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eMobility Ecosystem – from infrastructure to managed services

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10 billion
people by 2050


70% in cities

Clear purpose

Decarbonization

Renewables provide sufficient energy to fuel the energy demand

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Increased renewable power generation – Germany as an example

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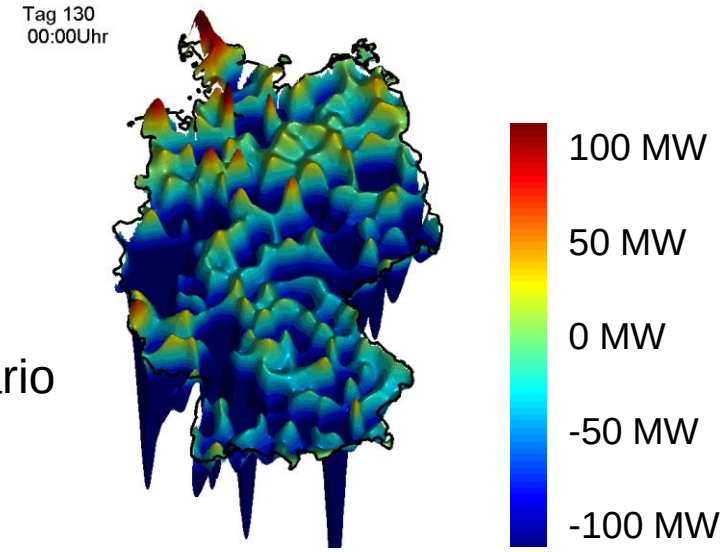
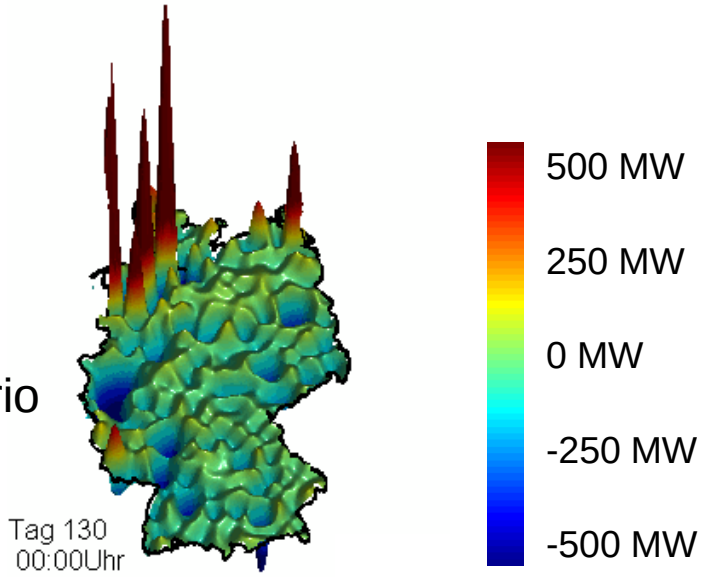
40% share of renewables

Most likely scenario for 2024



80% share of renewables

Most likely scenario for 2035+



Past
Generation follows consumption

Today
Generation and consumption: gap

In the future
Generation and consumption decoupled

Source: German Power Network Development Plan

Beginning of the eMobility transition

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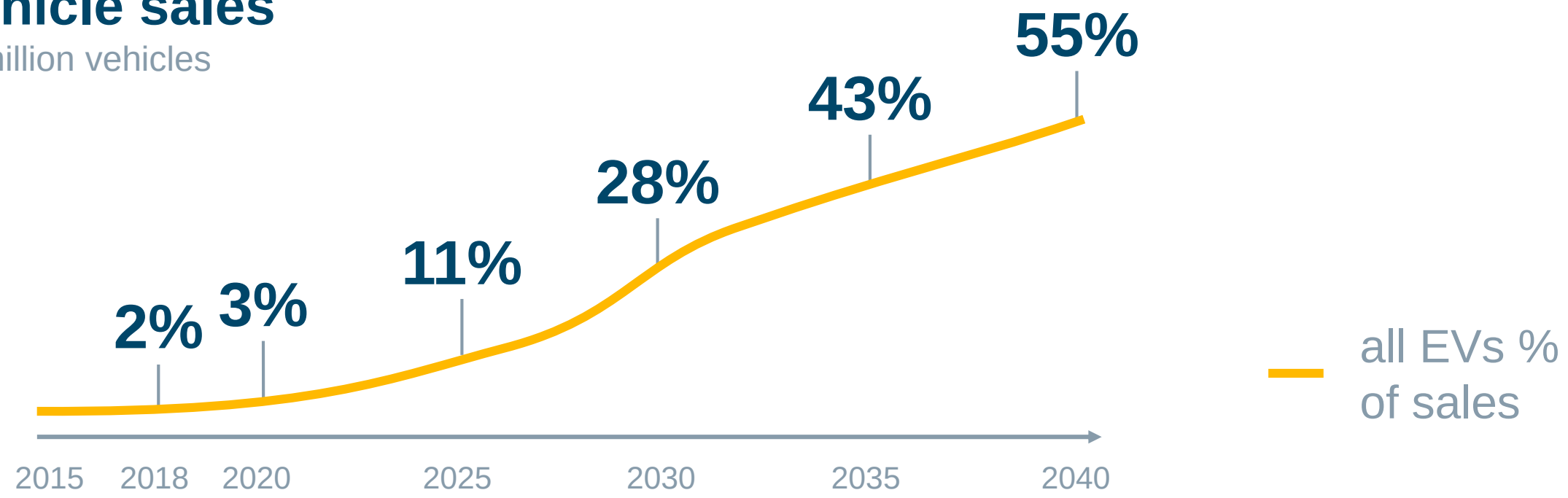
Annual global light duty vehicle sales

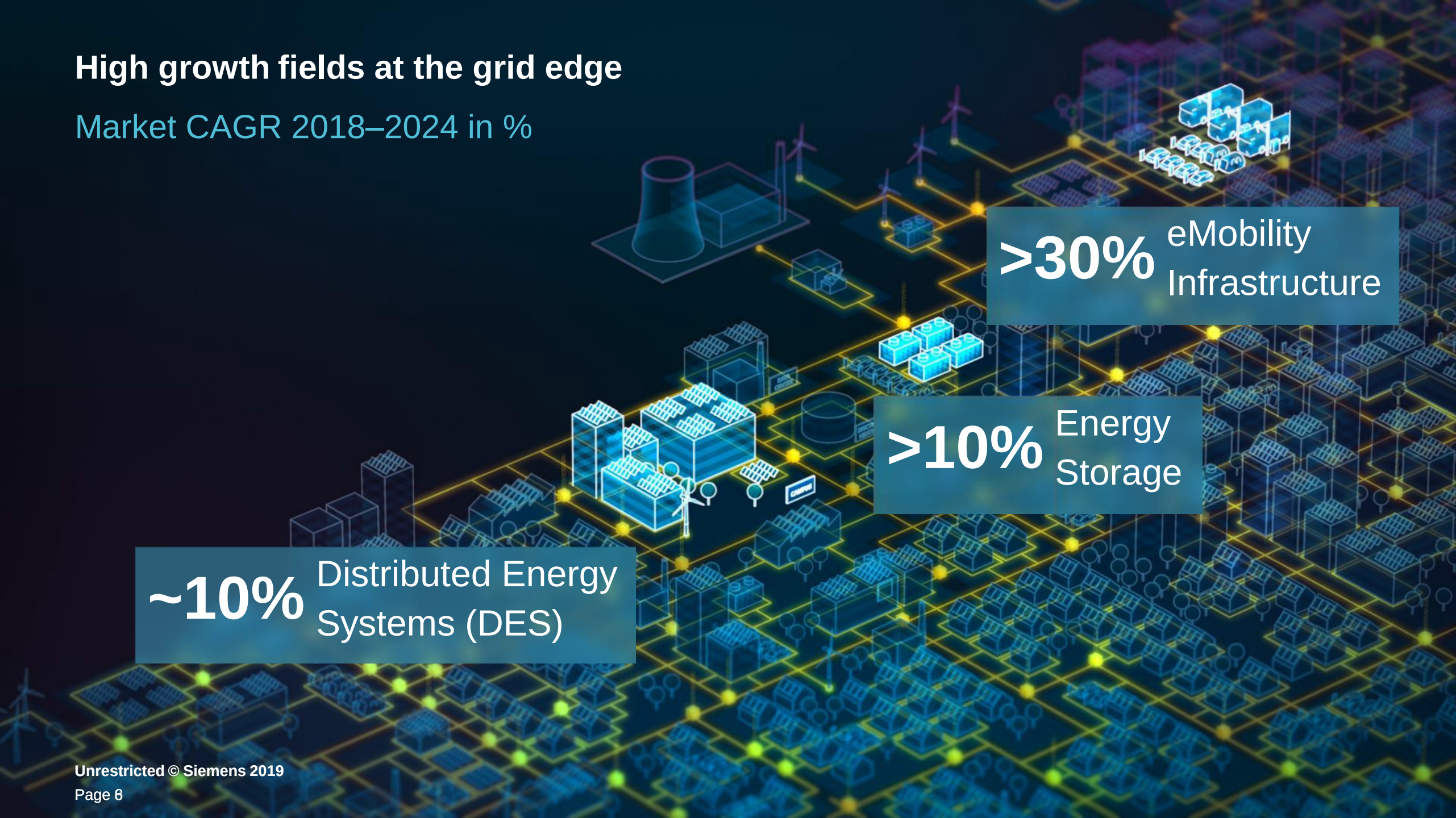
in million vehicles



Source: Bloomberg New Energy Finance

High growth fields at the grid edge

Market CAGR 2018–2024 in %



>30% eMobility Infrastructure

>10% Energy Storage

~10% Distributed Energy Systems (DES)

Siemens eMobility Charging Ecosystem

End to end charging solutions for multiple customer applications

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- **Highway transit charging**
- **Gas stations & truck stops**
- **E-Bus depot incl. opportunity charging**
- **Logistics depot charging (fleets)**
- **Enterprises & retailers (dealerships)**
- **Parking & real-estate**
- **Single-home & multi-home (private customers)**
- **City & town street parking**

eMobility Charging Ecosystem

- E-vehicle charging incl. product, systems' software, integration & operation
- Distributed energy systems: Storage and micro grid
- Grid connection and integration in existing power supply architecture
- Energy Management System

- eMobility infrastructure consulting & financing
- Planning & simulation, engineering
- Project management, installation & commissioning
- Operation & managed services

Siemens completing its charger portfolio – from small AC to high power DC Charger

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AC Portfolio

Wallbox 4.7-22kW
Versicharge Gen 3
End 2019

Charging Station
Sicharge CC AC22

Multipoint Charging System
End 2019

DC Portfolio

Public DC Charger
50 / 150kW

Depot Plug-in Charger
50-300kW

High Power
Pantograph Charger
300-600kW

Growing demand from industrial customers requesting comprehensive offerings

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AC & DC Charger mix for employee parking & garages

- Integrated Charging stations:
  - Individual required AC and DC chargers (Siemens or 3rd party)
  - Combined with storage applications when needed
  - Charger Load management
  - Integrated into Building Energy management system
  - Renewable energy integration
  - 1st-3rd level service support, hotline etc.

Managed services (CPO & MSP role)

Charge Point Operator

- Technical operator of charging units
- Responsible for managing of the charging units
- Provides services (, hotline, physical, digital) through Backend system

Enable Mobility Service Provider

- Charging services for eV drivers
- Provides charging possibilities (e.g. home charging, public charging, company charging)
- Responsible for billing
- Provides front ends (App) for the customer

Internal reference – Siemens Real Estate & company Fleet, Germany

- Providing CPO and MSP role
- Different users: company cars, employee cars, guest
- ~1,000 BEV & PHEV as users, ~450 Charge points, ~100 locations…and growing
- European role out bringing local solutions together

Solutions for seamless HPC integration – using own & partner HW products, managing the integration

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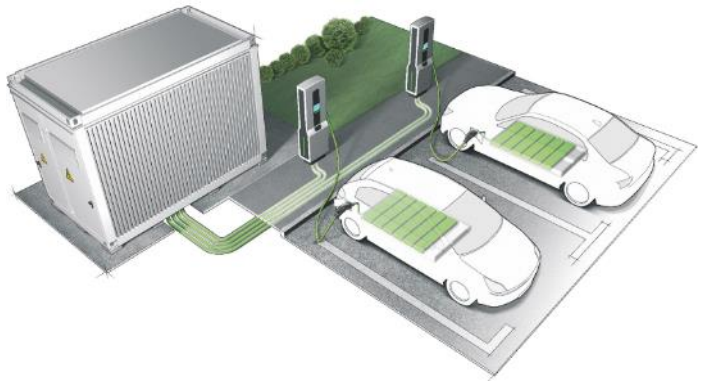
Urban & highway HPC charger

(HPC up to 450 kW)



High-power fast charging system

- Fully integrated HPC system including:
  - Grid connection infrastructure comprising transformer, switchgear and SCADA integration
  - Energy storage option for e.g. peak shaving to avoid grid stress
  - Renewable energy integration
- Operation e.g. charge point mgmt., classical and digital services

Grid integration consulting services

Multi layer approach to select potential charging stations

- Modeling and simulation of mobility demand and energy system
- Development of IT system landscape and requirement specification for HW/SW

Depot charging concepts – more than a charging pole, rather part of an electrification system

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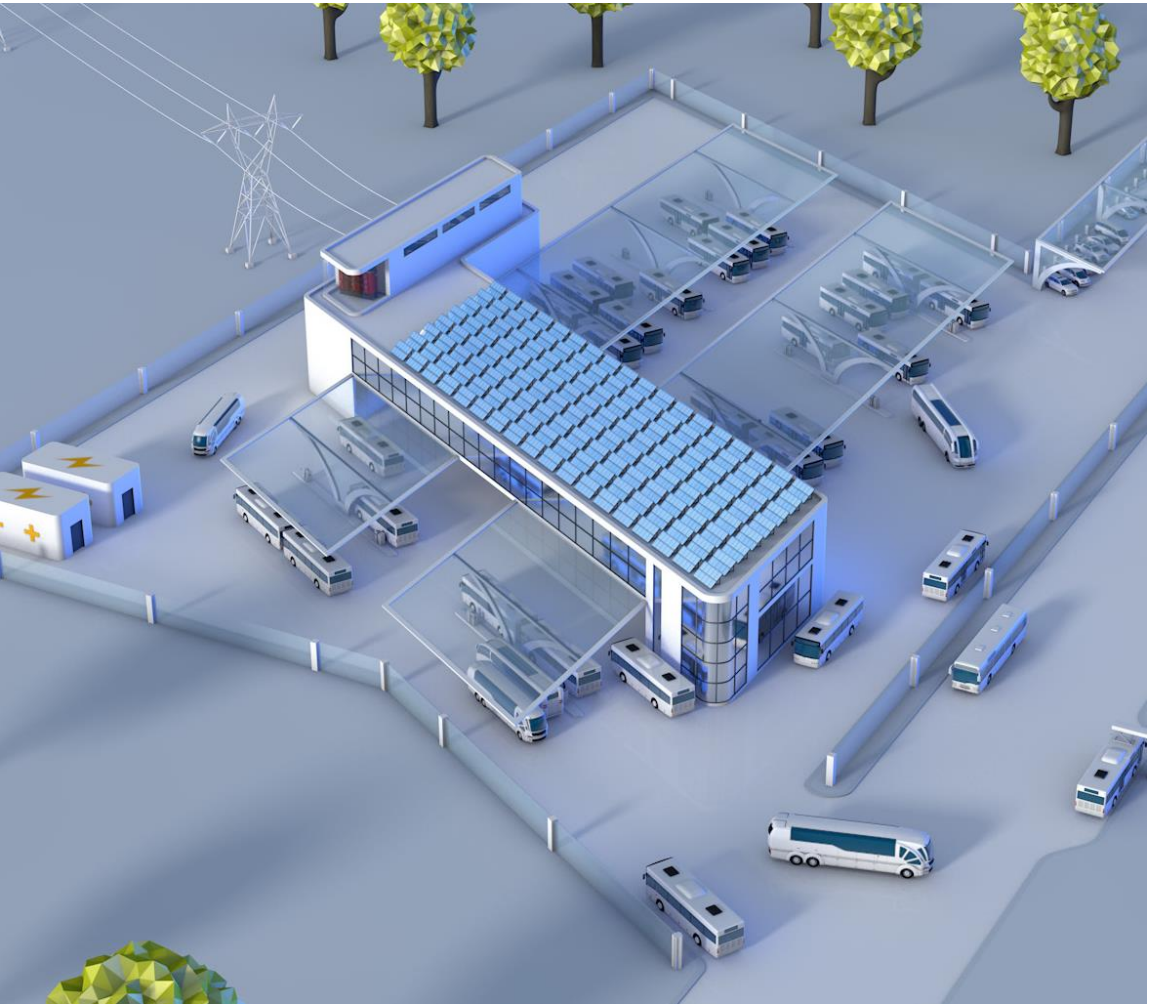
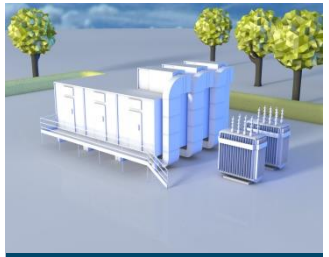
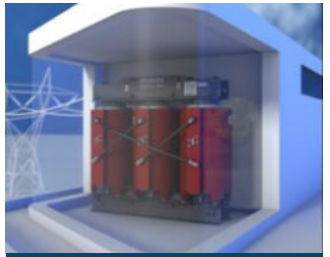


Power distribution	 Flexible and modular grid access	 Space optimized roof top or underground installed	 MV & LV distribution on site “clean-air”	 Busbar trunking system
Charging infrastrcture	 Charging poles – Plug-in or roof-mounted	 Indoor pantograph	 Fast charging stations outside	 Integration of e-cars service fleet
Distributed Energy Systems and services	 Renewable integration & micro-grid	 Modular storage & second life	 Monitoring & control SW	 Consulting, operations & managed services

Siemens Future Grid with the required portfolio – addressing the demand created by growth in eMobillity

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Innovation

eMobility portfolio

>40k chargers sold

Acquisition

Power electronics

10GW installed capacity

KACO

Partnering

Energy storage JV

#1 in energy storage

FLUENCE
A Siemens and AES Company

FAST COMPANY
2019 MOST INNOVATIVE COMPANIES

To protect the next generation…

…let’s shape together the eMobility world!

Thank you

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