IDA. Any new recruiting should be done through transparent competition.
- ASER Activity report. Three months after the end of ASER fiscal year, ASER will submit to IDA for comments an Activity report in a format and in a substance acceptable to IDA.
- ASER Annual Work Program and Budget. Two months before the end of ASER fiscal year, ASER will transmit to IDA for comments, its annual Work Program, operating budget and investment budget for concessions and ERILs projects.
- Audited Financial Statements of ASER. No later than six months after the end of its fiscal year, ASER will provide IDA with its audited financial statements, the auditors report to Management as well as the response of ASER Management to the auditors comments.
- Information-Communication. ASER will maintain a website describing its on-going activities and the activities planned for the current fiscal year.
- Tarriffing principles for electric services in rural areas. The principles of setting tariffs for electric services in the rural areas cannot be modified without IDA's prior agreement.
- Any Concession or ERILs project will be subject to an environmental and social assessment in conformity with the environmental and social policy frameworks agreed with IDA.
- Project Mid-term Review. A comprehensive project mid-term review will take place about two years into project implementation involving the main interested parties.
- The implementation manual for the project cannot be modified without IDA agreement.

## D. APPRAISAL SUMMARY

### 1 Economic and financial analyses (see Annex 8)

#### 1.1 Economic analysis.

1.1.1 The economic analysis of the project's rural electrification investments consists of three parts: (a) a demand analysis for electricity services; (b) a technical and economic analysis of investment alternatives (including capital costs and operations/maintenance costs); and (c) a cost/benefit analysis of the rural electrification program as a whole and for the portion of the investment program that IDA will finance. The demand analysis identifies the geographical location of the potential beneficiaries, the rural electricity services that the program/project will provide and the willingness of consumers to pay for these services. The project's appraisal has conducted separate demand analyses for each of the three types of investment projects/programs - concession projects; ERIL projects, and PREMs. The cost-benefit analysis compares the costs and benefits to rural communities of meeting energy needs "with the project" and "without the project" to determine the incremental costs and benefits of the rural electrification program. The economic costs of the ASER's rural electrification program consist of: investment costs, operations/maintenance costs; costs of capacity development and of the technical assistance; and overhead costs of the specific institutional arrangement (mainly the cost of operating ASER).

1.1.2 In calculating the economic internal rate of return (EIRR) and the net present value (NPV) of investments in the rural electrification program, the analysis considers only the benefits that are quantifiable. It includes only the direct benefits of electricity to consumers. It does not for example, include the indirect benefits that accrue to rural populations that will not have *direct* access to electricity but will benefit *indirectly* from access to improvements in social services that result from electrification. The total benefits consist of the gross consumer surplus resulting from electrical lighting and use of television and audio devices. The determination of the consumer surplus is based on estimated demand curves resulting from field surveys indicating the willingness to pay for electricity and the benefits that the consumer expects from electricity access.

1.1.3 The total benefits also include the global environmental benefits (avoidance of greenhouse gas emissions) that will result from the substitution of renewable energy alternatives for fossil fuels. These benefits will accrue from both the use of renewable energy sources for rural electrification and demand side management that is likely to result from the dissemination of energy efficient devices, mainly the use of efficient fluocompact lamps.

1.1.4 The economic analysis (base- case scenario and sensitivity analysis) shows high and robust EIRRs for ASER's rural electrification program as a whole. Table 1 below summarizes the results of the analysis and Annex 8 provides the details of the methodology, calculations and assumptions for the economic analysis.

**TABLE 1: Results of the Economic Analysis and Sensitivity Analysis for the whole ASER's Program**

(In million US\$)

	<i>NPV Project Cost</i>	<i>NPV Total Benefits</i>	<i>NPV Global Environment Benefits</i>	<i>NPV Net Benefits</i>	<i>EIRR</i>
<b>Base Case</b>	<b>273.4</b>	<b>372.8</b>	<b>1.7</b>	<b>101.0</b>	<b>28.45%</b>
Investment Cost +20%	299.6	372.8	1.7	74.9	23.30%

O&M Costs +20%	294.3	372.8	1.7	80.2	25.47%
Consumer Surplus -20%	273.4	372.8	1.7	68.3	23.48%

For details on the Economic Analysis methodology, calculations and assumptions, see annex 8.

1.1.5 The economic analysis includes a cost-benefit analysis for the IDA financed component for Phase 1 of the project to determine the economic viability of the investment in the event of a decision not to implement phases 2 and 3. As indicated in the table below, the analysis shows that in this case the EIRR will be 13.4 percent and the NPV will be positive (US\$ 2.7 million). The switching values are +11 percent for operations and maintenance costs and +9.5 percent for investment cost. When excluding the costs of “non-investment” activities (capacity-building, technical assistance, PREMs and the Government’s cost of operating ASER), the estimated EIRR on IDA investment in Phase 1 increases substantially, to 57.3 percent.

NPV Net Cost (Investment+O&M)	81.6	MUS\$
NPV Net Benefits for the Users	83.9	MUS\$
NPV Global Environment Benefits	0.4	MUS\$
NPV Net Benefits	2.7	MUS\$
EIRR	13.4%	

1.2 Financial analysis (*Financial Analysis of a PPER Concession from the Concessionaire point of view*). (see Annex 8).

1.2.1 The financial analysis assesses the attractiveness and sustainability of the PPER concession for the private sector investor. The analysis covers the three first concessions offered for bidding. These three concessions make up a representative sample of the 18 concessions in the rural electrification program. According to the analysis, the payback period for investment in the sample concessions is six years with a financial internal rate of return (FIRR) of 25.5 percent based on a concession period of 25 years (See Table 2 below). The sensitivity analysis demonstrates the robustness of the results.

**TABLE 2**

<i>BASECASE</i>	<i>MUSD</i>	
Total Initial investment	26.30	
Private Equity	5.45	
Subsidy	17.3	
	10 years	25 years
NPV (MUSD)	(1.82)	19.63
Financial IRR	7%	25.46%
Payback	6 years	

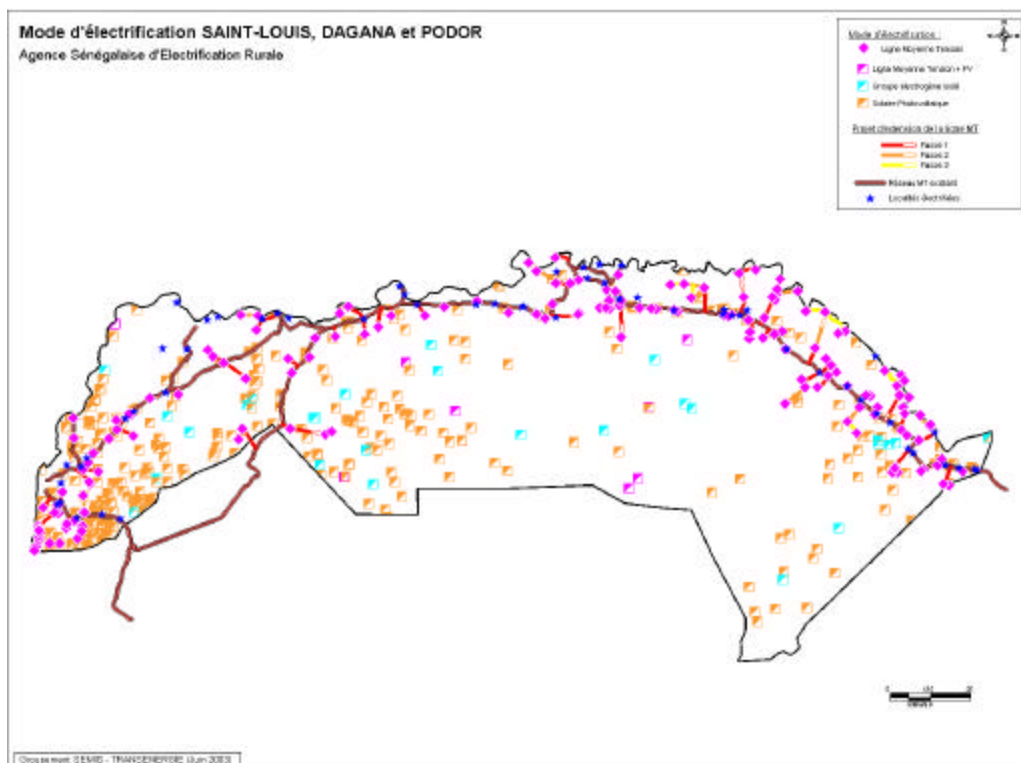
\* A 95 % bill collection rate was considered as the base case.

## 2 Technical

2.1 The project is "technology neutral" Technology choice will be market-oriented with bidders for the electricity concessions free to choose the technology to meet the minimum service requirements and standards set in the tender documents. To level the playing field for renewable energy technologies, the GEF grant will help remove existing barriers to their development by providing technical assistance and capacity- building and funds for limited, targeted investment subsidies designed to internalize the cost of global environmental externalities that result from fossil fuel alternatives. Annexes 9 and 10 discusses the rationale for the GEF Grant in detail.

2.2 The GEF cost effectiveness frontier of technology alternatives described in Annex 8, will depend on the load (size of villages) and distance to the existing grid in the choice between grid extension and decentralized individual systems (mainly solar energy systems) The concession-based Local Electrification Plans (PLEs) have performed such systematic techno-economic tests for all villages. These tests take into account the size of the village, its geographical location, and the results of the local survey, particularly the willingness to pay for electricity. The main technology choices are :(i) low- cost grid extension; (ii) diesel- based min-grids; and (iii) individual solar home systems. Figure 1 below presents a map of a possible rural electrification scheme in one of the first concessions to be bid.

Figure 1



## 3. Fiduciary.

3.1 The project's preparation phase evaluated ASER's financial management capability and procurement expertise. This evaluation led to the development of an action plan for strengthening the agency's capacity to implement the entire rural electrification program as well as the project.

As noted above ASER and the Government will need to take some specific actions, which are conditions of Credit effectiveness, to ensure that ASER has the capability to manage the rural electrification program.

#### **4. Social.**

4.1 The project focuses on assistance to the rural and peri-urban poor, as energy producers or consumers. Social benefits include improvement in living standards and employment creation as a result of direct access to electricity as well as indirect benefits such as local community and government empowerment. Rural energy programs also have a positive impact on women's and children's education and health because of improvements in these areas that are expected to result from electricity access. Also the rural energy programs that the project supports will contribute to reducing the overall energy expenditures of the poor.

4.2 The project has also been designed to ensure a certain degree of equity in public access to benefits accruing from the project, by:

- Geographically: (i) carving out the territory into 18 PPER concessions, each of which will be the subject of a specific implementation program (preparatory surveys, subsidy and PPP with specific concession holders), guaranteeing that all regions will benefit equitably from the program; and (ii) supporting ERILs in areas not scheduled for concessioning in the initial days of implementation; and
- Socially: the multi-sectoral energy programs (PREMs), especially the social-oriented ones (health, education) will broaden the beneficiaries beyond households directly integrated by the PPER or ERIL concession holders. With regard to direct access to electricity services by individual subscribers, a new pricing schedule has been established reflecting the payment capacity of the various segments of the population.

4.3 GOS has prepared a Resettlement Policy Framework (RPF) as specific investments are not yet identified. The RPF establishes the resettlement and compensation principles, organizational arrangements and design criteria to be applied to the needs of the people who may be affected by the project.

#### **5. Environment**

5.1 Rural Electrification. The proposed operation is countrywide, rather than site specific and the determination of the types of electricity service and the corresponding energy infrastructure will result from concession agreements to be developed during the project's implementation. However, the proposed technologies and service delivery systems for electricity access are not expected to have any significant negative environmental or social impacts that cannot be effectively mitigated and avoid any adverse impacts. ASER with the help of qualified consultants has prepared in February 2004 an Environmental and Social Management Framework that describes a clear and systematic process for the effective assessment of any potential environmental and social impacts that result from project-funded activities. Senegal's Ministry of Environment has approved the Environmental and Social Management Framework and disclosed it publicly.

5.2 The framework will be used by the concessionaires to spell out the institutional arrangements – along with capacity-building arrangements – for sound environmental and social review and the basic principles for environmental and social assessment. It covers (i) preliminary

screening; (ii) scoping; and (iii) detailed environmental impact analysis and related institutional arrangements. It also includes the monitoring of any measures necessary to mitigate potential environmental and social adverse impacts (such as resettlement because of land acquisition or access to legally designated parks and protected areas). The project will provide ASER with technical assistance necessary to strengthen the agency's capacity for monitoring the Safeguard Policies. Also, in the first phase of the program, experts from the Ministry of Environment will be working closely with ASER.

5.3 **Biomass Component.** The implementation of this component is not expected to have negative environmental impacts. Based on the implementation record of the PROGEDE I project, the biomass component, which supports PROGEDE II has a “C” environmental rating. The component is expected to: (i) reduce deforestation and soil degradation; (ii) contribute to reducing the loss of carbon sequestration capacity and of biodiversity; (iii) reduce carbon dioxide emissions through the promotion of better carbonization techniques and more fuel-efficient household stoves; and; (iv) reduce indoor air pollution and related health risks to women through the promotion of improved charcoal stoves.

5.4 The relocation of biomass production sites to other areas is not likely to happen for several reasons. First, there are no other areas in Senegal with forest resources (volume and density) which can be economically exploited to supply the large urban markets for woodfuels. Second, areas that do have sufficient forest resources ( which may or not be more fragile)- in (Casamance) and outside Senegal (Guinea)- are 350 to 500 km further away from the urban markets than the Kolda and Tambacounda sites covered by the component. The exploitation of these more remote sites would dramatically increase transportation costs, by as much as 50 percent. Third, the existing charcoal production monitoring system that the PROGEDE project has established has been effective in confining charcoal production to designated areas.

## 6. Safeguard policies

6.1 The project’s biomass component will be an extension of the PROGEDE model. This model has proven to have only positive environmental impacts and to be in compliance with the forests safeguard policy (OP/BP 4.36).

<b>Safeguard Policies Triggered by the Project</b>	Yes	No
<a href="#">Environmental Assessment (OP/BP/GP 4.01)</a>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Natural Habitats ( <a href="#">OP/BP 4.04</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pest Management ( <a href="#">OP 4.09</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Property ( <a href="#">OPN 11.03</a> , being revised as OP 4.11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Involuntary Resettlement ( <a href="#">OP/BP 4.12</a> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Indigenous Peoples ( <a href="#">OD 4.20</a> , being revised as OP 4.10)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Forests ( <a href="#">OP/BP 4.36</a> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Safety of Dams ( <a href="#">OP/BP 4.37</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects in Disputed Areas ( <a href="#">OP/BP/GP 7.60</a> )*	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects on International Waterways ( <a href="#">OP/BP/GP 7.50</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## 7. Policy Exceptions and Readiness

Not applicable

\* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas

## **Annex 1: Country and Energy Sector Background**

### **SENEGAL: SN-ELECTRICITY SERVICES for RURAL AREAS PROJECT**

#### **Country Background**

Senegal is at a decisive point in its economic development. It nears the end of a successful period of adjustment that began with the devaluation of the CFA franc in 1994. It achieved a historically high rate of economic growth in that period, 2.5 percent annually in real per capita terms. Senegal has however a significant unmet reform agenda. Its good growth after the devaluation had only a small impact on poverty, especially in rural areas. Income inequality is high. Social indicators - primary education, infant and maternal mortality, access to clean water - lag income indicators. The state of infrastructure - water, electricity, transport - handicaps development and poverty reduction and public policies, notably in the areas of taxation and incentives to invest, handicap growth by slowing down private sector development.

A new CAS was presented and approved by the Board on April 17, 2003. The CAS derives directly from the PRSP which main pillars are: (i) wealth creation; (ii) capacity building and social services; (iii) assistance to vulnerable groups; and (iv) implementation of the strategy and monitoring of its outcomes. IDA is supporting the achievement of the PRSP goals through its existing lending portfolio (especially in water, education, transport, and health), the planned CAS program of lending, new portfolio of the present CAS, advisory services, and capacity building for monitoring and evaluation. In support of the PRSP, the CAS proposes a base case lending program of US\$290 million, plus significant advisory services.

#### **Energy Sector Background**

Energy Sector Institutions.

The main institutions in Senegal's Energy sector are:

- **The Ministry of Energy**, responsible for the development of the energy policy and regulations pertaining to all the activities in the energy sector;
- **With respect to Electricity**, Senelec – is the public utility responsible for the development of electricity services in the urban areas of Senegal –, ASER (“Agence Sénégalaise d'Electrification Rurale”) is the Rural Electrification Agency, a public agency responsible for increasing access to electricity services in rural areas; and CRSE (“Commission de Regulation du Secteur "Electricité”) regulates all the activities in the electricity sector. Senelec has also contracted out with GTI, an independent power producer (IPP) and is also importing power for the Manantali Regional Hydroelectric project. A second IPP is also under preparation with Bank Group support;
- **With respect to the petroleum sector**, the upstream activities are coordinated by Petrosen – a government owned company- and downstream activities are carried out by SAR, a refinery owned by the oil companies and the State and by 6 private distributors. The CNH (“Commission Nationale des Hydrocarbures”) regulates all activities pertaining to the downstream activities; and
- **With respect to biomass fuels**, the Ministry of Energy and the Ministry responsible for forest resources coordinate the activities carried out by private entities. The Bank is providing financial resources for the implementation of a supply and demand side management projects (the Progede I) to ensure a sustainable supply of biomass fuels.

Energy Consumption and Resources Base.: Energy consumption in Senegal is dominated by woodfuels, which accounts for 53% of energy used. The country's hydroelectric potential (located on the Senegal and Gambia rivers) is estimated at 1,000 MW, which is just recently being tapped, with the completion of the Manantali hydroelectric project (200 MW). Fossils fuels in the form of heavy petroleum was discovered offshore at Dome Flore (100 million tons), but producing such oil was considered non-economical. Small amounts of natural gas, however, were discovered and produced onshore near Dakar (Diam Nadio and Thies) and used to produce electricity. Further exploration for gas and oil is underway. As of now, however, most of Senegal's commercial energy needs are met by imported petroleum products which totaled 950,000 tons, costed an estimated US\$250 million in 2000 and represented between 20-25% of Senegal's export earnings.

Woodfuels Supply. The supply of woodfuels to the urban and peri-urban areas is based on geographically concentrated and non-sustainable forest resource management practices (clear cutting). Some 3 million tons of woodfuels are consumed each year and it is estimated that some 80,000 ha of forest stands disappear each year due to land clearing for agriculture, bush fires, production of charcoal, overgrazing and scarce rainfall. To address these, a GEF / IDA project (Sustainable and Participatory Energy Management Project-the Progede project) was approved by the Bank's in June 1997. In May, 2002 a mid-term review confirmed the very positive outcomes regarding resources management, efficiency and institutional development and capacity building.

Electricity services in Senegal are currently provided by SENELEC which has power plants in Dakar and in five in regional areas. The capacity of the Dakar interconnected system is about 489 MW which include 371 MW of Senelec thermal plants, 66 MW from the regional hydroelectric plant at Manantali (installed capacity of 200MW) and 52 MW from an Independent Power Producer (GTI Dakar). The 2003 peak demand was about 400 MW. The number of connections has grown very slowly. The rate of electrification is relatively low (30%) with access to electricity largely confined to the capital city of Dakar (55%) and four urban centers: St. Louis, Kaolack, Ziguinchor and Tambacounda. Village electrification is limited (8%) to areas in the immediate vicinity of these large population center and some tertiary centers. But the vast majority of the population living in the smaller centers (<1,000 inhabitants), numbering nearly 10,000, are without electricity supply.

Senegal's electricity sector is characterized by: high costs largely due to high thermal generation costs and high transmission and distribution losses, poor quality of service, limited access to electricity services and the weak financial position of the utility. This is largely due to obsolete facilities, insufficient investments in generation, transmission and distribution over the last 10 years but also to SENELEC's weak technical and financial performance. SENELEC's weak financial position is due to high costs of generation and weak commercial performance. SENELEC cannot meet the rapidly growing demand for power, growing at a rate of 25-30 MWs a year. As a result load shedding is a common phenomena.

In 1997, given the critical situation, the Government of Senegal (GOS) undertook major reforms outlined in the 1997 Policy Development Letter for the sector. Such reforms aimed at introducing private sector participation in investments and operations of the power sector, encouraging sector efficiency and ensuring adequate supply. Specific actions were related to: (i) corporatization of SENELEC and transfer of all state-owned generation, transmission and distribution assets to the corporatized SENELEC, (ii) enacting of a new electricity law and corresponding application decrees, (iii) establishment of an independent regulatory agency for the power sector, (iv) privatization of SENELEC; and (v) separation of electricity services in urban areas from development of electricity services in rural areas. The electricity law provided for: (i) clear

separation of the policy, planning, regulatory and managerial responsibilities between sector authorities, (ii) clear regulations and principles for the operation of the independent regulatory agency, (iii) an evolving model towards progressive unbundling of the sector activities (generation, transmission and distribution), (iv) competition in generation, (v) open access to the transmission grid, and (vi) a rural electrification agency (ASER).

Two unsuccessful privatization attempts were carried out between 1999 and 2002. On March 1999, Senelec operational responsibilities were transferred to a strategic partner comprising Hydro-Quebec and Elyo who was holding 34% of Senelec's shares; however in September 2000, a "friendly" mutual agreement was signed between the Government and the Strategic Partner terminating the contract. The main reasons for this decision were: (a) poor services provided by Senelec under the new arrangement; (b) disagreement on the price of Senelec's shares that the Strategic partner wanted to acquire to reach a majority control of Senelec; (c) delays in tariff adjustments requested by the Strategic Partner; (d) substantial disagreements between members of the consortium; (e) government expectations regarding financing of investments considered by the Partner to be beyond the contractual obligations. On July 2001, GOS launched a new tender process and in November 2001 two technical and financial bids were received. In July 2002 after months of negotiations, GOS declared unsuccessful the second privatization attempt but reaffirmed its commitment intention to select a Strategic Partner for the management of Senelec. However all parties agreed that to be successful such privatization needed be accompanied by an investment plan financed largely with concessionary funds.

Government Strategy for the Electricity Sector. A new strategy reflecting the lessons learned over the 1999-2002 period was announced in early 2003. The Energy Sector Development Letter (dated April 9, 2003) notes that: (a) the main objective for the electricity sector is to secure the supply of electricity services required by the economy and the population with the best reliability and security and at the lowest cost possible; and (b) because of the poor physical conditions of the sector infrastructures and the need to develop these infrastructure, financing of the electricity sector investments is critical. To reach these objectives, GOS has proposed three areas for action: (a) restructuring of the generation, transmission and distribution activities currently carried out by Senelec; (b) as feasible, relying on private sector for financing and improving performance; and (c) implementing a new approach in order to quickly increase access to electricity services in rural areas.

Restructuring of the activities carried out by Senelec. The overall objective is to progressively open-up the electricity sector to competitive pressures, starting with the separation of generation activities from transmission and distribution activities. With respect to generation, the approach involves requesting competitive bids from independent power producers (IPP) and importers. Senelec will be the sole purchaser (through Power Purchase Agreements) of the power generated by the IPPs and overtime will divest or liquidate its existing generation assets. Senelec will remain responsible for planning generation requirements. Senegal is currently in the final stages of selecting a second IPP for about 60 MW and has started initial planning for another IPP of about 80-100MW. With respect to distribution of electricity, GOS has taken all the decisions required to separate the distribution of electricity in urban and semi-urban areas -to be carried out by Senelec - from the provision of electricity services in rural areas to be done by private sector operators coordinated and monitored by ASER. GOS has therefore removed the monopoly of SENELEC for providing electricity in the rural areas and transferred this responsibility to private sector investors and operators under the coordination of ASER which has sole responsibility to manage the RE program.

Private Sector Participation. Senegal twice attempted privatizing Senelec (para.9). Recognizing the current lack of appetite of private investors for buying Senelec's shares and also to ensure financing of the investment requirements in rehabilitation and extension, GOS has opted for the "Concession" model. Activities to select a strategic partner for Senelec owning a majority control in Senelec is underway. GOS expects however that public sector financing will be needed to carry out the substantial physical rehabilitation required over the next 5 years and to restore Senelec technical and financial strengths.

Rural Electrification. In its effort to reduce poverty and redress imbalances in development, GOS has concluded that developing rural electrification (RE) is a critical objective in its program. The Government intends to implement a major rural electrification program (described in annex 4) to be implemented over a 15-20 year period and aiming at reaching a 62% access rate in 2022 as compared with a 2003 access rate of 8%. GOS strategy in rural areas, described in the Rural Electrification Development Letter of May 2004, reflects two principles. The first principle is to rely on public/private sector partnership where the significant share of the rural infrastructure funding is provided by the national budget (the private sector will provide about 20-30% of the financing) while the private sector is called to manage technically and commercially the rural concessions and to ensure long term sustainability. The public entity – ASER – will define, coordinate and monitor implementation of the rural electrification program. The second principle is to increase access to electricity services in the rural areas of Senegal by granting geographical concessions (18 concessions are currently assessed) through a transparent and competitive bidding process. Smaller projects (the « ERILs » projects), developed by local sponsors (Community association, villages, other entities operating in the rural areas, etc.) will complement the rural concessions.

The key features of the rural electrification program (which IDA intends to support under the proposed APL) are: (a) selection of private concessionaires through competitive bids and transparent processes; (b) targeted, efficient and performance oriented subsidies (OBA) to take account of affordability and equity considerations; (d) technology neutral; the bidders will be free to choose the technology as long as it meets the tender minimum requirements. GEF grant funding would be available to level the playing field for renewable technology; (e) financial support for the development of productive and multi-sectoral activities requiring electricity; and (f) building capacity in ASER as well in the relevant rural institutions and in the private sector.

Linkage with Proposed Electricity Sector Efficiency Enhancement Project. Another APL program - the Electricity Sector Efficiency Enhancement Program - is under preparation by IDA. The first phase of the APL intends to support GOS's efforts to: (i) increase power generation capacity on the interconnected power grid through IPPs providing a decrease in generation costs; (ii) rehabilitate key generation, transmission and distribution infrastructures; (iii) improve Senelec technical and commercial performance and quality of services; (iv) select a strategic partner for Senelec; (v) assess hydrocarbon potential resources- crude oil and natural gas -; and (vi) enhance GOS and Senelec capacity for energy policy formulation and analysis and for investment planning.

## Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

### SENEGAL: SN-ELECTRICITY SERV. For RURAL AREAS PROJ.

#### World Bank Financed Projects

Project Name	ID	IBRD/ IDA	Product Line	Status	Approval Date	Rating	Sector issues
Social Development Fund Project	P041566	30	IBRD/ IDA	Active	20-Dec-00	S	Improving delivery of social services (potable water) including in rural areas
Quality Education for All Project	P047319	50	IBRD/ IDA	Active	11-Apr-00	S	Improving delivery of social services (schools) including in rural areas
National Rural Infrastructure Project	P057996	28.5	IBRD/ IDA	Active	27-Jan-00	S	Improving delivery of social services and access to basic infrastructure including in rural areas
Agricultural Services & Producers' Organizations Program	P002367	27.4	IBRD/ IDA	Active	20-May-99	S	Enhancing economic productivity in rural areas
Energy Sector Adjustment Credit Project	P051357	100	IBRD/ IDA	Closed	19-May-98	S	Rationalizing distribution and consumption of electricity, Decentralization of forestry resources management
Sustainable and Participatory Energy Management Project (PROGEDE I)	P046768	5.2	IBRD/ IDA	Active	12-Jun-97	HS	Ensuring and expanding sustainable supply of woodfuels

#### Other Development Agencies

ADB - PAPIL - US\$20.6	Small Irrigation
GTZ - PERACOD	Photovoltaic Solar Energy
AECI (Spain) - ISOPHOTON	Photovoltaic Solar Energy
UNDP - Multifunctional Platforms Program	Mechanical Energy and Electricity in Rural Areas

**Annex 3: Results Framework and Monitoring**  
**SENEGAL: SN-ELECTRICITY SERV. for RURAL AREAS PROJ**

**Results Framework**

<b>Project Development Objective (PDO)</b>	<b>Outcome Indicators</b>	<b>Use of Information on Results</b>
<p>Enhancing the rural population's access to electricity services and the poverty-reduction effect of such access.</p> <p><u>Global Environment:</u> Through use of renewable energy forms and low consumption light bulbs, avoiding to increase greenhouse gas emissions as a result the project.</p>	<p>Number of rural households, shops, artisans and rural SMEs benefiting from broader access to rural electricity services.</p> <p>Specific impact-measuring indicators (developed by the sectoral programs served by multi-sectoral energy programs (PREMs) carried out as sub-programs under this project)</p> <p><u>Global Environment:</u> Installed capacity in renewable energy based systems (measured in W or Wp). Number of highly efficient fluolamps renewable-energy-using RE systems, and the spread of low consumption bulbs. Greenhouse gases emissions avoided by the project, based on same calculation methods than those used in calculation of Global Environment Benefits in Annex 8 (Economic Analysis).</p>	<p>Years 1-3: Evaluating the appropriateness of the new rural electrification (RE) model recommended in the Sectoral Policy Letter and of the practical methods of implementation developed in the preparation stage. Year 4: Determining whether the new RE strategy should be modified and scaling up actually envisaged in phases 2 and 3.</p> <p><u>Global Environment:</u> If the volume of installed capacity in renewable energy and/or of low consumption light bulbs in years 1 and 2 stagnates in comparison to its level prior to the project, re-examining in year 3 the barriers to using such energy forms and bulbs and the means (particularly incentive mechanisms) employed to lower those barriers.</p>

### Arrangements for results monitoring

Intermediate Results - One per component	Results Indicators for Each Component	Use of Results Monitoring	Data Collection Instruments - Frequency and Reports	Responsibility for Data Collection								
<p>Component 1.1 PPER concessions activities: Enhancement of the rural population's access to electricity services in the PPER concessions awarded under the project.</p>	<p>Minimum number of new users with direct access to electricity services in the 3 concessions awarded and funded from the IDA loan and the GEF grant:</p> <table border="1" data-bbox="611 646 865 797"> <tr> <td>Year 1</td> <td>1,500</td> </tr> <tr> <td>Year 2</td> <td>5,000</td> </tr> <tr> <td>Year 3</td> <td>10,000</td> </tr> <tr> <td>Year 4</td> <td>20,000</td> </tr> </table>	Year 1	1,500	Year 2	5,000	Year 3	10,000	Year 4	20,000	<p>A low indicator value may signify:</p> <ul style="list-style-type: none"> <li>(i) unsuccessful private-sector involvement and the need to review the incentive mechanisms;</li> <li>(ii) inability of the concessionaires selected to service their potential clients sustainability and the need for technical assistance and/or review of the regulatory framework for client relations; or</li> <li>(iii) the need to revise phase 2 and 3 objectives.</li> </ul>	<p>Client management by PPER concessionaires. Data validation through monitoring before launching the results-indexed subsidy payment procedure, and annually thereafter.</p>	<p>Agence Sénégalaise de l'Électrification Rurale (ASER)</p>
Year 1	1,500											
Year 2	5,000											
Year 3	10,000											
Year 4	20,000											
<p>Component 1.1 PREMs activities: Maximization of the social and economic impact of access to electricity services.</p>	<p>2 PREMs actually implemented in each concession awarded.</p>	<p>An insufficient number of PREMs implemented may signify a need:</p> <ul style="list-style-type: none"> <li>(i) to review the methods of coordination between the actors of the project and the actors of other sectors; or</li> <li>(ii) to strengthen technical assistance for the preparation of PREMs, particularly in defining roles and incentive</li> </ul>	<p>Client management by concessionaires plus monitoring by ASER and/or other sectoral agencies monitoring results.</p>	<p>ASER</p>								

Intermediate Results - One per component	Results Indicators for Each Component	Use of Results Monitoring	Data Collection Instruments - Frequency and Reports	Responsibility for Data Collection
		mechanisms. If the objectives are attained, scaling up the number of PREMs in phase 2 may be considered.		
Component 1.2 (local-initiative RE projects (ERILs)): Increase of the number of communities with access to electricity through a local initiative, outside RE programs funded under the project in PPER concessions,	Minimum number of communities of at least 1,000 inhabitants gaining access to electricity through ERILs per year: 10 (or an equivalent number of communities of more than 1,000 inhabitants).	An insufficient number may signify that: (i) the sub-component is over-dimensioned, given the effective demand for expected access through PPERs; or (ii) the information campaign and the technical and financial support for the ERILs should be improved.	Client management by ERIL operators. Data validation through monitoring before launching the results-indexed subsidy payment procedure and thereafter annually.	ASER
Component 2.1 (capacity building in ASER): Fulfillment of ASER's project-implementation and monitoring role.	(i) 3 concessions PPER awarded in phase 1 and disbursements of the subsidies in phase with the number of users effectively serviced by the concessionaires. (ii) On the average, 20 ERILs per year approved and disbursements of the subsidies in phase with the number of users effectively serviced by the ERILs. (iii) 6 PREMs effectively implemented in total in the 3 concessions PPERs	Lower figures may signify insufficient ASER capacity to implement the project satisfactorily and in time, and a need to build the capacities of ASER staff according to the recommendations of the technical assistant for organization and management.	ASER Annual reports.  Rural Electrification Fund (FER) audit.  Continuous National Energy Directorate (DNE) oversight.  Biennial World Bank supervision missions.	ASER.  FER auditor.  DNE and World Bank.

<b>Intermediate Results - One per component</b>	<b>Results Indicators for Each Component</b>	<b>Use of Results Monitoring</b>	<b>Data Collection Instruments - Frequency and Reports</b>	<b>Responsibility for Data Collection</b>
Component 2.2 (capacity building in the Power Sector Regulatory Commission (CRSE)): Fulfillment of CRSE's regulatory role for RE (PPER and ERIL) concessions	3 contracts of concessions PPER signed in phase 1, PPER and ERIL concessionaire activities appropriately monitored, and phase 1 regulatory problems examined and treated.	Failure to finalize and sign contracts, oversight inadequacies identified on inspection, and untreated regulatory problems may signify insufficient CRSE capacity to perform the new RE-regulation functions and a need to detect weaknesses and build the capacities of CRSE staff.	ASER Annual reports.  Biennial World Bank supervision missions.	ASER  World Bank supervision.
Component 2.3 (capacity building in DNE): Fulfillment of DNE's role of support, results monitoring and RE policy adaptation in accordance with the of Sectoral Policy Letter and ASER's mission.	RE policy implementation carried out by DNE, resulting in evaluation notes and policy adjustment to ensure the application of the Sectoral Policy Letter and the conditions necessary for ASER to fulfill its mission.	Uncertainty about attaining the Sectoral Policy Letter objectives or ensuring the conditions necessary for ASER to fulfill its mission justifies reconsidering whether to proceed with project phase 2.	ASER Annual reports.  Biennial World Bank supervision missions.	ASER.  World Bank supervision.
Component 2.4 (capacity building in the Multi-Sectoral Committee): Identification of PREMs and facilitation of their preparation and of the coordination of multisectoral actors, in view of their implementation, by the Multi-Sectoral Committee.	For each new concession provided for in phases 1 and 2, at least 2 PREMs identified, prepared and approved by the sectoral actors interested.  No difficulties - due to non-finalization of PREMs - encountered by sectoral programs in attaining their development objectives.	A lower number may signify the incapacity of the Multi-Sectoral Committee to play the role of promoter of intersectoral coordination for maximizing the impact of access to electricity services in rural areas, and a need: (i) to strengthen technical assistance to the Committee, or	Quarterly reports by the Secretariat of the Multi-Sectoral Committee.	DNE and World Bank supervision.

Intermediate Results - One per component	Results Indicators for Each Component	Use of Results Monitoring	Data Collection Instruments - Frequency and Reports	Responsibility for Data Collection
		(ii) to seek another institutional mechanism for intersectoral coordination.		
<p>Component 2.5 (capacity building in the private sector): Increase of:</p> <ul style="list-style-type: none"> <li>(i) international and national private sector involvement in project implementation, and</li> <li>(ii) the use of renewable energy forms by private sector bodies involved in RE.</li> </ul>	<ul style="list-style-type: none"> <li>(i) Turnover of the RE sector and of related Senegalese and international private-sector activities increased.  The financial package allotted to strengthening private sector activities absorbed and appropriately used.</li> <li>(ii) Use of renewable energy forms in the PPER concessions awarded under the project increased.</li> </ul>	<ul style="list-style-type: none"> <li>(i) Stagnation in the turnover of the international or national private RE sectors may signify that ASER's strategy and activities for promoting the involvement of those sectors are inadequate and the strategy should be revised.</li> <li>(ii) Stagnation in the number of RE systems using renewable energy (by reference to the baseline) in the areas of the PPERs concerned justifies re-examining the barriers and the relevant strategy and incentive mechanisms.</li> </ul>	Annual activity report by ASER on this specific component.	DNE and World Bank supervision.
<p>Component 2.6 (capacity building in the banking sector): Involvement of the Senegalese banking sector in financing concessionaire investment.</p>	Loans extended by the Senegalese banking sector to private RE operators.	<p>Absence of loans and/or of growth of total commercial loans by the Senegalese banking sector may necessitate:</p> <ul style="list-style-type: none"> <li>(i) re-examining the tools made available to ensure the involvement of the banking sector, or</li> <li>(ii) abandoning the idea of</li> </ul>	<p>Annual activity report by ASER and consultants reports.</p> <p>FER audit.</p>	<p>FER auditor.</p> <p>World Bank supervision.</p>

Intermediate Results - One per component	Results Indicators for Each Component	Use of Results Monitoring	Data Collection Instruments - Frequency and Reports	Responsibility for Data Collection
		mobilizing Senegalese bank resources to attain the objectives of project phases 1 and 2.		
<p>Component 3.1 (ASER/PREMs technical assistance):</p> <p>(i) Conduct of studies necessary for finalizing phase-1 PREMs and preparing phase-2 PREMs.</p> <p>(ii) Involvement of microfinance institutions in financing individual - mainly productive - electrical equipment ("PREM microfinance")</p>	<p>(i) At least 2 identified PREMs prepared for each new concession scheduled to be awarded in phase 2.</p> <p>(ii) PREM microfinance design carried out and checked with microfinance institutions (SFDs); and the first SFD loans financing individual or collective electrical equipment actually extended.</p>	<p>(i) An insufficient number of adequately prepared PREMs necessitates revising:</p> <p>(a) the terms of reference for selection consultants for that activity in future, or</p> <p>(b) the relevant phase-2 objectives.</p> <p>(ii) Absence of SFD loans actually extended to finance individual or collective electrical equipment may justify abandoning that sub-component in phase 2; while growth of such loans and identification of refinancing needs may justify scaling it up in phases 2 and 3.</p>	Annual activity report by ASER and consultants reports..	DNE and World Bank supervision.
<p>Component 3.2 (ASER/PPERs- ERILs technical assistance):</p> <p>(i) Conduct of studies necessary for awarding phase-1</p>	<p>(i) Local Electrification Plans (PLEs) of phase-2 concessions completed.</p> <p>(ii) An action plan for identifying and promoting innovations, especially those enhancing</p>	<p>(i) An insufficient number of completed PLEs justifies reconsidering phase-2 objectives.</p> <p>(ii) Absence of an action plan and/or failure to carry out</p>	Annual activity report by ASER and consultants reports..	DNE and World Bank supervision.

<b>Intermediate Results - One per component</b>	<b>Results Indicators for Each Component</b>	<b>Use of Results Monitoring</b>	<b>Data Collection Instruments - Frequency and Reports</b>	<b>Responsibility for Data Collection</b>
<p>PPER concessions.</p> <p>(ii) Dissemination of RE innovations in general and of renewable energy uses in particular.</p> <p>(iii) Adequate technical support for preparing phase-1 ERILs.</p>	<p>and facilitating access to renewable energy forms in rural areas, formulated; and a report on carrying out the action plan activities submitted.</p> <p>(iii) A technical file finalized and deemed acceptable for 100% of the eligible applications for technical assistance in preparing ERIL projects.</p>	<p>activities under such a plan justifies an independent examination of the underlying causes and the adoption of corrective measures.</p> <p>(iii) A lower percentage necessitates investigation into the underlying causes and formulation of a plan of action.</p>		
<p>Component 3.3 (information and communication): Supply of effective information to the target groups and local communities, enabling them to participate in the project and benefit from it.</p>	<p>Phase-1 information and communication plan formulated and implemented.</p> <p>Level of information provided to potential beneficiaries and local communities considered acceptable by the evaluation procedures defined under Component 3.4.</p>		<p>Annual activity report of ASER and consultants reports..</p>	<p>ASER.  DNE and World Bank supervision.</p>
<p>Component 3.4 (impact monitoring and evaluation): Regular monitoring and evaluation of the impact of the project by reference to the PDO.</p>	<p>Design, actual implementation and satisfactory operation of a mechanism to monitor and evaluate project impact (in reference to the PDO) carried out.</p>	<p>Inexistence, non-implementation or unsatisfactory operation of an impact monitoring and evaluation mechanism implies that ASER should formulate a plan of action to correct that situation.</p>	<p>ASER Annual activity report and consultants reports.</p>	<p>ASER.  DNE and World Bank supervision.</p>

## Annex 4: Detailed Project Description

### SENEGAL : Electricity services for Rural Areas Project

#### INTRODUCTION

1. The proposed project aims, through a programmatic approach, to support the implementation of a Rural Electrification Program (RE) in Senegal and to continue supporting improvements in the management of the woodfuels supply in Senegal. Regarding the RE program, the Adaptable Program Loan (APL) financing instrument has been selected.
2. The APL program is conceived as a 12-year effort (2005-2016) to be implemented in 3 phases at a cost of about \$300 million. A detailed description of each of the Phase I four components – which covers the 2005-2008 period- is provided in this annex. A more detailed Project Description has been prepared and is available in the project files.
3. A cost breakdown by component and sub-component and financing sources is provided below for the project (Phase I of the APL) An estimate of the costs of the 12-year RE program is provided in attachment 4.A The RE program is also supported by other Donors which have provided resources for the preparation of rural electrification program (PPERs) and participated in the project definition and appraisal missions.

<i>IDA Project</i>						<i>Parallel financing</i>			
PHASE 1	IDA	GEF	Government	Private sector (IDA)	Total PHASE 1	Other Donors	Government	Private Sector	Sub Total (non IDA)
<b>Component 1</b>	16.25	3.60	3.10	7.85	30.80	10.10	2.00	4.70	16.80
Sub component 1.1	15.00	3.00	2.20	6.50	26.70	9.1	1.5	4.2	14.80
Sub component 1.2	1.25	0.60	0.90	1.35	4.10	1	0.5	0.5	2.00
<b>Component 2</b>	2.55	0.40	2.55	0.00	5.50	1.00	1.20	0.00	2.20
Sub component 2.1	1.00	0.10	2.55		3.65	1	1.2		2.20
Sub component 2.2	0.25				0.25				
Sub component 2.3	0.20				0.20				
Sub component 2.4	0.10				0.10				
Sub component 2.5	0.75	0.30			1.05				
Sub component 2.6	0.25				0.25				
<b>Component 3</b>	2.25	0.55	0.00	0.00	2.80	0.40	0.00	0.00	0.40
Sub component 3.1	0.50				0.50				
Sub component 3.2	0.95	0.25			1.20	0.4			0.40
Sub component 3.3	0.45	0.15			0.60				
Sub component 3.4	0.35	0.15			0.50				
<b>Component 4</b>	4.10	0.00	0.50	0.00	4.60				
Sub component 4.1	1.89		0.19		2.08				
Sub component 4.2	1.11		0.07		1.18				
Sub component 4.3	1.10		0.24		1.34				
<b>Sub Total 1</b>	25.15	4.55	6.15	7.85	43.70	11.50	3.20	4.70	19.40
+ PPF	2.00				2.00				
<b>Sub Total 2</b>	27.15	4.55	6.15	7.85	45.70	11.50	3.20	4.70	19.40
10%	2.72	0.46	0.62	0.79	4.57	1.15	0.32	0.47	1.94
<b>TOTAL</b>	<b>29.9</b>	<b>5.0</b>	<b>6.8</b>	<b>8.6</b>	<b>50.3</b>	<b>12.7</b>	<b>3.5</b>	<b>5.2</b>	<b>21.34</b>

4. The four components of Phase I include: (a) Provision of financing for development of access to electricity services to satisfy basic electricity needs of rural households and support programs maximizing social and economic benefits of rural electrification; (b) capacity development and institutional strengthening; (c) support for the implementation, the Communication, and Monitoring & Evaluation of the project; and (d) Sustainable Woodfuels Supply Management and Demand Management and Inter-fuel Substitution Options.

***Project Component 1*** – US\$ 30.8 million (IDA - US\$ 16.25 million). *Provision of financing for development of access to electricity services to satisfy basic electricity needs of rural households and support programs maximizing social and economic benefits of rural electrification.*

5. The first component intends to: (i) provide mostly OBA type capital subsidies under a transparent and competitive bidding process to ensure economic sustainability of rural electrification in primary targeted concession areas (Concession PPER) and to support multi-sectoral energy projects programs (PREMs) in order to increase productivity of small and medium enterprises and enhance the quality and efficiency of sectoral programs and to (ii) finance under a similar process direct proposals for some small specific areas (ERILs projects).

6. PPER concessions and Multi-sector Energy Programs (PREMs). Senegal's territory has been divided into 18 rural electrification concessions part of the Rural Electrification Priority Program (PPER), each of which covers one, two or at most three administrative divisions. Demarcation of the concessions, on the basis of a geographical demand survey, was carried out so as to attract international operators (minimum user potential of 5.000 households), while making them accessible to potential local operators. Likewise, the number of concessions should be enough to establish a competitive environment through benchmarking. The concession areas exclude territory for which the national utility (SENELEC) has a franchise. Working on the premise that the advent of electricity in an unserved area does not spontaneously induce the use of electricity for productive and social uses, ASER has also decided to accompany RE programs with public sector activities through multi-sector energy programs (PREMS) designed to serve as an effective interface between the development of PPER concessions and the programs implemented on the same territory by other sectors.

7. Local Rural Electrification Initiatives (ERILs). In addition to the PPERs, the program also provides for technical and financial support to local rural electrification initiative projects (ERILs) executed by associations, village groups, local government or private individuals, non-governmental organizations looking forward to electrification at local level. Such ERILs also allow to account for exceptional and specific needs such as in Casamance.

***Project Subcomponent 1.1 – Concessions PPER*** - US\$ 26.7 millions (IDA US\$15.0 millions & GEF US\$ 3.0 millions) . This component includes financial resources to: (a) develop access to electricity to satisfy basic electricity needs of rural households in pre-defined concessions areas; and; and to (b) support multi-sectoral energy programs maximizing social and economic benefits of rural electrification in targeted rural concessions.

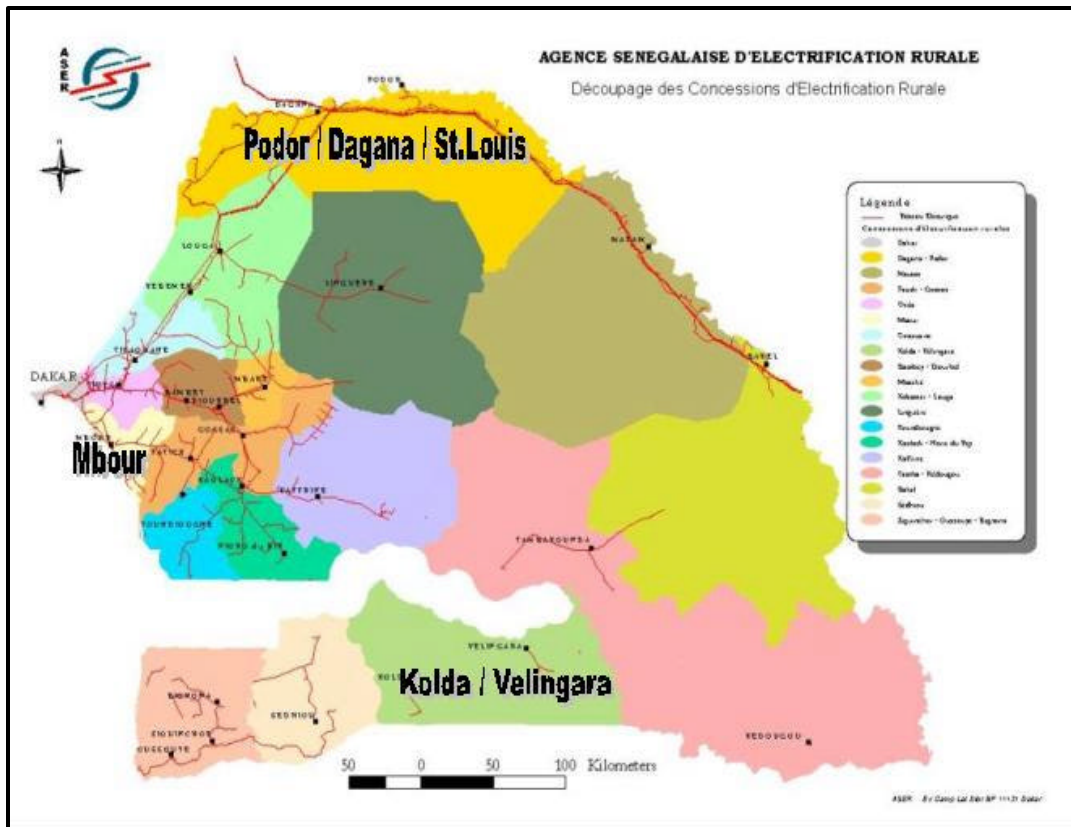
8. Description of subcomponent 1.1. This subcomponent objective is to provide OBA (output-based aid) capital subsidies under a transparent and competitive concession bidding process to ensure economic sustainability of rural electrification in targeted concession areas. This will be done through the Rural Electrification Fund (FER) and will finance part of the RE investments (see Annex 6).

9. Investment costs would be funded by a mix of private equity, commercial bank loans, and grants for the subsidized portion of the capital expenditures, channeled through the FER. Special financing instruments (refinancing account and guarantee account) will be finalized during the first phase of the project to help mobilize the required additional financing from commercial banks (see Annex 6).

10. During the first phase IDA financing will target three concessions (Dagana-Podor, Mbour, Kolda-Velingara) (see figure 4.1 below). Those three concessions were surveyed under

the local electrification plans (PLEs) and selected because they are a representative sample of 18 concessions. In addition, specific financing will be provided through this sub-component, to increase productivity of small and medium enterprises, to enhance the quality and efficiency of some sectoral programs such as in health, education, water and agriculture, to improve living standards, and focus on rural transformation. Three PREM families have been identified: (i) social-oriented PREMs, (ii) production-oriented PREMs and, (iii) a specific “micro-finance” PREM.

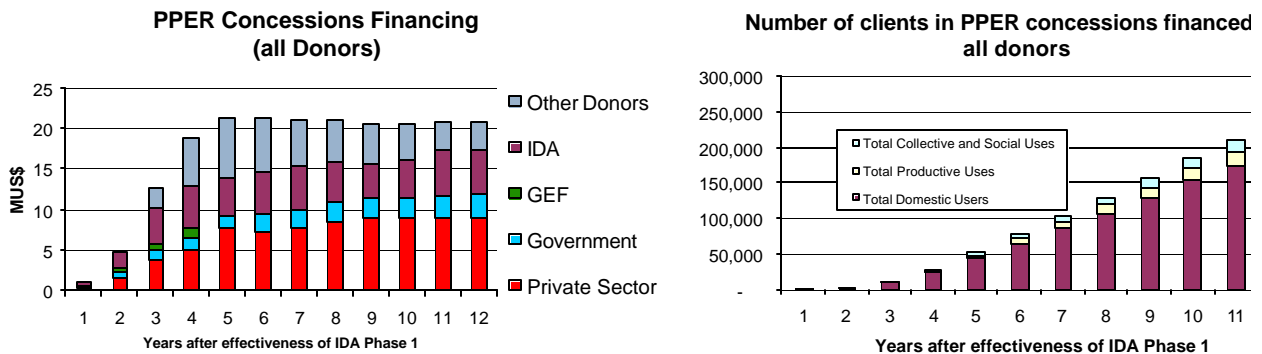
**Figure 4.1 – The 3 PPER Concessions financed under the Phase 1 of IDA Credit**



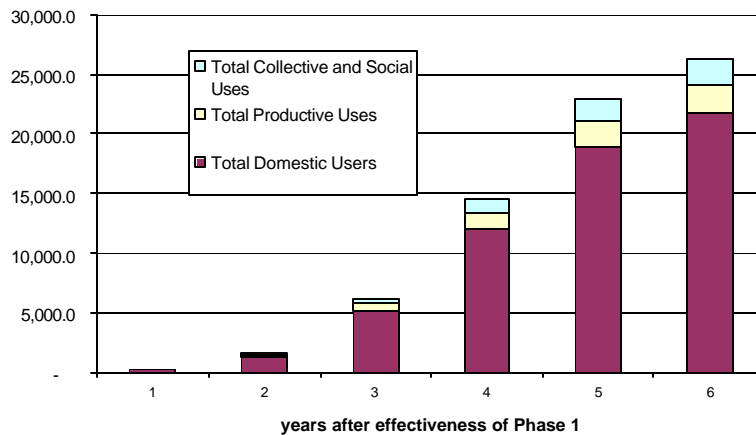
11. Financing Requirements (Phase 1). Through subcomponent 1, the project will focus on the Dagana-Podor, Mbour, and Kolda-Velingara concessions. Based on the PLE studies, financing requirements have been delineated. The table below provides for financing requirements by concession, broken down by financing resources (excluding PREMs financing).

Subcomponent 1.1							
PHASE 1	IDA	GEF	Government	Total Public financing	Private Sector	Total cost of the component	
Concession de Dagana-Podor	5.00	1.10	0.90	7.00	2.80	9.80	
Concession de Mbour	3.80	0.70	0.70	5.20	2.10	7.30	
Concession de Kolda-Velingara	2.70	1.20	0.60	4.50	1.60	6.10	
<b>Total</b>	<b>11.50</b>	<b>3.00</b>	<b>2.20</b>	<b>16.70</b>	<b>6.50</b>	<b>23.20</b>	

12. Expected number of customers (all program). The expected number of customers over the 12 year RE program implementation period is provided in the figures below.



Number of clients in PPER Concessions financed by IDA phase 1



13. Examples of multi-sector Energy programs (PREMs): Three sets of PREMs have been identified : (i) social PREMs, (ii) productive PREMs, and (iii) a specific micro finance PREM (pilot). PREMs that are ready to be implemented at the start of phase 1 are listed below. Out of the 14 PREMs identified, a total of 10 is likely to be implemented during phase 1 of the project. IDA financing of this sub-component is \$3.5 million US dollars. However, it is possible that new PREMs will appear and be ready to be implemented during this phase. Conversely finalization of some of the PREMs mentioned below may prove to be too difficult and may thus be deferred to phase 2.

Summary Statement of 1st generation PREMs financing				
CONCESSIONS	NAMES OF PREMS	SECTOR	SECTOR PROGRAM COST (In millions Cfa)	PREM COST (in millions Fcfa)
<b>Podor-Dagana St-Louis</b>	Health Infrastructures	Health	1 335	49
	Milk Processing	Husbandry/and	9 900	452
	Power Supply to Rural Populations	Energy	5 663	300
	Village Water Supply	Water	7 375	280
	<b>S/s Total</b>		<b>24 273</b>	<b>1 081</b>
<b>Mbour</b>	Health Infrastructures	Health	258	53
	Rural Schools' Infrastructures	Education	1 082	158
	Wells drilling	Water	5 178	111
	Modernization of Port	Fishing	1 989	56
	<b>S/s Total</b>		<b>8 507</b>	<b>378</b>
<b>Kolda Velingara</b>	Health Infrastructures	Health	252	52
	Rural Schools' Infrastructures	Education	1 353	198
	Corn	Agri/indust.	1 390	162
	Community Infrastructures	Social	27 900	57
	Community Infrastructures	Social	25 800	43
	<b>S/s Total</b>		<b>56 695</b>	<b>512</b>
<b>PREM micro-finance</b>				<b>125</b>
<b>Total (in MFCFA)</b>			<b>89 475</b>	<b>1 971 + 125</b>
<b>In US dollars</b>			<b>≅ 180,000</b>	<b>@ 4,200</b>

**Project Subcomponent 1.2 – ERILs** - US\$ 6.0 millions (IDA US\$1.25 million & GEF US\$0.6 million). This component includes resources to finance, under a process similar to PPER process, direct proposals for some small specific rural areas (the ERILs projects).

14. Description of subcomponent 1.2. ASER will launch tenders for ERIL projects on a quarterly basis. A predetermined amount will be allocated for each tender and eligible projects will be scrutinized and then ranked according to simple transparent criteria. As potential sponsors of ERIL projects will not necessarily have the competence and expertise for preparing their own project applications (demand analysis, technical specifications, financial set-up, business plan), a window will be opened under the Rural Electrification Fund (FER) to support the technical preparation of such small projects.

Subcomponent 12								
PHASE1		IDA	GEF	Government	Other donors	Total Public financing	Private Sector	Total cost of the component
Total ERIL		1.25	0.60	1.50	1.00	4.35	1.75	6.10

15. Costs of the sub-component and expected outputs. It is difficult to judge the number of technically and financially eligible projects that would be awarded a concession contract and would receive a financial contribution. It has been decided to cap available funds for this sub-component to limit the number of ERILs projects. The financial envelope envisaged for that activity and the IDA and GEF contribution are provided below.

***Project Component 2 – US\$ 5.5 million (IDA - US\$ 2.55 millions & GEF 0.4 million). Capacity Development and Institutional Strengthening Component***

16. The Capacity Development and Institutional Strengthening component is composed of six (6) subcomponents described below.

***Subcomponent 2.1 - Capacity development and institutional strengthening of ASER*** (US\$ 3.65 millions – IDA US\$ 1.0 million & GEF US\$ 0.1 million)

17. The RE project will be implemented through ASER, with the support of the CRSE. The objective is to support ASER in performing in a competent and efficient way the tasks related to its medium-term program, which mainly envisages the launching of five tenders for PPER concessions, between mid 2004 and mid 2008, at the rate of two tenders per annum. To this must be added the applications from ERIL projects. The project will provide working costs (Government), capacity building, training and technical assistance programs for the ASER staff, and will also finance some goods and equipment. IDA financial contribution to ASER is described in the following table.

**IDA Financing – Support to ASER**

IN US\$	IDA	GEF	TOTAL phase 1
<b>Specific expertise and recruitment</b>			
Recruitment agency	\$ 30, 000		\$ 30,000
Director of Finance in FER	\$ 260, 000		\$ 260, 000
Concession Contract specialist	\$ 130, 000		\$ 130, 000
Expert in management and organization	\$ 250, 000		\$ 250, 000
Expert in disbursement	\$ 100,000		\$ 100,000
<b>Needs in office space</b> To be funded by ADB			0
<b>Equipment</b>			
Specific software	\$ 30, 000		\$ 30, 000
Computers	\$ 40, 000		\$ 40, 000
Hardware	\$ 30, 000		\$ 30, 000
Acquisition of emergency material	\$ 50, 000	\$ 50, 000	\$ 100, 000
<b>Training</b>			
Training	\$ 25, 000	\$ 25, 000	\$ 50, 000
Training on specific software	\$ 30, 000		\$ 30, 000
Field trips and international seminars	\$ 25, 000	\$ 25, 000	\$ 50, 000
<b>TOTAL</b>	<b>\$ 1,000, 000</b>	<b>\$ 100, 000</b>	<b>\$ 1, 000, 000</b>

**Subcomponent 2.2 - Capacity building and institutional strengthening of the CRSE** (US\$0.25 million – IDA US\$0.25 million)

18. Under that component IDA will support three types of activities: (i) financing of training activities through field trips to regulators with relevant experience (i.e. Bangladesh) or by exchanges with counterpart experts with experience in regulating rural electrification (international co-operation); (ii) technical assistance for *ad hoc* studies on certain technical aspects of the regulatory function of rural electrification and development of specific analytical tools (i.e. SENELEC-operator relations, re-integration of the ERILs, principles and adjustments in electricity rates in rural areas and management of the payment facility component, etc); and (iii) supporting participation at relevant regional and international forums. IDA contribution is detailed below.

**IDA financing – Support to CRSE**

	<b>Total Phase 1</b>
Training	US \$ 100,000
Technical Assistance	US \$ 100,000
International Seminars	US \$ 50,000
<b>TOTAL</b>	<b>US \$ 250,000</b>

**Sub-component 2.3 - Capacity and institutional building of the Ministry of Energy and Mining** (US\$0.20 million – IDA US\$0.20 million)

19. Under that component IDA will financially support four types of activities: (i) training related to the rural electrification sub-sector; (ii) technical assistance for specific studies; (iii) organization of workshops or seminars, and (iv) missions abroad to take part in relevant events (regional and international seminars). IDA contribution is detailed below.

**IDA financing – Support to Ministry of Energy**

	<b>Total Phase 1</b>
Training	US \$ 50,000
Technical Assistance	US \$ 50,000
Workshops and Seminars	US \$ 50,000
International Seminars	US \$ 50,000
<b>TOTAL</b>	<b>US \$ 200,000</b>

**Subcomponent 2.4 – Capacity development of the Multi-Sectoral Committee** (US\$0.1 million – IDA US\$0.10 million)

20. This sub-component will support the strengthening of the multi-sectoral Committee by providing financing for: (i) field trips related to multi-sectoral programs (PREMs), (ii) technical assistance for preparation of a national workshop in line with the “Energy and Poverty” regional workshop held in Dakar in February 2002, but focused on the specificities of the country, (iii) organization of national workshop(s), and (iv) technical assistance to support the committee in developing actions to ensure that energy needs are appropriately integrated in PRSP.

**IDA Financing – Support to Multi-Sectoral Committee**

	<b>Total Phase 1</b>
On the field activities	\$ 10,000
TA (pour (ii) et (iv))	\$ 40,000
National workshop (s)	\$ 45,000
Reports	\$ 5,000
<b>Total</b>	<b>\$100,000</b>

***Sub-component 2.5 - Capacity building of private stakeholders*** (US\$1.05 million – IDA US\$ 0.75 million & GEF US\$ 0.3 million)

21. This subcomponent is aimed at enhancing the participation of international and local private stakeholders in rural electrification bidding processes and ERIL projects. The subcomponent will also focus on the implementation of a set of actions to maximize economic effects and jobs creation in rural areas resulting from projects implementation. IDA and GEF intend to contribute to: (i) organization of workshops for private operators, NGOs, and other civil society groups, (ii) specific training sessions and seminars (national and regional) for exchanging experiences, (iii) activities to promote the participation of Senegalese emigrant communities in the RE program (see annex 1), (iv) training to and diffusion of SME Toolkit developed by IFC, (v) technical assistance to define a set of actions to maximize economic effects for local companies and jobs creation in rural areas resulting from project implementation, (vi) technical assistance to define the accessory programs to maximize development of productive uses of electricity and promote complementary non-electrical energy solutions for production processes when necessary, and (vii) financing and supporting the implementation of activities identified by the technical assistance activities mentioned above (for instance support for the development of local industrial units for manufacturing material for rural electrification).

**IDA financing – Private Sector Support**

	<b>IDA Phase 1</b>	<b>GEF Phase 1</b>	<b>Total Phase 1</b>
(i) Workshops	\$50,000	\$25,000	\$75,000
(ii) Training, Exchange programs	\$50,000	\$25,000	\$75,000
(iii) TA migrants	\$200,000		\$200,000
(iv) SME Toolkit (see IFC)	\$100,000		\$100,000
(v) TA Maximize economic impacts	\$100,000	\$50,000	\$150,000
(vi) TA Prepare pilot actions	\$100,000	\$50,000	\$150,000
(vii) Financing of pilot actions	\$150,000	\$150,000	\$300,000
<b>TOTAL</b>	<b>\$ 750,000</b>	<b>\$ 300,000</b>	<b>\$ 1,050,000</b>

***Subcomponent 2.6 - Capacity building of the banking system*** (US \$ 0.25 million – IDA US\$ 0.25 million)

22. Under that subcomponent IDA will support: (i) technical assistance for the necessary additional developments expected to lead to the signing of conventions between the banking sector and ASER, (ii) specific workshops to ensure accurate information from the banking sector in relation to the RE program and more specifically, funding mechanisms available and

processes, and (iii) certain services that could be contracted out to the banking sector in support of ASER activities. (i.e. training, periodic updating of information furnished to ASER...).

**IDA Financing – Banking Sector Support**

	Total Phase 1
(i) TA (several studies)	\$ 100,000
(ii) Workshops	\$ 50,000
(iii) Professional fees	\$ 100,000
<b>Total</b>	<b>\$ 250,000</b>

**Project Component 3** – US\$ 2.8 million (*IDA - US\$ 2.25 millions & GEF – US\$ 0.55 million*). ***Support for the implementation, the Communication and Monitoring & Evaluation of the project*** This third component of the project is composed of four subcomponents

**Subcomponent 3.1 - Technical assistance for Multi-Sectoral Energy Programs (PREMs)** (US\$0.5 millions – IDA US\$ 0.5 million)

23. Through this subcomponent, IDA intends to finance technical assistance for: (i) finalizing the organizational and legal aspects of the PREMs identified within the first three concessions; (ii) effective implementation of these PREMs; (iii) identification and preparation of PREMs in the three concessions to be implemented under phase II; and (iv) development of the specific “micro-finance” PREM.

**IDA Financing Technical Assistance to the PREMs**

	TOTAL PHASE 1
(i) TA putting finishing touches to phase 1 PREMS	\$ 50,000
(ii) TA accompanying Phase 1 PREMs	\$ 50,000
(iii) TA identification of Phase 2 PREMs	\$ 200,000
(iv) TA micro-finance PREMs	\$ 200,000
<b>Total</b>	<b>\$ 500,000</b>

**Subcomponent 3.2 - Technical assistance to ASER** (US\$1.2 million – IDA US\$ 0.95 million & GEF US\$ 0.25 million)

24. Through this subcomponent, the project intends to assist ASER in: (i) preparing ERIL projects, (ii) providing technical assistance for drawing up the phase II Local Electrification Plans (PLEs), (iii) technical assistance for the updating, harmonization and capitalization on PLEs already completed; and, (iv) technical assistance and pilot operations related to technological innovation.

### **Financing – Technical Assistance to ASER**

	<b>IDA</b>	<b>GEF</b>	<b>TOTAL PHASE 1</b>
(i)TA Support preparation ERIL projects	\$ 350,000	\$100,000	\$ 450,000
(ii)TA for drawing PLEs for phase 2	\$ 350,000		\$ 350,000
(iii) TA methodology capitalization of existing PLEs	\$ 100,000		\$ 100,000
(iv) TA Technological Innovation	\$ 150,000	\$ 150,000	\$300,000
<b>Total</b>	<b>\$ 950,000</b>	<b>\$ 250,000</b>	<b>1,200,000</b>

**Sub-component 3.3 - Information, Education and Communication** (US\$0.60 million – IDA US\$ 0.45 million & GEF US\$ 0.15 million)

25. Through this subcomponent, the project intends to strengthen the transparency and the credibility of the RE program through consultation and information on the objectives and results from the program. This will be one of the main tasks of the ASER’s Communication Cell, which will be responsible for defining and implementing the communication strategy. It is therefore essential for ASER to formulate, adopt and implement a strategic communication plan targeting all interested groups and parties. To prepare and implement such plan ASER’s should benefit from specialized technical assistance.

### **Financing –Information, Education and Communication**

	<b>IDA</b>	<b>GEF</b>	<b>Total Phase 1</b>
(i) TA development methodology	\$ 200,000		\$ 200,000
(ii) Communication aids/publications	\$ 100,000	\$ 100,000	\$ 200,000
(iii) Workshops	\$ 50,000		\$ 50,000
(iv) International workshops & seminars	\$ 75,000	\$ 25,000	\$ 100,000
(v) Field trips	\$ 25,000	\$ 25,000	\$ 50,000
<b>Total</b>	<b>\$ 450,000</b>	<b>\$ 150,000</b>	<b>\$ 600,000</b>

**Subcomponent 3.4 - “Monitoring and Evaluation”** (US\$ 0.5 million – IDA US\$ 0.35 million & GEF US\$ 0.15 million)

26. The Monitoring and Evaluation subcomponent will focus on two main activities: (i) Monitoring and impact assessment through formulation and implementation of specific methodologies relevant to RE programs; and (ii) monitoring of contracts signed with operators and entities implementing the RE program (ASER, FER etc.) through a series of audits and various studies and reports (accounting, financial, organizational, procurement, etc.).

**Financing - Monitoring and evaluation**

	<b>IDA</b>	<b>GEF</b>	<b>Total Phase 1</b>
(i) TA Impacts	\$ 250,000	\$ 150,000	\$ 400,000
(ii) Audits and reporting	\$ 100,000		\$ 100,000
<b>TOTAL</b>	<b>\$ 350,000</b>	<b>\$ 150,000</b>	<b>\$ 500,000</b>

**Project Component 4** -- US\$ 4.6 million (IDA – US\$ 4.1 million). Sustainable Woodfuels Supply Management and Demand Management and Inter-fuel Substitution Options. Attachment 4.B provides for a detailed cost breakdown.

27. The Sustainable Woodfuels Supply Management subcomponent entails the implementation of: (i) selected activities to consolidate the ongoing PROGEDE project interventions; and (ii) sustainable community-managed forest management systems over an incremental area of 230,000 ha in the Sedhiou, Bakel and Kedougou departments within a total period of two years, at the end of which a minimum of 60,000 tons of sustainable charcoal will be annually produced by the participating 100 villages. The sub-component would further seek to expand the protective buffer zone around the Niokolo-Koba National Park (National and International Biodiversity Reserve). This sub-component will have six major activities: (i) sustainable and participatory forest/NRM management systems; (ii) participatory community-based biodiversity reserves; (iii) improvement of forestry, agriculture and pastoral production systems; (iv) capacity development of rural communities; (v) institutionalization of the “Forestry and Pastoral Information System” (*Systeme d’information ecologique forestire et pastorale - SIEF*) within the Forestry Department; and, (vi) institutional development support.

28. This subcomponent will finance technical assistance; small tools and field equipment for the rural communities; office and field equipment for the regional offices of the Forest Service; forest fire control equipment; materials and tools for the implementation of rural community projects (carbonization units, energy service platforms, agro-forestry enterprises, marketing chains, etc.).

29. The Energy Demand Management and Inter-fuel Substitution subcomponent will entail the implementation of: (i) technical assistance to villages participating in the Sustainable Woodfuel Management subcomponent to increase their access to modern energy services; (ii) rural community and SME modern biomass energy development pilot/demonstration initiatives; (iii) decentralized energy information and planning systems; (iv) selected consulting studies (household “indoor” air pollution”; renewable energy inventory/potential; household energy pricing, etc.); and (v) continued supervision and technical support of the revolving fund mechanism for the promotion of private sector/NGO-based improved household cooking stoves and interfuel substitution initiative.

30. This subcomponent will finance technical assistance, office, computer and communication equipment for the *Direction de l’Energie* and the *Direction des Eaux et Foret*., computers for decentralized energy information systems, publicity/communication services for the promotion of improved household stoves and interfuel substitution, renewable energy equipment (briquetting and micro-distillation equipment, etc.); and technical consultant studies (including household “indoor” air pollution” measurement equipment)..

### Attachment 4.A

<b>Financing of the all program</b>																			
PHASE	IDA	GEF	Government	Other donors	Private sector	Total PHASE 1	IDA	GEF	Government	Other donors	Private sector	Total PHASE 2	IDA	GEF	Government	Other donors	Private sector	Total PHASE 3	TOTAL
Component 1	18.25	3.00	5.10	10.10	12.55	49.00	27.10		10.40	20.90	34.25	58.25	28.20		12.75	18.00	38.00	58.95	244.40
Component 2	2.56	0.40	3.75	1.00		7.70	2.50		4.00	0.50		7.00	2.00		4.00	0.50		6.50	21.20
Component 3	2.25	0.55		0.40		3.20	2.50					2.50	2.00					2.00	7.70
Component 4	4.10		0.50			4.60						0.00						0.00	4.60
<b>Sub Total 1</b>	<b>25.16</b>	<b>4.55</b>	<b>9.35</b>	<b>11.50</b>	<b>12.55</b>	<b>63.10</b>	<b>32.10</b>		<b>14.40</b>	<b>27.00</b>	<b>34.25</b>	<b>107.75</b>	<b>32.20</b>		<b>18.75</b>	<b>18.10</b>	<b>38.00</b>	<b>107.05</b>	<b>277.90</b>
+ PPF	2.00					2.00						0.00						0.00	2.00
<b>Sub Total 2</b>	<b>27.16</b>	<b>4.55</b>	<b>9.35</b>	<b>11.50</b>	<b>12.55</b>	<b>65.10</b>	<b>32.10</b>		<b>14.40</b>	<b>27.00</b>	<b>34.25</b>	<b>107.75</b>	<b>32.20</b>		<b>18.75</b>	<b>18.10</b>	<b>38.00</b>	<b>107.05</b>	<b>279.90</b>
10%	2.72	0.46	0.94	1.15	1.28	6.51	3.21		1.44	2.70	3.43	10.78	3.22		1.68	1.91	3.90	10.71	27.98
<b>TOTAL</b>	<b>29.9</b>	<b>5.0</b>	<b>10.3</b>	<b>12.7</b>	<b>13.8</b>	<b>71.6</b>	<b>35.3</b>		<b>15.8</b>	<b>29.7</b>	<b>37.7</b>	<b>118.5</b>	<b>35.4</b>		<b>18.4</b>	<b>21.0</b>	<b>42.9</b>	<b>117.8</b>	<b>307.9</b>

**Attachment 4.B**

**Senegal: Electricity Services for Rural Areas Project**  
**"PROGREDE II" Component**

Subcomponent / Activity	NEW BUDGET		Total	%
	IDA	GoS		
<b>I. Sustainable Woodfuels Supply Management Subcomponent</b>				
1.1 Sustainable and Participatory Woodfuels Supply Systems	830,000	81,000	911,000	19.8
1.2 Community-based Biodiversity Reserves	430,000	43,000	473,000	10.3
1.3 Improvement of Forestry, Agriculture and Pastoral Production Systems	350,000	35,000	385,000	8.4
1.4 Capacity Development of Rural Communities	100,000	10,000	110,000	2.4
1.5 Institutionalization of the SIEF	100,000	10,000	110,000	2.4
1.6 Institutional Support to Forestry Directorate	80,000	8,000	88,000	1.9
<b>Sub-total I</b>	<b>1,890,000</b>	<b>187,000</b>	<b>2,077,000</b>	<b>45.2</b>
<b>II. Energy Demand Management and Interfuel Substitution Subcomponent</b>				
2.1 Increasing Rural Access to Energy Services within PROGEDE Zone	200,000	20,000	220,000	4.8
2.2 Rural Community/SME Modern Biomass Energy development	450,000	40,000	490,000	10.7
2.3 Decentralized Energy Information/Plannign Systems	50,000	5,000	55,000	1.2
2.4 Studies and Consultant Support	250,000	-	250,000	5.4
2.5 Equipment	80,000	-	80,000	1.7
2.6 Institutional Support to Energy Directorate	80,000	8,000	88,000	1.9
<b>Sub-total II</b>	<b>1,110,000</b>	<b>73,000</b>	<b>1,183,000</b>	<b>25.7</b>
<b>III. Component Management/Implementation Costs</b>				
3.1 Staff Costs	800,000	80,000	880,000	19.1
3.2 Operating Expenses	220,000	160,000	380,000	8.3
3.3 Audit of Information/Monitoring Systems	30,000	-	30,000	0.7
3.4 Monitoring and Evaluation	50,000	-	50,000	1.1
<b>Sub-total III</b>	<b>1,100,000</b>	<b>240,000</b>	<b>1,340,000</b>	<b>29.1</b>
<b>TOTAL BUDGET</b>	<b>4,100,000</b>	<b>500,000</b>	<b>4,600,000</b>	<b>100.0</b>

## Annex 5: Project Costs

### SENEGAL: SN-ELECTRICTY SERV. for RURAL AREAS PROJ

<b>Project Cost By Component (Phase I of APL) <sup>1</sup></b>	<b>Local US \$million</b>	<b>Foreign US \$million</b>	<b>Total US \$million</b>
Component 1 – RE Investments	3.08	27.72	30.80
Component 2 – RE Capacity Building	3.55	1.95	5.50
Component 3 – RE Technical Assistance	0.80	2.00	2.80
Component 4 - Biomass and Household Energy	3.22	1.38	4.60
Project Preparation Facility	0.20	1.80	2.00
<b>Total Baseline Cost</b>	<b>10.85</b>	<b>34.85</b>	<b>45.70</b>
Physical Contingencies	0.54	1.75	2.29
Price Contingencies	0.54	1.74	2.28s
<b>Total Baseline Costs <sup>2</sup></b>	<b>11.93</b>	<b>38.34</b>	<b>50.27</b>
<b>Total Financing Required Rounded</b>	<b>11.93</b>	<b>38.34</b>	<b>50.27 50.3</b>

<b>Project Cost By Category (Phase I of APL)</b>	<b>Local US \$million</b>	<b>Foreign US \$million</b>	<b>Total US \$million</b>
1. Grants for concession <sup>3</sup> of which (IDA)	2.80	24.50	27.30 (12.75)
2. Works of which (IDA)	0.15	0.38	0.53 (0.45)
3. Goods of which (IDA)	1.50	3.07	4.57 (4.45)
4. Consultants' services, Training of which (IDA)	2.25	5.00	7.25 (6.50)
5. Grants Micro finance PREM of which (IDA)	0.15	0.10	0.25 (0.25)
6. Recurrent costs of which (IDA)	3.80	0.00	3.80 (0.80)
7. Refunding of Project Preparation Advance of which (IDA)	0.20	1.80	2.00 (2.00)
8. Unallocated of which (IDA)	1.08	3.49	4.57 (2.70)
<b>Total Baseline Cost<sup>1</sup> Of which (IDA)</b>	<b>11.93</b>	<b>38.34</b>	<b>50.27 (29.9)</b>
<b>Total Financing Required Of which (IDA)</b>	<b>11.93</b>	<b>38.34</b>	<b>50.27 (29.9)</b>

<sup>1</sup> See also Annex 4 – Detailed project description.

<sup>2</sup> The share of project cost net of taxes is 59.45% for IDA and 9.9% for GEF.

<sup>3</sup> Grants for concessions means Subsidies allocated on an OBA basis to Concessionaires of PPER concessions and of ERIL concessions. This may also finance part of preparatory studies, engineering, goods and works.

## **Annex 6: Legal and Regulatory Framework and Financing Mechanisms SENEGAL: SN-ELECTRICITY SERV. For RURAL AREAS PROJ.**

1. Various regulatory measures have been adopted or progressed in addition to Law 1998-029 on power sector reform, the 2003 Energy Sector Policy Letter, the 2004 Rural Electrification Policy Letter, the 2004 CET Law on infrastructure project, related decrees setting up RE concessions, the CRSE, and the ASER.

### **Agreement between the rural operator and SENELEC**

2. A standardized agreement approved by ASER, CRSE and SENELEC describing the relations and the respective obligations of a RE concessionaire and of SENELEC has been drafted. Most of the provisions relate to infrastructure, the medium voltage (MV) power to be supplied by SENELEC to the concessionaire's network, and MV client management.

3. Delimitation of RE concessions perimeter and of Senelec. The Rural Policy Letter adopted in July 2004 states that in order to ensure the economic and financial viability of the RE concessions and preserve the consistency of the RE program implementation framework: (a) SENELEC's concession perimeter will contain all communes and villages electrified in 2000, including the rural communities listed in Convention No. 9 and those electrified through the "Fonds de préférence" [Priority Fund] at such date; (b) ASER's perimeter contains the 18 PPER RE concessions and all rural communities not electrified by 2000; and (c) given the scale of work required for electrification and the needs of service quality and continuity, SENELEC should ensure the rational use of the expansion potential of its networks by expanding its MV networks without jeopardizing the economic and financial sustainability of the concessions already defined by ASER. Any extension or further densification of SENELEC's lower voltage (LV) network must take place exclusively within SENELEC's perimeter.

### **Standardized contracts providing a framework for the activities of future concessionaires**

4. The following standardized contracts have been drawn up by ASER and will be part of the bid documentation: (a) a concession contract and related technical specifications laying out the concessionaire's obligations to the conceding Authority; (b) standard contracts that a RE concessionaire will offer to various customer categories; and (c) terms under which a PPER concessionaire may take-over ERILs launched before the PPER concession is awarded.

### **Bidding process for awarding PPER concessions**

5. The 2004 Law on of infrastructure construction, exploitation and transfer contracts, commonly known as "CET Act" sets the legal framework for awarding RE concessions. Such framework is in line with World Bank competitive bidding requirements.

6. The RE tendering process reflects the following principles:

Local Electrification Master Plans (PLEs) and business plan simulations are used to determine simultaneously the minimum number of households, productive or social clients; and a subsidy package, including a GEF contribution aimed at eliminating barriers to using renewable energy resources.

The winning bid is selected from short-listed bids on a financial basis and is the one providing services to the greatest number of clients for a preset level of subsidy and within the required implementation time frame. Such criteria allows to maximize private funds committed for a given subsidy level by motivating the bidders to increase their contribution in order to serve more clients. It

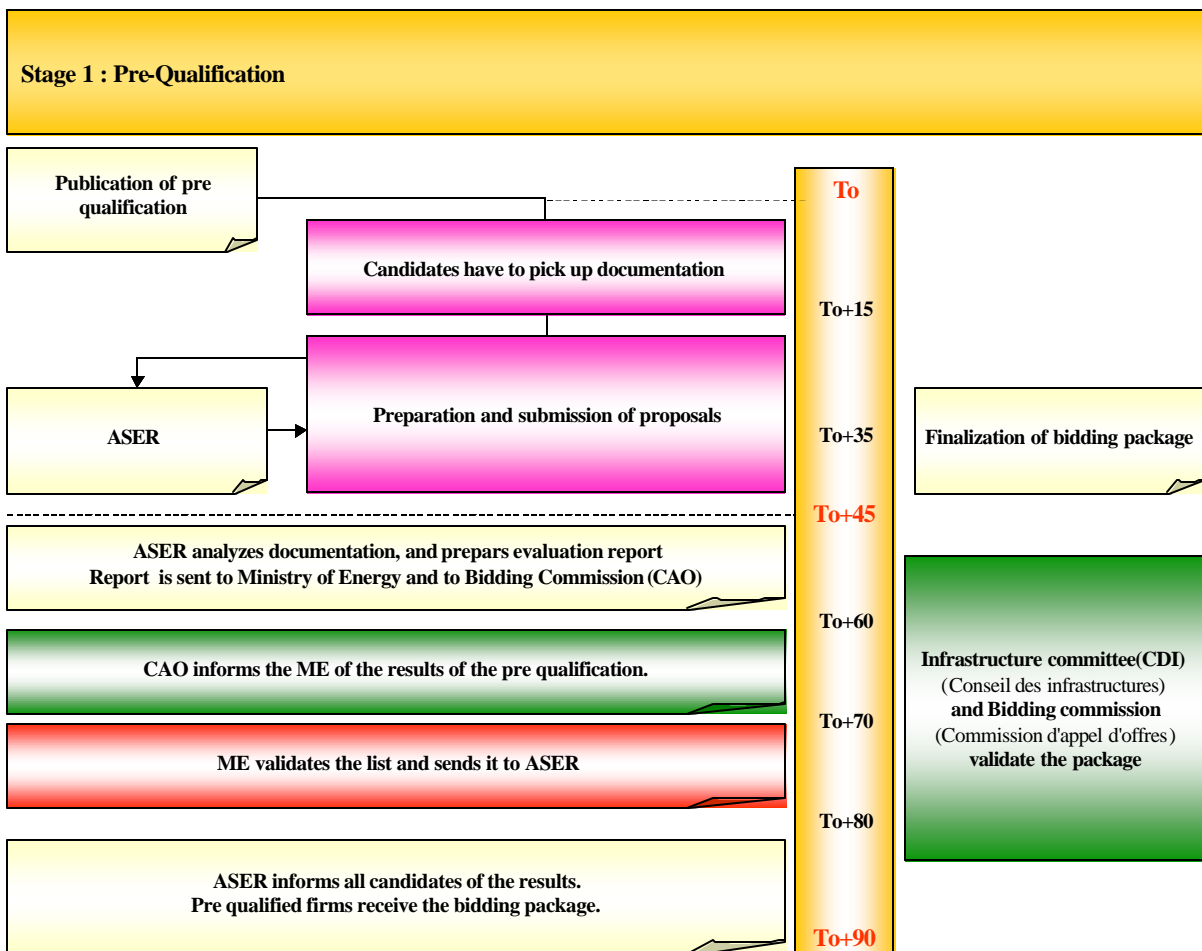
also encourages bidders to seek a lower unit cost as a way of increasing the number of clients served with a given total investment(subsidy plus private contribution).

7. The PPER concessionaires will be selected using pre-qualification and two-stage ICB process. The selected concessionaire will be free to procure the goods, works and services required under the concession contract using his own procedures. The process of awarding a concession from prequalification to signing the concession and the financing contracts is shown below. It complies with the CET Act and may be streamlined as per the CET Act for small investments such as the ERILs.

**PPER concessions awarding process**

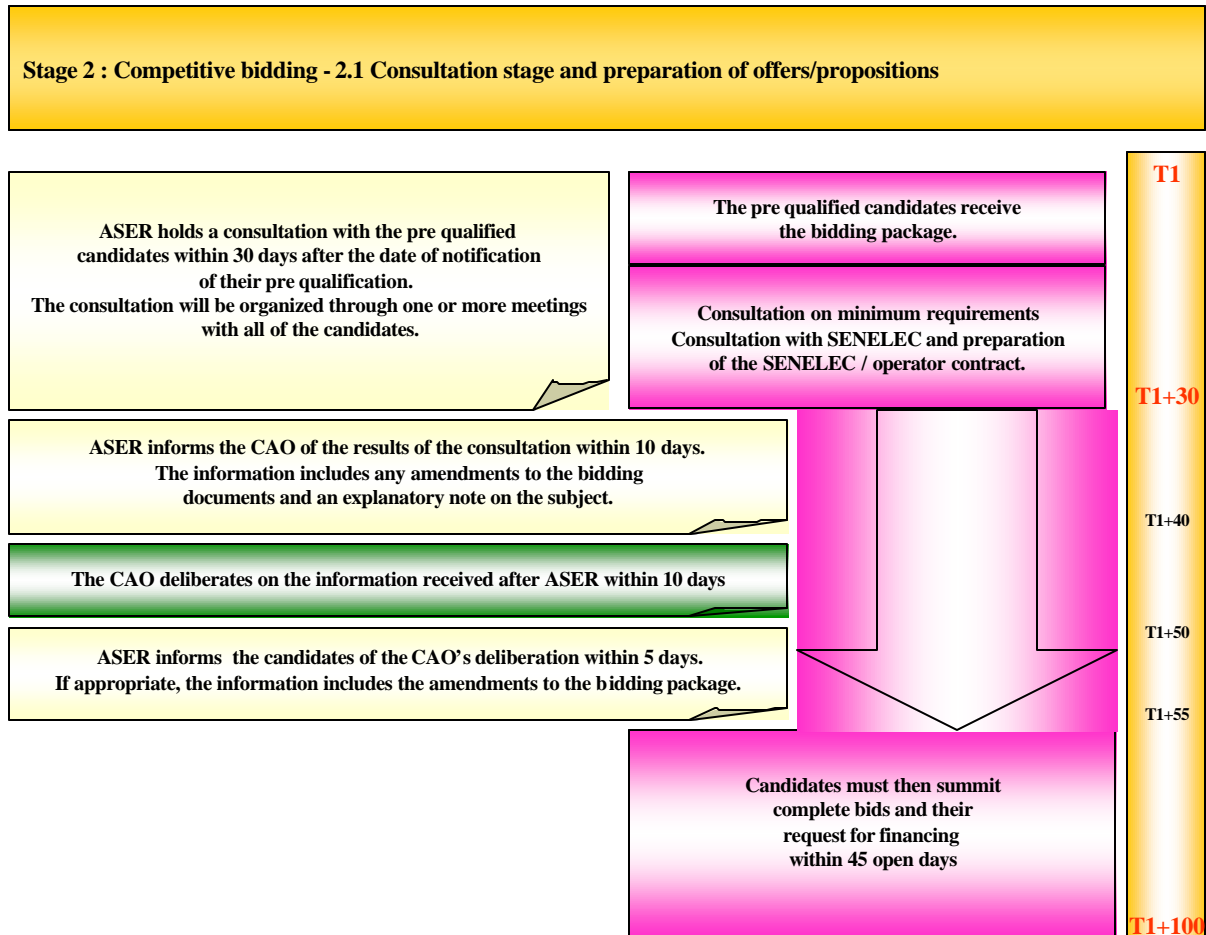
8. Stage 1 – Pre qualification. Pre qualified PPER candidates will be selected on the basis of their competence in the RE sector and experience in the given geographic area (figure 6.1 below).

**Figure 6.1**



9. Stage 2 – Tendering. As per the CET Act, tendering will be carried out in two stages. Stage 2.1 Consultations with the prequalified candidates and Stage 2.2 Tender - Evaluation . are described in figures 6.2 and 6.3 below

**Figure 6.2**



## Stage 2 : Competitive bidding - 2.2 Evaluation stage

The bids are evaluated by CAO within 45 days after opening of the offers.

For evaluation purposes, The CAO (with ASER) may ask any bidder to clarify specific points in the bid, but no bidder may be invited or permitted to modify the bid content or price once the first bid is opened.

**Technical evaluation → Acceptability of bids**  
 First, the CAO asks ASER to submit an opinion on the eligibility of the technical proposals within 15 days  
 (Evaluation of the proposal – Multi criteria analysis)

Bids technically acceptable

**Financial evaluation → Admissibility of the Business Plan**  
 The CAO asks ASER (DFER) to evaluate all the bids considered eligible  
 The evaluation addresses the financial proposals, and the Business Plan are analysed in details within 20 days  
 (Sustainability - Multi criteria analysis)

Bids financially acceptable

The evaluation report and datasheets of ASER are transmitted To the CAO within 10 days.

**Classification and notification**  
 The CAO then ranks the bidders considered acceptable, on the sole criterion of the subsidy requested per electrified household in the first three years of the concession

In fact, a given subsidies amount is announced to the candidate at the beginning of the pre qualification phase, the candidates will compete on the number of clients they will electricity within the first three years of the concession

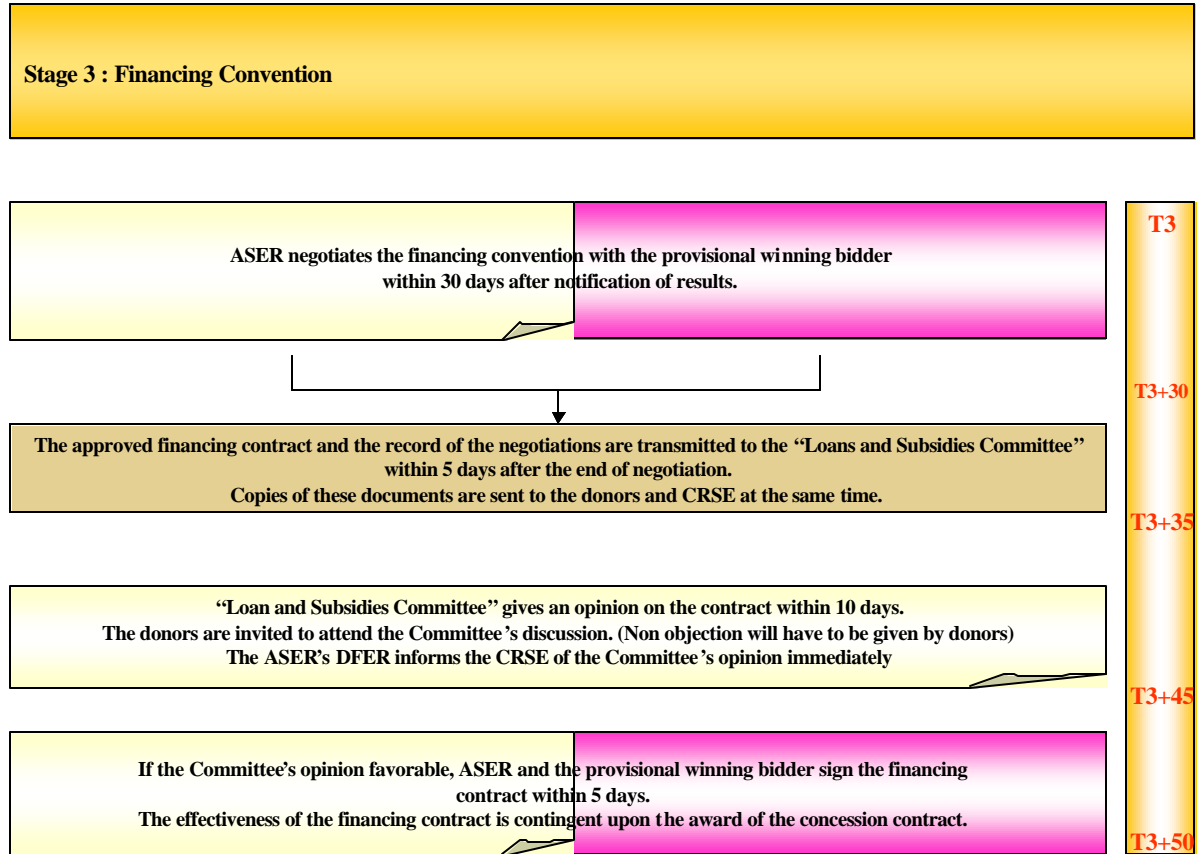
T2  
 T2+15  
 T2+35  
 T2+45  
 T2+55

Technical Qualification				
Minimas	Number	Minimas		
		No	Yes	
number of total users				
number of distant users				
number of users (Service 1)				
number of users (Service 2)				
number of users (Service 3)				
number of users (Service 4)				
<b>Technical criterias</b>	0	1	3	5
Specific experience of the candidate				
Description of the project				
Market assessment				
Technical choices				
Investment Costs				
Operating costs				
Operating organization (revenue collection)				
<b>Total</b>				
		PASS	FAIL	

Financial Classification				
Financial criterias	0	1	3	5
Overall quality of Business Plan				
Description of the project				
Cash Flow over 25 years				
Sustainability				
FR Min				
<b>Total</b>				
		PASS	FAIL	

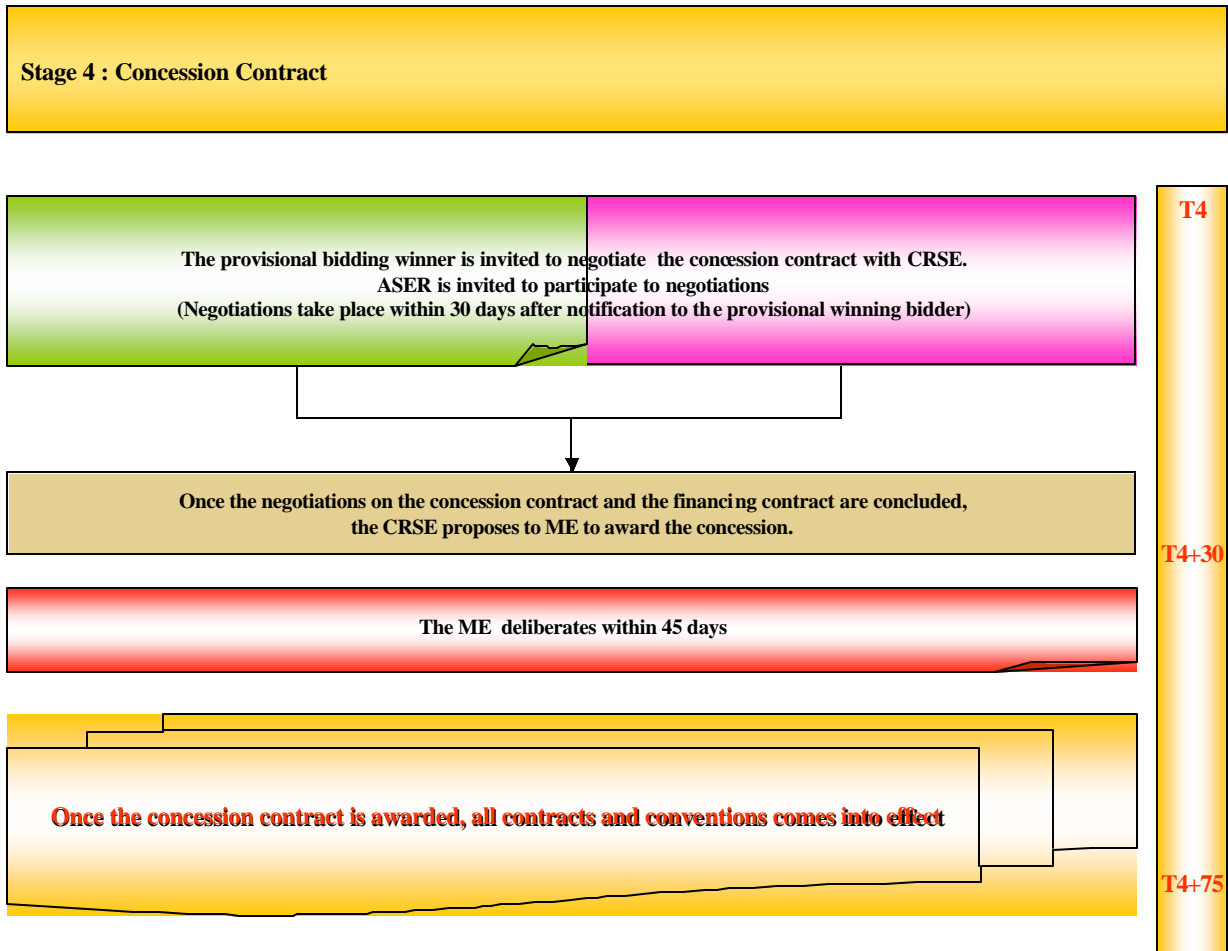
10. Stage 3 - Financing contract. This stage is described in figure 6.4 below.

**Figure 6.4**



11. Stage 4 - Awarding a Concession. This stage is described below in figure 6.5.

**Figure 6.5**



## FINANCING MECHANISMS

### Introduction

12. To encourage private operators in undertaking sustainable investment in RE concessions in Senegal and to ensure the long-term sustainability of PPP activities, it is necessary - over and above the institutional and regulatory measures described earlier - to provide for tax incentives and a public contribution towards investment financing. The scale of funding and the duration of the implementation of this national program require the establishment of a Rural Electrification Fund (FER) to ensure the sustainability of the institutional and financing mechanisms.

13. The RE financing mechanisms aim at four intertwined objectives:

- *reducing the operators' financial costs through investment subsidies* in order to compensate for low profitability, counterbalance risks and to allow for tariff levels affordable to the low-income rural population;
- *leveraging the public funds by mobilizing private funds* in particular from private operators and commercial banks;
- *optimizing the use of public resources* through appropriate selection of operations and operators on economic and financial criteria and effective procedures ensuring financial security; and
- *rationalizing and standardizing international assistance flows* for RE development in Senegal.

14. The financing mechanisms must also take into account the fact: (a) that between the call for tender and the submission of bids, bidders will incur bid preparation costs; (b) time lags between commitment of funds for setting-up, construction etc. and the availability of funds and long term financing is required.

### The Rural Electrification Fund (FER Fund)

15. A Rural Electrification Fund (FER) will be funded from resources provided by the National Budget and different Donors. Mobilization of these resources is subject to specific and strict procedures. Within FER, Special Accounts will be opened by ASER allowing: (a) a separation of funds allocated to investment in concessions from funds allocated to other supporting activities; (b) an easier traceability of sources and disbursements of funds (National Budget, Donors, etc.); and (c) meeting Donors specific requirements. As indicated in Annex 7, IDA and GEF will each open two Special Accounts for investments. Figure 6.6 below describes the financial flows.

16. Over time, it is envisaged that the financing tools and instruments may comprise: (a) direct subsidies; (b) refinancing; (c) guarantees backed up by the FER or through other instruments such as the IDA/BOAD guarantee facility; (d) interest-relief accounts; and (e) specific funding facilities for ERIL's set-up costs. In the initial project phase however only the subsidy account(s) and the funds for ERILs will be activated by ASER. While the operational modalities for the refinancing, guarantee and interest-relief accounts are largely defined, additional consultation with the banking sector and the concessionaires is required. Technical assistance (under component 2.6) is provided by the project to develop these arrangements.

### Disbursements of Investment Subsidies

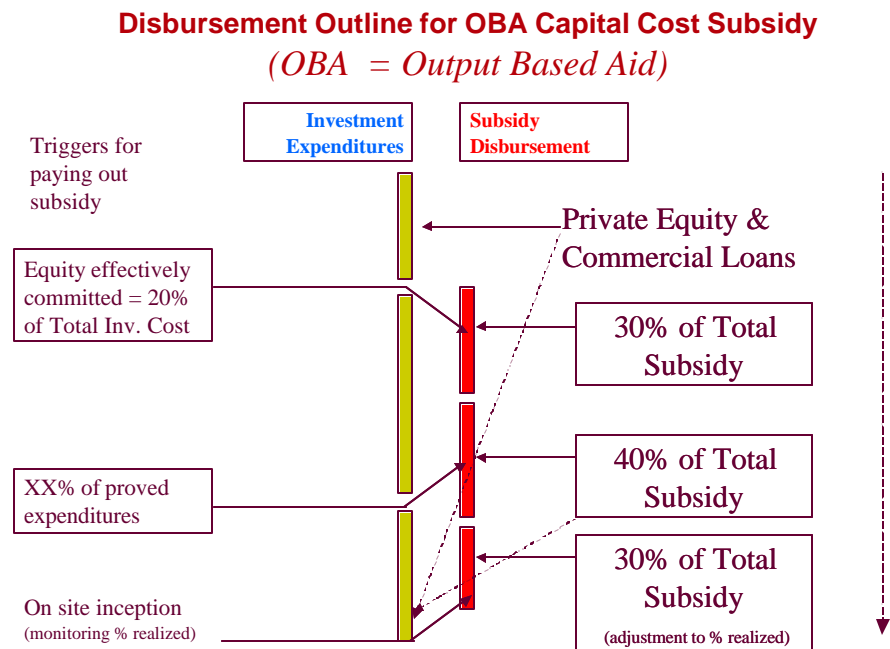
17. Subsidies for PPERs and ERILs will be disbursed once the following requirements laid-out in the concession and financing agreements are confirmed: (a) availability of concessionaire's financial contribution; and (b) availability of financing for construction and operation costs exceeding the

operator's own funds and the subsidy (conditional commitments from financing institutions or shareholder current-account contribution).

**Disbursements and OBA principles**

18. Application of the principle of results-indexed subsidy payments (OBA) guarantees the attainment of the contractual objectives. However as substantial costs will be incurred by the concessionaires well before services are provided, the following mechanisms for disbursing the subsidy to the concessionaire have been worked out (see also figure below):

- (a) First payment: 30 percent of the subsidy, payable on presentation of a certificate, issued by a commercial bank indicating that the capital has been paid in full and deposited;
- (b) Second payment: 40 percent of the subsidy, payable on a certificate provided by an independent certification body confirming the integrity of the equipment and its conformity to specifications. A bank guaranty on first demand will be required and returned to the concessionaire at the time of the third payment; and
- (c) Third payment: 30 percent. This last payment will be disbursed after inspection by ASER in the presence of the contracting parties, determination of the number of clients connected and ascertainment that the minimum technical requirements stipulated in the concession contract have been met. Adjustments may be made to reflect the number of clients and quality.



19. Subsidies for expansion investment. ASER will also launch periodic tenders for expansion investment. Additional work is however required to detail the bidding and payment mechanisms under an OBA approach.

**Allocation of GEF Subsidy to Investment**

(besides Capacity Building and Technical Assistance activities under components 2 and 3)

20. Through the project GEF Grant facility, incentives will be provided to bidders to increase the contribution of renewable energies in their proposal, while seeking the lowest "GEF" subsidy per

renewable-energy-based system (to win, bidders will be asked to maximize the number of consumers served for the total amount of subsidy (IDA+GEF) allocated to the concession.

21. The basic principles for allocating the GEF grant are as follows: (a) a share of the GEF grant will be allocated to each concession and specified in the Request for Proposals (RFP); (b) a bidder that proposes to use renewable energies will be able to claim an additional subsidy from the GEF grant; and (c).a per unit ceiling on the GEF subsidy that can be claimed for each renewable energy technology will be specified in the RFP; (for instance, in the case of photovoltaic systems, a maximum amount of GEF subsidy per Wp installed).

**Annex 7.A: Financial Management and Disbursement Arrangements**  
**SENEGAL: SN-ELECTRICITY SERV. for RURAL AREAS PROJ**

**Financial Management**

**A. Summary of Financial Management Assessment**

1. The proposed project has 4 main components. The first three components which pertain to rural electrification will be implemented by ASER (the Rural Electrification Agency) and the fourth component which pertain to biomass and household energy will be implemented by PROGEDE.
2. The main conclusion of ASER's financial management capacity assessment is that the Agency needs to be strengthened. Capacity-building needs to be carried out as soon as possible and preferably during the period preceding credit effectiveness. Capacity building activities relate to: strengthening human resources; updating the administrative, accounts and financial procedures manual in line with project requirements, and setting up a computerized management system. Such actions pertaining to ASER, including the recruitment of an external auditor under procedures acceptable to IDA, are detailed in the action plan provided in Annex 7.A.1.
3. The Biomass and Household Energy component (project component 4) will be managed by PROGEDE. The PROGEDE project, financed through an IDA Credit and a GEF Grant, is under implementation and has been managed satisfactorily. The same arrangements will therefore be maintained to implement such component. A Special Account will however be opened for this component 4.
4. **ASER Administrative and Financial Directorate (DAF).** In particular the human resources of the DAF need to be strengthened. The DAF will be responsible for the management of the donor special Accounts and of the ASER operational accounts (except for component 4) The DAF has a staff of four qualified staff, including the Director, and has the required qualifications for such project.
5. However, no DAF staff member has managed a World Bank project until now. It is therefore recommended that the Administrative and Financial Officer (RAF) of the Energy Sector Reform Preparation Unit (CPRSE) be integrated into DAF to assume responsibility for the Credit accounts and the associated financial operations. By managing the PPFs of the previous IDA energy projects, the RAF has acquired extensive experience in handling a World Bank operation. At the same time, the other members of the DAF team should participate in training activities organized by the World Bank on financial management and disbursements. In addition the DAF lacks a chief accountant. Given the volume of operations that the Directorate will be carried out such position is required and the recruitment should be carried out pursuant to terms of reference approved by IDA.
6. **ASER Rural Electrification Financing Directorate (DFER).** This Directorate does not yet exist but will be set up and staffed before Credit effectiveness. It will consist of a Director and a financial analyst. Its main tasks will be to review and analyze the PPER and ERIL bidding and subsequent documents to ensure compliance with the financial plan. In particular, it will follow up in detail the fulfillment of financial requirements stipulated in the concession and financing contracts. The accounting and financial aspects will then be reviewed by DAF. The terms of reference for the Director, the financial analyst and for candidates to any other positions must be approved by IDA before the recruitment process is launched.

7. **ASER Administrative, Accounts and Financial Procedures Manual.** ASER has a procedures manual compiled in December 2001. Such manual should however be revised to improve its structure, enrich it with more information on roles and responsibilities, and adapt it to ASER's new missions and to the implementation and funding frameworks agreed with the World Bank. The manual must specify in detail the procedures applicable to, inter alia, the administrative organization, general accounts, cost accounting, budget management, procurement and contracts management, disbursements follow-up, internal audit system, long-term asset management, human resources management etc. according to SYSCOA provisions and World Bank guidelines on project financial management. The new information system to be introduced in ASER and the need to draw up new staff task sheets must be addressed in revising the manual.

8. **ASER Computerized Management System.** ASER's accounts are currently kept on Excel spreadsheets; the DAF has decided on the acquisition of a new software (SAGE). This new software must be configured to provide the information required in the framework of the financing provided by IDA, the other donors and the State. As an integrated management system, it must simultaneously process accounts and the other management activities, including: cost accounting; financial and disbursements follow-up by donor; follow-up of FER accounts by type of account, operator and beneficiary; follow-up of tenders and contracts; budget management; long-term asset management; financial statement, utilities; and payroll management. This information system is a prerequisite for starting project implementation.

## **B. Audits Arrangements**

9. ASER's decree provides for various audit mechanisms to be carried out by internal and external auditors and by the Court of Auditors. None of these mechanisms has yet been implemented and no external auditor has yet been selected. An external auditor will need to be recruited and the external audit report will cover ASER accounts, including of donor financing and special accounts as per the World Bank's new audit guidelines.

10. **ASER Internal Audit Function.** Pursuant to the decree delineating the organization of ASER, the Agency has an internal auditor, who is supported by one officer. However, the internal audit functions have not yet been properly implemented nor are they defined correctly in the procedures manual, and consequently have not been regularly exercised to this date. It will be therefore required to review the internal audit task sheets and the description of ASER internal audit function in the procedures manual. The internal audit unit will be assessed during project supervision to ensure that it fulfills its role and that has the staff necessary for that purpose.

11. **External Audits of ASER, of the IDA Credit and of the GEF Grant.** External audits of the Project including of the Special Accounts will be carried out by auditors acceptable to IDA. The selection of an external auditor acceptable to IDA is a condition of Credit effectiveness. The external audit reports must be transmitted by ASER to IDA by June 30 of each year or earlier, depending on the date of closing the accounts.

12. **Audits of Concessionaires.** The concessionaires (PPERs and ERILs) funded by the IDA Credit will need to transmit their audited annual financial statements to the World Bank.

## **C. Disbursements Arrangements**

13. Disbursements under the proposed Credit will be made as indicated in Table A below for the IDA Credit and Table B for the GEF Grant, according to the percentages indicated for the different

categories. The project will be disbursed mainly through Statements of Expenditures (SOEs). Direct payments for larger amounts may also be used. The Project will be completed in four years (early CY2005- end CY2009).

**Table A: Allocation of IDA Credit Proceeds**

<b>Expenditure Category</b>	<b>Amount in US\$million</b>	<b>Financing Percentage</b>
Grants for Concessions	12.75	100% of foreign expenditures; 90% of local expenditures
Works	0.45	100% of foreign expenditures; 90% of local expenditures
Goods	4.45	100% of foreign expenditures; 90% of local expenditures
Consultants' services and Training	6.5	100% of foreign expenditures; 90% of local expenditures
Grants for micro financing of PREMs	0.25	100% of amount disbursed
Recurrent Costs	0.8	90% of local expenditures
Refinancing of PPF	2.0	
Unallocated	2.7	
<b>Total IDA Credit</b>	<b>29.9</b>	

**Table B: Allocation of GEF Grant Proceeds**

<b>Expenditure Category</b>	<b>Amount in US\$million</b>	<b>Financing Percentage</b>
Grants for Concessions	3.6	100% of foreign expenditures; 90% of local expenditures
Goods	0.3	100% of foreign expenditures; 90% of local expenditures
Consultants' services and Training	0.65	100% of foreign expenditures; 90% of local expenditures
Unallocated	0.45	
<b>Total GEF Grant</b>	<b>5.0</b>	

14. These methods will be used over a period of 18 months, during which the project will produce quarterly financial follow-up reports (RSFs). After 18 months, a capacity assessment will determine whether disbursements can be based on the RSFs. The Credit will be disbursed

### **Flow of Funds**

15. IDA Credit and GEF Grant. The Directorate of Debt and Investment (DDI) is the assigned representative of the borrower for the mobilization of the IDA Credit and of the GEF Grant. For direct payments and Special Account replenishments, the withdrawal requests with supporting documentation are prepared by ASER and PROGEDE, sent to DDI for signing and forwarding to the Bank to authorize direct payments and replenishments. The funds are then transferred directly into the beneficiary accounts. Copies of withdrawal applications prepared by ASER and PROGEDE will be kept by these entities.

16. Government Contribution. Through its annual budget the Government will, at the beginning of each fiscal year, provide ASER with grant resources adequate to allow ASER to carry-out its program of investments and its operations. During the annual budgetary process, ASER will formulate its needs and forward it for consideration to the Ministry of Economy and Finance.

### Use of Statement of Expenditures (SOEs)

17. Disbursements for all eligible expenditures would be made against full documentation, except for items of expenditures related to: (a) ICB contracts and Direct Contracting contracts estimated to cost up to \$150,000 equivalent; (b) contracts for works estimated to cost up to \$200 000 equivalent per contract; (c) consultancy services for firms estimated to cost up to \$100,000 equivalent per contract; (d) consultancy services for individual consultants estimated to cost up to \$50 000 equivalent per contract; and (e) miscellaneous expenses which would be claimed on the basis of Statement of Expenditures. All expenses related to contract below prior-review thresholds would be claimed on the basis of SOEs and the supporting documentation underlying all SOEs would be made available for review by Bank supervision missions. Supporting documentation would be retained by ASER and DDI. The primary responsibility of maintaining the records rests on the ASER accountant and DDI assigned specialist.

### Special Accounts

18. To facilitate disbursements, the Project will open five Special Accounts (SA): two for the Rural Electrification of the IDA Credit (SA A and SA B); one for the Biomass and Household Energy Component of the IDA Credit (SA C), and two for the GEF Grant (SA D and E). Each SA will be used as follows

- (a) Two SAs (SA A for the IDA Credit and SA D for the GEF Grant) will be exclusively used for disbursements for Project components 1.1 and 1.2 related to the financing of investment operations (PPERs and ERILs). Disbursements benefiting the concessionaires of PPERs and ERILs will be in the form of subsidies and the disbursement schedules will be provided in the concession and financing contracts to be signed once the bidding process is completed;
- (b) Two SAs (SA B for the IDA Credit and SA E for the GEF Grant) will be exclusively used for disbursements for activities related to Project components 2 and 3 (i.e. activities not related to direct investments in the rural concessions) and will follow standard Bank disbursements practices; and
- (c) One SA (SA C) will be exclusively used for disbursements for activities related to Project component 4 (the Biomass and Household Energy Component).

19. Disbursements to SA A (IDA credit) and SA D (GEF grant) will be subject to: (a) approval of relevant concession and financing contracts by IDA, and (b) availability of counterpart funds for investments in rural electrification.

20. Table C below provides information on management of SAs A,B (IDA Credit), D and E (GEF Grant) related to rural electrification. More details on disbursement mechanisms will be provided in the Project procedures manual.

**Table C: Management of Special Accounts**

<b>Nature of the account</b>	<b>Components</b>	<b>Mechanisms of disbursement</b>	<b>Conditions of disbursement</b>
<b>Special account SA A (IDA)</b>	Components 1.1 & 1.2	The disbursement mechanisms will be specifically described in the procedures manual and the concession or financing contract. In general, the disbursements by ASER for on PPERs will comprise 3 payments:	

		<ul style="list-style-type: none"> <li>- 1st payment: 30% of the subsidy)</li> <li>- 2<sup>nd</sup> payment: 40% of the subsidy</li> <li>- 3<sup>rd</sup> payment: balance (30%) of the subsidy</li> </ul> <p>ERIL disbursements will occur in payments based on work completed (certified by ASER according to the financing contract).</p>	<ul style="list-style-type: none"> <li>- Commitment of 30% of the operator's own funds</li> <li>- x% of operator expenses specified in the technical specifications, committed at y%</li> <li>- Connection of a certain number of operators according to the technical specifications</li> </ul>
<b>Special account SA B (IDA)</b>	Components: 2 and 3	Disbursements will be made on an SOE and direct payment basis.	Compliance with the tender procedures specified in the credit agreement
Special account SA C (GEF)	Components 1.1 and 1.2	See above for SA A.	See above for SA A
Special account SA D (GEF)	Components: 2 and 3	See above for SA B.	See above for SA B.

21. ASER will manage the four SAs (SA A, B, D and E) related to the rural electrification activities and DDI will manage the SA C related to the Biomass and Household Energy Component. A special dispensation will be requested from the Directorate of Debt and Investment (DDI) concerning the management of the four SA by ASER. Transactions on these SAs, opened in a commercial bank, will be jointly signed by the General Manager and DAF of ASER. This should allow ASER to manage the project more efficiently and effectively. All reimbursement requests (DRFs) and direct payment requests (DPDs) will be transmitted by the DDI.

22. The authorized amounts for each of the 5 special accounts are as follows:

Special Account	Authorized Amount (FCFA millions)
Special Account A – IDA Credit	550
Special Account B – IDA Credit	165
Special Account C- IDA Credit	200
Special Account D- GEF Grant	125
Special Account E- GEF Grant	35

23. Until the cumulative disbursements on the IDA Credit IDA and the total of IDA commitments not exceed SDR5 millions, the different authorized amounts will not exceed: (a) FCFA 275 millions for Special Account A ; (b) FCFA 85 millions for Special Account B ; and (c) FCFA 100 millions for Special Account C . With respect to the GEF Grant until the cumulative disbursements on the IDA Credit and the total of IDA commitments not exceed US\$1.25 millions, the authorized amount for Special Account D will not exceed FCFA 65 millions.

### **Counterpart Funds**

24. The Government counterpart funds required to implement the first phase of the APL (which includes financing from IDA, GEF and other Donors) is estimated at FCFA 5.5 billions (US\$10.3 millions) over a period of 4 years as indicated in table D below; this corresponds to an annual contribution of about FCFA 1.375 billion. Over the 2002 to 2004 period, annual resources provided by the Ministry of Economy and Finance to fund ASER's operations were about FCFA 2.3 billions.

25. Rural Electrification Counterpart Funds. Counterpart funds for the rural electrification components of the IDA project are estimated at the equivalent of \$6.5 millions over the project period of 2005-2008. Such contribution will be deposited by the Ministry of Finance in a commercial bank account opened by ASER for such transfers, every year in 2 equal tranches, following Senegal's budget cycle and budgetary transfers carried out usually by the Ministry of Finance at the latest by end March and by end September of each year. For year 2005, payments to ASER will be equivalent to \$1 million (2 tranches each of US\$500,000) and for years 2006, 2007 et 2008 these payments will be equivalent to US\$1 800 000 (2 tranches each of US\$900 000).

26. Biomass and Household Energy Component. This component will be implemented over a 2 year period (2005 and 2006). The Government confirmed its commitment to provide counterpart funding estimated to be equivalent to US\$500,000, corresponding to US\$250,000/year.

**Table D: Government Contribution – Phase I of the APL (in US\$million)**

<b>Allocation of resources</b>	<b>IDA Project</b>	<b>GEF and Other Donors</b>	<b>Total</b>
Investments in PPERs and ERILs	3.1	2.0	5.1
ASER operating costs	2.55	1.2	3.75
Biomass and Household Energy Component	.5		.5
Unallocated	.62	.32	.94
<b>Total</b>	<b>6.77</b>	<b>3.52</b>	<b>10.29</b>

See also Annex 4.

27. Before submitting its annual budget (investment budget and exploitation budget) to the Ministry of Economy and Finance as per Senegal's budget cycle, ASER will submit such budgets to IDA for non-objection. Before the end of the fiscal year, ASER will inform IDA of its budget allocation for the upcoming fiscal year.

**Attachment 7.A.1 - ACTION PLAN FOR ASER FINANCIAL MANAGEMENT**

Action	TASKS	1. ENTITY	Target Completion Date (to be discussed during the negotiations)
1. <u>Human resources</u>	<p><i>1.1 Recruitment of a chief accountant</i></p> <ul style="list-style-type: none"> <li>- Transmission of the ToR for the chief accountant to IDA for review</li> <li>- Start of the recruitment process</li> <li>- Opinion of IDA on the candidates selected</li> <li>- Signature of contracts</li> </ul> <p><i>1.2 Building the capacities of DAF</i></p> <ul style="list-style-type: none"> <li>- Transfer of the RAF of the CPRSE to manage the special accounts and prepare DRFs</li> </ul> <p><i>1.3 Review of DAF and internal audit task sheets</i> (see procedures manual attached)</p> <p><i>1.4 Establishment of the DFER and recruitment of qualified staff</i></p> <ul style="list-style-type: none"> <li>- Transmission of the ToR for RE financing Director to IDA for review</li> <li>- Start of the recruitment process</li> <li>- Opinion of IDA on the candidates selected</li> <li>- Signature of contracts</li> </ul>	<ul style="list-style-type: none"> <li>ASER</li> <li>ASER</li> <li>IDA</li> <li>ASER</li> <li>ASER</li> <li>ASER</li> <li>ASER</li> <li>IDA</li> <li>ASER</li> </ul>	<p>31/07/04</p> <p>06/08/04</p> <p>30/09/04</p> <p>Credit Effectiveness</p> <p>Credit Effectiveness</p> <p>31/07/04</p> <p>05/08/04</p> <p>30/09/04</p> <p>Credit effectiveness</p>
2. <u>Administrative, accounts, and financial procedures manual</u>	<ul style="list-style-type: none"> <li>- TOR for the consultant (see between ASER and Fily Sissoko)</li> <li>- Start of Selection process</li> <li>- Selection process completed</li> <li>- Draft manual</li> <li>- Review of the draft manual</li> <li>- IDA non-objection</li> </ul>	<ul style="list-style-type: none"> <li>ASER</li> <li>ASER</li> <li>ASER</li> <li>ASER / Consultant</li> <li>IDA and ASER</li> </ul>	<p>31/07/04</p> <p>06/08/04</p> <p>15/09/04</p> <p>15/10/04</p> <p>22/10/04</p> <p>30/10/04</p>
3. <u>Update of the financial management information system (FMIS)</u>	<p>* update of the system of accounting and financial information in order to bring to light the activities of the project and their financing source (uses and resources by category and component), the format of documents to produce, in particular the automatic production of DRF, comparison lists of banking and of the special accounts, the format for the quarterly Financial Monitoring Reports (FMR)</p>	<ul style="list-style-type: none"> <li>ASER / Consultant</li> <li>Installation of new software (SAGE)</li> </ul>	<p>15/08/04</p>

	<i>* Completing tests of transactions recording and production and printing of financial statements/report</i>	ASER / Consultant	30/09/04
<u>4. Selection of an external auditor</u>	<i>Preparation of the request for proposal package including the terms of reference and the standard bidding documents</i>	ASER	10/08/04
	<i>World Bank's non-objection on the request for proposals package</i>	IDA	30/08/04
	<i>Requests for proposals sent out</i>	ASER	1/09/04
	<i>Proposals received, Technical and financial evaluation completed and transmitted to IDA non objection</i>		30/09/04
	<i>IDA non objection</i>	IDA	5/10/04
	<i>Signature of contract</i>	ASER/Auditor	Credit Effectiveness

**Annex 7.B: Procurement Arrangements**  
**SENEGAL: SN-ELECTRICITY SERV. for RURAL AREAS PROJ**

**PROCUREMENTS ARRANGEMENTS**

**General**

Procurement for the proposed project will 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 Legal Agreement. The general description of various items under different expenditure category are described below. For each contract to be financed by the Credit, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are agreed between the Borrower and the Bank project team in the Procurement Plan. The Procurement Plan presented in attachment 7.B.1 will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

**Procurement of Works**

Works procured under this project, would include the following (Financing would be provided in the form of (mainly) output-based subsidies):

- Three PPER concessions. The concessions areas: Podor - Dagana - St. Louis (concession 1); Mbour (concession 2); and Kolda - Velingara (concession 3).
- Several ERIL sub projects . The number of ERILs to be implemented will depend on the number of proposals, which meet the eligibility criteria, and the requested subsidies of eligible project proposals.

PPER concessions: The concessionaires of PPER concessions will be selected using ICB (pre-qualification followed by two-stage bidding). Attachment 7.B.2 shows the procedures and the time schedule until the award of a PPER concession. For a given amount of subsidy, the candidates will compete on the number of clients to be provided with electricity services within the first three years of the concession. The selected concessionaire will be free to procure the goods, works and services required for the services, using his own procedures.

ERIL sub projects : A consultant will be selected on a competitive basis to assist the beneficiary ( the community or its partner ) in preparation of the ERIL. If the proposed ERIL is technically and financially feasible and accepted for financing under the Credit, implementation will be done through two ways depending on the technical and financial managerial of the beneficiaries.

When the ERIL sub project is approved and the funds put in place the procurement arrangement will follow through two possibilities at the choice of the community depending its technical and managerial capacity to manage such a sub project

The procurement activities will be conducted by the beneficiary ( community ) under the technical assistance of the consultant who has supported them to prepare the project; or

The procurement activities will be handled by the consultant in a second phase of his mission which will be more likely a delegated management contract.

The TORs of the consultant will clearly reflect the option chosen by the community . Whatever the option is, the procurement for goods works and consultant will be defined in the procedures and executive manuals .

### **Procurement of Goods**

Goods procured under this project will include: Electrical equipment for multi-sector projects (PREMs); software and training in its utilization; computer and EDP equipment (printer, scanner, plotter etc.); business management tools for small operators; equipment to assist operators in emergency cases; and printing of brochures, guidelines etc. The procurement will be done using Bank's SBD for all ICB and National SBD agreed with (or satisfactory to) the Bank.

Special requirements: Direct contracting is foreseen for the purchase of the software and the training in the utilization. Three contracts shall be awarded: one for software needed for the geographical information system (GIS), one for databank software, and one for accounting software. The GIS software would be from the same software family (ArcGIS), which ASER is using at present. The database software SQL is most suited for ASER's purposes, including an interface with the GIS. The recommended accounting software (SAGE) has already been used by ASER during a test period.

### **Procurement of non-consulting services**

Non-consulting services comprise the services of a recruitment agency, of auditors and of agencies specialized in communication. Furthermore, two staff of ASER will be recruited and financed during the first phase of the APL.

Recruitment agency: CQS will be used to select a local recruitment agency. The tasks of the agency will be to present ASER with candidates for several posts, which need to be filled, including the director of the finance department whose main task will be to manage the rural electrification fund. The Bank will finance the director until the end of the first phase of the APL. The salaries of the other staff will be paid by ASER. For each post, the recruitment agency will be provided with the task description and the qualification requirements, which have been prepared during project preparation.

Auditors: Least-cost selection will be used to sign a framework contract with auditors for the control of contracts, comprising contracts which ASER has signed with concessionaires or which the World Bank or ASER have signed with banks or other institutions.

Communication agencies: QBS will be used to hire local agencies, which shall support ASER in information campaigns and special communication activities. A short-list of qualified agencies will be established first. When an information campaign is planned or a need for special communication services arises, short-listed agencies will be invited to submit (i) a technical proposal how to execute the tasks and (ii) a financial proposal. Only the financial proposal of the firm rated highest on the technical proposal will be opened.

Procurement Specialist: Selection of individual consultant will be used for the recruitment of a procurement specialist through a specialized agency in staff recruitment . In order to recruit the specialist as soon as possible, ASER will handle the recruitment process. Using the services of the recruitment agency would delay the start of the recruitment process by at least two months. The position will be announced in the local media using the task description and the qualification requirements prepared during project preparation.

## **Selection of Consultants**

Consulting services will focus on the following areas: providing technical assistance for the implementation of the project; strengthening of ASER through the periodic review of the organizational arrangements, the management system, and the internal control procedures; Promoting the participation of the local economy and emigrants in the rural electrification program; providing technical assistance to the Regulatory Authority, the Ministry of Energy and the committee in charge of coordinating projects affecting several agencies; identification of the impacts of the rural electrification program; and preparing phase 2 of the APL.

Short lists of consultants for services estimated to cost less than \$100,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

### Special requirements

Contracts to assist the beneficiaries ( communities ) in preparing and implementing the ERIL sub projects, including the request for subsidies would be signed with consulting companies based in Senegal . The total amount reserved for these sub projects is US\$ 450,000 (excluding contingencies). Attachment 7.B.3 describes in detail why the signature of two or three framework contracts is considered the most appropriate method. The attachment also describes how a consultant with whom a framework contract has been signed is selected to execute the ERIL preparation work. The procurement method is similar to QCBS.

Single-source selection: One contract shall be awarded under single-source selection. The contract is planned for the consultant who was in charge of the PREMs during project preparation. His task will be to finalize the PREM arrangements. The contract value of \$ 50,000 does not exceed 33% of the original contract amount.

## **Recurrent Costs**

Recurrent costs of the Biomass and Household Energy component (project component 4), which would be financed by the project, would be mainly for study tours, field trips, conferences and for services of local banks. Procurement would be done using the implementing agency's administrative procedures, which were reviewed and found acceptable to the Bank.

## **ASER PROCUREMENT CAPACITY**

Procurement activities will be carried out by ASER. The agency has a staff of 26, including 11 non-operation staff (secretaries, chauffeurs, etc.). The Procurement unit has no personnel at present. However, key personnel of ASER has been trained in procurement and gained hands-on experience in the handling of the procurement of goods, works and services.

An assessment of the capacity of ASER to implement procurement actions for the project has been carried out on May 3<sup>rd</sup> 2004. Project procurement related risk was rated high until there is sufficient evidence that procurement is handled satisfactorily. The assessment reviewed the organizational structure for implementing the project and the interaction between the project's staff responsible for procurement and the Ministry's relevant central unit for administration and finance.

Since all the staff involved in the project implementation at ASER is not yet recruited, it was not possible to assess their full capacity on procurement. However two staff within the ASER team have already attended a procurement course training and are aware of the World Bank procurement procedures. As soon as all the staff is recruited, ASER will be evaluated again to determine whether all conditions are in place to procure in compliance with World Bank procedures. The core staff at the ASER would include a Procurement Specialist who should be familiar with World Bank's procurement procedures and would work closely with the local communities to ensure efficient and timely project execution through compliance with the procurement schedules agreed with the Bank. The Procurement Specialist will: (a) prepare and update the procurement plan for the project; (b) monitor the progress on procurement; (c) assist the implementing agencies in the preparation of bidding documents and advertisements for goods and works contracts and request for proposals for consulting assignments; (d) advise the implementing agencies on procedural matters; and (e) be responsible for bid opening and evaluation. These tasks will be an important part of the procurement specialist TOR; the contract will be drafted with the assistance of World Procurement team both at Washington and Dakar. The specialist will be financed through ASER's budget.

Most of the project implementation issues/ risks concerning procurement activities have been identified during appraisal. As discussed above, the major risk is that ASER does not have a Procurement Specialist. In addition taking into account the fact that awarding PPERs and ERILs concessions is new for ASER, that award procedures reflecting Bank procurement guidelines are relatively complex and that the number of contracts to be handled simultaneously will by far exceed the number handled so far by ASER, it was agreed that a specialist in concession contracting (during bids preparation, evaluation and implementation) be recruited. Such specialist, who will be financed through the Credit until the end of the first phase of the APL, will be employed directly by ASER to handle concession contracting.

## **PROCUREMENT PLAN**

ASER has developed a Procurement Plan for project implementation, which provides the an acceptable basis for the procurement. This plan has been agreed between ASER and the Project Team on June 23, 2004 and is available at ASER in Dakar. It will also be available in the Project's database and in the Bank's external website. The Procurement Plan will be updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

## **FREQUENCY OF PROCUREMENT SUPERVISION**

In addition to the prior review, supervision to be carried out from Bank offices. Two supervision missions per year will be carried out for post review of procurement activities.

## Attachment 7.b.1

### Details of the Procurement Arrangements involving international competition.

#### 1. Goods and Works and non-consulting services.

(a) List of contract Packages which will be procured following ICB and Direct contracting:

1	2	3	4	5	6	7	8	9
Ref. No.	Contract (Description)	Estimated Cost (*) (1000 \$)	Procurement Method	P-Q	Domestic Preference (yes/no)	Review By Bank (Prior / Post)	Expected Bid-Opening Date	Comment
1	PPER concession 1	9,800	ICB	P-Q	No	Prior	3/31/05	
2	PPER concession 2	7,300	ICB	P-Q	No	Prior	9/30/05	
3	PPER concession 3	6,100	ICB	P-Q	No	Prior	3/31/06	
4	Software: ArcEditor	28	Direct Con.		No	Prior		1)
5	Software: SAGE	12	Direct Con.		No	Prior		1)
6	Software: SQL	10	Direct Con.		No	Prior		1)
7	PREMs for conces. 1	1,900	Partly ICB		No	Prior		2)
8	PREMs for conces. 2	550	Partly ICB		No	Prior		2)
9	PREMs for conces. 3	800	Partly ICB		No	Prior		2)

(\*) Excluding contingencies.

1) Cost include training

2) Exact specification, costs of equipment and P-Q remain to be determined. Cost estimates reflect the costs of all PREMs whose electrical equipment would be financed by the project; probably 3 - 4 projects per concession. Procurement is expected to be partly using NCB.

(b) ICB Contracts estimated to cost above \$150,000 per contract and all Direct Contracting will be subject to prior review by the Bank.

#### 2. Consulting Services.

(a) List of Consulting Assignments with short-list of international firms.

1	2	3	4	5	6	7
Ref. No.	Description of Assignment	Estimated Cost (*)	Selection Method	Review By Bank (Prior / Post)	Expected Proposals Submission Date	Comments

		<b>1000 \$</b>				
1	ASER: support in organization and management	250	QCBS	Prior	9/30/04	
2	Comparison of existing PLEs, updating of PLE 2,3	100	QCBS	Prior	10/20/04	
3	Assistance with implement. financing instruments and involvement of local banks	100	QCBS	Prior	11/15/04	
4	Involvement of emigrants into RE program	200	QCBS	Prior	11/15/04	
5	Development of info., communication strategy	200	QCBS	Prior	01/15/05	
6	Strategies maximizing RE benefits of end-users and participation of the local economy in the RE progr.	150	QCBS	Prior	03/01/05	
7	Micro-finance: items and financing mechanisms	200	QCBS	Prior	06/01/05	
8	Evaluate impact rural elect.	600	QCBS	Prior	08/01/05	
9	PLEs for concessions 4,5,6	350	QCBS	Prior	03/01/06	
10	PREMs for concess. 4,5,6	200	QCBS	Prior	06/20/06	
11	Preparat. Of pilot projects promoting the participation of the local economy in the RE program	150	QCBS	Prior	07/01/06	
12	Identification of technical innovations for RE and implem. of pilot projects	500	QCBS	Prior	09/01/06	
13	TA for the Ministry of Energy, the CRSE and the Multi-Sector Committee	190				1)

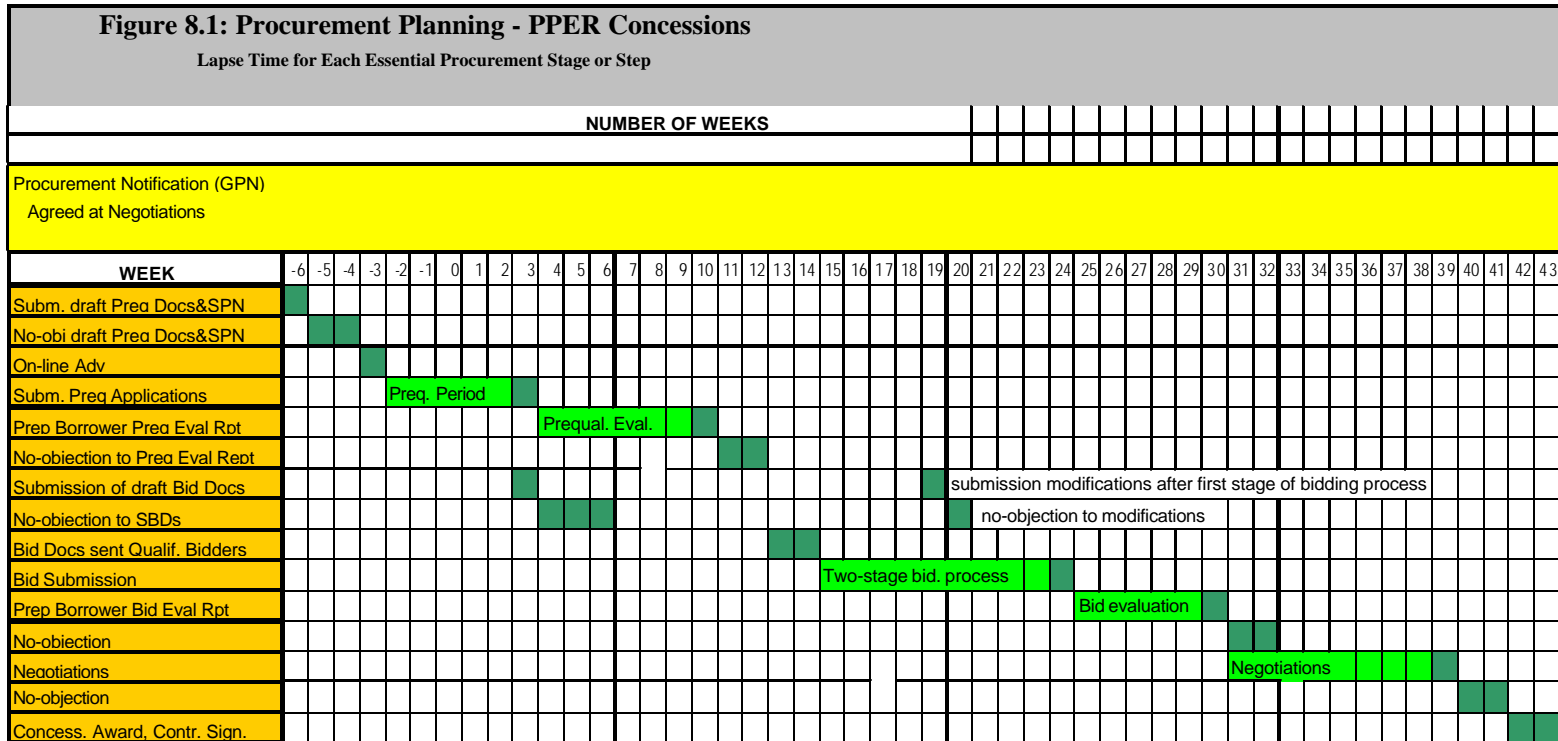
(\*): Excluding contingencies.

1): Several contracts for TA will probably be awarded; at least one for each institution. The procurement method will be decided once the content of each TA has been determined.

(b) Consultancy services estimated to cost above US\$100,000 per contract and Single Source selection of consultants (firms) for any assignments estimated to cost above \$50,000 will be subject to prior review by the Bank.

(c) Short lists composed entirely of national consultants: Short lists of consultants for services estimated to cost less than US \$100,000 equivalent per contract, may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

## Attachment 7.b.2: Award of PPER Concessions - Activities and Time Schedule



## **Attachment 7.b.3: Proposed procurement Procedures for Eril Concessions**

### **Background**

1. Two characteristics of ERIL concessions are that they would originate from a local initiative and that the concession area would be small. The typical area will be that of a village or on an exceptional basis a rural community. ERIL concessions shall be financially supported in two ways:
2. Support for project preparation. Provided that an expression of interest for an ERIL concession is declared eligible, the proponent could receive financial support for the preparation of the documentation to be submitted for the possible award of the concession and subsidies. The demand-for-concession documents (DFC documents) include, among others, the technical design of the planned electricity supply system, the investment costs, the business plan, requested subsidies, etc. The proponent will normally need the assistance of consultants to prepare the documents.
3. Financing a portion of the investment costs. The DFC documentation will be examined mainly with respect to the project's technical and financial feasibility. If judged satisfactory, a concession would be awarded and subsidies could be provided for the investment cost.
4. Awarding of ERIL Concession: Step #1: Package Procedure. A characteristic of this procedure is that expressions of interest and detailed project proposals are first collected and then dealt with at a certain point in time. In the first half of January and July of each year, ASER invites expressions of interest for ERIL concessions. The documents must be submitted until mid February (mid August). All EOIs, which have been received by mid February (August), are examined with respect to their eligibility for ERIL concessions. The decision is made on or before March 31 (September 30). A candidate who has been declared eligible can obtain financial support for the preparation of the DFC documents. The decision on all support requests is made soon after the examination of the eligibility. The DFC documents should be submitted at the end of July (January) if the preparation of the documents requires only shopping to obtain cost quotations. In case NCB has to be used to obtain the cost quotations, the DFC documents have to be submitted three or four months later. All DFC documents received at a certain time are examined within a period of about two months. In case they are accepted, the award of the concession is proposed and subsidies are provided subject to the availability of funds.
5. Awarding of ERIL Concession: Step #2: First-come-first-served procedure  
Under this procedure, financial support for project preparation and the ERIL concession would be provided on a first-come-first serve basis until the total amount reserved for project preparation and the ERIL concessions respectively has been committed. The funding would be subject to the condition that the proposed projects are eligible for funding.

### **Support for project preparation**

6. The costs for the preparation of the DFC documents mainly depend on three parameters: the size of the planned concession - the size in terms of potential customers - the location of the concession and the distance from the existing grid. Location of concession: Companies, which could help to prepare the documents, are mainly based in Dakar. Their fees would increase with the distance to Dakar. Distance from grid: From a certain distance onward, other supply options

than grid connection could be the least-cost solution. Preparing the DFC documents for those supply solutions (diesel generators, PV home systems) is more costly. Another cost factor is the bidding procedure, which the consultant must use during project preparation sub project .

7. Costs for the preparation of the DFC documents are estimated at between US\$7,000 and 15,000. Financial support would be limited to 50% of the cost or a maximum of US\$5,500, whichever is lower.

#### **Assistance in sub project preparation**

8. A short-list of technically qualified consultants would first be established. Once ASER has examined the EOIs for ERIL sub projects , which reach it by mid March or mid September, it produces a list of projects for which it would provide financial support for project preparation. Since the selection will be based on the consultant's qualification , only the most qualified and experienced consultant will be asked to submit a technical and financial offer for project preparation of **all** projects on the list in a given zone . Taking into account that all projects shall be executed within a certain period - preferably until the next round of awarding subsidies to proposed ERIL concessions (6 months) - the number of projects may exceed the capacity of each individual consulting company. If so, the companies will have to resort to subcontracting.

#### **Assistance in sub project implementation**

9. When the requested sub project is prepared in all aspects with the assistance of the selected consultant, the implementation will be conducted by the beneficiary in two ways. (i) the beneficiary will be fully responsible of the implementation but should need the assistance of the consultant who has prepared the sub project ; the payment of this second phase of the contract is time based since it is a technical assistance ; and (ii) the beneficiary will sign a delegated management contract with the consultant who will implement the sub project on behalf of the beneficiary; the payment of such phase of the contract will be a percentage ( 5 up to 10 % ) of the sub project amount. The TORs and the selection process will define the option chosen by the beneficiary depending on his/her technical and managerial capabilities. In case the consultant's TORs include the full implementation of the sub project the percentage of payment will be mentioned in the said TORs

#### **Procurement methods for the ERIL sub projects**

10. The ERIL sub projects will be executed under the CDD approach . The procurement methods for purchase of goods and execution of works will be defined in the executive manual

**Annex 8: Economic and Financial Analysis of the RE program**  
**SENEGAL: SN-ELECTRICITY SERV. For RURAL AREAS PROJ.**

1. This annex summarizes the conclusions of the economic analysis of ASER rural electrification program (RE) and of the investment to be supported by IDA under Phase I of the proposed APL. It also assesses the financial viability of a rural concession. The project files contain a more detailed assessment of the economics and financial review of the RE program and the IDA project (Annex 12).

**METHODOLOGY**

2. The analysis comprises: (a) a demand analysis identifying the demand for rural electricity services and the willingness to pay for these services; (b) an assessment of the alternatives; (c) a cost-benefit analysis comparing a scenario “with” the RE program to a scenario without the RE program; and (d) a financial analysis reviewing the attractiveness and sustainability of a concession from the private concessionaire perspective.

3. The economic analysis has been performed both for: (a) the whole RE program (12-year investment period) including all non direct investment costs (technical assistance, capacity building, implementing agency’s costs); and for, (b) the investment component in PPERs and ERILs supported in Phase I by IDA.

4. The economic costs consist of investment and O&M costs associated with the investment, capacity building, technical assistance and management costs, mainly of ASER. The economic benefits include the increase in total benefits for the users and the global environmental benefits. Many of the additional direct and indirect benefits from the project are difficult to estimate, in particular those associated with the Multi-sectoral Energy Programs (PREMs). Only benefits quantifiable using standard World Bank methods have been quantified for estimating the economic internal rate of return (EIRR) and the net present value (NPV) evaluation criteria. Additional benefits, particularly those resulting from PREMs (improvements in education, health, communication and productivity) have not been included in the quantitative cost benefit analysis.

**DEMAND ANALYSIS**

5. Estimates of remaining non electrified households and villages as of the year 2003 have been calculated according to latest data available from census and SENELEC clients registry. Such an estimate for the first 3 concessions to be bid is provided below (table 1).

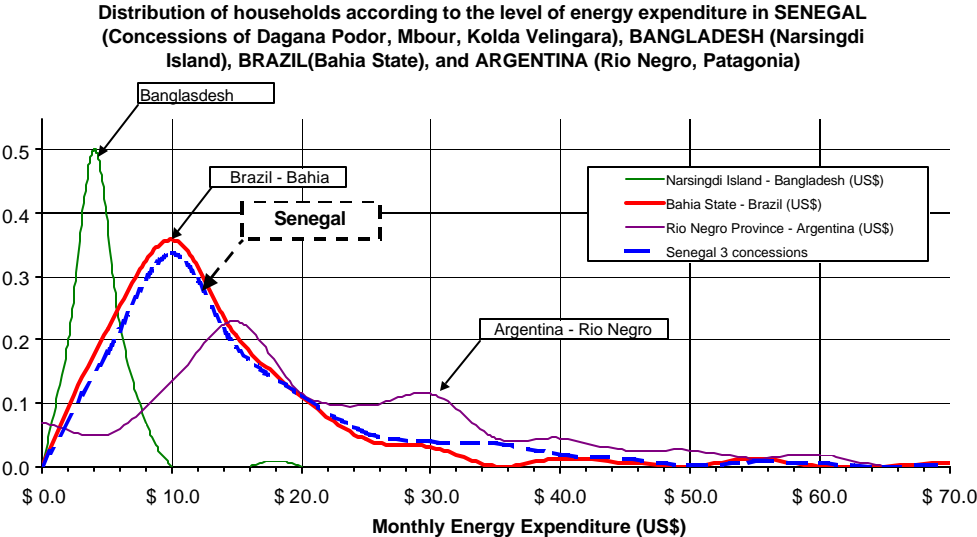
**Table 1: Estimates of non electrified households and villages as of 2003**

Concession	Households	villages	villages	villages
	(2008)	< 500 inhabita nts.	500-1000 inhabitant s	>1000 inhabita nts.
Dagana Podor	15,386	69	104	555
Mbour	11,003	19	90	87
Kolda Velingara	21,209	1,377	232	33
<b>Total 3 concessions</b>	<b>47,598</b>	<b>1,465</b>	<b>426</b>	<b>675</b>

(Source: Local Electrification Plans by SEMIS-Trans nergie, for the 3 concessions Dagana-Podor, Mbour, Kolda-Velingara, 2002)

6. Field surveys on domestic energy services market (400 questionnaires for each survey) have been undertaken in each concession <sup>1</sup> to measure: (a) current energy substitutable expenses and providing a conservative estimate of the ability of households to pay when offering to substitute existing inefficient and low quality technology (wick and hurricane lamps, ...) by an higher quantity and better quality service (electrical lighting, TV, etc.); and (b) willingness to pay, using the “contingent analysis” method, which provides a “ceiling” value of willingness to pay for the new service offered. Figure 1 provides for distribution of households according to energy expenditures and figure 2 an estimate of the ability to pay for various energy levels. Annex 8.A presents annual estimates of clientele and of equipment to be installed.

**Figure 1:**

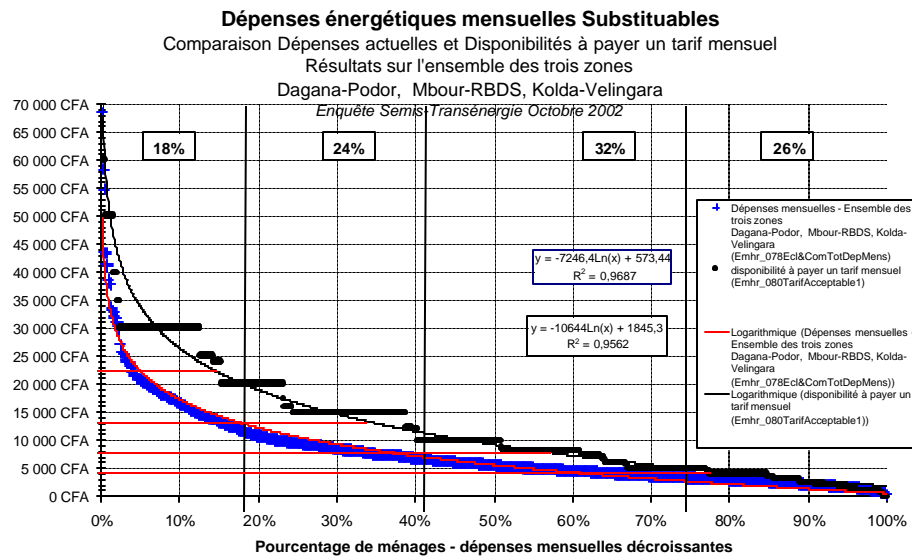


<sup>1</sup> Nine concession markets have so far been surveyed. The results of field surveys and demand analysis apply equally to PPER and ERILs sub-projects.

**Figure 2 : Substituable energy expenditures of non connected rural households.**

*Market segmentation and penetration according to willingness to pay and/or monthly payment charged*

(Source: Local Electrification Plans by SEMIS-Transénergie, for the 3 concessions Dagana-Podor, Mbour, Kolda-Velingara, 2002)



**Analysis of Alternatives**

7. The proposed project is technology neutral, i.e. the bidders will be free to choose the technologies they feel appropriate to achieve the minimum requirements as laid out in the bidding documentation. A GEF grant is also provided for leveling the playing field for renewable technology by financing technical assistance and capacity building activities, and by internalizing global environmental benefits.

8. On the basis of an ex-ante technico-economical analysis of the technology options, the cost effectiveness frontier of technology alternatives according to the load (size of villages) and distance to existing grid between grid extension and decentralized individual systems (mainly PV) has been delineated (Figure 3 below). A similar analysis has been carried out when preparing the Local Electrification Plans (PLE), taking account of village size, village surveys and GPS position, to estimate the most cost-effective technology to electrify it – alternatives are low cost grid extension, diesel based mini-grids and individual solar home systems - assuming normative hypothesis for unitary equipment and O&M costs. Figure 4 below presents the result of this techno-economic analysis for the first concession to be bid (Dagana-Podor).

Figure 3:

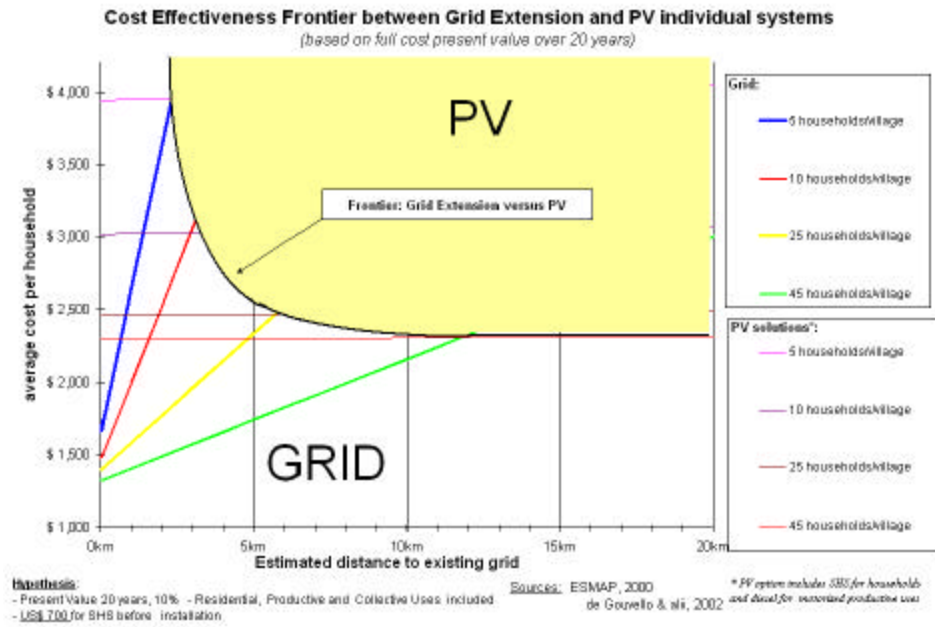
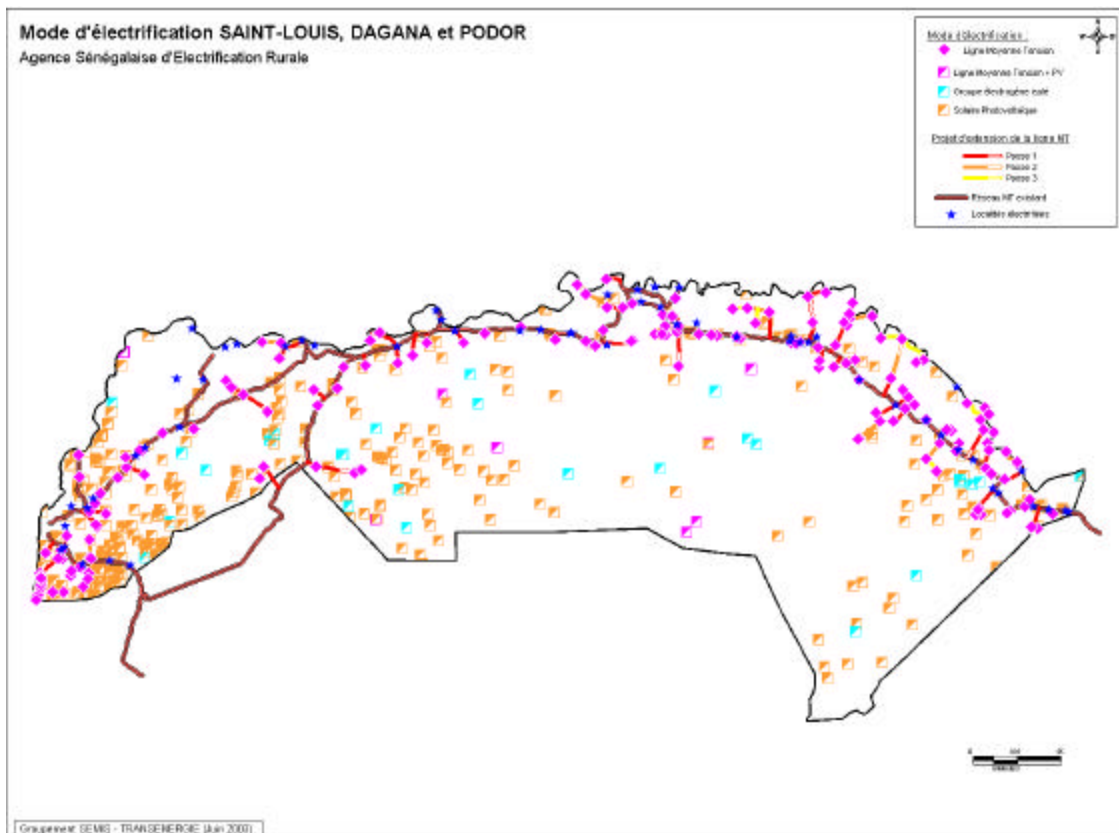


Figure 4: Local Electrification Master Plan of Dagana-Podor's concession



## COST-BENEFIT ANALYSIS OF THE RE PROGRAM

9. Economic costs and economic benefits for the whole ASER RE program, have been estimated assuming that: (a) the investment is concentrated over the 12 first years. The economic analysis is however done over a period of 25 years corresponding to the duration of a concession. As a result the economic benefits are understated since the net cash flows of last concessions (to be awarded in year 12) accruing between year 25 and 37 have not been accounted for; (b) total number of domestic clients (households) served by the program of 154,900; total number of productive clients served by the program of 17,400; (c) total number of social and collective clients served by the program of 14,700; (d) a 12% discount rate; and (e) all costs are in constant 2004 US dollar.

10. Yearly economic costs. Estimates for investment, operation and maintenance, capacity building and technical assistance are provided in Annex 8.B.

11. Economic benefits include (a) gross consumer surplus resulting from electrical lighting and use of TV/Audio devices (based on field survey data to estimate demand curves) provided by the program as compared to the situation without the program; and (b) global environmental benefits (avoidance of greenhouse gas emissions) resulting from both the use of renewable energy and demand side management through the systematic diffusion of efficient fluorescent lamps. The estimates of yearly economic benefits are provided in Annex 8.C.

12. Global Environmental benefits. Two approaches can be used to estimate global environment benefits i.e. gas emission avoided due to the project. One approach estimates the difference between emissions generated before the project and emissions generated after the project. This method doesn't however capture part of the effectiveness - in term of future emissions avoided - of specific economic mechanisms, like the GEF and the Clean Development Mechanism of the Kyoto Protocol<sup>2</sup>. The second approach considers that avoided emissions should be calculated as the difference between emissions that would have been generated by the project using the technology mix that would have been adopted in the absence of the such mechanisms, and the emissions generated by the project using the new technology mix resulting from internalization of global environment benefits by economic agents. This second approach has been used here based on carbon prices currently observed in the carbon market; one ton of avoided CO<sub>2</sub> emissions has been valued at USD 4.5/tCO<sub>2</sub>. Annex 8.C provides for a detailed estimate of the global environmental benefits.

13. The base case Net Present Value (NPV) and Economic Rate of Return (EIRR) of the RE program are summarized in table 2 below. The EIRR of the RE program is estimated to be 28.4%.

<b>Table 2</b> Base Case:	NPV Net Cost (Investment+O&M)		MUS\$
		273.4	
	NPV Net Benefits for the Users	372.8	MUS\$
	NPV Global Environment Benefits	1.7	MUS\$
	NPV Net Benefits	101.0	MUS\$
	EIRR	28.4%	

\* Discount rate of 12%.

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<sup>2</sup> While the Kyoto Protocol has not entered into force, the CDM already did so by anticipation in November 2001 under the juridical framework of the Climate Change Convention, which has been enforced in Rio in 1992.

14. The results of sensitivity analysis against variations in investment costs (+20%), O&M costs (+20%) and consumer surplus (-20%) are provided in table 3. The EIRR of the RE program appears very robust.

<b>Table 3</b>	<i>NPV Project Cost</i>	<i>NPV Total Benefits</i>	<i>NPV Global Environment Benefits</i>	<i>NPV Net Benefits</i>	<i>EIRR</i>
Base Case	273.4	372.8	1.7	101.0	28.45%
Investment Cost +20%	299.6	372.8	1.7	74.9	23.30%
O&M Costs +20%	294.3	372.8	1.7	80.2	25.47%
Consumer Surplus -20%	273.4	340.1	1.7	68.3	23.48%

#### **COST-BENEFIT ANALYSIS - IDA PHASE I ONLY**

15. A similar Cost-Benefit analysis of the IDA Project (IDA in Phase I) which include core investment, capacity building, technical assistance has also been carried out to ensure that even if Phase II and III were not implemented, the IDA investment will still make economic sense. The results presented in table 4 below show that the EIRR is 13.4% and the NPV is US\$ 2.65 million. Switching values are +11% for O&M costs and +9.5% for investment cost. If only Phase I physical investment is taken into account (excluding Phase I costs of capacity building, technical assistance, PREMs and ASER costs) the EIRR is estimated to be 57.3%.

<b>Table 4</b>	NPV Net Cost (Investment+O&M)	81.63	MUS\$
	NPV Net Benefits for the Users	83.90	MUS\$
	NPV Global Environment Benefits	0.38	MUS\$
	NPV Net Benefits	2.65	MUS\$
	EIRR	13.4%	

**FINANCIAL ANALYSIS - PPER CONCESSION LEVEL (PRIVATE CONCESSIONAIRE POINT OF VIEW).**

16. This financial analysis aims at assessing the attractiveness and sustainability of a PPER concession for the private investor and operator. The assessment shows a payback period of 6 years and a financial FIRR of 25.5% over the concession period of 25 years (Tables 5 & 6 below). The sensitivity analysis to variations in collection performance, investment and O&M costs and to the level of subsidy demonstrates the robustness of the results (Table 7 below).

<b>Table 5</b>	<i>BASE CASE *</i>	MUSD
	Total Initial investment	26.30
	Private Equity	5.45
	Subsidy	17.3

95 % bill collection rate.

<b>Table 6</b>	10 years	25 years
NPV (MUSD)	(1.82)	19.63
Financial IRR	7%	25.46%
Payback	6 years	

**Table 7: Sensitivity Analysis**

**Bill collection rate**

<i>rate of variation</i>	85%	90%	95%	100%
Fin IRR	3.20%	16%	25%	34.36%
Payback (years)	10 years	6 years	6 years	4 years
			Base Case	

**Investment Costs**

<i>rate of variation</i>	90%	95%	100%	105%	110%	115%
Fin IRR	125%	57%	34%	22%	14.2%	7.6%
Payback (years)		4 years	4 years	6 years	9 years	10 years

**O&M Costs**

<i>rate of variation</i>	85%	90%	95%	100%	105%	110%	115%	120%	125%
Fin IRR	51%	45%	40%	34%	29%	25%	20%	15%	9%
Payback (years)	4 years	4 years	4 years	4 years	5 years	6 years	6 years	7 years	9 years

**Subsidy**

<i>rate of variation</i>	70%	75%	80%	85%	90%	95%	100%	105%	110%	115%
% of initial Invest	46.01%	49.30%	52.59%	55.9%	59%	62%	65.73%	69.02%	73.31%	75.59%
Fin IRR	12.18%	14.42%	17.01%	19.69%	23%	28%	34%	44%	59%	110%
Payback (years)	9 years	9 years	7 years	6 years	6 years	5 years	4 years	4 years	4 years	4 years

### Annex 8. A Estimate of Clients and Equipment Requirements

#### Number of clients served by the whole program

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14(*)
Total domestic users	881	3,213	8,801	19,474	34,141	49,784	65,178	80,431	95,315	111,971	124,590	139,472	150,639	154,891
Total productive uses	85	332	945	2,142	3,801	5,565	7,303	9,024	10,701	12,592	14,000	15,679	16,947	17,408
Total social/collective uses	73	279	794	1,804	3,204	4,697	6,167	7,623	9,043	10,642	11,834	13,254	14,325	14,724
<b>Total Clients</b>	<b>1,038</b>	<b>3,824</b>	<b>10,539</b>	<b>23,420</b>	<b>41,146</b>	<b>60,046</b>	<b>78,648</b>	<b>97,079</b>	<b>115,060</b>	<b>135,205</b>	<b>150,425</b>	<b>168,404</b>	<b>181,911</b>	<b>187,023</b>
Total PV Systems	109	490	1,524	3,621	6,582	9,748	12,864	15,949	18,954	22,345	24,859	27,864	30,199	31,067
Total Grids (mini-grids and grid extension)	930	3,334	9,016	19,799	34,564	50,298	65,784	81,130	96,105	112,860	125,566	140,540	151,712	155,956

(\*)the OBA mechanism will lead the number of connections to increase until year 14.

#### Energy Equipment installed by the Program, Energy purchased from others, Jobs created (14 years)

<b>SOLAR SYSTEMS</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>Year</b>														
Number of Individual Solar Systems	109	490	1,524	3,621	6,582	9,748	12,864	15,949	18,954	22,345	24,859	27,864	30,199	31,067
Peak Solar Power installed (KWp)	12	49	145	336	602	886	1,165	1,443	1,713	2,017	2,244	2,514	2,721	2,798
<b>DISTRIBUTION GRID</b>														
Km of LV lines	36	126	338	735	1,273	1,840	2,397	2,948	3,480	4,059	4,536	5,075	5,467	5,613
Km of MV lines	12	55	185	466	875	1,321	1,761	2,197	2,626	3,122	3,459	3,882	4,223	4,355
Number of transfos	2	13	45	116	219	330	439	546	651	769	857	961	1,045	1,076
<b>ENERGY PURCHASE TO SENELEC (MWh)</b>	227	927	2,775	6,528	11,854	17,599	23,301	28,997	34,599	40,891	45,747	51,483	56,066	58,097
<b>POWER DEMAND TO SENELEC (KW)</b>	109	610	2,191	5,628	10,644	16,083	21,484	26,881	32,184	38,175	42,737	48,178	52,667	54,675
<b>DIESEL GENERATORS FOR MINI-GRIDS</b>														

Number of units	3	19	67	171	320	479	636	792	943	1,115	1,240	1,391	1,510	1,555
Installed Capacity (kW)	59	209	558	1,206	2,081	3,014	3,939	4,862	5,770	6,798	7,578	8,506	9,200	9,496
Diesel Demand (1000 litres)	72	267	738	1,624	2,787	3,938	5,010	6,095	7,152	8,402	9,274	10,378	11,148	11,351

<b>EMPLOYMENT</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
Number of Jobs created	10	42	107	223	382	555	725	893	1,058	1,243	1,382	1,546	1,668	1,721

### Annex 8.B Estimate of Economic Costs

#### Investment Cost (MUS\$) (including cost of renewal)

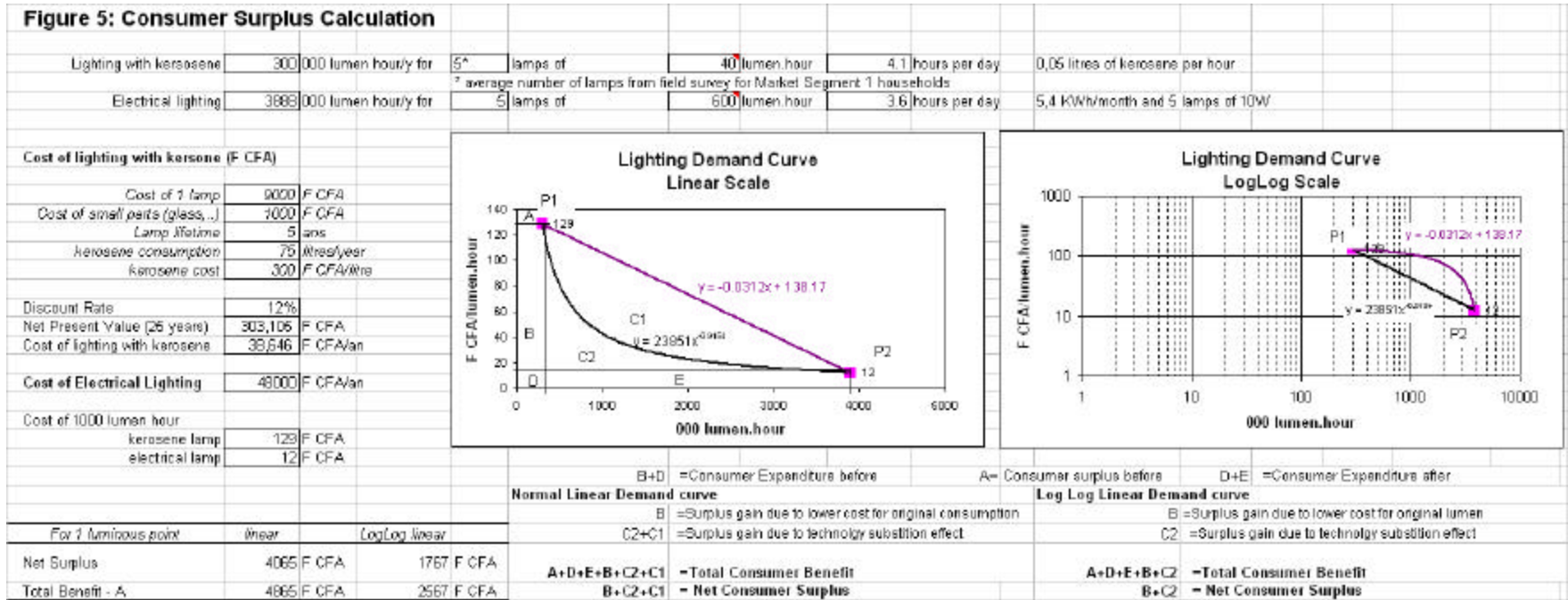
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Production	0.04	0.1	0.4	0.9	1.3	1.4	1.5	1.7	2.1	2.6	2.5	2.6	2.6	2.4	2.4	2.6	2.7	2.7	2.6	2.7	2.9	3.0	3.0	2.9	3.0	
MV Lines	0.14	0.5	1.7	3.6	5.2	5.7	5.6	5.6	5.5	6.3	5.3	5.4	4.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LV lines	0.35	0.9	2.0	3.8	5.1	5.4	5.3	5.3	5.1	5.7	5.1	5.2	3.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Internal wiring	0.16	0.4	1.0	2.1	3.1	3.7	4.5	5.2	5.8	6.9	7.4	8.0	8.2	7.7	7.6	8.0	7.9	8.0	8.4	8.4	8.5	9.0	8.9	9.0	9.5	
Individual PV System	0.14	0.5	1.2	2.4	3.5	4.0	4.4	4.7	4.9	5.9	5.6	6.0	5.8	4.6	4.1	4.5	4.5	4.5	4.8	4.8	4.7	5.0	5.1	5.0	5.1	
Public Lighting	0.01	0.02	0.05	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Structure	0.08	0.2	0.4	0.7	0.7	1.0	1.2	1.2	1.5	2.1	1.8	2.1	1.8	1.9	2.1	1.9	2.0	2.2	2.0	2.1	2.4	2.1	2.2	2.5	2.2	
Engineering	0.05	0.1	0.3	0.7	1.0	1.1	1.1	1.2	1.3	1.5	1.4	1.5	1.3	1.0	0.8	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	
<b>TOTAL</b>	<b>0.96</b>	<b>2.8</b>	<b>7.1</b>	<b>14.2</b>	<b>20.0</b>	<b>22.5</b>	<b>23.8</b>	<b>25.2</b>	<b>26.4</b>	<b>31.2</b>	<b>29.4</b>	<b>31.0</b>	<b>28.2</b>	<b>21.1</b>	<b>17.3</b>	<b>18.0</b>	<b>18.2</b>	<b>18.7</b>	<b>19.2</b>	<b>19.2</b>	<b>19.6</b>	<b>20.4</b>	<b>20.5</b>	<b>20.8</b>	<b>21.2</b>	

#### Operation and Maintenance Costs (MUS\$)

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Energy Purchase	0.03	0.12	0.3	0.8	1.5	2.3	3.0	3.8	4.6	5.5	6.2	7.1	7.8	8.2	8.5	8.7	8.9	9.2	9.5	9.7	10.0	10.3	10.6	10.9	11.2
Fuel	0.03	0.12	0.3	0.7	1.3	1.8	2.4	2.9	3.4	4.1	4.5	5.1	5.6	5.8	5.9	6.1	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8



### Annex 8.C Estimate of Economic Benefits



**Results of "B+C+D+E" Benefit Calculation (Hyp Demand Curve is linear in LogLog scale)**

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Service 1	0.1	0.2	0.5	0.9	1.6	2.3	2.9	3.6	4.2	5.0	5.5	6.2	6.6	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Service 2	0.2	0.6	1.7	3.9	6.9	10.0	13.2	16.3	19.3	22.7	25.3	28.3	30.6	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
Service 3	0.2	0.8	2.0	4.2	7.2	10.3	13.4	16.5	19.5	22.9	25.4	28.4	30.7	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
Pub. Lighting Service	0.0	0.1	0.2	0.5	0.9	1.3	1.7	2.1	2.4	2.9	3.2	3.6	3.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Service	0.2	0.6	1.9	4.3	7.7	11.3	14.7	18.2	21.6	25.5	28.4	32.0	34.7	35.7	35.9	36.2	36.6	37.0	37.3	37.7	38.1	38.5	38.8	39.2	39.6	



## **Annex 9 : Incremental Costs and Global Environmental Benefits of the Rural Electrification Components**

### **SENEGAL: SN-ELECTRICITY SERVICES FOR RURAL AREAS PROJECT**

1. Development Goals _____	94
2. Situation before the Project and Barriers _____	94
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6. Replicability and Sustainability: _____	100

#### **1. Development Goals**

1. The main development objective of the proposed RE program is to support the progressive transformation and improvement in the living conditions of rural Senegal. This should be achieved by: (i) providing lighting and access to modern communication to rural households; (ii) improving delivery of social services by providing electricity to potable water delivery systems, health clinics, schools, etc.; and (iii) enhancing economic productivity through the provision of electricity for productive purposes. Specific project objectives include promoting the development of clean, renewable energy sources, such as solar.

#### **2. Situation before the Project and Barriers**

2. There is a very low rate of rural electrification in Senegal (less than 10%) with most rural households meeting their lighting and small power needs with kerosene and dry cell batteries. Rural electrification has not been successful in Senegal for a number of reasons, principally the low density of rural population results in an extremely high cost for grid extension under the current SENELEC technical standards, high consumer up front connection costs, and a lack of investment capital to expand distribution systems.

3. Kerosene represents the primary source of lighting in rural areas with an average household expenditure on commercial energy of US\$ 6 to US\$ 7 per month. The dry cell batteries is the second source of lighting (flashlight) and the only one for radio, with an average household expenditure on commercial energy of US\$ 4 to US\$ 5 per month. Senegalese households have an ability to pay of about US\$ 10 to 12 per month for a sustainable access to electricity based upon current expenditures on modern forms of energy (see Demand Analysis in Annex 8).

4. Field studies have shown that households are willing to spend the same proportion of their income (or even more) on better energy services to enable them to become more productive and improve their quality of life. But, since any alternatives to get such services (PV systems or individual diesel gensets) suppose high up-front incremental costs, they could do so on their own only if they receive credit and/or are allowed to pay back the costs in small monthly installments over many years. The difficulties of obtaining credit to overcome such incremental cost and local technical support compounds households' problems in obtaining access to electricity.

5. Despite the existence of some marketing of SHSs they would not successfully be introduced into rural areas due to a lack of sufficient financing and scale to facilitate a successful penetration into the targeted rural markets.

6. Consequently, the scenario in the absence of the project is that these households communities will continue to rely on fossil fuel (kerosene lanterns and disposable batteries) for their basic electricity needs.

### 3. Incremental Costs of PV Systems for Households

7. The current costs taken into account in the calculation of the incremental cost are the costs associated with the delivery of energy services to rural populations based upon continued use of kerosene lanterns and disposable batteries by rural communities.

8. For small consumers, the first cost associated with the purchase of two kerosene lanterns is \$30, total consumption of about 88 liters annually and a net present value of operating costs of about \$470 over a fifteen year equipment life. The levelized cost is about \$6 month. Energy output is equivalent to a 20 watt SHS.

9. Medium consumers will use both lanterns and disposable batteries. The first cost associated with the purchase of three kerosene lanterns is \$45, total consumption of about 135 liters annually and a net present value of operating costs of about \$900 over a fifteen year equipment life. Disposable dry cell battery use is about \$28 year. The levelized cost is about \$12 month. Energy output is equivalent to a 50 watt SHS.

10. The incremental cost was calculated using the following assumptions to compare traditional technology to the GEF option, as noted in the Table 1 below.

**Table 1**

<b>Household type</b>	<b>Traditional Technology</b>	<b>GEF Provision</b>
	<b>Light</b>	<b>Electricity</b>
Small consumer	2 kerosene wick lamps	-20Wp SHS
Medium consumer	3 kerosene wick lamps	- 8 R20 batteries/m - 50Wp SHS

11. Renewable energy solutions are more expensive than the traditional existing solutions and their costs are unlikely to decrease until local capacity increases and economies of scale lower the price as the market grows. A national program of innovative rural electrification schemes is expected to induce private entrepreneurs to invest in this sector.

12. The concessionaire/rural electricity services provider will be given latitude to meet the demands of the market in terms of system type and size. Incremental costs have been based on estimated prices of equipment a concessionaire might be expected to pay for equipment.

13. Levelized Monthly Cost (LMC) is used for comparison with existing levels of payment. Investment costs are expressed as sum of the first cost of the system and the present value of the running costs. A discount rate of 12% and a lifetime of 15 years is used. Based on ESMAP survey data, the incremental cost of PV systems for households, as compared to baseline solutions, reveals a 15-year life cost of US\$ 245 for the 20 Wp systems and a cost of US\$ 427 for the 50 Wp systems.

14. Tables 2 and 3 below provides a summary of LMCs and incremental cost per unit.

**Tables 2 : Levelized Monthly Cost of traditional technology and PV systems**

<b>PV Systems</b>	<b>LMC of PV Systems(\$)</b>	<b>LMC of Traditional Technology (\$)</b>	<b>NPV, Lifecycle Cost, PV Systems (\$)</b>	<b>NPV, Lifecycle Cost, Traditional Technology (\$)</b>
20Wp	7.80	4.80	639	394
50Wp	15.10	9.90	1,234	807

**Tables 3 : Incremental Cost per System US\$**

<b>System</b>	<b>Incremental Cost/Unit</b>	<b>Incremental Cost/W</b>
20Wp	245	12.25
50Wp	427	8.54

#### **4. GEF Alternative and Global Environment Benefits**

15. The global environment objective of the GEF alternative is to both (i) mitigate carbon emissions resulting from the use of kerosene for lighting by rural households in Senegal and (ii) avoid new emissions that would result from both the shift to electricity and the increase of final energy demand.

16. The previous design of the project, as detailed in approved project brief, intended to install 20Wp systems (12,000 = 240,000 Wp) and 50 Wp systems (8,000 = 400,000 Wp), that is a total of 640,000 Watt peak over a five-year period. Average subsidy per Watt peak was planned at that time to be around USD 6.2/Wp (USD 7.66 for 20 Wp systems and USD 5.34/Wp for 50 Wp systems). As a result, at the time the Project Brief was approved, the total carbon emissions were expected to be reduced by about 74,110 tons of CO<sub>2</sub> over a 15 year period (corresponding to the lifetime of the equipment).

17. Under the new project design - as described in this PAD -, the final capacity effectively installed will result from the bidding process and for that reason cannot be known exactly beforehand. However the current project has design a competitive mechanism that will improve the efficiency of the use of the GEF cost subsidy by capping the subsidy per Watt peak to a maximum of USD 2.6/Wp (see details in next section below).

18. As a result, if the totality of GEF cost subsidy is consumed by the bidders, the capacity installed will be increased to 1,538.000 Wp during IDA Phase 1 only, that is will be more than doubled compare to initial Project Brief objectives.

19. Under this new project design, the total expected carbon emissions reduction are now estimated at least 340,000 tons of CO<sub>2</sub> along the 25 years concession period (IDA phase 1 only), due to both use of off grid PV systems renewable and diffusion of high efficient lamps in grid connected households (see detailed calculation of Global Environment Benefits in Annex 8 Economic and Financial Analysis).

**Table 4:**

	<i>Previous Project Design (Approved Project Brief)</i>	<i>New Project Design (IDA Phase I only)</i>
GEF Cost subsidy	3,972,500	4,000,000
Average subsidy (\$/Wp)	6.21	2.6
Capacity Installed (Wp)	640,000	1,538,462
Emissions avoided	74,110 tCO <sub>2</sub>	340,000 tCO <sub>2</sub>

20. The main reasons for such performance improvement is that under the new project design the incremental cost barrier perceived by the users is address by several means and not only through first cost subsidy.

21. The principal innovative means to address the incremental cost barrier perceived by the users in the new project design are:

- the fee for service model, which allows to maximize the financial contribution and willingness to pay of beneficiaries by spreading it along the whole concession period (25 years). The fee for service model acts as a long term financing mechanism of the service to the beneficiaries, reflecting a cost of financing far lower than the beneficiaries could get by themselves. To the contrary the previous design supposed cash up-front payment from the beneficiaries, or at best 3 years financing at quite high interest rate. As a consequence, the perceived monthly cost for the beneficiaries is significantly lowered and the gap to fill between effective payments and total cost is also reduced,
- more than two level of services: new regulated electricity services include 4 different level of services, allowing to higher service customer also to be shift to PV, even if they require more than 50 Wp,
- the concession model combined with international bidding process, which allows economy of scale / critical mass for the operators in bulk purchase of PV components and immediate access to competitive international prices,
- an international competitive process both for the awarding of the concession and for access to GEF subsidy, which, moreover, will be capped by a ceiling (US\$ 2.60/Wp). This original competitive mechanism will optimize the level of subsidy and ensure that this project will perform at least as well as the average of other GEF/ World Bank financed renewable energy based rural electrification projects. In fact it is expected that, as a result of the competition, the average subsidy will be lower than USD 2.6 /Wp, still improving the performance of the project (see detail of the mechanism below).
- the creation of a “payment facility” embedded in users’ bill (created by the Regulatory Agency during preparation phase), which allows to pre-finance both connection fees and efficient fluorescent lamps, making both far more affordable even for the poorest. Thus emissions reductions are also achieved for the grid- connected households,
- the concession model also ensures long term commitment from the concessionaire. The private concessionaire will be contractually committed to ensure the renewal of the equipment along the whole duration of the concession, sustaining emissions gains along the whole period (25 years) and beyond (since the concession will be re-biddded at the end of the period as it is current practice in infrastructure concessions).

22. To succeed in the challenging objective of implementing a new national model for rural electrification integrating widely renewable, the GEF alternative also includes capacity building and technical assistance for :

- support to ASER, the national rural electrification agency, in the launching of the bidding process, monitoring, oversight and independent evaluation. Technical assistance is required for the first four years costing a total of US\$ 4.80 million (components 2+3 – see detail description in Annex 4)), of which US1 million will be financed by GEF for the monitoring program (see description of project components in Annex 4), and,
- sub-sector policy reform (already implemented during project preparation phase, see sector policy letter).

23. It is important to stress, for the sake of comparison between the two project designs (project brief and new design), that the new project design supposes that part of the equipment will be installed up to 3 years after the last concession is awarded. That is, in the case of IDA first phase, the equipment installation in the third concession to be awarded will not begin sooner than the beginning of the third year. As a result, while IDA phase is 4 years long, figures of the end of the fifth year should be considered to get estimates of number of connections achieved by IDA phase 1.

24. The figures presented in the main text of the PAD and in the Annex 8 (Economical and Financial Analysis) reflect static estimates derived from the Local Electrification Plans (PLE), for both the global figure of total number of users served by the project and number of PV systems. While these estimates take into account the global volume of the GEF cost subsidy together with IDA subsidy, they are static because they don't integrate the effect of the specific design of the GEF cost subsidy, which will displace the competition frontier between grid and PV in favor of PV. As a consequence, the PV figures in annex 8 are expected to be minimum figures. As explained above, it is expected that the competitive mechanism designed specifically for maximizing the efficiency of the GEF grant (see section below) will increase very significantly this figure, to the point that, assuming all the GEF grant is consumed, installed PV capacity will reach at least 1,500,000 Wp.

### **5. Mechanism for competitive use of GEF cost subsidies for Renewable Energy**

25. As stated above, the considered project is aimed at supporting the development of access to electricity services in rural areas in Senegal through a fee-for-service model, by offering an initial investment cost subsidy to private operator selected under an international competitive bidding process.

26. The selection criteria of the bidding process to select future rural electrification concession operators is the following :

- A volume of subsidy coming from the IDA credit is targeted for each concession and announced in the Request of Proposals. Eligibility of proposals will include minima of connections to be achieved (minima may be detailed by sub-regions of the concession).
- The winner will be the bidder who commits to serve the highest total number of individual users.

27. The GEF grant will be used to ensure a level playing field for renewable energy in the following way:

- a pre-defined amount of GEF grant will be allocated to each concession as a “competitive renewable energy subsidy mechanism”, and announced in the Request of Proposals.
- the bidders who offer to use renewable energy may claim for an additional subsidy which will come from the allocated GEF grant.
- there will be a ceiling defining a limited maximum unitary amount of GEF subsidy for each renewable technology (for instance max \$ of GEF subsidy per Wp installed in case of photovoltaic). This ceiling will be defined according to both:

- values of subsidies observed in other WB projects for the same technologies,
- incremental cost calculated in Project Brief.

The ceiling retained is the less of both.

- the selection criteria to design the winning bid remains the maximum number of consumers served using both the non-targeted “IDA source” of subsidy and the targeted “GEF subsidy”.

28. In order to demonstrate commitment of Senegalese Government to sustain the share of renewable energy beyond phase 1 GEF support, it is envisaged that part of the IDA and/or GOS financial counterpart may be allocated to this “competitive renewable energy subsidy mechanism” in Phase 2 to replace partially or totally GEF grant in phase II.

29. This way the bidders will receive a double incentive:

to increase the proportion of renewable in their proposal, because of the additional “GEF” subsidy they can get to help overcome the adoption barriers,

to claim for the lowest “GEF” subsidy per renewable energy based system, since they need to maximize the number of consumers served to win, using the global amount of subsidy (IDA+GEF) allocated for the considered concession.

**Table 5: Level of GEF subsidy in other World Bank supported projects:**  
(average subsidy calculated on the basis of a 50Wp system)

Project	US\$ Subsidy per 50Wp System	Subsidy per Wp US\$/Wp
Bangladesh RERED (P074040)	90	1.80
Uganda ERT (P069996)	105	2.10
Ethiopia EAP (P049395)	120	2.40
Guinea DREP (P074288)	214	4.30
Mozambique ERAP (P069183)	270	5.40
Sri Lanka	115	2.30
Cambodia	125	2.50
China	75	1.50
Indonesia (Java)	75	1.50
Indonesia (off Java)	125	2.50
Average*	130	2.60

(\*) the average is calculated by project and not by volume, since this project will not be able to achieve the same volumes than can be achieved in large countries like China, Indonesia or Bangladesh (population of Senegal is only 12 million people).

30. Incremental cost has been calculated in Project Brief as US\$ 8.54/Wp for a 50Wp system. Thus the ceiling value adopted is \$US 2.6 /Wp, that is US\$ 130 for a 50 Wp system. To the extent that the subsidy will be allocated through a competitive bidding process, it is expected that the subsidy effectively allocated will be lower than this ceiling value.

31. This value of ceiling will apply only for the first concessions to be bided, and will be revised according to the market response during the first bids. For instance it may be equal to or lower than the maximum unitary subsidy claimed by the bidders for the first concessions bided.

32. In synthesis, this competitive GEF cost subsidy mechanism has been designed to ensure win-win results, that is to increase the number of beneficiaries while displacing at the same time the grid/ renewable competition frontier of the whole Senegalese rural electrification program in favor of renewable energy.

## **6. Replicability and Sustainability:**

*\* At the national level:*

33. This project (new design) is in fact supporting the implementation of a new rural electrification model in Senegal, which has its own institutional arrangement, innovative tariff structure, specific financing mechanism and adapted regulatory framework for a long term public-private partnership. As such the implementation of the 3 first concessions to be supported by IDA phase 1 will demonstrate that this new model has created the conditions for replicability to the 18 rural electrification concessions. As a matter of fact, at least three multilateral and bilateral donors have already indicated their intention to finance at least 16 of the 18 concessions during the next coming 12 years, among which 9 in the coming 4 years. ADB and KFW have already financed the corresponding Local Electrification Plans, which have already been completed, and they joined the WB in a Joint Appraisal Seminar held with the Senegalese Government delegation in Dakar in April 2004.

34. During negotiations, the GOS has committed itself (i) to continue to finance ASER under the national budget (as it has constantly done since 1998), (ii) to contribute to investment financing of the investment plans in the concessions to be awarded internationally, and (iii) to finance further densification of connections and decentralized PV systems in already awarded concessions. Thus, after the concessions being awarded with the support of international donors, the mechanism is designed to ensure that the further expansion of the electrification program though densification will be sustainable on the exclusive basis of financing from Senegal for the subsidy part. Regarding more specifically the sustained expansion of the use of renewable energy, it is envisaged in phase 2 that (i) the need of targeted subsidy will lower as a result of the opening and scaling up of the Senegalese market, (ii) part of it will be financed under the GOS counterpart for phase 2 and, (iii) remaining fraction of incremental cost, if any, may be proposed for additional support from GEF in phase 2. The level of GEF cost subsidy in phase 2, if any is still required, will be determined on the basis of the monitoring of the evolution of PV prices as observed from the bids proposals for the concessions to be awarded during phase 1.

*\* At the individual systems and concessions level:*

35. The regulated monthly payments paid by the beneficiaries, which result from the sum of the tariff and the payment facility embedded in the bill, have been calibrated by the CRSE (Regulatory Agency) to be consistent with the current substitutable energy expenditures measured by extensive field surveys in 9 concessions. The Business Plan models developed during the preparation phase have demonstrated that these financial contributions from the beneficiary will not only cover the operation and maintenance costs, delivery costs and replacement costs of systems, but also remunerate at least 20% of initial investment cost to be brought (see Financial Analysis in Annex 8). This private capital share threshold has been set as a qualification criteria in the bidding documents.

36. The financial commitment of the private concessionaires will ensure that they will sustain their efforts to keep systems running well, since they will have to get return on their investment through beneficiaries monthly payments.

37. At the end of the 25 years concession period, the rural concessions will be re-awarded under a new international bidding process, as is it current practice in infrastructure concession models.

*\* specific sustainability issue related to renewable energy systems for social and/or collective uses*

38. While social value may be very high, especially for the poorest and the weakest (children, women) lessons from former rural electrification programs and observations in current public or private electricity utilities have shown that certain collective uses of renewable energy systems face specific barriers that prevent their long term sustainability under pure commercial rural electrification model. In reason of the different nature of certain collective clients, it appears to be sometimes hard to ensure full and continuous coverage of operation and maintenance costs for corresponding isolated systems. And even short incapacity to pay may jeopardize durably the availability of the equipment and associated social benefits. This may typically occur when high decentralization of non commercial services is combined with poor liability of local authorities.

39. In such cases GEF first cost subsidy cannot remedy the problem. Another instrument may become complementary to GEF to improve long term sustainability of renewable energy systems, which is the newly implemented Clean Development Mechanism (CDM) of the Kyoto Protocol. By providing Certificates of Emission Reduction, which can be converted in carbon finance, along up to 21 years crediting period, CDM may help to overcome such specific type of barrier.

40. While for the time being rules are not clear regarding possibilities to combine or not GEF and CDM, this option will be explored further. In case it happens to be possible to combine both revenues from CDM certificates sales and GEF subsidy, carbon finance revenues will be used to feed a specific mechanism – still to be designed – to improve the long term sustainability of collective renewable energy based systems. Of course such mechanism shall avoid any double financing of the same emissions reduction, one possible way to do so being to lower up-front GEF first cost subsidy cap by the discounted value of expected CDM revenues. Such mechanism would operate a partial trade-off between up-front (GEF) and ex-post (CDM) incentives mechanisms to reduce emission reductions.

## Annex 10: GEF Grant - STAP Reviewer Comments and Answers

### SENEGAL: SN-ELECTRICITY SERVICES FOR RURAL AREAS PROJECT

Comments on Project Brief from the STAP Reviewer -- Daniel M. Kammen  
(University of California, Berkeley, CA)

#### *Summary*

This is an important, generally well-conceived, project that will provide a critical service. If implemented in a fashion that truly requires private-sector buy-in, the chances of success are excellent, and the project should be approved and supported. There is a need for the Senegal project to evaluate and benefit from the experience in other regional settings. To that end, an advisory/oversight board is needed to review the ongoing success/issues with the drive for private sector engagement and project leadership. It is recommended that an advisory and review board be constituted. This group would consist of a majority of individuals from the private sector, several academics and NGO representatives, and a minority from the multinational development community. The tasks of this group would consist of both charting and advising the project team, and to provide a private-sector study team that could look at other renewable energy/electrification projects, *and* to develop increase expertise within the private sector to facilitate future efforts.

#### *Major Comments:*

##### (i) Concession Models (page 1ff):

This program utilizes the concession approach as the primary mechanism to support private sector entry in the renewable energy market. There are a number of compelling arguments for this approach, particularly in rural/areas of low population density in poor regions of developing nations. However, the primary examples of concession-based approaches, in South Africa and the Caribbean, are not anticipated to build diverse, competitive, markets. Instead, they will likely develop localized, hopefully sustained, markets, but there is no clear reason to think that the investment of public funds in these concessions. In the South African case, for example, pre-existing companies interested to enter the market (RAPS) wanted to begin providing service, and the use of public – ESKOM – funds provided an initial impetus for action. Sustained use of public, or GEF, funds was not considered viable. This is not to say that the concession model *can not* work in Senegal, but a more detailed plan to develop competitive businesses may be required. The focus on financing mechanisms, as well as the existence of an independent agency (ASER) to operate the project are both good starts. To make this model not only work operationally, but to build groundwork for future competitive markets, greater attention should be given to issues of fee-for-service and other mechanisms. The anticipate co-financing level, \$20 million, is impressive and needed. However, with a total project budget of over \$130 million, a larger percentage share from the private sector is recommended. A more specific break-down of the multinational vs. true private sector financing is needed as the majority of the \$20 million are likely to from regional development banks. SENELEC is providing the largest share of financing. The source(s) of this support need to be specified if not wholly GoS allocations.

##### (ii) Page 3:

The two committees charged with the oversight of ASER, a Management Committee, and an Approval Committee, should be considered in the context of my comments on the need for an oversight/review panel that has a balanced Senegalese and international membership. The

purpose of this group is not to ‘micro-manage’ or to critique ASER/SENELEC operations, but to use this important project to build added private sector, regional, and international experience to facilitate this and future renewable energy electrification projects. This broader, private-sector review and advisory group becomes particularly important given the intended management of the REFM fund. Again, in the context of an advisory panel, groups such as ENDA-TM (Dakar) and AFREPREN (Nairobi, pan-African) could provide critical input and guidance on issues of income generation, local entrepreneurial involvement, and questions of equity and access. [See the comment below, as well.]

(iii) Page 4:

The mechanisms and role for NGOs and community organizations appears to charge them with much of the critical project leg-work, but an insufficient role in the subsequent management, leadership, and decision-making. One can not utilize the organizations in civil society to do the ‘work’, and not then empower them with real oversight and decision-making power. The management/oversight board recommended above provides one mechanism to remedy this major issue. The well-documented problems with the GEF Zimbabwe-PV loan provides a critical example of the problems that can arise when public sector/NGO constituents are not sufficiently empowered in a project of this nature. As a related comment (page 4ff), it seems unlikely that NGOs would choose to bid/submit proposals under the present project structure. This, too, could be addressed with the oversight and input mechanisms that I have recommended.

*Minor Comments:*

**PADGEF.doc:**

Page 1, paragraph 1:

The phrase, ‘fine grid extension’ has no meaning.

(iv) Page 4:

Further analysis of the 10+ year concession lifespan. Little relevant data exists from the energy sector. Cases from non-energy services could be used to evaluate the veracity of the conclusion that this is a lower-limit on the necessary concession period. A significant amount of lock-in/future monopoly is highly likely with this long duration, particularly as per capita energy use in Senegal is expected to change so dramatically during this time.

(v) Page 5:

The ‘critical’ role of rural consumers discussed in the document is, in fact, a critical, argument that non-concession models – or concessions based on fee-for-service and not so heavily on sales – would benefit the end users far more. As stated in the ‘major comments’ section, this issue needs to be examined in greater detail, preferably via a workshop with local NGO and community group participation. I would be willing to serve as part of an independent external review and convening group for this purpose.

(vi) Page 6:

Carbon dioxide abatement is likely to be a minor aspect of the project for the next many years (see, for example, Duke and Kammen, 1999; Duke, et al., 2000). While transformation of the energy sector is a critical goal of this and other renewable energy projects, one should be clear that most of the energy use will be new energy, not significantly wood, charcoal, or kerosene substitution.

(vii) Page 7:

The statement below needs further explanation, as well as a plan to address this problem: The World Bank is beginning to make more money available for RE projects, though the proposed

project is unlikely to attract significant funding beyond its current size given in inherent risks associated with the project and a need to build sufficient capacity to support the proposed RE project.

(viii) The ‘Lessons Learned’ section (3):

Several issues arise here, namely the true need for full cost-recovery of SHS installation. This is inconsistent with how *non*-renewable energy provision is provided by SENELEC as well as by most other national/regional utilities. Second, ‘rigorous economic and financial analysis’ (see, e.g. Duke, et al, 2000, for the case of Kenya) suggests that this project is not evaluating all logical options, such as fee-for-service, and fully competitive private sector businesses but supported strongly by public sector and NGO training, financing, etc ...

(ix) Page 9 -:

Annex 4: missing. Annex 4 is missing, and is needed for a full evaluation of section E.

(x) Page 11:

The social analysis/participatory evaluation is too incomplete for full commentary. It would clearly benefit from the NGO/civil society review, commentary, and input that the review/oversight board I suggested in the ‘Overview’ at the beginning of this document.

(xi) Page 16ff:

A number of the *Key Performance Indicators* are clearly unrealistic (1.2 - 50% electrification by 2005; 1.4 – liberalization of taxes, unless a very minimal ‘liberalization’ is all that is demanded). It makes more sense to develop a realistic set of indicators, and to provide specific funding and local support to help these to be realized.

(xii) Page 20:

Greater detail is needed to specify the function of the REFM. The statement:

**Project Component 2 - US\$ 50.00 million**

Establishment and financing of REFM. The creation, and functioning, of the REFM will be financed in such a way that it has a good chance of becoming self sustaining within the project period. A monitoring mechanism will be developed as well. The first tranche of financing will be fed into the REFM once it becomes operational and starts financing RE operations. Any subsequent donor contributions will also flow into the REFM. The REFM can only be used for decentralized applications; any grid extension will need to be done under Component 4.

does not sufficiently specify how NGOs and private sector groups will: (a) learn of this opportunity; (b) be assisted in the preparation of acceptable documents to be competitive; (c) will clearly lead to private-sector buy in and action; and (d) how SENELEC grid extension will interact with renewable energy stand-alone systems. Item (d), for example, has been critical to the slow pace of renewable energy/DE expansion in South Africa.

*Annex 4 :*

Page 1, paragraph 1;

Edit the sentence, “solar and hydraulic ...”. Incorrect: perhaps the intended meaning is, ‘hydropower’, or most likely, ‘hybrid’.

(xiii) The assumptions in the Annex for various customers all appear reasonable, although faster cost-declines are possible, and – critically – no induced demand effect (Duke and Kammen, 1999) is taken into account in the calculations of NPV. Including these items would reduce the expected costs significantly.

(xiv) Page 2 – 5:

The kerosene costs, as for many alternatives do not include any penalty for the fact that in rural Senegal these items are not always available *and* costs in local markets can vary widely. An inflator should be applied to fossil-fuel and traditional fuel prices to reflect this.

(xv) (Main document) Page 28:

The LMC's for the PV systems appear to be taken from older cost estimates. More recent values are available from ESMAP.

### *References*

Duke, R. D., Graham, S., Hankins, M., Jacobson, A., Kammen, D. M., Khisa, D., Kithokoi, D., Ochieng, F., Osawa, B., Pulver, S. and Walther, E. (2000) *Field Performance Evaluation of Amorphous Silicon (a-Si) Photovoltaic Systems in Kenya: Methods and Measurements in Support of a Sustainable Commercial Solar Energy Industry*, ESMAP Technical Report No. 005 (World Bank: Washington, DC). Duke, R. D., and Kammen, D. M. (1999) "The economics of energy market transformation initiatives", *The Energy Journal*, **20 (4)**, 15 – 64.

## Response to STAP Review

### *Major Comments*

(i) This project has evaluated all options, and fee-for-service and fully competitive private sector businesses supported by the public sector etc. is part of parcel of the package that ASER is able to offer the market. The Electricity Law, for example, clearly states that all grid extension will be done by competitive tendering. This means that the national power company has not first choice, but will have to compete like any other interested investor. Only when Senelec will increase connection rates within its own concession area there will be no competition.

The co-financing element of \$20 million by the private sector is only for rural electrification not for the Senelec grid extension component. As is explained in section C1 of the project brief, 50% of the RE investment cost will have to be financed by the beneficiaries and operators with their own funds. The fact that these funds may be borrowed by the investors from local Senegalese bank does not change the fact that it is an investment by the private sector. Senelec is not providing the largest share of the investment. According to the concession agreement with the private operator of Senelec, the utility has to connect 33,000 households over roughly the same period as that of the project. It may be that Senelec uses its own funds and/or borrows from local banks. It is also possible that the GoS participates in that investment, because it is majority shareholder in the national utility.

(ii) The two oversight committees will consist of both public and private sector representatives. According to ASER's operational manual representatives of the private sector (operators, banks, NGOs, consultants and consumers) will be in the majority in each of these committees. Whether groups such as ENDA and AFPEPREN should have a role to play is the prerogative of the Government.

(iii) Most of the legwork will be done by ASER (promotion, monitoring, etc) and the private sector (project identification and management). NGOs, as are other representatives of civil society, are invited to participate in making RE a success in Senegal. If they want a role in management, leadership, and decision-making they only have to propose a business plan for the electrification for one or more villages. Or, if they have shown that they have actual experience in this area, ASER may invite one to participate in one of its oversight committees. ASER is in contact with civil society and based on its feed-back will make a justified choice of its optimal inclusion in decision-making.

### *Minor Comments*

(iv) The text (pp. 8-9) clearly spells out the reasons why a 10 year period for a concession was chosen, one of which is the lifetime of non-renewable energy systems such as diesel groups. The main reason for the length of the period is to attract serious investors by giving them the opportunity to make money in rural areas, while at the same time offering rural consumers with a reliable electricity service they want and need, which is of an acceptable quality, and at a price that consumers can afford.

(v) The consumers have indeed a role to play in both the concession model and the spontaneous business plan proposals. In the methodology that describes how rural concessions need to be developed (see ASER implementation manual, vol. 1) consultation with the consumers constitutes one of the design features. After all, it is the GoS's objective to develop a sustainable RE program, from a technical, financial and institutional point of view.

(vi) Based on the representative rural energy consumption and expenditure survey carried out in July 2000 the CO2 abatement scenario is based on the expected replacement of kerosene and

other energy forms that were identified during that survey. How significant this abatement is as compared to the use of new energy is still open to question, but the text clearly states that it is an additional not the major benefit.

(vii) Given the fact that IDA intends to finance US\$59 million of the cost of the project there does not seem to be a need for further explanation. What the relevant text wants to convey is that if the GoS wants to count on future investment in RE, this project needs to demonstrate that it really will be able to establish RE as a sustainable activity.

(viii) The reviewer probably has only experience with power tariffs in Anglophone Africa. However, in Senegal, as in many of its neighbors, tariffs reflect economic cost and are not subsidized. As to the economic analysis comments see (i).

(ix) Annex 4 is not missing, but was just misnumbered.

(x) As pointed out above in (ii) civil society has been and will be involved in project development. ASER's oversight committees will not consist only of public sector representatives, but as has been laid down in ASER's implementation manual, will have a majority of representatives of civil society.

(xi) The text does not state that there will a 50% electrification rate in rural areas, but rather a 50% increase to electricity services by 2005. Liberalization of taxes means the exemption of import duties and VAT on RET for RE so as to bring the technology within easier reach of the rural consumers.

(xii) NGOs and other interested parties have already been informed about ASER's program during project preparation. In addition, ASER aims to organize a two-day workshop for all interested parties in February 2001 to acquaint them with its rules and regulations as formulated in its voluminous implementation manual as well as to get feedback, so as to adjust its manual. This manual contains all the information and guidelines needed, while ASER's past and future activities have and will sensitize interested parties about the RE financing opportunity, what kind of technical and financial assistance is available and under what conditions in preparing business plans as well as how to operate rural power 'utilities,' how grid extension will interact with renewable stand-alone systems.

(xiii) The reviewer may be right that faster cost reduction will be possible. However, the experience he refers to (a well developed RET market, where market barriers have been overcome) cannot be applied blindly to Senegal, where the RET market needs to be developed and the market barriers still loom large and constitute a major constraint for market development.

(xiv) To have as reliable data as possible a representative survey has been carried out in the rural areas in July 2000 to gather data on actual current energy expenditures by households. It is therefore not necessary to apply an inflator to fossil-fuel and traditional fuel prices, which would be warranted if no reliable data base reflecting cost in local rural markets would not have been available.

(xv) The LMCs for PV systems were taken from the most recent Bank project in neighboring Cape Verde, which reflect Senegalese reality more than that of Kenya. Moreover, there is an unwillingness in Senegal to use amorphous panels given the very negative experience with that technology in West Africa. It is therefore considered more prudent to maintain figures that reflect regional rather than international and even African experience.

**Annex 11: Project Preparation and Supervision**  
**SENEGAL: SN-ELECTRICITY SERV. for RURAL AREAS PROJ**

<b>Activities</b>	<b>Planned</b>	<b>Actual</b>
PCN review	10/21/2003	10/21/2003
Initial PID to PIC		
Initial ISDS to PIC		
Appraisal	06/17/2004	06/17/2004
Negotiations	07/27/2004	08/05/2004
Board/RVP approval	09/09/2004	
Planned date of effectiveness	12/01/2004	
Planned date of mid-term review	11/30/2006	
Planned closing date	12/31/2008	

**Key institutions responsible for preparation of the project:**

Responsible Agency for Rural Electrification:

ASER (Agence Sénégalaise d'Electrification Rurale)

Responsible for biomass component :

The National Water and Forest Directorate and,  
The Energy Directorate

**Bank staff and consultants who worked on the project included:**

<b>Name</b>	<b>Title</b>	<b>Unit</b>
M. Layec	TTL	AFTEG
	Lead Energy Economist	
S. Garnier	Power Engineer	AFTEG
C. de Gouvello	Senior Energy Specialist	AFTEG
B. Utria	Senior Economist	AFTEG
P. Vieillescazes	Senior Financial Officer	IEF
I. Menezes	Consultant	AFTEG
L. Ha	Language Program Assistant	AFTEG
L. Wong	Language Program Assistant	AFTEG
A. Seck	Economist	AFTEG
B. Diaite	Senior Procurement Specialist	AFTPC
L. Poirier	Senior Procurement Specialist	AFTPC
P. Morin	Senior Procurement Specialist	AFTPC
A. Albert-Loth	Senior Finance Officer	LOAG 1
F. Sissoko	Financial Management Specialist	AFTFM
R. Robelus	Sr Environmental Assessment Specialist	AFTS1
C. Ivarsdotter	Sr Social Development Specialist	AFTS1
R. Ridker	Consultant	AFTOS
M. Nawaz	Consultant	LEGAF
G. Veuillot	Counsel	LEGAF
MC Balaguer	Paralegal	LEGAF

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## 2. PEER REVIEWER

D. Barnes	Senior Energy Specialist	EWDES
C. Feinstein	Sector Leader	LCSFP
D. Lallement	Adviser	EWDES
D. Rysankova	Economist	LCSFR
I. Xenakis	Operations Adviser	AFTOS

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### **Bank funds expended to date on project preparation:**

1. Bank resources (excluding PPF): \$970,000
2. Trust funds: \$0
3. Total: \$970,000

(PPF: \$2 million)

### **Estimated Approval and Supervision costs:**

Remaining costs to approval: \$0

Estimated annual supervision cost: \$120,000

**Annex 12: Documents in the Project File**  
**SENEGAL: SN-ELECTRICITY SERV. for RURAL AREAS PROJ**

**A - Government Documentation**

- Energy Sector Policy Letter (April 2003)
- Rural Electrification Policy Letter – Draft- (July 2004)
- Construction, Exploitation, Transfert (CET/BOOT Law)
- Principes de tarification des services électriques en milieu rural (CRSE)
- Environmental Impact Assessment Framework (February 2004)
- Resettlement Policy Framework (February 2004)
- Project Implementation Manual (July 2004).

**B - Consultants' Reports**

- Définition d'un mécanisme financier de l'électrification rurale décentralisée au Sénégal (Août 1999)
- Etude des 3 plans locaux d'électrification des concessions de Dagana-Podor-St Louis Mbour et Kolda-Vélingara (février 2002)
- Etude des 3 plans locaux d'électrification des concessions de Louga-Kébémér-Linguère, Kaffrine, Tamba-Kédougou (juillet 2002)
- Etude des 2 plans locaux d'électrification des concessions de Fatick-Gossas et Kaolack-Nioro (mars 2003)
- Elaboration des procédures d'attribution des concessions d'électrification rurale et d'attribution de licences dans le cadre des projets d'électrification rurale d'initiative locale (ERIL) (août 2003)
- Rédaction d'un manuel de procédures pour l'attribution d'une concession ou d'une licence d'électrification rurale au Sénégal et pour le diagnostic des besoins en renforcement des capacités institutionnelles (août 2003)
- Conception et création d'un fonds d'électrification rurale (FER) avec garantie partielle de l'Association Internationale de Développement (IDA) au Sénégal (Août 2003)
- Etude pour la promotion de la participation du secteur privé national et international à la mise en œuvre du programme d'électrification rurale et analyse des risques (août 2003)
- Réalisation de deux logiciels : analyse de business plan de concession et de projets d'électrification rurale (ERILs) et analyse financière du programme d'électrification rurale (août 2003)
- Mission d'étude pour la valorisation de l'électricité en zone rurale et la maximisation de ses effets sur la pauvreté (septembre 2003)
- Mission d'élaboration d'un manuel de procédures pour l'attribution d'une concession ou d'une licence d'électrification rurale et diagnostic des besoins de renforcement des capacités institutionnelles (septembre 2003)
- Etude d'un cadre de Gestion des Impacts Environnementaux des Investissements Physiques et d'un cadre de la Politique de Réinstallation et de Compensation dans la concession de Dagana-Podor-St Louis (février 2004)
- Traitement des aspects juridiques liés au programme d'électrification rurale et la loi CET (Construction, Exploitation, Transfert) (avril 2004)
- Contrat pour assister l'ASER dans l'élaboration d'un plan de passation de marchés (avril 2004)
- Etude d'un cadre de Gestion des Impacts Environnementaux des Investissements Physiques et d'un cadre de la Politique de Réinstallation et de Compensation dans la concession de

- Kebemer—Louga-Linguère (juin 2004)
- ESW – Energie et Pauvreté
- Financial and Economic model (Matilde)

### **C - World Bank**

- Senegal World Bank Country Assistance Strategy
- Sustainable and Participatory Energy Management Project (Progede I) – Project Appraisal Document (June 2000)
- Sustainable and Participatory Energy Management Component of Electricity Services for Rural Areas Project (Progede II) – Detailed Note (June 2004).
- Electricity Services for Rural Areas Project – Detailed Project Description (June 2004)
- Electricity Services for Rural Areas Project – Detailed Economic and Financial Assessment (June 2004)
- Electricity Services for Rural Areas Project – Detailed note on Regulatory Framework and Financing Mechanisms (June 2004)

\* including electronic files

**Annex 13: Statement of Loans and Credits**  
**SENEGAL: SN-ELECTRICTY SERV. for RURAL AREAS PROJ**

**Operations Portfolio (IDA and Grants)**  
(As of 8/13/04)

<b>Closed Loans and Credits: 112</b>				<b>Original Amount in US\$ Millions</b>				<b>Difference between</b>	
<b>Active Credits 14</b>								<b>Expected and Actual</b>	
<b>Project ID</b>	<b>Project Name</b>	<b>FY</b>	<b>IBRD</b>	<b>IDA</b>	<b>GEF</b>	<b>Cancel</b>	<b>Undisb.</b>	<b>Disbursements <sup>a/</sup></b>	
								<b>Original</b>	<b>Formally Revised</b>
P074059	HIV/AIDS Prevention & Control (Map II)	2002		30			25.4	5.0	
P002369	Integrated Health Sector Development	1998		50			15.6	15.8	7.1
P041528	Long Term Water Sector	2001		125			115.3	38.9	
P070541	Nutrition Enhancement	2002		14.7			9.4	5.3	
P051609	Private Investment Promotion	2003		46			45.4	-3.8	
P080013	Private Sector Adjustment	2004		45			44.2	12.7	
P047319	Quality Education for All	2000		50			12.6	-38.6	-38.6
P057996	National Rural Infrastructure	2000		28.5			14.3	13.5	-0.9
P042056	Sustainable Participatory Energy Mgmt.	1997			4.7		0.1		0.1
P046768	Sustainable Participatory Energy Mgmt.	1997		5.2			0.5	0.5	0.6
P002366	Transport II	1999		90			58.1	46.5	
P002367	Agr. Service & Producers Organizations	1999		27.4			7.3	6.2	5.6
P041566	Social Development Fund	2001		30			20.9	17.0	0.6
P002365	Urban Devt. & Decentralization Program	1998		75			7.7	6.4	6.1
P055472	Urban Mobility Improvement Program	2000		70			71.4	65.8	
<b>Total</b>				<b>686.8</b>	<b>4.7</b>		<b>448.2</b>	<b>191.2</b>	<b>-19.4</b>

<sup>a/</sup> Intended disbursements to date minus actual disbursements to date as projected at appraisal.

<b>IBRD/IDA</b>	
Total Disbursed (Active)	280.1
of which has been repaid	0.0
Total Disbursed (Closed)	1,744.0
of which has been repaid	328.4
Total Disbursed (Active+Closed)	2,024.1
of which has been repaid	328.4
Total Undisbursed (Active)	448.2
Total Undisbursed (Closed)	0.0
Total Undisbursed (Active+Closed)	448.2

SENEGAL  
STATEMENT OF IFC's  
Held and Disbursed Portfolio  
In Millions of US Dollars

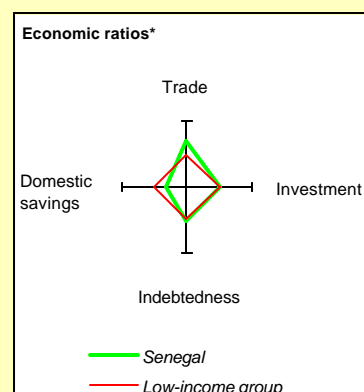
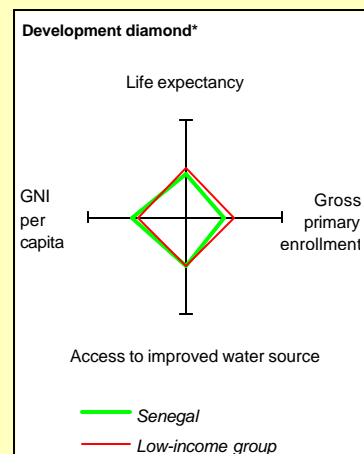
FY Approval	Company	Committed				Disbursed			
		IFC				IFC			
		Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
1996/97/98	AEF SERT	0.00	0.04	0.00	0.00	0.00	0.04	0.00	0.00
1980	BHS	0.00	0.46	0.00	0.00	0.00	0.46	0.00	0.00
1999	Ciments du Sahel	14.60	2.26	2.98	0.00	14.60	2.26	2.98	0.00
1997/98	GTI Dakar	1.54	0.00	0.00	0.00	1.51	0.00	0.00	0.00
1998	SEF Fanaicha	0.37	0.00	0.00	0.00	0.37	0.00	0.00	0.00
2001	SEF Royal Saly	1.36	0.00	0.00	0.00	1.368	0.00	0.00	0.00
	Total portfolio:	17.87	2.76	2.98	0.00	17.84	2.76	2.98	0.00

FY Approval	Company	Approvals Pending Commitment			
		Loan	Equity	Quasi	Partic.
	Total pending commitment:	0.00	0.00	0.00	0.00

## Annex 14: Country at a Glance

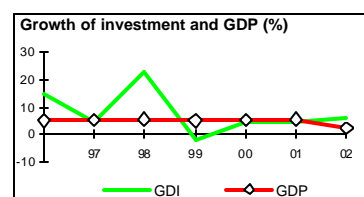
### SENEGAL: SN-ELECTRICITY SERV. for RURAL AREAS PROJ

POVERTY and SOCIAL	Senegal	Sub-Saharan Africa	Low-income		
<b>2002</b>					
Population, mid-year (millions)	10.0	688	2.495		
GNI per capita (Atlas method, US\$)	470	450	430		
GNI (Atlas method, US\$ billions)	4.7	306	1.072		
<b>Average annual growth, 1996-02</b>					
Population (%)	2.7	2.4	1.9		
Labor force (%)	2.7	2.5	2.3		
<b>Most recent estimate (latest year available, 1996-02)</b>					
Poverty (% of population below national poverty line)	..	..	..		
Urban population (% of total population)	49	33	30		
Life expectancy at birth (years)	52	46	59		
Infant mortality (per 1,000 live births)	73	105	81		
Child malnutrition (% of children under 5)	18	..	..		
Access to an improved water source (% of population)	78	58	76		
Illiteracy (% of population age 15+)	61	37	37		
Gross primary enrollment (% of school-age population)	75	86	95		
Male	79	92	103		
Female	70	80	87		
<b>KEY ECONOMIC RATIOS and LONG-TERM TRENDS</b>					
	<b>1982</b>	<b>1992</b>	<b>2001</b>	<b>2002</b>	
GDP (US\$ billions)	2.6	6.0	4.6	4.9	
Gross domestic investment/GDP	12.2	14.8	20.1	20.8	
Exports of goods and services/GDP	33.0	23.3	29.7	29.3	
Gross domestic savings/GDP	-2.5	7.4	12.0	13.0	
Gross national savings/GDP	-6.6	5.8	14.2	15.6	
Current account balance/GDP	-10.3	-6.7	-6.4	..	
Interest payments/GDP	1.5	0.8	1.2	1.3	
Total debt/GDP	72.1	60.8	75.1	79.3	
Total debt service/exports	12.7	13.0	12.6	14.3	
Present value of debt/GDP	..	..	51.9	..	
Present value of debt/exports	..	..	147.9	..	
	<b>1982-92</b>	<b>1992-02</b>	<b>2001</b>	<b>2002</b>	<b>2002-06</b>
(average annual growth)					
GDP	2.3	4.7	5.7	2.4	4.8
GDP per capita	-0.5	1.9	3.2	0.0	2.7
Exports of goods and services	1.7	5.1	6.6	5.4	5.1

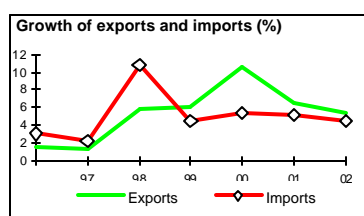


#### STRUCTURE of the ECONOMY

	1982	1992	2001	2002
<i>(% of GDP)</i>				
Agriculture	21.7	18.9	17.9	18.2
Industry	15.0	18.8	27.0	28.1
Manufacturing	10.4	12.5	17.7	18.2
Services	63.3	62.2	55.1	53.7
Private consumption	84.3	77.2	77.9	77.0
General government consumption	18.2	15.4	10.1	10.1
Imports of goods and services	47.7	30.7	37.7	37.1



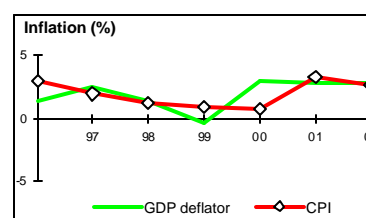
	1982-92	1992-02	2001	2002
<i>(average annual growth)</i>				
Agriculture	1.4	3.5	6.9	6.9
Industry	3.4	6.1	6.8	6.4
Manufacturing	3.6	5.0	4.7	4.7
Services	2.2	4.8	5.0	3.8
Private consumption	1.7	4.7	6.0	4.8
General government consumption	2.4	0.8	1.9	2.5
Gross domestic investment	4.5	6.0	4.7	6.2
Imports of goods and services	1.3	3.7	5.2	4.5



Note: 2002 data are preliminary estimates.

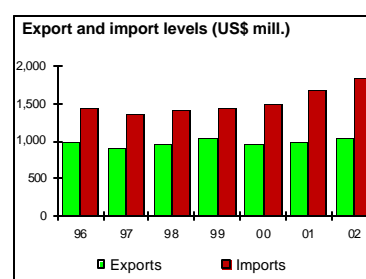
## PRICES and GOVERNMENT FINANCE

	1982	1992	2001	2002
<b>Domestic prices</b> (% change)				
Consumer prices	17.3	0.0	3.0	2.4
Implicit GDP deflator	9.3	0.6	2.6	2.6
<b>Government finance</b> (% of GDP, includes current grants)				
Current revenue	17.9	18.9	18.1	19.6
Current budget balance	-3.5	2.6	2.0	6.6
Overall surplus/deficit	-7.2	-2.6	-5.9	-2.1



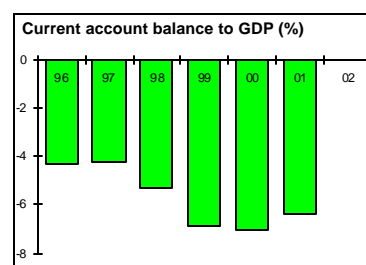
## TRADE

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Total exports (fob)	502	828	992	1,046
Groundnut products	128	66	112	147
Phosphates	56	60	35	37
Manufactures	182	190	250	250
Total imports (cif)	984	1,355	1,678	1,847
Food	235	363	359	409
Fuel and energy	292	150	283	278
Capital goods	137	175	283	313
Export price index (1995=100)	91	93	79	81
Import price index (1995=100)	80	89	93	97
Terms of trade (1995=100)	113	104	85	84



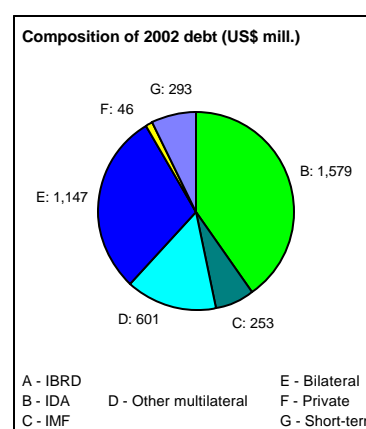
## BALANCE of PAYMENTS

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Exports of goods and services	892	1,404	1,375	1,448
Imports of goods and services	1,277	1,851	1,747	1,833
Resource balance	-385	-447	-372	-385
Net income	-116	-133	-79	-73
Net current transfers	10	34	181	205
Current account balance	-266	-401	-297	..
Financial items (net)	140	422	352	..
Changes in net reserves	126	-20	-55	-47
<b>Memo:</b>				
Reserves including gold (US\$ millions)	25	22	596	630
Conversion rate (DEC. local/US\$)	328.6	264.7	729.0	718.6



## EXTERNAL DEBT and RESOURCE FLOWS

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Total debt outstanding and disbursed	1,861	3,666	3,482	3,919
IBRD	79	62	0	0
IDA	166	873	1,384	1,579
Total debt service	123	210	206	218
IBRD	8	17	1	0
IDA	2	9	19	16
Composition of net resource flows				
Official grants	71	331	148	..
Official creditors	263	255	83	117
Private creditors	7	-31	41	1
Foreign direct investment	28	21	126	..
Portfolio equity	0	0	0	..
World Bank program				
Commitments	19	44	155	45
Disbursements	26	103	119	114
Principal repayments	3	14	11	6
Net flows	23	89	108	108
Interest payments	7	12	10	10
Net transfers	16	76	99	98



Note: This table was produced from the Development Economics central database.

8/20/03