

**Common Format for Project/Program Concept Note for Applying Resources from the SREP Competitive Set-Aside**

1. <b>Country/Region:</b>	Mali/Ségou	2. <b>CIF Project ID#:</b>	
3. <b>Project/Program Title:</b>	Scatec Solar Mali Ségou PV 33MWc		
4. <b>Date of Endorsement of the Investment Plan:</b>			
5. <b>Funding Request (in million USD equivalent):</b>	Grant:	Non-Grant (loan, equity, guarantee, etc.): Concessional loan US\$ 25 million (16,1m EUR)	
6. <b>Implementing MDB(s):</b>			<input checked="" type="checkbox"/> Private sector arm <input type="checkbox"/> Public sector arm
7. <b>Executing Agency:</b>			
8. <b>MDB Focal Point and Project/Program Task Team Leader (TTL):</b>	<i>Focal Point:</i> Mafalda DUARTE Climate Investment Funds Coordinator, AfDB <a href="mailto:m.duarte@afdb.org">m.duarte@afdb.org</a>		<i>TTL: tbd</i>

**I. Project Description**

1. The Project is to develop, finance, build, and operate a solar photovoltaic power plant of 33 MWp in Mali. This plant will be located in Ségou in the low part centre of the country and will be connected to the national grid. With an annual production of more than 57 GWh, the plant will provide about 4 % of the electricity of Mali, helping to solve the production shortfall affecting the economy and the Malian population.

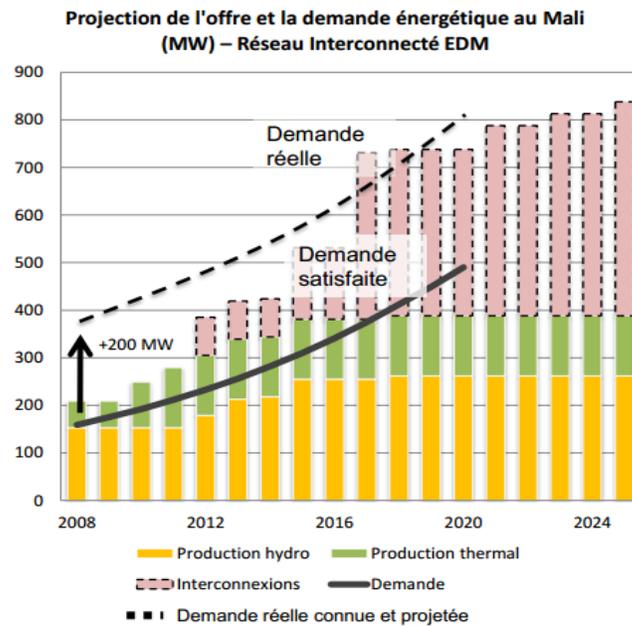
2. Assuming a continuation of the peace process and the return to normal conditions of safety, the use of solar energy can be quickly set-up at favourable financial conditions for the country. In order to speed up the project, to reduce the cost of electricity with a sustainable development approach, the developers wish to apply for the SREP program set-aside to provide part of the total funding.

## II. Rationale

3. The Scatec Solar Group (Scatec)<sup>1</sup> is an international group headquartered in Norway with extensive experience in the development, financing, construction and operation of solar PV power plants with more than 270 MWp installed around the World. The group is a pioneer of solar energy in Africa where it is currently completing the construction of 75 MWp at Kalkbult in South Africa, and - in parallel - recently started the construction of two power plants totalling 115 MWp. Scatec has been present in West Africa since 2011, and is currently, developing several large scale solar projects.

4. The success of Scatec is based on an integrated model and its ability to work with key partners. This integrated model –combining development, financing, construction and operation of solar power plants - is the guarantor of the quality of the plants where the group invests his own equity. This integrated model enables better risk management as well as quality of execution and O&M, while stringent governance model is set up to prevent and manage conflicts of interest.

5. The electricity produced and consumed in Mali is essentially coming from a mix of hydroelectric -diesel/oil (45% -55%). With a production capacity of about 345 MW, production ranges around 1000 GWh. Today, Mali is facing both a strong growth in demand for electricity, estimated at between 10 and 12% per year, and a chronic insufficiency of its production capacity.



Source: Analyse Banque Mondiale, entretiens d'experts EDM, COMTRADE, Présentations CNEsoler et AMADER, Energie du Mali (EDM)

<sup>1</sup> The Scatec Solar Group comprises the solar PV worldwide activity of Scatec A/S a Norwegian Holding, its main subsidiary Scatec Solar A/S in Oslo and many others direct or indirect companies dedicated to development or IPPs supporting SPVs. In Mali it includes Scatec Solar West Africa a development company established in 2010.

6. Thus to overcome this lack of power industries must operate at night, while others, including mining companies (ores, limestone, marble) and cement are facing energy shortages. Their needs in production capacity were assessed at 223 MW, of which 150 MW will soon be available and another 83 MW by 2015.

7. In this context of priority given to electrical energy, MMEE and Scatec Solar West Africa<sup>2</sup> signed on November 19th 2010, a Memorandum of Understanding under which Scatec is to undertake a program for the financing, construction and operation of solar photovoltaic power plants with a total capacity of 60 MWp in Mali.

8. Due to the political situation in Mali, development activity was suspended in March 2012 at a time when the final contracts negotiations between MMEE, EDM and Scatec were underway.

9. The perspectives opened by the peace, the official support of international institutions to finance the reconstruction, the key role of electricity in the pacification and economic development led the MMEE, Scatec and its partners to quickly resume the development of the photovoltaic projects in Mali (Amendment No. 2 to the Memorandum of Agreement of April 30, 2013).

10. The Parties now wish to resume negotiations on the Power Purchase Agreement and the Concession Agreement suspended in March 2012 adapting all contracts to the new schedule defined by the Parties. The preliminary schedule is based on the analysis of current conditions of installation / operation, particularly in terms of security and access to the grid at one of the sites previously identified in Ségou, a city of 130,000 inhabitants located 236 km north-east of the capital.

11. Scatec and the MMEE further agreed to explore and seek all opportunities to obtain concessional financing or grants that may accelerate the implementation of projects and reduce costs per kilowatt hour for EDM SA. It is in this context that a request for access to the SREP set-aside program was prepared and being submitted for consideration.

12. The current project proposed to benefit from the SREP Set-Aside is complementary to the 20 MW private project already part of the Mali SREP IP in the following ways:

- This current application is part of a process that aims to respond to an urgent need by the country to expand energy access;
- The project under the Mali SREP IP can be viewed as a more structuring second step that includes support to the Malian authorities to be capable of managing processes leading to private solar PV projects that would be ready 12 to 18 months after the Segou project;

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<sup>2</sup> A company established in Mali in 2010 by Scatec (51%) and its partner in Mali Doct. I. Togola (49%) with the purpose to develop PV large scale projects.

- The current application and the good execution of the Ségou project can only be favourable to the success of the Mali SREP IP.

13. It is with this objective that the 33 MWp project in Ségou has been reactivated with the following roadmap:

➤ **Project Schedule**

- Signing of Contracts end 2013/1<sup>st</sup> half of 2014 (Contracts were written in early 2012).
- Implementation of the financial structure by the lenders early 2014
- Start of construction end of 2014
- Connecting the plant to the national grid in Autumn 2015.

➤ **Economic, social and environmental benefits for Mali**

- Creation of direct and indirect jobs
- Improving the environment
- Reduction of fuel import
- Reduction of electricity prices

➤ **Financial balance**

- EDM PPA price substantially lower than current thermal generation price estimated at minimum 120/125 FCFA / kWh.
- Optimization of concessional financing.

➤ **Acceptability of the project and its structure**

- By the international lenders.
- By the investors.
- By concessional financing institutions.
- By international financing banks

➤ **Technical reliability**

- Scatec experience in Africa. Choosing a safe technology.
- Climatic constraints.
- Operation and Maintenance.

14. In this context, funding by the SREP set-aside program would have a very positive impact for the Republic of Mali for the following reasons:

- by accelerating the project process and rapid implementation, and through its sharing of financial risk. We estimate the SREP support will enable an acceleration of 12-18 months.

- by reducing the cost of electricity for EDM: directly attributing the effect of the cost savings due to the SREP intervention to the PPA sales price, this latter can be lowered by 29 FCFA per kWh vis-à-vis thermal generation for a considerable leverage on EDM finance and the Malian GDP with two cumulative effects:

- (i) as a PV power generation supported by the current SREP application the cost of 97 GWh for EDM is brought down close to the estimated level of grid parity (thermal + hydro).
- (ii) PPA price per kWh mentioned in this concept are estimations based on an indicative financial plan (see § VII). Final tariffs will be established in due time between the Project Company and EDM and will be based on the cost structure of the project, including CAPEX, cost of debt, cost of equity and financing fees. AfDB, as broker, will ensure that fees under the PPA reflect a fair deal for both parties.

- finally, it is clear that a participation of the SREP program also supports the pursuit of sustainability in Mali which is critical also given the climate issues facing the region (desertification, deforestation ...)

### **III. Consistency with Investment Criteria**

15. The Ségou project brings many benefits to the Malian economy and society that are in line with the objectives of the SREP program:

- A production of clean and renewable energy that allows the Republic of Mali to participate fully in the fight against climate change whereas by its very own geographical location, the country is facing this challenge more than others. It is estimated that the photovoltaic plant of Ségou 33 MWp will prevent the emission of 44-50 000 tons of CO<sub>2</sub> per year;
- A rapid increase in power production capacities installed (thanks to the rapid deployment of photovoltaic power plants): the production of the Ségou photovoltaic central which is between 56 and 59 GWh / year represents around 5% of the electricity production in Mali;
- At the end of the period covered by the Concession Agreement, the plants will be transferred to the State of Mali (BOOT Model). The value of these assets is important and with limited additional investment and proper maintenance it will allow the Malian society to benefit from solar energy at low prices for many additional years;
- Improved Mali trade balance by reducing the import of expensive fuels replaced by a local "raw material". It is estimated that the import of fuel replaced with solar production

will reduce the trade deficit by 165 billion FCFA, including an average 5% yearly increase in fuel prices;

- As Mali will be one of the pioneers of large scale photovoltaic power in West Africa, the country will be able to develop local skills to build and operate photovoltaic systems. In collaboration with Malian partners, Scatec will implement a training program for Malian technicians. According to estimates by economists, the construction of Ségou PV central will indirectly generate around 1650-2000 jobs / year in the country. In the operational phase, the PV plant will employ around 80 people.
- Construction of Ségou PV plant by Scatec represents a major opportunity for Malian companies in civil engineering, electrical engineering, construction, logistics and monitoring of industrial plants since it is estimated that about 150 people will work on the site during the 8 months of construction.
- The Scatec solar program in Mali and the Ségou PV Park allow the country to meet its objectives in the Western African Power Pool (WAPP) and thus be beneficial to the entire region.
- With a very high solar resource and despite several climatic stresses (heat and dust) the EDM cost of photovoltaic energy is below the cost of its own thermal production. The PV PPA Price can even be reduced further by using SREP (compared to a cost of thermal production of about 125 FCFA / kWh) which will significantly improve the financial performance of EDM and therefore its investment capacity.
- Finally a quick additional power generation at reduced rates combined with grid efforts (erasing peak, management of intermittent and inter-country interconnections) gives EDM capacity to meet the demand for energy and provide considerable leverage on the growth of Mali's GDP.

#### **IV. Type of Private Sector Engagement**

16. The 33 MWp PV plant project at Ségou is a private BOOT project after which the plant will be transferred to the State of Mali who will maintain and operate the power plant.

17. It is expected contractually that a dedicated Project Company - *Scatec Solar Mali IPP 1*- under Malian law will be the holder of all contracts including the concession agreement with the Republic of Mali, the PPA contract, the grid connection/operating contract with EDM, the development contract with the developers, the EPC contract with one of the European companies within the Scatec group, the O&M contract with another dedicated subsidiary of the Scatec group in Mali.

18. The structure is based on the creation in Mali of a dedicated SPV to which will be transferred the benefits of the MoU signed by the development company Scatec Solar WA. The actual legal framework will be designed by the legal advisors and submitted to the AfDB for their legal due diligence.

19. The deal structuring includes direct PPA negotiation including Scatec as EPC provider. The proposed scheme is based on a specific analysis of the sub-Saharan countries situation as regards large scale PV power plant.

20. Effectively the limited experience by the authorities, the un-crosschecked solar data, the limited number of PV related climate studies and the impact of grid management difficulties necessitates a long learning curve. The successful implementation of a first Solar IPPs is therefore viewed as faster and more secured when proposed under an integrated and direct negotiation. It will then lay the foundation for the Government of Mali to later issue RFPs for the sustained deployment of solar energy.

21. It is recognized that the integrated business model and direct negotiation scheme outline above may carry some risks that the developers have mitigated as follows:

- PPA price risk: no RFP for the EPC contractor choice, as this role is granted to Scatec, could lead to a non-optimized PPA price. In reality Scatec undertakes to realise competitive bidding processes for all the main equipment suppliers and sub-contractors. In addition Scatec undertakes to communicate to IFC Infraventures, and AfDB, the reasons leading to the choice of suppliers and sub-contractors.
- Legal risk: potential conflict of interest and governance issues are considered from the start of contract structuring. The choice of first tier law firms warranties a proper way in addressing this issue.

The diagram below summarizes the contractual structure proposed for the Ségou project:

## **V. Innovation**

22. The Project will be one of the very first large-scale PV plant in sub-Saharan Africa. As such, it is an innovation in terms of technology as central inverters, modules and electronic monitoring system will be tested for the first time in sub-Saharan climate. This choice of technology is based on the results of our PV test site of Mopti (Mali), of our partners in West Africa (Burkina Faso) and suppliers with whom Scatec has developed a technology watch on these climatic aspects.

23. Regarding the financial aspects, the structuring around an integrated model allowed by Scatec organization is an innovation that secures and guarantees the overall quality while the mix of sources of public / private funding allows a faster deployment of solar energy.

## **VI. Technology, Product, and/or Business Model**

24. The technology choice is focused on poly-crystalline modules on fixed structures because of its reliability, its profitability and its heat resistance ability. Details of the plant model used are described in the feasibility study. All equipment has been tested in the area or a similar climate.

25. The project is based on the ordinary grid management of intermittence and does not include battery solutions that appear at this stage still expensive and unreliable.

## **VII. Market**

26. The electricity produced and consumed in Mali is essentially coming from a mix of hydroelectric -diesel/oil (45% -55%). With a production capacity of about 345 MW, production ranges around 1000 GWh. Today, Mali is facing both a strong growth in demand for electricity, estimated at between 10 and 12% per year, and a chronic under-sizing of its production capacity.

27. While hydropower projects are under development in Mali, their implementation is substantially longer than the solar photovoltaic. On the other hand, interconnection with neighbouring countries provides some stability of supply but cannot alone solve the problems of under-sizing. There is therefore a real need linked to the growth in demand for electricity that the Ségou project will greatly contribute by its size and speed of implementation.

28. It should be noted that the issues of intermittency are also included in the study: EDM will use the national grid - and regional interconnection - and thermal power plants to ensure the stability. However, the fuel economy remains significant and the midday peak consumption is usually absorbed by the PV power plant production increasing, in marginal cost, the economic viability for EDM.

## **VIII. Financial Plan (Indicative)**

29. The Project is structured around an SPV project company (to be created) under Malian law with a consortium headed by Scatec being the main. Alongside Scatec the shareholders are planned to be its partners IFC Infraventures from the World Bank Group, a Malian investor group and one international investor who has expressed an interest to support this project. The

percentages displayed in the table here under are indicative. In addition, a Malian company, majority owned by Scatec will be created to ensure the O&M of the plant.

30. At this stage the financial plan is indicative, and therefore the PPA price per kWh under the project is Scatec’s best estimates. The financial model will ultimately include the effect of the final financing structure, of the actual EPC costs, and of the counterchecked irradiation data.

31. The financial plan of the Ségou Project is based on the main assumptions as described in annex 1

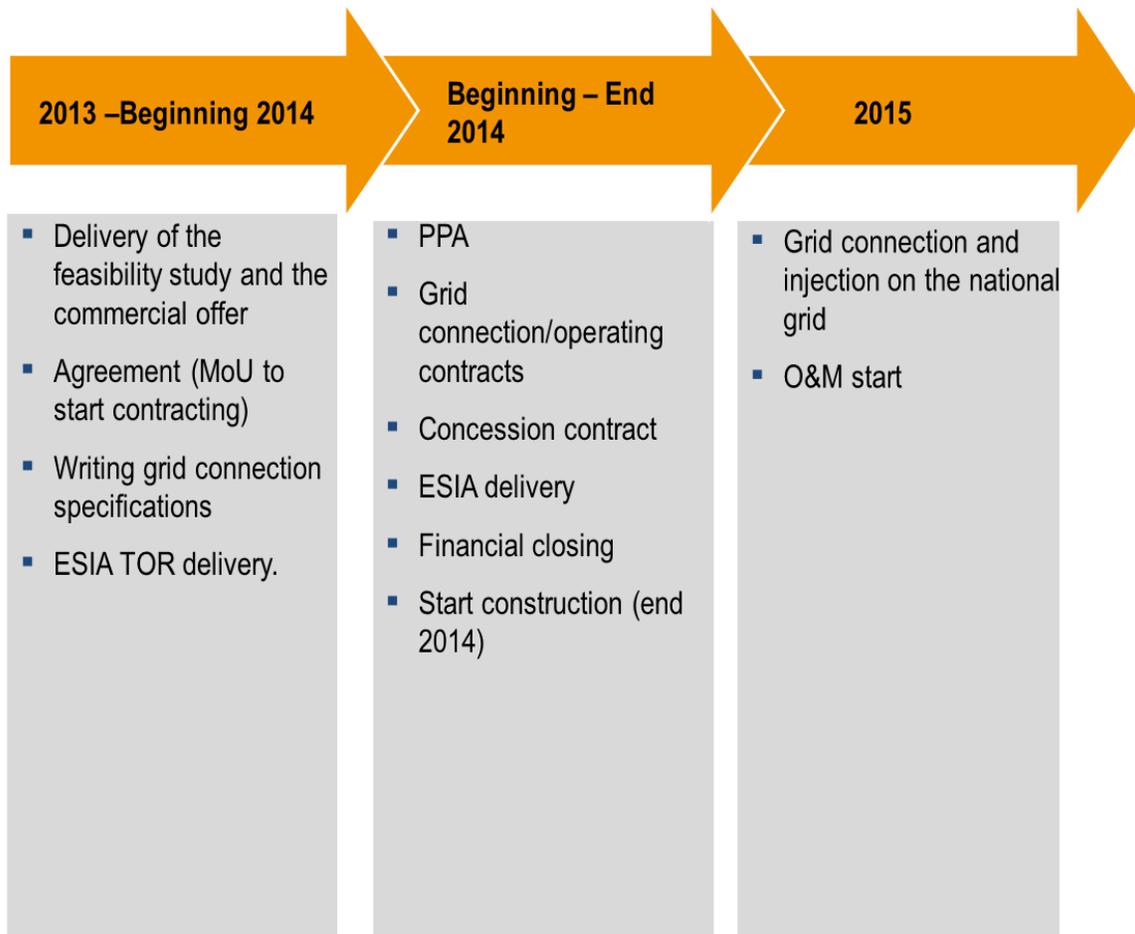
## IX. Expected Results and Indicators

<b>Results</b>	<b>Indicators</b>
Limitation of emissions of greenhouse gases	44-50 000 tonnes of CO2 saved per year
Increased electricity production units	Additional 33 MWp solar energy capacity in the Malian energy mix
PV Plant Transfer at the end of the concession	Assets today valued at CAPEX
Trade balance improvement	Limiting imports of fuel, with an increase of 5% per year, this represents almost 165 billion CFA over the period of operation of the plant by Scatec
Job creation	Between 1650 and 2000 indirect jobs created, a minimum of 150 jobs during the construction period and 80 annual jobs during the period of operation and maintenance.
Diversification of the energy mix	5% of Mali's energy production will be from solar
Lower EDM generation cost	Scatec project kWh significantly down (through SREP participation) compared to 125 FCFA / kWh from the thermal power plants
<i>Development Results(s):</i> Economic, social and environmental development thanks to the 33 MWp photovoltaic plant, the country will have access to a local, economical, renewable and reliable energy.	

**X. Implementation Feasibility and Arrangements**

32. On the assumption of the peace process continuation and the return to normal conditions of security, development of the Project, which already passed the pre-feasibility stage, will continue with the confirmation of hypotheses related to the grid, to impact study, geology / topography by independent firms. In parallel all contracts between Scatec, the Malian Government and EDM will be updated and negotiations with lenders will be engaged in order to reach financial closing and start construction second half of 2014.

33. The steps can be summarized as follows:



**XI. Potential Risks and Mitigation Measures (see Annex 2)**