

Madagascar

Opportunities for Solar Business

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The fourth largest island in the world is characterized by a high and stable solar irradiation. Its mountainous geography hinders a broad extension of the national grid, leading to one of the lowest electrification rates worldwide. Combined with an ambitious national energy policy and the presence of numerous international donors, Madagascar presents an interesting business case for the provision of decentralized power supply through solar PV installations.

Overview

The Malagasy economy is based on tourism and the cultivation of paddy rice, coffee, vanilla, and cloves. The return to political stability since 2014 concurred with the relaunch of private investments and international aid. GDP growth is expected to sustain above 3% per year in the coming years (World Bank, 2016). Private sector participants as well as donors are committed to further stimulate economic development through investments, particularly in the country's electricity sector.

With an electrification rate of only 14%, Madagascar is among the countries with the least access to electricity worldwide. While around a third of urban households are connected to the grid, this figure falls below 4% in rural areas.

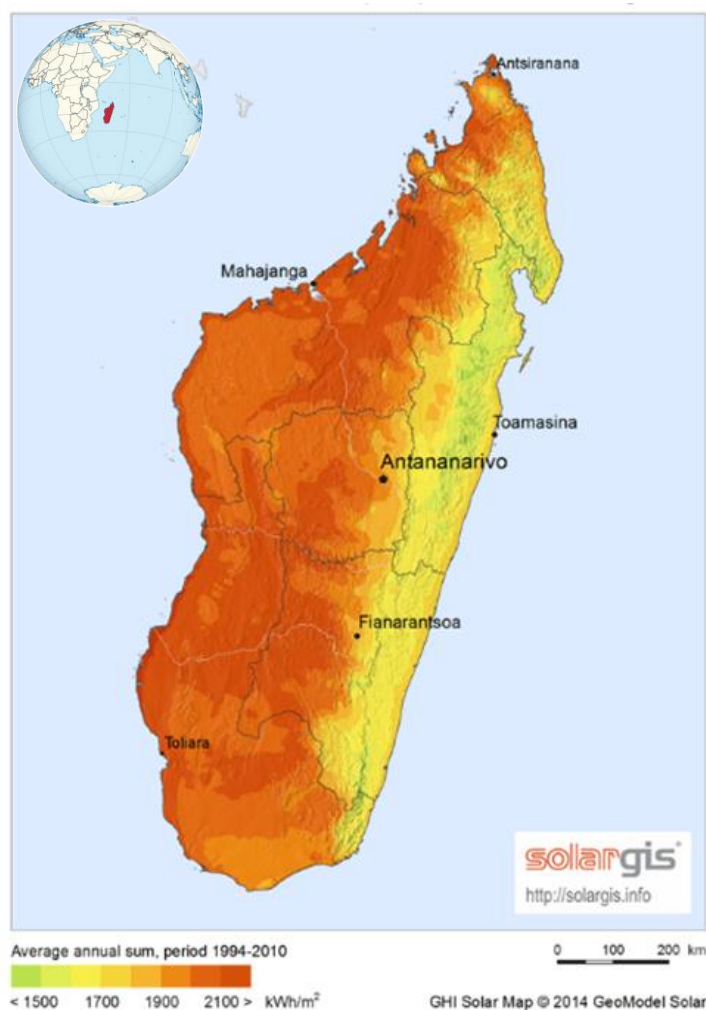
The national power utility, JIRAMA, operates selected grids only around major towns with the longest stretch of an overall length of approx. 180 km between the capital Antananarivo and Antsirabé.

The low electrification rate is considered a severe impediment to both private and public investments, and negatively impacts the manufacturing sector as well as on other producing sectors such as fisheries, mining, tourism and agro-processing which represent the country's main sources of wealth.

Facilitator

Figure 1: Country overview and average annual GHI (kWh/m²), period 1994-2010

Capital	Antananarivo
Official languages	Malagasy, French
Government	Semi-presidential Republic
Area (km²)	587,041 (1,64 x Germany)
Population	22,434,363 (2014) (28% of German population)
GDP (nominal, billion USD)	Total: 10,674 Per capita: 453
Currency	Malagasy Ariary (MGA); average inflation 6,95 %/y (avg. 2011-2014)



Sources: Wikimedia Foundation 2016, SolarGIS, 2016, IFM, 2015, United Nations Statistics Division, 2016, World Bank, 2016,

Solar Market Potential

Madagascar profits from an average Global Horizontal Irradiation (GHI) in the range 2,400 - 4,000 kWh/m² (SolarGIS, 2016). Almost all regions in the country count more than 2,800 hours of sunshine per year (Ministère de l'Énergie - Madagascar, 2016).

Numerous places are characterized by a high demand of electricity and provide excellent conditions for solar PV: the country's second most important seaport, Mahajanga, counts eight months of hot,

rain-free weather; Toliara (Tuléar in French) and Antsiranana (Diégo Suarez in French) are booming international tourism destinations.

Opportunities in the Malagasy solar market can be found in four categories:

- Commercial “fuel saving” projects that range from a few kilowatts to several megawatts and aim to reduce diesel or heavy fuel oil generation with solar power;
- Household and institutional systems of up to a few kilowatts;
- Solar products (lamps, phone chargers) which are sold or leased to rural and urban customers;
- Mini-grid projects from a few to several hundreds of kilowatts.

The national utility JIRAMA operates several scattered diesel mini-grids in the country and provides only basic services, mostly insufficient to meet demand. In order to cover their electricity demand, many domestic and industrial clients employ expensive diesel generators as back-up systems.

Legal Framework

Recent development in the energy sector can be broadly categorized into two phases:

- **The pre-crisis reform process of 1999-2005** ended the national utility's monopoly and resulted in a number of decrees to establish a concession-based regulated private sector.
- **The post-crisis reform process began in 2014** and culminated in September 2015 with the White Paper on the New Energy Policy (NPE). The document lays out a strategy to reach an electrification rate of 70% by 2030.

The NPE defined the following objectives for solar PV:

- Solar PV shall contribute 5% to the country's electricity mix by 2030;
- Grid connected PV plants shall constitute about 5% of installed capacity;
- The use of solar home systems shall be increased;
- The use of solar lights shall be increased;
- Existing diesel mini-grids shall be hybridized with solar.

The NPE also encourages the development of public-private partnership schemes and concessions to implement these targets. The rural electrification component will be implemented by the Rural Electrification Agency (ADER) through the National Electricity Fund (FNE).

A number of fiscal mechanisms support the use of solar energy, but apply mainly for batteries, inverters and generators. It is possible to obtain an exemption from import duties through a letter of dispensation from the Ministry of Energy and Hydrocarbons (MEH), however, this practice holds mainly for publicly supported projects.

Currently, no quality norms or standards with regard to solar PV are in place. As a result, the market is dominated by low-cost, low-quality products.

Current Solar Market

Several private actors of different capacity, size, and business model, operate in the Malagasy solar market. Particularly in national calls for projects and in rural areas, a general trend towards low-cost products can be observed. Several companies and organizations are active in the following fields:

- Raise funds through international calls for grants;
- Respond to calls for proposals launched by international organizations (e.g. UNICEF), local governments or ADER for the provision of different services, e.g. the supply and installation of small solar systems or the design, construction and management of mini-grids;
- Sell power to private off-takers such as telecommunication companies or the mining industry;
- Provide basic solar products in rural areas and compete directly with low-cost products.

Even though strong technical skills can be found amongst the local workforce, a general lack of education regarding renewable energy technologies presents an obstacle for local operations. Marketing skills are often found to be poor due to a cultural adversity to risk and a limited entrepreneurial approach.

Opportunities through calls and tenders

ADER calls for projects – ADER-AP

The Agency for Rural Electrification (ADER) has developed a rural electrification plan for Madagascar which it implements through a series of Calls for Projects (ADER-AP) for hydropower, solar, biomass and wind projects. Until now, ADER has launched two calls and is planning more calls for 2016 and 2017 to achieve its rural electrification objectives. PV, wind and hybrid power are expected to play a crucial role in the future.

Scaling solar

The World Bank's initiative *Scaling Solar* aims to create a viable solar market in Madagascar. Through the "one stop shop" programme, privately funded grid-connected solar projects are expected to operate at competitive tariffs within two years after kick-off of the initiative. This programme is implemented across multiple countries with the objective to create a new regional market for solar investment (International Finance Corporation, 2016).

Calls for proposals for the supply and installation of solar equipment

In addition to the Calls for Projects launched by ADER, several smaller calls for the supply and installation of solar equipment are published in national newspapers. They target primarily community infrastructures such as health centers, schools or police offices, and are either fully financed by the Malagasy Government or by donors such as UNICEF.

Calls for proposals – ACP-EU energy facility

The ACP-EU Energy Facility (EF) aims to provide modern, affordable, sustainable energy services to rural and peri-urban areas. Tenders can be found on the [EuropAid](#) website on a regular basis.

Conclusion

Madagascar presents numerous untapped market opportunities for rural electrification, the hybridization of existing diesel mini-grids with PV, and the provision of green technology for productive use. As a result, a growing number of private operators of different skills, sizes, products and market strategies enter the market, leading to increasing competition. In the absence of an effective quality standards regime, a trend towards low-cost products emerges.

The regulatory framework and the new energy policy that is currently under development promise an increasing focus on renewable energies and are expected to attract substantial international financial resources. The restructuring process of JIRAMA, currently undertaken by the World Bank, seeks to increase transparency and financial capacity in order for JIRAMA to become a potent partner in public-private partnerships.

Being one of Africa's most promising developing markets, major progress can be expected in Madagascar in the near future. The country's power sector will play a pivotal role in this development and should thus be observed closely.

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