BUSINESS
FINLAND

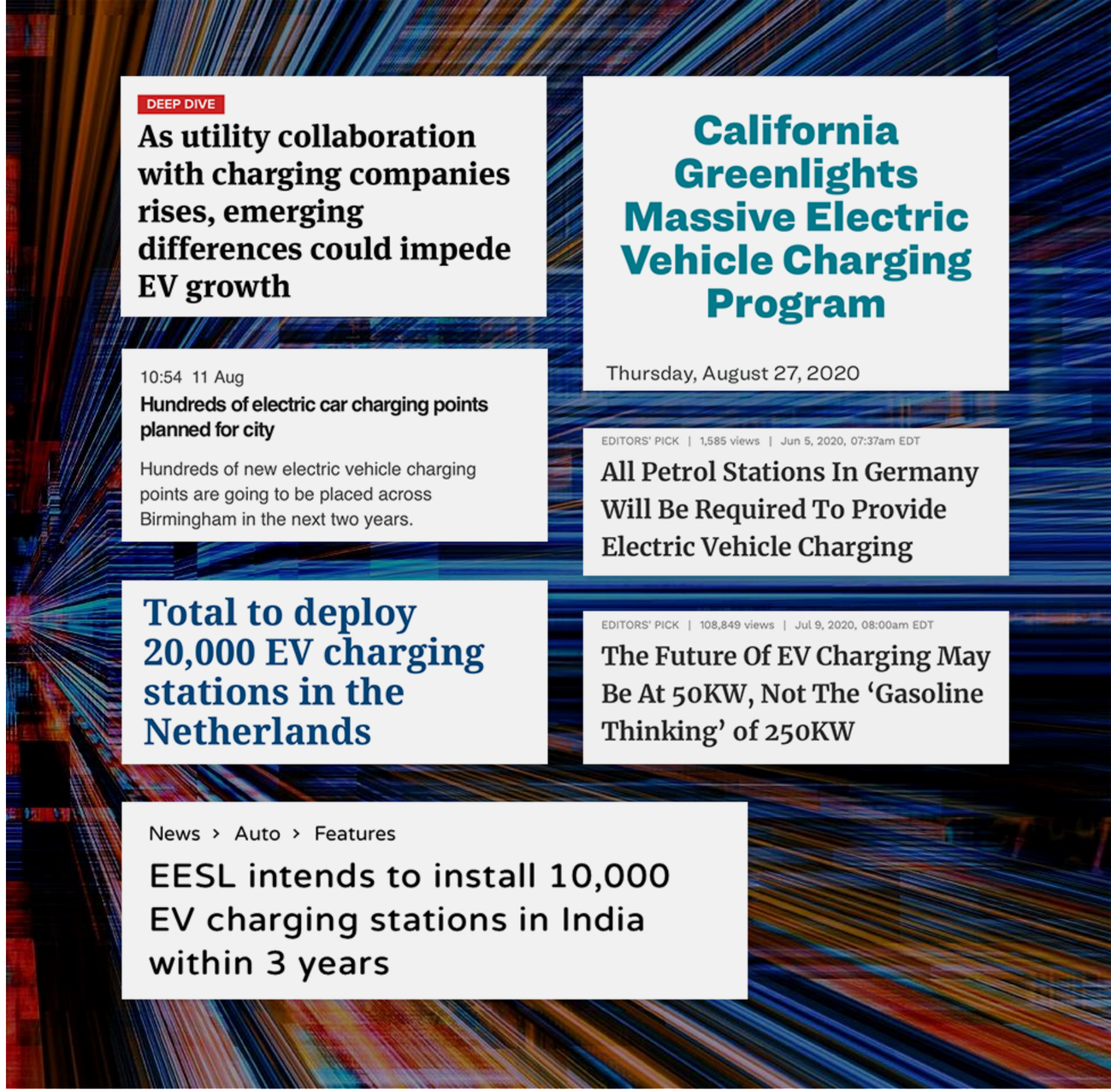
SMART ENERGY

Electric Vehicle (EV) charging infrastructure

FINLAND

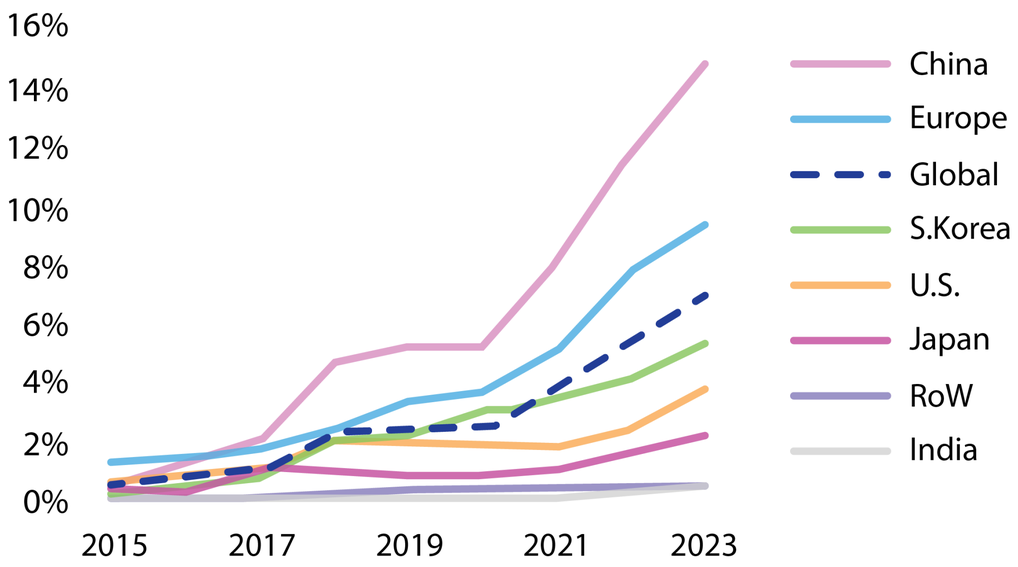
EV – CHARGING IS RAPIDLY DEVELOPING BUSINESS

- Megatrends
  - Electrification of society
  - Decarbonisation of transport
  - Flexible smart grids
- Commercial fleets drive BEV (battery electric vehicle) adoption
- New collaborations and business models
- Number of DC (fast) charging points is estimated to grow from 250 000 (2019) to 1 227 000 by 2030.
- Price parity between EVs (electric vehicles) and internal combustion vehicles is reached by the mid-2020s in most segments.

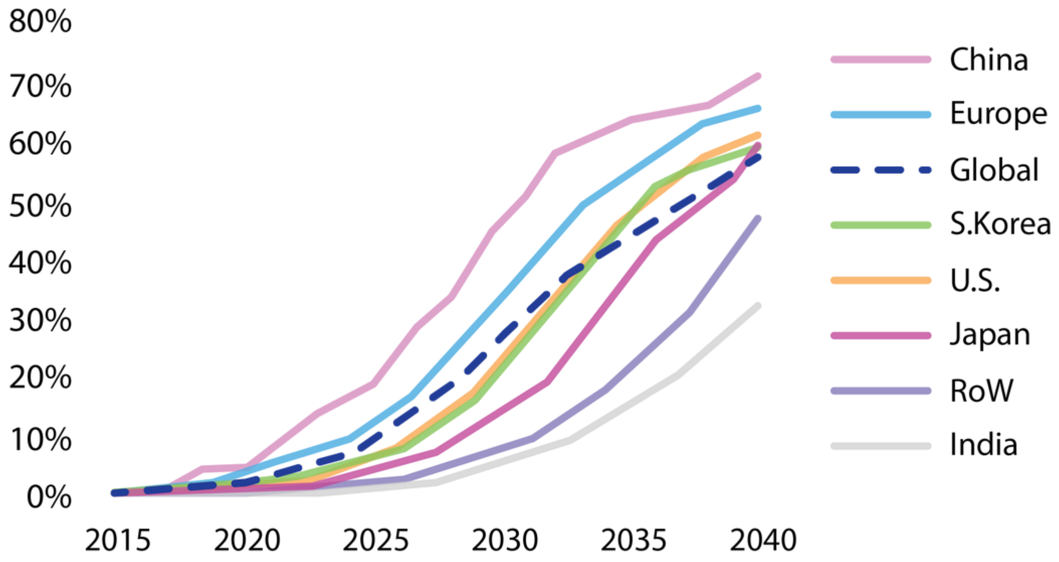


GLOBAL EV SHARE OF NEW PASSENGER VEHICLE SALES

Short-term



Long-term

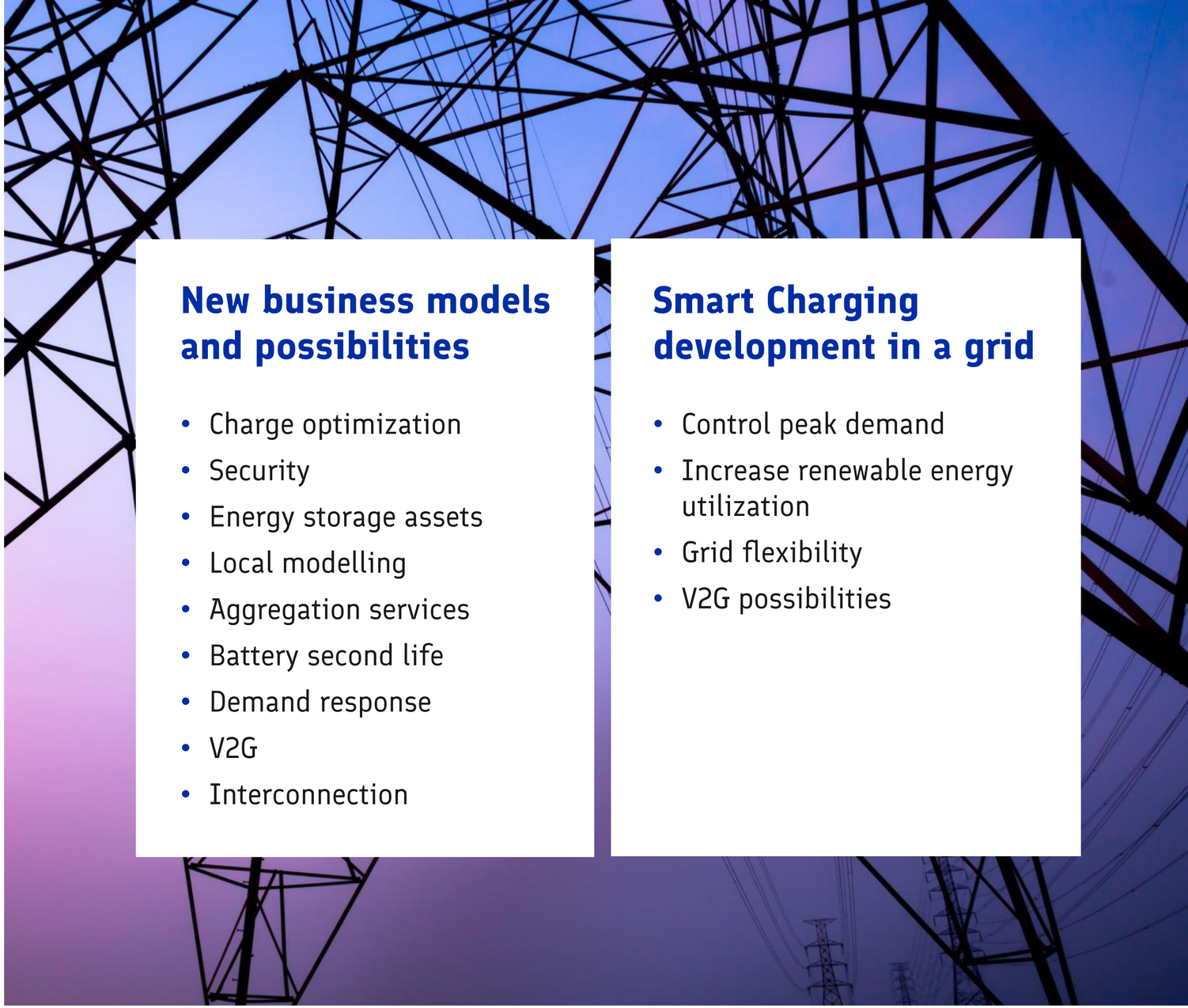


Source: BNEF. Note: Europe included EU, U.K. and EFTA.

EV CHARGING IN A DISTRIBUTION GRID

Charging will cause local consumption peaks to electricity distribution grids.

Charging network provides useful data to the grid owner to develop new functionalities and services at the grid.



New business models and possibilities

- Charge optimization
- Security
- Energy storage assets
- Local modelling
- Aggregation services
- Battery second life
- Demand response
- V2G
- Interconnection

Smart Charging development in a grid

- Control peak demand
- Increase renewable energy utilization
- Grid flexibility
- V2G possibilities

BEST PRACTICES FROM FINLAND

35%

Investment incentives for building more than 5 charging points to a residential building

30%

HSL (Helsinki city busses) electric by 2025

99,9%

99,9998% grid reliability at transmission lines

EV- CHARGING WITH FINNISH TOUCH (1/2)

SAAS PLATFORM & EMP MOBILE APP

- Remote monitoring and managing of the infra
- Smart and easy-to-use customer application
- Utilization of existing business systems with real-time data integration

CHARGING HW

- AC charging
- Fast DC charging, modular and scalable design, dynamic power distribution
- Environmental protection against harsh conditions
- EV-charging solution for a private subscriber

BATTERIES OPTIMIZATION

- Battery optimization
- Battery Powertrain
- Operational optimization

COMMUNICATION & CONNECTIVITY

- Reliable and interference free IoT connectivity
- 5G
- Data management and connectivity studies

EV- CHARGING WITH FINNISH TOUCH (2/2)

POWER MONITORING AND CONTROL

- Asset and device health monitoring
- Power forecasting
- Conversion efficiency

PLANNING & SIMULATION

- Traffic and charging station planning
- Simulations
- Parking space optimization
- End-to end planning and consulting

SAFETY & SECURITY

- Customer detection
- Advanced CCTV security and alarms
- Multi-source occupancy estimation

FLEET OPTIMIZATION

- Public transport electrification and fleet optimization
- Private fleet route and charging planning

FINNISH COMPANIES OFFER YOU

POWER FORECASTING AND CONNECTING TO LOCAL ENERGY SOURCE

- Power forecasting and control
- Windside tower solution for local power source
- V2G services

VEHICLE BATTERIES AND OPTIMIZATION

- Battery optimization
- Electric powertrain
- Techno-economics and operational optimization

EV-CHARGING HW

- AC
- DC
- Wireless
- Private consumer

POWER MONITORING AND CONTROL

- Power monitoring
- Power Conversion Efficiency
- Power monitoring and forecasting

COMMUNICATION AND CONNECTIVITY

- Radioconnectivity
- 5G
- Data management and connectivity studies

SAFETY AND SECURITY

- Video control and analytics, advanced activity search
- Multi-source passenger occupancy estimation

USER INTERFACE

- Flexible payment platform
- Connected with other service providers

PLANNING, SIMULATIONS

- Infra planning tools and simulations
- Parking space optimization
- Engineering, feasibility studies, maintenance management
- Fleet and route planning and optimization

SAAS PLATFORM FOR EV-INFRA

- Management platform
- Real-time IoT data analysis
- Business system real-time data integration

EV-CHARGING WITH FINNISH TOUCH

Comprehensive and collaborative approach to charging infrastructure and actors around it

Power Forecasting and connecting to local energy

Power monitoring and control

User Interface

SAAS platform for EV-infra

Safety and security

Planning and simulations

EV-charging HW

Communication and connectivity

Batteries, powertrain and optimization