

2019

Climate emergency
InnoVent is working
in France and Africa

Key figures

Main capacity figures in 2018



MW fully owned

241



Energy output in GWh

462.5



MW ready for construction in 2019

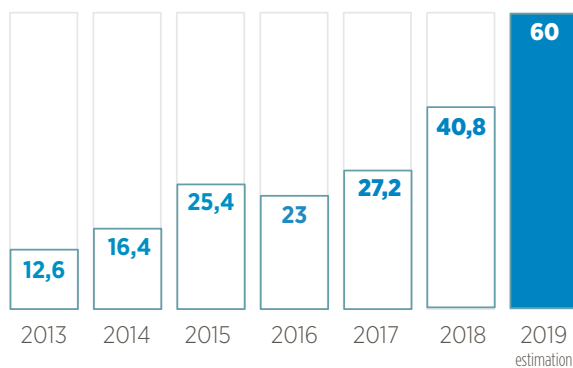
60



Pollution avoided in tonnes of CO₂

108,450

Evolution of the turnover in M€



Workforce



France

2019

38 people



Africa

2019

22 people

Edito



“

*In ten years,
InnoVent has become an
international group, established
in France and more than
12 African countries...*

The global carbon dioxide (CO₂) emission levels are on the rise since 1960, showing an increase from 320 parts per million (ppm) to 400 ppm in 2015. Nowadays, many countries and entities worldwide are uniting to tackle climate change. At InnoVent, we are doing our part by powering nations with green energy.

In France's significant deficit of € 60 billion, € 46 billion is spent on fossil fuel. The same issue impacts even more numerous countries in Africa.

With our international presence in more than 10 African countries and in France, we have spearheaded the renewable energy market evolution since 2001. In 2018, InnoVent is proud to have successfully produced 82.5 GWh in Africa, thereby cutting 74 250 tonnes of CO₂ emissions. Meanwhile, in France, we only managed to cut 34 000 tonnes of CO₂ emissions with the 380 GWh we produced as the activity of the nuclear power plants is ongoing.

Our highly competent team continuously provides answers to the challenges that InnoVent and its subsidiary face on a daily basis. In 2018, the InnoVent group accomplished to cut 1 800 tonnes of CO₂ per employee. In the same time; each member in France pays € 79 000 of various taxes.

In 2019, as our climate efficiency is 10 times greater in Africa, we are going to triple our production capacity with the creation and development of the following projects: 36 MW in Morocco, 3 MW in Comoros, 5 MW in Chad, 13 MW in Namibia and finally 40 MW in Zambia.

In France, we are going to complete our energy transition to zero carbon emission with an exclusively electric vehicle fleet, a self-energy sufficient building, about twenty hectares dedicated to biodiversity and the exclusion of SF₆ type gas in our electrical cells.

We will also continue to innovate with the very first hybrid wood/steel masts that allow us to consume 100 tons less steel and 600 tons less windproof concrete.

Grégoire Verhaeghe

CEO of InnoVent, InnoWind and InnoSun

Who are we ?

InnoVent was founded by Grégoire Verhaeghe in 2001 with the aim to design, install and operate wind farms in France.

For over 15 years, InnoVent has been using its internal resources and specialist partners to respond to the full range of issues linked to the development, construction and operation of wind and solar farms. Through its experiences, InnoVent became a skillful company that is well recognized in its field

With a long term vision, InnoVent chose to export its know-how in solar farms and wind turbines to ten countries in Africa with its subsidiaries InnoSun, Innowind and InnoVent.

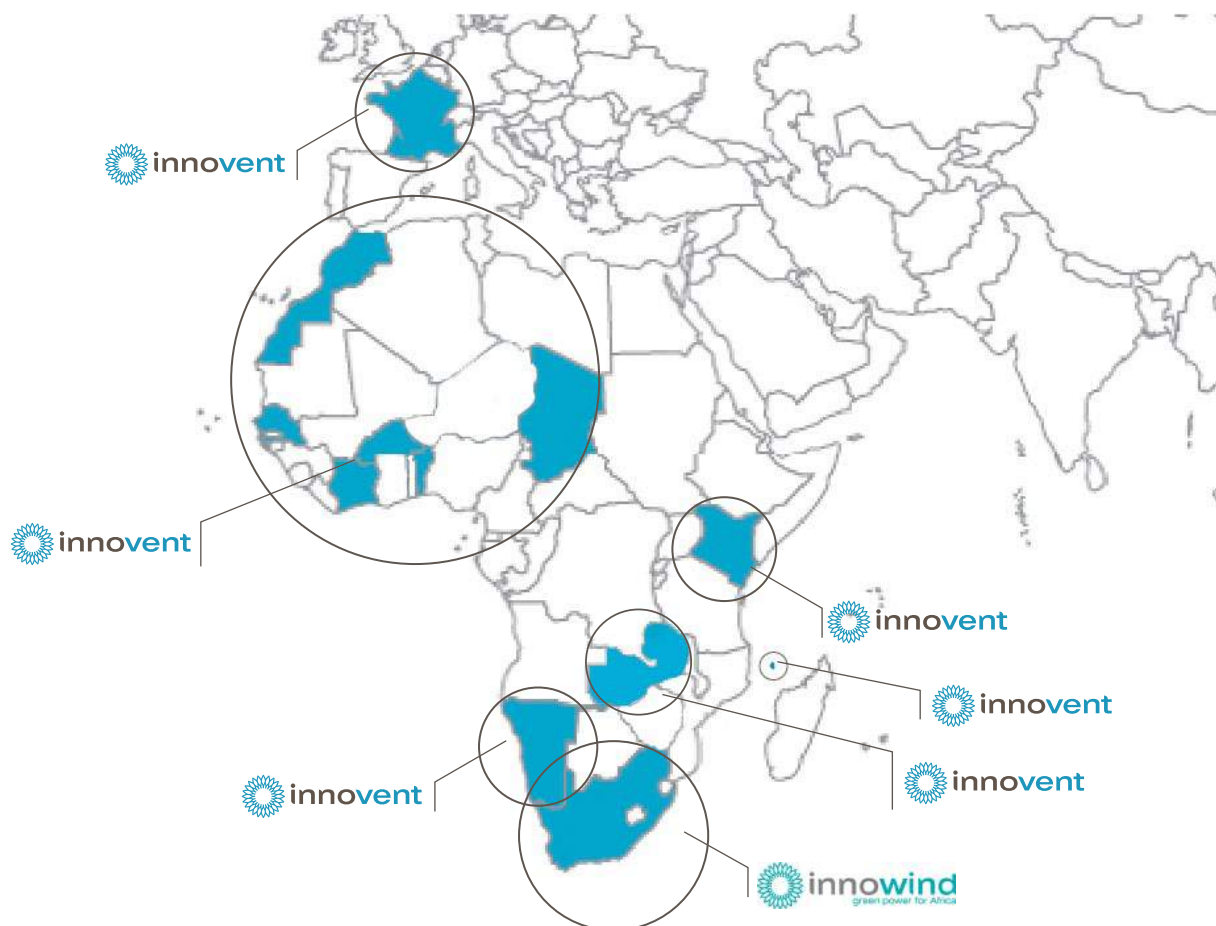
InnoVent invests in research and development of renewables energy technology, biogas, energy storage.

Today, InnoVent commits to expand its activities in France and in Africa, operating and taking decisions independently. In addition to its current activities, InnoVent is also developing new projects while awaiting to commission other ones.

516 MW

constructed since the creation of InnoVent

Locations





Buire le Sec wind farm in France

A sustainable vision

InnoVent wishes to reinforce its presence in France and in Africa through major investments in project development, R&D and Human Resources. Each year, InnoVent's team works on new renewable energy projects.

InnoVent is keen on sharing its knowledge and

expertise in order to utilize the natural resources that France and Africa can offer to produce clean, competitive and sustainable energy. We will continue to invest and trust in people and new technologies in order to achieve our goal: supplying clean energy to the largest population around the globe.

InnoVent vehicle fleet

- **27** electric cars
Tesla and Renault Zoe, charged by wind and roof top solar power.
- **4** NG*
- **9** diesel cars

*Natural Gas



InnoVent's vision

InnoVent sees itself as a big actor in the development of the energy sector. The issue is no longer just to supply kWh: rather already come forward with solutions for tomorrow: service in terms of frequency support, reserve capacity, auto-consumption, autonomous systems, hybridisation of generator sets, etc. InnoVent has developed its expertise in these fields and selected the best partners to providing energy storage and auto-consumption systems in order to offer these new solutions.

The wind farm at Essey les Ponts, for example, contributes to supporting frequency with its 5 MW of inverters connected to 10 MWh TESLA batteries. The solar farm under construction in Chad is connected to the generator sets in the town of Abéché, thereby saving 3,500 litres of fuel oil per annum.

Our expertise



Solar park of 5 MW of Aussenkher in Namibia.

Development

Our developers look for, define and mark out potentially suitable sites for wind and solar farms in France and on the African continent, taking into account the opinions of local populations.

Zones need to be defined in accordance with a wide range of spatial constraints, and meetings have to be held with local elected representatives and farm owners of the land that may prove suitable for the installation of wind turbines or solar photovoltaic panels.

Once an agreement has been reached, we have to carry out a number of feasibility studies: detailed study of the power network, impact study (landscape, acoustic, animal and plant life, etc.), Environmental Merge Protection (ICPE) studies in France (safety, health merge study). InnoVent and its subsidiaries have the human and technical means to carry out all these studies. Only the animal, and plants and habitat studies are outsourced to approved consultants.

During the entire project development phase, we follow thoroughly all local regulations and seek for all necessary authorizations.

7 to 10 years

Average to develop and build a wind farm in France

Financing

A wind farm or solar farm requires a large investment of around 1 to 1.2 million euros per megawatt installed. To set up these wind and solar farms, InnoVent relies on solid partnerships with a number of banks. Our internal teams take responsibility for obtaining the bank loan to develop our energy farms in France and on the African continent.

The initial development costs for a site are also high: wind studies, impact plus ICPE studies and mobilizing a team for many years. Therefore, it's critical to know that the

developer's business is sustainable.

InnoVent used to cover its development cost by selling some of its own its parks additionally to external investment. Today, InnoVent has the financial capacity to finance the development costs of a large number of future energy farms. InnoVent's 35 million euros worth of equity capital and its considerable experience show that we are able to obtain the required finance from the banks to enable us to further develop the company.

1,2 M€

Price of the MW installed



Fiefs wind farm in France



Construction

InnoVent and its subsidiaries run the energy farm projects, supported by the leading service providers in the wind and solar power industry.

Our teams coordinate all the various subcontractors, from connecting the site to the power network to service roads, foundations, the arrival of the machines and panels on site, right up to the moment when the equipment goes into production.

Thanks to our 15 years of expertise, we successfully manage to monitor our projects from the preparation of the site to the commissioning of the energy farm.

Our soil studies as well as the sizing of the foundation blocks are carried out by specialist firms. The foundation blocks and service roads are built by local subsidiaries of major groups.

14 ha

Footprint of a 4.5 MW solar PV plant



Operation and Maintenance

We currently take responsibility for the maintenance of a large number of our wind farms. Our team of engineers on the field is connected to 35 of our machines 24 hours a day via the Internet. If needed the wind turbines can send messages indicating the possible causes of breakdowns to help our teams work more efficiently on the field.

We ensure an availability over 95 % of our installations to maximize production.

To maintain production, and for a project to be feasible, it should be technically possible to connect to the power grid at a satisfactory financial cost.

In France, electricity production from our wind turbines is connected directly to the Enedis power network and bought by EDF.

In Africa, our electricity production is sold according to the laws of each country. (Nampower, Eskom, ONE, Sénélec, etc)

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Employees for the operation and maintenance

CSR

The world is changing faster and more profoundly than ever. We deeply believe that it is possible to slow down the pace of global warming while improving the quality of life and the environment of human beings :

- Providing new jobs with the construction of wind and solar farms
- Encouraging the development of the local economy
- Offering local populations access to clean energy at a low cost
- Offering an alternative energy that can compete with the polluting forms of energy
- Committing our teams on a supportive, long-term basis

Donations and charitable contributions

InnoVent donates regularly to various associations working in areas matching our values. In recent years, InnoVent has supported various projects for local associations maintaining heritage or organisations in the social sector.

An association that is particularly dear to our hearts is **Muzukidz**.

Maria Botha, the initiator of the project, gives violin lessons to underprivileged children in three towns in Cape area in South Africa. This initiative offers young people a channel to escape their daily life challenges through music.

Link : <http://www.capetownviolinacademy.co.za/muzukidz.html>



Solar park of Sakal, Senegal



It's a pleasure to work every day for the development of renewable energies in Africa. Solar, hydro, wind and biomass produce a competitive electricity, quickly implementable and provide sustainable job opportunities.

Grégoire Verhaeghe

Biodiversity reserves

In the interest of eco-responsibility, InnoVent proposes offsetting measures for each new wind project. In order to minimise the environmental impact of our machines, several solutions are available to us, such as the installation of nesting boxes for bats or birds. InnoVent decided to do more by supporting the establishment of biodiversity reserves and water points.

For new developed wind projects, InnoVent finance the reforestation of the land belonging to the project's host municipality. The reforested area allows some animal species to find refuge and to flourish again. The ultimate goal is to have a biodiversity reserve for each new wind farm developed.

To date, InnoVent has already created an eight-hectare reserve in the Valhuon municipality in the Department of Pas-de-Calais. Reserves will be set up in Buire-le-Sec (4 ha) in the same department and in Crouy (1 ha) in the Department of Aisne in 2019.

In Senegal, nearly the solar power plant of Sakal, a farm financed by InnoVent is under development. The installation of a solar pump permitted the planting of fruit trees on 5 hectares (lemon tree, orange tree, mango tree) and the arrival of the first poultry. This farm allows the development of a new economic activity that benefits the population of villages nearby.

Financial and technical partners

A wind or solar farm requires a high level of investment of around 1 to 1.2 million euros per megawatt installed. From the outset of a project, it is therefore important to ensure that the developer has the capacity to complete the project, with the help of financial partners and sound techniques, and to bring the investment to a successful conclusion.

Financial partners

InnoVent receives support to finance its projects from French, European, world and African banks to finance its many projects: ARKEA, BPI, DBN, IFC, CREDIT COOPERATIF, CMNE, Crédit Agricole, BNP Paribas, Bank of Windhoek, Caisse d'Épargne Hauts de France, LCL, Banque palatine, Crédit du Nord etc.

We also finance our projects on Lendosphere. It is a crowdfunding platform dedicated to sustainable development projects. On Lendosphere, private individuals lend, with interest in return, to project developers in whom they believe. InnoVent has already proposed twenty projects over the past four years.

Link : www.lendosphere.com



14 million Euros borrowed to individuals through the Lendosphere crowdlending web platform for 26 projects from InnoVent within 4 years

Technical partners

In our quest for maximum reliability of the wind turbines and solar panels, InnoVent has placed the emphasis on using the most advanced technologies.

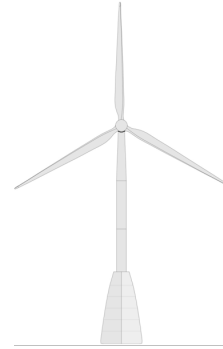
We are targeting an availability rate of at least 98%, a 40-year life span and controlled maintenance costs. We also want to contribute towards regional economic development.

To meet these objectives, we have chosen suppliers who offer machines that meet our requirements: Vensys, Siemens and XEMC for wind, and Canadian Solar, Optimum Trackers, DELTA for solar.

InnoVent, InnoSun and InnoWind have set up, over the last years, strong relationships with development banks, commercial banks, private equity funds, local subsidies as well as African and French states.

Research & Development

InnoVent invests heavily in research and development in order to answer some of the questions that French citizens ask about renewable energies. The issues raised in the field are often about the carbon footprint of wind turbines, the amount of concrete in foundations, foreign builders and also the visual impact of the wind turbines. InnoVent tries to find solutions for these issues:



Hybrid masts wood/steel

Hybrid masts



The hybrid masts in Essey les Ponts

InnoVent has identified a new challenge: how to reduce further more its carbon footprint. This is why InnoVent has developed a new concept in terms of a hybrid wood/steel mast.

More than 20,000 GJ are needed to manufacture a 100 m-tall steel mast (237 tonnes, made in Turkey and/or China) and it consumes 1,300 tonnes of CO₂. Our new hybrid steel/wood lattice mast of the same size, made of wood from French forests and machined in France, requires only 6,000 GJ for its manufacture. And it captures 175 tonnes of CO₂.

In addition, the spacing of the lattice mast's feet demands much less effort. Moreover, the spacing of the foundation anchor points in the ground means that, instead of a large block, seven times less concrete is needed for the foundations.

This choice also favours European technological innovation and industrial activity in rural areas.

The first hybrid masts in the world are currently being made in the Departement of Haute-Marne.

Transponder detector

The visual pollution that the flashing beacons on top of the turbines create for the millions of French people living near the wind farms creates an aversion to the wind power sector that is understandable.

It is on the basis of this observation that InnoVent decided to develop a transponder detector. This box, installed at the top of the wind turbines, allows the detection of the signals emitted by the aircraft transponders. When an airplane is detected, the camera will automatically turn on the flash. The detection sensitivity is adjustable in height and distance. With detection limited to 5,000 meters altitude and 30 kilometers radius, the flashes only light up 1 to 2% of the time.

These detectors are currently banned in France. However, InnoVent is doing everything to have them authorised and to market them.



The transponder detector

InnoVent's partners are...

RossiniENERGY

Rossini Energy, a company set up by Luca Rossini, became a partner of InnoVent in 2018, resulting in a perfect partnership between renewable energies and the storage of electrical energy. Rossini Energy has created several systems which assist in regulating clean energy in the electricity grid:

The intelligent terminal or cable:

It is the perfect interface between the production of renewable energies and the charging of electric cars. Using smart charging stations, Rossini Energy promotes auto-consumption or allows renewable energies to feed into the grid in a controlled manner.

Mineshafts:

Rossini Energy wants to set up a system for the creation and storage of clean energy using the old coal mineshafts in the Hauts de France region and other regions.

Forklift trucks:

Rossini Energy enables the batteries in forklift trucks with solar installations used to store energy not consumed during the day, and thus promotes auto-consumption.

Website : www.rossinienergy.com



The Intelligent cable of Rossini Energy



A methanizer Nénufar.

NÉNUFAR

Nénufar became a partner of InnoVent in 2015. The company specialises in the auto-production of methane on farms. The company's key innovation is the Nénufar cover. It makes it possible to transform any manure storage pit or digestate into a biogas production unit. Nénufar is able to respond to any demand for the production, transport, treatment and valorisation of biogas.

The Nénufar cover, tailor-made in France, allows the biogas to be recovered and used directly on the farm (transformation processes, heating of buildings, drying of fodder, etc.), while retaining smells and greenhouse gases.

Auto-methanisation on the farm is then profitable for human-sized farms.

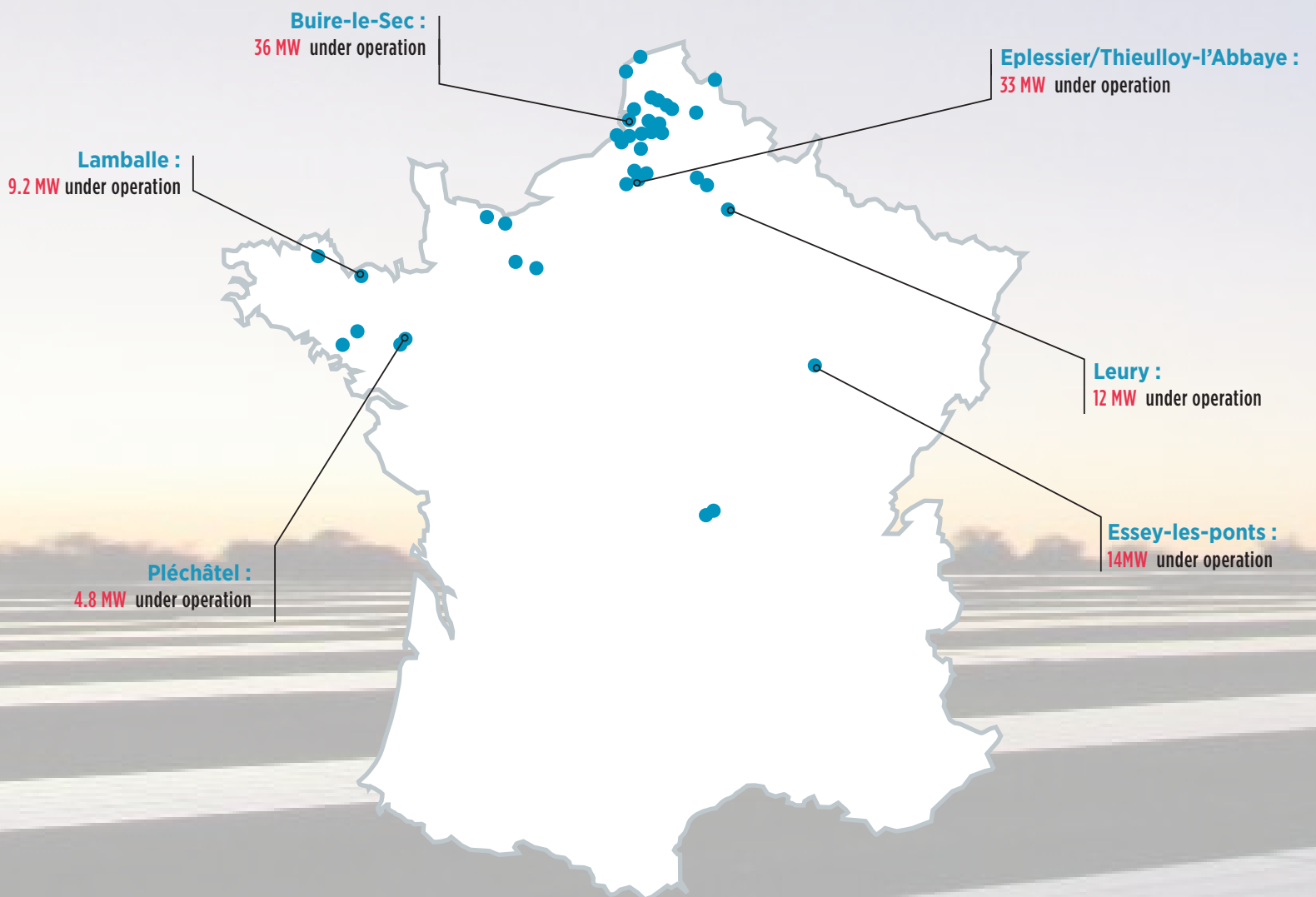
Website : www.nenufar-biogaz.fr/



Our locations

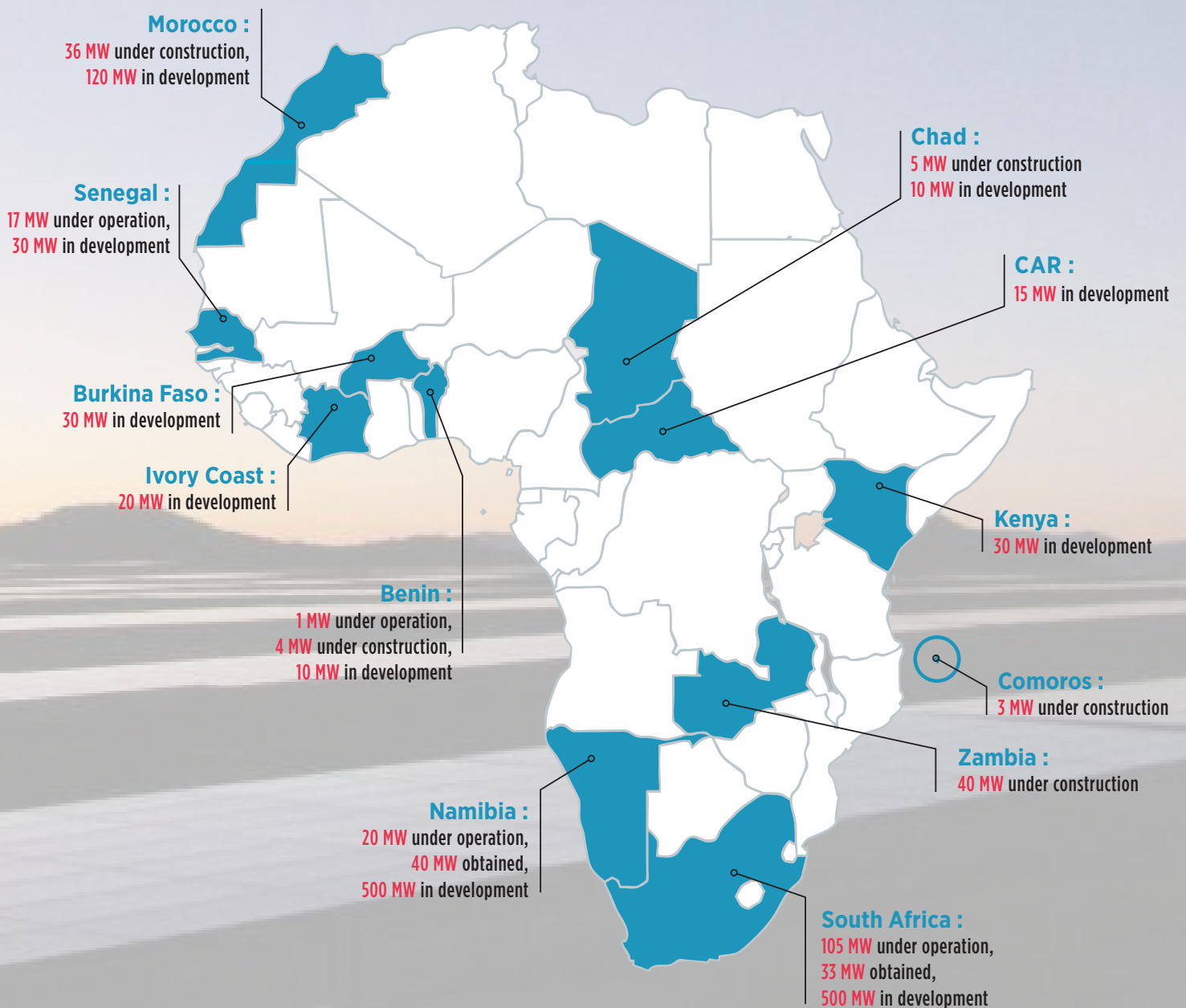
France :

373 MW under operation,
12 MW under construction,
100 MW in development



Africa :

143 MW under operation,
88 MW under construction,
73 MW obtained,
1265 MW in development



France - InnoVent

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Tel : +33 3 20 01 30 12

Ivory Coast - InnoSun

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Comoros - InnoVent

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Nénufar

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