

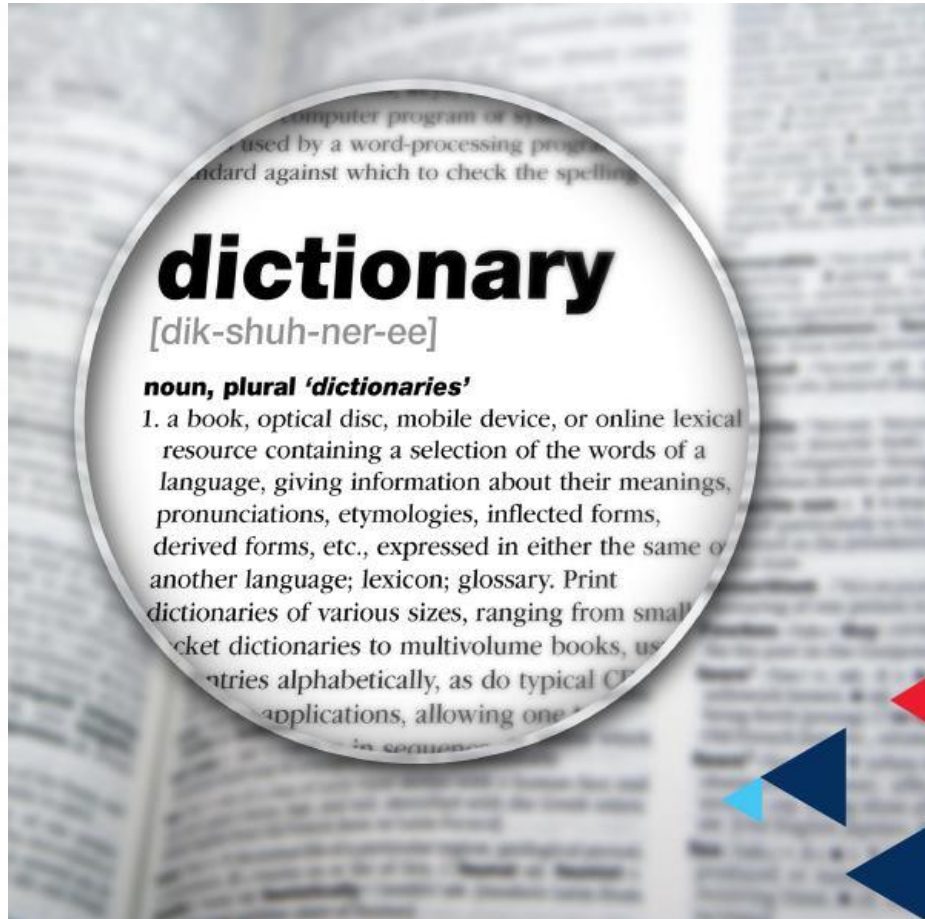
# Empowering the Future.

Efacec in the Renewable Energy  
(Past), Present and Future

EMSP Symposium, 21<sup>st</sup> October 2021, Evora, Portugal

# Efacec in the Renewable Energy

## Dictionary



**Renewable energy** is useful energy that is collected from renewable resources...

which for Efacec means:

Hydro

Solar

Biogas and Hydrogen

Enablers (Electrical Mobility, Light Railway, Energy Management Systems, Substations, ...)

# Agenda

1. Who we are?
2. (Past), Present
3. Future

# 1. Who we are?

# Our purpose is designing a smarter future for a better life

We do it by developing and delivering integrated solutions in the fields of energy, mobility, and environment, shaping the future of our cities, with digital connectivity always present.



## Energy

- Transformers
- Switchgear
- Systems
- Automation
- Service

## Mobility

- Transportation
- Electric Mobility

## Environment

- Water
- Solid Waste
- Air

## Cities

- Smart System

## Digital Connectivity

- Digital Technology

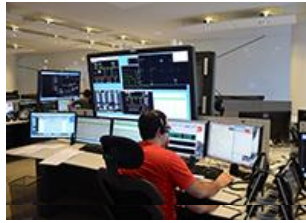
# We develop our activity in three segments, organized in eight Business Units within three main legal entities

## PRODUCTS (Efacec Energia)



### TRANSFORMERS

- Power Transformers:
  - Shell
  - Core
- Mobile Substations
- Distribution Transformers



### AUTOMATION

- Energy Management Systems
- Distribution Dispatch Systems
- Command & Control systems
- Application:
  - Electrical power grids
  - Utilities
  - Transportation
  - Cities
  - Industry



### SWITCHGEAR

- Primary Distribution
- Secondary Distribution
- Compact Substations
- High and Medium Voltage Switchgear
- Application:
  - Electric power grids
  - Electric distribution systems and Industry
  - Infrastructure systems



### SERVICE

- Vertically integrated services to:
  - Industrial facilities
  - Hydroelectric power plants
  - Thermoelectric power plants
  - Small hydro power plants
  - Cogeneration
  - Wind farms
  - Substations
  - Transformer stations

## SYSTEMS (Efacec Engenharia)



### ENERGY

- Production, Transportation & Distribution
- Integrated offer of Maintenance and Technical Assistance



### ENVIRONMENT

- Effluent treatment stations
- Water treatment plants
- Pumping for irrigation and supply stations
- Cogeneration/Combined Cycle/Conventional Thermal Plants (Coal/Oil)
- Distributed control systems



### TRANSPORTATION

- Integrated electrical and automation solutions for Railways, Light rails and Roadways segments
- Core capabilities also able to be used in Telecom

## MOBILITY (Efacec Electric Mobility)



### ELECTRIC MOBILITY

- Full range of charging solutions to Electric Vehicles
  - Private Chargers | Public Chargers
  - Quick Charging | Buses Charging
- Integration of cars, motorcycles and buses in management systems for efficient use of electric grid infrastructure

Always keeping in mind our legacy:

# 72 years of technological innovation.

1948

↓  
Beginning of the Efacec Project

Electro-Moderna, ACEC - Ateliers de Constructions Électriques and CUF - Companhia União Fabril

1983

↓  
Kick-off Automation operations

1987

↓  
Start up of Transportation operations + Beginning of Internationalization

1997

↓  
First revenues in the US

2016

↓  
Start of the Transformation Plan 2020 and its implementation

2019

↓  
Inauguration of Automation's new facilities

2021

↓  
Modular System Electric Mobility new products launch

2005

↓  
Kick-off Renewables operations

2009

↓  
Launch of the EEM project

2018

↓  
Inauguration of Electric Mobility's new facilities

2020

↓  
Modular System launch  
New Power Transformer launch

Now  
towards  
tomorrow.

What we are:

**A fully integrated solutions provider, from:**

**Products  
Manufacturing**

to

**Systems  
Integration**

&

**O&M  
Services**





# 2. (Past), Present

# The role of Efacec in Renewables

## Track Record in Numbers

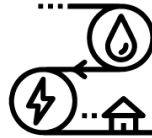


Strong engineering track record and experienced workforce worldwide. From Portugal to the World.



### Renewables:

More than **650 MW** in **Solar** and Wind Power Plants in **10 countries**.



### Hydro:

Over **900 MW** installed in Large and Small Hydro Power plants worldwide.



### Waste-to-Energy:

More than **300 MW** (equivalent) of Waste-to-Energy generation and valorisation (from Anaerobic Digestion/Biogas, Landfill, WWTP Sludge).



### T&D Substations

(up to 525 kV):  
EPC and Maintenance of more than **300** substations commissioned in 35 countries.

# Solar

**Project Name** – Mogadouro –Portugal (2021)

**Client** – Smartenergy / Edisun Power

**Scope** - Full Turnkey (EPC) including HV Substation

**Power** – 49MWp / 42MVA

**Mounting Structure** – Fixed Structure



# Hydro



**ALQUEVA II HPP**  
2 x 125 MW  
Pump-Turbine

400 kV Substation  
Transformers  
Bus Bars  
Cranes  
Drainage  
SCADA – Command & Control System  
AC/DC Systems  
All electrical auxiliary installations & HVAC



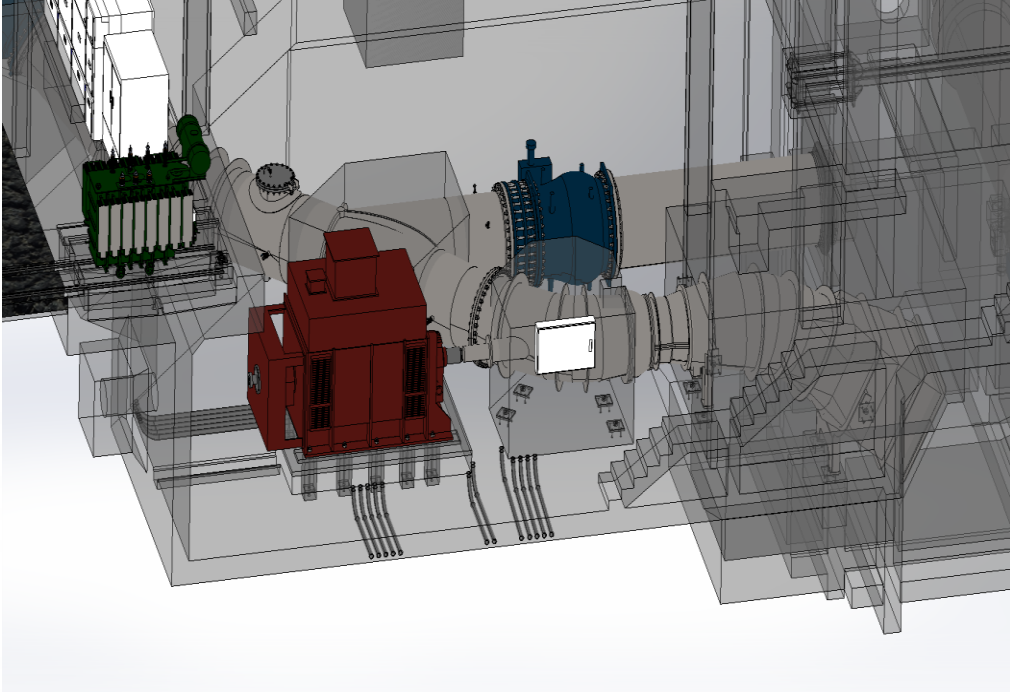
**SALAMONDE II HPP**  
1 x 250 MW  
Pump-Turbine

Generator Erection  
400 kV Substation  
Transformers  
AC/DC Systems  
Drainage  
All electrical auxiliary installations & HVAC



**FOZ TUA HPP**  
2 x 135 MW  
Pump-Turbine

Generators Erection  
400 kV Substation (GIS) and Transformers  
Bus Bars  
Cranes  
Drainage  
SCADA – Command & Control System  
AC/DC Systems  
All electrical auxiliary installations & HVAC



For EPAL – Empresa Portuguesa das Águas Livres, SA, of the AdP Group, whose main objective of the scope is to ensure energy neutrality, becoming the world's first WTP 100% self-sustainable in energy.

The contract, won by a consortium led by EFACEC on a turnkey basis (Basic and detail design, EPC integrated system), scheduled for completion in 2022, with a kaplan-S type turbine, "oil free".

EFACEC plans to install other similar systems in Portugal and abroad.

This new contract reinforces the vast 70 years history of EFACEC's work in Hydroelectric Power Plants area, currently having several projects under construction in Portugal and Angola.

# Flagship Biogas plant Korskro, Denmark

Tech  
Competence  
Center

Turnkey  
Solutions

Industrial  
+ Exportation

## Largest Biogas Plant in Europe



### Anaerobic digestion input (708.000 ton/year):

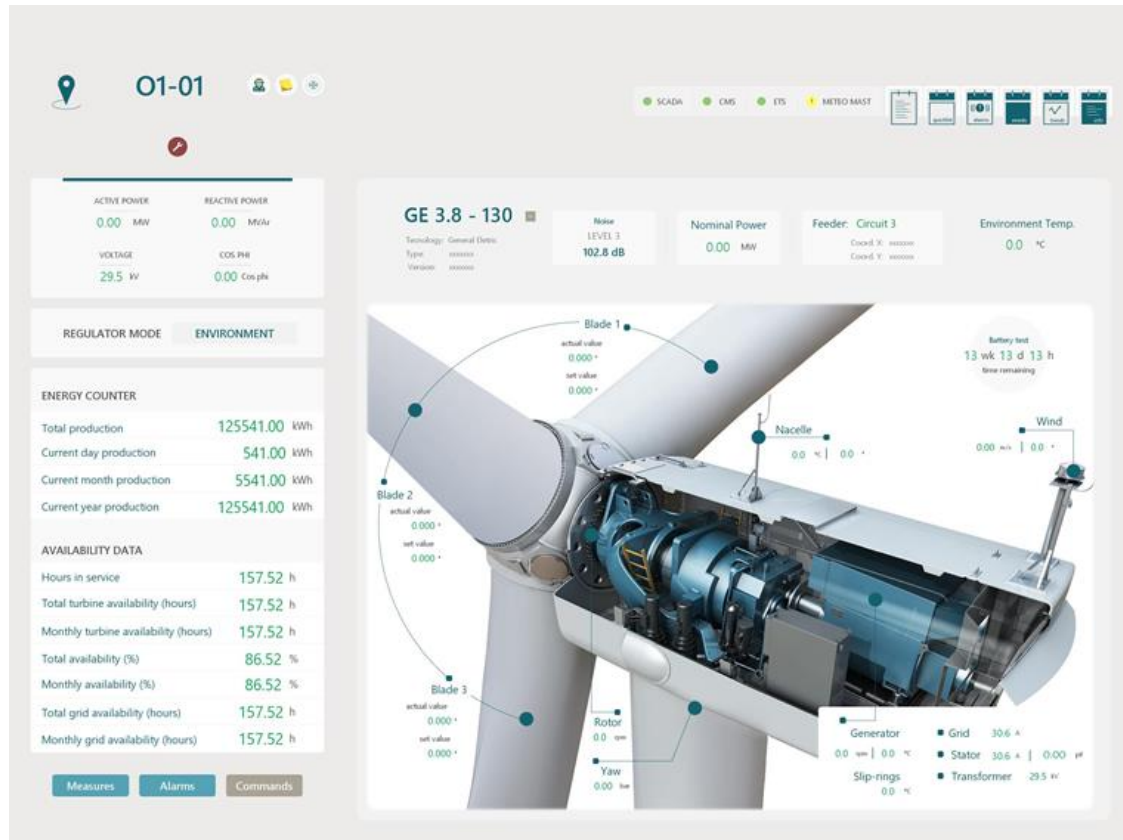
- Manure (524.000 ton/year)
- Energy crops (100.000 ton/year)
- Industrial waste (76.000 ton/year)

### Biogas valorisation output:

- Biogas: 37.000.000 Nm<sup>3</sup>/year

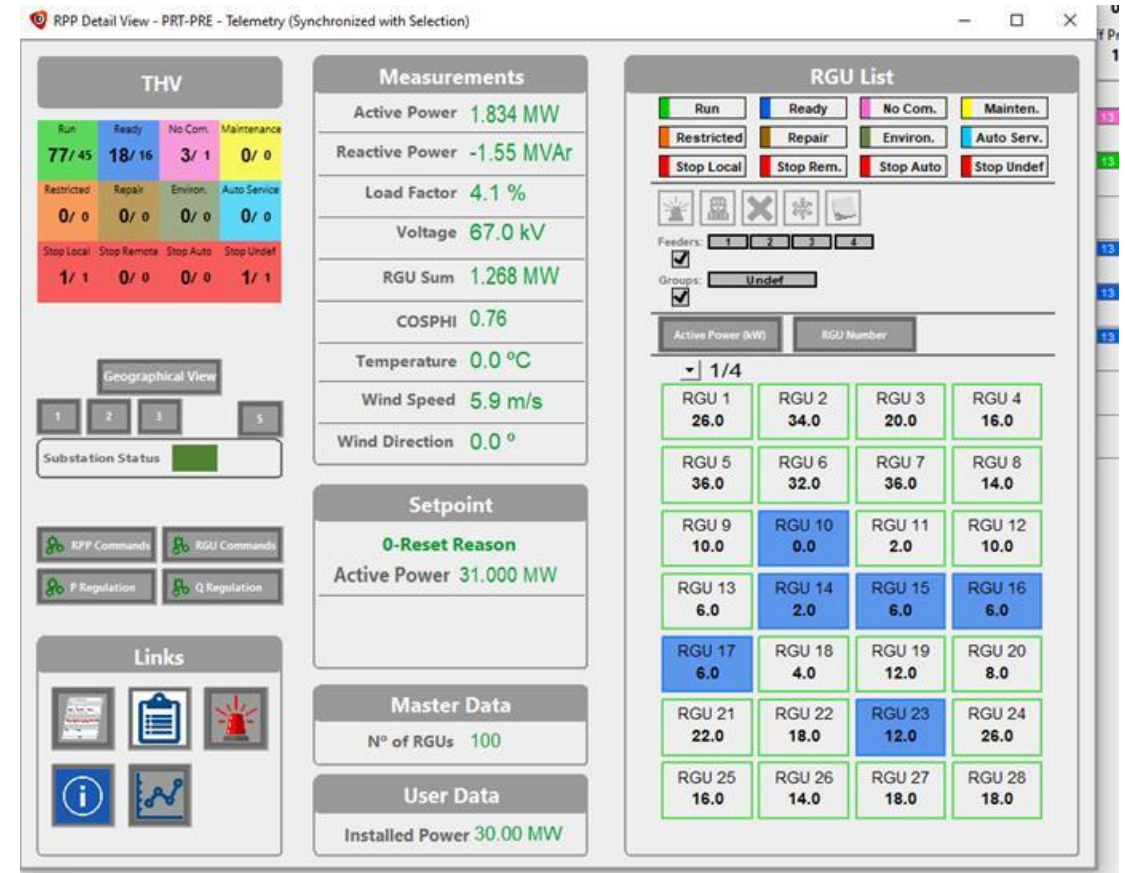
**7 Digesters**

# Enablers (Renewable Energy Management Systems)



## Events correlation

- Asset management
- Operational studies
- Post-disturbance review and replay
- Renewable generation forecast



# Enablers (Renewable Energy Management Systems)

- A “not yet disclosable” **reputable Spanish renewable operator** performing in Europe
  - 1,2 GW of installed power in Spain
  - Assets: 7 solar powerplants, 24 wind farms
  - Commissioning: partial deployment as of Q3 2021; full deployment by late Q4 2021
- A “not yet disclosable” **reputable Portuguese renewable operator** performing worldwide
  - 12 GW of installed power in Canada, United States of America, Mexico, Brazil, Poland, Romania, Greece, Italy, United Kingdom, Belgium, France, Spain and Portugal
  - Assets: 15 solar powerplants, 296 wind farms
  - Commissioning: partial deployment as of Q3 2021; full deployment by late Q1 2022





# 3. Future

**Accelerate our Purpose  
addressing relevant changes**

**Biomethane**





# Hydrogen and CCV



# Renewable Energy Management Systems

# Thank you!

[hugo.campelo@efacec.com](mailto:hugo.campelo@efacec.com)