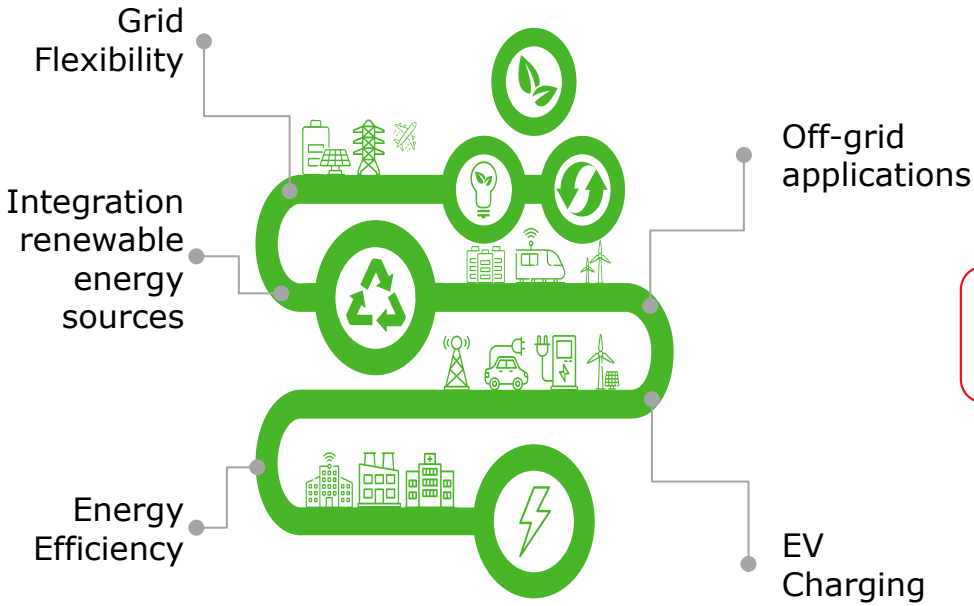
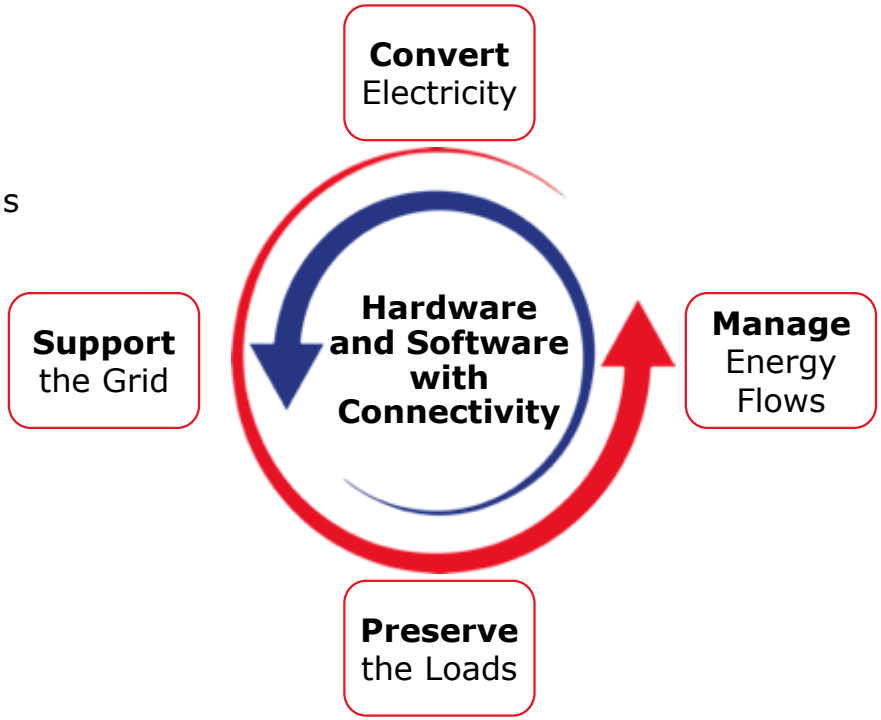
DC Grid for Industrial Use

Marc Van Goidsenhoven

Flux 50 Smart Energy – November 21, 2024

Energy Transition, a unique opportunity





Game changing technology for the Energy transition

Powering **Plasma Torches** for effluents recycling

Unilever plans to equip 1000 Diary farms by 2030

Louth Island Australia
Off grid containerized solution to provide solar power to the local needs.
(Over 730 millions people leave on one of the 11.000 permanently inhabited islands worldwide - nearly 10% of Earth's population)

Replacing traditional **fuel combustion generators**

CE+T global market leader, producing one system per day

Recycling braking energy
from building elevator in America


60kW UL924 Sierra UPS System


2 Hour Battery Backup

Deploying 1 system per month in the West Coast

ALPHA INNOVATIONS · CE+T AUSTRALIA · CE+T POWER · CE+T AMERICA · CE+T ENERGRID · CE+T LUXEMBOURG · GERTEK · RIPENERGY · CE+T CHINA · CE+T INDIA · JEMA · JEMA France

CE+T Group integrates international companies

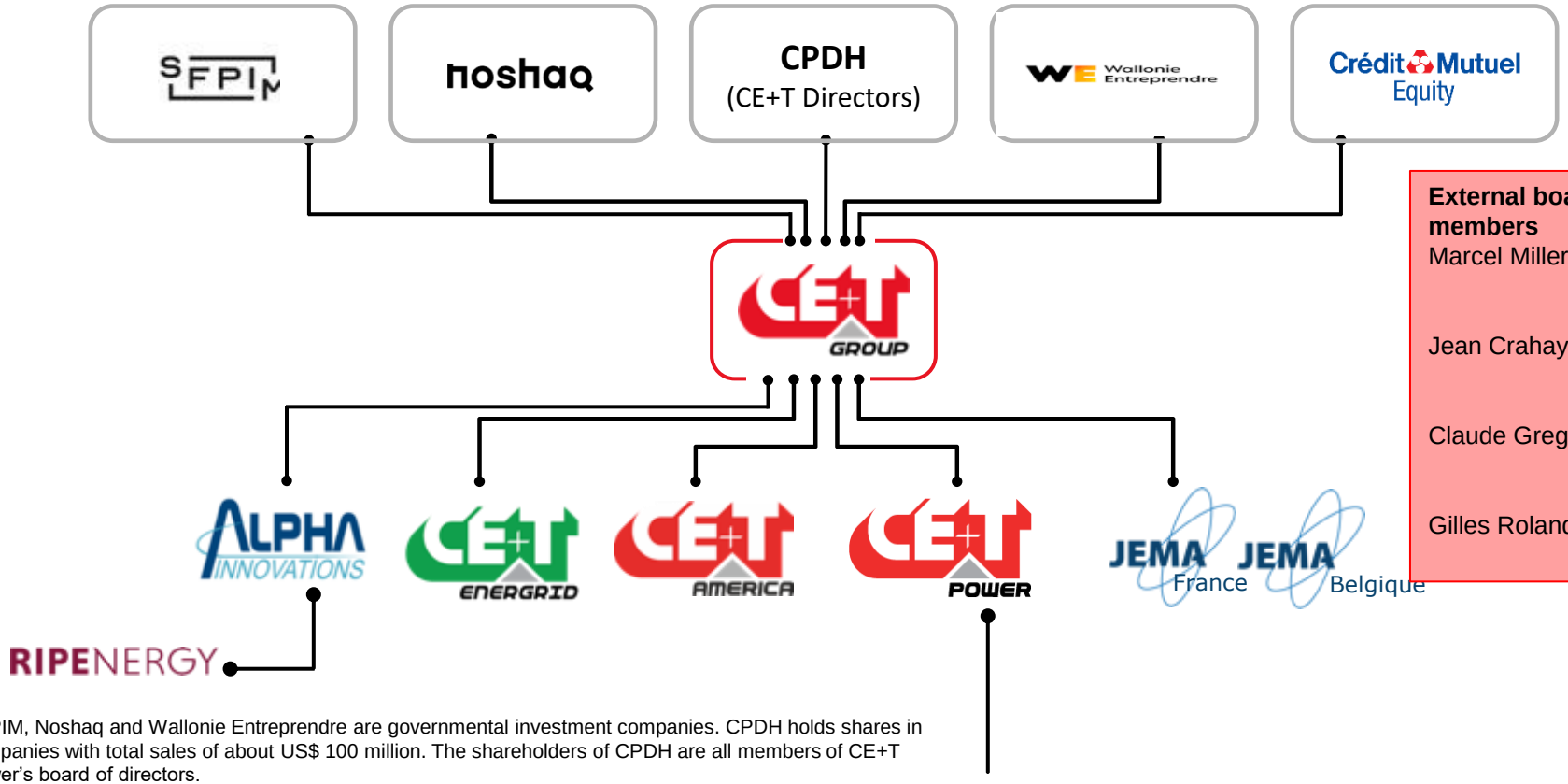
mastering advanced electrical energy solutions

for more reliable businesses

and sustainable future of the planet.

CE+T GROUP

Managers are also investors



External board members

Marcel Miller 

Jean Crahay 

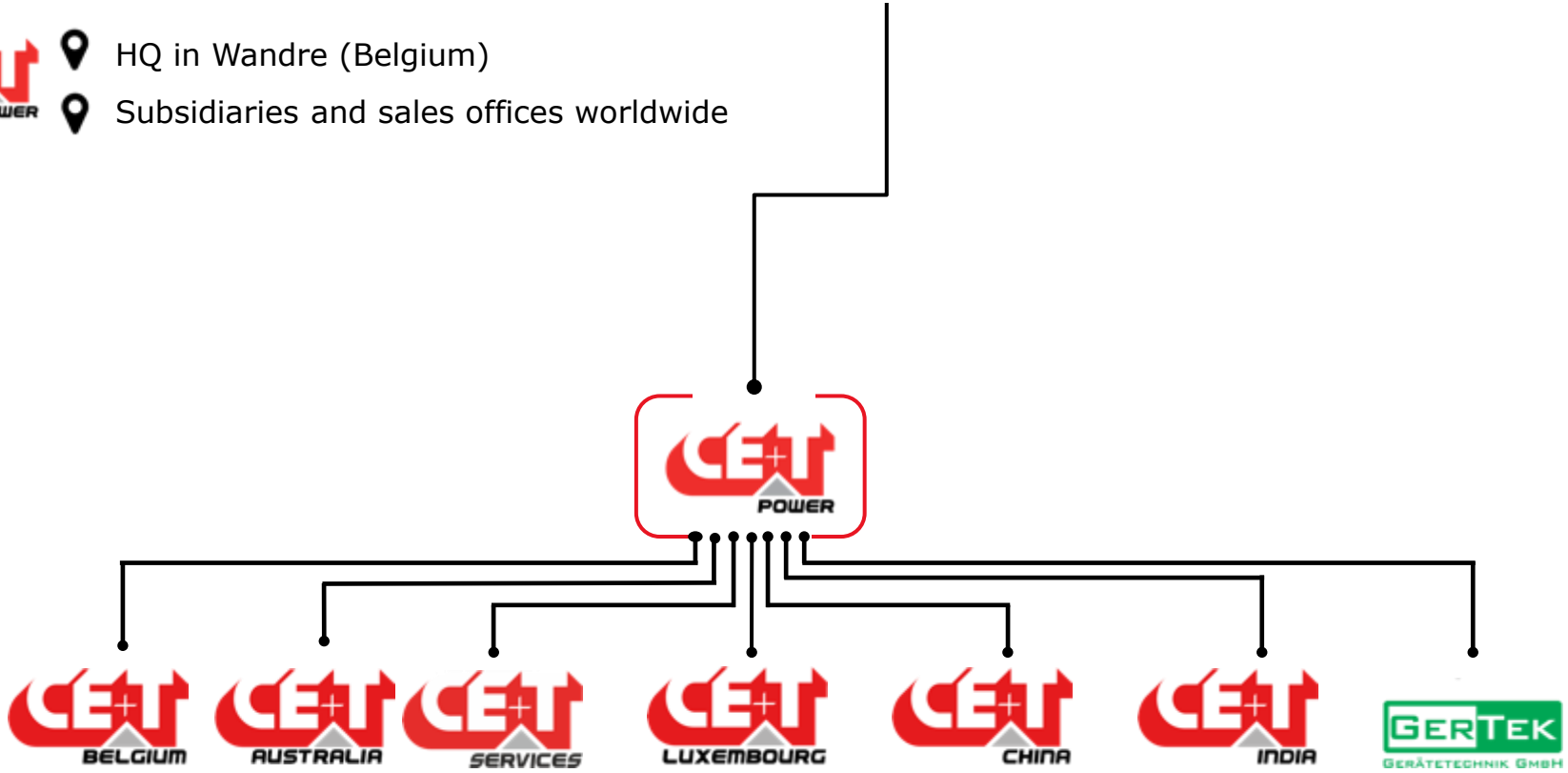
Claude Gregoire 

Gilles Roland (F) 

SFPIM, Noshaq and Wallonie Entreprendre are governmental investment companies. CPDH holds shares in companies with total sales of about US$ 100 million. The shareholders of CPDH are all members of CE+T Power's board of directors.

HQ in Wandre (Belgium)

Subsidiaries and sales offices worldwide



2023 Financials and facts

85 million €

Consolidated Turnover

8% EBITDA

18% AAGR

48% Solvency

80% Export

Proprietary production plants mainly in Belgium and India from 20 different nations

15% of the workforce is engaged in R&D mixing cultures to stimulate creativity

400 employees
One team!
200 in Belgium

Our key advantages

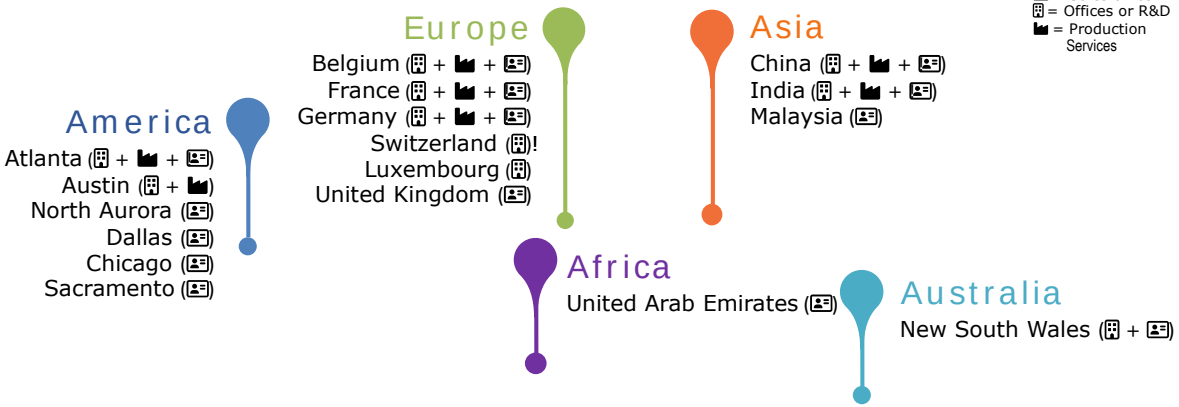
Innovation

Innovation has always been and still is our driving force, it has propelled CE+T at the leading edge of technology with the ability to provide solutions today for tomorrow's challenges.
45+ Active Patents

Unique solutions

Each project is unique, and the solutions offered are always based on constant exchanges with our clients, from design to installation and after sales services.

GloCal



Passion for Energy

Our business is electricity conversion to deliver the load with proper, qualitative and permanent power. With the Energy Transition on the move, support the grid and preserve the load are interlaced to set business resilience.

Quality brand

World-wide strong brand thanks to our expertise, motivated teams, high quality solutions and customer focus and after sales services

ESG leadership

Enabling the energy transition with our innovative technology and actively investing part of our profit in climate support.

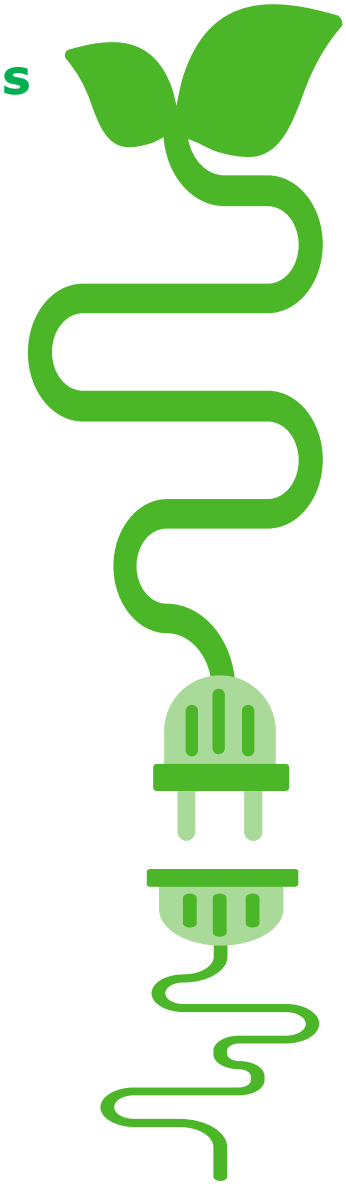
Strong global Pioneer in Energy Conversion solutions

Acquisitions
Asset transfer
NewCo

Cultivate excellence

Optimize the value chain and synergies

Profitable double-digit growth to achieve market leadership with innovative and fit-for-purpose solutions in selected global markets



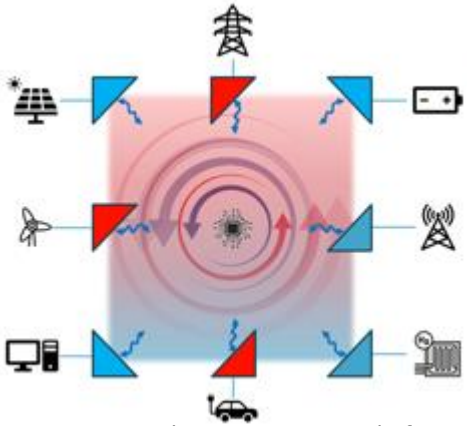
CE+T Group Eco system

135 Mio€ (consolidated) target for 2027

Strategic Alliances

Professional services

Investment in new technology competences



Joint Development Program Platform

WHY DC ?

WHY DC ?

Higher energy efficiency

Less components - higher operational reliability

Higher tolerances in the distribution network

Consider multiple droop-controlled sources

Consider non-dispatchable sources such as PV panels

A fast system of equations that can be easily solved

CLASSICAL SITUATION

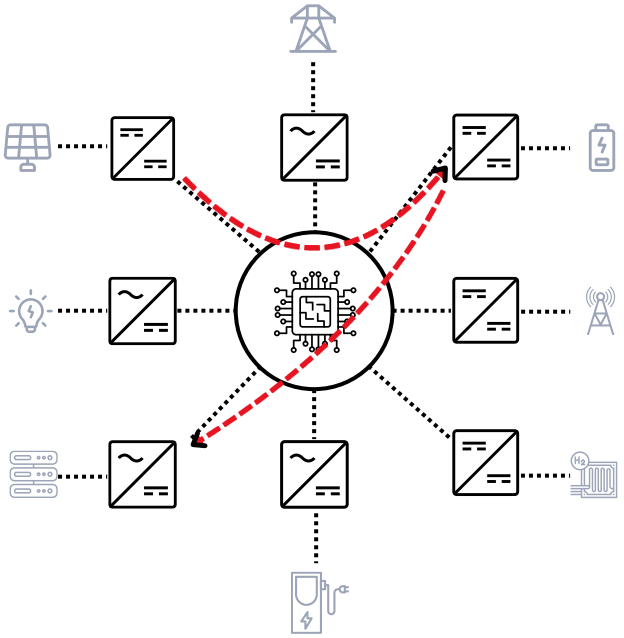
Complexity and Incompatibility

Every energy source requires a **different converter**. These converters, often from **different brands**, struggle to work together.

To make converters communicate, a custom **software solution** is often required, which is costly and time-consuming developments.

Multiple conversion leads to **energy losses**. More converters mean more cumulative losses.

Installation implies multiple **wall-mounted** units, a lot of **cables**, and the frequent need for **specialized electricians**. Maintenance is therefore also a challenge.

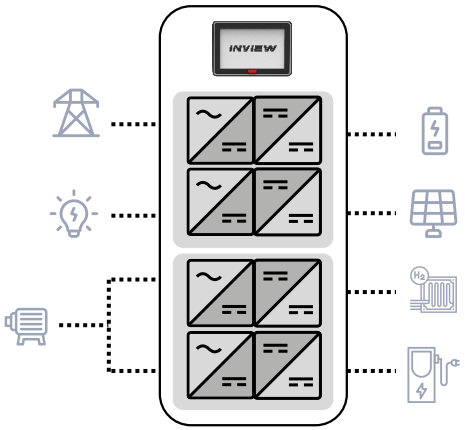


SITUATION WITH CE+T SOLUTION

From Complexity to Efficiency

Bringing all conversion functions together into one **compact, optimized and pre-assembled** cabinet.

Build systems **from 40kW up to 1MW+** !



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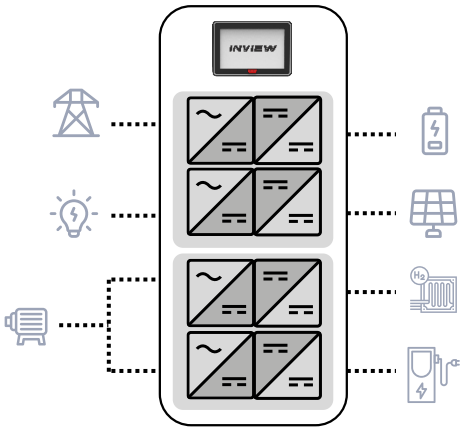


BENEFITS

Maximizing Efficiency with One-Stage Conversion

Let's take the example of night use of solar-powered energy with 98% efficiency converters

Traditional System
(two-stage conversion)

Production → Storage ≈ 96% efficiency flow
Energy goes through two conversion stages, resulting in more loss.

Storage → Load ≈ 96% efficiency flow
Again, two stages in the process lead to energy loss.

Total Efficiency ≈ 92%
Cumulative losses from two separate stages at both points in the flow.

CE+T System
(one-stage conversion)

Production → Storage ≈ 98% efficiency flow
With only one conversion stage, fewer losses occur.

Storage → Load ≈ 98% efficiency flow
Energy is transferred more efficiently with just one stage.

Total Efficiency ≈ 96%
Higher total efficiency compared to the two-stage system.

Consequences

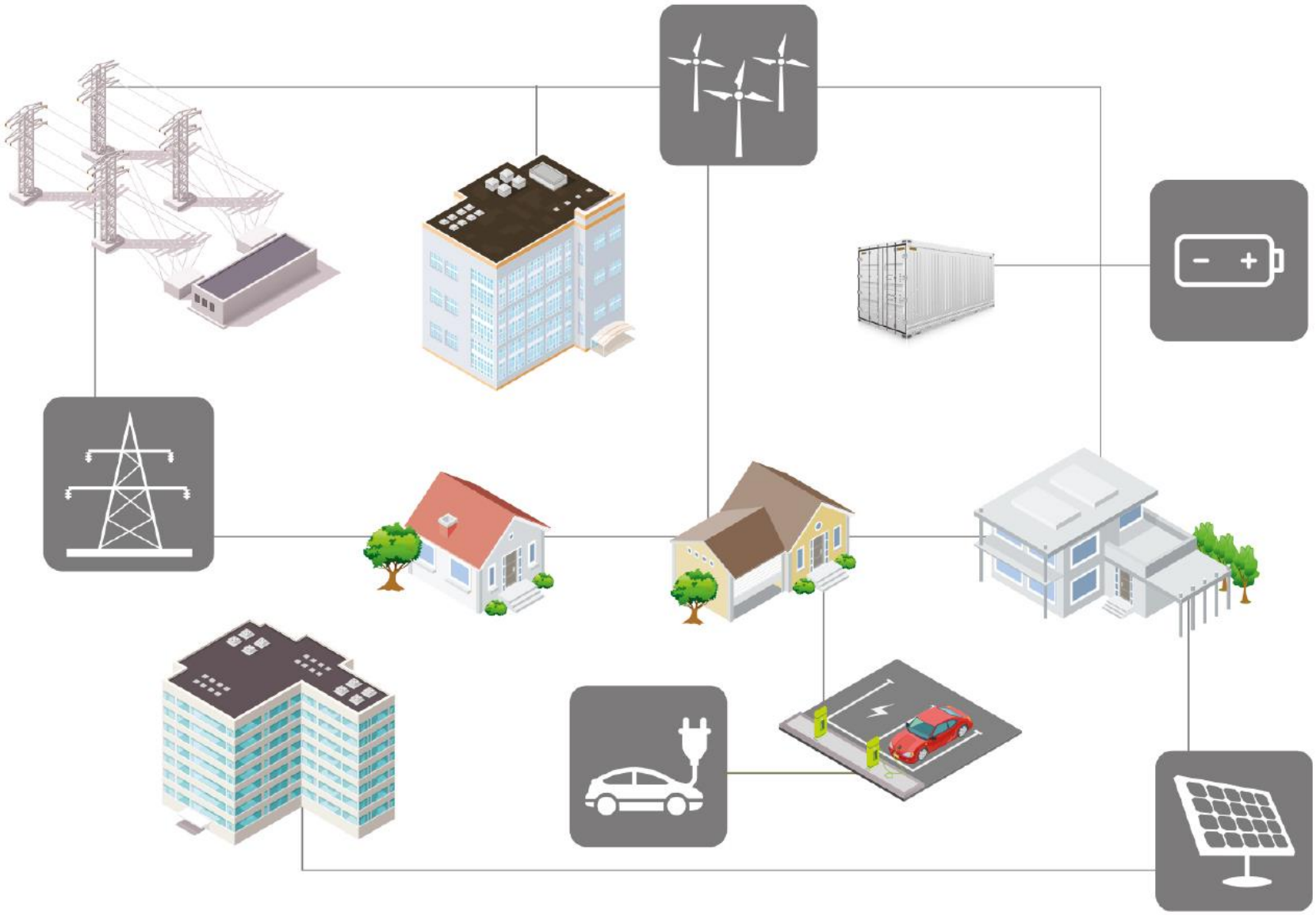
- One-stage conversion reduces energy loss, providing more usable energy.
- Higher efficiency means lower costs and extended battery life.

DC Projects

DC projects worldwide

cf. https://drive.google.com/open?id=1Wo_4jR2VH3E7e78zP-NOmGq_DC0&usp=sharing

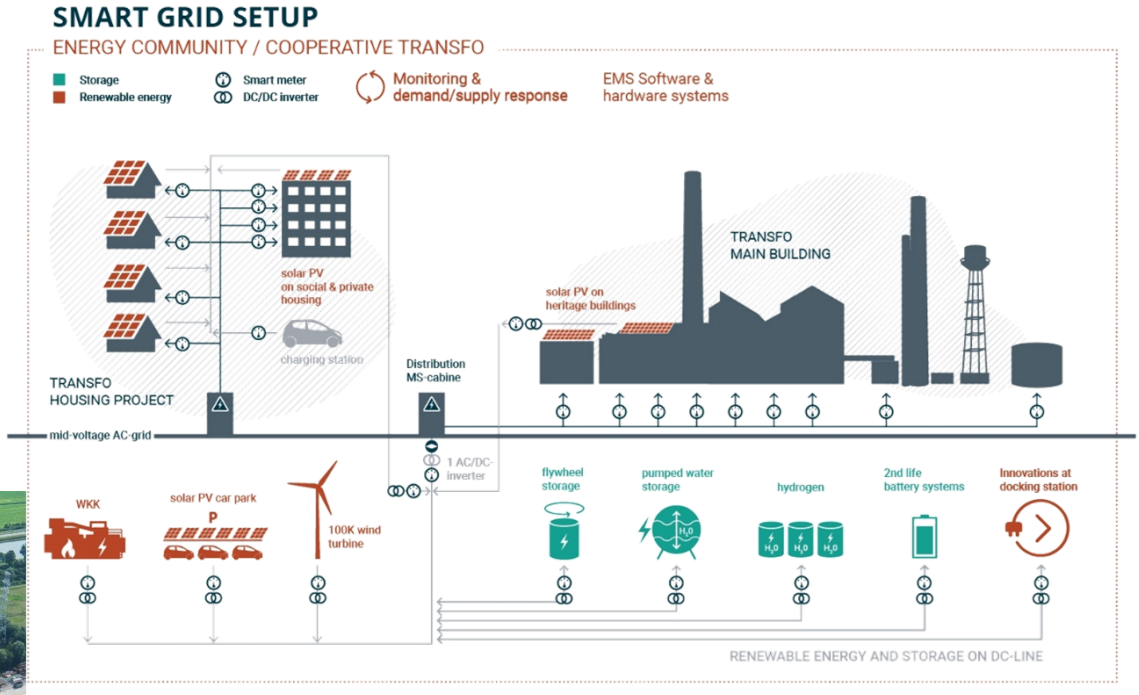
DC Projects Belgium



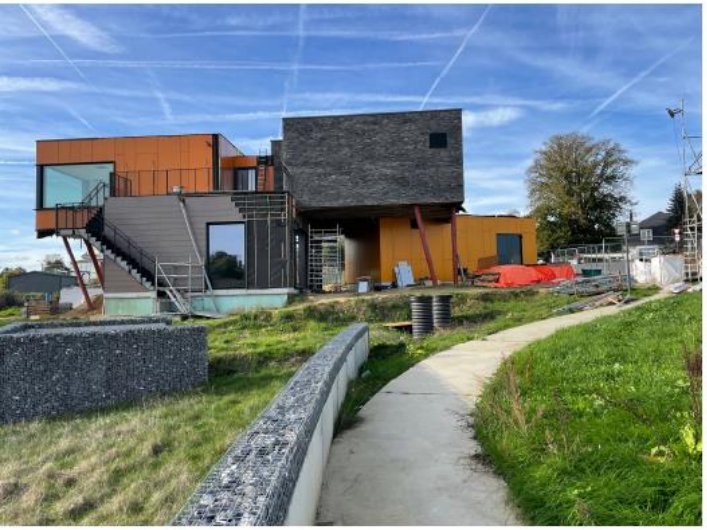
RE/SOURCED

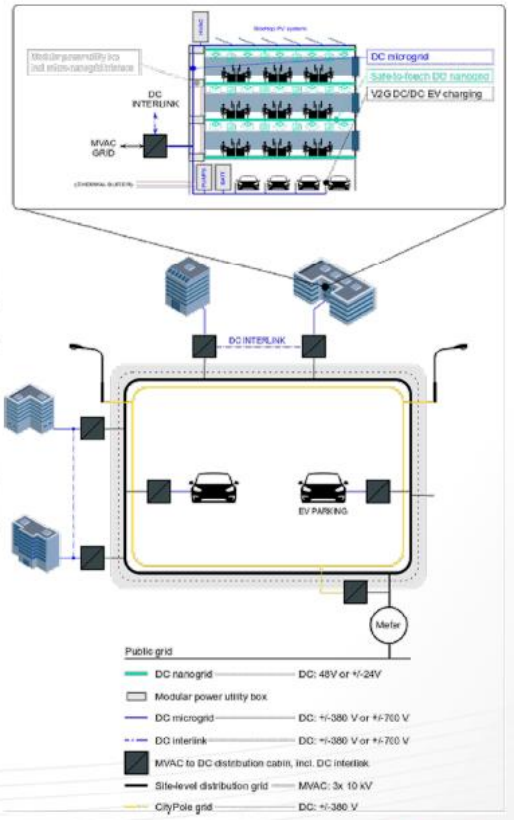
RE/SOURCED design and demonstrate a circular, mid-scale and self-sufficient energy system in an urban environment at Transfo. The backbone of the system is a DC (direct current) power grid, which offers efficiencies through fewer conversion losses and better use of materials.

- Leiedal Intermunicipal Association
  (Lead Partner and Main Urban Authority)
- Zwevegem Municipality
- University of Ghent
- Province of West Flanders
- Flux 50
- REScoop.eu
- Flemish Institute of Technological Research (VITO)



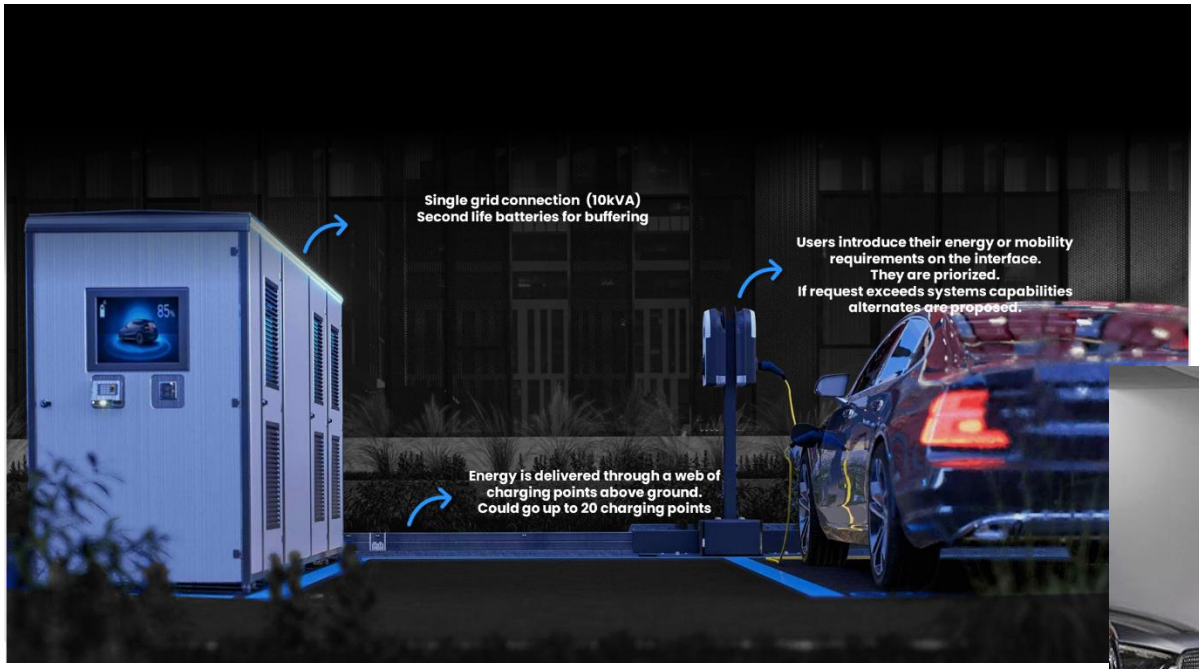
SELFIE





- Project location: Tervuren, Belgium (close to Brussels airport, Leuven)
- 15-20 office buildings
- Common DC infrastructure for shared use of PV generation, EV charging and battery storage
- 215-430 kW of power exchange capability between buildings
- Technical utility building currently being realized as the central point for the utilities

Electro mobility

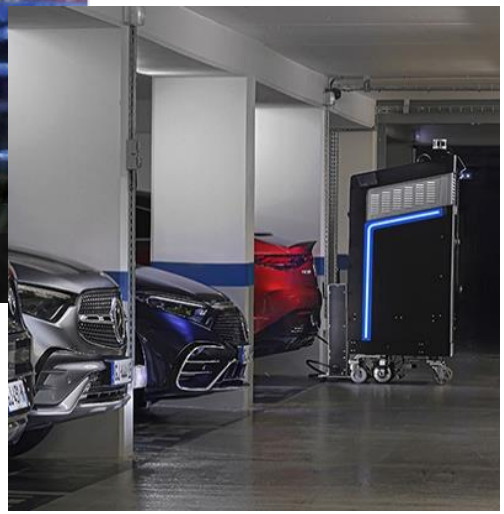


***E**iko* is the latest generation solution for charging up to 20 vehicles with the power of a single terminal.

Designed to meet the growing number of electric vehicles in your parking lots, Eiko is the most scalable and advanced system on the market in terms of energy optimization. Our power cube is easy to install, requires no construction work, and provides unparalleled flexibility.

Daily feeding of 20 vehicles with a single connection

By recharging 100% electric vehicles, in direct current, *Charles* can distribute up to 20 doses of 35 km of autonomy per day. That's 20 cars that regain the autonomy needed for their daily commute (6 kWh) over a 12-hour period. *Charles* can also recharge electric vehicles as well as hybrids or even two-wheelers.



Powering construction sites

Neargrid

Power booster and peak shaving for construction sites

Aim at supplying tower cranes with a limited grid connection. The batteries are slowly charging between the peaks through the residential grid. In other words, to deliver 120 KVA peak only 11 kVA from the grid are needed! Our modules are integrated into their solution to convert the current when needed.

Lavorante Vineyard Microgrid

SINCE 1904
PUCCIONI
VINEYARDS

Due to Lavorante's remote geographic location and its end of PG&E distribution line utility connection, there is a high probability that severe weather events combined with vulnerability to fallen trees, wildfires, and/or utility mandated regional grid curtailments when winds are high, do result in power outages of indeterminate length.
In fact, shortly after purchasing the property, a six-day power outage occurred which resulted in loss of most frozen and refrigerated food, and inability to heat the house.

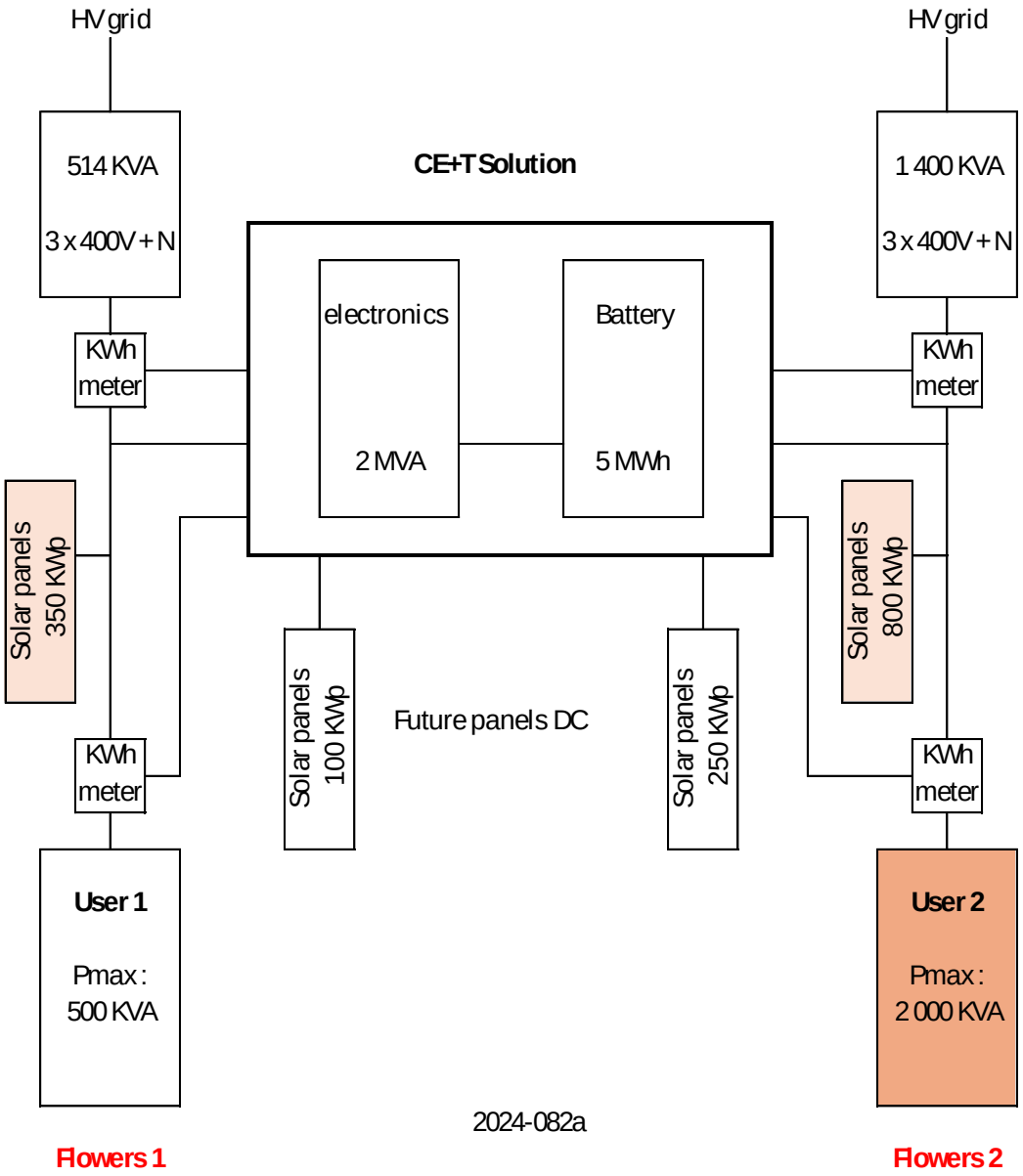
- **Forty-six-acre property requiring 9 pumps for water transfer, pressurization and fire suppression**
- **Challenges :**
  - Severe power outages impacting daily operations and safety measures.
  - Rising propane costs for backup power during extended outages.
- **Solution: Solar + Storage Microgrid backed by Stabiliti for enhanced reliability, with genset for additional support**

CE+T POWER

Dairy Farms

Energy Supply Resilience
When the connection to power grids is disrupted due to system faults or natural disasters like storms or fires, farmers are dependent on unreliable diesel generators to keep their businesses running.

- Energy Supply Resilience
- Energy Efficiencies & Costs
- Ability to Scale
- Carbon Emission Targets
- Technology Obsoletion Risks



Energy as a Service

COMMERCIAL BENEFITS

Energy cost reduction.
No capital risk.
No technical risk.

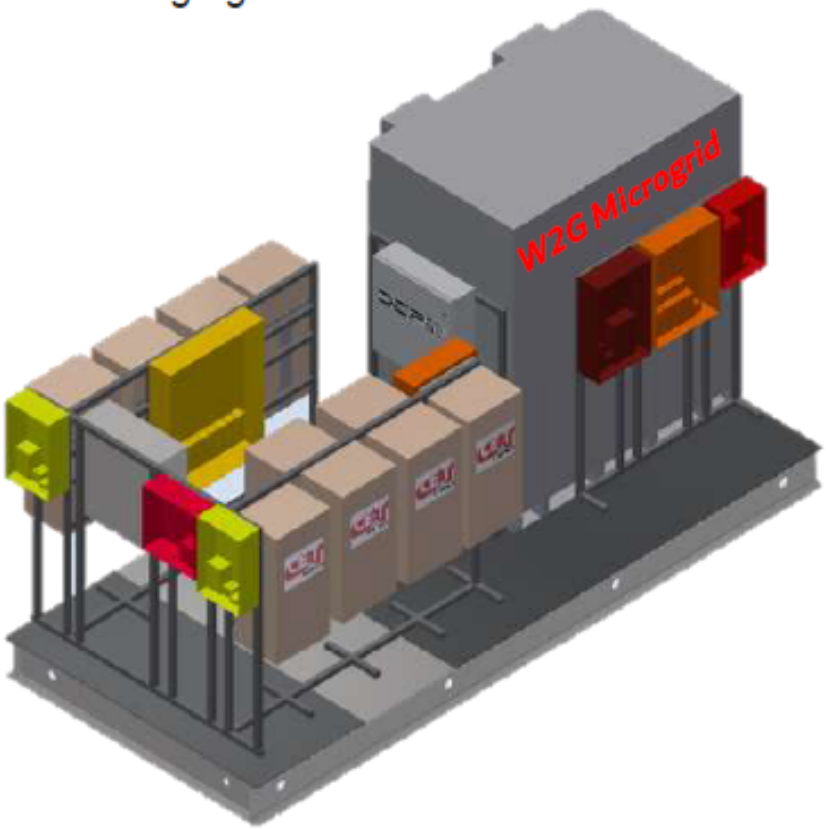
OPERATIONAL BENEFITS

More reliable.
Own and operate remote energy assets for over 35 years.
Scalable.

ENVIRONMENTAL BENEFITS

Fulfil your ESG obligations by targeting an 80% reduction in diesel consumption.
High quality low noise power.

C&I industries the ability to acquire local renewable energy & storage systems that current larger microgrid models find too challenging.



- **Rapid Deployment-** *Plug-N-Play small-scale factor microgrids can be transported anywhere they are needed via trucks & **commissioned within 5 hours of site delivery**.*
- **Scalable-** *Paralleled microgrids can **scale from 150kW to1MW** with full interoperability with ability to connect to cloud mesh networks.*
- **Safe-** *AC/DC microgrid configurable, **no-point-of-failure**, frequency response control , power factor correction, PV galvanic protection & black-start safety features.*
- **Resiliency** *-Ability to disconnect form the grid and go into island mode.*
- **Smart Controller –** *Peak shaving, TOU shifting, Storage mgmt., mesh network capable.*
- **Cost-Effective-** *Robust self-contained fully functional microgrids **reduce the need for additional equipment and installation costs.***
- **Single Source Solution-** *Fully assembled & tested in the USA using Made-in-USA UL 1741SB field proven components improve quality & reliability, reduce system complexity, CAPEX spend & warranty costs.*

Thank you
for your attention

Check our website

www.cet-power.com

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m.vangoidsenhoven@cet-power.com +32 473 95 48 83