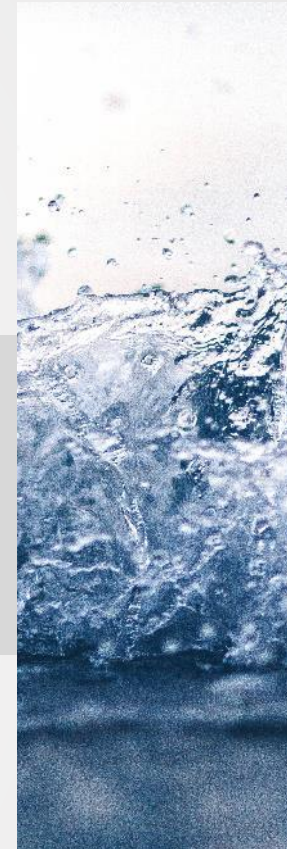


AKUO ENERGY

Capability Presentation

2020



| Entrepreneurs by Nature

Akuo Energy, headquartered in France, is an international renewable energy infrastructure company that develops, owns and operates generation and power systems assets.

Featuring a diverse technological and geographic portfolio Akuo has a deep experience of engineering, financing, constructing and operating bespoke grid management infrastructure in challenging technical, geographic and political environments.

This places the company in a leading position to engage with grid operators and provide solutions to complex grid support and stability challenges that can arise with the penetration of non-synchronous generation into established grid systems.

This presentation has been prepared to showcase Akuo's relevant project experience.





Established Business

1.2 GW in operation and under construction
Total pipeline in excess of **3 GW**



Governance

Privately owned company



Diverse Technology Mix

Wind, Solar, Hydro, Biomass, Hydrogen



Long-term Strategy

- Green power generation and asset control for project lifetime.



Strong Financial Performance

221€M total group revenues (2018 unaudited figures)
2.2€bn cumulative investment since 2007



Internal Expertise

Internal capacity across the entire value chain;
development, financing, construction, ASM.
>350 employees



Innovative

In house development of products and solutions.



Global Presence

Offices in **18 countries** :

France, Bulgaria, Croatia, Turkey, USA, Indonesia,
UAE, Mongolia, Dominican Republic, Mali, Australia,
Luxembourg, Montenegro, Uruguay, Argentina,
Colombia, Pologne and Greece

PRODUCTS AND SOLUTIONS DEVELOPMENT



GEM® Green Energy in Motion

SolarGEM®; 74 kWp mobile solar system.

StorageGEM®; max 1MW mobile BESS.

Developed and manufactured by Akuo Industries.

HYDRELIO® by Ciel & Terre

Modular floating solar mounting system

Manufactured for and exclusively distributed by Akuo Industries.

SUNSTYLE® solar tiles

Sunstyle®; Contemporary ceramic photovoltaic roofing system.

Developed and manufactured by Akuo Industries.

LAST MILE hydrogen fuel

The Last Mile project deploys zero emission mobility with a large scale network of green hydrogen production and distribution stations for urban logistics players.

Joint venture between Akuo Energy, Atawey, JCDecaux, Galeries Lafayette.

EMS (Energy Management System)

EMS is a digital platform for Energy and Smart-grid management. The plug and play system allows bespoke configuration for all hybrid energy power systems.

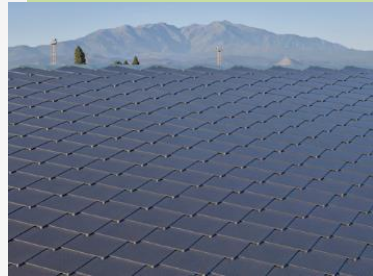
Developed by Akuo Energy

INTERNAL EXPERTISE



CONSTRUCTION EXPERTISE

Turnkey construction and delivery of industrial-scale solar projects ready to be connected.



SELF-CONSUMPTION EXPERTISE

Design, financing, construction and ASM of customized electrical self-sufficiency solutions (rooftop solar tiles) for commercial and industrial clients



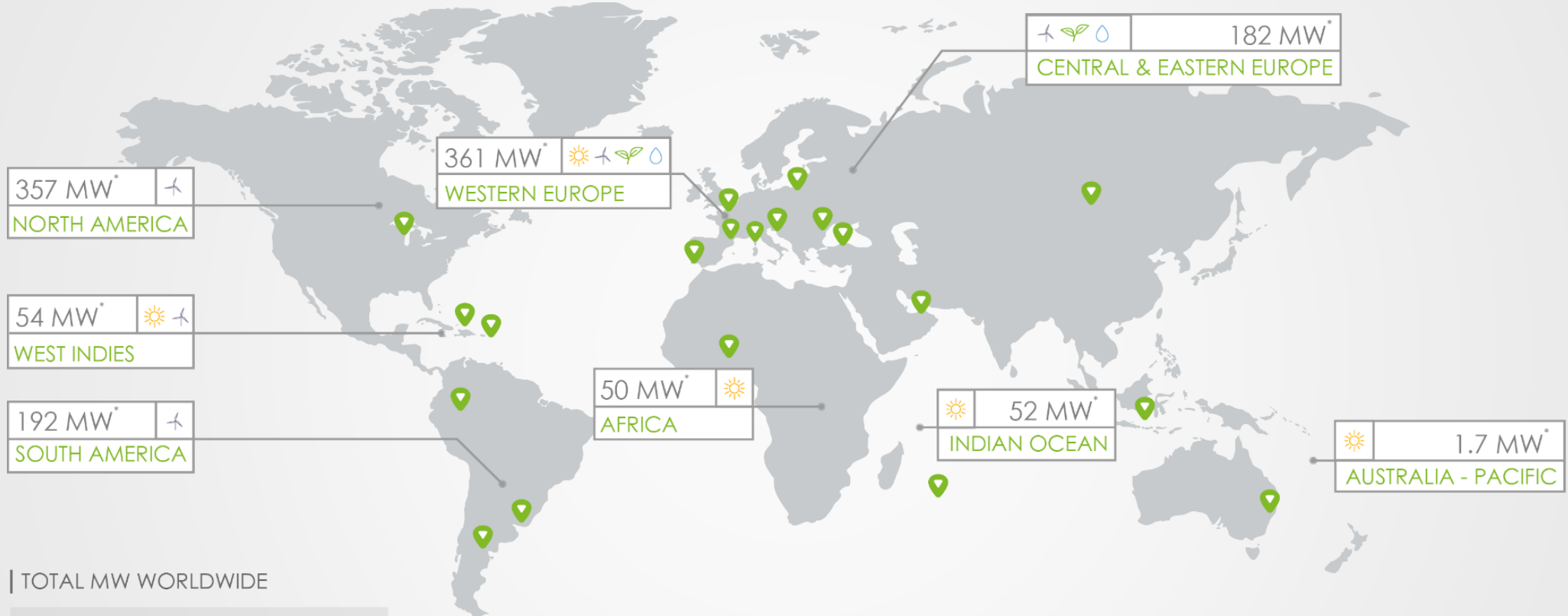
HYBRID ENERGY EXPERTISE

Design, financing, construction and ASM of customized hybrid generation and power systems solutions, combining solar and BESS systems for both off-grid and grid connected applications..



AUXILIARY SERVICES EXPERTISE

Development of digital platforms providing network balancing solutions (ancillary services combined with storage solutions – frequency regulation with millisecond response times, prediction and management of power curves, clipping, dispatchable demand management services.



| TOTAL MW WORLDWIDE

> 200 MW with financing underway
> 3000 MW in development

*MW in operation and under construction

| TECHNOLOGIES :



 AKUO'S LOCATIONS

INTERNATIONAL CASE STUDIES

1. Diverse experience in grid support services

- Olmo 1 (Corsica, France)
- Bardzour (Reunion island, France)
- Mortella (Corsica, France)
- Les Cedres (Reunion island, France)

2. Developing mini grid solutions

- MCAI (Indonesia)

3. Developing energy storage solutions

- Madinina (Martinique, France)
- Tonga 1&2 (Tonga)
- Amaury & Henrietta (Mauritius)

4. Portfolio financing

- Wielowies / EP44 / Gniew (Poland)

5. Working with utilities and grid operators

- Florida 1&2 (Uruguay)
- Krnovo (Montenegro)
- New Caledonia
 - Focola
 - Ouaco
 - Kwita Wije

6. Innovative financing approach

- Punta Cana (Dominican Republic)
- Rocksprings (United States)

7. Working in a challenging environment

- Kita (Mali)

1. DIVERSE EXPERIENCE IN GRID SUPPORT SERVICES

In 2011, Akuo won a call for tender for 29 MW of capacity and 29 MWh of battery storage in four unconnected grid areas on Corsica and Reunion Island.

- ❖ 2015 on Reunion Island solar power generation could provide up to 30% of daytime demand. Grid stability was threatened in the event of a rapid drop in solar generation. Additionally Reunion Island has a target of energy autonomy by 2030 requiring further penetration of renewables.



- ❖ Similarly, Corsica reached 30% of intermittent power generation in 2012 and has the objective of reaching 40% of electricity generation from renewable energy by 2030.

The tender required a solution to maintain grid stability whilst enabling the continuing penetration of renewable generation.

1. DIVERSE EXPERIENCE IN GRID SUPPORT SERVICES

- ❖ The Akuo proposal satisfied the energy regulator's strict constraints on the plant's generation profile: rapid generation ramp up and down at a given rate and maintenance of intermediate stationary phases. A suitably sized BESS coupled with Akuo's EMS in each of these projects enables each plant to respect those constraints and allows a flat generation profile.
- ❖ Bardzour and Olmo 1 were commissioned in 2014 and Les Cedres and Mortella in 2015, becoming the largest utility-scale battery storage solutions in the world at that time. All four systems are owned and operated by Akuo.

BARDZOUR (Reunion, France)

- 9 MW / 9 MWh
- GMPV+PV Greenhouses + BESS

LES CEDRES (Reunion, France)

- 9 MW / 9MWh
- GMPV+ PV fish-farm roof + BESS



OLMO 1 (Corsica, France)

- 4 MW / 4 MWh
- GMPV + BESS

MORTELLA (Corsica, France)

- 7 MW / 7MWh
- GMPV + BESS

❖ **AkuoCoop**

A percentage of the funding required for these projects was raised through a participative financing scheme. AkuoCoop, a crowd-funding platform developed by Akuo, allows individuals to take part directly in the financing of energy projects in their community. Via this platform local community members can enjoy the benefit of consuming locally produced renewable electricity, as well as the ongoing economic return of the projects.

1. DIVERSE EXPERIENCE IN GRID SUPPORT: OLMO 1

- **Location:** Corsica, France
- **Technology:** GMPV + BESS
- **Capacity:** 4 MWp PV + 4MWh
- **Status:** Operational, Commissioned 2014
- **Funded by:** French bank (Natixis Energéco)



❖ Collaboration with a regional utility

Akuo worked closely with the regional grid operator throughout development, design, commissioning and the collaboration continues under the project ASM. The BESS, owned and operated by Akuo, is located behind the meter, continues to provide firming services, a flat yield curve and the required rapid ramp rates.

❖ Additional Features

The project brings further economic benefits via support for additional agricultural and environmental initiatives. Areas of the site are made available to a local farmer for sheep grazing. Akuo also collaborated with a local honey producer to install bee hives on the site every summer. Finally two artificial ponds have been created to support the development of two indigenous species in their natural environment.

1. DIVERSE EXPERIENCE IN GRID SUPPORT: BARDZOUR

- **Location:** Reunion Island, France
- **Technology:** Ground Mounted PV + PV Greenhouses + BESS
- **Capacity:** 9 MWp PV + 9MWh
- **Status:** Operational, Commissioned 2014
- **Funded by:** French bank (Natixis Energéco)



❖ Collaboration with a regional utility

Akuo worked closely with the regional grid operator throughout development, design, commissioning and the collaboration continues under the project ASM. The BESS, owned and operated by Akuo, is located behind the meter, continues to provide firming services, a flat yield curve and the required rapid ramp rates.

❖ Additional Features

- When operation started in 2014, Bardzour was the largest utility-scale battery storage project in the world.
- Since inception in 2014, approximately 250 inmates have been trained in PV construction, operation and maintenance, agriculture, permaculture, and bee-keeping and are actively employed in Akuo's other projects on Reunion Island following release from prison.
- The greenhouses are used to produce food using innovative permaculture techniques and the crops from the project are sold directly on local market, encouraging local production and consumption through short supply chains.

1. DIVERSE EXPERIENCE IN GRID SUPPORT: MORTELLA

- **Location:** Corsica, France
- **Technology:** Ground Mounted PV + PV Greenhouses + BESS
- **Capacity:** 7 MWp PV + 7MWh
- **Status:** Operational, Commissioned 2015
- **Funded by:** French bank (Natixis Energéco)



❖ Collaboration with a regional utility

Akuo worked closely with the regional grid operator throughout development, design, commissioning and the collaboration continues under the project ASM. The BESS, owned and operated by Akuo, is located behind the meter, continues to provide firming services, a flat yield curve and the required rapid ramp rates.

❖ Additional Features

The project brings further economic benefits via support for additional agricultural initiatives. Hundreds of olive trees have been planted for organic olive oil production. Thus, the project supports the local economy with the supply of local organic produce and development of traditional regional farming.

1. DIVERSE EXPERIENCE IN GRID SUPPORT: LES CEDRES

- **Location:** Reunion Island, France
- **Technology:** PV Roof for shading structures + PV Roof for Fish Ponds + BESS
- **Capacity:** 9 MWp PV + 9MWh
- **Status:** Operational, Commissioned 2015
- **Funded by:** French bank (Natixis Energéco)



❖ Collaboration with a regional utility

Akuo worked closely with the regional grid operator throughout development, design, commissioning and the collaboration continues under the project ASM. The BESS, owned and operated by Akuo, is located behind the meter, continues to provide firming services, a flat yield curve and the required rapid ramp rates.

❖ Additional Features

The project brings further economic benefits via support for additional agricultural initiatives.

- 1.5 MW PV was mounted on bespoke structures to cover 12 fish rearing pools owned by a local fish farmer. The shade provided by the PV roof limits the death rate of the fish and improves the water cycle management. The fish are then sold on local markets.
- 7.5 MW of PV were mounted on tall shade structures covering agricultural land used for a permaculture project, mixing livestock farming, agroforestry and market gardening.
- In this project, Akuo rents the land and provides free access to local farmers for agricultural purposes. This innovative economic model allows important savings for the farmers on an island where land is limited and expensive. Those savings enable them to develop their agricultural projects and create new jobs.

2. MINI GRID SOLUTION: MCAI

- **Location:** East Kalimantan, Indonesia
- **Technology:** SPV (SolarGEM) / BESS (StorageGEM) / Diesel genset back-up
- **Capacity:** 1.2 MWp PV / 2.1 MWh
- **Status:** Operational, Commissioned 2018
- **Funded by:** Grant from Millennium Challenge Account Indonesia (MCAI)



❖ Innovative solutions for a specific problem in remote locations

Three Indonesian villages relied solely on diesel gensets. Given the remote locations fuel supply was unreliable and expensive resulting in frequent blackouts. Akuo was selected via a public tender through Millennium Challenge Account – Indonesia (MCAI) to deploy its innovative containerised SolarGEM and StorageGEM solutions.

❖ Additional Features

The mini-grids are owned by the villagers (with a 2-year performance guarantee) who received training from Akuo to be able to maintain and operate the mini-grids by themselves.

3. ENERGY STORAGE SOLUTIONS: MADININA

- **Location:** Martinique, France
- **Technology:** BESS
- **Capacity:** 14.6 MW/19.2 MWh
- **Status:** Under Financing



❖ Provision of grid services

Madinina is a centralised battery owned and operated by Akuo. The BESS supports a market service to the grid operator through energy arbitrage, helping them keeping the grid economically balanced as well as improving its reliability.

❖ Bespoke revenue structure

The 15-year contract defines revenues based on the battery availability over the year, and not on the electricity sent into the grid. Annual revenue is equal to the annual OPEX (inflation linked) plus 7.5% of the CAPEX (depreciated by 1/15 every year).

Additionally, the contract includes an upside/downside sharing scheme based on the battery performance.

3. ENERGY STORAGE SOLUTIONS: TONGA 1&2

- **Location:** Tonga
- **Technology:** BESS (StorageGEM)
- **Capacity:** Phase 1: 10 MW / 5 MWh
Phase 2: 6 MW / 23.4 MWh
- **Status:** 1&2 Under Construction – COD Q3 2020
- **Funded by:** Green Climate Fund, ABD, Gov of Tonga, TPL, Aus Gov



Projects in bold font are the ones currently in operation

❖ Innovative storage solution for remote locations

Tonga has a renewable energy target of 50% renewable penetration by 2020. Tonga Power Limited (TPL) released a call for tender for battery storage systems to strengthen the national grid. Akuo was selected to install its StorageGEM product. Akuo will train the grid operator to operate and maintain the storage assets. The assets will be owned and operated by TPL, and was funded through a consortium including the Green Climate Fund, Asian Development Bank, Govt of Tonga, TPL & Aus Govt.

❖ Additional Features

Tonga 1 is designed to improve grid stability to provide support for increased renewable penetration to the Tongan electricity grid, while Tonga 2 is designed for load-shifting purposes to ensure renewable power can supply the evening peak. The suite of grid services provided to TPL achieves network augmentation investment deferral, while also allowing for increased penetration of renewable energy to reduce Tonga's dependence on diesel imports for energy.

3. ENERGY STORAGE SOLUTIONS: AMHE

- **Location:** Mauritius
- **Technology:** BESS (StorageGEM)
- **Capacity:** 2 x 2 MW / 1 MWh
- **Status:** Operational, Commissioned 2018
- **Funded by:** Grant from the Green Climate Fund



❖ Provision of grid services and early innovators

Mauritius has a renewable energy target of 35% renewables by 2025. Without additional grid augmentation a high renewable penetration rate would threaten the stability of this non-interconnected grid. The Central Electricity Board (CEB) launched a call for tender in 2017. Akuo was selected for its proposal to install two storage systems to bring more stability to the grid.

Amaury & Henrietta were the first storage solutions that were not coupled to a renewable energy generation plant. The systems regulate the frequency of the entire grid facilitating the integration of more renewables in the network.

Akuo also proved its ability to provide exceptional performance, as the systems achieve a response time of only 5 ms, while the requirement from CEB was 20 ms.

3. ENERGY STORAGE SOLUTIONS: ST VINCENT & THE GRENADINES

- **Location:** Saint Vincent and the Grenadines
- **Technology:** Ground Mounted PV + BESS
- **Capacity:** 600 kW / 640 kWh
- **Status:** Operational, Commissioned 2019
- **Funded by:** Abu Dhabi Fund for Development



❖ Storage on non-interconnected zones

The project was developed by Masdar, an Abu Dhabi based global renewable energy developer, as part of the UAE-Caribbean Renewable Energy Fund US\$50 million initiative to deliver renewable energy projects in the Caribbean. Akuo took part to the project as an EPC contractor.

The project includes a 600 kW/ 630 kWh lithium-ion battery which allows the plant to supply 100% of the island's power needs during the day and reduces the island's reliance on diesel fuel for electricity production.

4. PROJECT PORTFOLIO: WIELOWIES / EP44 / GNIEW

- **Location:** Poland
- **Technology:** Wind
- **Capacity:** 66 MW / 44 MW / 22 MW
- **Status:** Under Construction
- **Funded by:** French bank (BNP) /German bank (Commerzbank)



❖ Portfolio approach

In 2018, Akuo won a call for tender launched by the Polish government for a total of 132MW of capacity across three wind farms. Akuo successfully developed a proposal in which the three projects could be completed simultaneously and are currently all under construction. The three projects are portfolio financed under one PPA with a government body.

5. WORKING WITH UTILITIES AND GRID OPERATORS: FLORIDA 1&2

- **Location:** Uruguay
- **Technology:** Wind
- **Capacity:** 50MW + 50MW
- **Status:** Operational, Commissioned 2014 & 2016
- **Funded by:** Netherlands Development Finance Company FMO, German Investment Cooperation (DEG), French development Financial Institution (Proparco)



❖ Working with a state-owned utility

Florida 1 was developed after Akuo successfully tendered for a 50MW wind farm issued by the Uruguayan state-owned utility company. A 20 year PPA was executed with the utility company. On the back of the success of Florida 1 Akuo signed a second PA for an additional 50MW, Florida 2, under similar terms.

❖ Network Augmentation

As part of the development of Florida 1 and 2 network augmentations were required. Two substations were built: the measurement substation is now owned and operated by the national utility while the collection substation is owned and operated by Akuo. The existing main substation owned by the national utility was modified to connect Florida 1 to the national grid. Additionally, another 150 kV transmission line was constructed to connect Florida 2.

5. WORKING WITH UTILITIES AND GRID OPERATORS: KRNOVO

- **Location:** Montenegro
- **Technology:** Wind
- **Capacity:** 72 MW
- **Status:** Operational, Commissioned 2017
- **Funded by:** European Bank for Reconstruction and Development, German bank (KfW IPEX-Bank)



❖ Upgrade to the grid

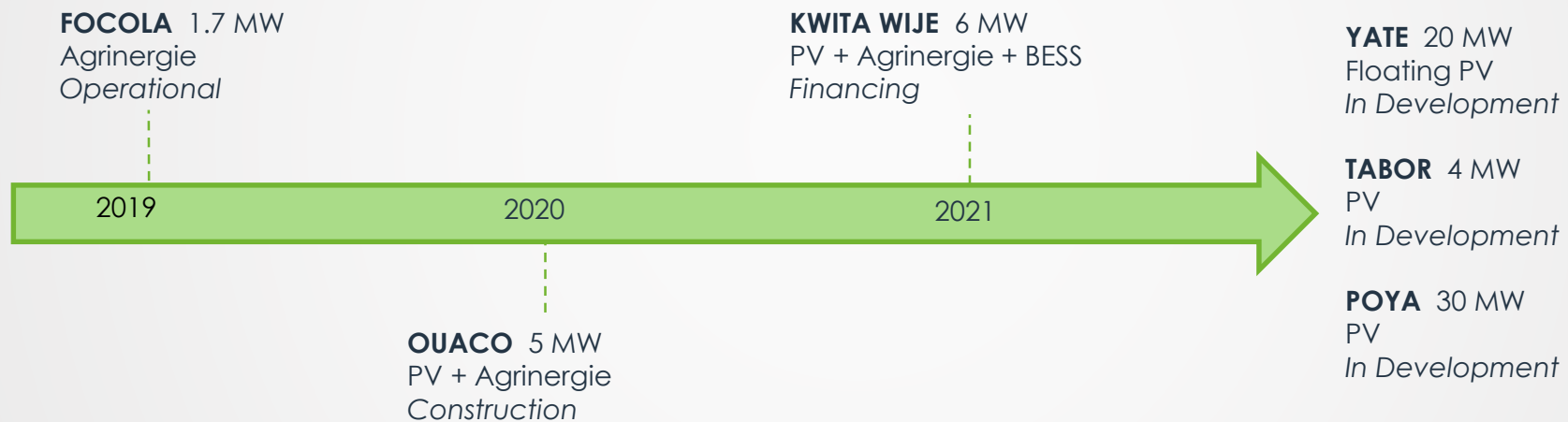
In addition to the wind farm the project contributed to improve the grid infrastructure with the construction of two new 110 kV lines and a 35/110kV substation. One transmission line was built and transferred for free to the grid operator. The substation and the other transmission line will be paid back by the grid operator over the 12-year PPA duration and become its property at the end of this period. These assets are operated by the grid operator during the project life.

❖ Collaboration with a national utility

Krnovo was the first wind farm developed in Montenegro, requiring close collaboration with the grid operator throughout development, design, commissioning and operation. Akuo was also able to secure 12 year PPA with the state-owned electricity market operator.

5. WORKING WITH UTILITIES AND GRID OPERATORS: NEW CALEDONIA

- ❖ In New Caledonia, 80% of the electricity is produced from thermal generation.
- ❖ The power system consists of two different grid systems:
 - the interconnected grid of the main island
 - several autonomous grids in remote islands, powered by diesel generators and renewable energy capacities



- ❖ Akuo installed the very first PV greenhouses on the island (Focola)
- ❖ Akuo currently has a portfolio of more than 60 MW of renewable energy projects in New Caledonia, all at different stages of development, and works closely with the local grid operator and stakeholders in maintaining a system plan that preserves energy security whilst enabling increasing renewable penetration into the two grid systems.

5. WORKING WITH UTILITIES AND GRID OPERATORS: FOCOLA

- **Location:** New Caledonia
- **Technology:** Photovoltaics Greenhouses
- **Capacity:** 1.7 MW
- **Status:** Operational
- **Funded by:** BPCE International et outre-mer, Banque de Nouvelle Calédonie, Natixis



❖ Collaboration with a local farmer

The project was initiated by a local farmer who wished to collaborate with Akuo in using the innovative concept of PV Greenhouses for market gardening. He was also interested in developing permaculture techniques on his land.

❖ Additional Features

The land is now able to be used both for electricity production and agriculture: PV panels are mounted over cyclone-proof greenhouses provided at low cost to the farmer. By protecting crops from the weather, allowing a limited use of chemicals and improving harvest quality, the Agrinerjie project enables a sustainable and local food production.

5. WORKING WITH UTILITIES AND GRID OPERATORS: OUACO

- **Location:** New Caledonia
- **Technology:** Ground Mounted PV + PV Greenhouses
- **Capacity:** 5 MW
- **Status:** Under Construction
- **Funded by:** BNP Paribas



❖ Collaboration with a regional utility

Akuo is working with the regional grid operator under the terms of a 25 year PPA.

❖ Additional Features

A local financing institution supporting the economic development of the region is taking an active role in the project. They proposed the site for the project and will be responsible of the agricultural aspects.

The land will be used both for electricity production and agriculture: 0.6 MW of PV panels will be mounted over cyclone-proof greenhouses provided at low cost to farmers. By protecting crops from the weather, allowing a limited use of chemicals and improving harvest quality, the Agrinerjie project enables sustainable and local food production.

5. WORKING WITH UTILITIES AND GRID OPERATORS: KWITA WIJE

- **Location:** New Caledonia
- **Technology:** Ground Mounted PV + PV Greenhouses + BESS
- **Capacity:** 6 MWp PV + 2.1 MWh
- **Status:** Under Financing



❖ Collaboration with a regional utility

Akuo is working with the regional grid operator under the terms of a 25 year PPA.

❖ Bespoke Funding Structure

Kwita Wije is leading the way in terms of local integration: a group of local individuals will become shareholders of the project. Thus, they fully participate in the development of their region and will enjoy the economic benefits of the project.

The project includes a 2.1 MWh BESS providing grid stability and enabling additional renewable penetration.

6. INNOVATIVE FINANCING APPROACH: PUNTA CANA

- **Location:** Dominican Republic
- **Technology:** SolarGEM
- **Capacity:** 1.85 MWp
- **Status:** Under Construction
- **Funded by:** Akuo



❖ Innovative solution for remote locations

Since the early 90s, the annual electricity demand in Dominican Republic has been growing considerably. Consequently, it is estimated that a high portion of the demand remains unserved. To overcome this issue, and as the offtaker is located in a non-interconnected area, Akuo was selected to deploy its containerized SolarGEM solution which facilitates the installation of ground-mounted PV in remote locations.

❖ Bespoke funding structure

For this project, Akuo signed a 15-year fixed rate (inflation adjusted) lease agreement with the offtaker (an international hotel group). A minimum amount of energy generated is guaranteed.

6. INNOVATIVE FINANCING APPROACH: ROCKSPRINGS

- **Location:** United States
- **Technology:** Wind
- **Capacity:** 149.5 MW
- **Status:** Operational
- **Funded by:** General Electric Financial Services, John Laing Group



❖ **Bespoke funding**

Akuo signed a 15-year Power Purchase Agreement at AUD\$ 44 /MWh for 100 MW and a 12-year Hedge Agreement at AUD\$ 45 /MWh for 50 MW.

❖ **Challenging environment**

Like in Australia, generators in the US are subject to Transmission and Distribution Loss factors.

7. CHALLENGING ENVIRONMENTS: KITA

- **Location:** Mali, Africa
- **Technology:** Ground Mounted PV
- **Capacity:** 50 MWp
- **Status:** Under Construction
- **Funded by:** Emerging Africa Infrastructure Fund Limited, West African Development Bank, Green Africa Power, Banque National de Développement Agricole



❖ Challenging economic context

Akuo overcame many challenges in implementing the Kita solar farm. A significant misalignment between electricity production costs and sale prices is contributing to the weakening financial position of the main electricity distributor. In the face of rapidly increasing demands for power the distributor was unable to maintain a sustainable system plan. Working with dedicated regionally focused infrastructure funds and development banks Akuo successfully developed a proposal to provide an 50MW of renewable capacity to the grid and a favorably priced PPA as compared to the average production costs in the region.

❖ Grid Network Augmentation

Included in the scope of works is the upgrade of a spiked substation which will help the grid operator to improve the grid capacity to limit blackouts. It will also provide the plant with two alternative lines to export electricity to the wider grid.

7. CHALLENGING ENVIRONMENTS: NAURU & PALAU



- **Location:** Nauru
- **Technology:** GMPV + BESS (StorageGEM)
- **Capacity:** 6.9 MWp PV + 5 MW / 2.5 MWh
- **Status:** In Development

Nauru has a target of 50% renewables by 2020. Akuo has submitted a proposal to the Nauru Utilities Corporation (NUC) for a 6.9 MWp PV plus a 5 MW / 5 MWh BESS (StorageGEM).

- **Location:** Palau
- **Technology:** GMPV + BESS
- **Capacity:** 45 MWp PV + 85 MW / 85 MWh
- **Status:** In Development

Palau has a target of 20% renewables by 2020 and 45% by 2025. Akuo has submitted a proposal to the Palau Public Utilities Corporation (PPUC) solar + storage plant.



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