PROJECT INFORMATION DOCUMENT (PID)
IDENTIFICATION/CONCEPT STAGE

Report No.: PIDC61984

Project Name	Madagascar Scaling Renewable Energy Program (SREP) Investment Plan (IP)
Region	AFRICA
Country	Madagascar
Sector(s)	Hydropower (30%), Other Renewable Energy (70%)
Theme(s)	Infrastructure services for private sector development (20%), Micro, Small and Medium Enterprise support (50%), Rural services and infrastructure (30%)
Lending Instrument	IPF
Project ID	P159725
Borrower Name	Ministry of Finance Economy and Budget
Implementing Agency	Ministry of Energy
Environment Category	B - Partial Assessment
Date PID Prepared	20-Apr-2016
Estimated Date of Approval	28-Mar-2016
Initiation Note Review Decision	The review did authorize the preparation to continue

I. Introduction and Context

Country Context

1. Madagascar is a low-income country with a population of about 23.6 million and a Gross Domestic Product (GDP) of US$10.59 billion in 2014. Madagascar ranked 155 out of 187 countries in the United Nations 2014 Human Development Report. A vast majority of the Malagasy population is extremely poor. Extreme poverty (per capita consumption under US$1.9 purchasing power parity – PPP – 2011 per day) was around four fifths of the population between 2001 and 2012 (the latest data available). Over the same timeframe, absolute poverty (US$3.1 PPP per capita per day) rose from an estimated 84.1 percent in 2001 to 89.9 percent of the population in 2005, then continued to rise reaching 93 percent in 2012. Madagascar is also highly vulnerable to natural disasters, including cyclones, droughts, and flooding. It is estimated that one quarter of the population, or approximately five million people, currently live in zones at high risk of natural disasters.

2. Madagascar is emerging from several years of political and economic turbulence, following a political crisis that started in 2009. Madagascar returned to constitutional order when a duly-elected Government took office in 2014, after a five-year political crisis. The crisis had devastating effects on the economy, poverty, and social outcomes. The return to constitutionality was an event welcomed by all, but it is only a first step in putting the country on track in terms of sustainable development. Despite continued tensions between the executive and legislative branches, steps have been taken since the election: a new National Development Plan and its implementation strategy

were elaborated; a process of national reconciliation has been initiated and democratic institutions have been strengthened with municipal (July 2015) and senatorial (December 2015) elections taking place; macroeconomic stability has been maintained and the Ministry of Finance has launched reforms of its public finances, starting with the customs and tax administrations; and respective Ministries have elaborated strategies for social protection, education, and universal health coverage and are starting to implement them.

3. The Government suffers from a paucity of public resources. Given the low level of public resources, few reforms requiring large, new expenditures are feasible in the near future. The fiscal authorities have little space to conduct countercyclical policies to stimulate growth. Madagascar's tax revenue as a share of GDP has historically been among the lowest in the world, hovering below ten percent in 2014. Strategies for increasing tax revenue have been elaborated and are starting to show some initial results. The Government still allocates a large share of the discretionary spending to unaffordable and poorly-targeted fuel subsidies and transfers to finance the losses of the two troubled state-owned companies: JIRAMA, the public water and electricity utility, and Air Madagascar. It is making efforts to improve the performance of both companies but progress is slow and vested interests in favor of status quo abound.

4. Social and economic development is constrained by the lack of electricity. At the household level, inadequate electricity access constrains the delivery of basic social services and is a factor of inequality and exclusion within the society. Unreliable current power supply also makes it difficult to do business in Madagascar. Insufficient and unreliable electricity is clearly one of the most severe constraints in Madagascar's investment climate. In Doing Business 2015 Madagascar is ranked 189 out of 189 countries in regard to the difficulty, delay, and cost of getting electricity. The private sector has cited unreliability of electricity supply as one of the most important factors affecting competitiveness, having indicated a willingness to pay more if the reliability and quality of the electricity service was improved. Further expansion of mining, agriculture, and manufacturing, with the corresponding gains in terms of employment creation, will indeed require an increased, reliable supply of electricity. Access to electricity by the general population stood at about 14 percent in 2010, lower than many comparable countries. It is estimated to have fallen to around 12-13 percent currently given population growth since 2010. New connections are increasing at a rate of approximately one percentage point annually partly because of JIRAMA's inability to invest. Increasing access to electricity, particularly in suburban and rural areas, would result in the improvement in the living conditions of the populations served and provide a stronger foundation for the development of income generating activities.

Sectoral and Institutional Context

5. The electricity sector in Madagascar is dominated by JIRAMA, the vertically integrated state-owned utility. JIRAMA is responsible for the majority of the generation, transmission, and distribution of electricity in Madagascar. The Ministry of Energy and Hydrocarbons (MEH) implements Government policy and provides strategic coordination of the energy sector, and oversight of JIRAMA's electricity sector activities. The Energy Regulation Office (ORE) reviews and approves tariffs. The Rural Electrification Agency (ADER) is responsible for rural electrification through grid-extension and/or off-grid and mini-grid systems. Other important sector agents include private companies that supply power to JIRAMA under an independent power producer (IPP) arrangement and through power rentals. The current legal and regulatory framework of the sector was developed in the last decade. The Electricity Law of 2000 and its regulations

enabled the establishment of a fairly comprehensive institutional framework. Following the promulgation of the Electricity Law, private investment is legally possible in the energy sector in Madagascar. IPP tariffs are currently negotiated on a contract by contract basis and are supervised by ORE.

6. Access to electricity services is low countrywide, and even more so in rural areas. The estimated current electricity access rate countrywide is around 12-13 percent, with an estimated 39 percent of the population in urban and peri-urban areas having access and an estimated five percent of the population in rural areas having access. This is mainly due to the country's poverty level and low population density, particularly in rural areas where over 67 percent of the population lives. In addition, due to the adverse effects of the political crises of 2002 and 2009, and the continuing deterioration of JIRAMA's financial situation, the country achieved little progress in terms of electrification between 2003 and 2013.

7. Electricity infrastructure and services are deteriorating throughout the country. The electrical system in Madagascar is composed of two types of installation: (i) three interconnected networks, i.e., Antananarivo, Toamasina, and Fianarantsoa, which are controlled by JIRAMA; and (ii) about 130 isolated centers installed by JIRAMA and ADER. The interconnected networks, which account for about 70 percent of the total load of the country, have hydro power plants whereas most of the isolated centers are supplied by diesel power plants. The total installed capacity of the country was about 450 MW in 2014, of which about 50 percent is in the interconnected network of Antananarivo. The total firm capacity was decreasing due to lack of maintenance, and the system was not able to fully satisfy existing demand. The suppressed power demand for the Antananarivo interconnected network in 2014 was approximately 40 MW during the dry season, which would require the installation of additional generation capacity in the short term. In addition, the availability of some of the generator sets owned by JIRAMA is decreasing due to lack of maintenance. The total generation of the country was about 1,487 GWh in 2014 and the total energy billed was about 1,000 GWh, of which just over 51 percent is consumed by large customers (26 percent by medium voltage (MV) customers, and 25.4 percent by low voltage (LV) customers). The remaining consumption is by LV customers who consume less than 1,000kWh per month.

8. JIRAMA's financial position has deteriorated significantly in recent years, and the company is a heavy fiscal burden for the Government. The financial position of JIRAMA deteriorated between 2010 and 2013 due to declining operational efficiency, inability to collect revenues sufficient to cover costs, and the rising price of inputs, primarily imported fuel. To address the electricity supply gap, the Government and JIRAMA have entered into several ad-hoc, expensive, quasi-IPP/leasing contracts, awarded in general on a noncompetitive basis, to install thermal power plants running on diesel. This approach resulted in a large increase in the country's cost of electricity production. The current average supply cost is about US$0.23 per kWh mainly due to the fact that the share of thermal generation, which reached about 45 percent of total generation in 2013, significantly increased. On the other hand, the average revenue from JIRAMA's sales is about US$0.17 per kWh. JIRAMA has relied on Government subsidies to pay the fuel bills, generator rentals, and energy purchases from private power generators, adding fiscal pressures on the already resource-starved State. The Government subsidy to JIRAMA imposed a heavy cost on the Malagasy treasury, and diverted resources from more productive expenditures with direct impacts on the poor. The amount of Government subsidies to JIRAMA for the years 2012 and 2013 are respectively about US$67.7 million and US$73.2 million, which corresponds to approximately seven percent of annual Govern ment revenues. A reduction in unaffordable and poorly targeted

subsidies is one of the focus areas of the International Monetary Fund staff monitored program in Madagascar.

9. Weak planning and poor choices regarding generation options for the country have exacerbated the poor financial situation of the sector. Weak enforcement of sector planning over recent years and lack of governance in the development of generation options for the country has translated into high costs for JIRAMA and the sector as a whole. Today the country relies primarily on expensive imported thermal fuel based generation. However, Madagascar possesses enormous potential in renewable energy resources, particularly hydro. Hydropower potential has been estimated at 8.4 GW although the economically exploitable potential has not been established. The number of untapped hydro sites has been reported as more than 800, ranging from a 10 kW (or less) to 600 MW located throughout the country. The Government must carry out systematic planning to identify and implement generation projects that represent the least cost options for the country, making it possible to move gradually away from imported, fuel-based generation.

10. The development of renewable could be used to increase generation capacity on both grid and off-grid. Given the high cost of generation in Madagascar, the use of certain renewables could be used to lower the cost of supply. Renewables could also be used off-grid in isolated centers to substitute expensive diesel generation through most likely the introduction of Independent Power Producers (IPPs).

11. Scaling Up Renewable Energy Program in Low-income Countries (SREP) is part of the Strategic Climate Fund under the Climate Investment Funds (CIF). CIF support developing countries as they move toward low emissions and climate resilient development. The CIF provides developing countries with grants, concessional loans, and risk mitigation instruments that can achieve significant leverage of private sector resources, investments from MDBs, and other co-financing . The objective of the SREP is to pilot and demonstrate the economic, social and environmental viability of low carbon development pathways in the energy sector by creating new economic opportunities and increasing energy access through the use of renewable energy. The SREP Sub-Committee approved the selection of 14 new SREP pilot countries, including Madagascar, in June 2014, expanding to 27 countries participating in the SREP program. In September 2014, the Government of Madagascar was invited to take a leadership role in working with the MDBs to develop a full SREP Investment Plan (IP). Madagascar is eligible to receive grant funding of up to US$ 300,000 for the preparation of the SREP IP. In January 2015, the SREP Sub-Committee agreed with the indicative allocation of US$ 50 million to Madagascar. It was also agreed that the investment plans from the 14 new pilot countries would be endorsed on a first-come, first-served basis taking into account the quality of the investment plans, regardless of funding availability under the SREP. Funding for the projects and programs proposed in the investment plans will be contingent upon the availability of funds under the SREP. The Government has requested a preparation grant to enable it to prepare the SREP investment plan that would be presented to the SREP board to apply for the program.

12. Government has also requested IFC support through the Scaling Solar program. Government requested support from IFC in June 2015 for the implementation of grid-connected solar PV installations on an IPP basis and IFC and Government agreed to use the World Bank Group designed Scaling Solar approach to implement that project . Scaling Solar provides competitive and transparent tendering in countries with limited experience developing solar power, and helps countries access solar power more quickly and affordably than they could otherwise. It

provides a simple yet innovative package that combines several World Bank Group services under one um brella comprising: the World Bank's partial risk guarantees, MIGA's political risk guarantees, and IFC's expertise in developing and financing power plants, which helps governments mobilize privately funded grid-connected solar plants.

13. The proposed project is complementary to other support provided by the Bank. The Bank is currently implementing technical assistance, financed by the Energy Sector Management Assistance Program (ESMAP), which is mapping the potential of small hydropower projects (less than 20 MW). This will improve datasets and increase the awareness of stakeholders (both Government and private sector) for facilitating the development of this renewable energy resource. Most importantly, it will create opportunities to lower the cost of generation, green the energy mix, and foster private sector participation in hydro generation. This activity will provide an indication of the sites with the best potential for electricity generation. The Bank is also supporting the Electricity Sector Operations and Governance Improvement Project (ESOGIP), under which it is developing of a Least Cost Power Development Plan (LCPDP), a tariff study, and an Electrification Strategy Access strategy. The project also seeks to improve the performance of JIRAMA (which should help making it a healthier utility and more able to enter into IPP arrangements in the future). The Government has equally requested support through the IFC-led Scaling Solar initiative and it is possible that SREP funds could be used to support this.

14. Private sector participation in the electricity sector requires a healthier utility and the recently approved Electricity Sector Operations and Governance Improvement Project (ESOGIP) supports this objective. Additional private sector investment is needed to implement the least cost options and increase generation capacity. However, the private sector currently faces difficulties given JIRAMA's inability to pay for supply contracts. There are also reports of underperformance of existing IPPs, which are failing to supply contracted power. Several IPPs have recently presented proposals for development of certain sites. However, despite the urgent need for additional sources of generation, the Government lacks clear criteria, rules, and procedures for determining which, if any, of these unsolicited proposals should be pursued. Government needs to put in place the governance framework to guarantee that once the least cost options have been identified, decisions regarding investments on additional generation capacity will be made on the basis of this plan, and selection of private partners done on the basis of competitive procedures.

15. The project contributes to poverty reduction and shared prosperity. Reliable and expanded electricity supply is a key determinant of productivity and competitiveness and is critical to enable economies to attract investments, expand and diversify production, and ultimately create jobs. Insufficient and unreliable electricity is clearly one of the most severe constraints in Madagascar's investment climate. Power shortages mean big losses in terms of foregone production to Malagasy firms. At the household level, inadequate electricity access constrains the delivery of the basic social services, and electricity access is a factor of inequality, leading to the exclusion of poorer people. It would be ineffective and unsustainable to focus on access improvements in this project: efforts to increase electricity generation capacity will not translate into better access without first addressing transmission and distribution capacity bottlenecks due to the poor state of the grid. Investments under the project will target rehabilitation and upgrade of the national distribution system to alleviate distribution capacity constraints, reduce losses, and ultimately support the expansion of electricity supply and access, in line with the goals of reducing poverty and promoting shared prosperity. This project would set the basis for future projects focusing on access. A parallel program of support, under the Scaling Up Renewable Energy in Low Income Countries Program

(SREP), is also currently being discussed to support Madagascar in developing off-grid access. Moreover, a Sustainable Energy For All (SE4All) initiative for Madagascar is being implemented by the European Union (EU); under this initiative an investment prospectus will be prepared to help accelerate implementation of the access agenda.

Relationship to CAS/CPS/CPF

16. The activity is aligned with the Bank's twin goals, the conclusion of the Systematic Country Diagnostic and the themes being elaborated for the Country Partnership Framework (CPF) under preparation. Access to electricity is key to economic growth and social inclusion. In Madagascar, efforts to increase access are hindered by the financial position of JIRAMA, the lack of generation capacity, and the poor state of the grid. The activity addresses these aspects as critical first steps to improve the expansion of electricity supply and access, in line with the goals of reducing poverty and promoting shared prosperity. The activity is grounded in the Systematic Country Diagnostic (SCD), electricity having been identified as the top constraint to private sector development (and employment). Building on the SCD, the CPF under preparation identifies power sector reform and the need to improve electricity service as a top priority. The activity also contributes indirectly to other CPF proposed objectives, such as the need to increase fiscal space (including for infrastructure investments and social spending) and improve agricultural productivity (which may require power inputs).

II. Project Development Objective(s)

Proposed Development Objective(s)

The project development objective is to support the Malagasy government to prepare a renewable energy investment plan for consideration by the SREP for funding.

Key Results

Renewable energy investment plan prepared.

III. Preliminary Description

Concept Description

18. The project will provide support the Recipient in the preparation of the SREP Investment Plan for consideration by the SREP board for funding. Specifically, government will be financing consultants to do a review of existing studies that may be reused in the framework of SREP, identify the most appropriate components and investments following specific criteria, and will prepare the investment plan. The consultants will also review the enabling environment for the development of renewable sin the country and propose any necessary changes and finally they will review and provide recommendations regarding the current business models and selection criteria and mechanisms in use and to be used by ADER, as well by the National Electricity Fund (FNE), with the aim of promoting additional transparency and objectivity. It is possible that the grant would also co-finance the program for scaling solar, as well as operating expenses.

IV. Safeguard Policies that Might Apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	×		
Natural Habitats OP/BP 4.04		×	

Forests OP/BP 4.36		×	
Pest Management OP 4.09		×	
Physical Cultural Resources OP/BP 4.11		×	
Indigenous Peoples OP/BP 4.10		×	
Involuntary Resettlement OP/BP 4.12		×	
Safety of Dams OP/BP 4.37		×	
Projects on International Waterways OP/BP 7.50		×	
Projects in Disputed Areas OP/BP 7.60		×	

V. Financing *(in USD Million)*

Total Project Cost:	0.3	Total Bank Financing:	0
Financing Gap:	0		

Financing Source	**Amount**
Borrower	0
Strategic Climate Fund Grant	0.3

VI. Contact point

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