2020 edition

ENERGY ACCESS : PRESENTATION OF THE KNOW-HOW *MADE IN FRANCE*

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ADEME
AGENCY FOR ECOLOGICAL TRANSITION

ser French Renewable Energy trade association

This document is published by SER,
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ADEME
AGENCY FOR ECOLOGICAL TRANSITION

Here at ADEME - the French Agency for Ecological Transition - we are firmly committed to fighting global warming and the depletion of our natural resources. On all fronts, we mobilise citizens, economic actors and territories, giving them the means to move towards a fairer, more harmonious, low carbon and resource-efficient society. Whatever the field - energy, air, circular economy, food, waste disposal, soils, etc. - we advise, facilitate and help finance many projects, from research to solutions sharing. At every level, our expertise and forecasting capacities serve to guide and inform public policies.

ADEME is a public agency under the joint authority of the Ministry for the Ecological Transition and the Ministry for Higher Education, Research and Innovation.

www.ademe.fr

ser French Renewable Energy trade association

The Syndicat des énergies renouvelables (French Renewable Energy Trade Association) was founded in 1993 and comprises, whether directly or indirectly, several thousand businesses, resource producers, manufacturers and installers, power plant developers and operators, and specialist professional organisations, representing the different sectors. Its members include world leading energy companies as well as local groups and stakeholders in the renewable energy sector, but above all it comprises a large number of SME's. Its mission is to increase renewable energy's share of the energy produced in France, and to promote the interests of the industrialists and professionals operating in the sector, in both the domestic and foreign markets. As a key contact for the public authorities and a proactive representative of the whole sector, the SER works with French, European and worldwide institutional bodies to help draft and implement renewable energy development programmes, and also serves as a catalyst in efforts to structure French export streams.

www.enr.fr

A WORD FROM THE CHAIRMAN OF SER, THE FRENCH RENEWABLE ENERGY TRADE ASSOCIATION

Jean-Louis Bal

Sustainable development goal n°7 aims to ensure access to affordable, reliable, sustainable and modern energy for all by 2030. Despite the progress made in recent years, 789 million people remain without electricity, while several hundred million have to depend on unreliable power supplies that prevent any kind of lasting economic development.

Although the global electrification rate did rise from 83% in 2010 to 90% in 2018, behind these figures lie significant geographical disparities. While Latin America and South-East Asia have achieved a rate of 98% electrification, in 2017, 570 million people living in Sub-Saharan Africa were still unable to access electricity.

Yet, the technological solutions already exist. The drastic reduction in renewable energy production costs, combined with the development of digitalisation, has opened up a whole raft of sustainable, affordable solutions for populations without access to electricity. Meanwhile, storage technologies have made enormous progress and the cost is following the same downward path as that of renewable energy.

Clean cooking is still a segment where our efforts need to increase tenfold. In 2017, about 3 billion people worldwide still had no access to sustainable, non-polluting cooking systems. Here too, innovative solutions are available, but they are thwarted by regulatory, organisational and cost-based obstacles.

French actors of the renewable sector, including administrative regions, NGOs and innovative businesses, have the wherewithal to meet these vast needs. France's offer – whether in terms of technologies (e.g. multi-purpose public lighting systems, pico, micro and mini-networks, renewable cooling, multifunction kiosks), new ways of financing and supporting economic development in electrified villages, or regional initiatives facilitating the emergence of a sector – deserve to be promoted and made more visible.

Therefore, in late 2018, ADEME and the SER launched a national Access to Energy task force, intended to structure the sector in France and optimise coordination between the different types of stakeholders, identify the primary obstacles preventing solutions from being implemented, and make an inventory of the French offer. This inventory serves as the foundation stone for an attempt to structure the sector, granting increased knowledge of our strengths, as well as showing where are the missing links that prevent us from meeting people's expectations.

This document, presenting the French offering in terms of access to energy, is the national task force's first contribution to a market brought to weigh over 8 billion USD in 2022, and which has grown by nearly 30 % p.a. over the last 2 years.

A WORD FROM THE CHIEF EXECUTIVE OFFICER OF ADEME, THE FRENCH AGENCY FOR ECOLOGICAL TRANSITION

Arnaud Leroy

One of UN's Sustainable Development Goals for 2030 is to ensure access to affordable, reliable, sustainable and modern energy for all. Yet, according to the latest "Tracking SDG 7 - the Energy Progress Report", today, with less than 10 years left to achieve this goal, 789 million people worldwide remain without electricity and around 2.8 billion people have no access to clean cooking systems. Access to energy is at the crossroads of the fight against poverty and global warming, as well as the improvement of living conditions and people's health. It is vital to find levers of action that will help to create a true dynamic for change and mobilise stakeholders to work together in a coordinated manner.

For nearly 30 years, ADEME and its partners have contributed to the implementation of access-to-energy solutions based on renewable energy, primarily in Africa. From providing support to public policies to strengthening local skills and funding innovative projects, ADEME has played a pioneering role in introducing lasting solutions that meet the needs in rural and peri-urban areas.

In areas such as these, it is often better to develop decentralised solutions that are most suited to the local geographical, social and economic conditions. This is why, in 2017 and 2019, we launched two calls for projects in partnership with the French Ministry for the Ecological Transition and the French Development Agency, respectively. These calls aimed at supporting the implementation of innovative, off-grid renewable energy solutions. The selected projects do not just involve technological innovations, but also promote new organisational frameworks and support technologies deployment through business models that should ensure their sustainability.

We also launched an initiative in partnership with the French Renewable Energy Trade Association to strengthen the joint mobilisation of French stakeholders engaged in the field of access to energy. France has many advantages when it comes to renewable energy, with several dynamic businesses, start-ups and NGOs that all have very precise knowledge of the needs and challenges of the areas most affected by access to energy issues.

Despite this, the French know-how needs to increase its visibility among international organisations and contractors. Thus, the aim of this brochure is to showcase solutions developed by French companies, NGOs, Regions and associations, with numerous examples of projects carried out abroad.

In short, the solutions are there: it's time to accelerate their deployment!

We wish you an insightful reading.

FOCUS ON THE 2017 ADEME CALL FOR PROJECTS: INNOVATIVE SOLUTIONS FOR OFF-GRID ACCESS TO ENERGY

In the framework of the French co-founded initiative Mission Innovation, launched at COP21 to increase R&D financing for decarbonized energy technologies, ADEME launched in 2017 a call for projects on innovative solutions for off-grid energy access. Its purpose was to enable the development of innovative projects carried out by French companies or NGOs in partnership with local stakeholders (particularly in Africa). 9 projects were selected for a total budget of 5.8 million euros and an ADEME financial support of 1.8 million euros.

The 9 selected projets are located in Africa (Benin, Burkina Faso, Cape Verde, Madagascar, Mauritania, Uganda and Togo) and combine technological, social and business model innovations. You will find a brief description hereunder.

For more information, see:
https://www.ademe.fr/innovative-solutions-for-off-grid-access-to-energy

TECHNOLOGICAL INNOVATIONS

1


2


3

ERHYGE / MADAGASCAR

The "ERHYGE" project in Madagascar is led by Guinard Énergies, in partnership with the French NGO GRET and the Malagasy SM3E company. It aims to provide access to energy via a hybrid electricity production system combining solar panels, batteries and the P66 river turbine. This innovative river turbine designed by Guinard Énergies can produce up to 3.5 kW of electricity and is both compact and easy to set up. It also perfectly suits the local context as it has reasonable size and cost.

DESOLFU / CAP-VERT

The "DESOLFU" project in Cape Verde is led by Mascara Renewable Water, in partnership with ELSEG and the local authority. In a context of extreme water scarcity, the project aims to set up an innovative solar desalination system that meets the inhabitants' needs (20 cubic metres per day). This infrastructure, the OSMOSUN® 20, is also easy to set up, operate and maintain.

IINDUSTRIAL TYPHA BIO-CHARCOAL / MAURITANIA

The "Biocharbon Typha Industriel" (Industrial Typha bio-charcoal) project in Mauritania is led by GRET, in partnership with the Rosso Institute for Higher Technology Education (ISET). This project emerges after several years spent developing typha processing technologies. Typha is an invasive reed living in the Senegal river and causing agricultural decline, rural exodus and vector-borne diseases recrudescence. The project consists in setting up an industrial capacity pilot plant producing typha biocharbon, within a Mauritanian company. Thanks to the transformation of this invasive reed, the project will provide healthier and cheaper biocarbon to replace charcoal.

1. P66 river turbine, ERHYGE project in Madagascar © Guinard Énergies
2. OSMOSUN 2.6 SW unit, DESOLFLU project in Cape Verde ©Mascara
3. Industrial typha bio-charcoal project in Mauritania © GRET

SOCIAL OR BUSINESS MODEL-RELATED INNOVATIONS

EMPER / TOGO

The "EMPER" project (Renewable Energy Micro-Producers) in Togo is led by Benoo Energies, in partnership with the Togolese NGO ETD (Enterprises, Territories and Development). The project aims to produce electricity and provide energy services through scalable solar kiosks ("energy agencies") managed by local businesses. The project also develops a mobile app to help local entrepreneurs manage the energy agencies and calculate their turnover.

PIVERT / BENIN

The "PIVERT" project (Green Innovation, Energy and Processing Clusters) in Benin is led by SENS France, in partnership with SENS Bénin, local authorities and Investi'SENS Bénin, a Beninese group of inclusive investors. A PIVERT centre relies on a service company called ESSOR (Inclusive Rural Services Providers), which provides power for both domestic use and agri-food processing (threshing, shelling, grinding, etc.). These processes create economic value that is eventually shared between the ESSOR and its clients, thereby generating viable, lasting and inclusive economic and social development. PIVERT centres are scalable in order to suit specific local needs. They develop gradually depending on villages demand.

SISAM / BENIN, BURKINA FASO, TOGO

The "SISAM" project (Enhanced Solar Irrigation Solution) is implemented in Benin, Burkina Faso and Togo by the NGO Electriciens Sans Frontières, in partnership with the Burkinabe NGO Dakupa, the Togolese association JARC, the Beninois NGO Action Bénin Solidarité, the PRACTICA foundation and the NGO Positive Planet International. The project aims to provide access to renewable energy to small market gardeners through a high-performance and sustainable irrigation system. This latter relies on a new locally produced pumping technology using solar powered engines, optimized to suit a shallow pumping range. The project includes micro-financing solutions along with affordable prices, as well as management and maintenance support for local farmers and businesses.

ZEMBO / UGANDA

The "ZEMBO" project (leasing of electric motorcycles) in Uganda is led by ZEMBO France and ZEMBO Ouganda. The project addresses the dual challenge of using motorcycle taxis in Uganda: this activity generates significant pollution and represents a financial burden for drivers who usually have to rent their motorbikes. To this end, the project aims to sell at least 200 electric motorcycles via leasing agreements. It will also set up a network of solar power stations to provide a battery-charging service.

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5

6

7

CROSS-CUTTING PROJECTS (SOCIAL AND TECHNOLOGICAL INNOVATIONS)

LATERAL ELECTRIFICATION / MADAGASCAR

The Lateral Electrification project in Madagascar is led by Nanoé in partnership with Michaud Export, the Malagasy consultancy firm Sintogno and Club ER. It offers a new electrification model based on the gradual connection of nano-grids. Nano-grids provide a flexible, safe and quality service, and can supply affordable electricity to 4 to 6 homes. Nano-grids are built and operated by local entrepreneurs, in order to develop an income-generating activity.

PAYGO AND MICROFINANCE / BENIN

The "PAYGO and microfinance in Benin" project is led by the NGO Pamiga in partnership with the French company MyJouleBox and the Beninese company ARESS. It aims to develop 'pay as you go' (PAYG) solutions, with an innovative financing mechanism provided through Microfinance Institutions (Solar Microcredit). It also creates a distribution network made of Energy Entrepreneurs located in rural areas. In this way, the project addresses three challenges hampering the development of solar power in Benin. First, clients' capacity to pay upfront for solar equipment Secondly, distributors' challenges in terms of pre-financing their solar solutions. Thirdly, distributors' difficulties to cover the last mile when they are to reach clients in non-electrified areas. Technological innovation also represents a significant part of the project. Indeed, the PAYG meter, developed by MyJouleBox, enables to safely commercialize solar energy systems of a wide power range (50 to 6,000 Wc) through credit mechanisms. This innovative meter can be used with both AC and DC systems. It is combined with a monitoring platform that centralizes information about clients, payments and electricity consumption in real time. It also allows a flexible offer of services, thanks to system capacity growing gradually, and financial flexibility.

4. EMPER project in Togo © Iris Nicomedi / ADEME
5. ZEMBO project in Uganda © ZEMBO
6. Lateral electrification project in Madagascar © Nanoé
7. PAYGO and microfinance project in Benin © PAMIGA

PROSPECTS
FOLLOWING THE CALL FOR PROJECTS

To sum up, these innovative projects address many challenges: financial accessibility and the innovative business models, their adaptation to the local context, the importance of bringing various stakeholders together, customer loyalty, the strengthening of local capacity and the development of income-generating activities.

This call for projects mobilized many economic and non-governmental organisations in France and Africa. While innovations already exist, this call for projects proves that there are still many challenges to be addressed, especially in the regulatory and financial fields. One of the main issues faces by small project developpers is the moving from a demonstration project to funding the deployment phase.

Considering the success of this call, and in order to continue the mobilisation and discussions among stakeholders on the challenges that have come to light, ADEME and the French Development Agency (AFD) launched a second call for energy access projects in 2019. This second call built on this dynamics by supporting the development of innovations and their large-scale deployment, this time exclusively in Africa.

For the second time, project leaders proved their great capacity to innovate: at the end of the selection process, 10 out of the 80 submitted projects were selected to benefit from a financial as well as technical assistance (this latter concerns for instance reaching financial close or conducting an impact assessment).

OBJECTIVE:
SHOWCASE THE FRENCH OFFER ABROAD

One of the objectives of the national Access to Energy task force initiated by ADEME and the SER was to contribute to the promotion of the French know-how concerning renewable energy access.

At the first national conference on Energy Access held in June 2018 and at the task force kick-off meeting that followed, the stakeholders identified four priority working areas: regulatory framework, cooperation between stakeholders, innovation and financing.

French stakeholders all felt that there was insufficient knowledge of the French know-how concerning the various energy access technologies, as well as the capacities and programmes implemented by NGOs or regions. This lack of visibility also concerns international decision-makers, energy ministers, bi- and multi-lateral financial institutions and local economic players (businesses, development agencies, etc.).

In order to catalyse multi-actor integrated offers, the first step is to conduct a comprehensive knowledge of Businesses', NGOs' and administrative regions' know-how and expertise.

The aim of this document is to give visibility to the current French offer, and to structure it according to needs, technologies and position in the value chain.

This inventory of the French know-how is intended to be a living, regularly updated document.

INDEX BY TECHNOLOGIES OFFERED

	Page	Mini-grid	Pico/micro-grid	SHS - solar home systems	Pico solar light	Clean cooking	Storage	Pay As You Go solutions	Training platforms	Innovative means of production and agrivoltaics	Smart grids	Socially-orientedengineering, Technical assistance
AGENCE DE DÉVELOPPEMENT ET D'INNOVATION DE LA NOUVELLE-AQUITAINE	14	●	●	●								
AKUO ENERGY	16	●	●				●			●		
ARTELIA	18	●	●	●	●		●		●	●	●	●
BAOBAB+	20			●	●			●				
BENOO ÉNERGIES	22											●
BEST ENERGIES	24		●		●	●				●		
ÉCOSUN INNOVATIONS	26	●		●								
ÉLECTRICIENS SANS FRONTIÈRES	28	●	●	●	●					●		
ENGIE AFRICA	30	●	●	●		●	●	●			●	●
ENTREPRENEURS DU MONDE	32		●		●			●		●		
EXPERTS-SOLIDAIRES	34	●		●		●	●		●			●
FONDATION ÉNERGIES POUR LE MONDE	36	●	●	●								
GAIA IMPACT FUND	38	●	●	●	●	●		●	●	●	●	
GÉNÉRALE DU SOLAIRE	40	●					●			●		
GRET	42	●				●			●			●
GUINARD ÉNERGIES	44	●	●							●		
HÉLIOSLITE	46	●					●			●	●	
INFINERGIA	48											
INNOVATION ÉNERGIE DÉVELOPPEMENT (IED)	50	●	●	●	●		●	●	●	●		●
INSTITUT SMART GRIDS	52	●					●		●		●	
LAGAZEL	54			●	●							
LE PARTENARIAT	56	●	●		●	●						
MASCARA RENEWABLE WATER	58	●										
MOON	60			●				●				
MYJOULEBOX	62	●	●	●	●		●					
NANOÉ	64		●					●	●		●	●
PAMIGA	66	●	●	●	●			●				
PÔLE MEDEE	68	●	●				●		●	●		
QOTTO	70			●			●	●				
RÉGION HAUTS-DE-FRANCE	72	●	●	●			●				●	
REYES GROUPE	74	●	●				●			●	●	
SABELLA	76									●	●	
SCHNEIDER ELECTRIC	78	●	●	●	●				●			
SETEC ÉNERGIE ENVIRONNEMENT	80										●	
SUN'AGRI	82									●		
SUNNA DESIGN	84		●				●	●				
SUPERGRID INSTITUTE	86	●									●	
SYNERGIE SOLAIRE	88	●	●	●		●						
TOTAL	90			●	●			●				
TOTAL EREN	92	●					●					
ZEMBO	94						●	●		●	●	

INDEX BY NEEDS MET

	Page	Agriculture	Electricity	Water (pumping, treatment, desalination)	Street lighting	Multiservices (e.g.: solar kiosks, water kiosks)	Cooling	Cooking	Technical assistance	Microfinance
AGENCE DE DÉVELOPPEMENT ET D'INNOVATION DE LA NOUVELLE-AQUITAINE	14			●	●	●				
AKUO ENERGY	16	●	●							
ARTELIA	18		●	●		●	●		●	
BAOBAB+	20	●	●				●	●		●
BENOO ÉNERGIES	22			●		●	●		●	●
BEST ENERGIES	24	●	●				●		●	
ÉCOSUN INNOVATIONS	26		●							
ÉLECTRICIENS SANS FRONTIÈRES	28		●	●	●	●			●	
ENGIE AFRICA	30	●	●	●	●	●	●		●	●
ENTREPRENEURS DU MONDE	32	●								●
EXPERTS-SOLIDAIRES	34		●	●				●	●	
FONDATION ÉNERGIES POUR LE MONDE	36	●	●	●	●		●		●	
GAIA IMPACT FUND	38	●	●	●			●	●	●	●
GÉNÉRALE DU SOLAIRE	40	●	●	●	●	●				
GRET	42	●	●	●	●	●	●	●	●	●
GUINARD ÉNERGIES	44		●							
HÉLIOSLITE	46	●	●	●						
INFINERGIA	48		●	●	●	●				
INNOVATION ÉNERGIE DÉVELOPPEMENT (IED)	50		●		●	●	●		●	●
INSTITUT SMART GRIDS	52		●						●	
LAGAZEL	54		●							
LE PARTENARIAT	56	●				●		●		
MASCARA RENEWABLE WATER	58					●				
MOON	60	●	●							●
MYJOULEBOX	62			●	●	●				
NANOÉ	64	●	●	●	●	●	●		●	●
PAMIGA	66								●	●
PÔLE MEDEE	68		●						●	
QOTTO	70		●			●	●			
RÉGION HAUTS-DE-FRANCE	72		●			●	●	●	●	
REYES GROUPE	74	●	●	●	●	●	●	●	●	
SABELLA	76		●							
SCHNEIDER ELECTRIC	78	●	●	●	●	●			●	
SETEC ÉNERGIE ENVIRONNEMENT	80		●							
SUN'AGRI	82	●	●							
SUNNA DESIGN	84		●		●					
SUPERGRID INSTITUTE	86		●						●	
SYNERGIE SOLAIRE	88	●	●	●	●	●	●	●		
TOTAL	90				●	●				
TOTAL EREN	92		●			●				
ZEMBO	94		●							●

AGENCE DE DÉVELOPPEMENT ET D'INNOVATION DE LA NOUVELLE-AQUITAINE

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https://energies-stockage.fr/a-35-actelier-acces-a-leenergie-hors-reseau-en-afrique.html

DESCRIPTION

Support of the regional offgrid sector: Analysis of the value chain, market targeting, organisation of events to bring together the players, distribution of calls for projects and market opportunities; Individual and collective support of companies and industries.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid · Solar kiosk · Public lighting / solar outdoor light

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Senegal · Burkina Faso · Madagascar

LEADING PROJECT ON ENERGY ACCESS

Group of companies and NGO witch have product, services, network, or budget to develop offgrid projects.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

- Organization in 2019 of the following event in partnership with FONDEM and Région Nouvelle-Aquitaine: Workshop «Access to energy off-grid in Africa» What opportunities for the actors of Nouvelle-Aquitaine? This event brought together a hundred of players from the NGO sector, companies, funders, elected officials, support structures to connect, inform and disseminate innovative solutions.

AKUO ENERGY

Projects development · Equipment manufacturer · Construction · Operation and maintenance · Storage

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DESCRIPTION

Akuo Energy is a leading independent French player in distributed and renewable energy. Founded in 2007 and controlled by its co-founders, the group develops its own assets, operates them as soon as they are commissioned and consolidates their revenues. As an integrated player, Akuo Energy is present throughout the entire value chain: development, financing, construction and operation of its projects. Akuo Energy is growing according to a strategy of geographical diversification, on a global scale, with subsidiaries in 18 countries, on which it bases its regional influence.

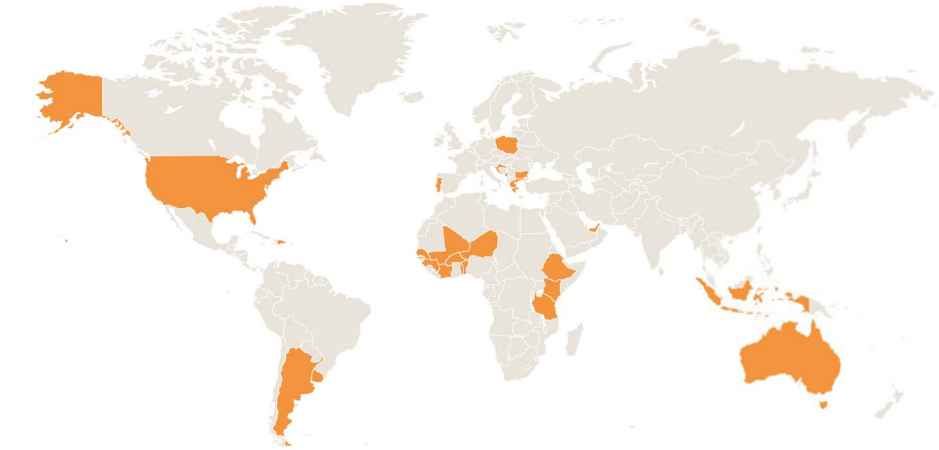
TECHNOLOGIES

Pico/micro grid · Mini grid

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Akuo subsidiaries: Portugal · Greece · Poland · Bulgaria · Indonesia · Australia · Uruguay · Argentina · United States · Dominican Republic · Croatia · Mali · Mauritius · Dubai · Montenegro

Priority of intervention: Senegal · Burkina Faso · Niger · Benin · Ivory Coast · Togo · Guinea · Ethiopia · Kenya · Tanzania



LEADING PROJECT ON ENERGY ACCESS

MCA-INDONESIA : ELECTRIFICATION OF 3 ISOLATED VILLAGES

Indonesia

The 400 households of Merabu, Long Beliu and Teluk Sumbang, 3 villages located on the island of Borneo and several hours away from the first large city, have now access to electricity in their homes. This crazy project, carried out by Millunium Challenge Account Indonesia, was brilliantly conducted by Akuo Energy's team. The project MCA-Indonesia is combining solar, storage and micro hydro and mobilizing more than thirty collaborators. It led to the creation of distribution mini-grids that are working 24/24, in complete autonomy, and are equipped with a pre-paid solution. For each villages, the human component was very important: a community management was established, local staff was trained, and villagers participated in the implementation of the project. At the end, this project represented a full-scale demonstration of Storage GEM® and Solar GEM® solutions, and a beautiful showcase of Akuo Energy's know how that could revolutionize the lives of the one billion people living away from the networks.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

HENRIETTA / MAURITIUS

Located in Mauritius, Henrietta, a 17MW solar project, was one of three projects to win the government's latest call for tenders. Jointly developed by the Akuo Energy Indian Ocean teams and local real-estate leader Médine Ltd. teams, Henrietta will benefit from the industrial, administrative and regulatory expertise of its two shareholders.

KITA / MALI

With installed capacity of 50MW it is the biggest solar farm in west Africa. Initiated by the 'R20-Regions of Climate Action' NGO founded by Arnold Schwarzenegger, the project will meet the vital energy needs of a region suffering from significant electricity shortages, and will help the country begin the move towards energy independence that is vital to its development. The Kita project will also generate numerous social benefits, creating many local and sustainable jobs. As an integrated company, Akuo Energy is setting up a local subsidiary, employing only Malian teams, and will have control over the plant's full life cycle.

ARTELIA

Support profession · Storage

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DESCRIPTION

ARTELIA Group has now 5,900 staff members, and a turnover of €632M in 2018 (Artelia and MOE combined), 37% of which coming from exports. The group specializes in nine business lines: Building, Water, Energy, Environment, Industry, Maritime, Multi-site Projects, Urban Development and Transportation. There are still many isolated regions in the world that cannot be served by existing networks. Giving access to electricity to the populations of these areas requires a thorough knowledge of the needs and resources available locally. Based on the experience acquired through its assignments related to rural development, Artelia offers a wide range of solutions for the installation of stand-alone power plants (based on renewable energies or hybrid systems) and micro-distribution networks, with and without storage system. ARTELIA thus proposes a comprehensive approach to energy access programmes.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Africa · Middle East · Southeast Asia · Latin America

LEADING PROJECT ON ENERGY ACCESS

HYBRID SYSTEMS AND RURAL ELECTRIFICATION PROJECT (PHARE)

Mali · 2019-2023

PHARE project consists in implementing hybrid solar/diesel systems in 60 villages in order to improve rural populations' access to basic energy services. The assignment, carried out in collaboration with our local partner CTEX-CEI, consists of the following: assistance with the studies realization, recruitment of the works companies, follow-up & control of the installation works and assistance with the realization of the 60 hybrid systems.

- No. of power plants: 60
- No. of connected people: 156,000 / No. of new customers: 22,000 / Total No. of customers: 26,000
- Total PV output: 3.6 MWp / Total diesel output: 4.5 MW
- Length of MV/LV lines: 100 km / 740 km

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

PHARE project (Hybrid Systems and Rural Electrification Project) · *Bamako (Mali) · 2019 to 2023*

Hybridization of MiniGrids with renewable energy sources · *Kenya · 2018 to 2022*

Technical assistance for the development of renewable energy projects · *Maputo (Mozambique) · 2018 to 2022*

Zagtouli solar photovoltaïc power plant 33 MWp · *Zagtouli (Burkina Faso) · 2017 to 2020*

Technical consultant for works supervision and control - rural electrification hybrid systems (SHER Project) · *Bamako (Mali) · 2017 to 2019*

Feasibilty study - Shinyanga solar PV power plant 150 MW · *Tanzania · 2018 to 2019*

Pre-feasibilty of a hybrid power plant on Gorée island · *Gorée island (Senegal) · 2018 to 2019*

Belep hybrid solar PV power plant with storage system · *Belep (France) · 2018*

Hybrid power plants and solar PV plants on MicroGrids · *Madagascar · 2016 to 2017*

Feasibilty studies for hybrid renewable energy projects (PV&Hydro) with storage system · *Nosy Be-Bevory (Madagascar)*

Realisation of a solar PV/Hydro/Diesel hybrid MiniGrid · *Kouramangui · Guinea · 2016*

Hybrid solar power plant 4.8 MWp with storage system 4 MWh *Remire Montjoly (Guyane Française) · 2011 to 2015*

Pre-feasibilty study for the electrification of Nosy Be island · *Nosy Be (Madagascar) · 2012 to 2014*

BAOBAB+

Distribution and financing of pay as you go solar kit · Projects development

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DESCRIPTION

Baobab+ is a social business committed to providing access to energy, digital and financial inclusion in Africa. We commercialize innovative products that meet the needs of local populations (Solar home systems and digital products with social impact content) with financing solutions like Pay-As-You-Go to make them accessible to all. Baobab+ is active in Senegal, Ivory Coast, Madagascar and Mali. In less than 4 years, Baobab+ has equipped over 170,000 households with solar energy and 40,000 with digital products.

TECHNOLOGIES

SHS - solar home systems

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Senegal · Ivory Coast · Madagascar · Mali

LEADING PROJECT ON ENERGY ACCESS

In order to reach urban, peri-urban and rural areas, Baobab + has implemented an innovative distribution model:

A dedicated sales force to prospect in villages: people living in rural areas can benefit from a Pay-As-You-Go (PAYG) offer. Payments flexibility can adapt to their spending habits and revenues. It also allows remote control access of the product. After an initial deposit equivalent to 10% of the price of the product, the customer makes payments via mobile money according to its repayment capabilities to activate the product before becoming owner. Once owner of the kit, the customer becomes eligible for a digital loan (scoring analysis is based on its payment history of the solar product). The client will be able to upgrade the current kit by adding new equipment (television, fans, digital tablets...) for example.

Microfinance network: thanks to a partnership with Baobab Group, their clients can benefit from our offer with dedicated lending products.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Pay-As-You-Go (PAYG) SHS not only provides access to a clean, safe and reliable energy, but can also be exploited as an entry point to much more! At first, we offer access to energy. Secondly, we offer access to financial inclusion. Together with Baobab Group we have developed a unique scoring analysis for their PAYG clients, based on their SHS reimbursement data. Once owners of their solar kit, they can access a digital loan with Baobab MFI. A pilot was conducted in Casamance (Senegal) and 150 loans were disbursed, this offer will extend in 2020. Clients can upgrade their existing SHS with additional devices (tablet, TV, fan...) or invest in their activities.

Access to energy also increases access to connectivity. This is why Baobab+, with the help of partners, select and add specific content on its digital tablets to address different needs such as education, business empowerment or health care.

BENOO ENERGIES

Projects development

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DESCRIPTION

Benoo Energies is a renewable energy access operator founded in 2015, with the aim of addressing productive energy needs of rural businesses in 'last mile' areas. Benoo has been created to address the funding issue of energy access. Its founders strive to develop, design, distribute and operate energy access solutions in off-grid rural areas that fit with local energy needs and capacity to pay, and anticipate the future growing energy demand in a sustainable way.

TECHNOLOGIES

Solar kiosks

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Burkina Faso · Togo

LEADING PROJECT ON ENERGY ACCESS

ENTREPRENEURS RENEWABLE ENERGY MICRO PRODUCERS (EMPER)

Location: Togo. French partner: ADEME. Local Partners: NGOs, Companies, Territories and Development ETD.

The EMPER project aims to promote productive access to energy in 10 rural off-grid villages of the Plateaux region by deploying self-sufficient standalone units equipped with solar production and storage systems, offering a point of sale and a set of business equipments (freezer, printer, TV) allowing productive and commercial activities. They are operated by rural entrepreneurs trained by Benoo and his local partner Entreprises, Territoires et Développement (ETD). The entrepreneurs are provided with digital tools for sales, supply management and business intelligence. Financial partners: ADEME (France).

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

FOSTERING EMPLOYMENT OF YOUNG PEOPLE AND WOMEN THROUGH SOLAR ENERGY ACCESS IN SAHEL REGION OF BURKINA FASO

Benoo Energies operates as a technical partner in this programme is financed by the European Union and led by A2N, a local NGO. Firstly, it aims to foster the employability of young people and women, via vocational training tailored to local demand, and, secondly, to promote the creation of productive employment, by stimulating the development of micro and small businesses through solar energy access.

PROMOTION OF RURAL ENTREPRENEURSHIP THROUGH SOLAR ENERGY ACCESS / TOGO

The project is operated by ETD, with technical and financial support of Benoo Energies and Watt for Change Fund (Valorem). It aims at promoting an innovative 'energy entrepreneurship' model that fits with energy needs and capacity to pay in off-grid remote areas in Togo. For that purpose, a value-added service hub offering affordable and reliable energy services (fresh and frozen food, phone charging, copy) is being deployed in an off-grid area of the Plateaux region, run by a local entrepreneur trained and equipped with a mobile app serving as a point of sale to manage payments and supply.

BEST ENERGIES

Waste recovery · Projects development

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DESCRIPTION

With its experience of more than 25 years in the optimization of energy production and distribution facilities and reduction of the ecological impact, Best Energies develops systems for the recovery of agricultural or household waste destined for communities having little or no access to affordable energy. Best Energies has created Terravolt, to develop proven and standardized technological solutions, by ensuring their adaptation to the socio-economic conditions of these isolated, deprived or disadvantaged areas in a resolute short circuit circular economy approach. 2 processes based on pyrogazification are developed: Pack'n'Power and Valomm.

TECHNOLOGIES

Pico/micro grid

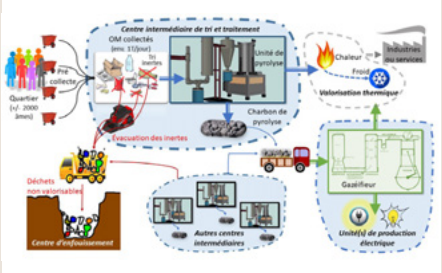
COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Madagascar · Togo · Morocco · Cameroon

LEADING PROJECT ON ENERGY ACCESS

VALOMM, MUNICIPAL WASTE MANAGEMENT

The management of municipal household waste in Africa is a subject of concern in more than one respect: With a very high growth rate of urbanization and the exodus of rural populations, the production of household waste is growing concomitantly, aggravated by notoriously inadequate infrastructure investments; With a garbage collection rate of less than 50%, wild dumps and unhealthy practices are commonplace; The health consequences are critical. WHO estimates that 80% of diseases in developing countries are related to unsanitary conditions (see «Preventing disease through a healthy environment»: WHO report; www.who.int / publications /).



Valomm is a treatment and recovery of municipal garbage unit, autonomous and decentralized (at the level of a district, a city or an industrial zone or commercial) so as to eliminate and valorize them, by producing char and Energy. It is a circular economy project. The benefits are sanitarian (reduction of unhealthiness), as well as environmental (reduction of pollution) as economic (endogenous energy production).

The solution is based on pyrolysis to reduce household waste, whether putrescible, solid or plastic. The char (pyrolysis coal) produced is then gasified to feed an electric generator. Innovation here consists of adapting and combining existing technologies to achieve standard, autonomous and repeatable units, close to waste production areas, reducing transport (only ultimate waste must be taken to controlled garbage dumps) and favoring a circular economy. Socially, the objectives are also to provide local employment opportunities, for garbage collecting and sorting activities before treatment, as well as easy operating and maintenance jobs thanks to the implementation of a simple and robust product. The capacity of the proposed system is 1 ton per day and corresponds to the production of a population of circa 2,000 inhabitants in disadvantaged urban areas.

In brief, Valomm is a local solution, close to waste production sites and has the following advantages:

- Collecting garbage is facilitated by the vicinity of the treatment unit that covers the needs of a neighborhood.
- Pre-collecting of waste is over short distances therefore simple and inexpensive (manual collection bins).
- Transport to final dump sites is reduced, only non-energetic (inert) waste has to be disposed of.
- Nearby employment is encouraged because of the work needed for collecting garbage and operating the equipment.
- The installation is simple and the size of premises limited.
- Operation and maintenance of the system can be done directly by local staff.
- Energy production allows public lighting and domestic electrification.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Projects in Madagascar and development in Togo and Cameroon

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DESCRIPTION

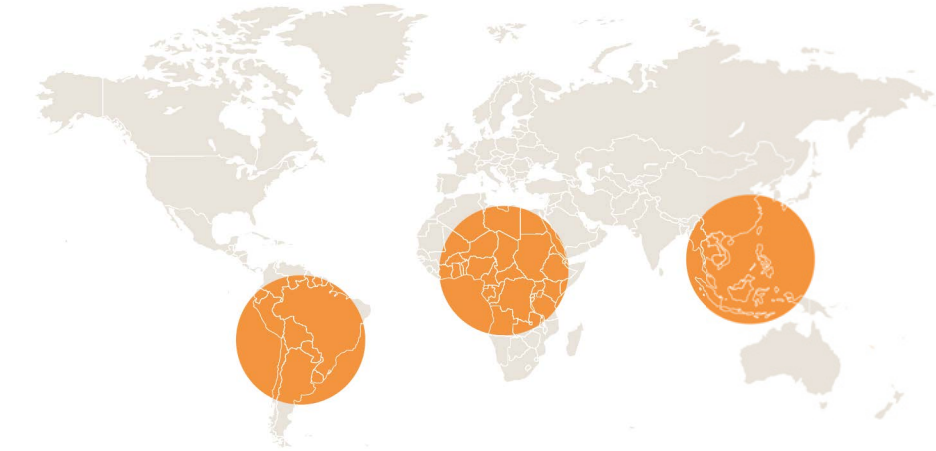
Écosun Innovations is part of the group Écosun, specialized since 2008 in the production of electricity and the installation of conventional on-grid solar plants. Launched in 2015, the company Écosun Innovations develops, manufactures and sells a full range of innovative patented solar off-grid and mobile Plug & Play solutions dedicated to bring energy to off-grid remote areas and mobile operations. The aim of those solutions is to replace diesel gensets and to reduce carbon footprint. To date, more than 20 containerized solutions are in operation across the world (Africa, Europe, Latin America, Caribbean) for various applications.

TECHNOLOGIES

Innovative solar off-grid and mobile Plug-and-Play solutions

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Africa · South America · Asia



LEADING PROJECT ON ENERGY ACCESS

FIMELA, ELECTRIFICATION OF THE SOUIMANGA ECO LODGE / SENEGAL 2018

The Souimanga eco lodge is located in Africa two hours and a half away from the south of Dakar in one of the most beautiful areas in Senegal, the Sine Saloum delta. In order to commit themselves to an ecological and environmental approach, the eco lodge has decided to order a photovoltaic solar power generator to reduce their carbon footprint: the Mobil-Watt® for ensuring their energy requirements. The Mobil-Watt® is a solar power generator in form of a shipping container 20 foots that comes pre-wired and pre-connected easily deployable in less than 2 hours with no civil engineering. The container is fitted with an insulated, air-conditioned control cell, helping to extend the lifespan of the unit's components. This is a rapid deployment solution, ideal for use in isolated areas or for ad hoc needs.

This solar power generator is connected to the SENELEC electricity grid and is also connected to a back-up power generator. The power of the solar power generator is 32 KWp, with annual production around 50.000 KWh. The solar power generator is connected to the public grid and to the existing genset and contributes from solar to about 80% of the energy need of the lodge.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Algiers, Algeria: Delivery of a container Mobil-Watt® and Frame-Watt® to its partner SUNGY. These 2 units will be used as demos for the Algerian army as well as for Telecoms applications in Algeria.

Conakry Guinea: The second solar and storage container was supplied for the TOTAL filling station in Yattaya.

Vilankulo, Mozambique: The ROTARY Club has chosen the Mobil-Watt® for its first electrification project within the global ROTARY network. The solar installation with the Mobil-Watt® will provide electricity and lighting for both the training centre and the Majianza health centre.

Zambia: village electrification in Zambia: A village electrification project using the Mobil-Watt® "Charger" solar container, containing 100 batteries that can be dispatched directly to homes for direct use, without the need to create a grid or individual metering. The batteries can either be rented or purchased by inhabitants of the village and recharged at the container.

Martinique | Caribbean: Frame-Watt® to ensure the energy needed for a PET bottles recycling container. This product is easy to deploy on top of a 20-foot container. It was for this reason that Tri-Center made the decision to choose this patented system to power their recycling systems.

Other references: NATO, German army, mining projects in Chile...

Non Governmental Organization (NGO)

ELECTRICIENS SANS FRONTIÈRES

Projects development · Construction · Support profession · Storage

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DESCRIPTION

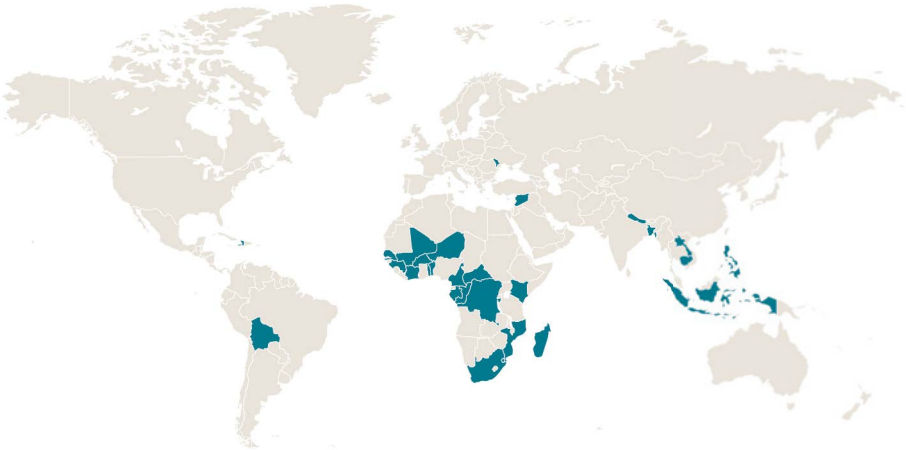
Electriciens sans frontieres (Electricians without borders) is an international aid NGO which has impacted the lives of millions of people throughout its 30 years of experience in more than 50 countries. Targeting the most isolated and vulnerable, it improves their access to efficient, sustainable and clean energy and to safe water. We work with partners from local NGOs to authorities, private sector to offer experience-based scalable solutions with the latest technologies, high-quality equipment, adapted to local needs, from emergency to development.

TECHNOLOGIES

Mini grid · Public lighting / solar outdoor light ·
Acces to energy in time of crisis or post natural catastrophies

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Some countries of intervention where Electriciens sans frontières carries out a significant part of its projects:
South Africa · Bangladesh · Benign · Bolivia · Burkina Faso · Burundi · Cambodia · Cameroon · Comoros · Congo Brazzaville · Ivory Coast · Dominica · France (Saint-Martin) · Gabon · Guinea · Haïti · India · Indonesia · Kenya · Laos · Madagascar · Mali · Moldavia · Mozambique · Nepal · Niger · Palestine · Philippines · Central African Republic · Democratic Republic of the Congo · Senegal · Swaziland · Syria · Togo



LEADING PROJECT ON ENERGY ACCESS

CAFÉ LUMIÈRE

Madagascar

The Café Lumière («Light Café») solution is deployed in six villages of the Vakinankaratra Region in Madagascar. It's a multi-services energy platform, mainly powered by solar energy, allowing durable access to electricity for small rural communities which are not concerned by the national electrification plan. The platform allows the development of productive services (refrigerating food or drinks, grain milling, local craft etc.), comfort services (phone charging facility, lighting kits, computing) and public services (electrification of schools and health centers). Hence, it contributes to foster economic growth, cover domestic needs but also improve the quality of community-level services through a tax on sales revenues covering their electrification. The Café Lumière solution is a public private partnership involving an NGO (Electriciens sans frontieres), the Malagasy agency for rural electrification (ADER), the municipalities of the areas of intervention, a local private operator (ANKA), a research foundation (FERDI) and a monitoring company (Monabee).

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

LIGHT FOR THE ROHINGYAS / BANGLADESH

Distribution of solar lamps to 700 households in the refugee camp and photovoltaic training for 20 Bangladeshi and Rohingyas apprentices.

IMPROVED IRRIGATION SYSTEM / BURKINA FASO, TOGO, BENIN

The project aims at conceiving and deploying an innovative solution for solar pumping in rural areas of the three countries of intervention. It will strengthen the role of local actors in this sector and enhance the agricultural production of small farmers in each area of intervention.

ELECTRIFICATION OF ISOLATED VILLAGES IN PHONGSALY NORTHERN PROVINCE / LAOS

To respond the electricity needs of the inhabitants in the field of health, education, social and economic activities, Electriciens sans frontières implement several different solutions (hydro-electric facility, photovoltaics) for the electrification of ten villages, depending on the local resources.

PILOT PROJECT IN DOMINICAN HEALTH CENTERS / LA DOMINIQUE

Installation of solar panels on the roof of four health centers damaged after Hurricane Maria to reinforce energy resilience in Dominica.

ENGIE AFRICA

Projects development · Construction · Operation and maintenance · Storage

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DESCRIPTION

Engie is a major player in independent electricity production, natural gas and energy services. With more than 50 years of experience on the African continent and 4,000 employees, Engie Africa has the unique ability to implement integrated solutions, from centralized electricity production (3.15 GW of installed capacity) to off-grid solutions (Solar Home Systems, mini-grids) and energy services. Engie is the leader in the decentralized energy market providing clean energy to more than 4 million people, through a wide range of solutions for households and productive usages.

TECHNOLOGIES

SHS - solar home systems · Mini grid · Public lighting / solar outdoor light

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Tanzania · Zambia · Uganda · Ivory Coast · Benin · Nigeria · Kenya · Mozambique · Rwanda

LEADING PROJECT ON ENERGY ACCESS

SMART SOLAR MINI-GRID IN ZAMBIA

Engie PowerCorner is a mini-grid developer and operator that provides electricity to off-grid rural businesses, public services, households and facilitates access to energy efficient appliances (mills, industrial tools, etc.) via lease-to-own model. Engie PowerCorner's capacity ranges between a few kWp and several hundred kWp, stored in batteries. Already active in 4 African countries: Tanzania, Zambia, Benin and Uganda, benefitting thousands of customers, Engie PowerCorner aims to continue expanding its activities in sub-Saharan Africa with the ambition to develop thousands of mini-grids in the coming years and becoming the leading mini-grid developer in Africa.

In Zambia, Engie PowerCorner commissioned its first Smart Solar Mini-grid project in February 2019 in Chitandika Village Chipata, Eastern Province of Zambia. With the help of key stakeholders (Communities, authorities and regulation bodies) and other strategic alliances, the site operations started with success and positively impacted the lives of the people of Chitandika Village.

The mini-grid has a generation capacity of 28 kWp and 125 households have been connected within the first phase connections, including a school, rural health center and 8 big productive usage businesses.

The innovation behind the technology is such that it combines solar energy, mobile money, pre-paid smart meters, modular design, efficient appliances and social engagement to offer a compelling service to its customers.

Engie PowerCorner has powered Chiziye Secondary School, which is a Day Secondary school in Chitandika village and has supplied on lease-to-own basis, 15 Computers and a computer software that enables students and teachers to access online applications even when not connected to the internet.

Engie PowerCorner also connected Chitandika health centre, which directly translates into improved efficiency and service delivery for the benefit of the community. Thanks to the availability of power, the centre can properly refrigerate and store medication and vaccines, while improving lighting at the maternity ward and other blocks as well as allowing visibility at night.

Engie PowerCorner has encouraged productive end-users and enterprises to acquire energy efficient powered machinery to reduce on cost that comes from energy usage. Acquiring appliance from Engie PowerCorner enables productive end-users to own long lasting, quality and efficient machinery, which in turn will allow growth and expansion of their business with exposure to different synergies.

Non Governmental Organization (NGO)

ENTREPRENEURS DU MONDE

Projects development

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DESCRIPTION

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Haiti · Burkina Faso · Togo · Philippines · Cambodia

LEADING PROJECT ON ENERGY ACCESS

NAFA NAANA

Burkina Faso

Nafa Naana – which means «the benefit has arrived» in the local Dioula language – aims to make clean and economical cooking and lighting equipment accessible to Burkinabe populations in fuel poverty. Nafa Naana is involved in three areas: the creation of distribution channels in the form of social micro franchising; the implementation of financial services at all levels of the production and distribution chain; and the promotion of equipment among the population. From 2010 to the end of 2017, with the technical and financial support of Entrepreneurs du Monde, Nafa Naana distributed more than 56,930 energy-efficient equipment, including 26,000 improved stoves, 18,000 gas stoves and more than 12,000 solar lighting equipment. In terms of impacts, this represents, over the lifetime of the equipment broadcast, 114,476 tonnes of wood saved, 198,264 tonnes of CO_2 equivalent avoided, CFAF 8.2 billion in savings and more than 107 million hours of lighting generated. As a result, 45,544 direct beneficiaries have seen their living conditions improved thanks to the use of this equipment.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Entrepreneurs du Monde has been operating access to energy programs since 2010. Entrepreneurs du Monde's access to energy programs aim to mitigate energy poverty in developing countries by making clean, modern and affordable energy technologies (cooking and lighting equipments) available to the poorest. The NGO operates as an incubator for social businesses which distribute LPG stoves, improved biomass stoves, solar-powered lights and solar-home-systems. With the 5 social enterprises we are incubating, more than 28,000 off-grid energy appliances – solar lamps, solar kits, LPGstoves and improved biomass stoves - were sold through 320 resellers in 5 countries in 2016. Overall, more than 90,000 off-grid energy products have been made available to an estimated 70,000 households since Entrepreneurs du Monde pioneered its energy microfranchising methodology in 2010.

Non Governmental Organization (NGO)

EXPERTS-SOLIDAIRES

Projects development

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DESCRIPTION

With its network of experts, Experts-Solidaires technically supports development projects in the fields of energy, water, sanitation, food safety and waste management. The association was born from the aknowledment that access to expertise is an essential parameter for the development of the least industrialized countries. The members have committed themselves to putting their professional skills and expertise at the service of international solidarity initiatives. Experts-Solidaires creates lasting partnerships for each project which it accompanies until reaching the final result.

TECHNOLOGIES

Mini-grid · Clean cooking · Storage · SHS - solar home systems · Training platforms · Socially-oriented engineering and technical assistance

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Benin · Burkina Faso · Cameroon · Indonesia · Morocco · Madagascar · Palestine · Senegal · Togo

LEADING PROJECT ON ENERGY ACCESS

VILLAGE ENERGY NETWORK (VEN)

The VEN is a space located in the center of a village which combines both economical and social development objectives, and that allows progressive growth of energy access for local populations at a apropriate cost regarding their income. Its objective is to develop employment as much as social well-being through the development of services, training and entertainment.

The VEN was created to fit into small villages, from 1,000 to 3,000 inhabitants, with assembled housing and pre-identified economic potential. The development of a VEN is accompanied by a systematic training of local actors, economical and social actors, businesses, decision-makers, who are likely to find a way to valorize thethe production ofelectricity in their activities.

The implementation of a VEN implies the development of one or two local economic sectors, identified and supported by an improvement in practices related better access to electricity. For example:

- Where rice production is important, the VEN will promote the development of electric hullers;
- Where woodworking is important, the VEN will encourage the use of electric saws;
- In fishing grounds, the VEN can start by installing an ice factory.

As for the social aspects, the VEN will have the effect of developing access to basic electrical services such as lighting, telephone charging or even office works (computer, scanner, printer). These new services will have a beneficial impacton education (lighting for homework), communication (internet access, facilitated email exchanges), entertainment (television, radio), etc. In all of these figure cases, the VEN will have to facilitate access to equipments (mill, planers, computer, etc.) for the populations, initially through demonstration and secondly through sales, in correlation with credit systems.

Construction, implementation and management are the responsibility of theoperating partner, also an investor in the system in regards of predefined financial terms. The pricing methods must comply with the rules in force in the country and ensure the financing of operations and of the capital. It can be considered that the subsidy contribution does not need to be amortized.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Ampasindava, Madagascar : Rural electrification of the village of Ampasindava, village mini-grid with 100 subscribers.

Marosely, Madagascar : Rural electrification of the village of Marosely, village mini-grid of 450 subscribers.

Mangaoka, Madagascar : Setting up of the VED in Mangaoka, 10 electrified businesses in rural area.

Zaffé, Bénin : Electrified training center and promotion of improved stoves in Zaffé for 500 households.

© José Nicolas

Non Governmental Organization (NGO)

FONDATION ÉNERGIES POUR LE MONDE

Projects development

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ÉNERGIES POUR LE MONDE

DESCRIPTION

Fondation Énergies pour le Monde (Fondem) has been promoting and developing access to electricity through renewable energies for nearly 30 years in order to improve the living conditions and income of rural populations. It concentrates most of its action where the needs are greatest, in rural areas in sub-Saharan Africa. It leads the setting up of projects, the search for financing, the coordination and/or the follow-up of the various activities in close cooperation with the local stakeholders of the projects. It has carried out 73 projects in 28 countries to this day, benefiting more than one million people who now have sustainable access to electricity services.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid
Solar-powered public lighting · Solar-powered pumping

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Today, the priority countries of intervention of Fondem are the French-speaking countries of sub-Saharan Africa:
Mali · Senegal · Guinea · Burkina Faso · Madagascar · Uganda · Cameroon

LEADING PROJECT ON ENERGY ACCESS

RESOUTH-BORÉALE IN MADAGASCAR

The Resouth-Boréale programs, launched in 2008 and finished in 2016, represent an ambitious challenge: electrifying two, and then simultaneously, seven localities in rural areas in the Androy and Anosy regions of southern Madagascar. In a first phase, 2 localities were electrified, one by 2 wind turbines of 6 kW and the second by 78 solar kits. In the second phase, 7 solar power plants and associated mini-grids were installed. These two successive operations were closely carried out with the Ministry of Energy, the Malagasy Rural Electrification Development Agency and regional and local stakeholders.

The scale of the project required effective coordination between its different phases and partners, which Fondem was able to provide. The environmental, economic and social impact of the actions carried out is considerable: 25,000 people have seen their living conditions improved. The impact of electrification in the 9 localities was immediately felt: the daily life of households has improved and the cost of cell phone recharging, lighting and radio has decreased. Public lighting allows new activities to be carried out after dark. Finally, electrification has fostered the emergence of some fifty local entrepreneurs.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

PAMÉLA PROJECT IN MADAGASCAR AND SENEGAL

Launched in 2016, the PAMÉLA project aims to strengthen the local economies of Senegalese and Malagasy regions where Fondem has already worked in the past by supporting income-generating activities through electrification using renewable energies. The PAMÉLA program has led to the redaction of a methodological guide that can be replicated in other regions.

PEHGUI PROJECT IN GUINEA

Conceived from 2015, PEHGUI is a pilot project. It helps reduce poverty for more than 3,000 people in the Labé region who directly benefit from access to clean and reliable energy. The first part of the project has enabled the locality of Kouramangui to be electrified by three mini-grids made up of hybrid solar/diesel power plants. The second part was based on the study of an electrification program for about ten other localities as well as on the training of the staff of the Guinean Rural Electrification Agency (AGER).

TREZOR PROJECT IN MALI

Fondem has been asked by the decentralized cooperation services of the Departmental Board of Ille-et-Vilaine to provide its expertise in the implementation of TREZOR, a public lighting program in 10 rural localities in the Mopti region in Mali.

GAIA IMPACT FUND

Financing

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DESCRIPTION

Gaia Impact Fund is a French impact fund initiated by a team of seasoned entrepreneurs and philanthropists active in the renewable energy sector. Its goal is to support innovative & sustainable energy access ventures where energy is needed the most: among populations living off the grid in Sub-Saharan Africa et South East Asia. Gaia Impact Fund finances and supports the growth of start-ups and SMEs which have a positive social, environmental and economic impact on their territory. Selection and monitoring methodologies seek to promote the deployment of sustainable energy access solutions at an optimised & competitive cost. Gaia pushes for bottom-up market approaches bringing a deep and structured understanding of the local populations' needs.

TECHNOLOGIES

Minigrid · Pico/micro grid · SHS - Individual solar systems · Pico solar light · Clean cooking · Pay As You Go solutions · Innovative means of production and agrivoltaics · Smart grids

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Sub-Saharan Africa and South East Asia

LEADING PROJECT ON ENERGY ACCESS

ENABLING ACCESS TO CLEAN ENERGY THANKS TO AFFORDABLE SOLAR HOME SYSTEMS PURPOSED FOR PEOPLE LIVING OFF THE NATIONAL GRID IN CAMEROON

Headquarters: Cameroon, Grenoble (France) · Year of creation: 2014
Co-investors: Persistent Energy Capital, Aviva Impact Investing France

Context and energy challenge: According to the World Bank, no more than 57% of the Cameroonian population had access to energy in 2014. Although the potential resources of natural gas, hydropower and other renewable energies (solar, biomass, wind) are important, the energy sector in Cameroon is characterized by insufficient supply. In addition to being a basic resource, energy access is also a catalyst for counter-poverty initiatives. This makes energy access in Cameroon a social but also environmental issue.

Solution: In 2014, two French entrepreneurs based in Grenoble made the bet to render solar energy affordable to rural off-grid households in Cameroon. Based on a pay-as-you-go payment system, the Franco-Cameroonian start-up provides robust solar solutions at a very affordable cost. Thanks to its partnership with Orange money, up0wa uses mobile money to distribute its products in a lease-to-own manner across the country. The startup is now one of the main players in the distribution of solar kits in Cameroon. This investment further strengthened Gaia Impact Fund's strategic positioning in French-speaking Africa and signals its desire to support the growth of efficient energy access in a region with tremendous needs.

SHS solutions have several social environmental and economic benefits. On average users, brightness in households using an SHS has more than tripled. The purchase of an SHS, comes to replace energy sources often more costly regarding both time and money. Prior to owning an SHS, people would travel long distances to charge their phone. This purchase not only saved users money and time to individuals, it also turned some shops and homes into references point in terms of phone charging in their neighborhood. The installation of solar kits allows many homes to save money over the life of the system. Electricity has also allowed shop owners to work on a longer duration every day. The majority of up0wa customers reported an increase in their revenues, especially those that remained open later since the purchase of the kit. Solar kits also have a positive impact on the environment as they replace polluting and dangerous solutions such as kerosene.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

MANUFACTURING AND DISTRIBUTION OF SOLAR HOME SYSTEMS PURPOSED TO PEOPLE LIVING OFF THE NATIONAL GRID IN SENEGAL, MALI AND BURKINA FASO

Headquarters : Dakar, Sénégal · Year of creation : 2015 · Co-investors: Persistent Energy Capital, Y Combinator...

Oolu's core mission is to replace dirty and expensive lighting solutions with sustainable energy alternatives for the 150 million people living without electricity in West Africa. Oolu was launched in Senegal in 2015, and has sold over 34,000 solar home systems (SHS) in less than three years to rural customers across Senegal, Mali, and Burkina Faso. As one of the fastest-growing SHS distributors in West Africa, and with over 130 full-time employees, Oolu is consistently able to adapt its customer offering to local market dynamics. Oolu's team is one of the most experienced in West African solar. From a monthly payment, paid by a mobile payment system, Oolu installs «pay-as-you-go» solar kits to power lights, various household devices such as phone chargers, radios, fans and televisions. Oolu offers its users a more reliable, less dangerous and more environmentally friendly energy access solution (unlike candles and kerosene) while sparing its customers the need to walk long distances only to charge their phones.

GÉNÉRALE DU SOLAIRE

Projects development · Financing · Construction · Operation and maintenance

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www.gdsolaire.com

DESCRIPTION

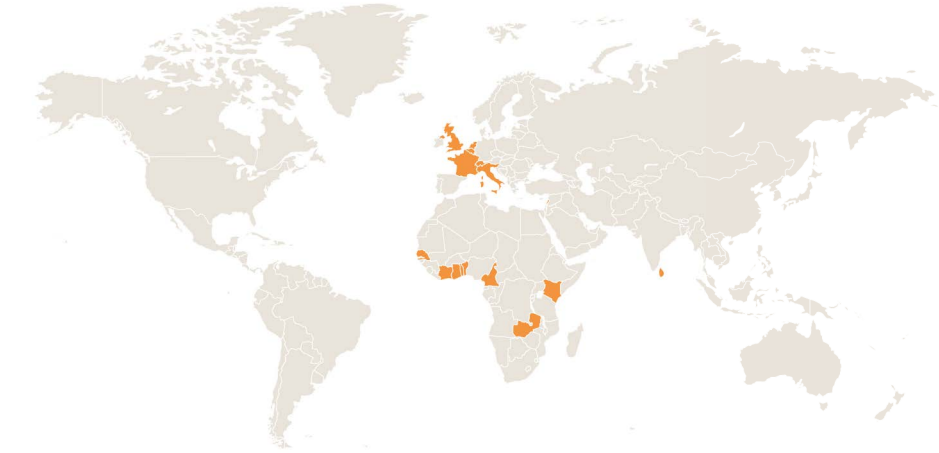
The Générale du Solaire Group is a French leading independent power producer, with more than 10 years' experience in the development, design, financing and operation of solar power plants. Générale du Solaire was founded in 2008 by Daniel Bour, its owner and chairman. The Group is operates in Europe, Africa, Middle East and Asia with local subsidiaries and experienced team in each area of presence. Our expertise in the solar PV field allow us to cover all types of projects (utility scale, commercial & industrial, mini-grids & rural electrification), making the most of various technologies (on/off-grid, storage & hybrid systems, innovative project).

TECHNOLOGIES

Mini grid · Storage · Innovative means of production and agrivoltaics

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Benin · Togo · Ivory Coast · Senegal · Zambia · Cameroon
Our company is also present in Lebanon and Sri Lanka as in Europe (France · Italia · Switzerland · Benelux · UK)



LEADING PROJECT ON ENERGY ACCESS

SOLAR WITH STORAGE MINI-GRIDS IN BENIN

The company is developing solar mini-grids with storage all over Benin, for a project combining access to a clean and competitive energy in rural areas. Our project's vocation goes beyond energy access by promoting local economic development, through productive electrical services. We provide a sustainable technological solution designed to address the challenges in remote sites. The project is developed in partnership with ARESS (African Renewable Energy Systems & Solutions) and Blue Solutions.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

- Mini-grid projects in Bénin, Togo and Zambia.

Non Governmental Organization (NGO)

GRET

Projects development

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gret@gret.org

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DESCRIPTION

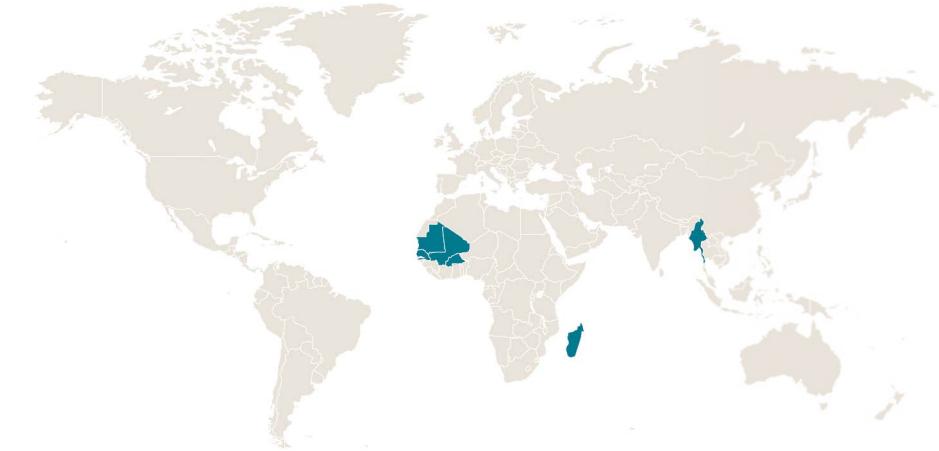
Founded in 1976, GRET is an international development NGO which acts from work on the ground all the way up influencing policy, with the aim of providing durable and innovative answers to the challenges of poverty and inequalities. Its professionals provide lasting, innovative solutions for fair development in the field and work to positively influence policy.

TECHNOLOGIES

Mini grid · Cooking · Training platform · Pico/micro-grid · Social engineering and technical assistance

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Mauritania · Madagascar · Senegal · Mali · Burkina Faso · Myanmar



LEADING PROJECT ON ENERGY ACCESS

RHYVIÈRE, MINI-HYDROPOWERPLANTS

Madagascar

The Rhyvière programme set up by GRET has electrified 13 communes thanks to 4 mini-hydropower-plants in Madagascar with a capacity of 50 to 500 kW. GRET supports the private operator in setting up the service, supports the development of small and medium-scale business activities and has put in place environmental measures to protect the watershed.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

As global energy consumption increases, fossil energy resources become scarcer and the climate changes, more than 1 billion people lack access to electricity and 3 billion still depend on wood energy for cooking. Access to energy is, however, one of the conditions for economic and social development. For GRET, the energy transition requires a sustainable improvement in the access of people in energy insecurity to reliable, affordable and environmentally friendly energy. Since the 1990s, GRET has been working to improve access to energy for the most disadvantaged by integrating it into the public policies of the countries in which it operates. It provides long-term support for technical, organisational and financial innovation through the design and implementation of sustainable energy solutions for economic and social development. GRET promotes the implementation of balanced governance mechanisms that take into account the rights and obligations of each party (national institutions, local authorities, social enterprises, private operators, users, etc.), a necessary condition for ensuring the quality of the service and the sustainability of the resource. It favours renewable energies in a territorial and concerted approach, as close as possible to the needs, resources and constraints of the actors. GRET capitalizes on and shares its experiences, in a collective learning process, to help achieve the Sustainable Development Objectives. GRET supports the various stakeholders in the territory in the exercise of their responsibilities. It mobilizes a variety of skills: R&D, market research, technico-economic studies, support for the implementation of governance mechanisms for resources, infrastructure and services, project management and project management assistance, support for entrepreneurship, development of economic activities and sectors...

GUINARD ÉNERGIES

Projects development · Equipment manufacturer

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GUINARD ENERGIES

DESCRIPTION

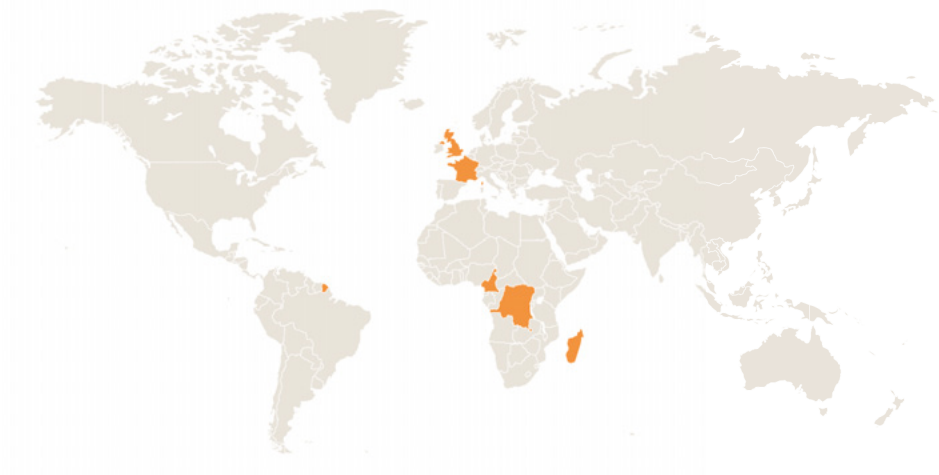
Guinard Energies develops autonomous power grid hybridizing its patented technology of kinetic turbines dedicated to estuaries, rivers or very low head streams (3 kW, 20 kW, 250 kW) to other renewable energy sources such as photovoltaic or wind turbine. Guinard Energies offers complete support in the development of off-grid or grid-connected projects, from the socio-economic study of demand and the valorization of existing supply chains, the evaluation of the potential of currents, the commissioning of the production system and the training of the future grid operator.

TECHNOLOGIES

Mini grid · Pico/micro grid

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

France · Madagascar · Cameroon · French Guyana · United Kingdom · Democratic Republic of Congo



LEADING PROJECT ON ENERGY ACCESS

ERHYGE, INNOVATIVE SOLUTION FOR OFF-GRID ENERGY ACCESS

Lieu : Madagascar

Winner of the call for project, « Innovative solutions for access to off-grid energy » Guinard Energies and its partners Gret (operational implementation) and SM3E (local grid operator) teamed up to put together a project in 2 phases.

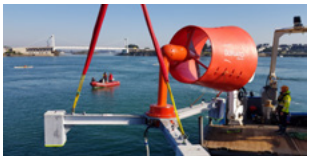
Phase A: A demo in Ambatolaona (Madagascar) A live demo of a hybrid production system including a P66 hydrokinetic turbine system and a 4-kWp photovoltaic set, the project Rural Electrification by Hydrokinetic turbine Guinard Energies (ERHYGE) benefited directly to 50 households, 5 companies and all of the local public services, including the communal school of Amboarakely. In a logic of local consultation and community-involvement, the inhabitants have taken the project as their own, building the shelter for the electrical equipment. The students of the master's degree in renewable energies of Ankatso University (Antananarivo) have been put to contribution as well, they helped a great deal during the installation of the distribution grid.

Phase B: Study on the hydrokinetic potential of the Island Further studies have been conducted to evaluate the electrical potential and the socioeconomical conditions of more than 80 villages from the far east coast to the great South. Guinard energies and Gret have then established a first cartography of potential hydroelectrical sites... Waiting for this new power source to be installed...

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

MEGAWATTBUE PROJECT / FRANCE, APRIL 2019

First power grid system hybridizing a P154 tidal turbine (20 kW) and a photovoltaïc set (6 kWp) with storage connected to the french national grid.



RESTAURATION OF PEN CASTEL TIDAL MILL / FRANCE, APRIL 2018

Installation of a P66 marine turbine in the old filling conduct to supply a nano grid (self-consumption).

ELECTRIFICATION OF THE CNRS CANOPY STUDY CENTER / FRENCH GUYANA, NOVEMBER 2019

Replacement of the CNRS French Guyana generator sets with a Guinard energies hybrid set

HELIOSLITE

Equipment manufacturer

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DESCRIPTION

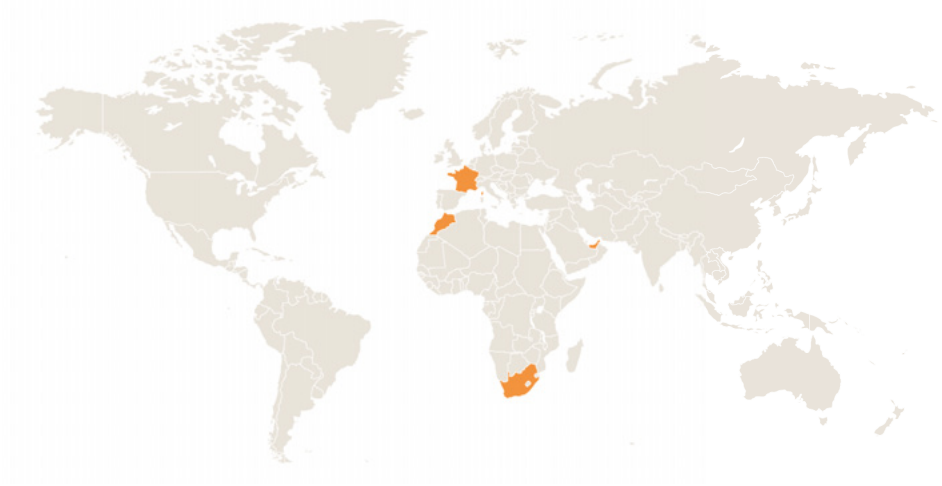
HeliosLite provides higher performance and patented photovoltaic trackers to reduce the cost of energy and to open new market applications (isolated sites, self-consumption, hybrid genset, industrial zones, steep slopes...). Scalable, easy to install and movable, more than 300 units of HeliosLite's 1.5 axis tracker have been deployed in France, the United Arab Emirates, South Africa, and Morocco.

TECHNOLOGIES

Solar tracker for photovoltaic energy production for ground mounted installations from 20 kWp to several MWp

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

HeliosLite works with project developers – IPPs, EPC companies, distributors, and engineering consults worldwide.
France · United Arab Emirates · South Africa · Morocco



LEADING PROJECT ON ENERGY ACCESS

SUPPLY OF TRACKERS FOR ENERWHERE IN THE UNITED ARAB EMIRATES

Thanks to an extended power production curve, HeliosLite's 1.5 axis tracker improves the global performance of a photovoltaic plant. The IPP Enerwhere (UAE) selected the 1.5 axis tracker with bifacial modules for an off-grid, hybrid diesel – PV plant under an industrial PPA.

Results = 30% more energy annually (versus a East-West structure) with 2 fold decrease in seasonal variation.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

United Arab Emirates: off-grid for industry and tourism

France: self-consumption for industry and tourism

South Africa: self-consumption for industry and agriculture

INFINERGIA CONSULTING

Projects development

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DESCRIPTION

Infinergia is a B2B consulting company specialized in clean energy markets and technologies. We provide strategy consulting, market research, marketing consulting and business development services. We have been working on off-grid markets for 10 years on technological aspects (PV, battery, hydrogen...), and end-markets (rural electrification, C&I, emergency...). We help innovators (Technology manufacturers, system integrator...) to find their market and decision-makers (NGO, development banks, governments) to make the right choices for the solutions they finance.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid · Solar kiosk · Public lighting / solar outdoor light · Commercial and industrial facilities

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Global coverage

LEADING PROJECT ON ENERGY ACCESS

MARKET REPORT ON MINI-GRIDS FOR RURAL ELECTRIFICATION IN AFRICA AND ASIA

We released a market report on mini-grids for rural electrification in Africa and Asia covering the main actors along the value chain, analyzing the existing and planned projects in 30 different countries, and analyzing the regulatory and political framework in those countries.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Support of a battery manufacturer in quantifying the off-grid market for its applications. Identification of commercial leads.

Benchmark of containerized mini-grid solutions.

Analysis of the Energy Management System (EMS) market for hybrid plants.

INNOVATION ÉNERGIE DÉVELOPPEMENT (IED)

Development · Financing · Construction · Operation and maintenance · Support profession · Consulting & Strategy · Training · Software publishing

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DESCRIPTION

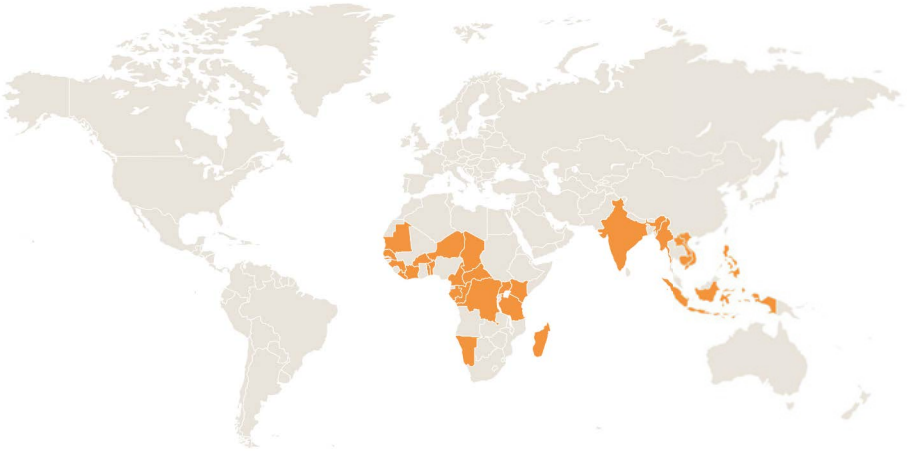
IED - Innovation Energy Development - is a company engaged in international cooperation since 1988, specializing in renewable energy projects (photovoltaic, biomass and hydroelectricity) in Africa and Asia. Inspired by sustainable development, IED carries out with international funding, electrical and socio-economic engineering studies, advises public decision-makers, designs and supervises construction of production, transport and distribution infrastructures, and support energy players.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid · Public lighting / solar outdoor light · Production PV / Mini hydro / Biomass

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Africa : Benin · Burkina Faso · Cameroon · Central African Republic · Chad · Comoros · Congo-Brazza · Democratic Republic of Congo · Gabon · Guinea · Ivory Coast · Kenya · Liberia · Madagascar · Mauritania · Namibia · Niger · Senegal · Tanzania · Togo · Uganda
Asia : Burma · Cambodia · India · Indonesia · Laos · Philippines · Vietnam



LEADING PROJECT ON ENERGY ACCESS

DECENTRALIZED ELECTRICITY GENERATION UNITS IN CAMBODIA BY BIOMASS GASIFICATION TECHNOLOGY

The project consisted to supply two isolated mini-grids in Cambodia by electricity production from gasifier plants using rice husk, residues surrounding plantations and wood, as well as strengthen associated distribution networks.

IED group finances and operates the gasification system via its subsidiary in Cambodia, mobilizing funds through equity, loans and grants (French Fund for the Global Environment and UNIDO). IED sells all of its electricity production to Rural Electrification Companies, but at a better price for their customers and with an improved quality supply. The IED group is carrying out on this project:

- Financial engineering and institutional/legal arrangements;
- Concept design, consulting and contract settlement with providers;
- Construction, installation, testing and commissioning of power plants, Electrical work;
- Training and implementation of the teams;
- Operations management and monitoring of the decentralized power generation units.

Power plants currently operating on the Sraem (800 kW) and Charchuk (210 kW) sites have already created more than 50 sustainable jobs, and are helping to achieve nearly 3,000 tonnes of CO_2 savings per year. This project promotes income-generating activities by producing more than 50 tonnes of charcoal briquettes per month sold for economical cooking of foodstuffs. IED group is currently developing the transfer of these biomass gasification technologies in Benin and Ivory Coast.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

ENGINEERING STUDIES: Solar power plants from 100kWc to 42 MWc (Burkina Faso, Cameroon, Comoros, DRC, Ivory Coast, Niger) - Interconnexion of supra-national HV Grids (Cameroon), extension of MV/LV grids (Benin) - Hydroelectric power plants from 0,5 to 2MW (Cameroon) - Social intermediation, implementation of energy productive uses (Benin, Cameroon, Kenya, Senegal)

ENERGY STRATEGY CONSULTANCY: Energy development plan until 2040 (Cambodia) - 2020-2040 national master plan for production, transport and distribution (Gabon) - National geospatial electrification plan (Namibia) - National Electrification Strategy (Uganda)

DEVELOPMENT AND BUILDING OF INFRASTRUCTURES: Hydroelectric power plant (1MW) built and operated by IED (Cameroun) - Site supervision for dozens of localities : solar hybridization of thermic plants on mini-grids (Ivory Coast, Niger), construction of MV/LV grids and connection on national grid (Congo), rehabilitation of MV/LV grids and public lighting in main cities (Central African Republic)

ENERGY PROFESSIONALS SUPPORT: technical assistance to private operators for green mini-grids facilities (Kenya) - Due diligence for green energies projects and financing files setting up support for Sunref program facilities (Cameroon) - R&D and selling of engineering design software, capacity building courses for professionals (Benin, Cameroon, Guinea, Madagascar and Senegal)

Association

INSTITUT SMART GRIDS

Training · Innovation · Project achievements in France and abroad

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DESCRIPTION

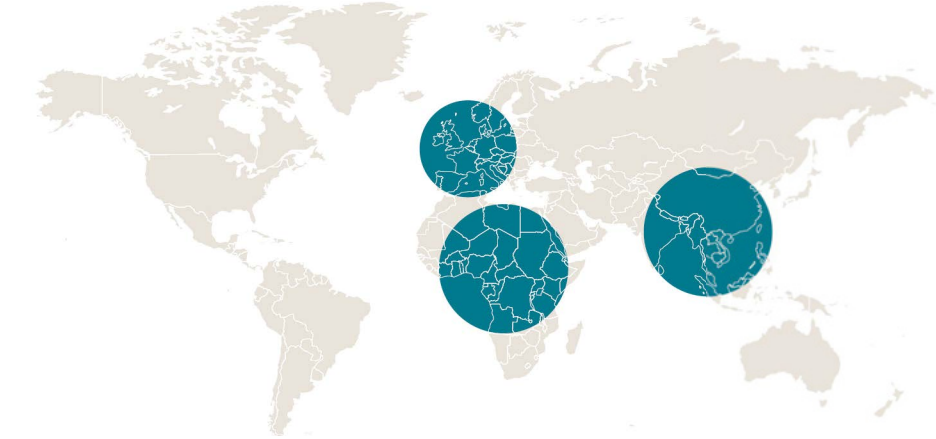
Smart grids combine digital and energy technologies to support the energy transition (renewable energies, sustainable mobility, energy efficiency,) and territories' economic development, by offering new solutions and services to communities and citizens. Founded in the spring of 2018 in the Auvergne-Rhône-Alpes Region, the Smart Grids Institute gathers smart grid key players to maintain our regional leadership. Our association brings together more than 25 entities, companies & smart grids experts, start-ups & manufacturers, research specialists, and academics, around the 6 founders: Enedis, RTE, UGA, Académie de Grenoble, Université de Lyon, and CEA. Smart Grid Institute's main goals are to develop Smart Grids projects in 3 areas: academic education and professional trainings, innovation and projects, industrial development in France and abroad.

TECHNOLOGIES

Smart Grids: digitalized energy networks, renewable energies, energy efficiency, sustainable mobility, new energy services

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Europe · Africa · Asia



LEADING PROJECT ON ENERGY ACCESS

AFRICIT-E PROJECT IN BURKINA FASO

Africit-e Project is smart grids demonstrator in Burkina Faso, coordinated by Smart Grid Institute with 3 partners: Odit-e, SmartSide & GridPocket, beginning in March 2020. The project consists in rolling out smart meters, with advanced software to make remote data collect, grid modelling, providing grid operation anticipation and energy sharing between clients as well as reducing power shortages. This project is already followed by Agence Française de Développement (AFD), Association of Power Utility of Africa (APUA) and several african countries.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

- Smart grids training courses for universities, private company experts, and international utilities
- Training tours for international decision makers

LAGAZEL

Equipment manufacturer

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www.lagazel.com

DESCRIPTION

Lagazel produces a range of off-grid solar products in Africa in order to bring affordable and high-quality solutions to 700 million African people who do not have access to grid.

TECHNOLOGIES

SHS - solar home systems

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Burkina Faso · Mali · Senegal · Niger · Benin · Ivory Coast · DR Congo

LEADING PROJECT ON ENERGY ACCESS

INNOVATIVE ECONOMIC MODEL FOR THE MANUFACTURE OF LAMPS

Lagazel innovation mainly lies in its manufacturing model. Products are designed with quality components sourced from French suppliers, are and assembled in African workshops by trained people. More than 65,000 Kalo solar lamps have been produced in the facility Burkina Faso since 2016 by a local team of 15 technicians, and sold over the West African region. Lagazel also offers contract manufacturer services in Africa for the industry. This innovative business models contributes to jobs creation and local economic development, and reduces the environmental footprint of the value chain.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

KIERMA SCHOOL / BURKINA FASO, DECEMBER 2018

Provide Kierma school in Burkina Faso with 8 collective charging stations and 310 solar lamps to enable pupils to study at night and walk after dark, in partnership with Electriciens sans frontières, December 2018.

UNITED NATIONS

Provide United Nations organisations and Rural electrification agencies with solar lamps and collective charging stations.

Non Governmental Organization (NGO)

LE PARTENARIAT

Cooperating projects development

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DESCRIPTION

Le Partenariat is an international NGO based in the North of France whose purpose is to carry out development cooperation projects and to foster international solidarity. The organization has developed an expertise in the implementation of development cooperation projects. The organization has four main working axes: strengthening of local governance; provision of basic services such as education, health, water, sanitation or hygiene; vocational training & professional insertion and sustainable development and environmental issues. For the latter, le Partenariat has started developing projects on the promotion of renewable energies with a specific focus on biogas & solar energy.

TECHNOLOGIES

Mini grid

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Senegal · Guinea · Morocco · France

LEADING PROJECT ON ENERGY ACCESS

BIOGAZ PROJECT IN SENEGAL

Lack of energy access is a major issue in Senegal where wood and coal for cooking purposes represent nearly 87% of energy consumption in households which have detrimental consequences on deforestation, loss of natural resources and desertification.

To simultaneously tackle these issues, provide a solution to households in the City of Saint-Louis (northern Senegal) and contribute to the 15% target of renewables in the energy mix fixed by the Senegalese government (sectoral policy), the biogas project (phases 1 & 2) was carried with the help of the City and District of Lille, the French Ministry of Foreign Affairs (MEAE) and the support of the National Biogaz Program (PNB). The main purpose of this project was to promote the use of methanization as access to energy solution for cooking in the framework of circular economy (input of organic wastes).

75 biodigesters have been built in Saint-Louis so far preserving more than 600 kilograms (1,322 pounds) of wood and 180 kilograms (397 pounds) of coal each day. More than 2,000 people have also benefited from our awareness rising campaigns. More actions are nevertheless still much needed to ensure a larger access to sustainable sources of energy for Saint-Louis' citizens.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

In the Northern Region of Senegal (Saint-Louis), the NGO le Partenariat works in partnership with local authorities (Regional Development Agency - ARD) and a French NGO specialized in sustainable energies (GERES) to promote the use of renewable energies, especially biogas and solar energy, and the fight against deforestation. The Access to Sustainable Energies Program (ASEP/PAER in French) is primarily targeting economic operators working in the agricultural sector which need support for their energy transition or which lack energy access due to their remote localization. ASEP is based on 5 pillars that constitute a "sectoral approach", its core methodology: stimulation of local demand; structuring of local supply; support to public policies; research, development and capitalization and implementation of demonstrative projects (solar platforms, energy mix platforms, biogas solutions).

Since 2017, ASEP I has led to the creation of the institutional conditions to improve the steering of the energetic sector (diagnostic and cartography of needs, identification of local entrepreneurs, revitalization of energy steering committees - CIMES), enhance South-North exchanges and carry out demonstrative projects.

Based on this experience, the start of ASEP II will help consolidate and increase the efforts made since 2017 in the energy sector:

- Institutional anchorage of sectoral steering committees in Northern Senegal;
- Development of demonstrative projects improving renewable energy access for remote populations ;
- Capacity-building of the civil society on the use of renewables;
- Support to local entrepreneurship and professional training to provide adapted and reliable energetic supply to remote communities.

ASEP I was carried out with the help of the French Development Agency (AFD), the Hauts-de-France Region, the EDF, Raja & Air Liquide Foundations, Watt for Change Foundation and the SYDESL.

The main targets of the ASEP are local inhabitants in need of energy sources, especially households, small farmers and companies working in energy-consuming sectors.

MASCARA RENEWABLE WATER

Projects development · Construction · Equipment manufacturer

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http://www.mascara-nt.fr

DESCRIPTION

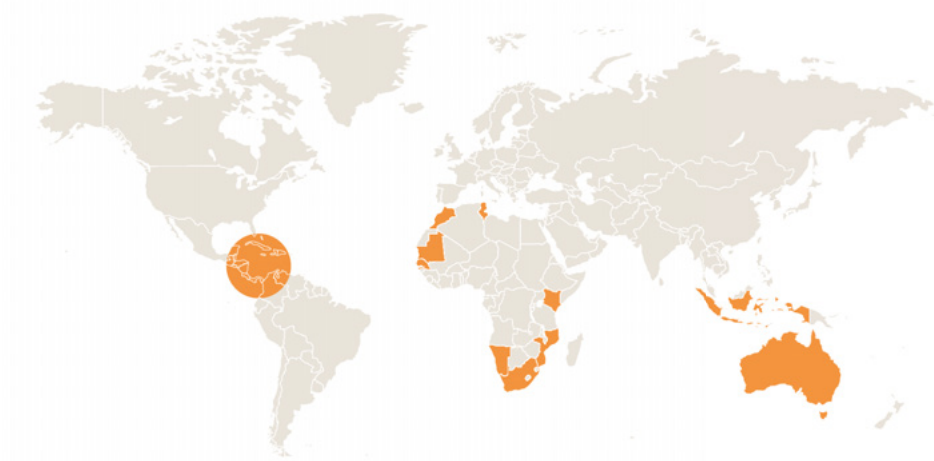
The company Mascara is specialized in innovative water treatment solutions using renewable energies. The first development resulted in the industrialization of the OSMOSUN® units, the world's first reverse osmosis desalination solution powered exclusively by photovoltaic solar energy, and without batteries, to produce between 1 and 2,000 m^3 per day. This innovation, patented by Mascara, enables the production of drinking water anywhere at an affordable cost, and without greenhouse gas emissions. The OSMOSUN® units currently supply more than 15,000 people in more than 15 installations deployed to date on 3 continents facing critical issues of access to drinking water.

TECHNOLOGIES

Mini grid · Water production through solar energy

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Southern Africa (Africa du Sud · Namibie · Mozambique) | Eastern Africa (Kenya · Maurice)
Western Africa (Senegal · Mauritania · Cap Vert) | Northern Africa (Morocco · Tunisia) | Caraïbe | Pacific (Australia · Indonesia)



LEADING PROJECT ON ENERGY ACCESS

DESALINATION PLANT IN SOUTH AFRICA

Over 3,000 local inhabitants are benefitting from the fresh water supply of about 100 m^3 produced per day by the OSMOSUN® 16 SW desalination plant using solar energy only. The unit has been implemented to alleviate the severe impact of the drought in the Western Cape Province in South Africa. Operation is managed by the local utility supported by Turnkey Water Solutions, exclusive representative organisation of Mascara Renewable Water in South Africa...

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

DESALINATION PLANT IN CAVERNE BOUTEILLE / RODRIGUES' ISLAND

The OSMOSUN® 13 SW desalination plant, based in Caverne Bouteille, on Rodrigues' Island in Mauritius in the Indian Ocean, is operated by the Water Department of the Rodrigues' Regional Assembly, to supply the local freshwater system with 240m^3 per day. The unit is fed with raw water with 35g/L salinity through a beach well drilled in coral subsoil. The unit produces, along with the sun exposure, 80m^3 per day in complete autonomy, and when required by the local population, 160m^3 powered by the local energy grid at night.

MOON

Rural electrification operator

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DESCRIPTION

Moon enables rural Africans to access the world through Digital, Energy and Financial inclusion with a proprietary «Pay As You Go» smartphone loaded with off-line and low data content, sold combined with a Solar Home System. Moon is a unique innovation that leverages three major levers of development: Energy inclusion: The Moon kit includes a solar home system with LED lights and USB charging; Digital inclusion: a PAYG «Moonphone» is included, offering a first digital experience with a customized portal and a bundle of apps allowing access to relevant information (agriculture, health, education, recycling phone, etc.); Financial inclusion: a dedicated suite of apps on the Moonphone eases the repayment of the kit on installment. This rent to own PAYG model creates data and credit scoring, leading to financial inclusion.

TECHNOLOGIES

Solar home kit

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Senegal · Togo · Western Africa

LEADING PROJECT ON ENERGY ACCESS

ELECTRIFICATION IN TOGO

Moon won the CIZO tender in Togo, becoming a licensed solar home system operator. Moon is aiming at electrifying 150,000 households by 2025, bringing product, technology, local operations, and financing.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Today Moon operates in Casamance, Senegal, and has equipped 3,500 clients. Products are field-tested and a team of 45 people is ready for scale, looking at achieving the ambitious goal of 5,000 sales. Moon has recently won a public tender in Togo, aiming at equipping 150,000 households by 2023.

MYJOULEBOX

Projects development · Equipment manufacturer

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https://myjoulebox.com/

DESCRIPTION

MyJouleBox develops hardware and software solutions to facilitate access to energy in Africa.

TECHNOLOGIES

SHS - solar home systems · Solar kiosks · Pico/micro grid · Mini grid

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Benin · Togo · Niger · Senegal · Burkina Faso

LEADING PROJECT ON ENERGY ACCESS

PAYGO & MICROFINANCE, SHS LEASING

Installation of leased solar systems in Benin with our partner ARESS Benin. Together with our partner we were able to bring electricity to more than 120,000 people in Benin.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

- In 2018, MyJouleBox was laureate of the ADEME project - Off-grid access to energy via the Pay as you go and microfinance project in Benin where MyJouleBox was in charge of developing hardware and software tools to enable Micro Finance Institutes to sell solar kits in pay-as-you go.

- In 2019, we won a project initiated by the United States for the installation of 5,000 decentralized solar systems in Benin.

Private sector

NANOÉ

Projects development

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DESCRIPTION

Nanoé is a young French social venture, designing, developing and deploying innovative energy access solutions for rural Africa intended to pave the way for a new power infrastructure path named "Lateral electrification". This model, based on the diffusion and successive interconnection of smart solar nanogrids by a multitude of small local franchized entrepreneurs, aims to offer a more affordable, flexible and sustainable energy alternative than solar home systems and centralized micro or mini-grids.

TECHNOLOGIES

Pico/micro grid

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Madagascar

LEADING PROJECT ON ENERGY ACCESS

ÉLECTRIFICATION LATÉRALE À MADAGASCAR

Thanks to a full set of proprietary hardware, software, organizational and financial innovations, Nanoé has been deploying this unique electrification model since 2017 in the North of Madagascar. As of today, the company has deployed two training and support platforms in the Diana region and franchised around 50 local entrepreneurs who have connected over 2,000 users to over 400 decentralized nanogrids.

Sponsored by robust technical and financial partners, Nanoé aims to empower several tenth ou thousands new users by 2023 and to support several hundreds new local entrepreneurs in the progressive building of lateral grids (smart, decentralized and 100% renewable-based).

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Nanoé and its lateral electrification model have received numerous international energy access innovation awards in the last few years, including:

- 2nd Orange Prize for Social Entrepreneurship in Africa and the Middle East in 2016;
- Call for project "Innovative solutions for offgrid renewable energy access" from ADEME and the French Ministry of Environment in 2017;
- Special prize of the EDF Pulse Africa competition in 2018;
- Grand winner for Africa of the "Empower a Billion Lives" competition organized by the IEEE in 2019;
- Call for project "Innovative solutions for offgrid renewable energy access" from ADEME and the French Development Agency in 2020.

Non Governmental Organization (NGO)

PAMIGA

Projects development · Financing · Support profession ·
Technical assistance to microfinance institutions to distribute solar products

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https:// www.pamiga.org

DESCRIPTION

Pamiga (Participatory Microfinance Group for Africa) is a non-profit organisation created in 2006, which aims to unlock the economic potential in Africa by promoting the growth of existing financial institutions that service rural areas.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid ·
Financing access to solar solutions through microfinance

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Benin · Senegal · Cameroon · Kenya · Madagascar

LEADING PROJECT ON ENERGY ACCESS

PAYGO & MICROFINANCE, SHS LEASING

The programme was launched in January 2018 with the support of the Environment and Energy Management Agency and other Pamiga donors.

The project will enable the establishment of an innovative partnership between ARESS, MyJouleBox and local microfinance institutions, allowing each partner to focus on its area of expertise: access to renewable energy for ARESS, research and development for MyJouleBox and financing for microfinance institutions. The financing of the solar solutions will be provided by the microfinance institutions rather than by the distributor PAYGO, which will lighten the burden on its cash flow and its responsibility for credit management. ARESS will ensure the marketing, distribution, installation and after-sales service of PAYGO's solar solutions, through the development of a rural network of energy entrepreneurs to solve the «last mile» challenge.

The PAYGO meter developed by MyJouleBox is based on a digital platform for monitoring customers, payments and consumption in real time. It offers a technical flexibility allowing a progressive increase of the system's capacities and a financial flexibility: pay-per-view, via mobile phone services and microfinance networks, while securing credit thanks to the remote deactivation of the system.

Within the framework of this mission, Pamiga provided the following services:

- Assessment of the energy and financial services needs of rural populations;
- The establishment of partnerships between MFIs and PAYGO solar solution providers/distributors;
- The design of financial products and adapted procedures for energy access in partnership with PAYGO;
- Technical training for MFI staff;
- Strengthening the supply chain of solar solutions through the development of networks of local technicians.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

ACCESS TO RENEWABLE ENERGY THROUGH MICROFINANCE - AFRICAN DEVELOPMENT BANK / BENIN, MADAGASCAR, SENEGAL

The programme was launched in January 2018 with the support of the African Development Bank and other Pamiga donors. The programme aims to facilitate access to solar energy for rural households and micro, small and medium enterprises (MSEs) through the provision of appropriate financial services.

Cluster / Centre of excellence

PÔLE MEDEE - MOTORS AND ELECTRICAL DEVICES FOR ENERGY EFFICIENCY

Support profession

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DESCRIPTION

The Cluster MEDEE – Motors and Electrical Devices for Energy Efficiency – brings together companies and academics around collaborative Research & Development & Innovation (R&D&I) projects in electrical engineering. Our topics are related to several sectors and target markets: Industrial processes energy efficiency; Electricity generation from renewable sources; Smart Transmission System; Transportation (rail, More Electric Aircraft, electrical vehicle...). Since June 2017, we support the development of our community in Africa. We deliver supports for access to funding and financing solutions, identifying economic, academic or institutional partners in Africa and France, technical evaluation and improvement of projects, international promotion of innovative solutions from partners.

TECHNOLOGIES

Mini grid · Solar kiosk · Maintenance and energy efficiency · Storage and connection · Electrical systems (transmission and interconnection)

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Africa

LEADING PROJECT ON ENERGY ACCESS

SÈMÈ CITY – SUSTAINABLE AND INCLUSIVE CITY

In Benin, Sèmè City will be a campus dedicated to innovation, training and entrepreneurship. MEDEE is part of a project financed by the French Government, with the Hauts-de-France Region, the Sèmè-Podji city, and the Sèmè City Development agency.

The main actions are:

- Concrete collaboration and exchanges between MEDEE and the Energy Cluster in Benin, to foster development of both communities;
- Organization of a call for projects for innovative solutions in renewable energy to be tested in the campus;
- Organization of an event on «training and innovation in the energy sector in Africa» in Lille, with the Beninese partners as honor guests in December 2019.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

ONGOING PROJECTS:

- Creation of a Hauts-de-France directory of energy companies in Africa
- Support for the creation of the Beninese Cluster «Energies et Applications» and definition of a collaborative roadmap
- Delivering a methodology for strategic alliances between entreprises

REFERENCES:

- Co-organisation of the «Energy for Africa» forum on 12 October 2018 in Lille and various events with the Hauts-de-France Region
- Support to more than ten collaborative projects with Africa (innovation and formation) since 2017
- Jury member for the co-experimentation call in renewable energies organized by the Sèmè City Development Agency
- Partner of the «ProForElec project: Professionalizing training in Electrical Engineering in Guinea to foster the employability of young people and the competitiveness of companies» with the University of Artois, the SME Flipo-Richir and the Superior Institute of Technology in Mamou (Guinea)

© Sèmè City

QOTTO

Projects development · Operation and maintenance

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DESCRIPTION

Qotto sells, distributes, install and manages Solar Home Systems in West Africa. Qotto group employs over 150 people and provide access to electricity to thousands of people in rural areas.

TECHNOLOGIES

SHS - solar home systems

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Benin · Burkina Faso

LEADING PROJECT ON ENERGY ACCESS

MODULAR SOLAR HOME SYSTEMS IN BENIN

In Benin, Qotto deploys modular solar home systems, connected and supervised by a «MaChina to Machina» system. Customers pay in Mobile Money in a leasing system. Our kit is unique in its modularity, connectivity and financing. Today, more than 12,000 people benefit from access to electricity thanks to Qotto. Thus we avoided the use of kerosene lamps and generators for all these people. To operate on the spot we have created a subsidiary and hired a Beninese team.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

We are in the process of duplicating in Burkina Faso what we started in Benin and we have the ambition to deploy distribution, storage and after-sales service centres throughout the territory of the two countries. Our ambition is to equip 30,000 households within 3 years.

RÉGION HAUTS-DE-FRANCE

Support profession

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DESCRIPTION

The Hauts-de-France regional council is working on improving access to electricity in Africa since June 2017, inspired by former Minister Jean-Louis Borloo's work in this field. The aim is to demonstrate the high potential of renewable energies in helping left-behind areas improve their living standards, create jobs and help communities sustain themselves.

TECHNOLOGIES

Cooperating and energy access · Energetic transition

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Africa

LEADING PROJECT ON ENERGY ACCESS

SÈMÈ CITY, SUSTAINABLE CITY

The Sèmè City project aims to create a city dedicated to innovation and knowledge, part of which is located in the territory of Sèmè-Podji commune. The Ministry of Europe and Foreign Affairs, within the framework of the call for projects «Sustainable City in Africa», has selected the proposal made by the Regional Council of Hauts-de-France, in partnership with the Sèmè City Development Agency and the MEDEE cluster, for collaboration with the Municipality of Sèmè-Podji. This project has 3 lines of action:

- A close collaboration between MEDEE and the Energy Cluster in Benin of Sèmè City, currently being created, in order to promote exchanges between entrepreneurs and universities;
- The organization of a competition for innovative solutions on renewable energies and eco-construction that can be tested directly on the future Sèmè City campus;
- The organization in February 2020 of a Forum of Energy Stakeholders for Africa which brought together 350 participants and many exhibitors from academia, industry and associations.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Call for Projects «Energy Actors for Africa»

2019-2020 «Sèmè City, sustainable and inclusive city» project led by the Hauts-de-France Region and the city of Sèmè-Podji, supported by the Ministry of Europe and Foreign Affairs within the framework of the call for projects «Sustainable City in Africa».

Project under study with three departments in Northern Senegal and with the Regional Development Agency within the framework of a FICOL of the French Development Agency

REYES GROUPE

Equipment manufacturer

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DESCRIPTION

Reyes Groupe is specialised in design, manufacturing and HV/LV electrotechnical equipment integration. Our solution can be used as back up for isolated electrical networks, minigrids or offgrid sites. We are able to manage storage and distribution of energy in the same container. We can work on hybrid project for solar or wind farm with mixed of energy by diesel generators and storage solutions. We can provide also outdoor PV Solar panels or switchboard for harsh environments.

TECHNOLOGIES

Mini grid · Off grid · Solar kiosk · Energy storage container
Hybridization solution · Solar / hybrid power plant · Backup

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Africa · Europe

LEADING PROJECT ON ENERGY ACCESS

ENERGY STORAGE CONTAINERS

Development of energy storage containers in connection with ENR projects (Africa / Europe / Overseas (Guadeloupe, Martinique, La Réunion, Mayotte, Nouvelle -Calédonie).

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Solar power plant

Solar container + storage

SABELLA

Projects development · Construction · Equipment manufacturer · Operation and maintenance

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DESCRIPTION

Sabella has designed and developed a tidal technology that allows to produce renewable electricity by harnessing marine currents: a clean and predictable energy. The turbines are installed on the seabed below the ocean surface. The blades are spun by the action of the marine current. This mechanical energy is then transformed into electricity through an electric generator. Sabella differentiates its positioning in the marine energy sector by an approach of simplicity and ruggedness in order to avoid costly and risky offshore maintenance operations. In addition, to fit with characteristics of concerned territories, Sabella offers tidal turbines from 100 to 2,000 kW. The origin of marine currents (astronomical phenomenon depending on the position of the Moon and the Sun) gives this mean of production a perfect predictability and a strong synergy with energy storage systems for off grid areas.

TECHNOLOGIES

Mini grid through tidal technology

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Canada · Chile · Indonesia · Philippines · Australia · France

LEADING PROJECT ON ENERGY ACCESS

TIDAL TURBINE IN THE FROMVEUR PASSAGE, USHANT ISLAND

In the Fromveur Passage of Ushant Island, France, Sabella installed its first tidal turbine in 2015, which was connected to the island's remote grid. This first turbine made it possible to reduce by 10% the consumption of the Diesel generators that supply this territory with electricity. In 2022, two new tidal turbines will be deployed by Sabella, in partnership with Akuo Energy, as well as one wind turbine, PV solar panels and an energy storage capacity. This hybrid project will cover 80% of Ushant's energy needs, cutting annual Diesel consumption by 1.5 million litres.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

CAPUL / PHILIPPINES

In the Philippines, Sabella is leading a project together with the local project developer H&WB to provide a solution for the Capulinos. Today, Capul Island has an electrification rate of 60% and access to electricity through Diesel generators is only granted for a few hours a day. In order to enable this island an economic and social development, particularly through the fishing industry (possibility of a ice production for the conservation of seafood products) and tourism, H&WB and Sabella have the ambition to deploy two hydro turbines in the San Bernardino Strait, combined with energy storage capacity, in order to guarantee access to continuous energy for all inhabitants.

SCHNEIDER ELECTRIC

Equipment manufacturer

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Life Is On | Schneider Electric

DESCRIPTION

As a leader in the digital transformation of energy management and automation, we believe that access to energy and digital are fundamental human rights. That's why more than 10 years ago we have set up an ambitious program called Access to Energy, which combines technology solutions, investment funds, training and entrepreneurship support. Between 2009 and 2019, we have provided energy access solutions to more than 27 million people, invested in 20 ventures, trained more than 246,000 people, and supported more than 800 entrepreneurs.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid · Solar kiosks
Public lighting / solar outdoor light · Solar water pumping systems · didactical benches

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Worldwide, with special focus in Africa, South-East Asia, India, Middle East and South America.

LEADING PROJECT ON ENERGY ACCESS

ELECTRIFICATION OF THE COOPERATIVE IN THE VILLAGE OF DONVAGNE IN IVORY COAST

Schneider Electric and IECD supported a Solar Mama project in Ivory Coast and partnered with AFD to deploy a model of access to electricity and productive development. The project has enabled the distribution of a hundred solar home systems and portable lamps for the most disadvantaged households, but above all to equip the women's cooperative with mills, a kneader, refrigerators and computers, powered by a 25 kW mini-grid with solar panels attached to the roof of the cooperative.

In addition to the equipment provided, IECD is deploying a program to support the cooperative and entrepreneurs from the village, in order to ensure the sustainability of the facilities and maximize the impacts on entrepreneurship.

The equipment installed will accelerate the economic development of the cooperative whose main activities are the cultivation of cashew, yam, corn, cassava, and plantain:

- A kneader for cooking cakes;
- Two mills for cassava and corn;
- Two freezers for the sale of fish, meat, juices and cold drinks;
- Computers with Internet and a TV, provided by Lifi-Led;
- 100 solar lanterns and 100 solar home systems by Schneider Electric for the most needy.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

SCHNEIDER ELECTRIC'S PORTFOLIO OF ENERGY ACCESS PRODUCTS AND SOLUTIONS

Portable solutions

Mobiya

Mobiya Original
Mobiya Lite
Solar powered portable LED Lamp with mobile charger

Mobiya Front
Head lamp

Domestic electrification

Homaya

Homaya Family
Solar Home System including a solar panel and lamps

Homaya PAYG
Including Pay As You Go

Homaya Hybrid
AC and DC, Solar and Grid Home System

Collective electrification

Villaya

Villaya Microgrid
Solar microgrid to power off-grid sites

Villaya Community, Villaya Emergency
Customized, Packaged, Containerized

Villaya Water
Solar Water Pumping System

Villaya Lighting
Solar Street Lighting

Villaya Recharge
Entrepreneur USB charging station

Including: EcoStruxure for Energy Access, remote monitoring of microgrids

Training

Training

Didactical benches;
Course contents;
Training of electricians, installers, facility managers, entrepreneurs, trainers

Life Is On Schneider Electric

SETEC ÉNERGIE ENVIRONNEMENT

Projects development · Assistance in project management

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setec
énergie environnement

DESCRIPTION

Setec energy environnement belongs to the setec group, present in Lille, Paris, Lyon, Nantes, Marseille, Monaco Setec Energy Environnement's businesses concern waste management, energy production, distribution networks, hydropower, marine engineering and environmental studies related to facilities. Assistance to the Client, project management, feasibility studies, technical assistance, contract research, and generally all engineering, consulting and engineering services or control in the fields of the professions of production and control of energy, environment, sustainable development.

TECHNOLOGIES

Smartgrid / energy production · Distribution grids

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Africa · Middle East · South Amercia

LEADING PROJECT ON ENERGY ACCESS

PROCESS AND CIVIL ENGINEERING FOR THE DAS ISLAND POWER PLANT / UNITED ARAB EMIRATES

The Project As part of the construction of a new 36 MW power plant on Das Island (United Arab Emirates), a major Oil & Gas compagnie entrusted setec énergie environnement with the realization and supervision of the project civil engineering as well as with a number of missions related to the process. This outdoor power plant has the «black start» function with a GE Frame 4 turbine. It is operated with sweet or sour gas. Focus Thanks to its powerful tools in the fields of thermondynamics, setec énergie environnement can realize or check designs of thermal installations in combined cycles and initiate equipment consultations. Engaging performance (guarantees) are provided by the equipment manufacturers, but setec énergie environnement can control and ask the right questions, so as to secure its customers' procurement.

Our Services - setec énergie environnement expertise was solicited for the following missions in the process making:

- Optimization of the plant arrangement in a very constrained zone;
- Verification of the plant's mass and energy balance, with and without the combined cycle option;
- Piping synthesis review in interface with the turbogenerator group;
- Consistency review of the gas booster utility design;
- Design, checking and validation of the industrial HVAC of the electric building.

Setec énergie environnement expertise was solicited for the following missions in civil engineering:

- Optimization of concrete formulations in aggressive environments and very hot climate;
- Definition, monitoring, and interpretation of the geotechnical campaign;
- Project design in the tender phase, update of the civil engineering specifications to the offshore and American (ACI, ASCE) standards, assistance with drafting the contract with local companies;
- Onsite follow-up of works for 18 months;
- Basic and civil engineering details studies of the plant (about 300 documents);
- Dynamic calculation of the turbine foundation.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

ISOLATED MINI-GRIDS / FRENCH GUYANA

AFD wishes to bring forward proposals and financing to accelerate the implementation of Energy Transition (TE) investments in its intervention areas, particularly in French Guyana.

ELECTRICITY PRODUCTION AND DISTRIBUTION / IVORY COAST

As part of its Production-Transport (energy) master plan, Ivory Coast has set a target of 42% renewable energy by 2030, including a sharp rise in biomass.

SUN'AGRI

Projects development · Construction

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DESCRIPTION

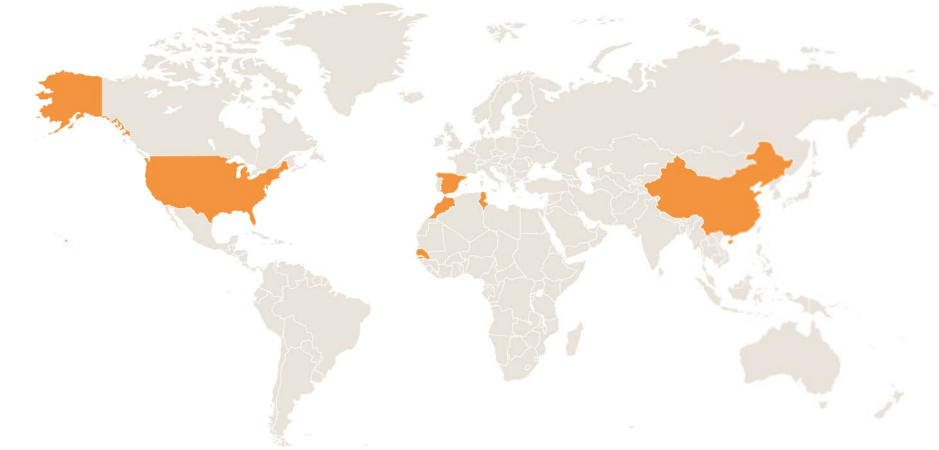
Dynamic agrivoltaism is an innovative technology for farmers facing climate change. Photovoltaic panels, positioned over the crops are monitored based on complex algorithms, in order to optimize the well-being of the plants.

TECHNOLOGIES

Agrivoltaism

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Morocco · Tunisia · Senegal · United States · China · Spain



LEADING PROJECT ON ENERGY ACCESS

DEMONSTRATOR IN TRESSERRE

In November 2018, the first agrivoltaic system has been installed in Pyrénées-Orientales, in Tresserre, France. The agrivoltaïc structure has helped recover an unused plot of the winery. The panels, positioned at 4,5m high, provide a protection to the vines. Remotely monitored, their orientation is always done to favor the plants' well-being.

Innovation :

- Mobile photovoltaic panels are monitored to adapt their orientation depending on the need of the plant;
- The panels are monitored in real time based on complex algorithms that use growth models, weather forecast and cultural itinerary of the plant;
- The structure is a solution to protect the crops against destructive climate events, by combining agricultural practices with an agrivoltaic structure (anti-hail nets).

Economic and social: The major societal benefits of the project are:

- An answer to the problem of «how to feed 10 billion humans»;
- Adaptation of agriculture to climate change;
- Preservation of resources, especially water;
- A solution for a massive, total, and competitive energy transition;
- Creation of jobs.

Environment: Dynamic agrivoltaism enables a decrease on water consumption of the plants of 20%, which means a decrease in irrigation. Moreover, the production of renewable energy avoids using limited fossil resources.

Application and valorization: The Sun'Agri technology is an agricultural tool addressing climate change harmful effects on crops. This innovation offers to farmers from the wine, tree growing and market gardening sectors a solution to adapt and protect. As to address the problems met on the parcel, the Sun'Agri technology adapts to each specificity of the studied crops. This answer to the emergency of climate change is particularly adapted to the French territory but also all over the world. Sun'Agri is a solution that could bring protection to crops suffering from more and more violent heat waves or drought (for example in Africa, California, South America, ...).

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Nidolères winery · *Tresserre, Pyrénées-Orientales, France*

La Pugère experimental system on arboriculture · *Mallemort, Bouches-du-Rhône, France*

Piolenc experimental system on vines · *Vaucluse (84), France*

Project in Morocco

SUNNA DESIGN

Projects development · Equipment manufacturer · Operations and maintenance · Support · Storage

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DESCRIPTION

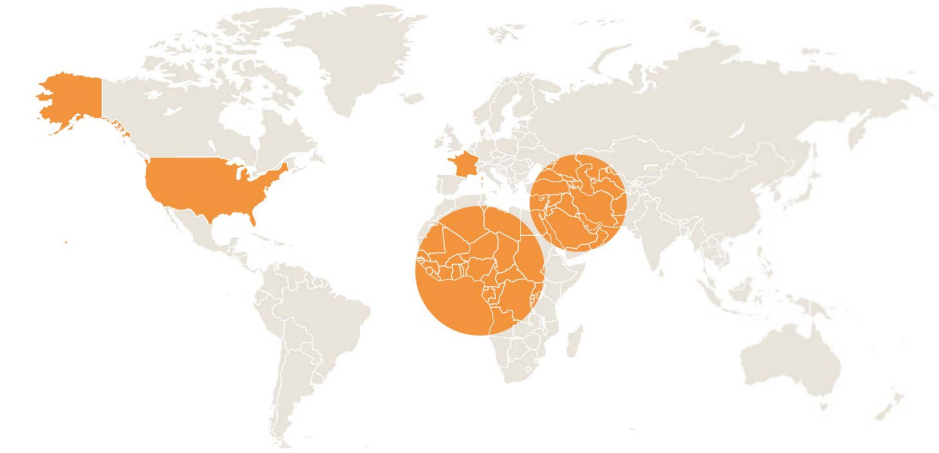
Sunna Design is a pioneer and leader in solar street lighting and energy management for stand-alone connected applications. Our state-of-the-art technology platform allows to Power & Connect™ smart and clean outdoor applications. We deliver solutions that stand out for their robustness, recyclability, superior performance and unmatched lifespan across all climate conditions thanks to our built-in electronics and mastery of the latest generation battery technologies. Combining the power of solar energy with connectivity, we invent future uses: in the field of street furniture to offer more services to citizens; in the field of security to protect them; in the field of telecoms to deploy wifi access using our solutions. The company, the holder of 14 patents and winner of 11 international awards, has deployed more than 100,000 intelligent solar solutions in more than 45 countries thanks to its network of high value-added partners.

TECHNOLOGIES

Solar public lighting

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

France · United States of America · Africa · Middle East



LEADING PROJECT ON ENERGY ACCESS

PUBLIC LIGHTING IN CAMEROON

In Eastern Cameroon, at the border with the Central African Republic, tens of thousands of people have found refuge after fleeing the war that has been raging in the CAR for several years. In Gado, NGO Solidarités International looked into the living conditions of people in the village and neighbouring refugee camp. In light of the security problems faced by the population, the NGO issued a call to tender to meet the significant lighting needs in high-traffic areas such as the main roads, intersections, market square, health centres and sanitary facilities in both the village and the camp.

There is no area-wide electricity generator in the village and installing an engine-generator was not a viable solution given how difficult sourcing diesel fuel is in this remote area. Moreover, it is impossible to install a grid-connected lighting circuit in this extensive off-grid region. Hence, the NGO Solidarités International chose to turn to renewable energies and to use standalone solar solutions to light the designated areas.

In order to ensure the durability of the infrastructure, particular attention was paid to the quality of the equipment, while remaining within budgetary constraints of funding. Technical specifications included: lighting performance; year-round availability of lighting, including after the rainy season when sunlight is limited; product adaptability according to application; little or no maintenance within the first 10 years.

The ISSL+ street light with a road optics was selected for the lighting of pathways, while the Maxi4 with a wide optics was selected for the lighting of larger areas. An autonomy study was carried out to reproduce how these two products would perform in Gado, taking into account data relating to solar irradiance of the last 10 years. Our products showed perfect performance results for that geographical location. HELIOS ENERGY, a company based in Cameroon, partnered with Sunna Design to deploy the products and explain to the local population how they operate.

All in all, more than 30,000 people have now access to street lighting on vital roads and pathways, as well as in places where they can gather and interact with each other. Insecurity reduced dramatically and economic activities developed in those areas, including in the evening with shops and street food stalls that stay open later.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

PUBLIC LIGHTING IN DEMOCRATIC REPUBLIC OF CONGO

Sunna Design also operates in the Democratic Republic of Congo (DRC) through its local partner Congo Energy. In Lubumbashi, Sunna Design's iSSL Maxi 4 and iSSL+ stand-alone solar street lights have been installed at Square Forrest to light and improve the security of the park, alleys and sports grounds, and an additional 208 street lights are in the process of being deployed on Kasa-Vubu Avenue.

SUPERGRID INSTITUTE

Institut de transition énergétique

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DESCRIPTION

SuperGrid Institute est dédié au développement des technologies pour les systèmes de transmission et de distribution des réseaux électriques du futur, basés sur les technologies DC interconnectées aux réseaux AC. Ils permettront de transporter de grandes quantités d'électricité sur de longues distances et contribueront à l'intégration massive des énergies renouvelables ainsi qu'à la stabilité des réseaux. Leader des innovations au service des industriels du réseau électrique de demain, notre mission est de créer de la valeur pour nos clients à travers des technologies et des services innovants.

TECHNOLOGIES

Réseau de transmission électrique MT/HT

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Europe and rest of the World

LEADING PROJECT ON ENERGY ACCESS

CNR - COMPAGNIE NATIONALE DU RHÔNE

Réalisation pour le compte de la CNR d'une étude de faisabilité technique et de design d'une architecture de réseau électrique à courant continu dans le cadre d'un projet de centrale photovoltaïque le long du Rhône (France).

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

PROJET LISORE

Contribution au projet LISORE, coordonné par France Energies Marines. Fédérant 9 partenaires, ce projet de 15 mois vise à explorer la viabilité de sous-stations innovantes en mer (flottantes ou sous-marines) pour l'intégration des énergies marines renouvelables.

GENERAL ELECTRIC GRID SOLUTION

Design et caractérisation de gaz isolants de type g3, alternative au gaz SF6 traditionnellement utilisé dans les appareillages électriques haute et moyenne tension.

PROJET PROMOTION

Partenaire clé du projet européen H2020 intitulé 'PROgress on Meshed HVDC Offshore Transmission Networks', lancé en 2015 et destiné à étudier les bénéfices d'un réseau de transmission offshore à courant continu pour la collecte et le raccordement de parcs éoliens offshore.

ALSTOM TRANSPORT

Etude de design d'un transformateur de type « Solid state transformer » utilisant une technologie innovante de conversion AC/DC, destiné au secteur du ferroviaire embarqué.

AUTRES PROJETS

Merci de consulter notre liste de références sur notre site internet www.supergrid-institute.com

Non Governmental Organization (NGO)

SYNERGIE SOLAIRE

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Synergie Solaire
Les énergies durables au service de l'Homme

DESCRIPTION

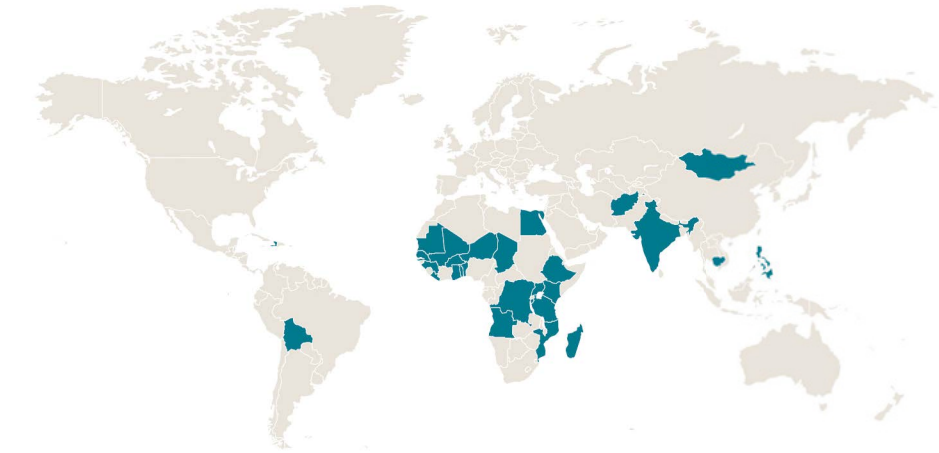
Endowment fund for the European renewable energy sector. Synergie Solaire centralizes not only funds, but also the skills of companies in the sector, to technically and financially support selected NGOs, carriers of humanitarian energy access projects all over the world. A strong ambition for the future: To contribute to a better world for people and the planet. Synergie Solaire acts in the form of donations exclusively to selected NGOs and does not intervene in endowing the private sector.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Mini grid · Solar kiosk · Solar pumping
Solar cooking stove · Small wind turbine · Passive ecological building techniques

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Afghanistan · Angola · Benin · Bolivia · Burkina Faso · Burundi · Cambodia · Egypt · Ethiopia · Ghana · Guinea Conakry · Haiti · India · Kenya · Liberia · Madagascar · Mali · Mauritania · Mongolia · Mozambique · Niger · Uganda · Philippines · Democratic Republic of Congo · Senegal · Tanzania · Tchad · Togo



LEADING PROJECT ON ENERGY ACCESS

RENTAL AND SALE OF LIGHTING KITS IN MANILA'S SLUMS / PHILIPPINES

ONG partner: Entrepreneurs du Monde (EdM) · Local partner: ATE Co.

Context & energy issues: In 2015, 26% of of Filipinos lived below the poverty line in underprivileged urban areas without access to basic services (drinking water, energy...). Edm decided to address the issue of fuel poverty by creating the ATE Co program.

Selected solutions: Since 2016, ATE Co has developped a innovative solution : to enable the poorest families in the slums of Manila to benefit from good quality, economical and safe solar lighting and to become owners of it. This is a solar kit with 3 light points that also allows to charge small electrical appliances for less than 3USD per week. The innovative pay-as-you-go approach allows them to acquire the solar system smoothly, over 18 months, by paying daily and at their own pace for its activation. Payments are made to ATE Co agents who train each customer. Thanks to software connected to the battery of installed kits, the kit is deactivated if the customer is not up to date with his payments. This makes it possible to reach poorer households who would not have access to credit.

Impacts :

- Improvement of the living conditions of very vulnerable people;
- Reduction of health hazards and risks of explosion or fire;
- Reduction in energy expenditure on the family budget (the average amount of savings is 9USD/month, about 45% of the energy budget);
- Climate protection (reduction in the use of kerosene lamps).

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Electrification of schools by a solar and wind Energy mix in Boromo, Burkina Faso

Energy mix for the energy empowerment of a remote village in Ethiopia

Diffusion of solar cookers and drying kit in Bolivia

Installation of a solar pumping station for market gardening in an agro-ecological seed farm in Mali

Construction of a solar-powered refrigerated chamber for tuber conservation in Mali

Rental-purchase of lighting kit for residents of Manila's slums in the Philippines

Complete electrification of the new Boromo high school by a solar and wind energy mix in Burkina Faso

Economic development in rural areas through access to energy in Mali

TOTAL ACCESS TO ENERGY SOLUTIONS

Projects development · Equipment manufacturer · Support profession · Solutions Distributor

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DESCRIPTION

Total Access To Energy Solutions is developing a range of decentralized solutions that meet the energy needs of people in emerging countries while helping to combat climate change. From kits to solar street lights, our solutions meet the ever-changing needs of individuals and communities. In this sense, TATES offers an evolving range of products and partners with local actors to propose financing solutions adapted to each individual's resources. Since 2010, more than 3.5 million solar solutions have been distributed in 40 countries through commercial channels involving social entrepreneurs and NGOs, improving the daily lives of more than 15 million people.

TECHNOLOGIES

SHS - solar home systems · Pico/micro grid · Solar kiosk · Public lighting / solar outdoor light

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Cameroon · Kenya · Nigeria · Burkina Faso · Uganda · Ivory Coast · Mali · Senegal · Zambia · Niger · Malawi · Zimbabwe · Ghana · Mozambique · Ethiopia · Chad · Puerto Rico · Pakistan · Papoua-New-Guinea · Cambodia · Haïti · South Africa · Congo Brazza · Tanzania · Namibia · Botswana · Swaziland · Democratic Republic of Congo · India · Equatorial Guinea · Guinea Conakry · Liberia · Gabon · Togo · Mauritania · Argentina · Mexico · Dominican Republic · Angola · Sierra Leone

LEADING PROJECT ON ENERGY ACCESS

SUPPLY OF 200 SOLAR KITS TO FARMERS

Location: Uganda. Local partner: Amigos Farm

In rural areas, few farmers have access to energy and prefer kerosene lamps. In collaboration with Amigos Farm, an agricultural training centre, 200 solar kits have been provided to apprentices. These kits, composed of a solar panel, a battery, two light bulbs, a neon light, a torch and a radio, offer a sustainable and economical solution.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

Partnership with ASOBO to accelerate the deployment of electric mobility solutions on the Kenyan shore of Lake Victoria

500 solar lamps distributed in partnership with Total Puerto Rico and Mercy Corps for families without electricity following the earthquake in Puerto Rico

Partnership with Hydro-gen for the installation of a tidal turbine on the Congo River to provide a unit of essential services for villages: lighting, refrigeration, water purification and processing of agricultural products

Partnership with the company Solergie for the implementation of solar nano-grid in pay-as-you-go, which aims to provide electricity to 5 to 8 households per system: 420 systems installed and 15,000 people impacted.

TOTAL EREN

Projects development · Equipment manufacturer · Financing
Construction · Operation and maintenance · Support profession

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DESCRIPTION

Total Eren's strategy is to develop a diversified and profitable portfolio of solar and wind assets, primarily in countries where renewable energy constitutes an economically viable response to growing energy needs. Thanks to fruitful collaborations with local developers and a strict investment discipline, the group owns more than 2,8GW either in operation or under construction, as well as a portfolio of projects under development which exceeds 2GW. On December 1st, 2017, the French oil major Total acquired an indirect interest of 23% in Total Eren by subscribing to a capital increase for an amount of €237.5 million. Today, Total holds circa 30% (directly and indirectly) of Total Eren along with Bpifrance, Tikehau, FFP Invest and NextWorld Group at c. 24% and Total Eren's founders for the remaining shares. Total Eren is active in rural electrification via Winch Energy, a company of which Total Eren is a shareholder, that designs, develops, builds, installs, operates and finances solar plus storage mini-grids across Sub-Saharan Africa.

TECHNOLOGIES

Mini-grid · Storage

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Mauritania · Sierra Leone · Benin · Ouganda · Éthiopie · Angola · Senegal · Sao Tome · Nigeria

LEADING PROJECT ON ENERGY ACCESS

TYPE OF INNOVATION: CONTAINERIZED SOLAR PLUS STORAGE SOLUTION OF 7 KW TO 100 KW

Location: Benin. Local partners: ASPER (local business)

Environmental, economic and social impact: electricity supply in rural areas: currently 60 connections and nationwide extension program underway for 100 villages with a financing from UKEF under finalization.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

2 mini-grids installed in Mauritania (2 x 17 kW plus storage) providing electricity and Wi-Fi to 1,000 people

1 mini-grid installed in Benin and 100 villages under development (2,300 connections)

1 mini-grid in Uganda (Bunjako island, mainly populated by fishermen), and 4 mini-grids under financing to electrify the Bunjako island and that will serve 2,500 people

25 mini-grids in Uganda (GIZ tender, awardee) under financing

24 mini-grids in Sierra Leone (UNOPS/DIFID tender, awardee) under financing to reach 5,200 connexions

100 mini-grids in Ethiopia under development

2 mini-grids in Angola under development to electrify schools in particular

ZEMBO

Sustainable mobility · Operation and maintenance · Storage

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DESCRIPTION

Millions of motorcycles taxi drivers are present in sub-Saharan Africa. This is a revenue generating activity for young people and their family, and an affordable transport solution for low-revenue people, adapted to African roads and often the single available solution. The problems are that drivers rent their vehicle, putting a strain on their revenues, and that this activity causes a high environmental pollution. Zembo focuses on 2 complementary activities: the leasing (rent to own) of electric motorcycles to taxi drivers, and the battery charge through a network of solar stations. The advantages of our electric solution are the following: Improvement of drivers' revenues (who become owner of their vehicle after 2 years); Environmentally clean solution (lowering CO_2 and particles emissions, reducing noise); Better service, including security training and gears for drivers and passengers. After the successful pilot in Uganda and 40,000 km driven, Zembo starts the commercial phase with the objective to reach 2,000 vehicles in 2020.

TECHNOLOGIES

Sustainable mobility

COUNTRIES OF INTERVENTION, PRIORITY COUNTRIES

Uganda

LEADING PROJECT ON ENERGY ACCESS

SOLAR RECHARGE OF ELECTRIC MOTORCYCLE-TAXIS

Location: Kampala, Uganda.
Local partners: KCCA (Kampala Capital City Authority)

Environmental impact: reduction of CO_2 and fine particles emissions, noise reduction.
Social impact: improvement of drivers revenue.

REFERENCES AND/OR ONGOING PROJECTS ON ENERGY ACCESS

250,000 km driven and 6,500 battery swaps (hybrid solar recharge) in real conditions in Uganda. Commercial launch in October 2019.

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ADEME
AGENCY FOR ECOLOGICAL TRANSITION

ser French Renewable Energy trade association