Continental
The Future in Motion

Electrified CV Charging Technology Solution

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E-Mobility for the Truck Market

Overview – Market Demands

Market Demands

In this complex field,
OEM's need
an experienced partner
to help them deliver the
right solutions.

Increasing demand
for alternative powertrain concepts in the CV market.

Worldwide emission regulations
OEMs need to move fast to bring their solutions to market.

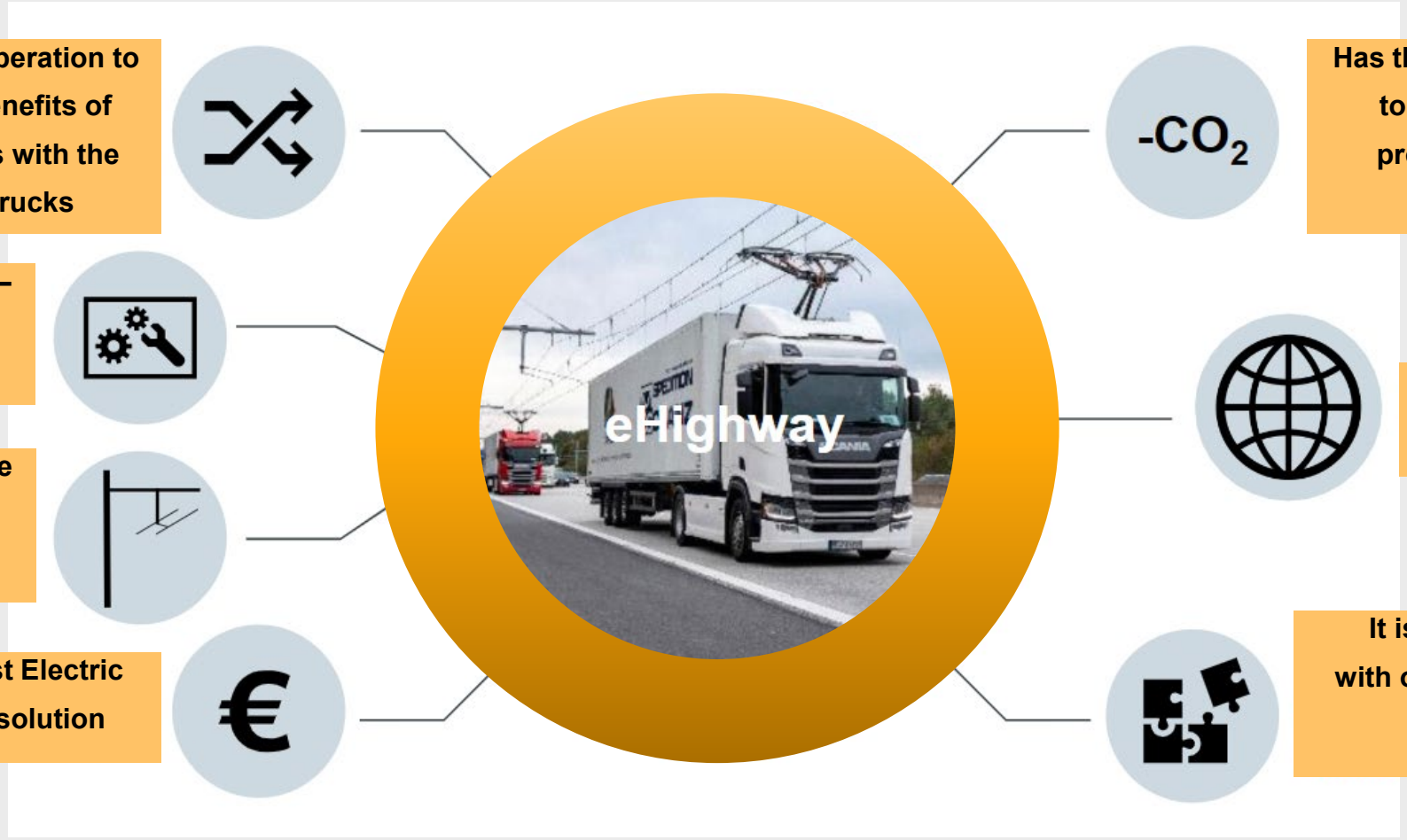
Technological uncertainties
with regards to energy carriers, low volumes and high investment costs make profitable investments harder.

Charging infrastructure
will need to be developed to guarantee reach and availability for commercial vehicles.

Sustainability
proven CO_2 neutral production + reduction of global CO_2 emissions

Overhead Catenary Line Advantages

Dynamic Charging is an Essential Solution for Climate Protection



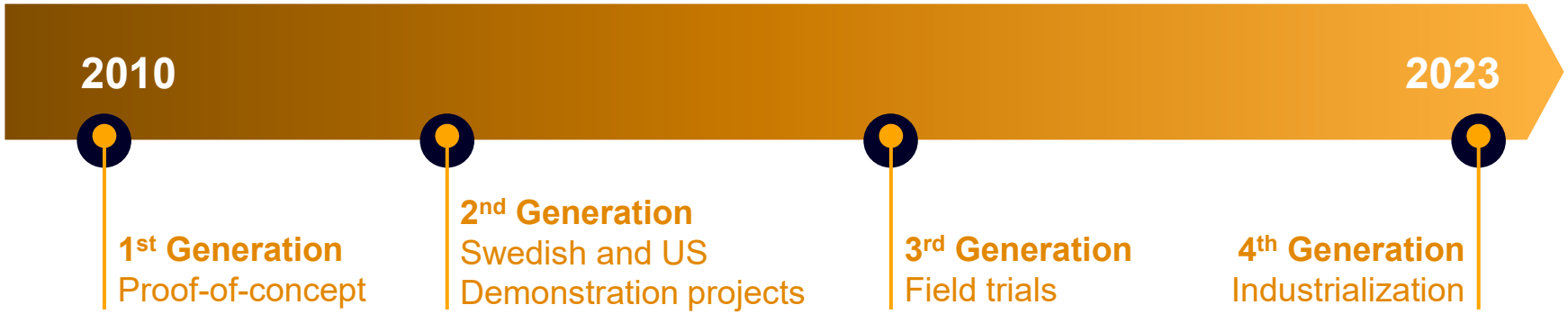
The Technology is Mature. The Technology is Proven

The Technology can be implemented now

Key Characteristics

- **Connection and disconnection to catenary in motion**
- **Recharging of onboard energy storage while driving**
- **Operation up to highway speed possible, including platooning**
- **No limitations for first and last mile**
- **Creates a new level of convenience, no fuel stops**
- **Can be expanded for future technological innovation**

Development of the eHighway dynamic charging technology



SIEMENS

E-Mobility for the Truck Market

Products

Thermal Input/ Output ECU

Electric Vehicle Charging Controller (EVCC) incl. PLC[1]

Sound Module (AVAS)

High Voltage Cables

Low Voltage ECU

Twin Motor Control

Sensors

Pantograph

Body Controller

Body High Performance Computer

Level & Roll Control

Battery Management Systems

Vehicle Control Unit

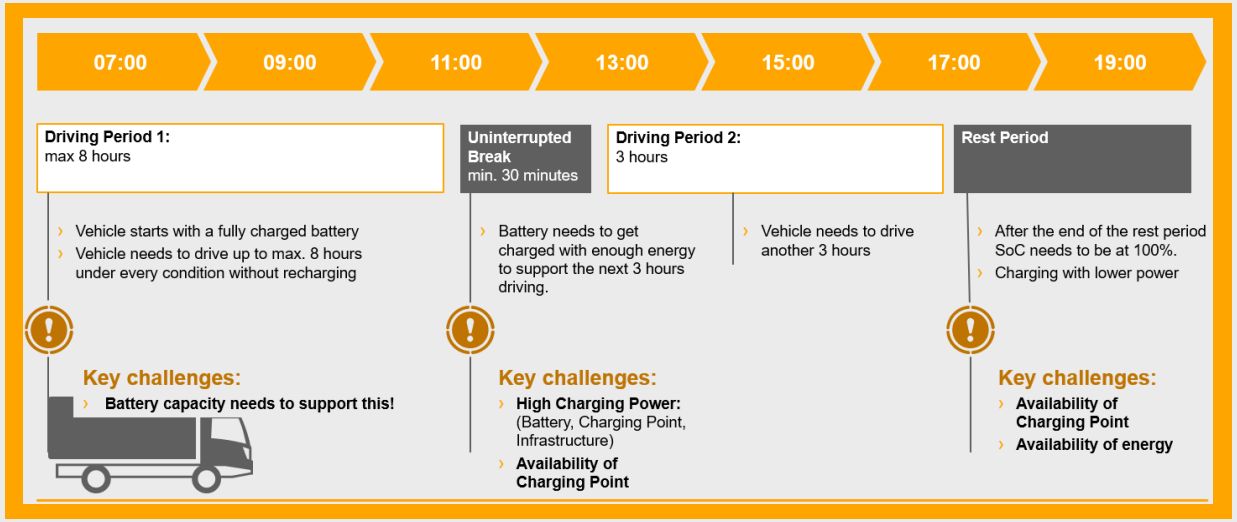
Access Systems

Gateways

1 PLC: Power-Line Communication

Adding a Convenience Factor to Trucking

- Removes anxieties of refueling/recharging
  e.g. independent of truck drivers taking breaks
- The technology exists, is mature and has been proven over millions of miles – truck drivers don't have to deal with teething problems of more novel ERS solutions
- Allows for regen going down hill
- Minimal construction to install infrastructure as the roads are not impacted
- Technology compliments future innovations
  e.g. Level 5 autonomy of trucks



Catenary Electric Road System Summary

What is Catenary **ERS?**

Trucks are connected to an overhead contact line and receiving energy used for:

- Electric Propulsion System
- Charging the battery

That means for the **key challenges**:

Charging during rest period no longer required

- No search for charging station
- High power charging not necessary (battery, infrastructure)
- Rest break can be planned independent of charging
- Battery capacity can be reduced by 50 to 75%
- Not reliant on single power inputs – can be distributed over distance – higher reliability
- No weather/environment limitations

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Thank you!