Hybrid Microgrid – AC & DC electrical power distribution for maximum efficiency

Hybrid Grid projects in the Netherlands

Presented by Sebastian Greiner

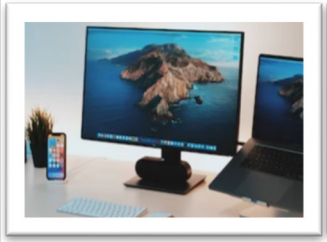
SYSTEMS by Schneider Electric | Elektro Internationaal | Life Is On Schneider Electric

Current Challenges for the Electrical Grid

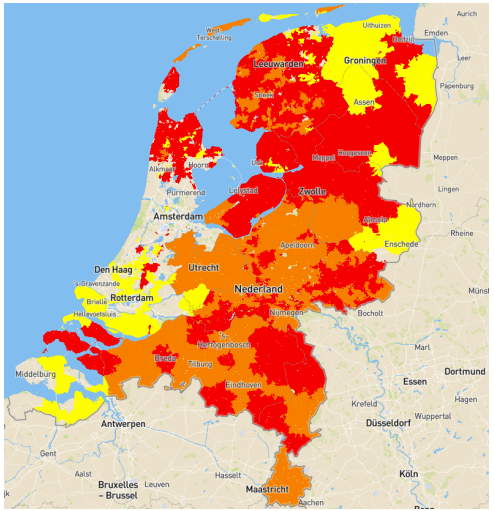
Are we taking energy for granted?

Energy crisis drives up cost of resources

Rapid increase and transformation of loads



No available capacity in grid

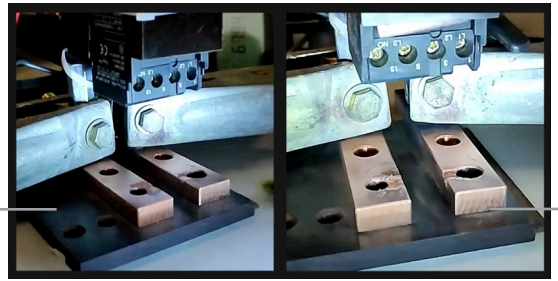


DC Systems in a nutshell

DC Systems B.V.

- 28 people company based in the Netherlands
- Engineers focused on electrical distribution in DC (Direct Current)
- Holistic vision for hybrid AC/DC microgrids
- Comprehensive range of products
- Scalability of Hybrid MicroGrids

Without
solid state protection



With
solid state protection

ABN Circl pavilion
First 100% DC-electrified building

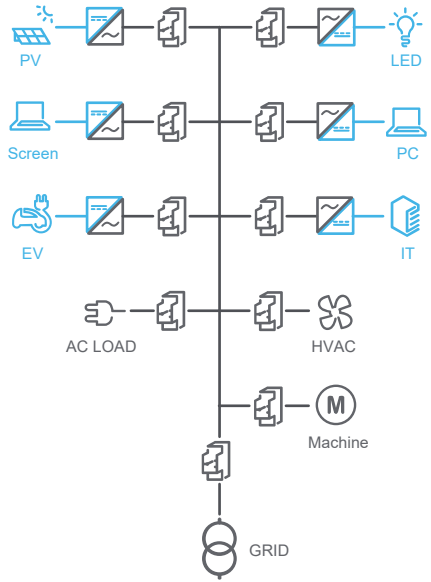
Highway N470
First road to be CO_2-negative

ASR Car Charging
5000 m^2 smart charging park

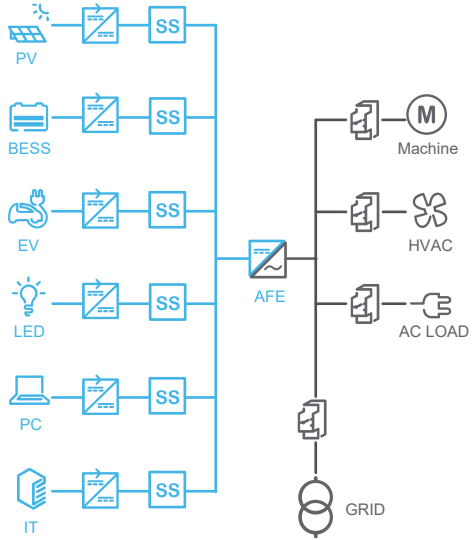
Buildings of the today

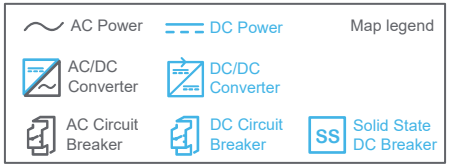
70% of the world's generated AC power gets converted into DC power, resulting in energy inefficiency.

AC Design



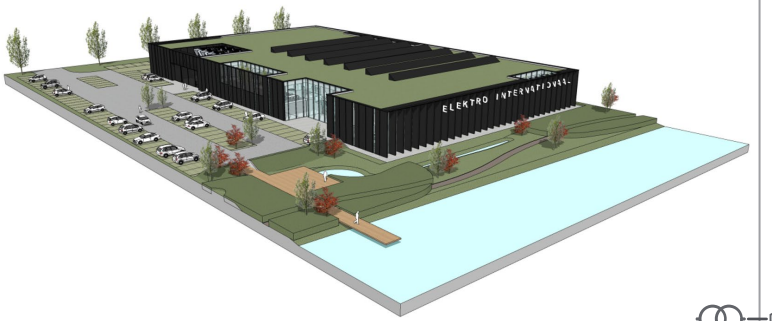
Hybrid AC/DC

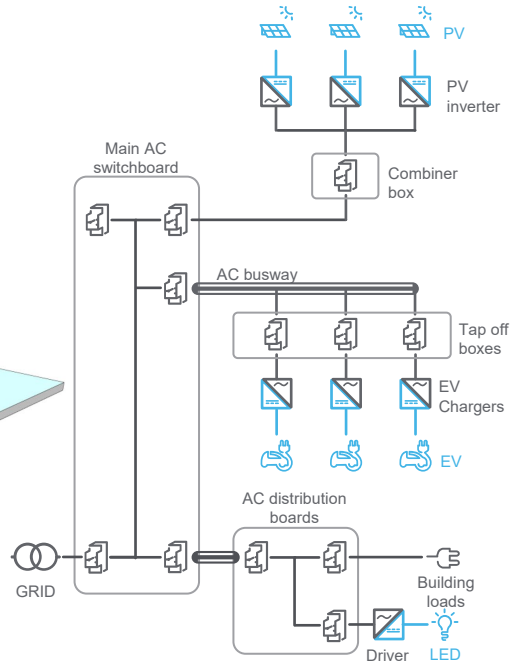




Traditional AC solution

Isolated DC sources and loads





Reference building scenario:

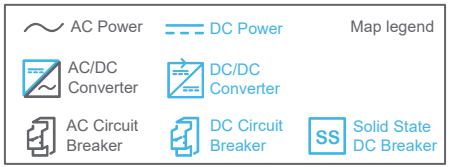
- 640 KVA subscribed power
  400 KVA granted by Utility
- 190 KW building loads
- 250 KW EV charger
- 125 KW / 550 KWh BESS
- 180 KWp PV solar system

Main benefits:

- Well known solutions

Main challenges:

- Complex integration of DER and EV chargers into an existing infrastructure.
- Dedicated protections and cabling for DER and EV.
- Multiple AC/DC conversions lead to power losses and distortions.
- Grid connection sizing.



Elektro Internationaal

Life Is On Schneider Electric

Hybrid AC-DC solution

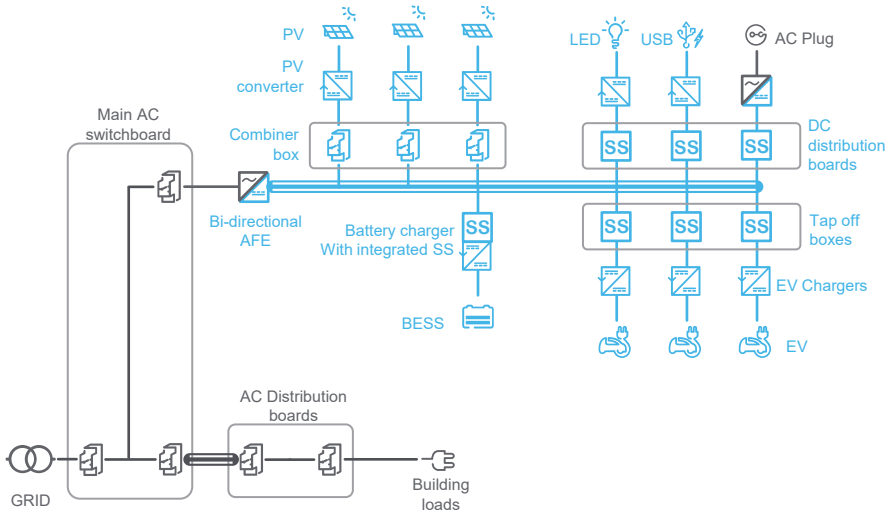
Optimal AC & DC mix for maximum efficiency

Compared to AC Solution

290kVA Grid connection needed

7-10 % Improved efficiency (depending on use case)

-35 % Copper reduction

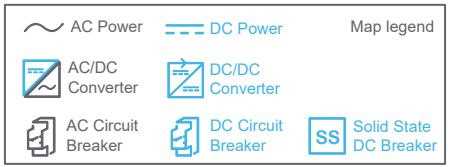


Main benefits:

- Easier integration for DER.
- Scalable solution.
- Less component.
- Better efficiency.
- Reduced power demand.
- Vehicle-to-building (V2B) future ready capability.
- Lower carbon footprint.

Reference building scenario:

- 640 KVA subscribed power
  400 KVA granted by Utility
- 190 KW building loads
- 250 KW EV charger
- 125 KW / 550 KWh BESS
- 180 KWp PV solar system



Elektro Internationaal Life Is On Schneider Electric

Hybrid AC-DC solution for disruptive EV car parks

EV charging: the challenges of traditional infrastructure and how to overcome them with Direct Current

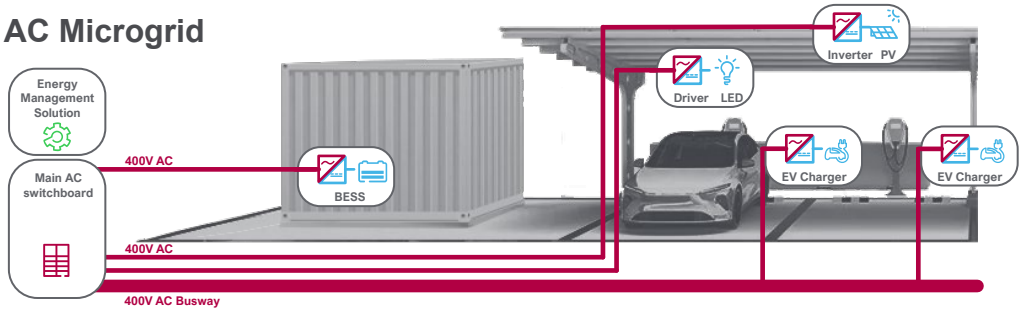
Customer's Challenges

- Grid congestion
- Load and Source management
- Complex integration of DER and EV chargers in an existing building

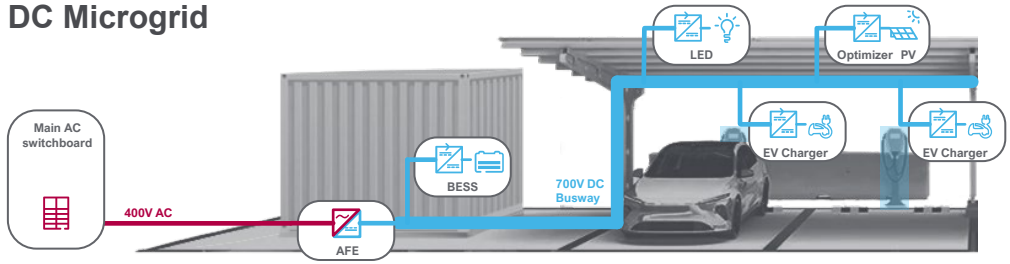
DC Value Proposition

- Simple and scalable solution
- Higher efficiency
- More sustainable

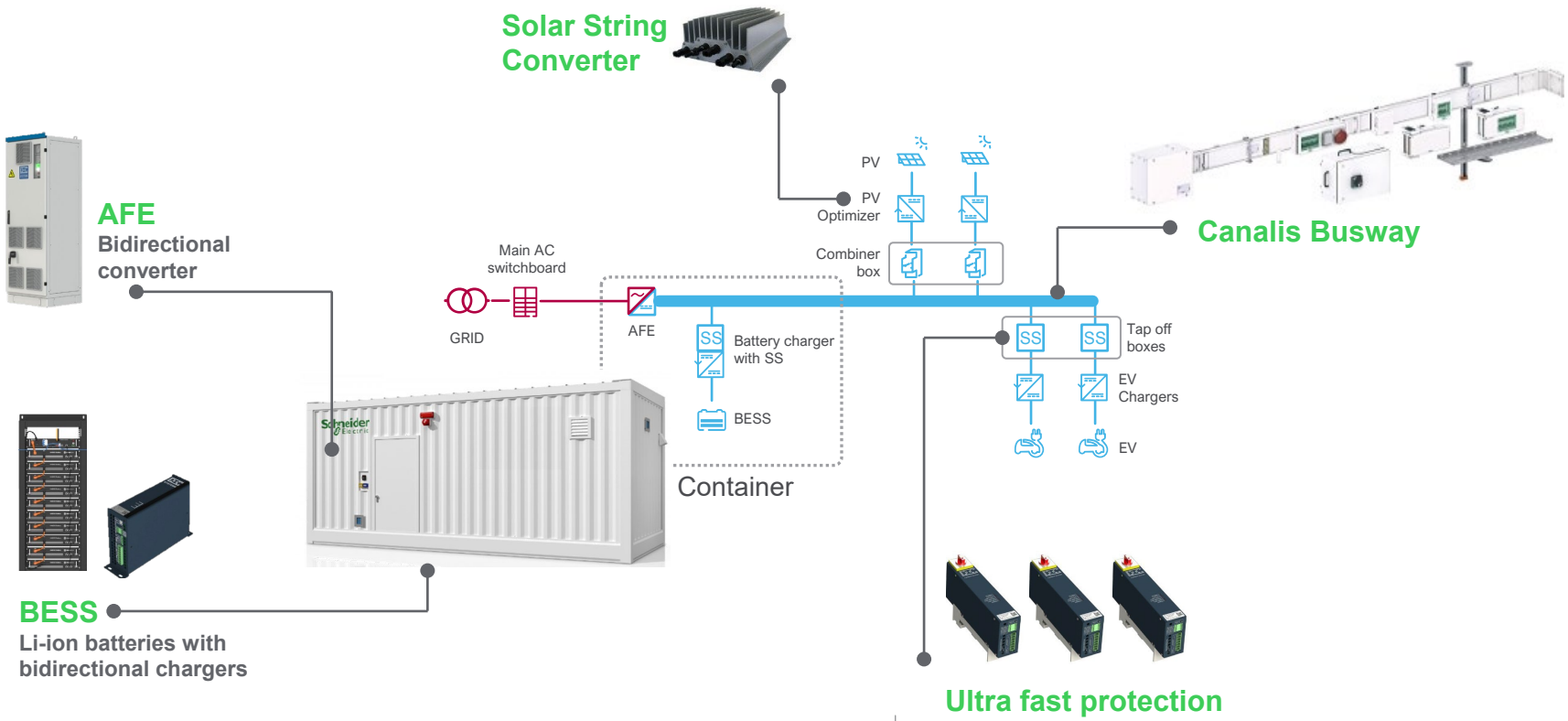
AC Microgrid



DC Microgrid



EV in a Box: products and architecture



Interested in further information?

SYSTEMS by Schneider Electric

dcgrid Direct Current powered by Elektro Internationaal

OR

Join one of the open and independent foundations for the adoption of active DC Microgrids based on a set of rules to ensure **Interoperability**, **Safety**, **Scalability** and **Resilience**

CurrentCDS

ODCA direct current by zvei

Thank you

Questions?