



Conference “Energy Access: supporting innovation between Europe and Africa”

Lille, 15 September 2022



Co-funded
by the COSME programme
of the European Union

The ESECA project has received funding from the European Union's COSME Programme under Grant Agreement 101035882.

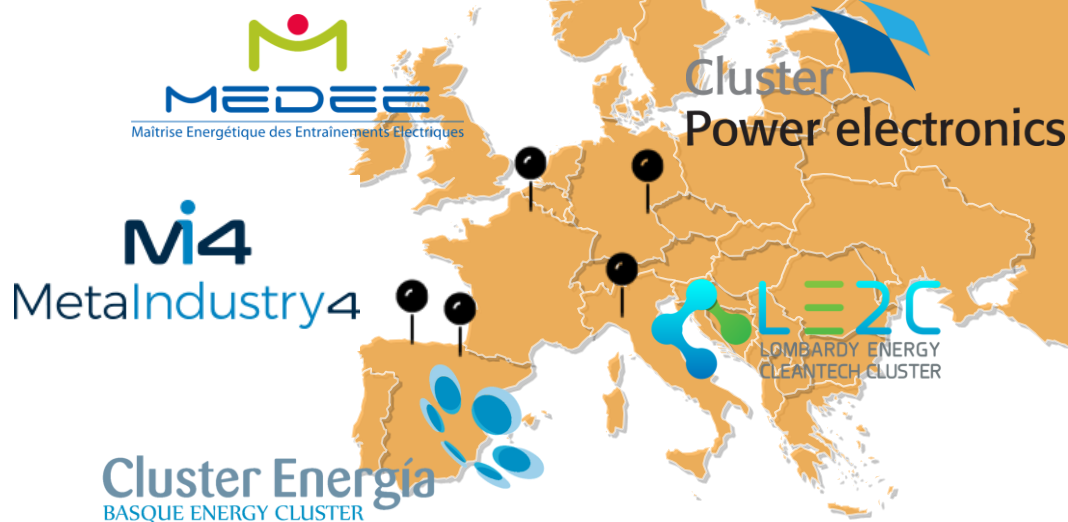
What is ESECA?

2

- **European Sustainable Energy Cluster partnership for Africa (ESECA)** is a partnership formed by five European clusters (ACE, MEDEE, LE2C, MetaIndustry4 and ECPE) from **Spain, France, Italy, and Germany**. Together, we gather around **550 organizations and 290 SMEs**.
- ESECA project is funded by the European Commission, with a duration of **36 months** (starting in September 2021) and approximately 600 k€ of budget. The project aims to contribute **positioning European companies from the sustainable energy sector in sub-Saharan African markets**.

Consortium

3



Main objective

4

- (1) Intensify business network collaboration among European companies from the renewable energy and smart grids sectors ...
- (2) ... to develop a joint internationalisation strategy plan ...
- (3)... with common goals towards sub-Saharan African markets.

Specific objectives – 1/3

5

(1) Intensify business network collaboration among European SMEs from the renewable energy and smart grids sectors

- Foster clusters & SMEs trans-regional cooperation and partnership building
- Help SMEs identify business and internationalisation opportunities
- Position SMEs into trans-European consortiums

Specific objectives – 2/3

6

(2) To develop a joint internationalisation strategy plan

- Identify and analyse potential target markets
- Analyse in depth these target markets
- Develop specific market reports
- Define an internationalisation strategy plan
- Organise direct and reverse missions
- Sign Cooperation Agreements with relevant African associations and/or clusters

Specific objectives – 3/3

(3) With common goals towards sub-Saharan African markets.

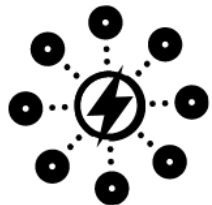
5 target countries :

- Senegal
- Ghana
- Tanzania
- Kenya
- Rwanda



Technologies

8



Distributed Energy Resources



Smart Grids



Solar, Wind & Bio Energy



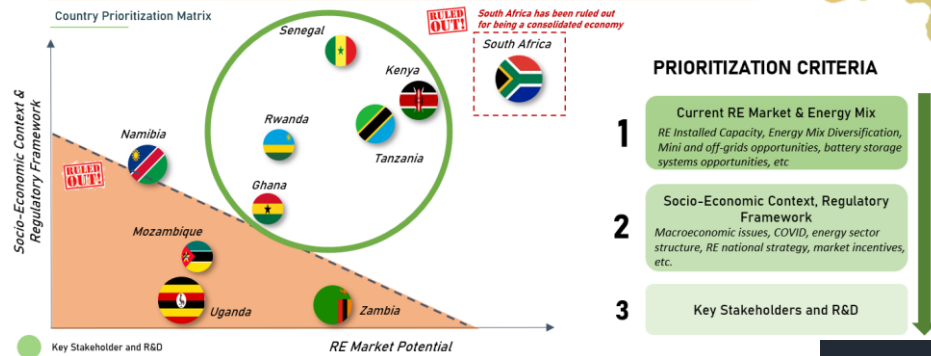
Energy Storage



Innovative metering and digital solutions

Activities developed

The 5 countries prioritization process has taken into account the 5 axes of the high-level analysis, but with different levels of importance



The prioritized 5 countries are Kenya, Tanzania, Senegal, Rwanda and Ghana

High level analysis of 10 countries in Africa



WEBINAR in June 2022

**In-depth market reports of 5 countries
+ 2 exploratory trips**



01. 5 Sub-Saharan African countries

- Kenya
- Tanzania
- Rwanda
- Senegal
- Ghana



ESECAfrica

European Sustainable Energy Cluster partnership for Africa

Analysis of key Sub-Saharan African markets in
renewable energy and smart grids sectors

Market reports from Ghana, Senegal, Kenya, Tanzania and Rwanda

ESECA Networking workshop – Lille, 15 September 2022



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Content

01. 5 Sub-Saharan African countries

- Kenya



- Tanzania



- Rwanda



- Senegal



- Ghana



02. Conclusions and next steps



KENYA



REPUBLIC OF KENYA

Population

53,771,300 inhabitants

Human Development Index

0.601

GDP (CAGR 10'-20')

8.3%

Ease of doing
business index

56th

Global
competitiveness index

95st

National Electrification Rates



Urban

91%



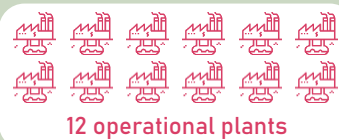
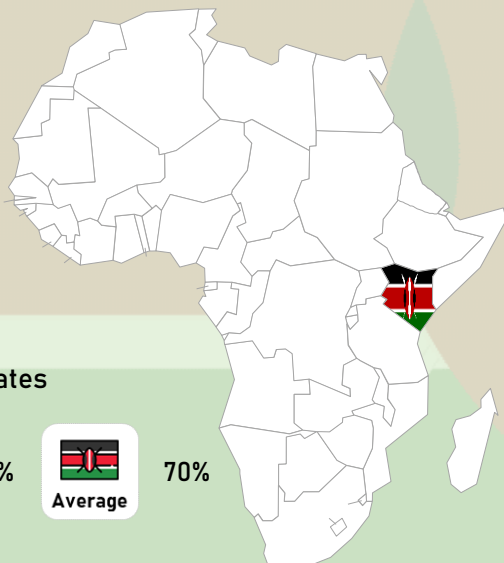
Rural

62%



Average

70%



Geothermal
41%

Biogas
0.1%

Solid
Biofuels
2.9%

Hydro/marine
32%

10 operational
plants

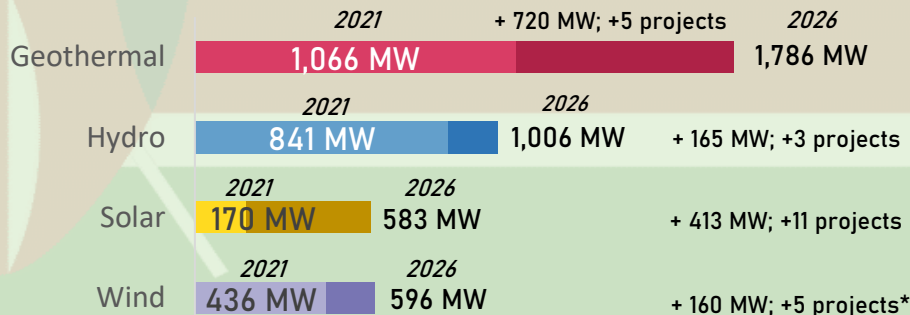
2 operational plants

2,601 MW
RE installed
capacity in 2021

Solar
7%

Wind
17%

Current Plants + Planned / Under Construction Projects (MW, 2021-2026E)



*Bubisa and Lamu Power Plants' MW are not included in the chart

Future energy-related projects will be more related to smart grids, as well as the development of RE electrical equipment market

- Public initiatives as well as private companies are currently launching mini grids projects in Kenya, scattered throughout the country, with more than 150 new solar powered mini-grids expected to be developed in the medium term
- Kenya presents a good context for the development of smart grids, having both public institutions and private companies' initiatives for grid digitalization
- Automation and digital control systems as the most interesting technologies
- Within Sub-Sahara Africa region, Kenya has one of the most developed BESS (Battery Energy Storage Systems) markets, and it is expected to be highly supported in the next decade
- Kenya is the country within the 5 analysed with the highest amount – in USD – of electrical equipment imports due to their grid modernization and development plans



Mini-Grids & Off-Grids



Smart Grids

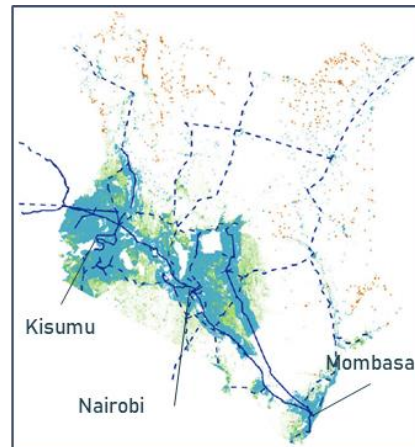


Energy Storage



Electrical Equipment

Kenya planned electricity connections by 2030



- On-grid
- Mini-grids
- Off-grid systems
- Existing transmission lines (>69kV)
- Planned lines

+15%
(2015-2019)
+ 16,174,000
People connected to solar mini and off-grid systems

+1%
(2015-2019)
+ 98,000
People connected to hydro mini and off-grid systems

+15%
(2015-2019)
+ 85,000
People connected to bioenergy mini and off-grid systems

Geothermal energy is the main activity among Kenyan stakeholders, as well as solar energy

Regulatory Framework

- The Energy sector is mainly structured around the Ministry of Energy and monopolized by state-owned companies
- The Kenya National Electrification Strategy (2018) is the most relevant current document for the country's energy sector and Market incentives in RE have been recently included



- High number of agents specialized in geothermal energy
- Most important stakeholders in renewable energies are in the public sector
- Universities and RE associations are numerous and active in RE, with continuous collaboration with R&D centres

Key Stakeholders

Research & Development

- The number of R&D centres active in renewable energies is much higher in Kenya than in other African countries
- A large part of the country's RE R&D centres have emerged from universities and public authorities
- Geothermal is the most advanced RE in R&D, since it has specific R&D centres, yet solar has also relevant R&D activities





TANZANIA



UNITED REPUBLIC OF TANZANIA

Population

59,734,213 inhabitants

Human Development Index

0.529

GDP (CAGR 10'-20')

6.9%

Ease of doing
business index

132th

Global
competitiveness index

N.d.

National Electrification Rates



Urban

73%



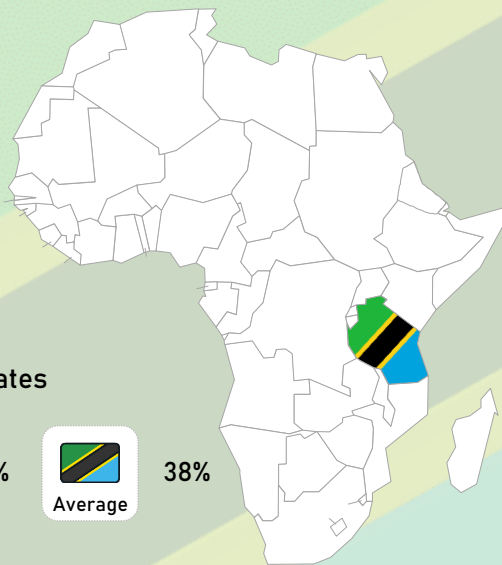
Rural

19%



Average

38%



1 operational
plant

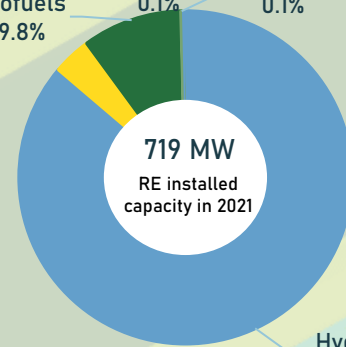
Solid
Biofuels
9.8%

Wind
0.1%

Biogas
0.1%

Solar
4%

No utility-scale solar
plants, all the installed
capacity from mini- and
off-grid systems



9 operational
plants

Hydro/marine
86%

Current Plants + Planned / Under Construction Projects (MW, 2021-2026E)

	2021	+ 3,391 MW; +8 projects	2026
Hydro	620 MW		4,011 MW
Solar	26.6 MW		360 MW
			+ 333 MW; +5 projects
Wind	2.4 MW		253 MW
			+ 251 MW; +3 projects
Geothermal	0 MW		200 MW
			+ 200 MW; +1 project

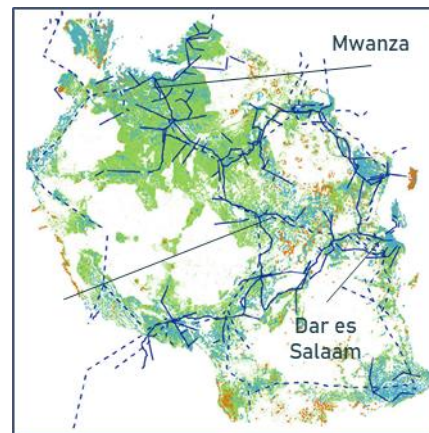
**No Biogas and Solid Biofuels utility-scale projects planned for the next 5 years*

Mini grids and small energy storage systems linked to renewables are the most interesting technologies to be developed in Tanzania

- Tanzania is the Sub-Saharan African country with the most opportunities for the development of mini and off grid systems, specially in the northern regions
- Although off-grid great potential in Tanzania, smart grids market is very limited currently as electrification rates are low and the technology is still incipient
- There is a growing activity regarding BESS in Tanzania, mainly because the use of photovoltaic (PV) and battery storage systems is one of the most viable options for electrification in rural areas
- Electrical equipment market is very limited, and mainly concentrated around Dar-es-Salaam
- Even though imports of electrical equipment have increased significantly in recent years, they are insufficient



Tanzania planned electricity connections by 2030



- On-grid
- Mini-grids
- Off-grid systems
- Existing transmission lines (>69kV)
- Planned lines

+3,551,000
 (2015-2019)
-67%
 People connected to solar mini and off-grid systems

+52,000
 (2015-2019)

People connected to hydro mini and off-grid systems

+27,000
 (2015-2019)

People connected to bioenergy mini and off-grid systems

Numerous stakeholders with activities in renewable energies, standing out hydro and solar in relation to R&D activities

Regulatory Framework

- Among the public companies, TANESCO is the most relevant, responsible for a large part of the generation (78%), and the monopoly of transmission
- National RE policies and strategies are not very recent, and the framework for Action is not very concrete



- Stakeholders map relatively dense compared to other East African countries
- Universities and R&D centres are very active in renewable energies
- TAREA stands out as the most active and important association in the RE sector
- Private companies focused on hydro (IPPs) and solar (installers and distributors)

Key Stakeholders

Research & Development

- Not very developed R&D activities compared to other Sub-Saharan African countries
- Renewable Energy Technology Centre (RETC) and the renewable energy associations are the most active agents
- Hydropower is the most developed technology in recent years, with the focus on small-scale projects



Exploratory mission – Kenya and Tanzania



26 – 28 June 📍 Nairobi (KE)

Meetings:

- 2 Universities
- 2 Associations
- 1 Accelerator



29 June – 1 July 📍 Dar Es Salaam (TZ)

ARE Energy Access Investment Forum

Meetings:

- 1 University
- 2 Consultancies
- 4 Associations
- 5 Companies
- 1 R&D



RWANDA



REPUBLIC OF RWANDA

Population

12,952,209 inhabitants

Human Development Index

0.543

GDP (CAGR 10'-20')

5.4%

Ease of doing
business index

38th

Global
competitiveness index

100st

National Electrification Rates



Urban

93%



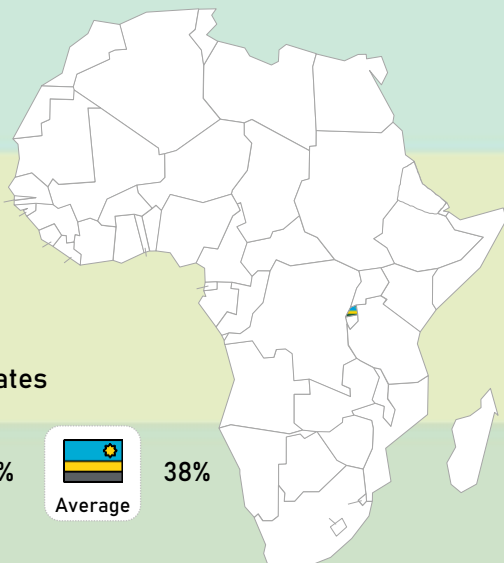
Rural

26%



Average

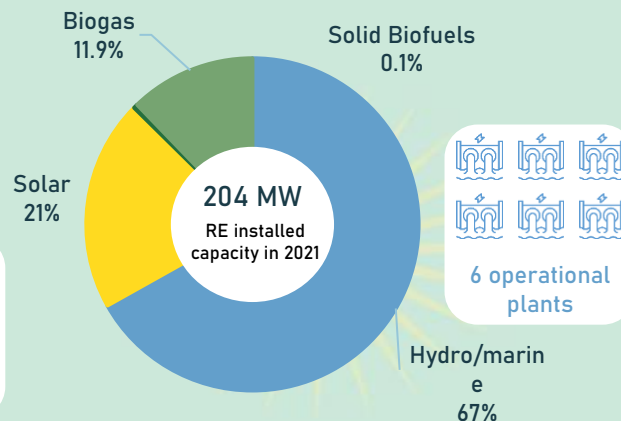
38%



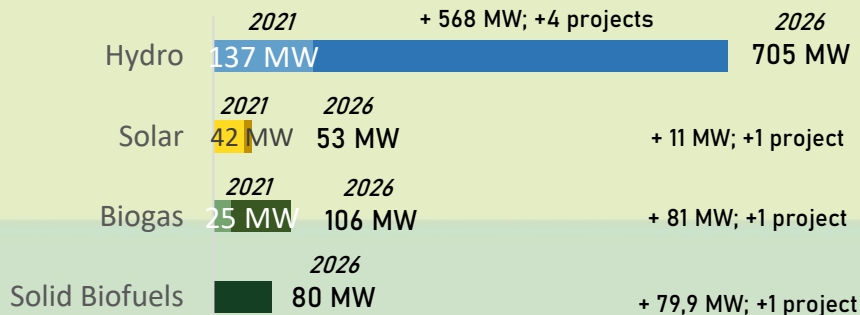
1 operational
plant



5 operational plants



Current Plants + Planned / Under Construction Projects (MW, 2021-2026E)



As electrification rate is still very low in Rwanda, public institutions' priority is to develop mini and off-grids in order to achieve universal access to electricity

- Due to Rwanda's hydropower resource potential and geographical characteristics, small and medium hydro power plants will be much developed in the coming years
- Rwanda is facing significant challenges for the implementation of smart grids, yet there are some ongoing projects
- In the last 5 years, there is a growing activity related to energy storage solutions in Rwanda, driven mainly by foreign private companies
- Rwanda's electrical equipment market is still very low, since the Ministry of Infrastructure has set out several initiatives to spur the sector, which is also driven mainly by foreign private companies



Mini-Grids & Off-Grids



Smart Grids

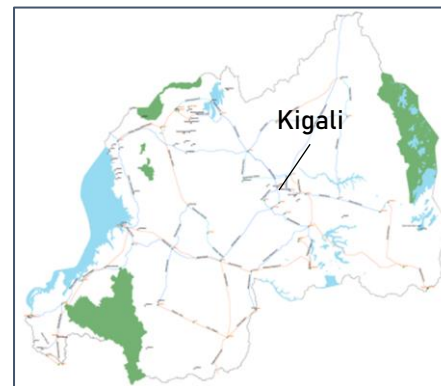


Energy Storage



Electrical Equipment

Rwanda planned electricity connections by 2030



- Existing
- Ongoing
- Planned

+44%
(2015-2019)
+ 2,513,000
People connected to solar mini and off-grid systems

+7%
(2015-2019)
+ 32,000

People connected to hydro mini and off-grid systems

+27%
(2015-2019)
+ 47,000

People connected to bioenergy mini and off-grid systems

Low number of stakeholders in renewables compared to the other analysed countries, and there is a lack of a network dedicated to RE research and development

Regulatory Framework

- There is no ministry with exclusive regulatory competencies in Energy, yet there is an Energy Directorate
- The National Energy Policy of 2015 has a clear tendency to encourage private investment
- Not very attractive market incentives scheme (only some Duty & VAT exemptions and F-i-T for small-hydro)



- Lower number of stakeholders in RE within the 5 countries, but relatively high considered Rwanda's size
- IPPs are a relevant stakeholder and exploited, in 2021, around 51% of the country's total installed capacity
- Universities are not relevant stakeholders in terms of knowledge and technology transfer, and private companies are focused on solar (installers) and hydro (IPPs)

Key Stakeholders

Research & Development

- There is not a R&D centres network dedicated to renewable energy
- The African Centre of Excellence in Energy for Sustainable Development is the only R&D centre exclusively dedicated to renewable energies
- Smart grids have been identified by the Government as one of the destinations for RE R&D due to their relevance





SENEGAL



REPUBLIC OF SENEGAL

Population

16,743,930 inhabitants

Human Development Index

0.512

GDP (CAGR 10'-20')

4.3%

Ease of doing
business index

123rd

Global
competitiveness index

114th

National Electrification Rates



Urban

95%



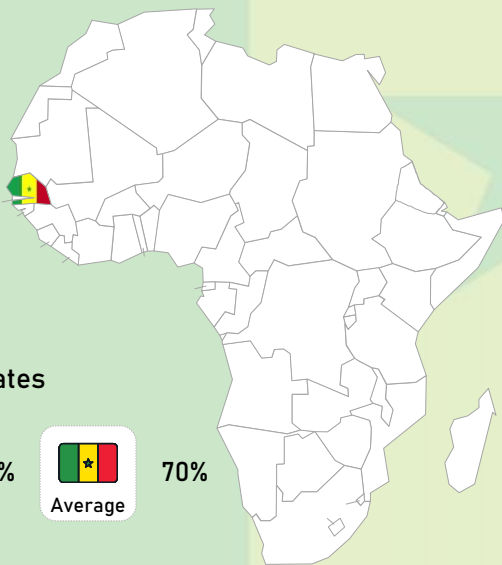
Rural

48%



Average

70%



No utility-scale solid biofuels
plants



1 operational
plant

Solid
Biofuels
7%

Wind
41%

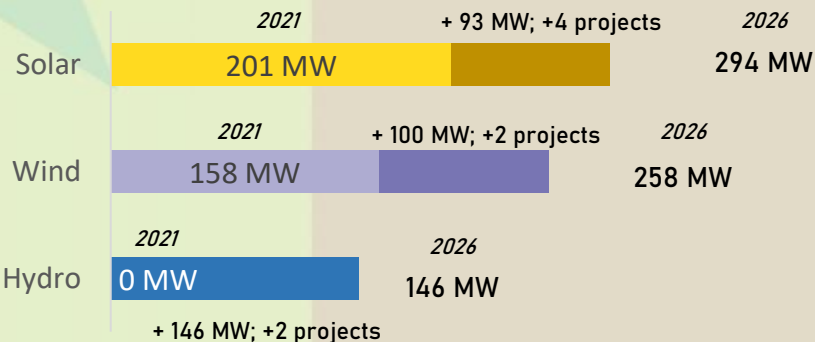
384 MW
RE installed
capacity in 2021

Solar
52%



8 operational plants

Current Plants + Planned / Under Construction
Projects (MW, 2021-2026E)



Strong growth of mini grids is expected despite high electrification rates, as well as several initiatives in smart grids and energy storage

- Despite the high electrification rates, by 2021 Senegal was the second country worldwide with the highest number of planned mini grids, being more than 1,200 new mini grid connections
- Smart grid projects in Senegal have begun to be deployed in the last 3 years in order to integrate renewable energies, improve access to electricity and avoid technical losses
- First utility scale Battery Energy Storage System project under development in the Taiba N'diaye Wind Farm (40 MW battery system), yet the activity in relation to energy storage in Senegal is still incipient
- Although the equipment related to solar installations is the most developed in recent years, it is insufficient to meet the current demand, thus having to import large quantities of equipment (mainly from China)



Mini-Grids & Off-Grids



Smart Grids

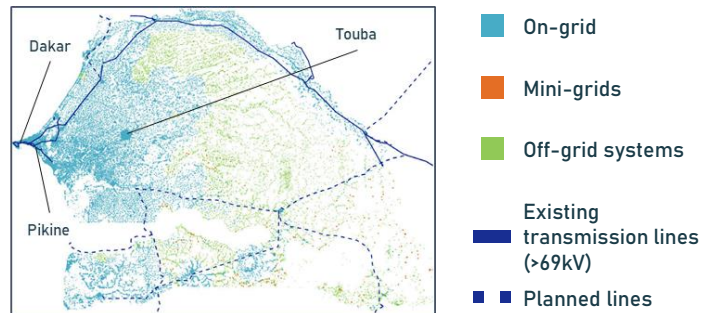


Energy Storage



Electrical Equipment

Senegal planned electricity connections by 2030



 + 1,440,000 <sup>+75%
(2015-2019)</sup>

People connected to solar mini and off-grid systems

 + 69,000 <sup>+130%
(2015-2019)</sup>

People connected to bioenergy mini and off-grid systems

The involvement of some agents in the renewable energy sector in order to develop R&D activities in Senegal is limited

Regulatory Framework

- Well-organized electricity sector, with clear division of responsibilities
- SENELEC has a monopoly in transmission and distribution, but in production it reaches power purchase agreements with IPPs
- VAT exemptions on renewable energy products is the most interesting market incentive



- Public and governmental agents, the public company (SENELEC) and the IPPs, are the most relevant stakeholders in the RE sector
- There is no large associative movement around renewable energies in Senegal
- Private companies are mainly focused on solar (IPP, installers and EPCs), yet wind is having a growing activity

Key Stakeholders

Research & Development

- Existence of public agents with clear R&D guidelines
- Lack of involvement of SENELEC and other RE agents in R&D activities
- Solar is the technology that is generating the most research and development activity



Exploratory trip SENEGAL



17 July – 22 July 📍 Dakar

20th APUA Congress (Association of Power Utilities of Africa)

Meetings:

+ 25 contacts made during the conference

5 visits :

- 2 Renewable energy production sites
- 1 Laboratory
- 1 Training Center
- 1 Company
- 2 National Agencies



GHANA



REPUBLIC OF GHANA

Population

31,072,945 inhabitants

Human Development Index

0.611

GDP (CAGR 10'-20')

7.8%

Ease of doing
business index

118th

Global
competitiveness index

111st

National Electrification Rates



Urban

94%



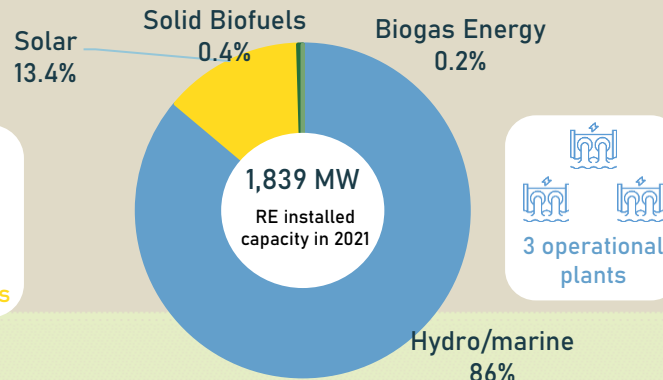
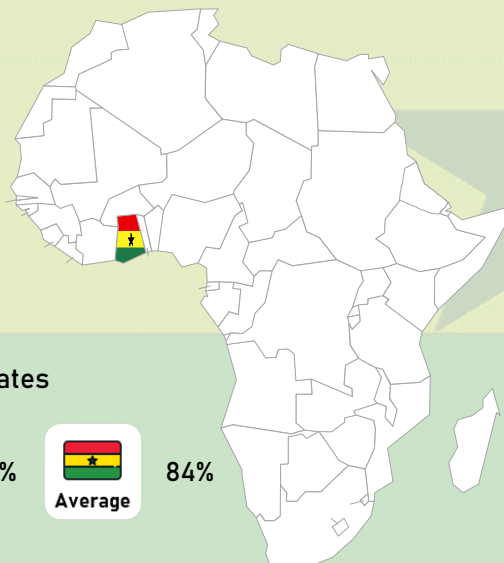
Rural

70%

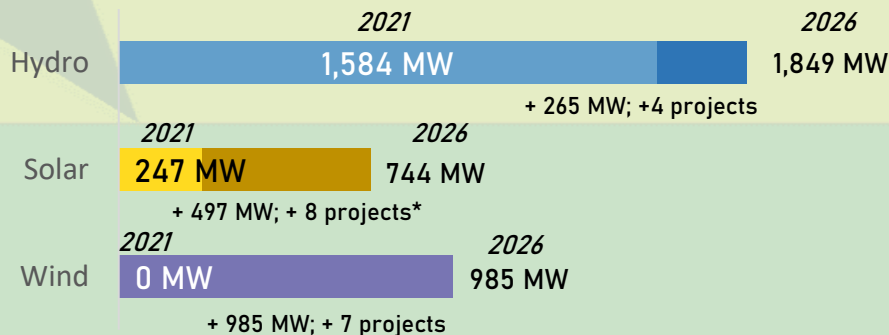


Average

84%



Current Plants + Planned / Under Construction
Projects (MW, 2021-2026E)



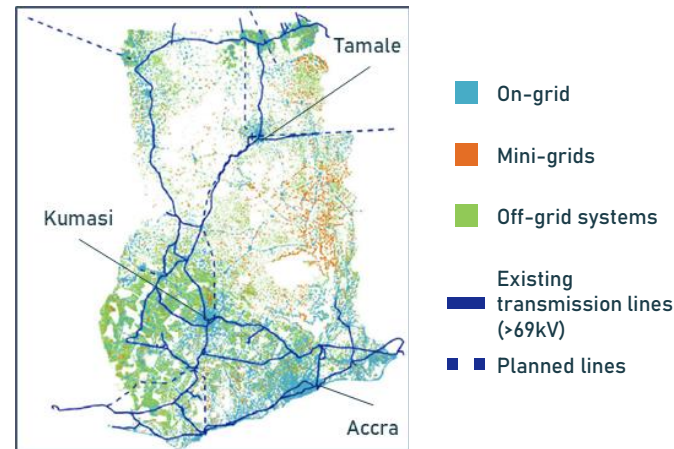
*1,000 MW Huawei/Meinergy Solar Power Plant's MW is not included

As electrification rate has grown significantly in the last 15 years, grid digitalization and energy storage solutions are expected to be developed in the near future

- Limited ongoing mini and off grid projects in Ghana compared to other Sub-Sahara African countries, as electrification rates are already high
- Ghana's electric grid uses old technology, not having incorporated new digital technologies extensively, and there are currently few ongoing projects
- Despite having little activity in energy storage, several projects have been announced recently, and energy storage-related regulatory framework development is expected for the coming years
- Electrical equipment related to renewable energies is mainly focused on solar, and in particular in Solar Lighting, yet there is a need to import more electrical equipment to modernize the existing electrical equipment



Ghana planned electricity connections by 2030



 + 525,000 ^{x 3}
(2015-2019)

People connected to solar mini and off-grid systems...

... being the 83% connected to low-power Solar Lights, and the remaining 17% to solar mini grids

Universities and R&D Centers are the most numerous stakeholders, and there are several agents with R&D activities

Regulatory Framework

- Coexistence of two bodies with regulatory activity in the sector
- National Energy Policy has sufficient mechanisms in order to achieve electrification targets in the medium term
- Significant number of market incentives and public funding programs to encourage the growth of renewable energy



- The main stakeholders are still public, yet the RE market tends to liberalize
- University and R&D centres are the most numerous stakeholders in the country, without significant knowledge-transmission activities
- Private companies mainly focused on solar (installers, distributors and EPCs)

Key Stakeholders

Research & Development

- Significant number of agents with research and development functions in Ghana, but their activity and involvement in the renewable energy sector is not very high
- In terms of R&D in specific technologies, BESS (with some innovative projects such as Huawei, the largest BESS in Africa), in wind, and some bioenergy projects, stand out



To sum up, the 5 Sub-Saharan African countries have great development opportunities in the discussed areas

Overall conclusions of the market reports

Socio-Economic Context

- In general, all 5 are highly populated or dense countries, with high annual GDP growth (Kenya, Tanzania and Ghana)
- In addition, they stand out among other sub-Saharan countries in terms of Ease of Doing Business (Rwanda), development and security levels (Kenya, Ghana) and stable currency (Senegal, Rwanda)

Regulatory Framework

- The institutional and legal framework of the energy sector is correct in all the selected countries
- In terms of market incentives, Kenya, Ghana and Tanzania are ahead of Senegal and Rwanda
- In general, all countries have facilities in the consenting process for small scale projects

Current RE Market and Energy Mix

- Kenya and Tanzania are the countries with the most RE resource potential, yet Kenya has made further progress
- Kenya and Ghana as the countries with the largest number of planned projects
- Tanzania and Rwanda are the most interesting countries for the development of mini and off-grid systems

Key Stakeholders

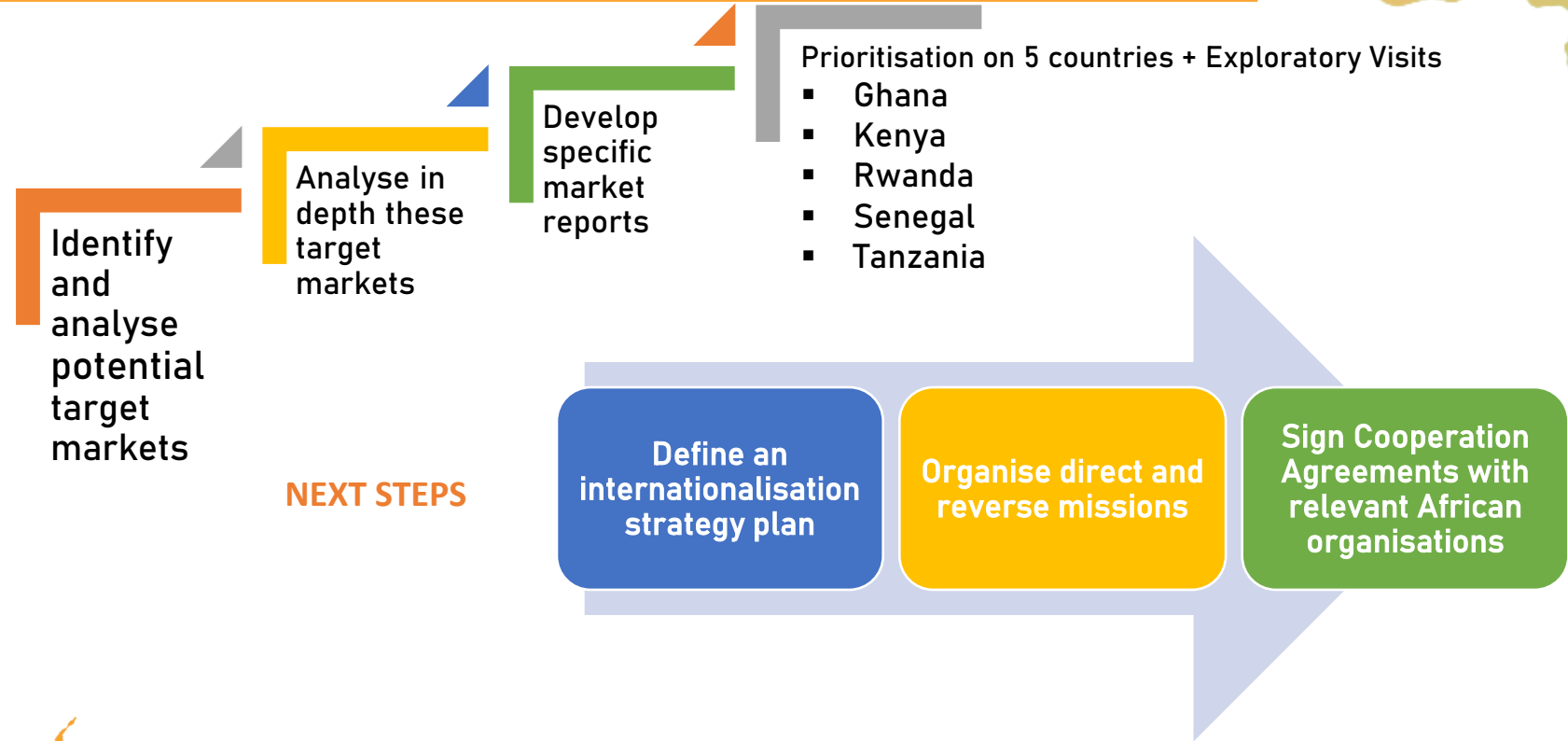
- Tanzania is the country with the highest number of stakeholders related to renewable energies
- In Rwanda and Senegal, IPPs stand out as a relevant stakeholders, while in Ghana universities and R&D centres, and in Kenya the specialization of some stakeholders (Geothermal)

Research & Development

- Generally, R&D activities in the RE sector are occasional and isolated
- Kenya is the country with the most R&D activity in RE technologies
- Senegal also stands out, thanks to the University, which is quite active

Develop a joint internationalisation strategy plan

35



ESECA poll

Joining as a participant?

No account needed.

ESECA



By using Slido you accept our [Policy](#).

- Brief poll to receive feedback for future ESECA activities
- Select the answers of major interest for your company
- Enter in your navigator, smart phone or computer: slido
- Introduce the code **ESECA**
- The results will help ESECA partnership to know the needs of their members and prepare the best activities for them during the project

THANK YOU VERY MUCH FOR YOUR ATTENTION!

37



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European Sustainable Energy Cluster Partnership for Africa





Pitches



Energy Transition



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30 years in Energy Distribution

41



AC Charger; from 3 to 22kW
DC Charger; from 25 to 150kW

Great opportunity and partnership to support e-mobility in Africa

42

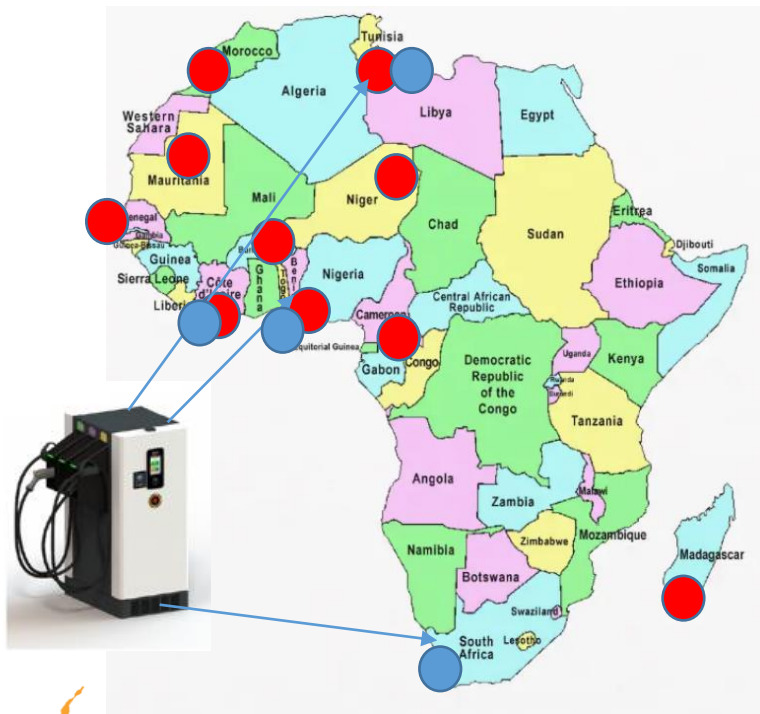
MY J^ULE B^UN



Charging
Electric Vehicles

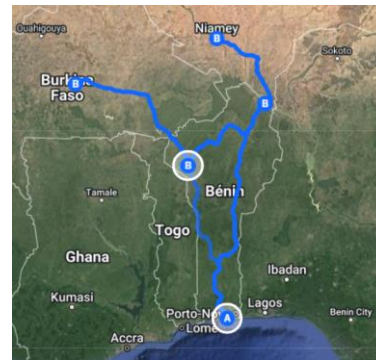
educare
by DBT

Arts
et Métiers
Sciences et
Technologies



Specific design for solar energy
& tropical environment

2 DC Compact 50 kW chargers



European Sustainable Energy Cluster Partnership for Africa



M4
Metalindustry4



Cluster
Power electronics





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ISOTRON, S.A. was established in 1989 with the aim of performing activities related with engineering, manufacture, erection, commissioning and maintenance of electrical, instrumentation, regulation and control installations.

In 2007 ISOTRON is incorporated in the holding ISASTUR, where it has maintained its international vocation, which has led the Company to performing important projects all around the world.

Projects completed by ISOTRON cover different fields such as:

- Industrial electrical and instrumentation projects.
- Substations and power lines.
- Renewable energy: wind farms and solar plants.
- Automation and control
- Maintenance of electrical systems and instrumentation.

ISOTRON has permanent offices in the following countries: Spain, United Kingdom, Argentina, Chile, Colombia, El Salvador, Mexico, Peru, Uruguay, Venezuela, Jordan, Algeria and Morocco.





**Zigor Corporación
SA**



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Business Units

47

GENERATION



PV electric energy generation,
Energy Storage



TRANSMISSION & DISTRIBUTION



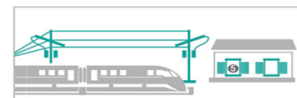
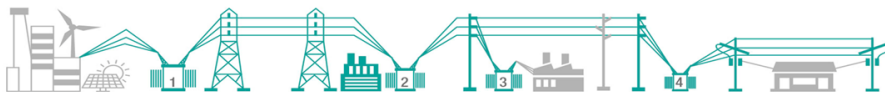
Ensure power supply for grid
operations



INDUSTRY

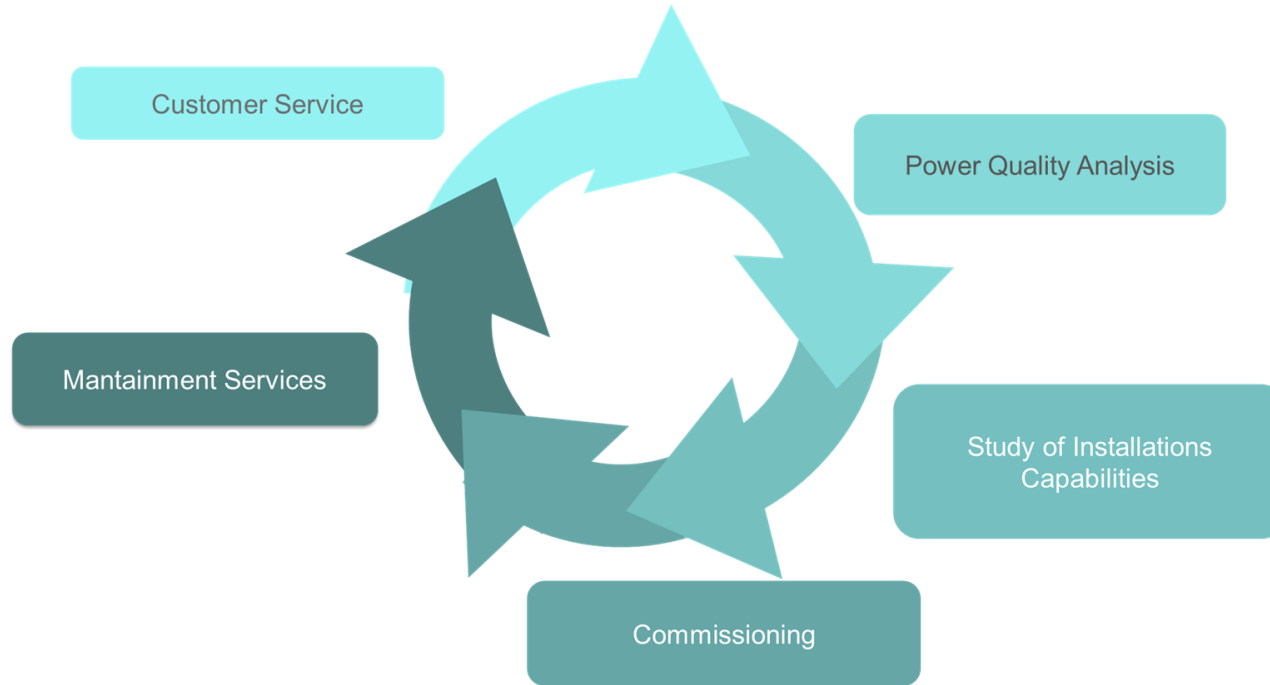


Ensure high quality power supply
for critical processes



Projects and services in Africa

48





Questions ?



Storage

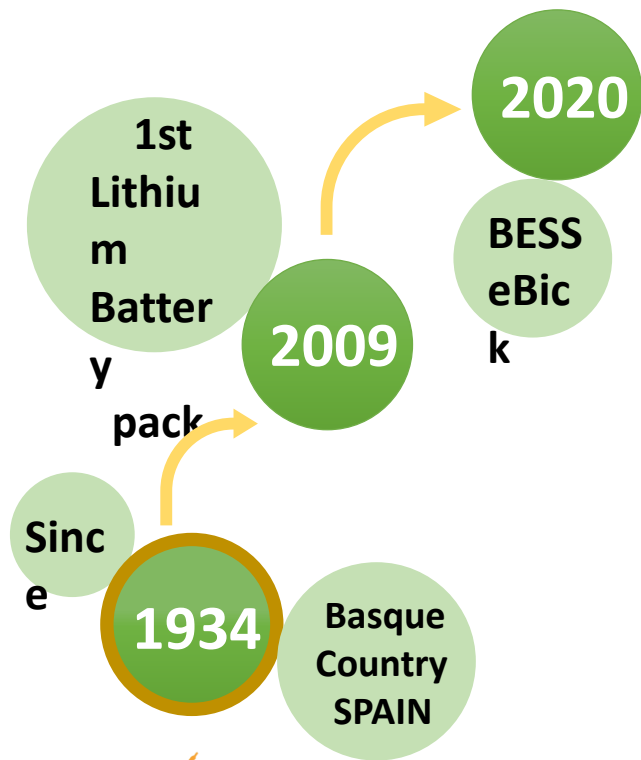


Ángel Aragón Méndez

Sales Manager Lithium Projects

aaaron@cegasa.com





Industrial up to 6 MWh



Bick
280 Pro



Li
ION

+

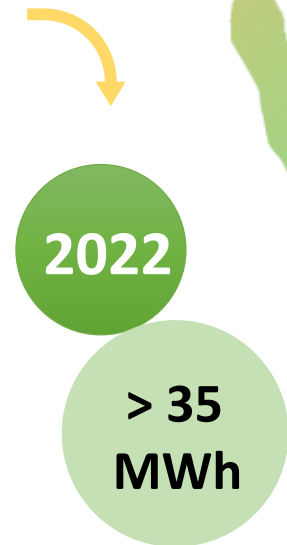
LFP



Bick
Ultra 175



Residential till 80 kWh





1,1
MWh

2021
GHANA

tta Trama
TecnoAmbiental



2020
BENIN

484
kWh



Alliance for
Rural
Electrification

Shining a Light for Progress



2020
ETHIOPIA

1,4
MWh

tta Trama
TecnoAmbiental



African
Energy™

2022
CONGO

3
MWh



KITE RISE
T E C H N O L O G I E S



Peter RECHBERGER
Business Development Manager
peter.rechberger@kiterise.at
Leechgasse 5, 8010 Graz, Austria

Stationary Sodium-Ion Battery Storage

Who we are:

- ❖ Kite Rise is an Austrian start-up
- ❖ Founded by battery experts with years of experience in the automotive industry

What we do:

- ❖ Combine top-notch engineering with sustainable sodium-ion cell technology
- ❖ Produce stationary battery storage offering both **high performance** and **true sustainability**

High performance



- ❖ **Fast charging**
up to 4C (constant)
- ❖ **Long life time**
5.000 – 10.000 cycles
- ❖ **High temperature range**
Only 10% loss at -20°C

Max safety



- ❖ **No fire or explosion**
- ❖ **No thermal runaway**
- ❖ **Easy transport**
0-volt storage ability

True sustainability



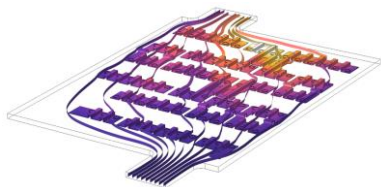
- ❖ **Beyond greenwashing**
- ❖ **Without Li, Co, Ni**
- ❖ **Easier recycling**

Regionality



- ❖ **Abundant materials**
- ❖ **Security of supply**
- ❖ **Made in Europe**

Timeline



**Research, development
& cell testing**



**Module and battery pack
prototype & testing**

21'

2022

2023

2024

25'

**Company
founding**



**Module prototype,
simulation & testing**



**Start serial
production**



**Please get in touch to discuss
your battery storage needs!**



Christophe Piquemal

General Manager

christophe@otonohm.com

+33 6 40 22 82 50

otonohm 

What OTONOHM does

58

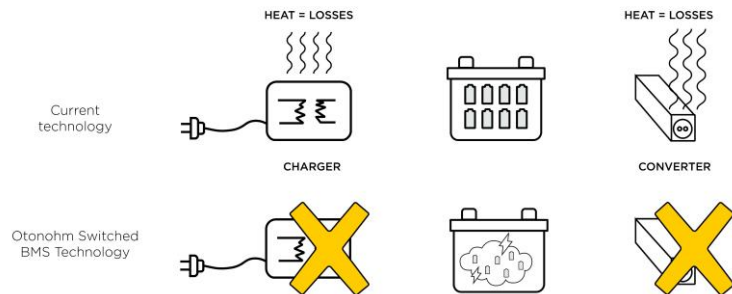
Otonohm is an engineering company that develops and patented a new battery architecture capable of eliminating all power devices from a power supply chain and therefore the losses related to these devices.

We intervene from the study of the specifications to the delivery of the prototype in the customer environment.

The main benefits of our innovation are

- Increased efficiency and lifespan.
- Reduction of weight and volume.
- Reduction of maintenance costs.
- Increased safety.

A game-changing technology



A battery with Otonohm switched BMS technology generates any signal or voltage and any current. It simplifies an electric drive chain, removing chargers, converters, inverters and controllers.

Wishes for collaboration

59

We would be interested in collaborating with European companies specialized in:

- The manufacture of battery packs.
- The supply of solar panels and/or small wind turbines to offer a complete and operational energy solution.
- The supply of energy solutions on the African market.



Questions ?



Analysis,
Monitoring,
and Control



Jean-Sébastien CARDOT
Research Engineer

EIFER European Institute for
Energy Research by EDF and KIT



European Institute
for Energy Research
by EDF and KIT

We envision future-proof, low-carbon energy systems aligned with societal needs

63

The European Institute for Energy Research was founded by EDF and the KIT in 2002 with the legal structure *European Economic Interest Grouping* aiming at enhancing collaboration through joint projects applied to industrial issues.



Climate Neutral Communities

- Sustainable and efficient energy supply in cities
- Smart urban mobility
- Local governance and citizen empowerment



Local Multi-Energy Systems

- Low carbon heating and cooling systems
- Sector coupling
- Local energy planning and design



Low Carbon Hydrogen Systems

- Fuel cell technologies
- Renewable hydrogen production via water electrolysis
- Innovative hydrogen applications



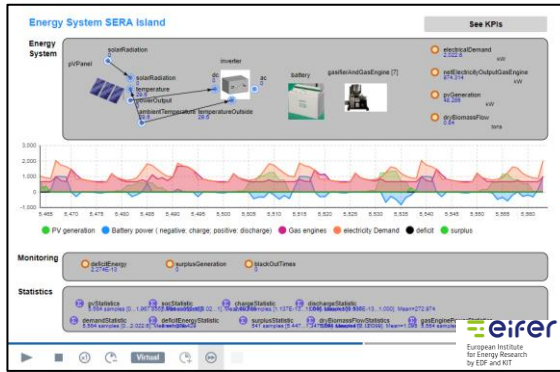
Energy Transition, Markets, Environment

- Analysing energy policies
- Assessing energy markets and business models
- Analysing environmental regulations and practices
- Assessing environmental costs

Area of expertise and projects in microgrids in Africa

MEMOGRID

It is a Decision Helping tool for Local Multi-Energy System **design** and **analysis** and it allows **real time simulation** and **optimization**.



An **online tool for the identification of population clusters**, and for performing a rapid pre-assessment of the costs technical/local geographical conditions feasibility for various rural electrification solutions such as solar home system, microgrid and grid extension.



European Sustainable Energy Cluster Partnership for Africa

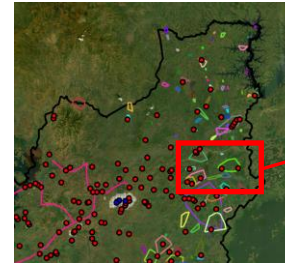
Sénégal, Segou Coura (2018):
Design validation



Senegal & Benin (2021- 2023):
Replicability study of existing
microgrid solution as part of the
LEOPARD Consortium

Cameroon (2022): Identification
of microgrid candidates

Togo (2021):
Optimization of 186 microgrids





ARC Informatique



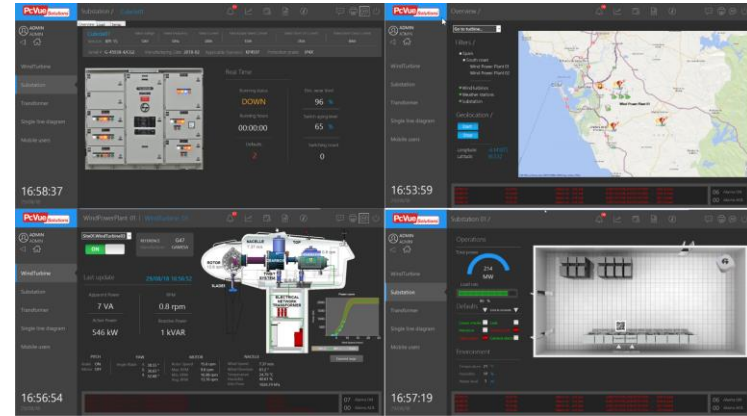
David GASPEL
Sales Engineer
Head of Africa Zone

Who are we? Innovative software solutions for monitoring & control

Industry
Energy
Buildings
Environment
Transportation

40+
Years
of experience in **SCADA**

Global player/Local approach



Collect

Enhance

Display &
Control

Store &
Report

Share

Open
Connectivity

Data
processin

HMI

Dashboards

Remote
solutions



Partner



European Sustainable Energy Cluster Partnership for Africa



Who are we? Innovative software solutions for monitoring & control

67

made available in

12 languages



150+ people
working in
ARC Group



90000+ Licenses
installed in the world



15 International
Branches



40+ Years
of experience in **SCADA**



20 \$+M Turn Over



Experience in African countries

68

Partnerships in West & Central Africa :

Sénégal :

- Akilee, Cisix, L.S.E, Telogic, Houdatech

Burkina Faso :

- Butec (Engie)
- Sipieh

Côte d'Ivoire :

- Butec (Engie)
- DM Company
- Xensor
- Ciber
- Ikatec
- Iteleges
- ...

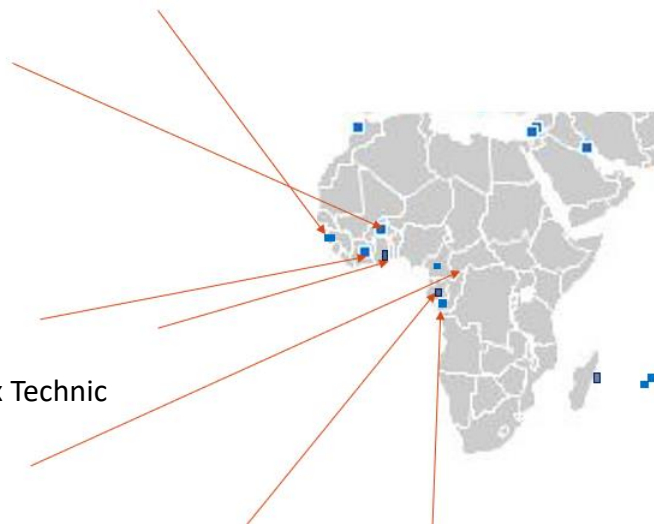
Cameroun :

- Omnium Gpe Snef
- Power Control

Togo
- Ronix Technic

Gabon : Prodergie

RDC : BuildLive



End users :

- Energy :
- Senelec
- Sonabel
- Sbee
- Seeg
- Snel- Inga
- Kengen
- ...
- Water:
- Seeg – Onea - Sodeci
- ...
- Industry:
- Oryx Energie - Cotonou
- Solibra – Sobraga
- Grands Moulins d'Abidjan
- Palmco (Palm Oil)
- Petroci
- Unilever (Savonnerie)
- Cacao (Unicao, Cemoi, Cargill...)
- Sucrivoire
- ...
- BMS:
- Clinique Biasa
- Didd (Marine Dakar)
- Orange Sonatel
- ...

Partners :

It's very interesting to pool efforts to come together to present smart solutions for end users

As an expert in Monitoring/HMI/Scada/Platform/Hypervision we like to know and go together with all companies that could be Interesting for our end users

Examples :

- Lacroix (Sofrel)
- GE Energy
- Chauvin Arnoux
- Dimo
- Ensto
- Paratronic
- Wago
- ...

I remain at your disposal lets talk about that

Temper Energy Intl.

ESPAGNE



Enzo Macera
Directeur zone Afrique & Moyen-Orient

Mob: +33 (0)6 29 88 77 74

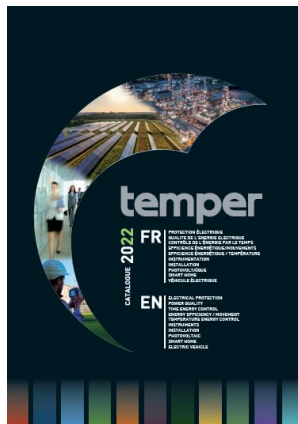
Skype: enzo.macera.grupotemper
E-mail: enzo.macera@temper.es

www.grupotemper.com



Distribution de matériel électrique BT

TEMPER Energy Intl. (Asturias, Espagne) est une filiale du groupe BOER POWER (Wuxi, Chine).



Nous sommes spécialisés dans la distribution de matériel électrique BT destiné principalement à l'efficacité énergétique. Notre offre comprend notamment une famille importante dédiée aux installations photovoltaïques (panneaux solaires, accessoires de montage, onduleurs & micro-onduleurs, protection électrique DC & AC, instrumentation spécifique, compteurs d'énergie, onduleurs pour pompage solaire, etc...).

Nous sommes déjà présent en Afrique (via nos distributeurs), dans les pays suivants: **Algérie, Maroc, Tunisie, Mauritanie, Sénégal, Côte d'Ivoire, Cameroun.**



Notre maison mère BOER POWER

71

Fabricant de matériel et d'équipement électrique BT et MV (tableaux de distribution, MCC, pupitre de contrôle,...) et de solutions (qualité de l'énergie, centrale électrique solaire, chargeur pour véhicule électrique, smart home,...)



Intégrateur important et
réputé en Chine, jouissant d'un
partenariat **Prémium** avec
Schneider Electric



Ses principaux clients sont principalement des entreprises internationales de renom.

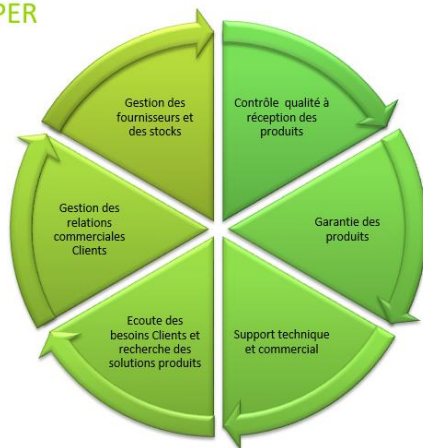
Recherche de partenariats

72

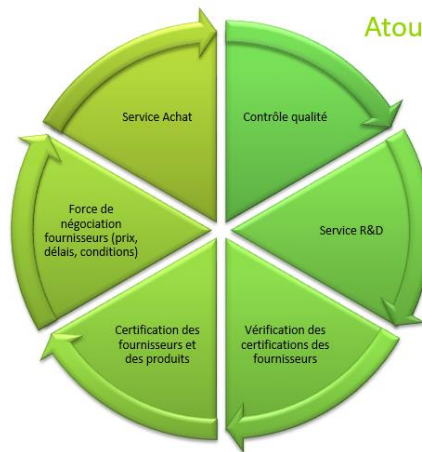
Fort de notre structure dédiée au commerce international basée en Espagne, nous rayonnons sur de nombreux pays en apportant des solutions économiques et efficaces.

Nous recherchons à développer de nouveaux partenariats commerciaux en France et en Afrique, pour la fourniture de matériel électrique, notamment dans le domaine de l'énergie solaire.

Atouts TEMPER



Atouts BOER POWER





Questions ?



Electricity conversion and distribution





**Leaders mondiaux
dans chaque
segment**

Systèmes de mesure et de surveillance

Expertise dans les produits axés sur les systèmes de mesure de l'énergie



- Transformateurs haute tension
- Transformateurs moyenne tension
- Grille numérique
- Capteurs de tension et transformateurs de mesure basse puissance

Automatisation du réseau de transport et de distribution

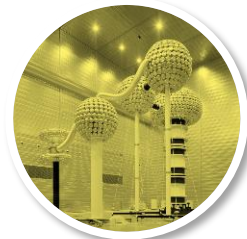
Des solutions qui garantissent la digitalisation et l'automatisation du réseau de distribution électrique



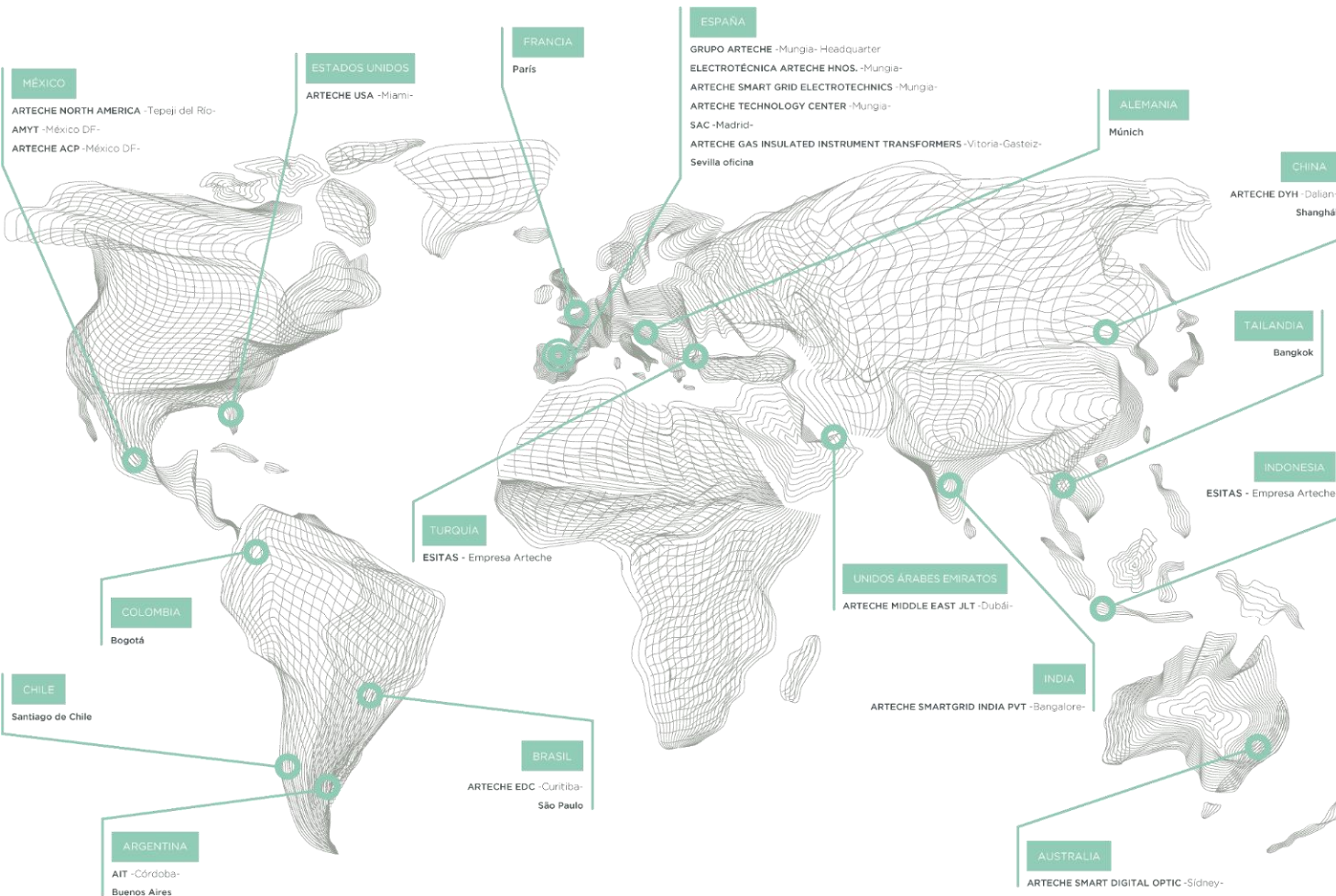
- SAS : Systèmes d'automatisation des sous-stations et de la distribution
- Relais : interrupteurs électroniques pour réseaux électriques et ferroviaires

Fiabilité du réseau

Des services qui renforcent l'efficacité des infrastructures électriques



- Réenclencheurs
- Services d'analyse, de conseil et d'ingénierie
- Qualité de l'alimentation : batteries de condensateurs et filtres d'harmoniques



1

Notre monde

Proximité

Fiabilité

Confiance



Christophe DEBENDERE

christophe.debendere@flipo-richir.com

- ✓ **1921** : Date de création
- ✓ **70** : Nombre de collaborateurs
- ✓ **2** : Champs d'expertise
 - Ingénierie
 - Service Après-Vente
- ✓ **3** : Localisations
 - France : www.flipo-richir.com
 - Pologne : www.flipoenergia.pl
 - Guinée : www.flipo-afrique-energie.com

✓ 4 : Domaines d'activité

- Machines Tournantes Electriques : Moteurs, Alternateurs



- Transformateurs



- Groupes Electrogènes



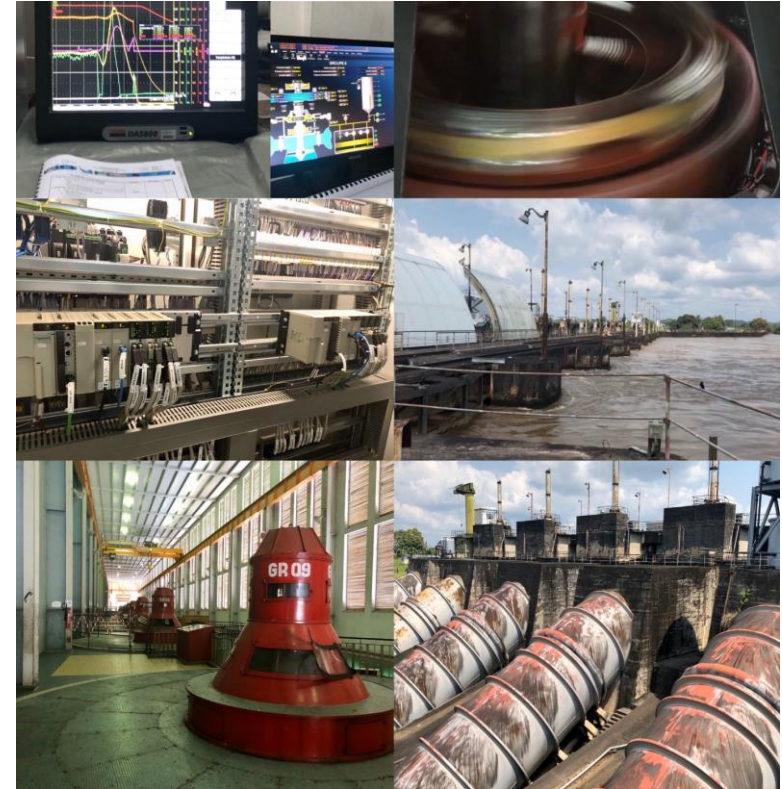
- Automatismes industriels et variation de vitesse



Un exemple de réalisation dans le domaine hydroélectrique :

Cameroun : 6 groupes hydro de 20 MVA unitaire :
Etudes, Fabrication, Montage et Mise en service en remplacement :

- Des systèmes d'excitation
- Des armoires de régulation de tension
- Du système de contrôle commande de la centrale
- De la supervision et du réseau de fibre optique
- Des nouveaux excitateurs à diodes tournantes





Who we are

Experts in customised, reliable and high-tech solutions for the electrical infrastructure

1 Research &
Technology
Centre +
Product
Development
in 8 Countries

16
Industrial
Facilities

Present in
+50
countries

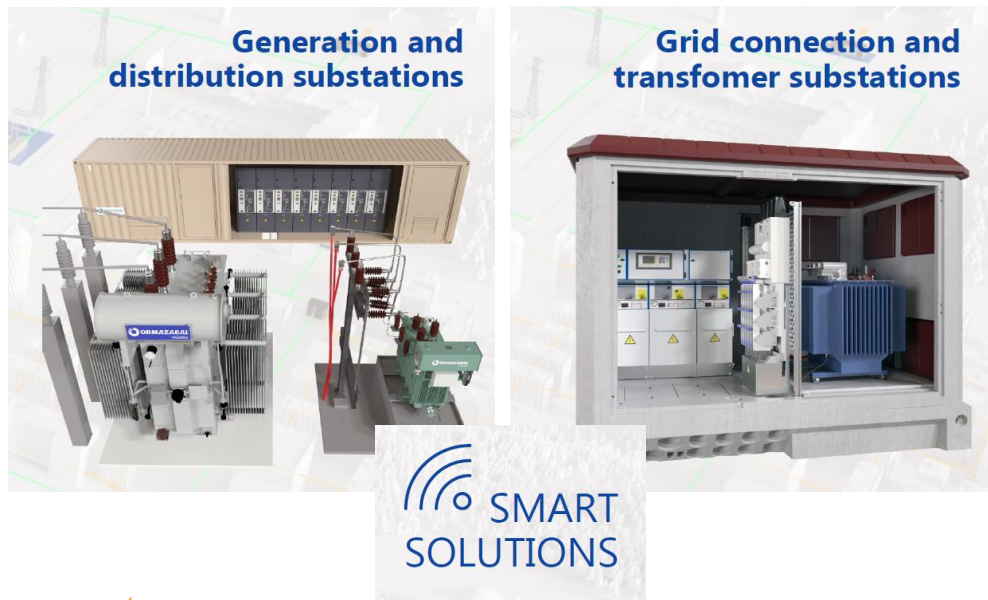
+50 Years
of
experien
e

Turnover
+540 M€

+2,400
Employee
s

What we do

Our solutions



Applications

Smart Grids

- +15 years experience.
- +24M end users.

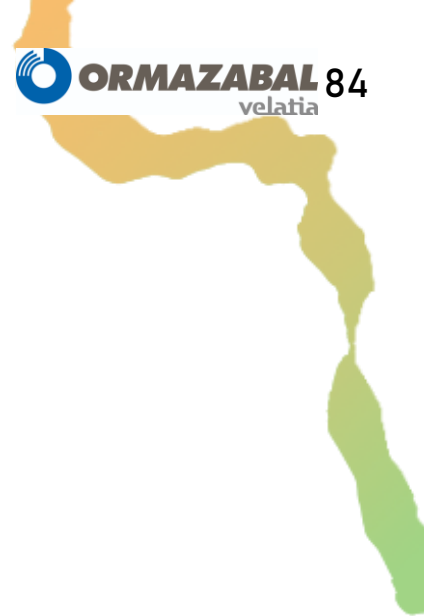
Smart Green Generation

- +30 years developing solutions for RES.
- +150 GW protected & automated worldwide.

Smart Infrastructures

- e-Mobility.
- Data Centres.
- Green Ports.
- Key Infrastructures: airports, tunnels, hospitals...

Why we are here today



- Own presence in Africa. Algeria & RSA // Partners in several countries: <https://www.ormazabal.com/en/about-us/where-we-are>
- Some African references:
 - RES: +2.2 GW Wind // PV: +670 MW
 - DNOs: SENELEC (Senegal), ESKOM and Municipalities (RSA), NamPower (Namibia), SEEG (Gabon), STEG (Tunisia), Sonelgaz (Algeria), EDEL (Angola), etc...
 - Infrastructures: Mining, O&G, Airports, Ports, Industry, Tertiary...



Thank you!

Elena RODRIGUEZ
Head of Marketing
Western Europe & Africa
erg@ormazabal.com



Questions ?