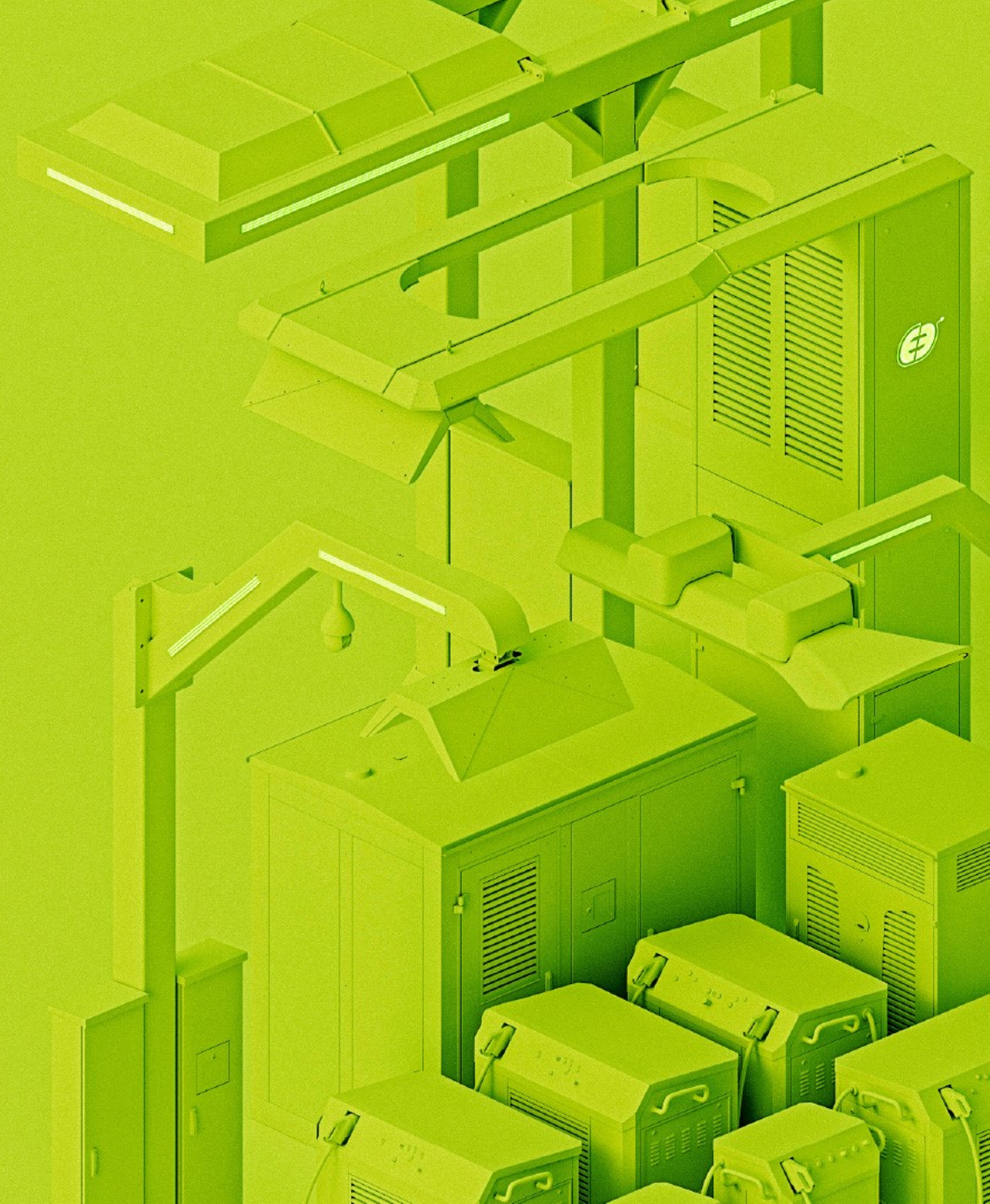


EKO SMART ENERGY SYSTEMS **ENERGETYKA**

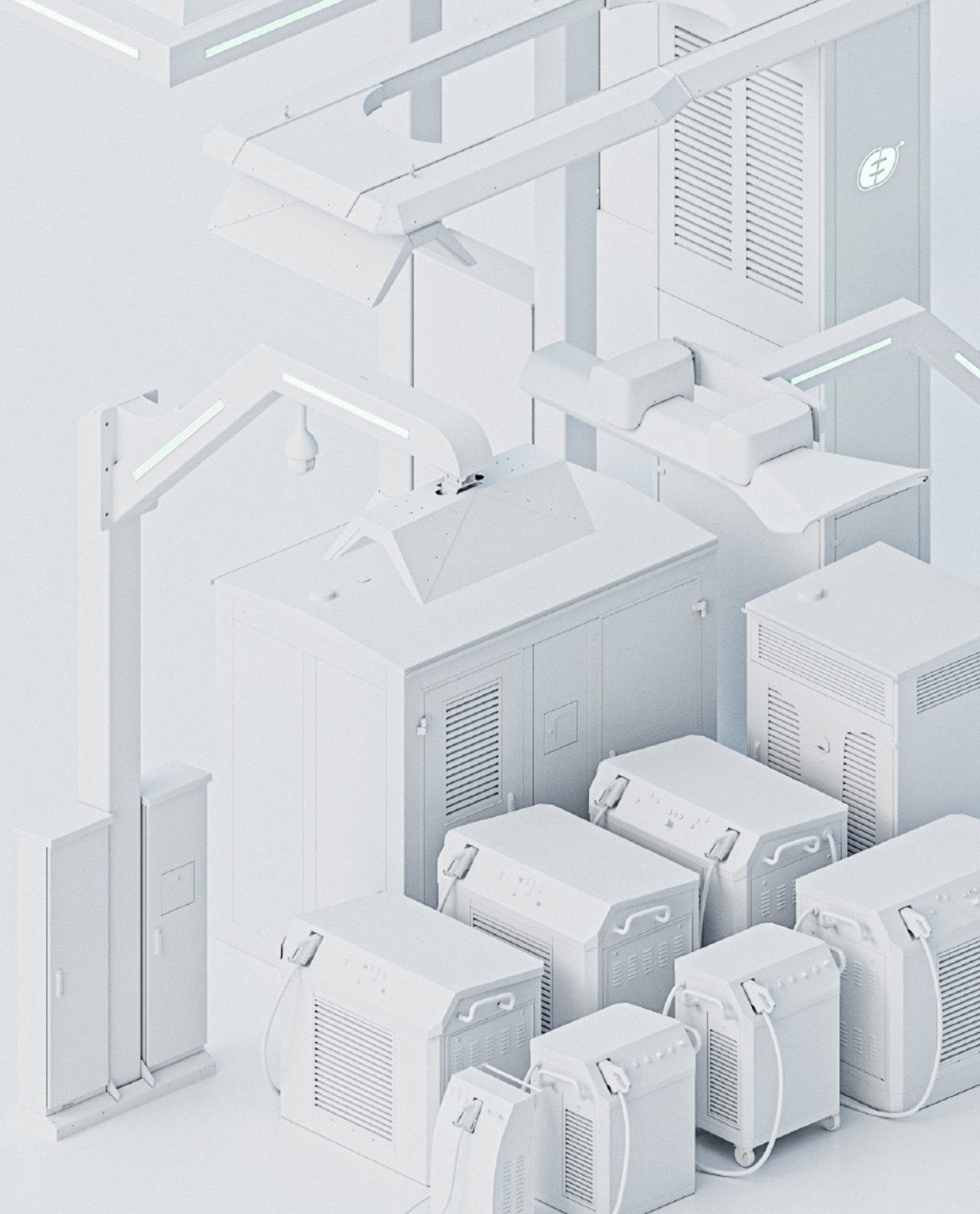


Wojciech Twardowski | 17.11.2020

Polish manufacturer of high power charging infrastructure



Products
Turnkey solutions
Technology
Know-How





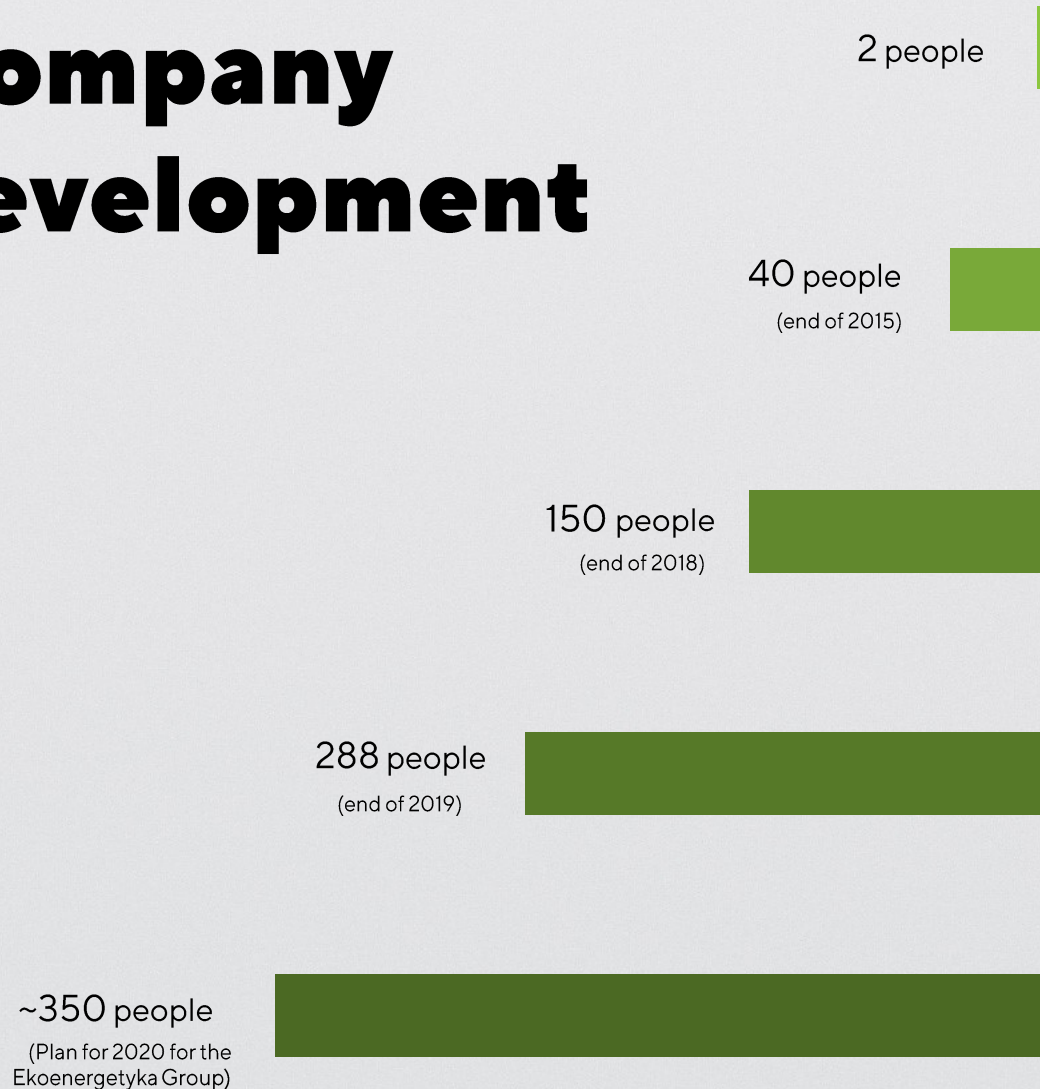
**We cover the whole activity
chain in projects deployment**

Our competences

- ✓ 10 years of market experience has resulted in the implementation of standards in communication on the „vehicle-charging station” line.
- ✓ Our products comply with ISO 15118 and DIN 70121 communication standards.
- ✓ We also have many implementations with OppCharge.
- ✓ As the only Polish company, we belong to the JWG 11 group at the International Electrotechnical Commission, which aims to develop a completely new communication standard IEC 63110.
- ✓ In addition, Ekoenergetyka is also an active member of industry organizations.



Company development



2009
company establishment

2012 - 2016
gaining experience in many pilot projects on the bus market in Europe

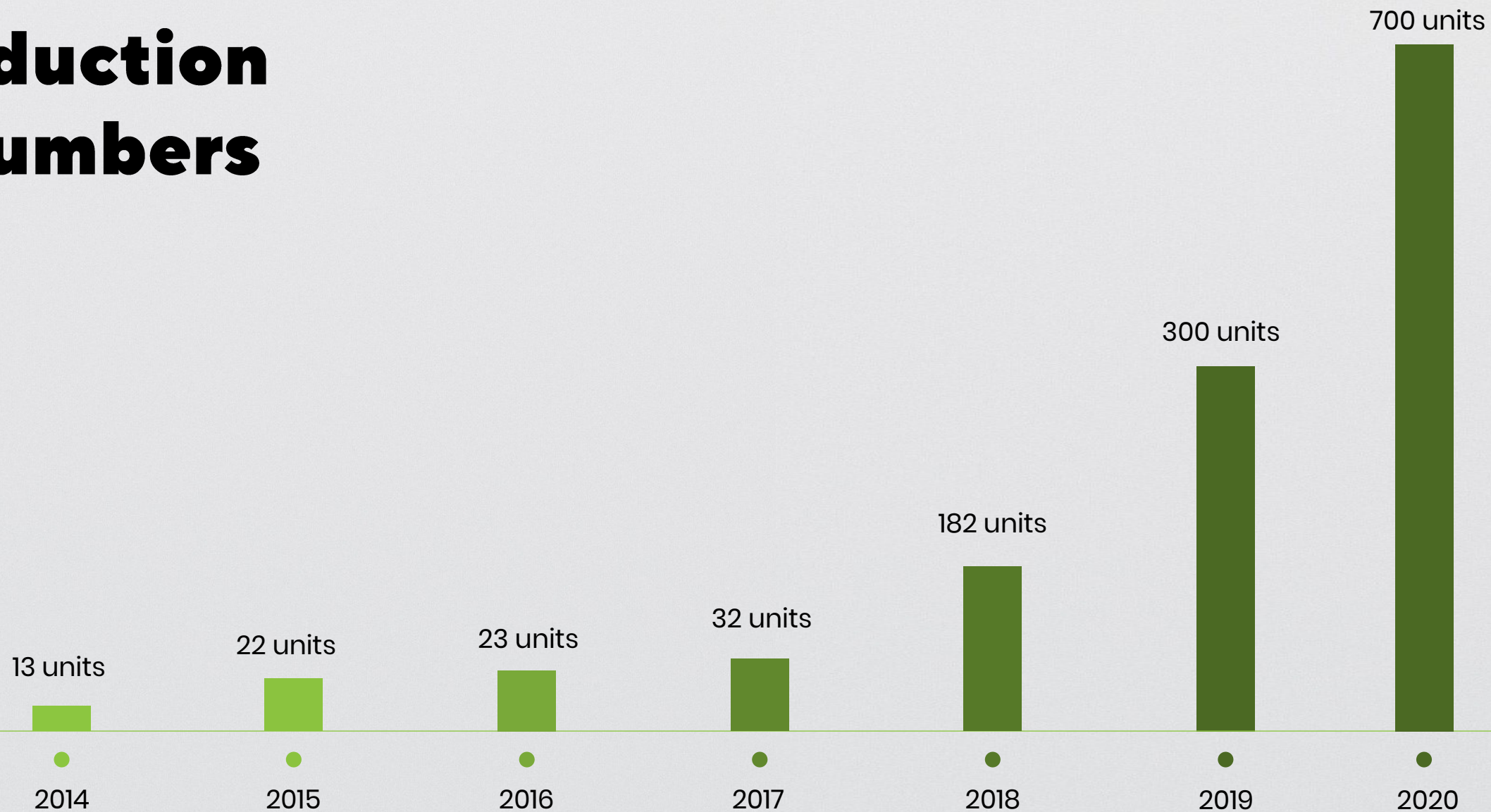
2017 - today

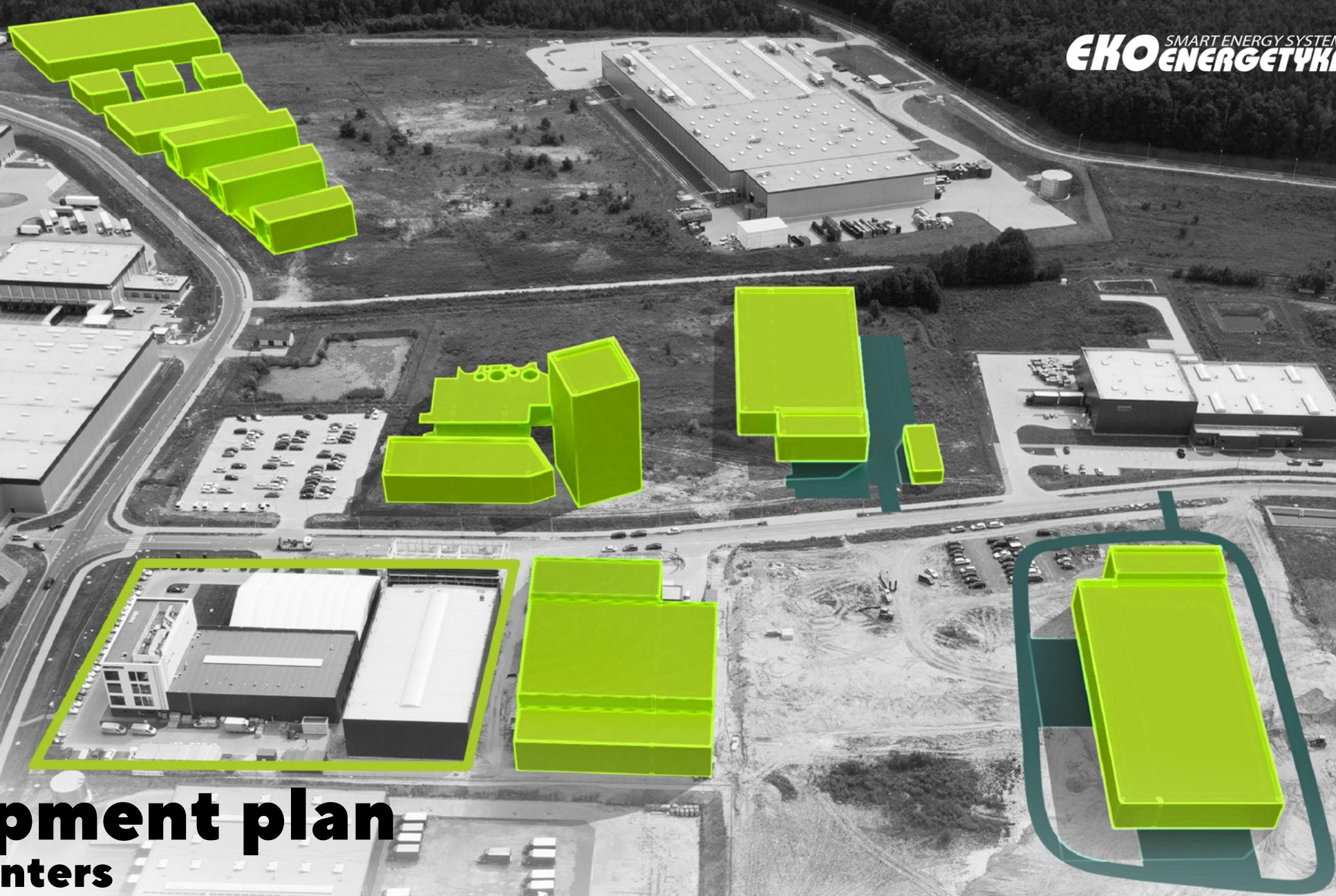
- new ownership structure
- dynamic company development
- increase in employment
- investments in lands, buildings, production capacity, R&D
- branches in Warsaw, Łódź, Katowice and Berlin
- development of the holding structure of Grupa Ekoenergetyka SA

Employment in numbers:

- current employment - 343 people
- full time employment - 312 people
- white collars - 216 people
- blue collars - 96 people
- higher education - 72%
- higher technical education - >30%

Production in numbers





Development plan

New R&D centers

New production halls

Production capacity

starting from 2022

Expansion of production
Capacity up to **300 MW** per year

~ **2500** units per year



Our market

over 1000
charging stations

13 countries



Our Norwegian partner

- ✓ Otera is among the country's leading players in the development, operation, and maintenance of technical infrastructure for energy and transport.
- ✓ Otera in case of this project will take care of civil, electrical, and maintenance works.
- ✓ With the help of this company, we are able to face any project.



Ruter# case

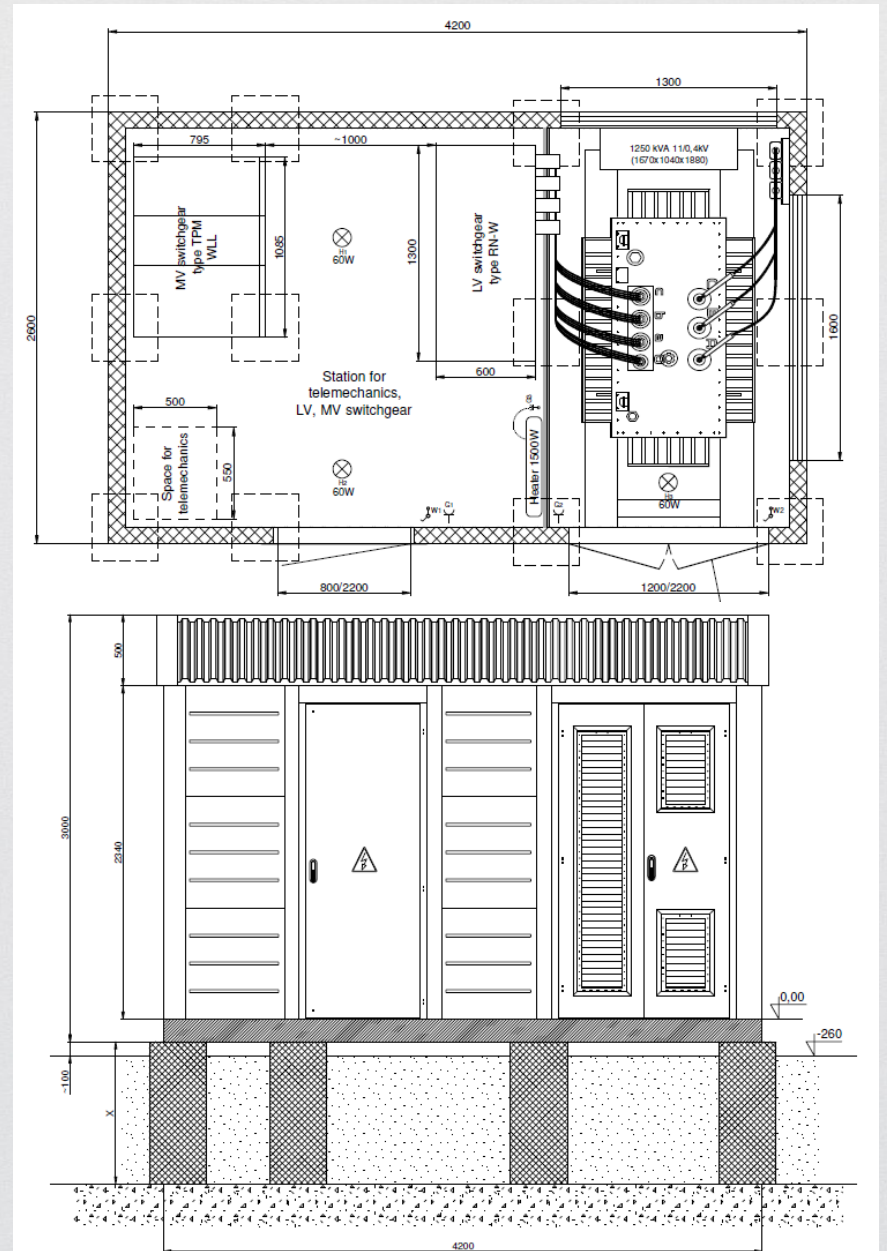
- ✓ Our solution for the "Stubberud" depot is based on the mobility of the offered devices.



Ruter#

#1 Scenario

- **30kW/bus and 17x450kW**
- ✓ Scenario no 1 assumes charging with the power of 30kW / ebus.
- ✓ In addition - 17 fast charging stations - with a power of 450 kW.
- ✓ First, energetic part. Housing with medium voltage switchgear, a transformer, and low voltage switchgear. Then there will be the entire distribution of the low voltage network to power the individual chargers.



#1 Scenario

- **30kW/bus and 17x450kW**
 - ✓ Wallboxes - 30kW each with CCS Combo 2;
 - ✓ Monolithic charging stations 450kW. The charger and the mast are in one housing.
 - ✓ only one foundation and only AC power - there is no DC connection in the ground.
 - ✓ The whole station is easily dismantled and divided into several parts for easy transport.
 - ✓ This solution is prepared for a standard or inverted pantograph.



- ✓ To take up as little space in the parking lot as possible, wallboxes will be hung on poles above the height of the buses.
- ✓ Housing/containers with transformers will also be appropriately placed at the depot to keep the distances as short as possible.



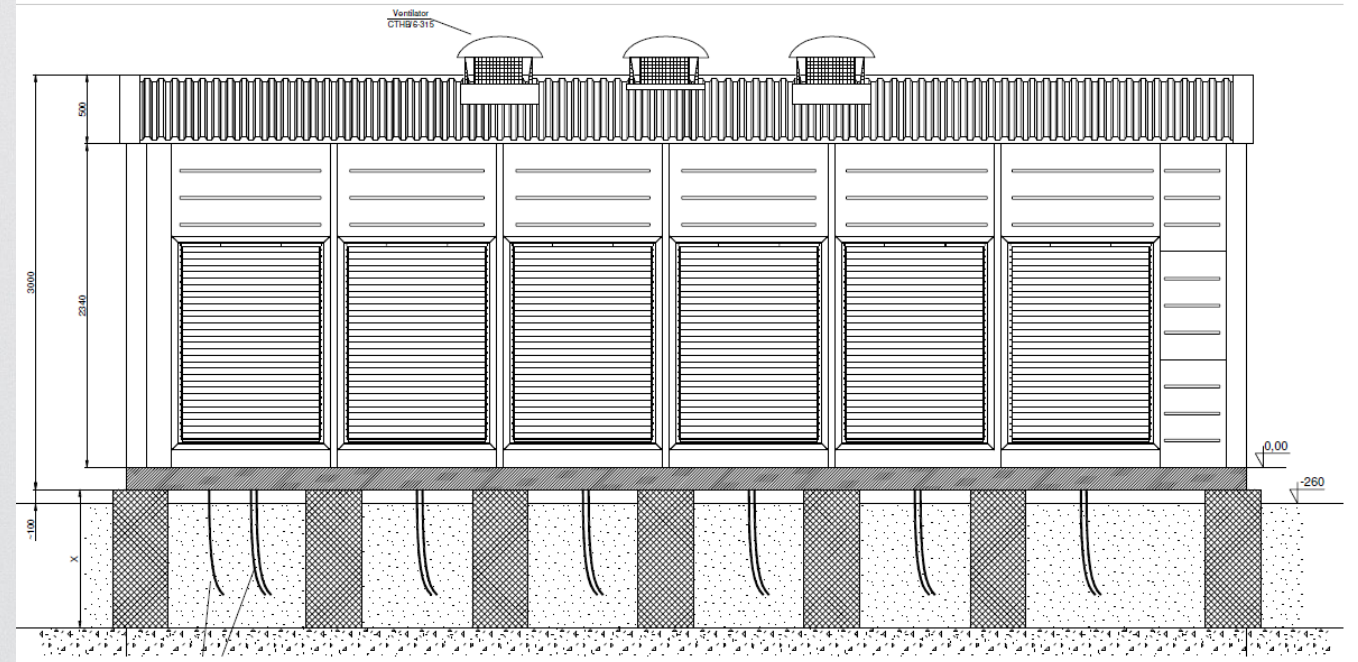
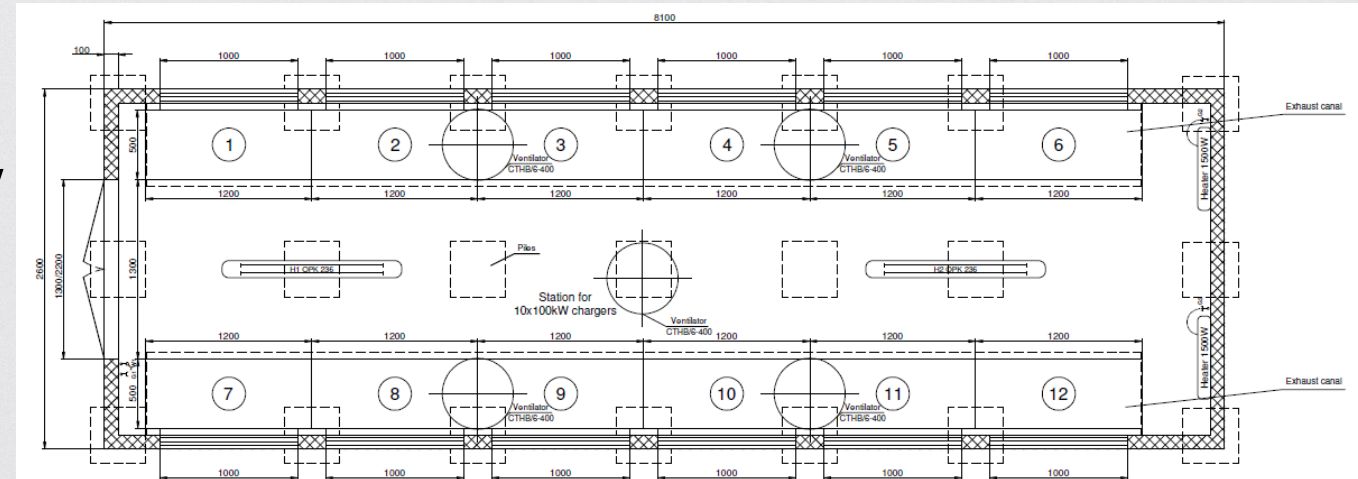
#1 Scenario - visualisation

- 30kW/bus and 17x450kW

#2 Scenario

- **100kW/bus and 17x450kW**

- ✓ Energetic part - the housing/container with the energetic part is almost the same as in the previous case.
- ✓ Container with charging units. We can fit 12x100kW in each such housing.
- ✓ This infrastructure, thanks to combining the power between the outputs, will power not only the outputs prepared for 100kW, but also outputs with pantographs - up to 450kW.



#2 Scenario

- **100kW/bus and 17x450kW**

- ✓ Satellites - as boxes with CCS Combo 2, which will also be hung on poles above the height of the buses.
- ✓ Pantographs - standard or inverted - will be mounted on L-shaped and T-shaped masts.



#2 Scenario

- **100kW/bus and 17x450kW**

- ✓ We've already done it;
- ✓ We have completed a similar project in the Netherlands, where we delivered steel container and satellites on the poles.



- ✓ To take up as little space in the parking lot as possible, satellites will be hung on poles above the height of the buses.
- ✓ Housing/containers will be appropriately placed at the depot to keep the distances as short as possible.



#2 Scenario - visualisation

- 100kW/bus and 17x450kW

Thank you for attention

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Ruter#



#WePowerRevoluton