How Power Electronics & Energy Storage help us to accelerate in the energy transition

Bredenoord

Introduction

Noël Steentjes
Technical Director

Bredenoord

Power Electronics & Energy Storage event

POWER ELECTRONICS

ENERGY STORAGE

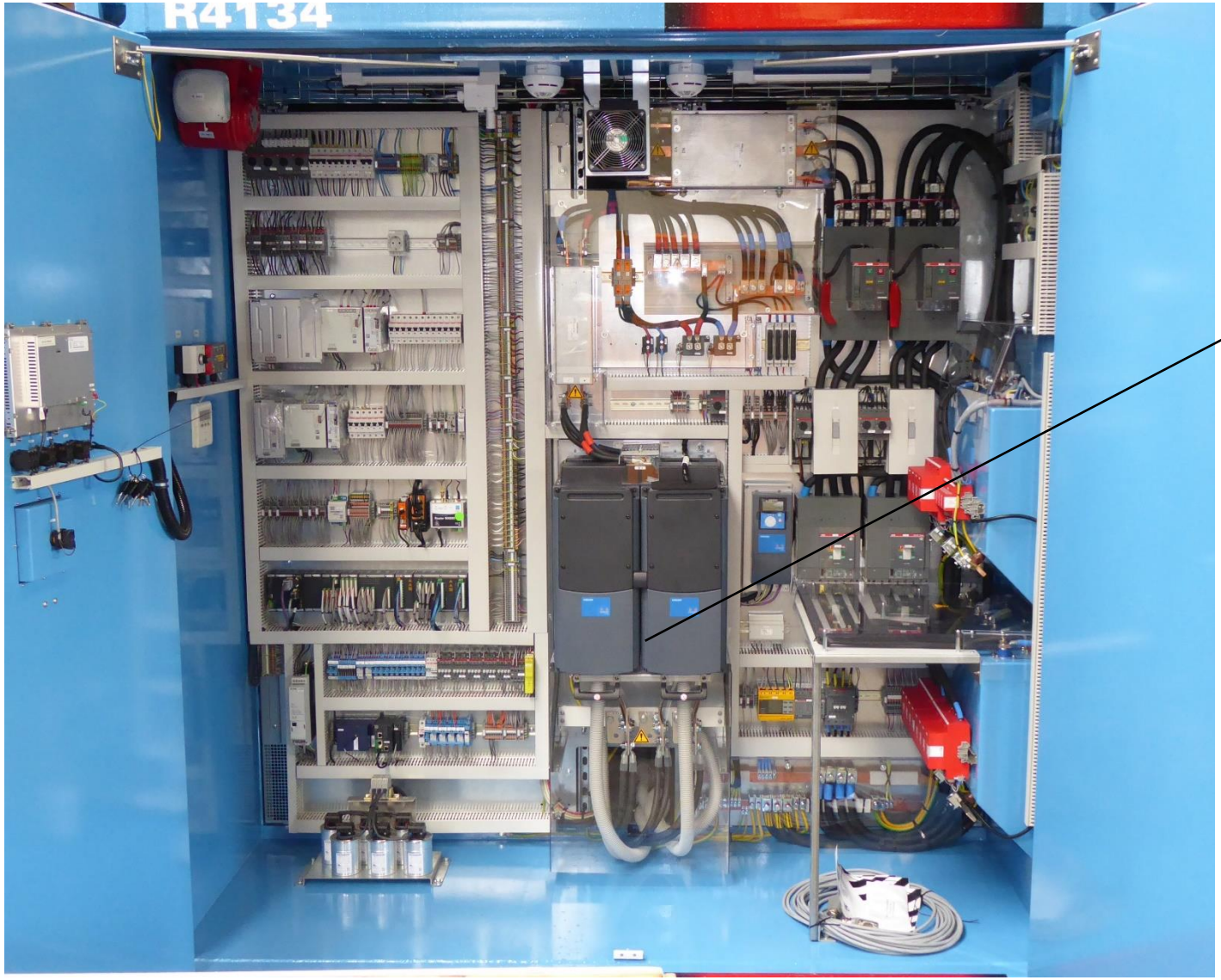
28 mei 2024 | 1931 Congrescentrum 's-Hertogenbosch

Example of a Battery Energy Storage System

BB300

- Power: 300 kW
- Energy: 355 kWh
- Current: 433 A
- Voltage AC: 230 / 400 V
- Frequency: 50 / 60 Hz
- Size: 10ft. container
- Weight: 7.160 kg

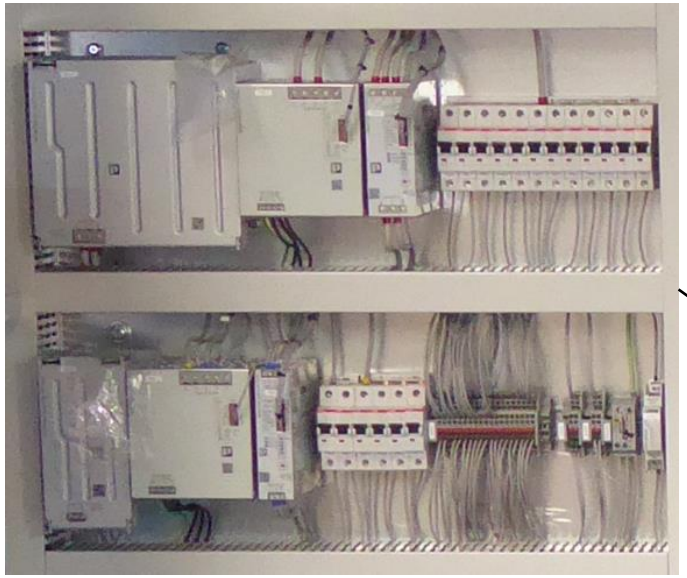
Power Electronics in a Battery Box



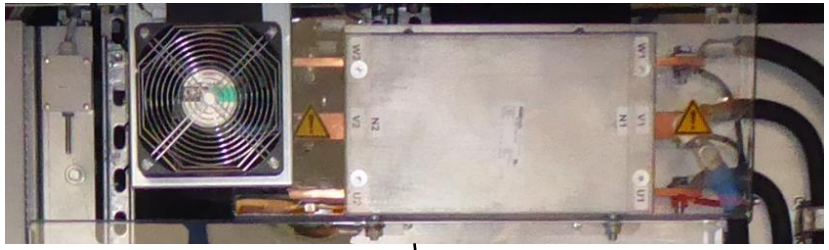
Inverter

Power Electronics

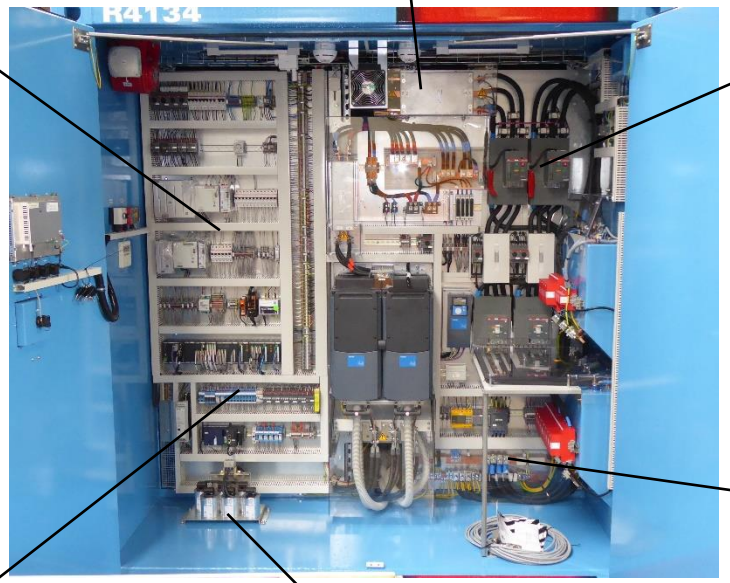
Equipment Room

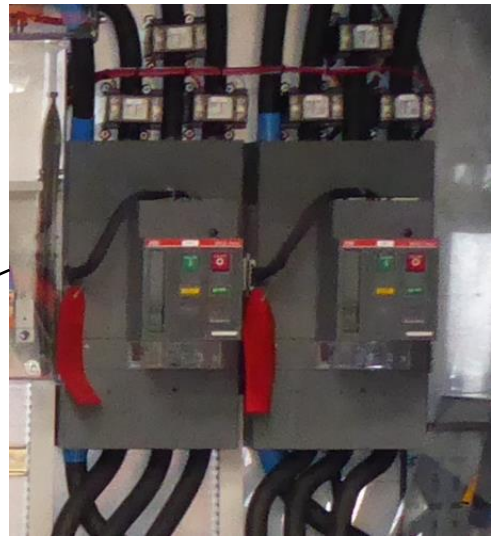


UPS and auxiliary circuit breakers



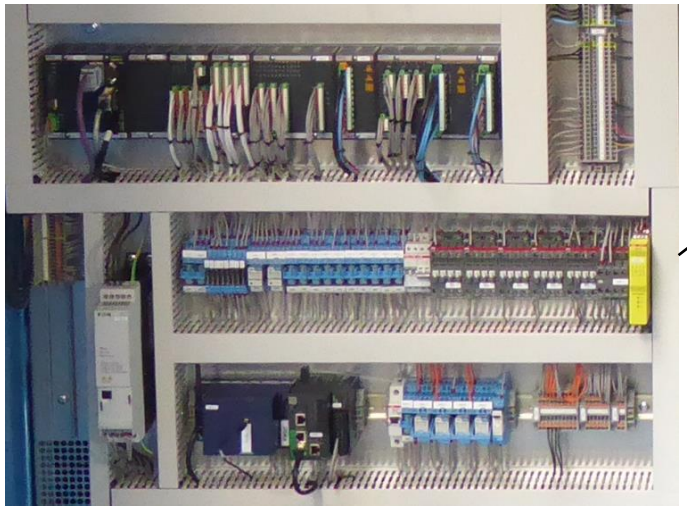
EMC filter





Main circuit breakers

Insulation monitoring and overvoltage protection



Automation and communication

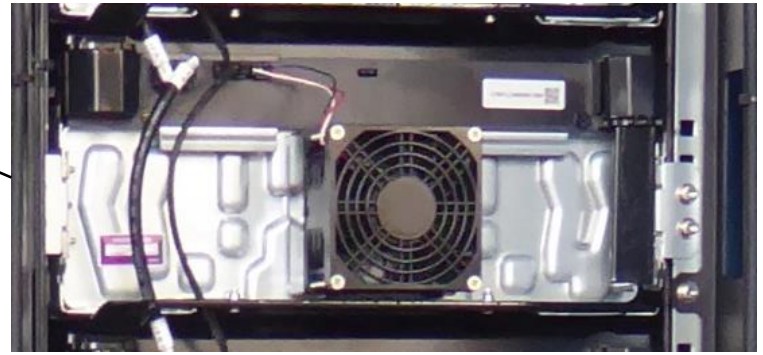
Capacitors

Energy Storage in a Battery Box

Battery Equipment Room

Battery Rack

Rack BMS



Battery Pack

Other systems in a Battery Box

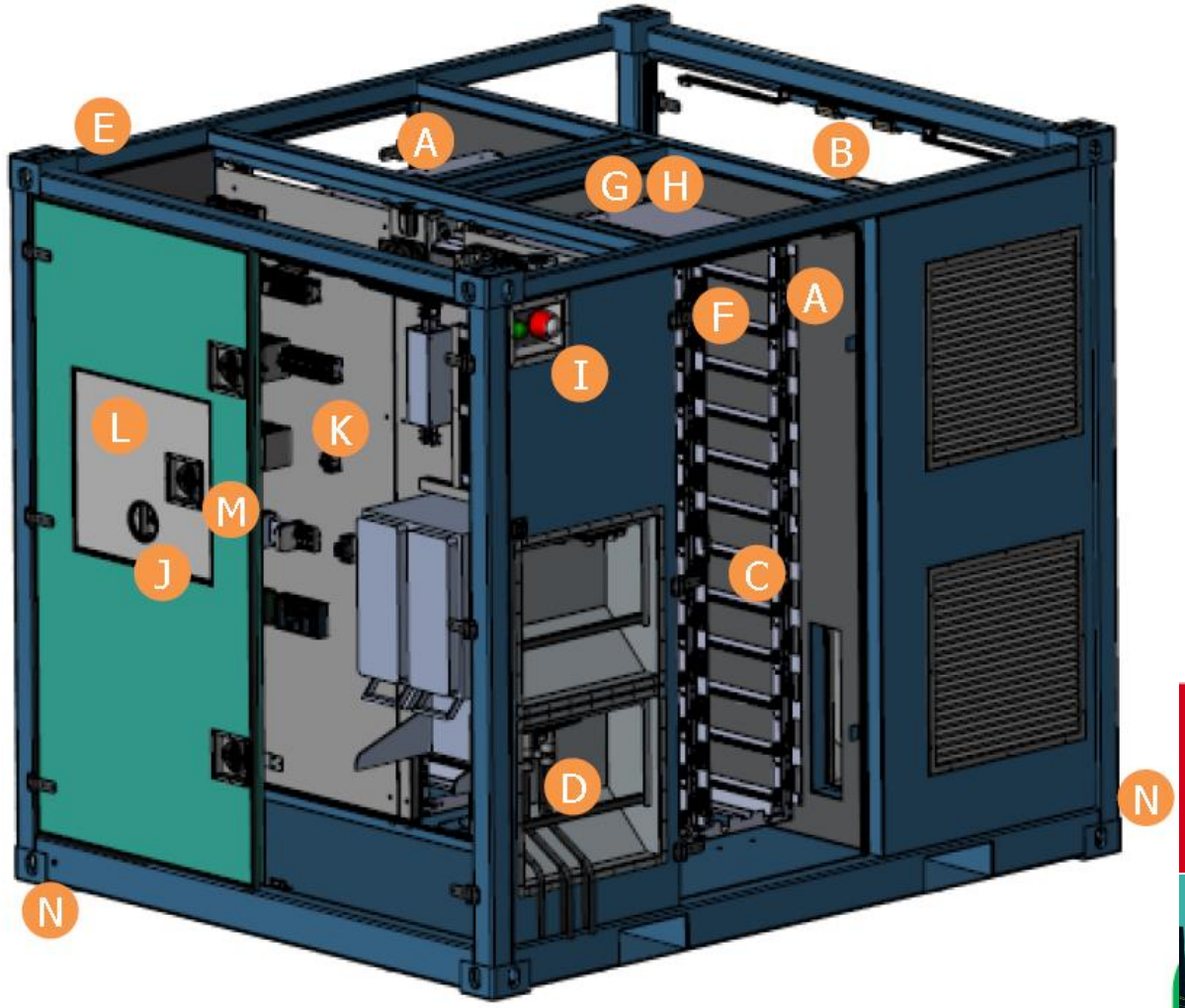
HVAC (air heating and cooling)

Inverter cooling (liquid)

Transformer

Safety measures in a Battery Box

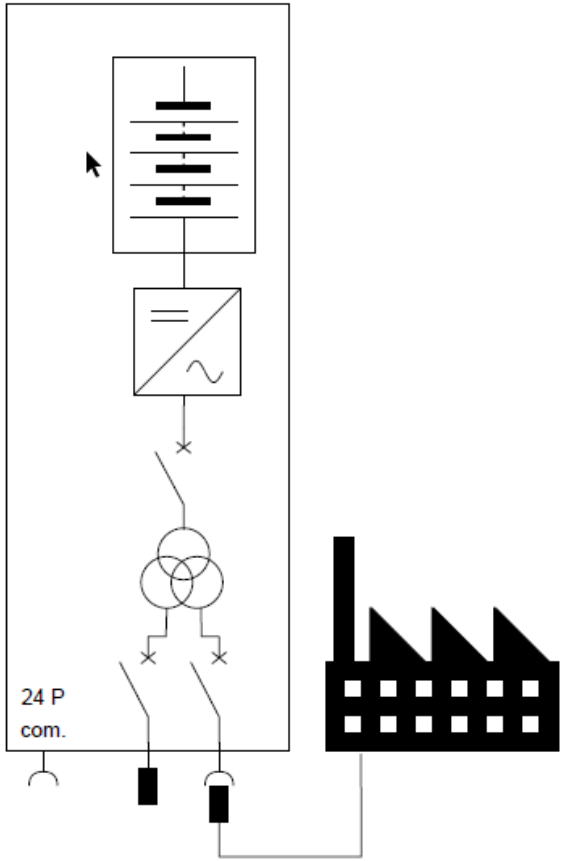
A – Battery Equipment Room – IP54
B – HVAC Equipment Room – IP33
C – Certified batteries
D – Overvoltage protection connections
E – Lightning protection (Faraday cage)
F – Fire Extinguisher
G – Temperature detection & alarm
H – Gas and smoke detection & alarm
I – External audiovisual warning
J – Emergency shutdown button
K – Safety Chain (hard wired)
L – Monitoring & Control
M – Key-plan locks
N – Ground point



Different Operation modes

Most used modes:

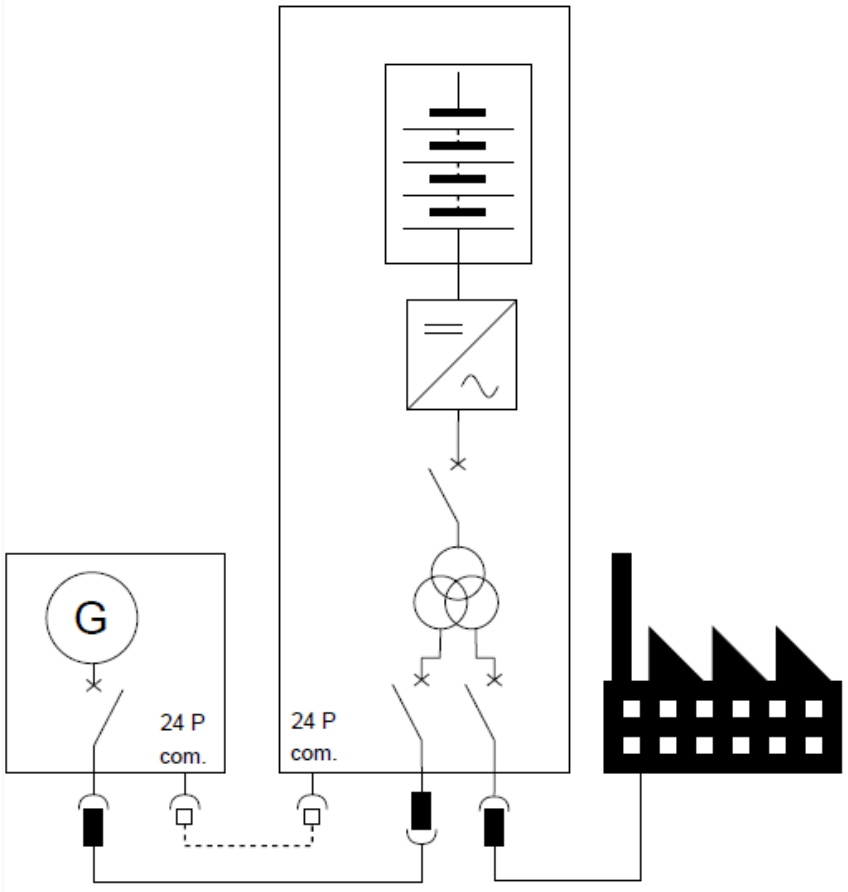
- Island
- Hybrid
- Peak shave



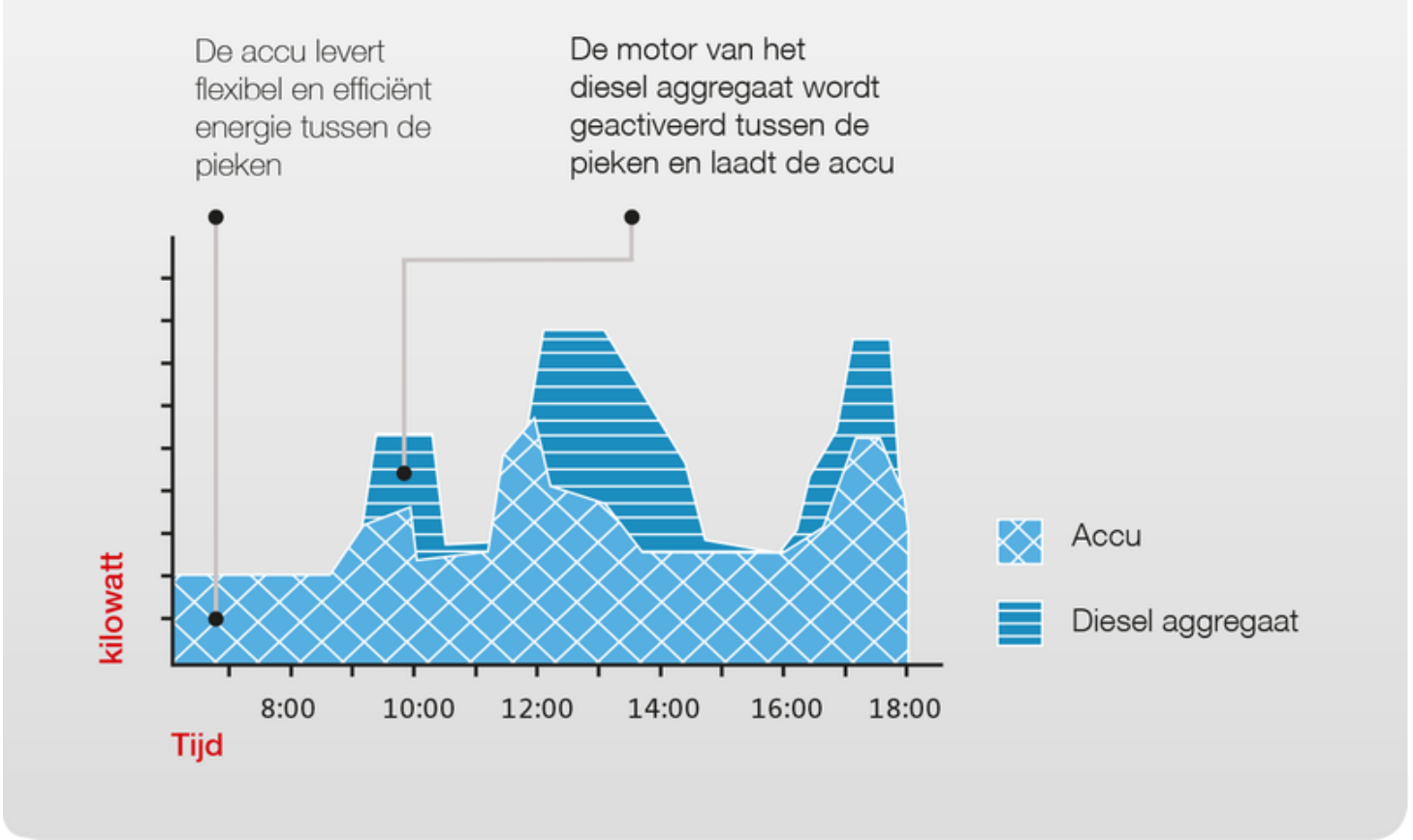
Island mode

BESS = “Power bank” in Island mode

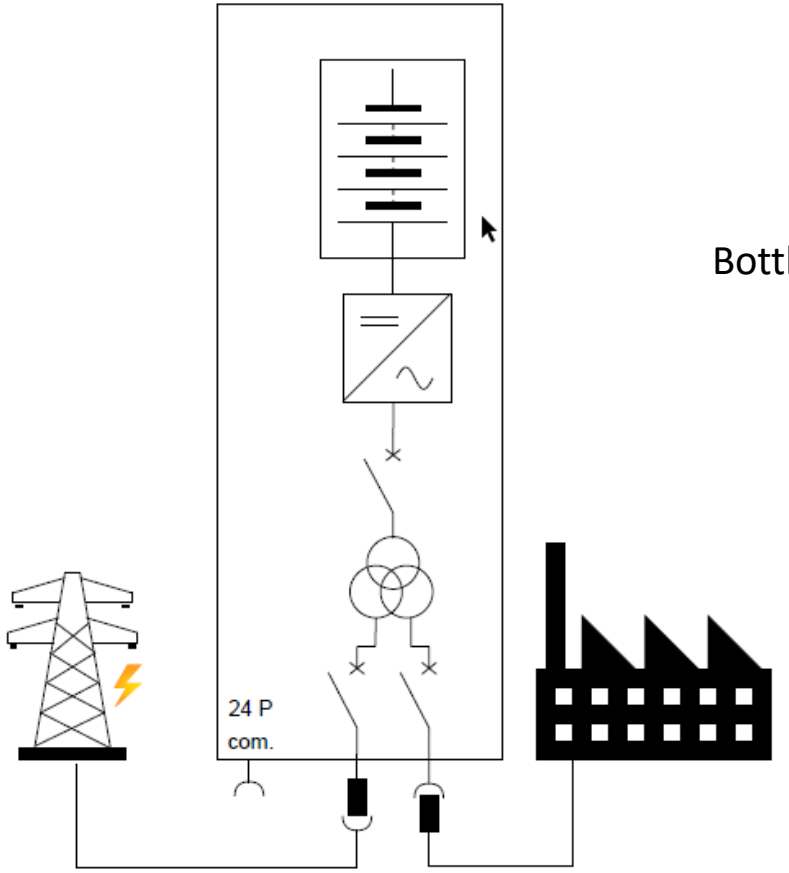
Different Operation modes



Hybrid mode

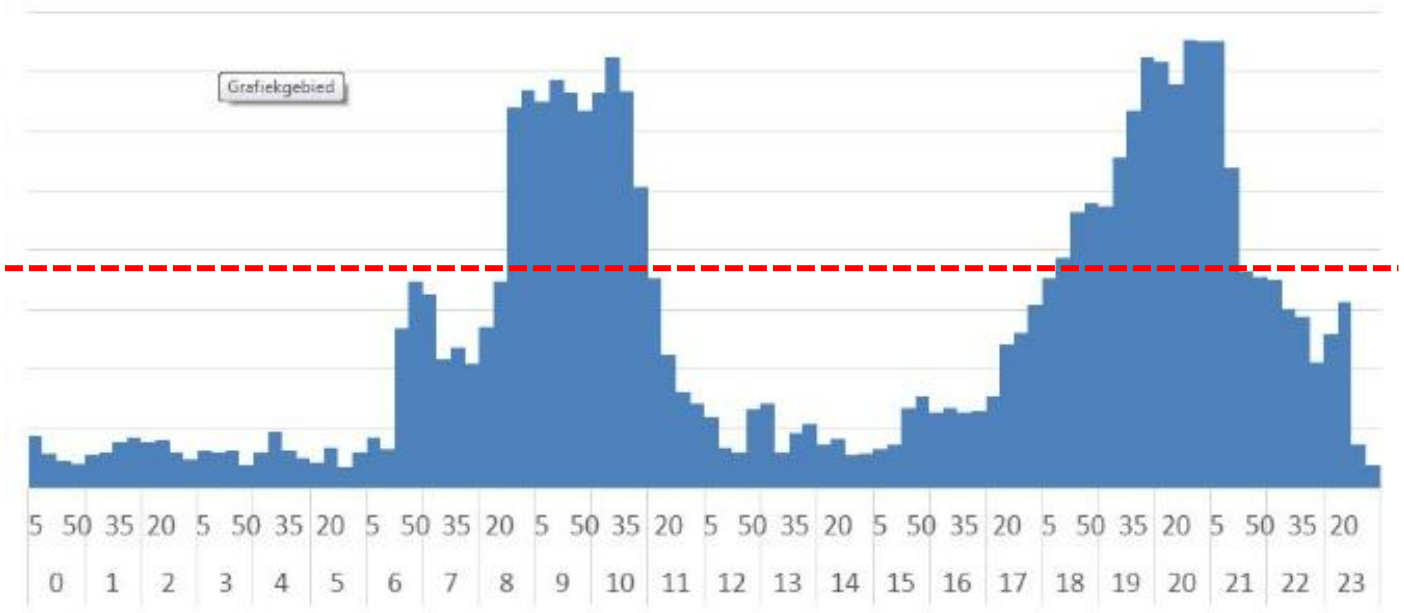


Different Operation modes



Peak shave mode

Bottleneck



Reference

Off grid peak shaving

- Peaks of 1.250A
- Average load 50kW

Case examples

Reference

80A grid connection

The new ovens/cooling demanded more energy than available around lunch time.

Reference

500A Grid connection

Not enough shore power for refugee shelter. Battery meets peak demand.

Questions?

Noël Steentjes
Technical Director

n.steentjes@bredenoord.com
+31 6 5022 4406