

# **Evaluation of Rural Electrification Concessions in sub-Saharan Africa**

## **Detailed Case Study: Senegal**

**Report to World Bank**

**December  
2015**

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## Executive Summary

Senegal has implemented an area-based concession approach to rural electrification. Since 2008, six large concession areas have been competitively tendered, and four of them have started serving customers. The implementation of these concessions has been significantly delayed and the uptake in the concession areas has been lower than expected. The large zonal PPER concessions have extended connections to 3,726 subscribers in four rural concessions in operation.

**History:** Senegal established an Agency for Rural Electrification (Agence Sénégalaise pour l'Électrification Rurale - ASER) in 1999. The state-owned vertically-integrated power company, SENELEC, was privatized using a concession contract in 2000, but reverted to state control 18 months later. In 2002, the Government tried unsuccessfully to lease the company to a private operator. In 2004, the Government developed a strategy to carve the country into 10 large rural concession areas and competitively select private companies to build and operate power infrastructure for 25-year terms. Concurrently, small village-level operations would be tendered under a separate program. The first six large concession contracts were signed between 2008 and 2011. These concession contracts become operational between 2011 and 2015. Four of the six concessions are supplying electricity to customers as of October 2015.

**Large Area Concessions:** ASER implemented a “top-down” approach for rural electrification. SENEGAL was divided into 10 concession territories that would see their electricity development and operation entrusted to the private sector. Each concession agreement was based on a priority investment program called PPER (Programmes Prioritaires d'Électrification Rurale). These concessions currently have around 3,726 customers.

**Bottom-Up Concessions:** ASER also implemented a bottom-up approach, ERIL (Projets d'Électrification Rurale d'Initiative Locale). In those areas that did not yet have a top-down concession, ASER was supposed to encourage village-level concessions by communities, consumer groups or private operators.

**Concurrent Efforts:** Since 2004, the Government has been financing its own emergency rural electrification programs, deploying diesel-fired generators in the concessionaires' service areas. The majority of these generators are now out of order due to disrepair or to users' inability to pay for the fuel and operation of the equipment. Meanwhile, the state-owned national utility SENELEC has been making significant investments in distribution infrastructure, adding hundreds of thousands of customers since 2004, many of them rural. SENELEC has generally undercut the efforts of private concessionaires in the country.

**Key Lessons:** The PPER projects illustrate lessons for governments considering using a concession approach to rural electrification:

- **The state-owned national utility can be an obstacle to achieving the Government's private-sector rural electricity objectives.** SENELEC has made things difficult for private-sector rural electrification efforts. For example, by failing to agree on power purchase agreements with GTDs and not cooperating

until recently in contemplating a harmonization of tariffs. It took 4 years to agree on a convention between SENELEC and the PPER concessionaires.

- **Setting up robust organizational, legal and regulatory processes takes time.** A significant part of the delays in implementing the PPER concessions were due to capacity development at key agencies or to long stakeholder consultations.
- **Separating the regulator and rural electrification agency can complicate rural electrification efforts.** The regulator's goals may differ from the REA's goals.
- **Political support for private concessions fluctuates.** In Senegal, this wavering political support has been a hindrance to the development of the concessions.

# 1 Introduction

The purpose of this report is to review Senegal's experience with rural electrification concessions. This case study is one of six detailed case studies that form a body of evidence on the experience and successes of rural electrification concessions across sub-Saharan Africa.

Background on the Senegal power system is presented in Section 0. The large zonal concessions implemented under the priority investment program, PPER (Programmes Prioritaires d'Electrification Rurale), are reviewed in detail in Section 3. The small concessions under the ERIL program (Projets d'Electrification Rurale d'Initiative Locale) are briefly reviewed in Section 4. The report concludes with an assessment of the success of these concessions, in Section 5.

## 2 Senegal Background

Summary statistics on Senegal are presented in Table 2.1.

**Table 2.1: Senegal Summary Statistics**

Indicator	Value
<b>Demographics</b>	
Population, total (2014)	14,548,171
Population growth, 10-year average (2004-2014)	2.82%
Rural population (% of total population) (2014)	56.61%
Rural population growth, 10-year average (2004-2014)	2.41%
Population density (people per sq. km of land area) (2014)	75.56
<b>Economy</b>	
GDP per capita (2014, current US\$, market exchange rate)	1,071
Real GDP per capita growth, 10-year average (2004-2014)	0.95%
Debt to GDP (2014)	47.50%
<b>Electricity Sector</b>	
Access to electricity, rural (2012, % of rural population)	26.60%
Access to electricity, national (2012, % of total population)	56.50%
Electric power consumption (kWh per capita) (2012)	210
<b>Governance</b>	
Ease of Doing Business index (2015 ranking out of 189 countries)	161
CPIA property rights and rule-based governance rating (2014); 1=low to 6=high	3.5
Government bond ratings (S&P Long-Term)	B+ (2000)
Corruption Perceptions Index (2014) - scale of 0 (highly corrupt) to 100 (very clean)	43
Legal system	Civil law
Administrative tradition	French
Fragile or conflict-affected state (any year, 1990-2015)	No

### **Economy and demographics**

Senegal is a country of 14.6 million people and GDP per capita at US\$1,071. Between 2004 and 2014 the population grew at 2.82 percent per year, while GDP per capita (in real PPP terms) grew at 0.95 percent per year. The majority of people in Senegal (56.5 percent) live in the countryside.

## Politics and governance

Senegal was a colony of France until 1960, when it gained independence as part of the short-lived Mali Federation and then as a wholly sovereign state.<sup>1</sup> The country was ruled by Leopold Sedar Senghor and his Senegalese Progressive Union party (later known as the Socialist Party) until 1980. Two opposition parties were allowed starting in 1976. Senegal formed the confederation of Senegambia by joining The Gambia in 1982, but integration of the two countries was never implemented and was cancelled in 1989.

Transparency International's corruption perceptions index ranks Senegal tenth best in sub-Saharan Africa and at 69 out of 175 countries globally.<sup>2</sup> The legal system is based on French civil law, and the highest court is the Supreme Court (Cour suprême du Sénégal).<sup>3</sup>

The legislative branch is made up of a National Assembly. A second legislative body, the Senate, was twice created and abolished: in 1999-2001 and then again in 2007-2012.<sup>4</sup>

Infrastructure and energy sector reforms in Senegal have been encouraged by the IMF and World Bank.<sup>5</sup>

The security and humanitarian situation in Senegal has been relatively stable. Senegal has not been considered a fragile or conflict-affected state by the World Bank.

### 2.1 Power Market Structure and Evolution

The current structure and legal framework of the electricity in Senegal result from an institutional reform undertaken in accordance with the Electricity Law no. 98-29 dated 14 April 1998. According to the Electricity Law, concessions and licenses may be granted as follows:

- Distribution Concession: 25 years
- Production License: 15 years
- Sales License: 15 years.

The structure of the power market in Senegal is presented in Figure 2.1.

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<sup>1</sup> Encyclopedia Britannica, "Senegal", 30 July 2014, <http://www.britannica.com/place/Senegal> (accessed 17 September 2015)

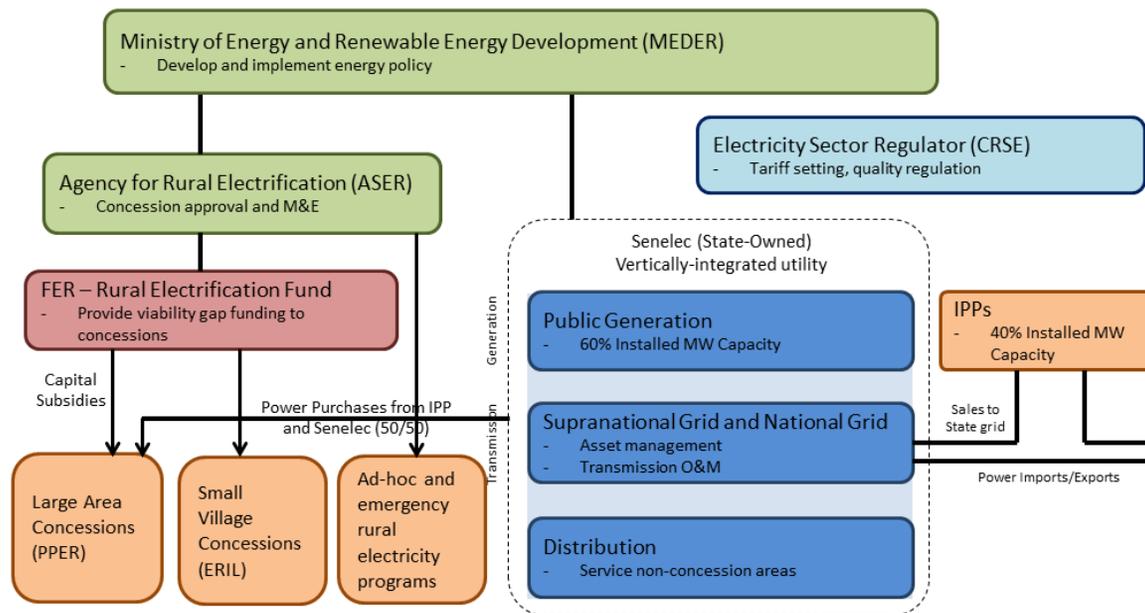
<sup>2</sup> In the Transparency International corruption perceptions index, a higher score and ranking implies a lower perceived level of public sector corruption

<sup>3</sup> Supreme Court of Senegal, "Presentation", 2011, <http://www.coursupreme.sn/menuprescs.html> (accessed 17 September 2015)

<sup>4</sup> Encyclopedia Britannica, "Senegal", 30 July 2014, <http://www.britannica.com/place/Senegal> (accessed 17 September 2015).

<sup>5</sup> Encyclopedia Britannica, "Senegal", 30 July 2014, <http://www.britannica.com/place/Senegal> (accessed 17 September 2015).

**Figure 2.1: Senegal Power Market Structure**



## SENELEC

SENELEC is the national government-owned electric utility that handles the generation, transmission and distribution for the majority of Senegal’s electricity sector. Between 1999 and 2001, SENELEC was partially privatized and a concession agreement was signed with the Government of Senegal for the lease and operation of the assets. The motivation for the concession was the poor performance of SENELEC, and SENELEC’s fiscal burden on the state. Privatization of the electricity sector and other state-owned enterprises became conditions for lending by the World Bank and IMF.<sup>6</sup>

Hydro-Québec (Canada) and Elyo (France) formed a consortium which acquired a 34 percent stake in SENELEC. A 10 percent stake was set aside for purchase by employees, and the remaining 15 percent was traded on the regional stock exchange, the Bourse Régionale des Valeurs Mobilières (BRVM).<sup>7</sup> The government’s stake was reduced to 41 percent of the shares.

SENELEC’s customers and grid were almost entirely located in urban areas. However, the concession agreement included an obligation to extend the grid to specified rural areas and target numbers of new connections and electrification rates in those areas.<sup>8</sup> SENELEC had a

<sup>6</sup> Nilgün Gökçür and Leroy Jones (October 2006) Privatization of Senegal Electricity, pg. 4

<sup>7</sup> International Business Publications (23 May 2012) Senegal Business Law Handbook: Strategic Information and Laws (Volume I), pg. 70

<sup>8</sup> République du Sénégal (31 March 1999) Cahier des Charges de Contrat de Concession et de Licence. (“Book of tariffs for the concession contract and license”)

plan, Program 3000, to electrify 150 villages and to increase power availability by 95 percent in rural areas by 2004.<sup>9</sup>

SENELEC's partial privatization lasted only eighteen months. The concession contract was hindered by disagreements between the Government and the consortium over questions of investment and pricing.<sup>10</sup> In September 2000, the new government announced that it would re-purchase HQI/Elyo's shares. The cancellation was abrupt, and one cited reason for the cancellation is that the newly elected Government (of Abdoulaye Wade) was dissatisfied with the progress made in reducing power cuts.<sup>11</sup> In 2001, the Government of Senegal tried to re-privatize SENELEC using a lease model. An initial group of five potential bidders formed into two consortia. Discussions with both consortia were unsuccessful, and that privatization process was cancelled in July 2002.<sup>12</sup>

The steady growth in connections continued throughout this period. The percentage of rural households with electricity connections grew during the 18-month long concession. However, it is difficult to attribute this to the concession as the electrification rate during the 1996 to 2004 grew at a steady pace during this time and the majority of the investment took place while the Government ran SENELEC.

SENELEC operates most of the generation premises. However three independent power producers (IPPs) supply SENELEC with electricity: GTI-Dakar, Eskom-Energie-Manantali (EEM - a subsidiary of Eskom South Africa) and Kounoune Power SA.

A map showing the existing electricity production and transportation network is presented in Figure 2.2: The red squares show the location of grid-connected generators, the green squares show the location of regional-grid generation plants, and red and green lines show the high-voltage and medium-voltage transmission lines respectively.

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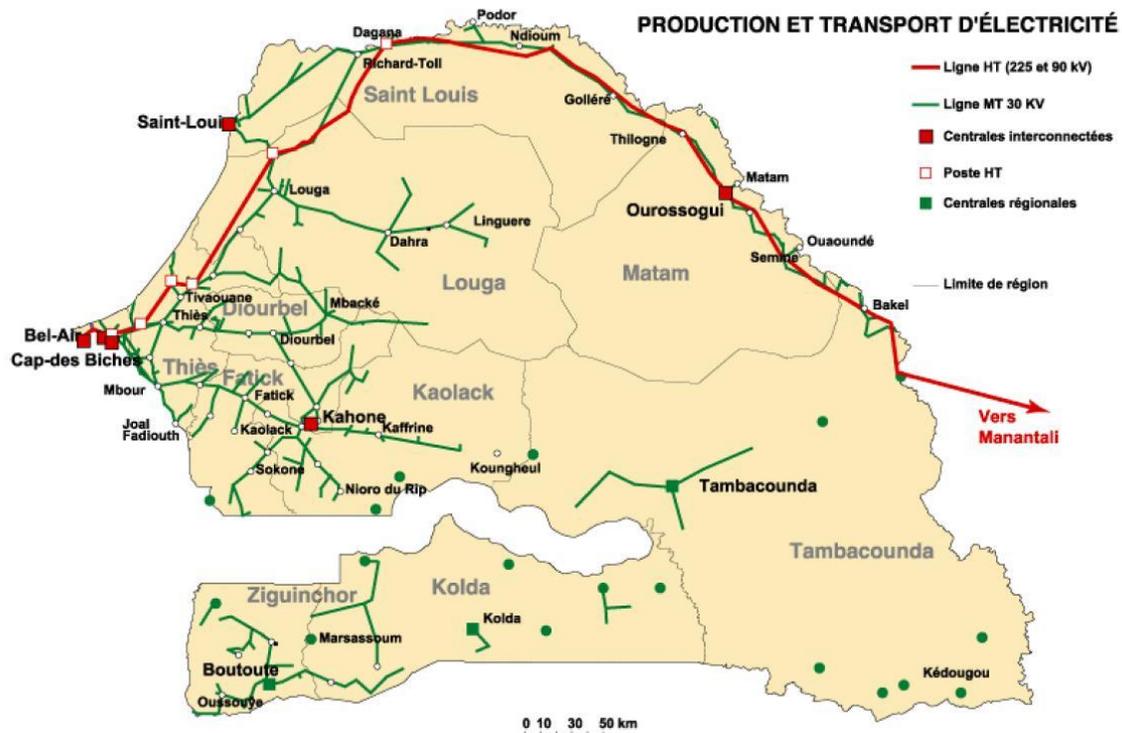
<sup>9</sup> International Business Publications (23 May 2012) Senegal Business Law Handbook: Strategic Information and Laws (Volume I), pg. 71

<sup>10</sup> Nilgün Gökğür and Leroy Jones (October 2006) Privatization of Senegal Electricity

<sup>11</sup> Oxford Business Group (2008) Senegal Country Report

<sup>12</sup> Nilgün Gökğür and Leroy Jones (October 2006) Privatization of Senegal Electricity

Figure 2.2: Map of Electricity Generation and Transmission in Senegal (2009)



Source: Commission de Régulation du Secteur d'Electricité (CRSE)

### Other Electricity Sector Actors

The Ministry of Energy and Renewable Energy Development (MEDER - Ministère de l'Énergie et du Développement des Énergies Renouvelables) has overall responsibility for developing and implementing the government's energy policies. Within MEDER, the Electricity Division (DEL-Direction de l'Électricité) is responsible for electricity.

Responsibility for rural electrification in the country lies with Agence Sénégalaise d'Électrification Rurale (ASER).<sup>13</sup> ASER has a rural electrification fund, the Fonds d'Électrification Rurale (FER).<sup>14</sup>

Electricity sector regulation is done by Commission de Régulation du Secteur de l'Électricité (CRSE-Electricity Sector Regulator).<sup>15</sup>

MEDER recently established an interministerial committee for rural electrification (CISPER-Comité Interministériel de Suivi du Programme d'Électrification Rurale). CISPER aims to remedy some of the rural electricity sector problems that the sector regulator, CRSE, has

<sup>13</sup> Law no. 98-29 dated 14 April 1998 on Electricity and Decree no. 99-1254 dated 30 December 1999 organizing the Agency for Rural Electrification

<sup>14</sup> Decree no 2006-247 dated 21 March 2006 creating the rural investment funds

<sup>15</sup> Law no. 98-29 dated 14 April 1998 on Electricity and Decree no. 98-333 dated 21 April 1998 creating Electricity Sector Regulator

been unable to remedy. CISPER is coordinated by the Direction de l'Electricité (DEL) and brings together the:

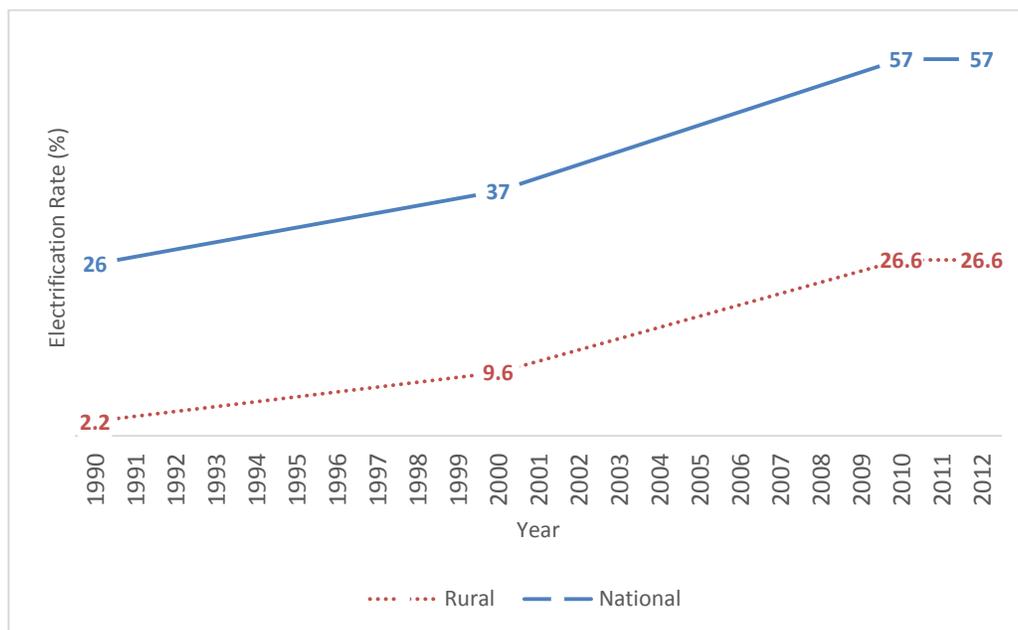
- Finance Minister (including the tax and customs departments)
- Environment Minister (including the water and forests departments)
- Minister of the Maritime Economy (including the Port of Dakar)
- Ministry of Energy (including notably ASER and SENELEC).

In addition to the World Bank, some of the donors active in Senegal's rural electrification concessions include: Agence Française de Développement (AFD-French Development Agency); Africa Development Bank (AfDB); German International Development Agency (GIZ); German Development Bank (KfW-Kreditanstalt für Wiederaufbau); and the European Union.

### Electrification Rate

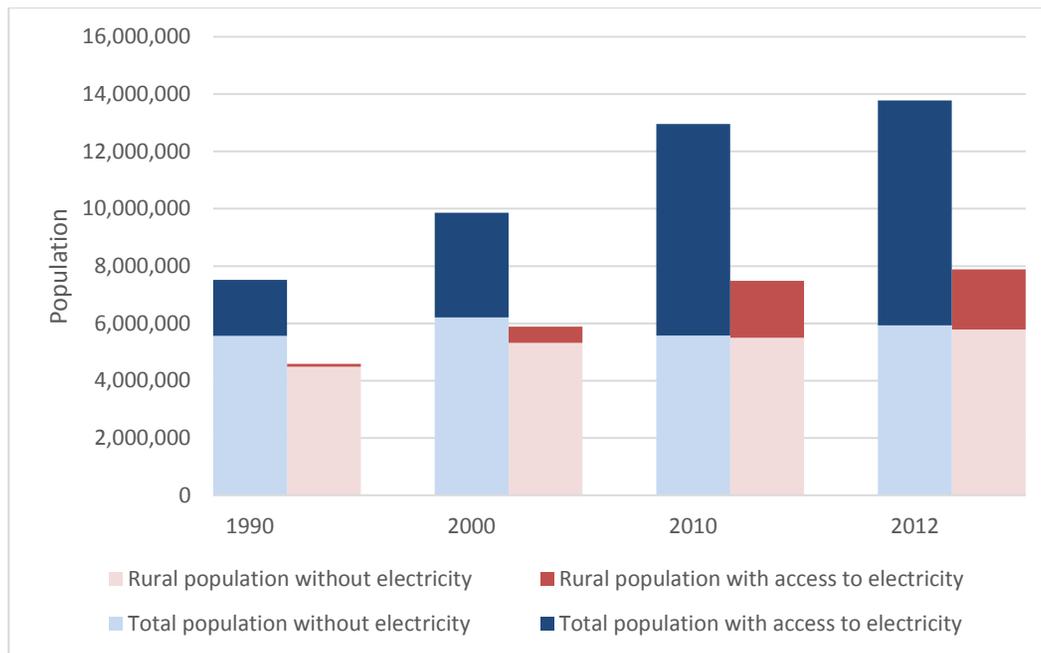
In 2012, the electrification rate in the country was 57 percent and the rural electrification rate was 26.6 percent. The change in the electrification rate between 1990 and 2012 is presented in Figure 2.3.

**Figure 2.3: National and Rural Electrification Rate in Senegal (1990-2012)**



Source: World Bank Open Data

**Figure 2.4: Population with Access to Electricity, Senegal (1990-2012)**



Source: World Bank Open Data

## 2.2 Rural Electrification Approach

The Electricity law of 1998 has provided for the creation of a Senegalese Agency for Rural Electrification (*Agence Sénégalaise pour l'Électrification Rurale-ASER*), as an independent agency responsible for:

- Granting technical and financial assistance to support initiatives for rural electrification to the electricity sector companies
- For that purpose developing electrification programs decided on the basis of the rural electrification planning defined by the Minister of Energy
- Organizing annual tenders for the granting of new rural electricity distribution concessions in rural areas
- Inviting and encouraging the submission of electrification projects by private operators.

ASER was established in December 1999 and started implementing programs to deploy small diesel generators or solar home systems.

Since 2003, concessions have been expected to become an important approach in Senegal for electrifying rural areas, but the primary means of electrifying rural areas has been through grid extension by the state-owned utility SENELEC. These grid extension projects are largely financed by the government.<sup>16</sup>

<sup>16</sup> CRSE, "Bilan des Activités SENELEC 2011-2013."

In 2003, Senegal developed a Rural Electrification Program with the assistance of the World Bank to electrify rural areas using a concession approach. In that year, the rural electrification rate was between eight percent and 12 percent.<sup>17</sup>

The development policy of rural electrification was set out in a document (*Lettre de Politique de développement de l'électrification rurale*) from the Ministry of Energy and Mines and the Ministry of Economy and Finances dated 23 July 2004. This policy set forth the guidelines for expanding access to electricity in the country. The Letter provides for a dual approach to rural electrification:

1. A “top-down” approach for dividing the country into 18 concession territories that would see their development and operation entrusted to the private sector.<sup>18</sup> Each concession agreement was based on a priority investment program called **PPER (Programmes Prioritaires d'Electrification Rurale)** that would be updated regularly. The number of concession territories was eventually reduced to 10
2. A bottom-up approach, **ERIL (Projets d'Electrification Rurale d'Initiative Locale)**. In those areas that did not yet have a top-down concession, ASER was supposed to encourage spontaneous village-level concessions by communities, consumer groups or private operators.

Once a PPER concession is awarded, it is possible for a private developer to obtain an ERIL concession in the same geographic area, provided it meets certain conditions. If a PPER concession is awarded, ASER can also bring in Transitional Delegated Managers (Gestionnaires Délégués Transitoires–GTD) to operate rural electrification projects.

### **Other ASER efforts**

While the PPER and ERIL concessions were being implemented and procured, ASER implemented other large-scale rural electrification programs that bypassed the concessionaires. Implementation of such programs was continued in parallel with the concessions. Diesel-fired generators and solar home systems were deployed using “emergency rural electrification programs”. Most of these generators, which were put at the disposal of villages and were not operated by professionals, are now out of order.

The coordination of these ASER programs appears to have been not thoroughly considered. Specifically, the purchasing new equipment and the existing concessions, their perimeter, and the modalities for transferring new equipment to the concessionaires were poorly planned. A new emergency program is currently under discussions between the Government and Lenders.

### **SENELEC**

In addition, SENELEC is authorized to establish a subsidiary whose purpose is to carry on activities in the rural electrification sector including bidding in view of obtaining a PER Concession. This company, called *Société Sénégalaise d'Electrification Rurale* (SSER) (Senegalese company for rural electrification).SA has been incorporated in October 2004.

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<sup>17</sup> Agence Sénégalaise d'Electrification Rurale – ASER (2004) Description ASER concession program; and Nilgün Gökğür and Leroy Jones (October 2006) Privatization of Senegal Electricity

<sup>18</sup> Agence Sénégalaise d'Electrification Rurale – ASER (2004) Description ASER concession program; and Nilgün Gökğür and Leroy Jones (October 2006) Privatization of Senegal Electricity

SENELEC has been relatively rapidly extending the grid, sometimes in rural areas. SENELEC added over 90,000 customers between 2011 and 2013.<sup>19</sup> However, the extent to which SENELEC's customers are officially considered rural customers is unknown.

### **Transitional Delegated Managers (Gestion Transitoire Delegee – GDT)**

Because the PPER concessions took several years to be implemented and ERIL was virtually unused, an alternative program was developed. ASER implemented a Transitional Delegated Managers' program (Gestion Transitoire Delegee – GDT). A public tender was launched and several private operators were recruited to manage power assets in certain pre-determined lots, including generators and grid extension. These contracts were 25-year affermage contracts that didn't require the private operators to investment in grid extension.

A first competitive procurement took place for the Fatick zone. The date of this procurement is unknown. A second competitive procurement took place in January 2005 for six lots. The bidders included: SS2E, SENELEC, CSI (MATFORCE) and GSERM/SODIDA. SSER won three of the lots, SS2E won one of the lots, and GSERM won a single lot. The winning bidders were selected on the basis of multiple bid parameters, including their technical capability, experience, and financial offer. SSER was disqualified from some of the lots because it was a subsidiary of SENELEC.

The delegated manager is compensated with 40 percent of the energy billed (pre-tax) plus 40 percent of what subscribers pay for new connections (to compensate for marketing costs).<sup>20</sup> Concessions were granted for 25 years and included a commitment of the concessionaire to transfer it to the PPER concessionaire being granted a concession including this region upon his request.

SENELEC did not sign power purchase agreement with two of the GTDs (SS2E and EQUIP PLUS) and this issue was only solved in January 2015. As result these operators could not serve clients from grid extensions.

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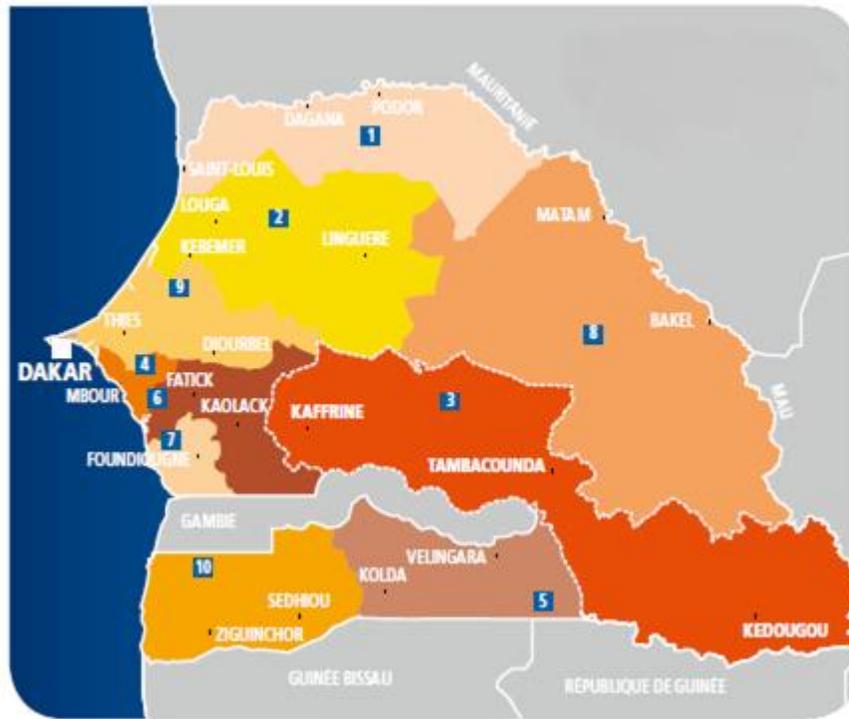
<sup>19</sup> CRSE, "Bilan des Activites SENELEC 2011-2013."

<sup>20</sup> Bruno Legendre, "Organizational, technical and financial audit of ASER's programs, evaluation of intervention strategies and recommendations for optimization," 4 August 2015, pg. 45

### 3 The “Top-Down” PPER Concessions

The PPER concessions are the “top-down” rural electrification concessions for ten regions of the country. The original planned 18 concession territories. The number of concession territories was eventually reduced to ten, as shown in Figure 2.2

**Figure 1.4: Map of SENEGAL PPER Concession Areas**



Source: ERA

The main characteristics of the six concessions already granted for 25 years periods in accordance with the Electricity Law are shown in Table 3.1. Studies and preparations are currently ongoing for four additional PPER concessions:

- Concession 7 - Matam- Kanel-Ranérou-Bakel;
- Concession 8 - Rufisque- Thiés- Tivaouane-Bambey- Diourbel- Mbacké;
- Concession 9 - Foundiougne; and
- Concession 10 - Ziguinchor-Oussouye-Bignona-Sédhiou.

Studies for the local planning for electrification have been achieved and a search for investment financing has begun for Concessions 9 and 10.

**Table 3.1: Rural Electrification Concessions under the PPER Program (2015)**

Concession Name	Operator/ Strategic Partner	Objectives (connections)	Date of signature	Entry into force
Concession 1 Dagana-Podor- Saint Louis <sup>21</sup>	Compagnie Marocco- Sénégalaise d'Electricité (COMASEL) ONEE <sup>22</sup>	19,574	30 May 2008	29 March 2011
Concession 2 Louga-Linguère- Kébémér <sup>23</sup>	Compagnie Marocco- Sénégalaise d'Electricité (COMASEL) ONEE	11,826	20 November 2009	20 November 2011
Concession 3 Kaffrine-Tamba- Kedougou	Energie Rural Africaine (ERA) EDF <sup>24</sup>	18,001	29 June 2011	24 December 2013
Concession 4 Mbour <sup>25</sup>	SCL (Energie solutions, STEG International Services, les Câbleries du Sénégal, COSELEC) STEG <sup>26</sup>	7,500	9 November 2012	Entry into force shall be within three years from the signature.
Concession 5 Kolda- Velingara	Groupement ENCO Sénégal /ISOFOTON	20,500	29 July 2013	24 April 2015
Concession 6 Kaolack- Nioro- Fatick- Gossas	Groupement ENCO Sénégal/ISOFOTON	27,000	22 November 2012	12 November 2014

Note: "Objectives" refers to the number of households the private parties proposed to electrify in the first three years. This was the basis on which the concessions were awarded.

Source: ASER

Provided they met the technical and financial conditions in the bid, the winning bid was awarded on the basis of a single parameter: the number of promised connections. The 6

<sup>21</sup> Règlement de service de la concession d'électrification rurale Dagana – Podor – Saint-Louis, Commission de régulation du secteur de l'électricité : <http://www.crse.sn/upl/RegComasel-2013-01.pdf>

<sup>22</sup> Office National de l'Electricité et de l'Eau potable (Morocco)

<sup>23</sup> Règlement de service de la concession d'électrification rurale Louga – Linguere – Kebemer, Commission de régulation du secteur de l'électricité: <http://www.crse.sn/upl/RegComasel-2013-01b.pdf>

<sup>24</sup> Electricité de France

<sup>25</sup> Avis 2013- 01 relatif à l'attribution d'une concession de distribution d'énergie électrique et d'une licence de vente à la société SCL Energie Solutions, Commission de régulation du secteur de l'électricité, <http://www.crse.sn/upl/AvisAttribution201301.pdf>

<sup>26</sup> Société Tunisienne de l'Electricité et du Gaz (Tunisia)

bidders together have an objective of 106,601 rural connections. As of October 2015, 3,726 connections have been established for the four concessions.

The main objectives and achievement of each concession are presented in the following tables:

**Table 3.2: Implementation Status of Concession 1- Dagana- Podor- Saint Louis**

<b>Concession 1- Dagana- Podor- Saint Louis</b>				
	<b>Connections</b>	<b>MT and BT lines</b>	<b>Electricity Grid</b>	<b>Solar energy</b>
Objectives	19,574	Information not provided	156 villages	142 villages
10 September 2015	2480	232 km MT line and 375 km BT line 125 transformer substations	148 villages including 126 connected (94.87%) 997 subscriptions signed and 890 customers connected	87 villages (61.26%) 1,483 subscriptions signed and 1,477 customers connected

Source: ASER

**Table 3.3: Implementation Status of Concession 2 Louga-Linguère-Kébémér**

<b>Concession 2 Louga-Linguère-Kébémér</b>				
	<b>Connections</b>	<b>MT and BT lines</b>	<b>Electricity Grid</b>	<b>Solar energy</b>
Objectives	11,826	Information not provided	254 villages	118 villages
10 September 2015	165	129 km MT line and 197 km BT line 197 transformer substations	158 villages including 98 connected (62.60%) 285 subscriptions and 82 customers connected	7 villages 83 subscriptions signed

Source: ASER

**Table 3.4: Implementation Status of Concession 3 Kaffrine-Tamba-Kedougou**

Concession 3 Kaffrine-Tamba-Kedougou				
	Connections	MT and BT lines	Electricity Grid	Solar energy
Objectives	18,001	Information not provided	109 villages	71 villages
10 September 2015	1,368	21 km MT line and 20.88 km BT line 7 transformer substations	Potential 1,442 customers 319 subscriptions signed and 292 customers connected	90 villages 1,047 subscriptions signed and 902 customers connected

Source: ASER

**Table 3.5: Implementation Status of Concession 4 Mbour**

Concession 4 Mbour				
	Connections	MT and BT lines	Electricity Grid	Solar energy
Objectives	9,700	Information not provided	111 villages	N/A
10 September 2015	0	6.01 km MT line and 26.05 km BT line 1 transformer substation	6 villages	N/A

Source: ASER

**Table 3.6: Implementation Status of Concession 5 Kolda-Velingara**

Concession 5 Kolda-Velingara				
	Connections	MT and BT lines	Electricity Grid	Solar energy
Objectives	20,500	90 km by medium voltage electricity supply in 148 mm <sup>2</sup>	At least 7 villages	N/A
10 September 2015	Analysis and commercial prospections in progress			N/A

Source: ASER

**Table 3.7: Implementation Status of Concession 6 Kaolack- Nioro- Fatick- Gossas**

Concession 6 Kaolack- Nioro- Fatick- Gossas				
	Connections	MT and BT lines	Electricity Grid	Solar energy
Objectives	27,000	In progress	225 villages	250 villages
10 September 2015	0	NA	Upgrading of 9 villages starting.	NA

Source: ASER

### 3.1 Stages of Development

In 1998, Senegal passed a law creating a rural electrification agency, l'Agence Sénégalaise d'Électrification Rurale (ASER), with the objective of promoting rural electrification using a concession approach.<sup>27</sup> In 2003, Senegal developed a Rural Electrification Program with the assistance of the World Bank to electrify rural areas using a concession approach.

The first concession area, Dagana-Podor-Saint-Louis, was bid out in 2008. The second and third concessions were in 2009 and 2010. The size of the concession areas was set at around 10,000 to 30,000 customers as this was believed to be the minimum size necessary to attract significant commercial interest from international or large companies.<sup>28</sup>

Implementation of the PPER concessions has been slow to several factors, including<sup>29</sup>:

- A high amount of procedural, institutional and regulatory capacity building
- A high number of stakeholders
- Overly elaborate stakeholder consultations
- Wavering political commitment from the Government, especially the Ministry of Energy
- Tensions between SENELEC and ASER
- Disagreements between ASER and the regulator CRSE
- A focus at ASER on short-term government-funded emergency rural electrification programs, rather than on development of the concessions
- A lack of management capacity at ASER
- Generally slow decision-making.

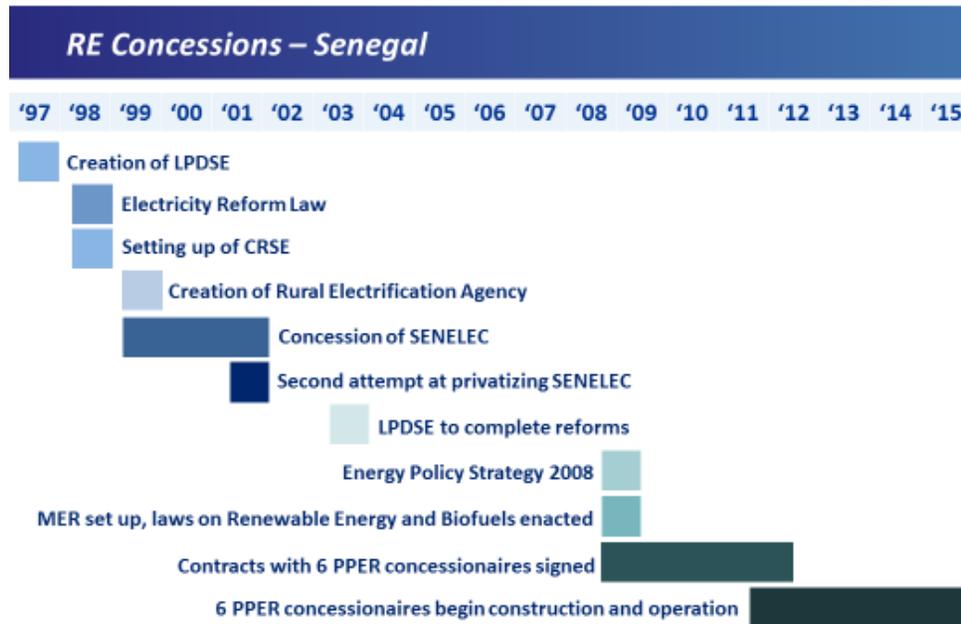
<sup>27</sup> Loi n 98-29 no 98-29 dated 14 April 1998

<sup>28</sup> Interview, World Bank (July 2015)

<sup>29</sup> Many of these factors are drawn from: Rebecca Mawhood and Robert Gross, "Institutional barriers to a 'perfect' policy: A case study of the Senegalese Rural Electrification Plan," Energy Policy (2014, volume 73). Others are drawn from the results of a World Bank Implementation and Completion Results report mission in 2012.

A timeline showing the major stages of development leading up to the concession is presented in Table 3.8.

**Table 3.8: Stages of Development of Concession**



### 3.2 Operations and Management

The concessionaires have adequate skills, resources and management.

The extent to which international partners are involved in operations and management is substantial. All the PPER concessionaires are backed by international companies.

#### Pre-paid meters

COMASEL and SCL Energie Solutions use pre-paid meters for their grid-connected clients.<sup>30</sup> PERACOD and ERA do not use pre-paid meters for their grid connected clients. No private operator uses pre-paid meters for use in solar home systems.<sup>31</sup>

### 3.3 Financing Arrangements

The PPER concessionaires receive a subsidy from ASER for a portion of their initial investment cost. They do not receive a subsidy on their ongoing operations and maintenance costs.

The subsidy amount at the outset is determined during the negotiations following from a competitive public tender process. The share of private financing ranges from 22.49 percent to 67.80 percent of the total financing. In practice, ASER has pledged subsidies of between

<sup>30</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 6

<sup>31</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 6

CFA3.211 billion and CFA7.134 billion to each concession (US\$5,562,608 to US\$12,358,656).<sup>32</sup>

The financing arrangement for the first six concessions is presented in Table 3.9.

**Table 3.9: Financing Arrangements of PPER Concessions 1-6**

<b>Financing Arrangements (Billions CFA)</b>			
<b>Concession 1 Dagana- Podor- Saint Louis Program overall cost 10,800,000,000</b>		<b>Terms of Call for Tender (Offered Subsidy)</b>	<b>Offer</b>
	Subsidy	3.211	3.477
	Equity	0	2.92
	Debts	0	4.4
	Total	3.21	10.80
	Share of private financing	0.00%	67.80%
<b>Concession 2- Louga_Lingu ère-Kébémér Program overall cost 9,200,000,000</b>		<b>Terms of Call for Tender (Offered Subsidy)</b>	<b>Offer</b>
	Subsidy	7.134	7.134
	Equity	0	2.07
	Debts	0	0
	Total	7.13	9.20
	Share of private financing	0.00%	22.49%
<b>Concession 3- Kaffrine- Tamba- Kedougou Program overall cost 7,920,000,000</b>		<b>Terms of Call for Tender (Offered Subsidy)</b>	<b>Offer</b>
	Subsidy	5.05	5.05
	Equity	0	1.263
	Debts	0	1.604
	Total	5.05	7.92
	Share of private financing	0.00%	36.21%
<b>Concession 4 Mbour 7,450,000,000</b>		<b>Terms of Call for Tender (Offered Subsidy)</b>	<b>Offer</b>
	Subsidy	2.722	2.722
	Equity	0	0.945
	Debts	0	3.778
	Total	2.72	7.45
	Share of private	0.00%	63.44%

<sup>32</sup> Using an October 2015 exchange rate of 1 West African CFA Franc to US\$0.0017

	financing		
<b>Concession 5- Kolda - Velingara Program overall cost 8,000,000,000</b>		<b>Terms of Call for Tender (Offered Subsidy)</b>	<b>Offer</b>
	Subsidy	5.49	5.49
	Equity	0	2.468
	Debts	0	0
	Total	5.49	8.0
	Share of private financing	0.00%	31.01%
<b>Concession 6- Kaolack- Nioro – Fatick - Gossas Program overall cost 11,420,000,000</b>		<b>Terms of Call for Tender (Offered Subsidy)</b>	<b>Offer</b>
	Subsidy	3.42	3.42
	Equity	0	1.7
	Debts	0	6.3
	Total	3.42	11.42
	Share of private financing	0.00%	70.05%

Source: ASER

### 3.4 Contractual Arrangements

The private operators enter into contracts with ASER as well as with the Ministry of Energy, MEDER.

The type of contract is a 25-year concession contract.

The concessionaire undertakes in particular to:

- Design and built the installations, maintain and renew the equipment;
- Provide inside electrical installation for the subscribers;
- Provide services during at least six hours per day (7 pm to 1 am);
- Recover the tariffs from users
- Pay the royalty regulation of public procurement at the rate of 0.1 percent of turnover (for other taxes, exemption shall apply in accordance with the Master Agreement No. 03035 of 24 July 2003 between the Government of the Republic of Senegal and ASER); and
- Comply with the applicable law and specifications for the concession contract and license (Cahier des Charges de Contrat de Concession et de Licence).

### 3.5 Technological Approach

Distribution in the concessions is done through a variety of technological approaches. ASER based its strategy on “technology neutrality,” leaving the private operators free to decide on the choice of technology, within the constraints of the technical standards defined by ASER.

The technologies used on the four PPER concessions are a mix of technological approaches.

**Table 3.10: Number of Customers Currently Served by Technology in Each Concession Area**

	Concession 1	Concession 2	Concession 3	Concession 4	Concession 5	Concession 6
Grid extension	890	82	292	In progress	In progress	In progress
Diesel mini-grid	0	0	0			
Renewable mini-grid	0	0	0			
Solar home system	1477	83	902			
Total	2367	165	1194			

Source: ASER data, Castalia analysis

Some of the donor financing was partly conditional on the use of certain technologies. This resulted in case-by-case negotiations that increased delays and construction costs.<sup>33</sup>

#### Grid Extension

The concessionaire SCL Energie Solutions is installing single phase grid extensions.<sup>34</sup>

The concessionaire ERA is extending the grid using cement poles. ERA is refusing to integrate other poles into their distribution network that haven’t been built according to their standards. The other poles exceed the minimum technical standards established by ASER but ERA claims that poles that meet these other poles would not be economically viable for the 25-year duration of the concession.<sup>35</sup>

ERA estimates that in its concession area, grid extension costs twice as much as solar home system installations. Because the electricity uptake rate is much lower than expected (20 percent in the targeted villages instead of the forecast 70 percent), the actual cost of a grid connection per user is eight times more than a solar home system.<sup>36</sup>

<sup>33</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 7

<sup>34</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 6

<sup>35</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 6

<sup>36</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 6

## **Mini-Grids**

Some diesel-gensets directly supplied outside PPER concessions implementation were deployed. The majority of diesel generators are out of order due to disrepair or because the costs of operating them are too high.<sup>37</sup>

## **Solar Home Systems**

Senegal has invested substantially in solar home systems with the support of a German solar energy program between 1989 and 2005. 65,000 solar home systems are expected to have been installed or be in the process of installation. As shown in table 2.2 to 2.7, solar home systems are expected to be deployed in 581 villages within the 6 PPER concessions. Two PPER concessionaires, COMASEL and ERA, which are operating the three most advanced concessions, are expected to deploy solar home systems in over 10,000 rural households. As of today the concessionaires have obtained around 4,000 solar home systems (1,500 by ERA and 2,500 by COMASEL).<sup>38</sup> Around 2,500 have been installed.

## **Technology Neutrality**

Some rural electrification actors have suggested that the “technology neutrality” policy should be reconsidered. Rather than leaving concessionaires free to choose technologies, a comprehensive least-cost electrification plan should form the basis of a national electrification strategy.<sup>39</sup> They suggest that the current concessionaires don’t sufficiently take into account the cost of service for users is higher than expected and that an eventual harmonization of tariffs between SENELEC and the concessionaires would be too costly for the state. ASER could play a more active role in directing investments to better meet demand.

## **3.6 Regulatory Arrangements**

The concessions are regulated by the electricity sector regulator, the Commission de Régulation du Secteur de l’Electricité (CRSE) pursuant to Article 28 of the Law no. 98-29.

The tariffs, service standards and also their duration are defined in the concession specifications (Cahier de charges de la concession). The tariffs databases are subject to a 5-year and/or extraordinary revision if a significant change in the financial conditions was observed, an unforeseeable event beyond the control of the concessionaire or over-costs which made the tariffs inappropriate.

When concessionaires purchase electricity from SENELEC, the applicable tariff is the general medium voltage (MV) tariff, minus 20 percent. This assumes a load factor of 25 percent, 30 percent of the energy consumed during peak periods and 70 percent consumed off-peak.

A royalty is provided in order to develop the electricity sector in accordance with the law no. 2006-18 dated 30 June 2006 creating the rural electrification royalty and the ministerial order no. 8442 MEM-MEF dated 18 December 2006. This royalty is collected by SENELEC to be

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<sup>37</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 5

<sup>38</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg.

<sup>39</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 7

repaid to FER. The royalty is set at FCFA 0.7 (pre-tax) on customers with a meter and 2.5 percent on the energy component for customers without a meter.

According to the tariff system agreed by the CRSE:

- For small residential subscribers, the tariff is fixed depending on a certain number of lighting and power outlets points. Three package levels are offered.
- For all subscribers (whether residential or not) who require more power, billing will be done according to measured consumption
- The refund of all the connection and installation costs is integrated in a lump sum.

However, in order to ensure applicant's willingness and ability to pay for connection, non-refundable connection royalty and an advance on consumption (refundable payment guarantee of contract) are required.

The tariffs and service standards by concession are indicated in Table 3.11.

**Table 3.11: Rural Tariffs at Different Service Levels**

Level of service	Service 1	Service 2	Service 3	Service 4 Grid	Service 4 Solar
<b>Power provided</b>	0.-50W 0-50 Wc	50-90 W 50-75 Wc	90-180 W 75-150 Wc	>180 W	150 Wc
<b>Investment share (FCFA)</b>					
<b>All concession</b>	12,000	22,500	39,000	66,000	66,000
<b>Monthly energy component</b>					
<b>Concession</b>	FCFA/month			FCFA/kWh	FCFA/Wc
<b>SLDP<sup>40</sup></b>	1,981	3,567	6,857	102	71
<b>LLK<sup>41</sup></b>	2,602	4,803	9,005	133	93
<b>MBOUR<sup>42</sup></b>	3,010	5,557	10,419	154	108
<b>KTK<sup>43</sup></b>	2,526	4,663	8,743	130	91
<b>Table royalties (Redevance tableau)</b>					
<b>SLDP</b>	302	302	302	587	302
<b>LLK</b>	302	302	302	587	302
<b>MBOUR</b>	231	231	231	448	231
<b>KTK</b>	231	231	231	448	231
<b>Reimbursement of inside installations FCFA</b>					
SLDP	1,266	1,634	2,783	3,401	3,401
LLK	638	763	1,275	1,391	1,391
MBOUR	532	637	1,065	1,162	1,162
KTK	532	637	1,065	1,162	1,162

Source: Bruno Legendre, ASER Technical Audit, 2015.

Rules on determining and changing the tariff are included in the concession agreement. Tariffs can be unilaterally changed in the case where the concessionaire chooses a new service offering. For instance, a special tariff could be made available if a customer uses only three lamps instead of 5 provided in the subscription agreement.

The S1-S3 tariffs are flat or fixed monthly tariffs. These are tariffs based on the customer's peak power (watts) used rather than energy (kWh) consumed. The existence of both fixed tariffs (S1-S3) and a kWh tariff (S4) in a village served by a PPER concessionaire can create problems if the kWh tariff is capped at SENELEC's kWh tariff. The reason is that the flat rate tariff may have an implicit kWh charge that is considerably higher than the S4 kWh tariff. Therefore the concessionaire's S1-S3 customers will want to move to the S4 tariff to

<sup>40</sup> Concession 1-Dagana- Podor- Saint Louis

<sup>41</sup> Concession 2- Louga-Linguère-Kébémér

<sup>42</sup> Concession 4- Mbour

<sup>43</sup> Concession 3- Kaffrine- Tamba- Kedougou

get a lower kWh charge. But if the concessionaire allows this migration, it will reduce its overall revenues.<sup>44</sup>

The CRSE has broad investigation powers on the sector. Its decisions and recommendations are published in the Official Bulletin of the Commission. The Commission decisions may be contested before the courts

SENELEC tariffs established in 2009, regarding low voltage used in rural areas are as follows.

**Table 3.12: SENELEC Tariffs for Professional Subscribers**

Professional subscribers			
Power subscribed >32 kw UP2		Power subscribed <32 kw UP1	
Fixed payment (Fcfa/kWh)	1.852,63	Tariff of first installment (Fcfa/kWh)	125.16
<b>Tariff of first installment (Fcfa/kWh)</b>	84.79	Tariff of second installment (Fcfa/kWh)	112.26
<b>Tariff of second installment (Fcfa/kWh)</b>	76.56	Tariff of third installment (Fcfa/kWh)	76.56

Note: The “installments” refer to tariff blocks.

Source: SENELEC

**Table 3.13: SENELEC Tariffs for Residential Customers**

Residential subscribers			
General regime UDG		Special Regime UDS	
<b>Tariff of first installment (Fcfa/kWh)</b>	120.28	Tariff of first installment (Fcfa/kWh)	95.48
<b>Tariff of second installment (Fcfa/kWh)</b>	87.07	Tariff of second installment (Fcfa/kWh)	106.55
<b>Tariff of third installment (Fcfa/kWh)</b>	62	Tariff of third installment (Fcfa/kWh)	62

Source: SENELEC

Discrepancies exist between the tariffs of the PPER concessions and the SENELEC tariff. The PPER tariffs are generally higher. This creates frustration for customers in PPER concessions who live in villages near other villages served by SENELEC and supplied under the lower prices of the SENELEC residential tariff.

In this respect a study on harmonization of tariff has been recently launched by the CRSE.

<sup>44</sup> See Tenenbaum et. al., *From The Bottom Up: How Small Power Producers and Mini-Grids Can Deliver Electrification and Renewable Energy in Africa*, World Bank, Directions in Development, 2014, p. 266-267.

## 4 The ERIL Concessions

The ERIL concessions were the bottom-up concessions. They have around 500 customers.

Small bottom-up concessions were intended to be procured using a competitive tender twice a year, in accordance with a detailed procedure set by the Ministry of Energy.<sup>45</sup> This procedure provides for detailed assessment criteria and includes various supporting tools, such as the allocation of subsidies, the selection of engineering consulting firms to advise private operators in preparing their projects, the collective purchase of equipment and the selection of installers by ASER. However, it appears that the competitive procedure was organized by ASER only twice.

The ERIL concessions are not well-documented. However, they appear to include:

- Three concessions following a call for proposals in 2006: won by COSEER, SUD SOLAR and ENERGIE-R. COSEER could not start its projects due to a number of requirements from ASER, in particular on its relocation. SUD SOLAR is established in Casamance and operates a minigrid with 21 hybrid power stations in the Sédhiou region. It serves 457 users (an average of 20 subscribers per plant, with a maximum of 50). Level 4 Subscribers (professional users mainly) represent on average 20 percent of its subscribers (but over 30 percent in one third of villages).
- ERSEN-1 (Rural Electrification Senegal (ERSEN) Project): funded by KFW, GIZ and the Dutch government.
- ERSEN-2: second phase of the ERSEN project. Details unknown.
- PASES (Projet d'accès aux services électriques des localités de petites tailles de la Région de Sédhiou): a project financed by the European Union. Details unknown.

According to ASER, another call for bids under ERIL is under preparation.

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<sup>45</sup> This is quite different from the approach used in Mali and Tanzania where bottom up proposals are spontaneous. In Mali and Tanzania, rural project proposals below a certain size can be initiated by private developers and are not subject to a competitive procurement process.

## 5 Assessment of Concession

We evaluate Senegal’s concession approach to rural electrification against its targets, analyze the reasons for the results, and present lessons for future concessions.

### 5.1 Evaluating Success of Concession

The Senegal concessions have succeeded at extending 3,726 connections to rural households. This achievement, however, is significantly short of the Government’s objectives.

#### 5.1.1 Access

The concessions have increased access to electricity in rural areas. Specifically, the PPER concessions have extended connections to 3,726 subscribers identified in four rural concessions in operation.

In comparison, in 2012 and 2013, SENELEC added over 95,000 connections (rural and urban combined), increasing their total connections from 901,515 to 998,423 connections.<sup>46</sup>

The concessions have failed to achieve the objectives set out in their contracts, the Government’s goals and the objectives of the World Bank’s interventions in Senegal.

#### Access objectives in concession contracts

The concessions aim to connect 106,601 rural households. Due to delays in starting the concessions, two of the six concessions have not yet connected any customers.

#### Access objectives of Government of Senegal

The concessions have failed to achieve the Government’s stated goals.

The Government has made repeated commitments to ambitious, highly-publicized rural electrification targets, which have been unrealistic.<sup>47</sup>

#### Access objectives of World Bank interventions

In 2004, the objective of the World Bank’s *Electricity Services for Rural Areas Project* in Senegal was an increase of 35,000 households benefiting directly from electricity by 31 December 2012. The actual number of new connections achieved through World Bank interventions by that date was **20,386**.<sup>48</sup> However, the majority of these connections were the result of emergency rural electrification programs outside of the World Bank. 1,634 of the connections were through small-scale ERIL concessions funded by KFW/GIZ and the Netherlands. Twenty-four of the connections were the result of solar home system tests in one of the PPER concessions financed by the French development agency AFD.

#### 5.1.2 Quality of service

The quality of service from the concessions depends on the electricity supply technology.

The minimum service levels are presented in Table 5.1.

**Table 5.1: Minimum Service Levels**

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<sup>46</sup> CRSE, “Bilan des Activites SENELEC 2011-2013.”

<sup>47</sup> Rebecca Mawhood and Robert Gross, “Institutional barriers to a ‘perfect’ policy: A case study of the Senegalese Rural Electrification Plan,” *Energy Policy* (2014, volume 73).

<sup>48</sup> World Bank ICR (2013) *Electricity Services for Rural Areas Project*

Type of Supply	Norms
Villages supplied by medium voltage network	Access of 24 hours per day
Villages supplied by mini-grids	Electricity access of a minimum of 6 hours per day (7pm to 1am)
Solar home system	Minimum service levels are the same as for mini-grids

Source: Bruno Legendre, ASER Technical Audit, 2015.

The concessionaires try to strictly respect these minimum service standards. However, this demand pattern favors demand for the “social users” who mostly use electricity for lighting, at the expense of professional users, who would prefer to have access during the day.

Basic electricity supply technical studies were conducted in three concessions: RTTBM, Foundiougne and ZOBS. The studies found that the concessions in Foundiougne and ZOBS experience voltage dips significantly greater than the authorized 7.5 percent.<sup>49</sup> The studies also found that the existing network in the RTTBM concession is likely to reach maximum capacity in the next five years.

The concessionaires have criticized the quality of the construction arranged by ASER in the context of emergency rural electrification programs. This construction respects the technical standards of ASER. However, the concessionaires assess the quality of the construction to be below their standards and below international standards. As a result, they have refused to take over certain newly electrified villages. Instead, operation has been delegated to GDT operators or to SENELEC.<sup>50</sup>

### Solar Home Systems

Opinions on the quality of solar home systems are mixed among both concessionaires and consumers. They remain the “least-good-option” for some people but a good transitional step in specific cases for others.

Some concessionaires have limited the hours of operation of solar home systems to put electricity availability on equal footing with the electricity coming from other sources (such as mini-grids). ERA has installed systems to limit the possible operating hours of solar home systems (SHS) in order to harmonize the SHS access conditions with their other non-SHS customers.<sup>51</sup> Therefore consumption is limited for these customers. Most solar home system customers consume less than their systems produce.<sup>52</sup> Removing these consumption limits would improve the attractiveness and service quality of solar home systems.

<sup>49</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 8

<sup>50</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 8.

<sup>51</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 18

<sup>52</sup> Bruno Legendre, “Organizational, technical and financial audit of ASER’s programs, evaluation of intervention strategies and recommendations for optimization,” 4 August 2015, pg. 18

In the Foundiougne concession, 10,000 households have been equipped with 50W solar home systems between 2005 and 2014. Studies performed before and after the deployment of the solar home concessions show that most rural households **cannot** meet their household energy needs using solar home systems.<sup>53</sup> For example, many households with solar home systems still use rechargeable lamps or flashlights to light their homes. Homes that have solar home systems limited to evening hours cannot charge their phones during the day, use fans, or listen to the radio.

The accessibility of solar home systems is generally considered good in areas where SHS hours of operation are not limited. But the available peak power produced is usually deemed to be very insufficient.

### 5.1.3 Sustainability

At this early stage, it is difficult to tell how financially sustainable the arrangement is for concessionaires. Though we were not able to review the financials of any concessionaire, it is our understanding that the concessionaires have made capital investments, and that they are not yet recovering their investments.

### 5.1.4 Efficiency

ASER believed that its technology-neutral approach would encourage least-cost expansion by technico-economic optimization.<sup>54</sup>

It appears that some technologies are not adapted to specific needs of users. For example: solutions for the supply of solar energy to run mills, power supply pumping systems with photovoltaic or hybrid generators of greater power. A study of technical solutions that would accord to different regional contexts might be conducted and be used to guide candidates to future concessions in their choice of technologies.

## 5.2 Arrangements that Could Have Delivered Better Results

Ex-post, we can say that alternative arrangements would have delivered better results. We would improve this arrangement by doing the following:

- **Allowing local companies to compete.** The criteria in the original PPER concession tenders effectively precluded any Senegalese company from qualifying.
- **Giving ASER some institutional autonomy.** ASER's Managing Director is appointed by the Ministry of Energy, who are also invested in state-owned SENELEC. When the priorities of SENELEC and ASER have diverged, the Ministry of Energy either delayed or acted in SENELEC's interests.

## 5.3 Reasons for Results

From the World Bank's perspective, there were a number of problems in the implementation of the project:

- **The regulator was uncooperative.** The electricity sector regulator, the Commission de Régulation du Secteur de l'Electricité (CRSE), sought to regulate

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<sup>53</sup> Bruno Legendre, "Organizational, technical and financial audit of ASER's programs, evaluation of intervention strategies and recommendations for optimization," 4 August 2015, pg. 9

<sup>54</sup> Ousmane Fall, ASER, "Rural Electrification and Programmatic CDM – the Senegalese Rural Electrification Agency's Experience," 11 June 2009, Presentation in Maputo

concessionaires with the same kind of rules as they regulated the national utility SENELEC. They were not flexible around designing the tariff. Following the award of the bids, concessionaires were asked to agree to changes in the concession model. It therefore took quite a long time for investors to start the projects.<sup>55</sup> Senegal needed a pragmatic regulator.<sup>56</sup>

- **There was competition and lack of cooperation from SENELEC.** The concessionaires were expected to buy some of their power from SENELEC, who were under the impression that this new model of rural electrification was against them.<sup>57</sup> According to the ICR: *“SENELEC did not react well to the end of its monopoly in rural areas, making it reluctant to engage in the rural electrification project. Not accounting for SENELEC’s engagement risk contributed to implementation delays”*.<sup>58</sup>
- **ASER (Senegal REA) quite quickly became a political entity.** The institution tried to influence rural actors by promising to electrify certain areas in exchange for votes.<sup>59</sup> The World Bank reported having difficulty focusing their attention on the broader missions of the project. ASER was created in 2000, with 10 people, and has grown to have around 85 civil servants.<sup>60</sup>
- Other internal and external factors that also contributed to the results include: the 2 year delay to agree on the legal framework; the focus on “emergency” programs between 2007 and 2010, at the expense of the rural concessions; the lack of bidding documents for this specific type of rural concession; and the high number of stakeholders.<sup>61</sup>

#### 5.4 Replicability of Experience and Success

The concession model used in this country can be replicated elsewhere. Senegal has invested a significant amount of time and political capital in the rural electrification concessions. However, the concessions have not met the expectations set for them so far.

#### 5.5 Lessons for Future Concessions

The concession illustrates lessons for governments considering using a concession approach to rural electrification:

- **The state-owned national utility can be an obstacle to achieving the Government’s private-sector rural electricity objectives.** SENELEC has made things difficult for private-sector rural electrification efforts. For example, by failing to agree on power purchase agreements with GTDs and not cooperating

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<sup>55</sup> Interview, World Bank (July 2015)

<sup>56</sup> Interview, World Bank (July 2015)

<sup>57</sup> Interview, World Bank (July 2015)

<sup>58</sup> World Bank ICR (2013) Electricity Services for Rural Areas Project, pg. 8

<sup>59</sup> Rebecca Mawhood and Robert Gross, “Institutional barriers to a ‘perfect’ policy: A case study of the Senegalese Rural Electrification Plan,” Energy Policy (2014, volume 73).

<sup>60</sup> Interview, World Bank (July 2015)

<sup>61</sup> These and other constraints were identified during a World Bank mission in August 2012 for the preparation of a World Bank “implementation completion and results report”.

until recently in contemplating a harmonization of tariffs. It took 4 years to agree on a convention between SENELEC and the PPER concessionaires.

- **Setting up robust organizational, legal and regulatory processes takes time.** A significant part of the delays in implementing the PPER concessions were due to capacity development at key agencies or to long stakeholder consultations.
- **Separating the regulator and rural electrification agency can complicate rural electrification efforts.** The regulator's goals may differ from the REA's goals.
- **Political support for private concessions fluctuates.** In Senegal, this wavering political support has been a hindrance to the development of the concessions.

# Appendix A: Map of Senegal

Figure A.1: Map of Senegal (August 2010)



Source: World Bank, Senegal Electricity Services for Rural Areas Project, ICR, 2013.