



iINVEST IN
ENERGY

MADAGASCAR, THE BOUNDLESS ENERGY ISLAND



ECONOMIC DEVELOPMENT
BOARD OF MADAGASCAR



Photo : ONUDI

MADAGASCAR,

Thanks to the abundance and diversity of its resources, Madagascar is an ideal destination for investments in renewable energies.

Located in the crossroads of Africa, Asia and Middle East, the country also has privileged relationships with Europe and the United States.

Solar, wind and hydro potentials are exceptional and unrivaled with the European or Chinese resources, yet in advance on renewable energy volumes used. Rich of an abundant and young manpower, Madagascar has skills throughout the value chain, proposing conditions of optimal development.

Madagascar therefore has the necessary assets to become a reference in renewable energy projects.

Key figures



Area:
587,295 km²
4th largest island in the world



Population:
24.5 million



Official languages:
Malagasy, French



Rate of growth:
4.1% (2017)



GDP:
1,506 USD / inhabitant



Coastline:
4,800 km

RENEWABLE ENERGIES: A GLOBAL CHALLENGE



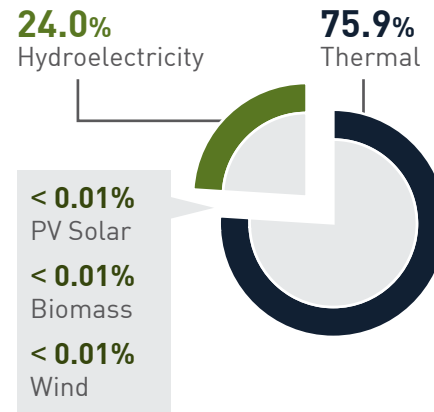
Photo : pexels.com

In the face of the global Climate Change issue, renewable energies have a major role to play in the energy transition and in the reduction of greenhouse gas (GHG) emissions. Energy production accounts for 26% of global GHGs (IPCC 2007). Madagascar is particularly concerned by these climatic changes. The Big Island is positioned in 3rd position of the countries most exposed to the effects of the Climate Change.

The Malagasy electrical installed capacity is today dominated by 50% of thermal energy sources (heavy fuel oil, gas oil), whose price is fluctuating and rising and whose consequences on the environment and health are harmful. Beyond an undeniable environmental and societal emergency, renewable energies today offer significant economic and technical opportunities. They are part of the sustained development of the country, through the strengthening of energy independence, cost control and strengthening of the national economy.

Installed production capacity (2016)

Total : 681 MW





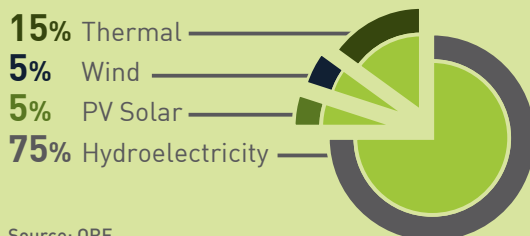
GOOD REASONS TO INVEST IN MADAGASCAR IN RENEWABLE ENERGIES



A POLITICAL AND REGULATORY ENVIRONMENT GETTING MORE AND MORE MATURE

The Malagasy economy in the electricity sector has been liberalized since 1998, promoting free competition in the production sector. The New Energy Policy (NEP) of 2015, gives the framework and the objectives of deployment of renewable energies. The new Electricity Code, in development since 2017, completes a simplification of procedures and the strengthening of market liberalization, particularly on transport and distribution. The support of the international community strengthens the dynamics of the sector and helps securing investments.

% SOURCE OF PRODUCTION BY 2030 (NEP)



Source: ORE



A GROWING ECONOMY

With a growth rate of 4.1% in 2017, one of the highest in Africa, the economic situation in Madagascar follows a positive and promising trend. The growth rate is expected to reach 5.1% in 2018. Several sectors related to electricity (agriculture, tourism, industries, telecom, etc.) are following a similar trend.



A STRATEGIC TRADE POSITION IN THE INDIAN OCEAN

Positioned in the very heart of the Indian Ocean, Madagascar constitutes a strategic hub for exchange (equipment, materials, raw materials, products) between Asia, Africa and the Middle East. Member of regional commercial areas - COMESA, SADC, IOC and EPA - Madagascar has strong arguments for economic exchanges with its neighbors.

SOME SOLUTIONS FIRMLY EXPECTED



Photo : ONUDI

RURAL AREAS WAITING FOR INNOVATIVE SOLUTIONS

Madagascar is a country large like France and Benelux whose population is divided between urban and peri-urban consumption poles and large rural areas where more than 65%* of the population is concentrated. With a density of 41.4 inhabitant / km², the Malagasy population is spread over the entire territory. The deployment of innovative and sustainable decentralized solutions is a major challenge.

THE KWH TARIFF : A REAL CHALLENGE

The massive use of fossil fuels implies a strong dependence on external raw materials whose prices are very fluctuating. In addition, the high maintenance costs of thermal installations, coupled with lower prices for renewable technologies and Climate Change issues, allow renewable energies to become competitive solutions that can challenge the current kWh costs, which vary, for industries and manufactures, from 0.08 € / kWh (day) to 0.25 € / kWh (day), depending on the zone on the territory.

At the same time, as part of the JIRAMA restructuring program supported by the World Bank (PAGOSE program), it is planned to standardize the tariff's rate across the country as well as to increase the tariff so that it becomes more representative of the investments made by the national operator.

* Source: <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=MG>

A DIVERSIFIED POTENTIAL WITHIN EASY REACH



**HYDROELECTRIC
POTENTIAL**



**SOLAR
POTENTIAL**



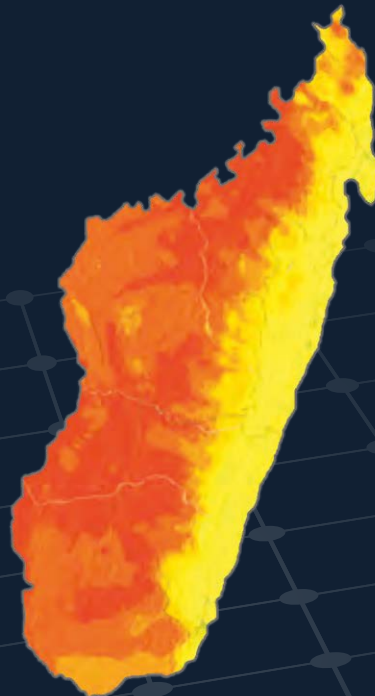
**WIND
POTENTIAL**



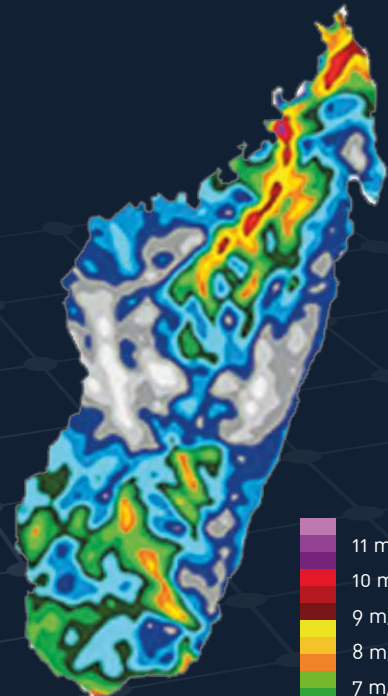
HYDROELECTRIC POTENTIAL
SITES < 60 MW



HYDROELECTRIC POTENTIAL
SITES > 60 MW

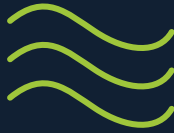


Average annual sum, period 1994-2010



Average speed
winds





A HUGE HYDROELECTRIC POTENTIAL OFFERING MANY OPPORTUNITIES

The hydroelectric potential has been estimated at about 7.8 GW. Today, only 2% of this potential is exploited. More than 800 hydropower sites with high untapped potential have been identified, ranging from 10 kW to 600 MW located throughout the country. The World Bank (through the ESMAP project) is implementing technical assistance for mapping the potential for small hydropower projects (<20 MW). One study has identified 2,045 small hydropower sites and has prioritized about 30 promising sites from 1 to 20 MW.



AN EXEMPLARY AND EVENLY DISTRIBUTED SOLAR RESOURCE

Almost all regions of Madagascar receive more than 2,800 hours of sunshine a year. Average annual production is about 1,600 kWh/kWp. The Malagasy potential is among the highest potentials in the world. Even the less endowed areas show solar potential which is on average 3 to 4 times higher than the potential in Western Europe.



AN UNTAPPED WIND POTENTIAL

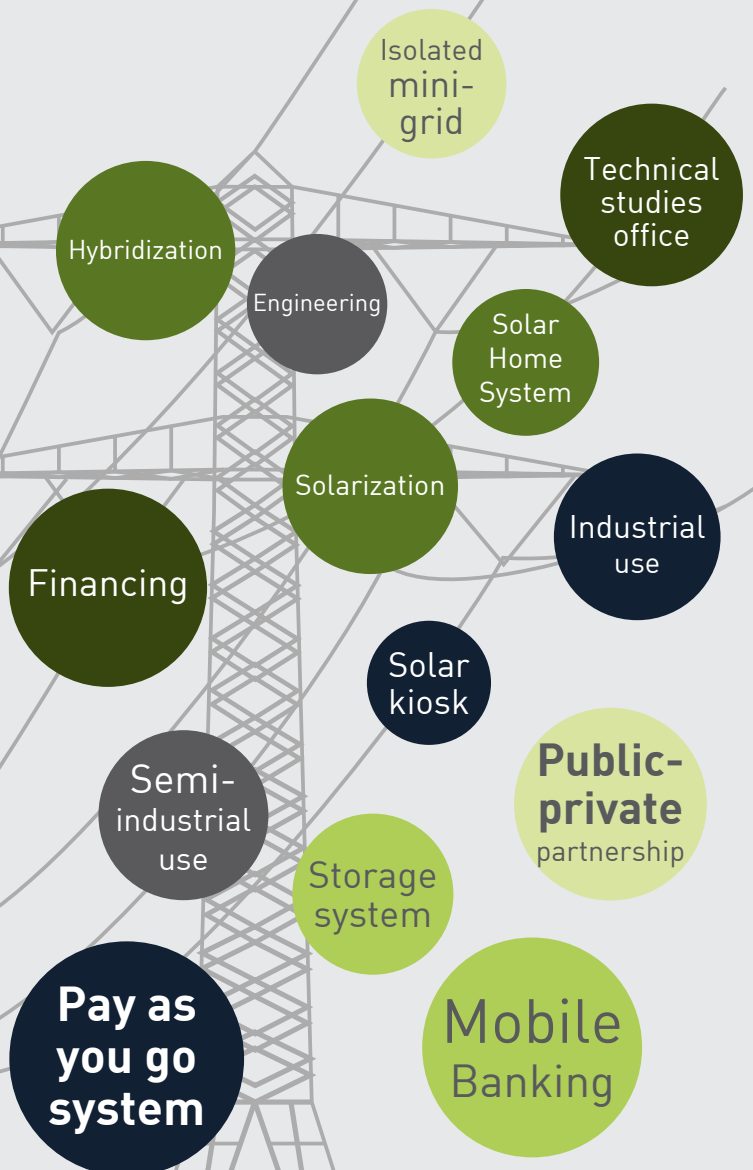
The Northern part (around Antsiranana) and the Southern part (around Taolagnaro) show wind speeds from 3 to 8 m/s to 20 m/s, with a potential capacity of around 2,000 MW for electricity generation. The demand for hybridization with other technologies for commercial purposes is high.



THE BIOMASS, AN ENERGY STILL TO BE EXPLOITED

More than 80% of the Malagasy population lives from the agricultural sector, a sector that produces many unexploited vegetable waste. Combined with an efficient collection system, the biomass electricity generation technology could represent a significant economic and ecological opportunity, especially for rural areas. The potential varies, depending on the site and the raw materials, from a few kW to more than 150 MW.

VARIOUS MARKET OPPORTUNITIES



PUBLIC OFFERS

Madagascar has regulatory channels of incentives for different types of projects:

- International calls for tenders for PV solar hybridization of sites historically operated by the JIRAMA with diesel gensets (Call for Tenders for big cities, 2017 ; Call for Tenders for intermediate cities, 2017)
- International Rural Electrification Calls for Projects (Call for Projects 1 Hydroelectricity, 2015 ; Call for Projects 2 Solar / Wind / Hydroelectricity, 2017 ; Call for Projects 3 Solar / Hydroelectricity 2018)
- Spontaneous applications for rural electrification

PUBLIC-PRIVATE AND PRIVATE-PRIVATE PARTNERSHIPS

Malagasy institutions are multiplying public-private partnerships.

Many players in the electricity and renewable energy sector are present in Madagascar or wish to set up shop there. Many invest in the creation of high added value synergies and partnerships.

Many related sectors including tourism, agriculture or telecoms keep an eye on the electricity sector to prepare for boosting their growth.

THEY SEIZED THE MALAGASY OPPORTUNITY AND ARE NOW HAVING A FOLLOWING WIND



MAJIKA

Rural electrification
35 kW hybrid solar
Since 2017



NANOE

Pre-electrification
Solar nano-grid
Since 2017



FIRST ENERGY

JIRAMA Hybrid PV-Diesel
365 kW Solar PV hybridized
with 600 kW of GenSet
Since 2017



BETC NANALA

Interconnected grid
2.3 MW hydro
By 2018



HERi Madagascar

Pre-electrification
120 solar kiosks distributed
in several regions of Madagascar
Since 2012



SAHOFIKA PROJECT

Interconnected grid
300 MW hydro
By 2020



EOSOL Madagascar

Rural electrification
75 kW solar (100%)
Since 2014



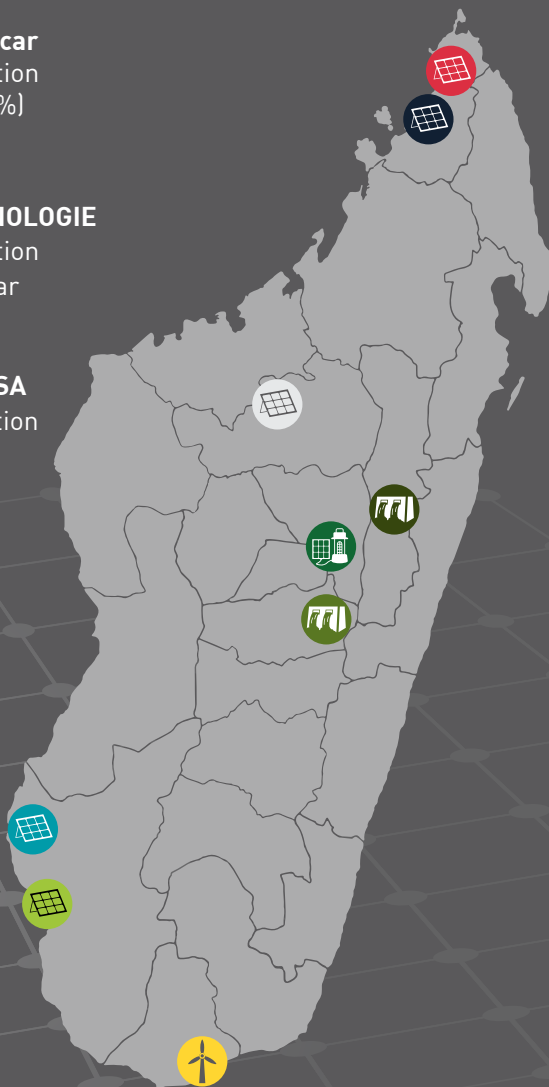
ENERGIE TECHNOLOGIE

Rural electrification
15 kW hybrid solar
Since 2017



ASSOCIATION ASA

Rural electrification
12 kW eolian
Since 2008



A LEGAL FRAMEWORK COMPLETELY EVOLVING

The New Energy Policy (NEP, 2015): An ambitious policy



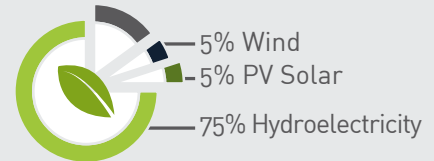
70% of households have access to modern energy



60% of industries and businesses adopt energy efficiency and thermal measures



70% of households use improved cookstoves



85% of energetic mix represented by renewable energies

Source: ORE

The Electricity Code (in process 2017-2018): On the road to renewable energies

- Introducing the renewable energies in the law
- Transparency and equal treatment
- Introducing the "green supply" license for the sale of 100% renewable energy, without prejudice to a thermal supply provision whose capacity is < 10% of the annual production in MWh
- Reviewing and simplifying thresholds for concessional documents (declaration, authorization, concession)
- Introducing the Grid Code
- Promoting the connection to the grid

The 2017 Finance Law: Supporting the Electricity Sector

- Tax reduction of -50% possible for investments made in the production and supply of renewable energy as well as in the agricultural, tourist, industrial, building and public works sectors.
- Exemption from duties and taxes on various renewable energy equipment: PV panels, solar kits, 2V batteries, etc.

The National Fund for Sustainable Energies (FNED, in process 2017-2018): A suitable tool

- National fund dedicated to sustainable energies including renewable energies
- Offers guarantees, debt and subsidy

RENEWABLE ENERGY PROJECTS DEVELOPMENT: SIMPLIFIED STEPS



Photo : EOSOL

Introduction of the Grid Code



Improving
governance of the
sector



Promoting
renewable energies



Simplifying
procedures



Rephrasing
Planning and
Pricing Principles

Declaration regime

Hydroelectricity	$P \leq 500 \text{ kW}$
Wind	$P \leq 250 \text{ kW}$
PV Solar	$P \leq 150 \text{ kW}$

Authorization regime

Thermal	$P \leq 500 \text{ kW}$
Hydroelectricity	$500 \text{ kW} < P \leq 5 \text{ MW}$
Wind	$250 \text{ kW} < P \leq 5 \text{ MW}$
Solar thermal	$P \leq 5 \text{ MW}$
PV solar	$150 \text{ kW} \leq P \leq 5 \text{ MW}$
Biomass	$P \leq 5 \text{ MW}$
Geothermal energy and marine energy	$P \leq 10 \text{ MW}$
Waste	$P \leq 5 \text{ MW}$

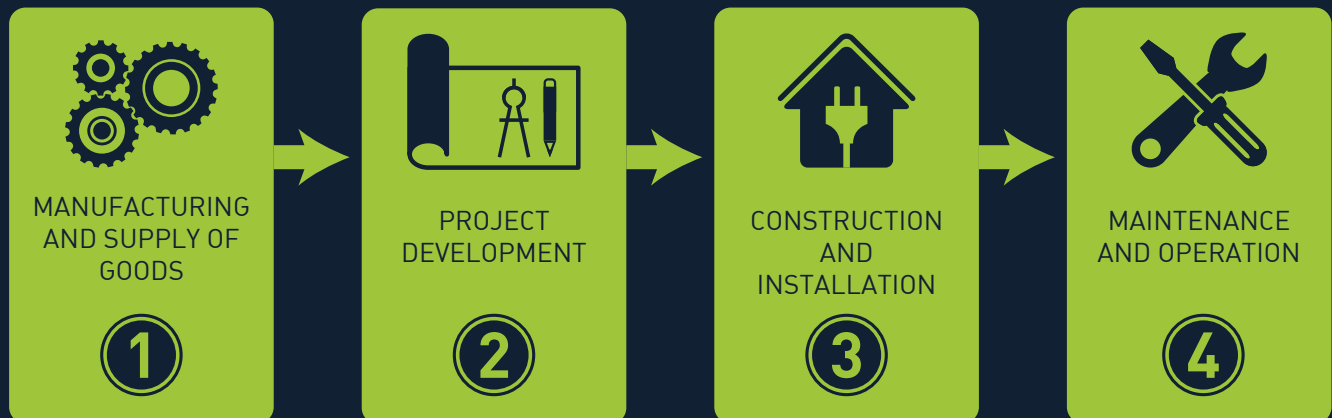
Concession regime

Beyond these thresholds, it is the Concession Regime that applies

GRADUATING TRAINING COURSES THROUGHOUT THE ENTIRE VALUE CHAIN



The renewable energy sector and the electricity sub-sector have four main components in their value chains: manufacturing, project development, construction and installation, and maintenance and operation.



In addition to existing graduating training courses, alternative education and training projects are emerging. This is the case of the Barefoot College project developed by WWF or that of the United Solar School developed by EOSOL Madagascar / GC Solar / SMA Sunbelt and GIZ.

	Degree	①	②	③	④
IST ANTSIRANANA					
New electricity technologies	Master degree	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Renewable energy and alternative systems	Bachelor's degree	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Grid communication and distribution	Master degree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
ECOLE SUPÉRIEURE POLYTECHNIQUE ANTSIRANANA					
Hydraulic and Energetic	Master degree	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
IST ANTANANARIVO					
Automation and Energetic Engineering	Master degree	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Industrial production and maintenance	Master degree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
ECOLE SUPÉRIEURE POLYTECHNIQUE ANTANANARIVO					
Telecommunication	Master degree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Electrical Engineering	Master degree	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Construction and civil works	Master degree	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Automatic, Electronics, Applied Informatics	Master degree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
UNIVERSITÉ MAHAJANGA					
Energy conversion	Master degree	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

MADAGASCAR : DIRECTIONS DEVELOPING AN ACTIVITY IN RENEWABLE ENERGIES

KEY CONTACTS



Ministry of Water, Energy and Hydrocarbons (MEEH): It ensures the design, management, coordination, harmonization and implementation of the National Development Plan (PND) and the General Policy of the Government (PGG), particularly in the energy sector (NPE 2015). It is also the authority that grants licenses and concessions for the operation, production, transmission and distribution of electrical energy.



Regulatory Office for Electricity (ORE): It has for main missions to determine, publish and monitor the prices of electricity ; to ensure the respect of quality of service standards ; to control and enforce healthy competition ; to provide mediation actions; and to ensure compliance and implementation of the Grid Code.



Development Agency for Rural Electrification (ADER): it implements the Government's policy on rural electrification. In this capacity, it promotes the supply of electricity services in rural areas; it supervises and finances rural electrification projects; it monitors projects and supports rural development initiatives.

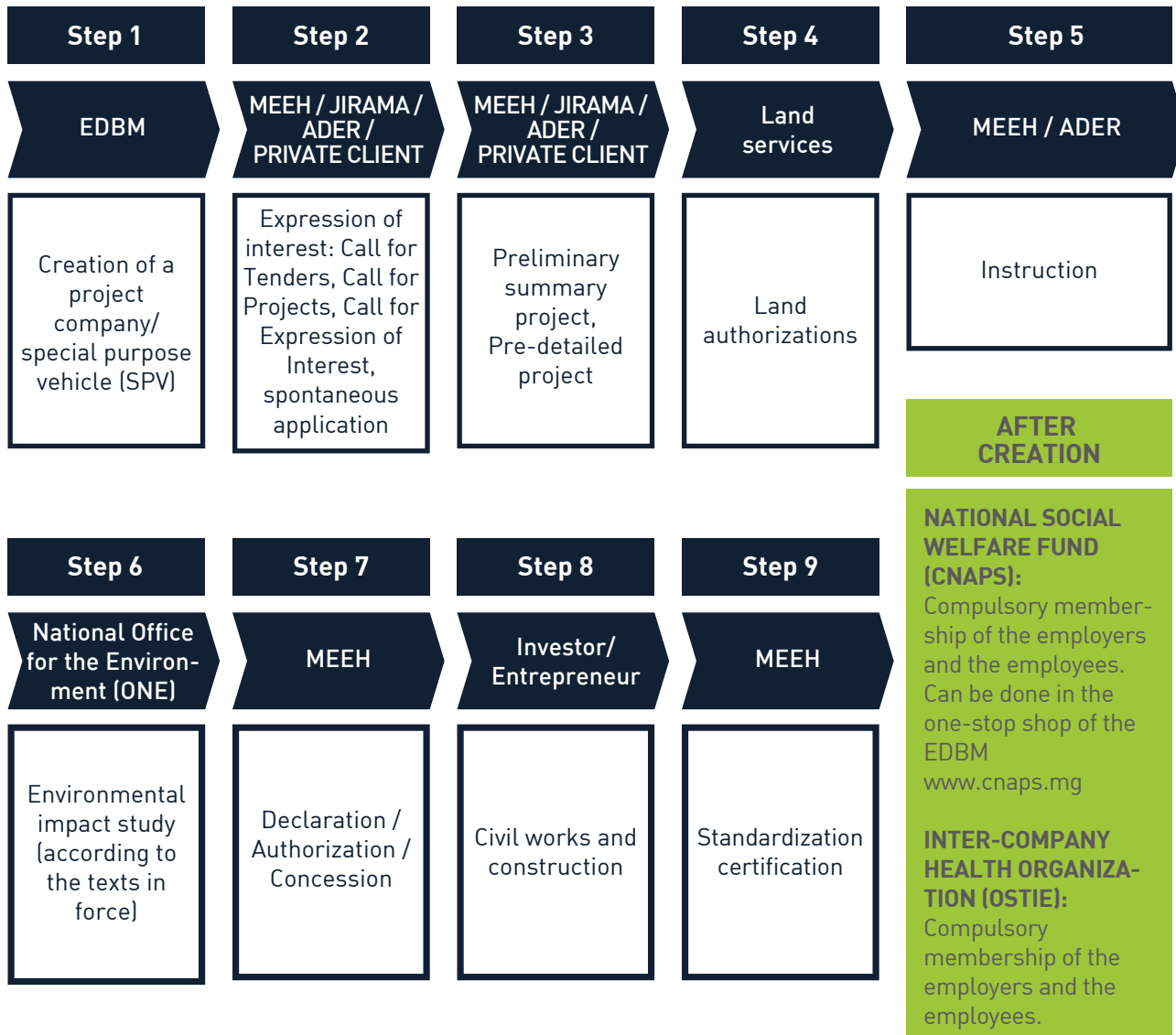


JIRAMA: State-owned water and electricity company. It is responsible for the majority of production, transmission and distribution of electricity and water services in urban areas. The company is under the joint supervision of the Ministries in charge of Water, Energy and Hydrocarbons and Finance and Budget.



Economic Development Board Of Madagascar (EDBM): It supports investors and entrepreneurs in the creation of their businesses, improves the business climate, promotes and facilitates investments and ensures the respect of competitiveness especially in the energy sector.

MADAGASCAR : PROCESS TO DEVELOP A RENEWABLE ENERGY PROJECT



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INCENTIVE TOOLS

INCREASINGLY NUMEROUS

The international community alongside Madagascar

Technical and financial partners such as GIZ, UNIDO, the European Union, KfW and AfDB, work with the licensing authorities and operators to operationalize the energy transition and to participate in the harmonization of the sector. In addition, the World Bank and its partners, together with the government, stakeholders and the JIRAMA, participate through the PAGOSE project to restructuring the governance of the state-owned water and electricity operator. International donors are more than ever committed to the sustained development of Madagascar.

- World Bank: \$ 150M fund for micro and meso finance (PAYG system, mini-grid, etc.)
- French Development Agency: SunRef program under development, offering loans to local partner banks, investment bonuses and technical support (that can be free) for green investment projects (energy efficiency, renewable energy)
- International banks (EXIMBANK): guarantees, insurance and concessional incentive rates up to 7 years, and setting up buyer credit schemes
- Central Bank of Madagascar: member of international banking groups with extensive experience in renewable energy project financing

A dynamic local market



Competition bidding between banks (BOA / BNI / Groupe BPCE / Société Générale Group) and credit guarantee institutions (Solidis / ACEP) to provide, in particular, either capital support or portfolio loan guarantees.



Microcredit and crowdfunding => 80% of the local banking sector, active support to VSEs / SMEs through direct impact project financing and consulting programs.



Impact investment funds (MIARAKAP) or venture capital funds (ADENIA PARTNER / MDP): supporting green projects from their starting point to their scaling-up.



National Fund for Sustainable Energies (FNED): guarantees, debt, subsidy.



Useful links

PRESIDENCE DE LA REPUBLIQUE DE MADAGASCAR

www.presidence.gov.mg

MINISTERE DE L'EAU, DE L'ENERGIE ET DES HYDROCARBURES

www.meeh.gov.mg

COMPAGNIE NATIONALE DE L'EAU ET DE L'ELECTRICITE

www.jirama.mg

AUTORITE DE REGULATION DE L'ELECTRICITE

www.ore.mg

AGENCE DE DEVELOPPEMENT DE L'ELECTRIFICATION RURALE

www.ader.mg

MINISTERE DES AFFAIRES ETRANGERES

www.diplomatie.gov.mg

BANQUE CENTRALE DE MADAGASCAR

www.banque-centrale.mg

DIRECTION GENERALE DES DOUANES

www.douanes.mg

OFFICE NATIONAL DE L'ENVIRONNEMENT

www.pnae.mg



**Improving the business climate in Madagascar,
promoting local and foreign investment,
facilitating the implementation of investment projects**



The Economic Development Board of Madagascar (EDBM)

is the partner of reference for investors in Madagascar. As an investment promotion agency, the EDBM has set itself the following objectives: to strengthen the competitiveness of the Malagasy private sector, increase foreign direct investment, develop incentives linked to private investment in Madagascar, accompany investors in their implementation by providing them with dedicated services through a one-stop shop for business creation and specialized advisors



EDBM 10 YEARS

ECONOMIC DEVELOPMENT
BOARD OF MADAGASCAR

EDBM'S SERVICES

Provision of economic and sector information

Liaison with central and local authorities.

Identification and connection with local potential private partners

One-Stop Shop: facilitation of establishment and support for your activities.



10 YEARS

Decree 2007,
renewed in 2014



Directly attached to the
**PRESIDENCY
OF THE REPUBLIC**



CLEAR MISSION :

Business climate,
promotion, facilitation



ONE-STOP SHOP :

Representation from 9
ministerial departments
involved in company
creation



NATIONWIDE :

8 regional offices across
Madagascar







MULTI-SECTOR :

Board members from
the public and private
sectors. Personalized
support for companies



ECONOMIC DEVELOPMENT BOARD OF MADAGASCAR

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