Electric Vehicles and Charging Infrastructure Outlook

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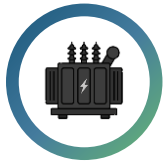
Specialized Power Grid & New Energy Market Research

Power Technology Research covers all aspects of Transmission & Distribution grid and emerging New Energy topics



Transformers
(Dist., Power)

Switchgear
(HV, MV)

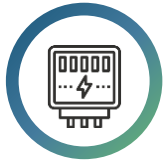
Flexible AC Trans. Systems
(SVCs, STATCOMs)

HVDC Market Analysis
(VSC, LCC)

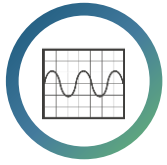
Synchronous Condensers
(4-Pole, 6-Pole,...)

Substation Automation
(Dist. vs Cent.)

DC Power Grid
(Shore to Ship, MVDC)



Smart Meters
(Power Quality, AMI)



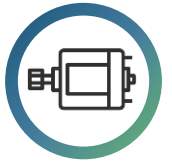
Power Factor Correction
(Active, Passive)

Grid Communication
(Private LTE, 5G)

EV Charging Infrastructure
(Public, Private, Passenger/Comm.)

Storage Value Chain Monitor
(Utility Scale, C&I)

Comm. & Off-Highway Vehicles
(BEVs, PHEVs, ICEs)



EV Traction Motors
(ACIM, PMSM, HTM)

Industrial Motors & Drives
(MV/LV - Custom)

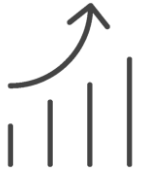
We Cover More than Market Sizing

Work is Highly Customizable to Fit Our Client's Needs

Market Sizing & Forecasting

Historical Data

Segmentation



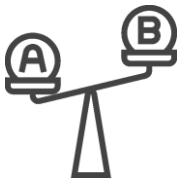
Forecast

Project Specific

Competitive Analysis

Market Shares

SWOT Analysis



Benchmarking

Cost Breakdown

Market Accessibility

Business Practices

Regulatory Landscape

Product & Market Trends

Sales Channel Analysis

EVSE Service Overview

Global Coverage of EV Charging Infrastructure & EV Market

EV Chargers (EVSE) Service Overview

Global Coverage of Public and Private EV Chargers Market

Service Description:

The whole world is focusing to replace the traditional ICE vehicles with electric vehicles, however in order to completely bring about this turnaround enough charging infrastructure needs to be installed first to gain consumer confidence. Within PTR's e-Mobility segment, this service gives an in-depth analysis of the private and public charging infrastructure, role of stakeholders (CPOs, MSPs, etc.) and charging infrastructure for Commercial and Off-Highway Vehicles(COHV). A Unique model-based methodology combined with publicly available data is used to analyze and report different aspects of the service.

Market Sizing

Installed base and annual market of EV chargers with historical data from 2018 to 2020 and forecast 2021 to 2026.

Policy & Incentives

Major long-term and short-term plans, initiatives and incentives with an impact on EV chargers market forecast.

Market Shares

Market shares of top EV charging suppliers segmented by AC and DC category on regional level.

Key Market Trends

Highlights of key market trends such as growth of AC vs DC chargers in different markets.

Supplier Profiles

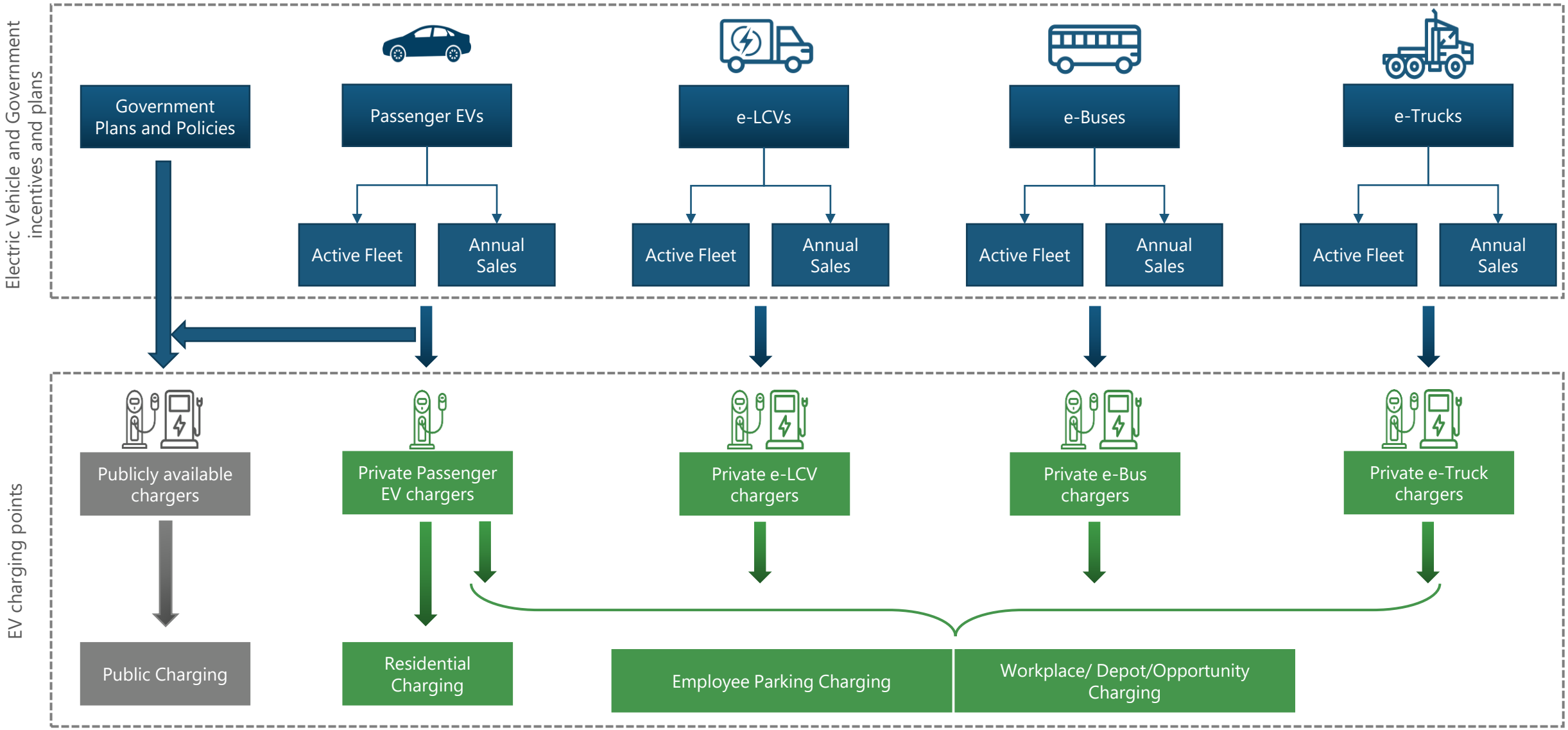
Profiles of 15 major EV charger manufacturers globally.

PowerBI

In addition to the traditional excel and power point format, EVSE service is available through PowerBI platform.

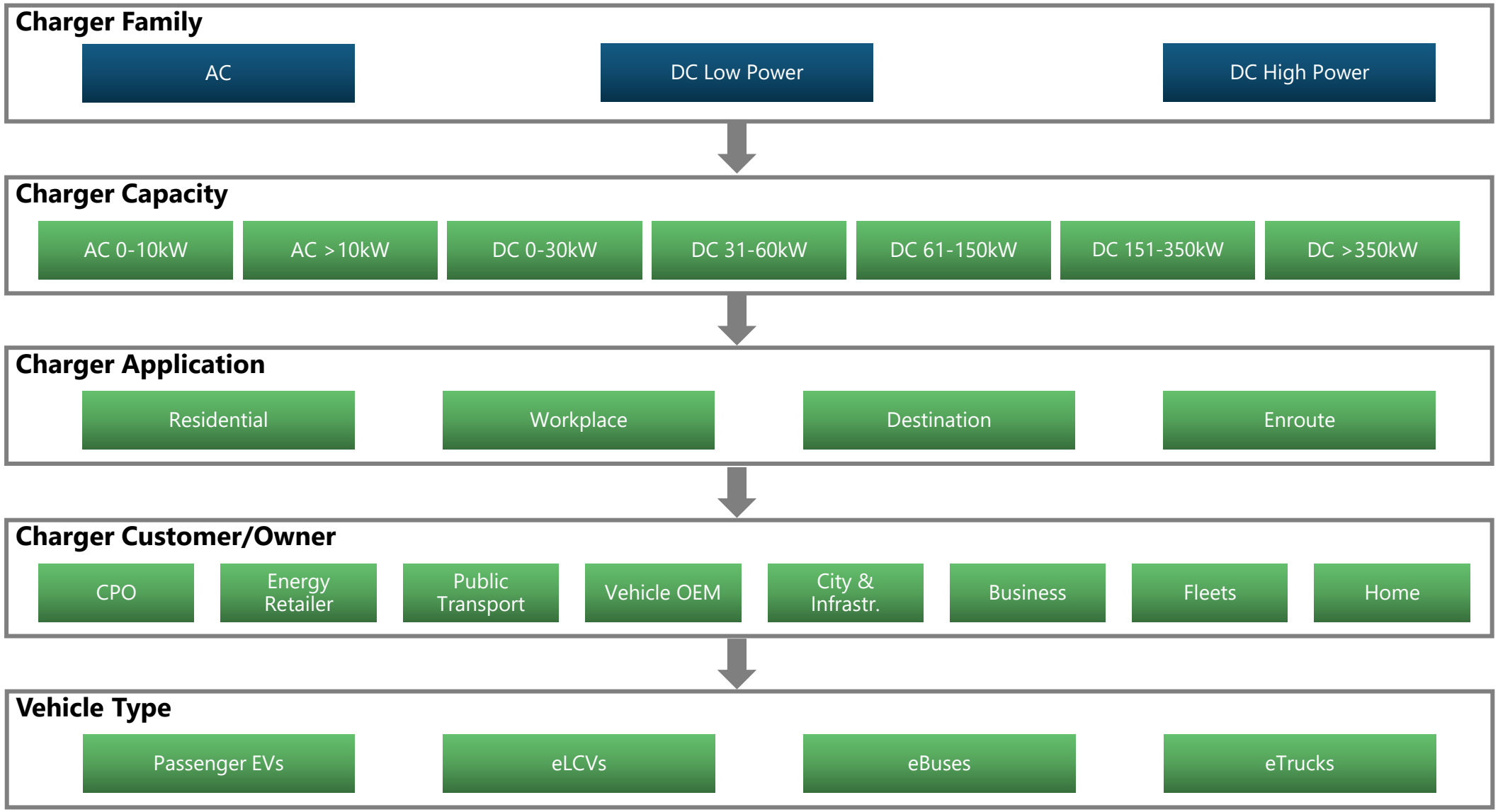
EV Data for 4-Vehicle Segments Correlated with Chargers

Vehicle electrification, government targets and incentives drive the EV charging market



Market Sizing Segmentation

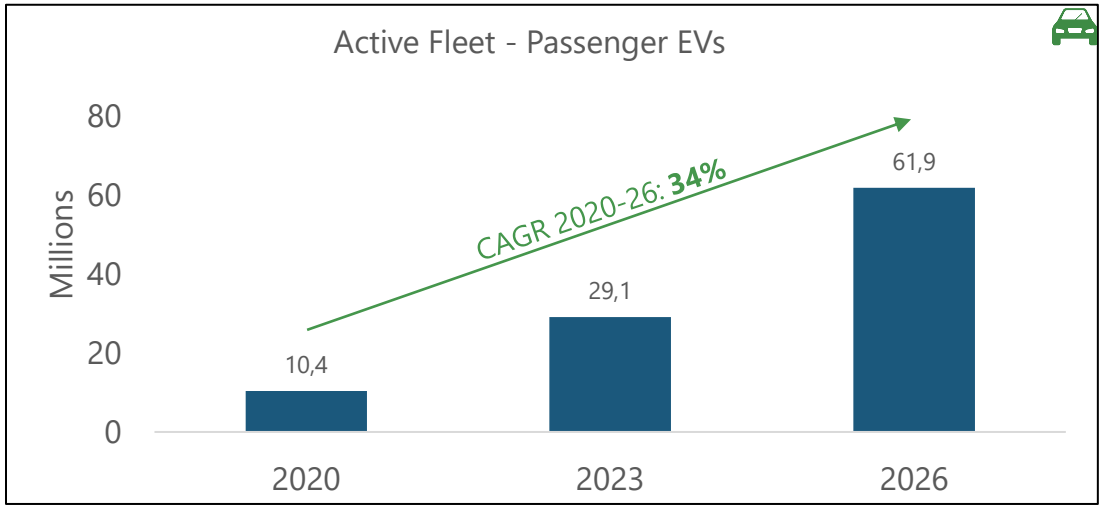
Country Specific EVSE Infrastructure Growth

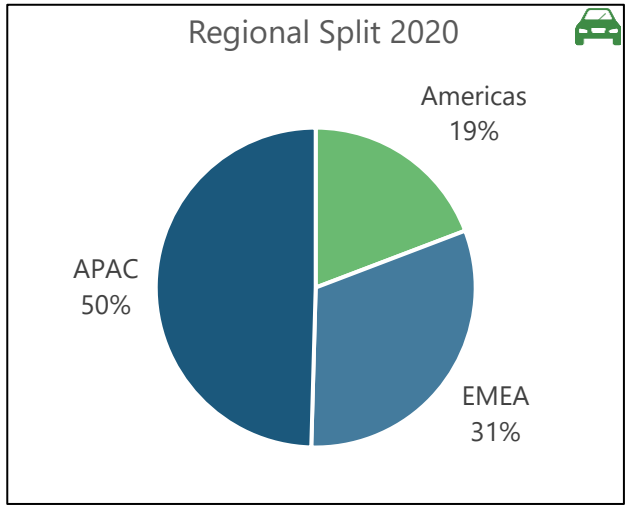


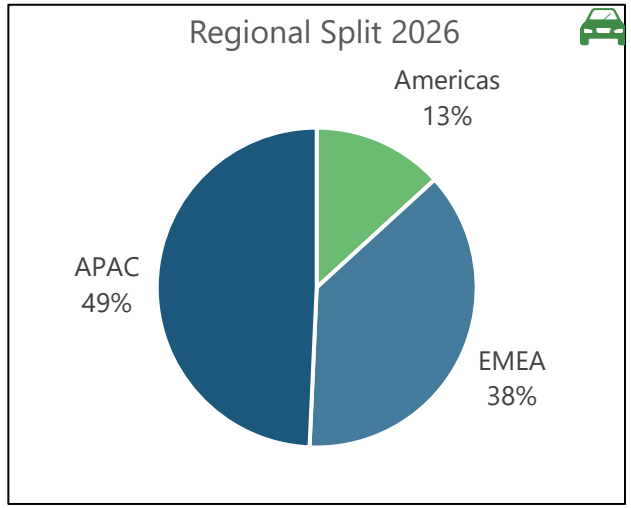
Electric Vehicles

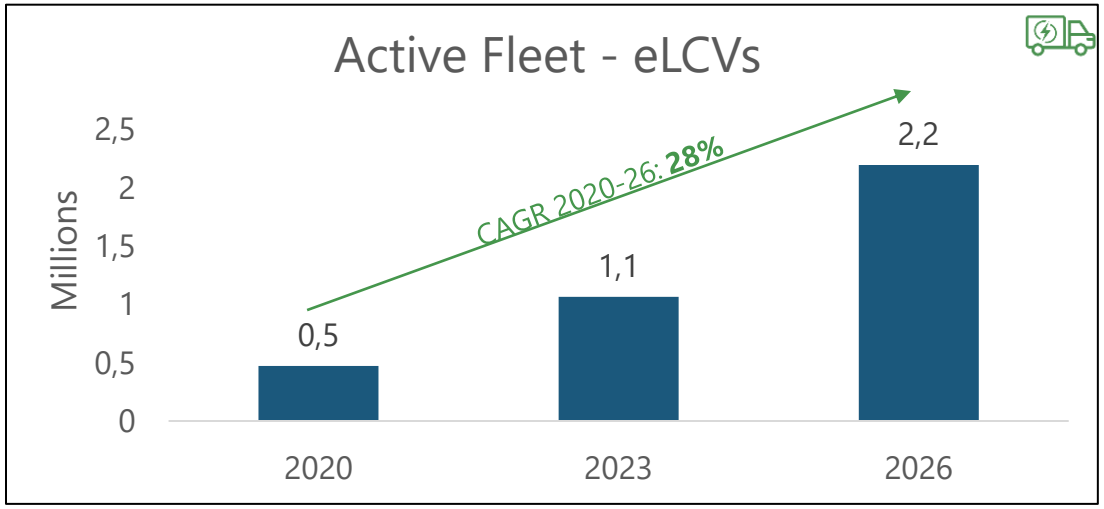
- Electric Vehicle Market Sizing
- Announced ZEV Targets
- EU's Climate Action Plan
- Maritime Industry and 2/3-wheelers

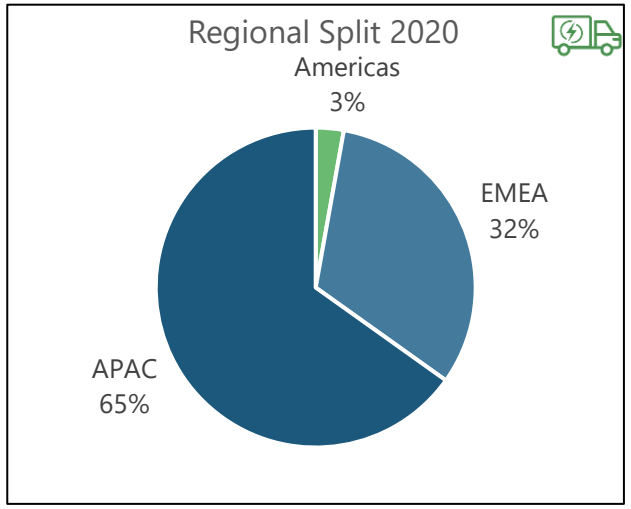
APAC dominating electric vehicle market in short-term, driven by demand in China

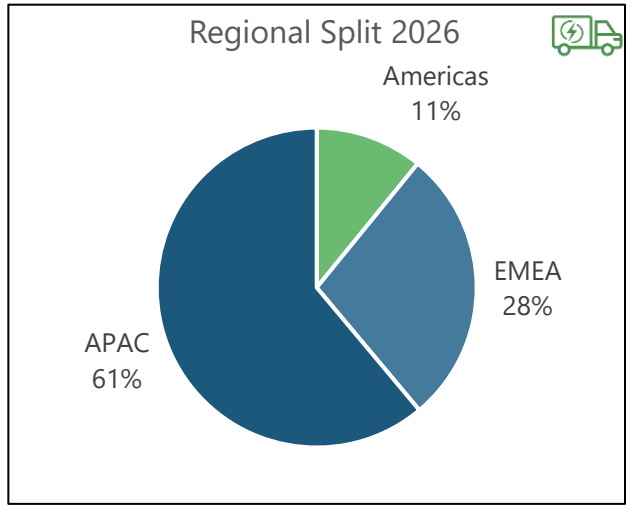




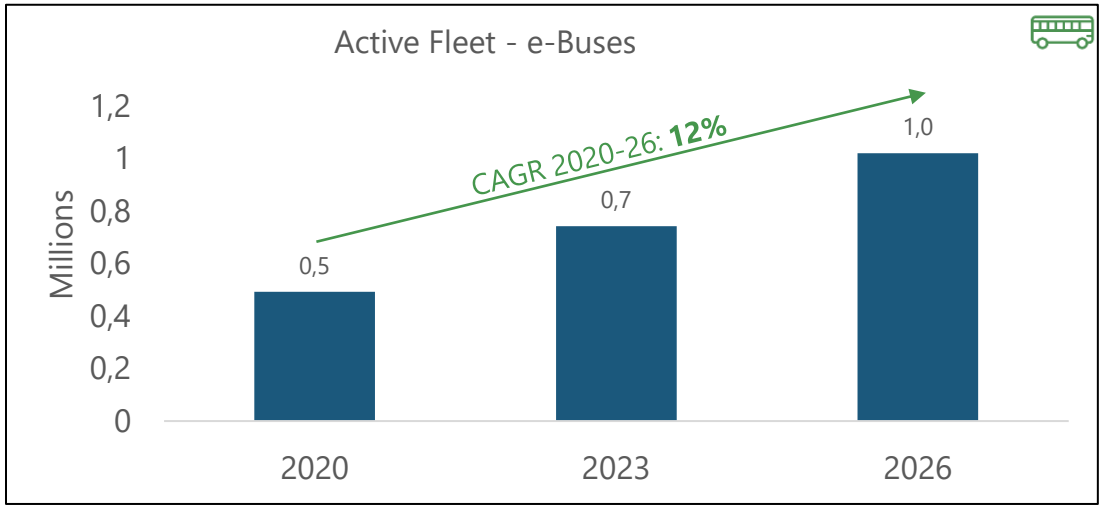


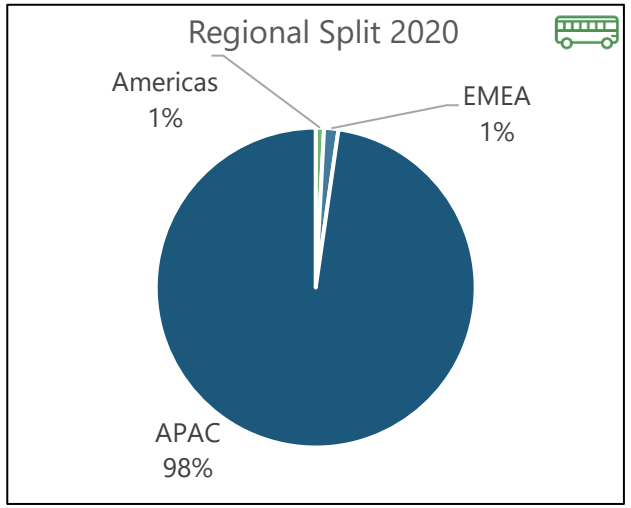


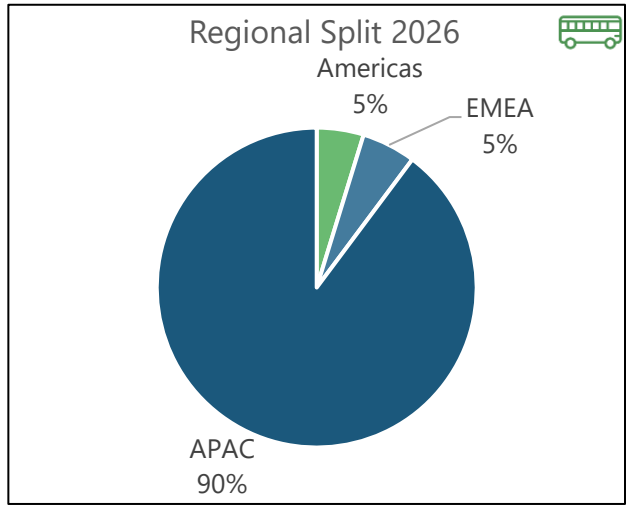


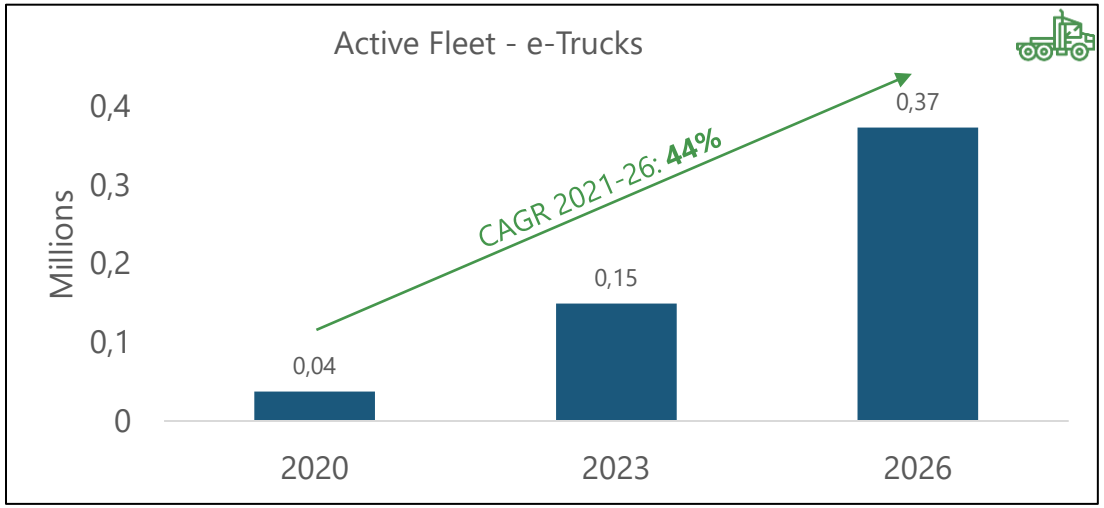


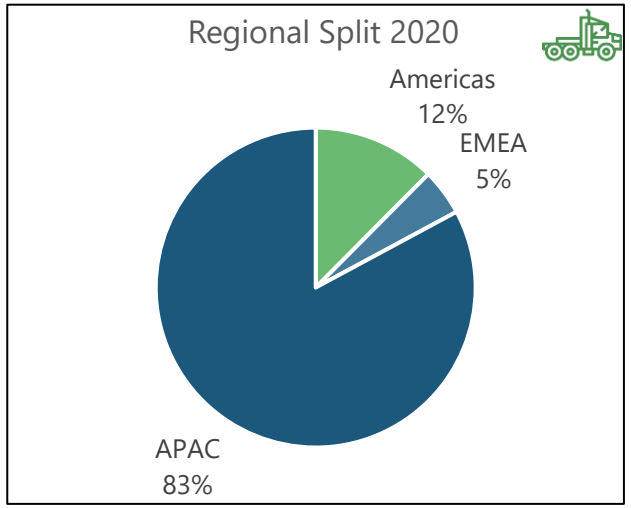
Europe and US to increasingly adopt electric buses and trucks

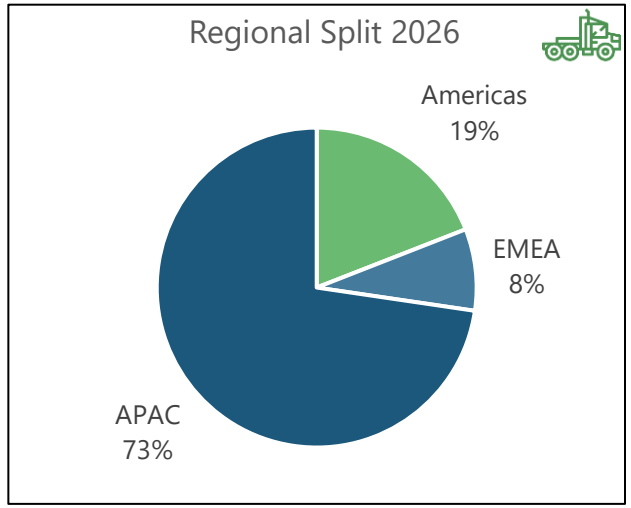




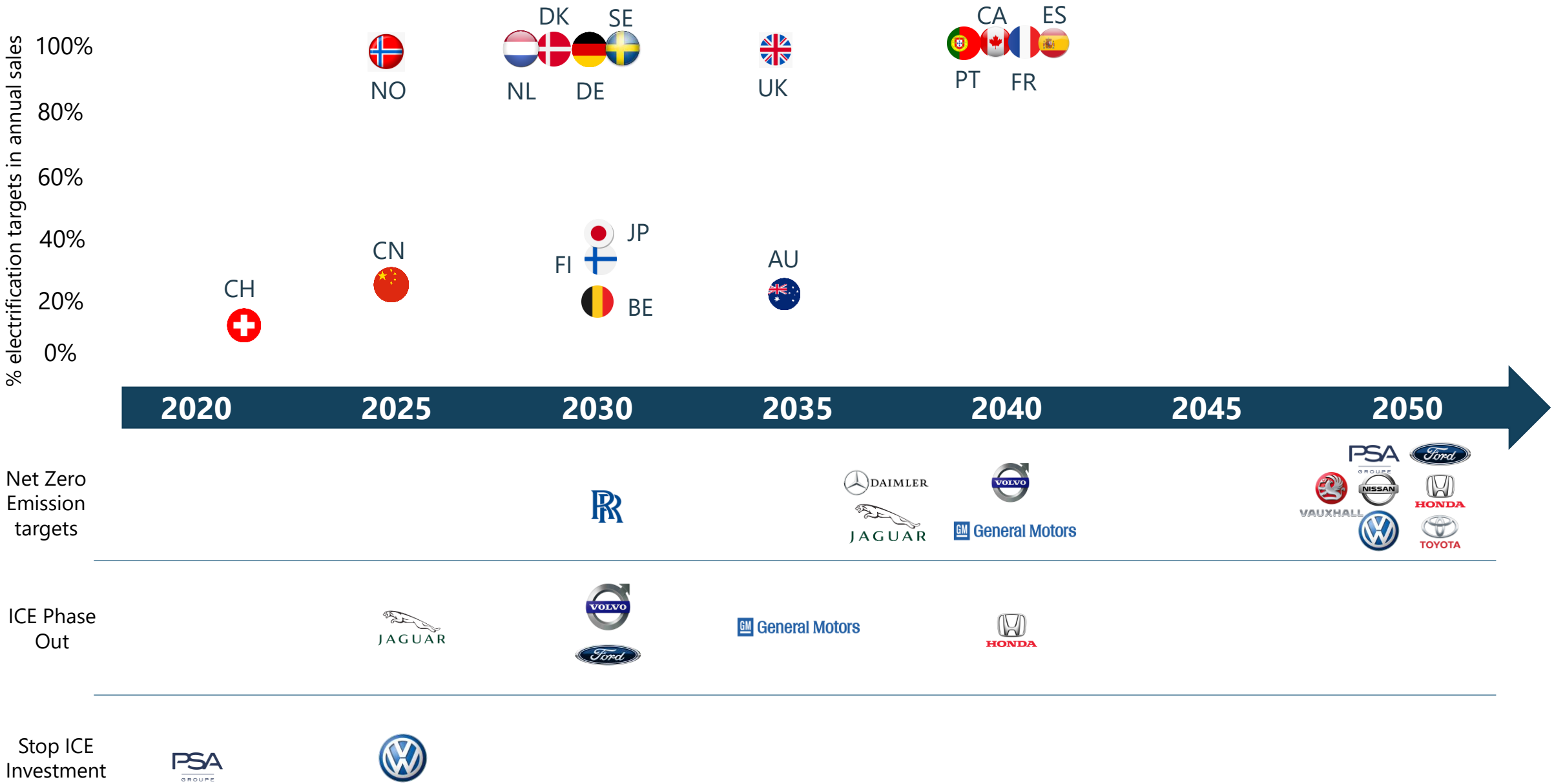






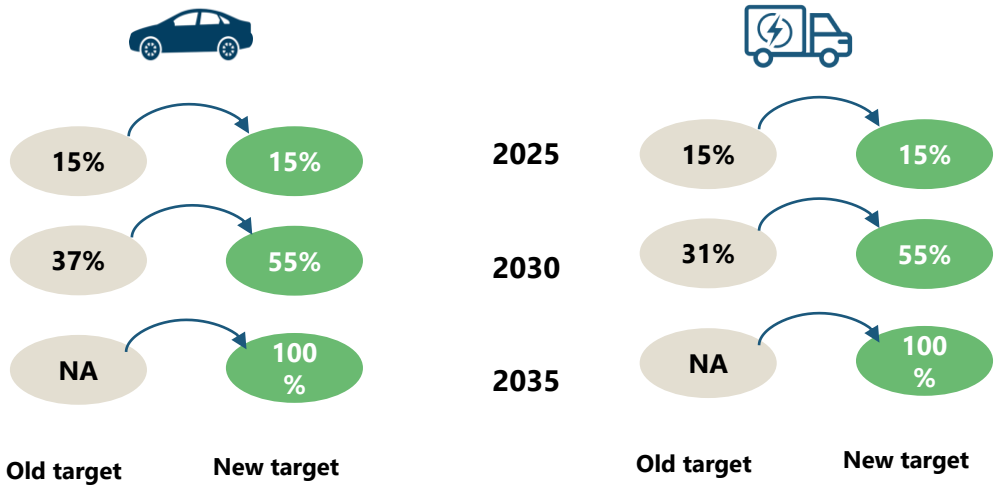


A gap between the **country targets** and announcements from **automotive players**



European commission recommends preponing emissions targets from the transport sector

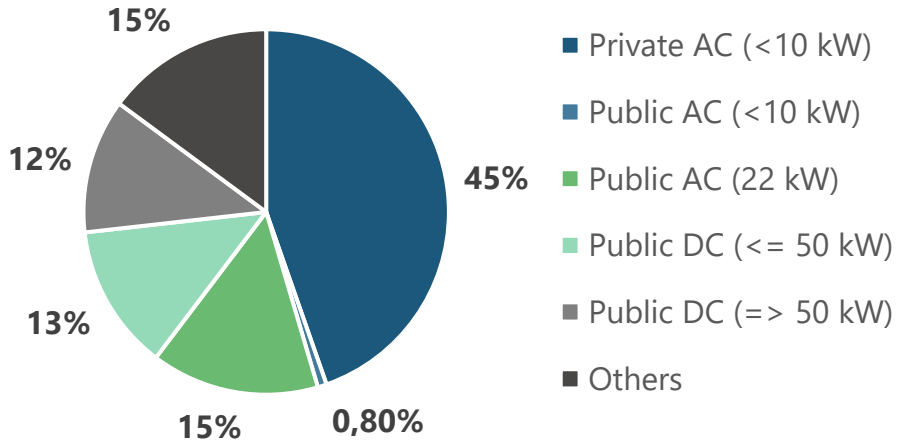
Revised CO2 Reduction Targets for Road Transport



Investment expenditures in EV charging infrastructure (2020-2030)

Cumulative Investment required from 2020-2030 (AFID Scenario):

€ 64 billion



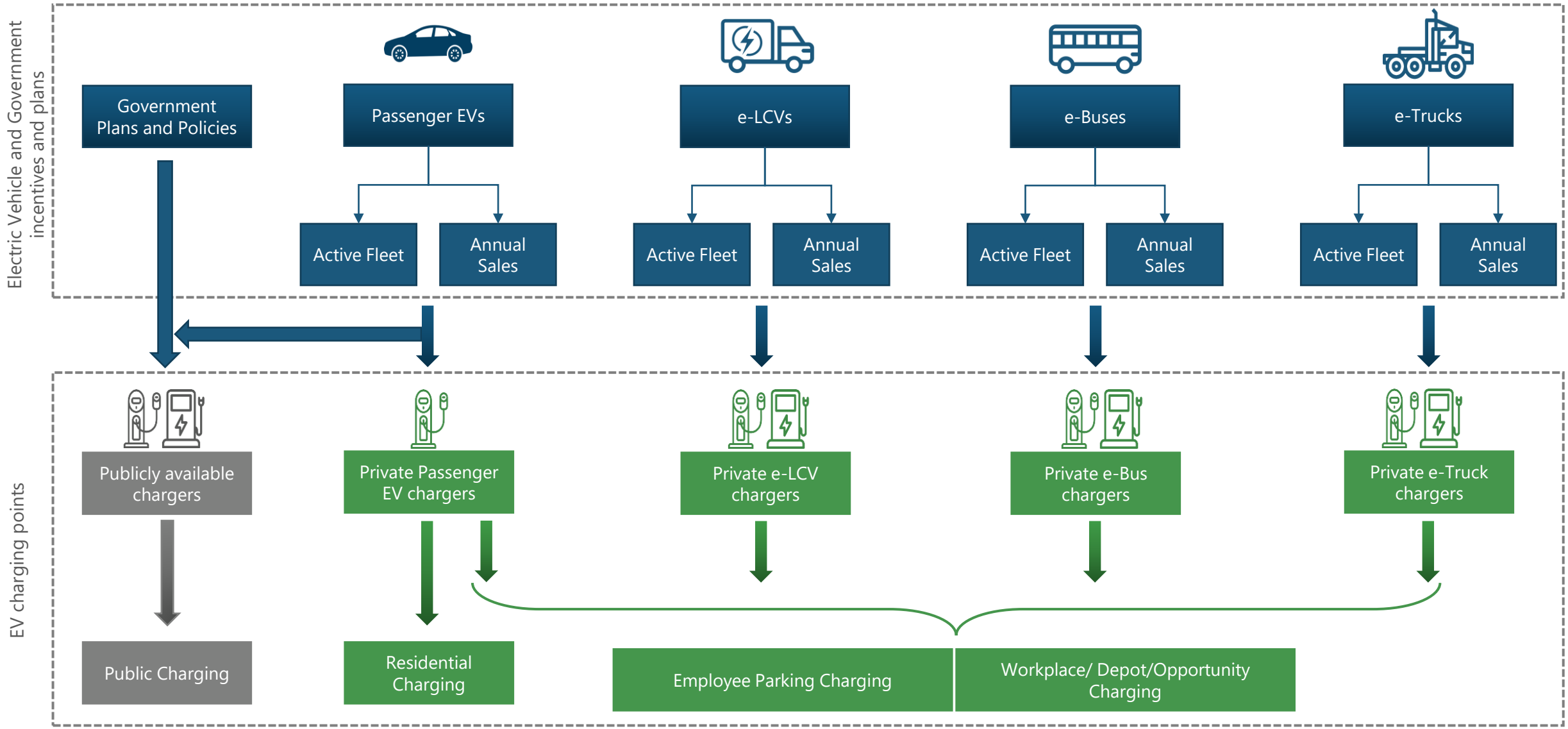
Recommendations/Actions from EU

- Countries should ensure availability of 300 kW and 600 kW installed capacity of chargers every 60 km on TEN-T Core Network by 2025 and 2030, respectively.
- For Heavy Duty Vehicles (HDV), countries must ensure availability of 600 kW and 1200 kW installed capacity of chargers every 60 km by 2025 and 2030 respectively, in every urban node of TEN-T network.
- Guidelines about full interoperability of charging infrastructure, transparency of pricing and payment modes are discussed to achieve market maturity and customer confidence in the EU.
- Apart from EV charging infrastructure, Hydrogen, LNG refueling, on-shore power supply (OPS) and electrification in Aviation industry are also part of the directive.

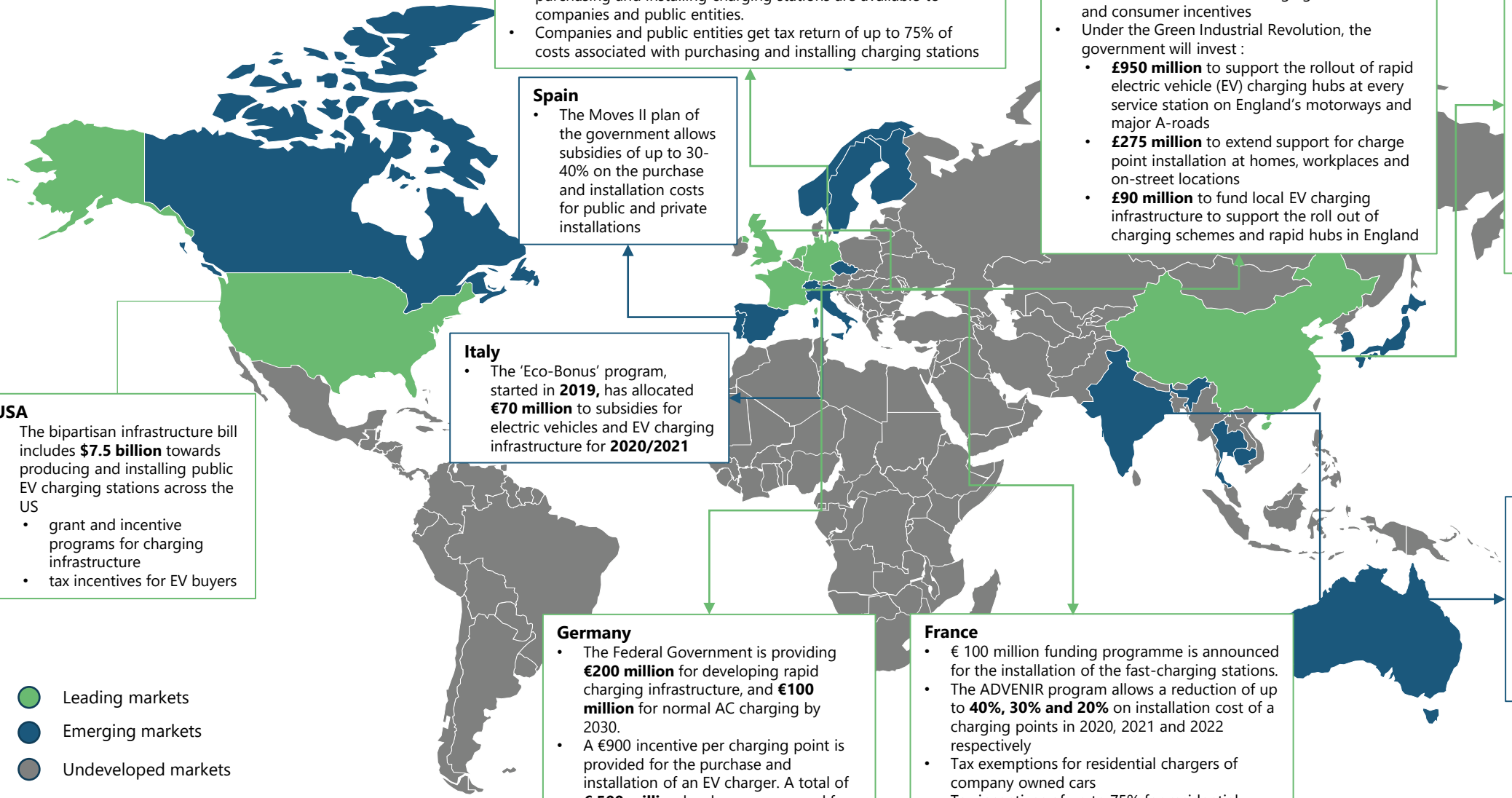
Charging Infrastructure

- Policy and Incentives
- Volatility of Forecasts
- Market Sizing
- Evolving business models

Electrification of vehicles, government targets and incentives drive the EV charging market



EV charging market is currently an **incentive driven market**



Netherlands
- •Deductions of up to 36 percent on costs associated with purchasing and installing charging stations are available to companies and public entities.
- Companies and public entities get tax return of up to 75% of costs associated with purchasing and installing charging stations

Spain
- The Moves II plan of the government allows subsidies of up to 30-40% on the purchase and installation costs for public and private installations

United Kingdom
- In order to support ZEVs, government will invest a total of **£1.9 billion** in charging infrastructure and consumer incentives
- Under the Green Industrial Revolution, the government will invest :
  - **£950 million** to support the rollout of rapid electric vehicle (EV) charging hubs at every service station on England's motorways and major A-roads
  - **£275 million** to extend support for charge point installation at homes, workplaces and on-street locations
  - **£90 million** to fund local EV charging infrastructure to support the roll out of charging schemes and rapid hubs in England

China
- In the 14th five-year plan (2021-2025), all provinces have announced EV and EVSE friendly policies and targets.
- The central government promotes the development of EVSE as a matter of national policy
- Provincial and municipal governments have numerous financial incentives for installing charging infrastructure
- The two largest utilities, China State Grid and China Southern Grid have programs to install EV chargers

Italy
- The 'Eco-Bonus' program, started in **2019,** has allocated **€70 million** to subsidies for electric vehicles and EV charging infrastructure for **2020/2021**

USA
- The bipartisan infrastructure bill includes **$7.5 billion** towards producing and installing public EV charging stations across the US
  - grant and incentive programs for charging infrastructure
  - tax incentives for EV buyers

Germany
- The Federal Government is providing **€200 million** for developing rapid charging infrastructure, and **€100 million** for normal AC charging by 2030.
- A €900 incentive per charging point is provided for the purchase and installation of an EV charger. A total of **€ 500 million** has been announced for residential charging up till now

France
- € 100 million funding programme is announced for the installation of the fast-charging stations.
- The ADVENIR program allows a reduction of up to **40%, 30% and 20%** on installation cost of a charging points in 2020, 2021 and 2022 respectively
- Tax exemptions for residential chargers of company owned cars
- Tax incentives of up to 75% for residential chargers

India
- Phase II of the FAME scheme was launched in 2019 with a budget outlay of **$1.3 billion** for three years for development of EVSE.
- A policy to set up charging station every 25 km on highways and main roads connecting major cities

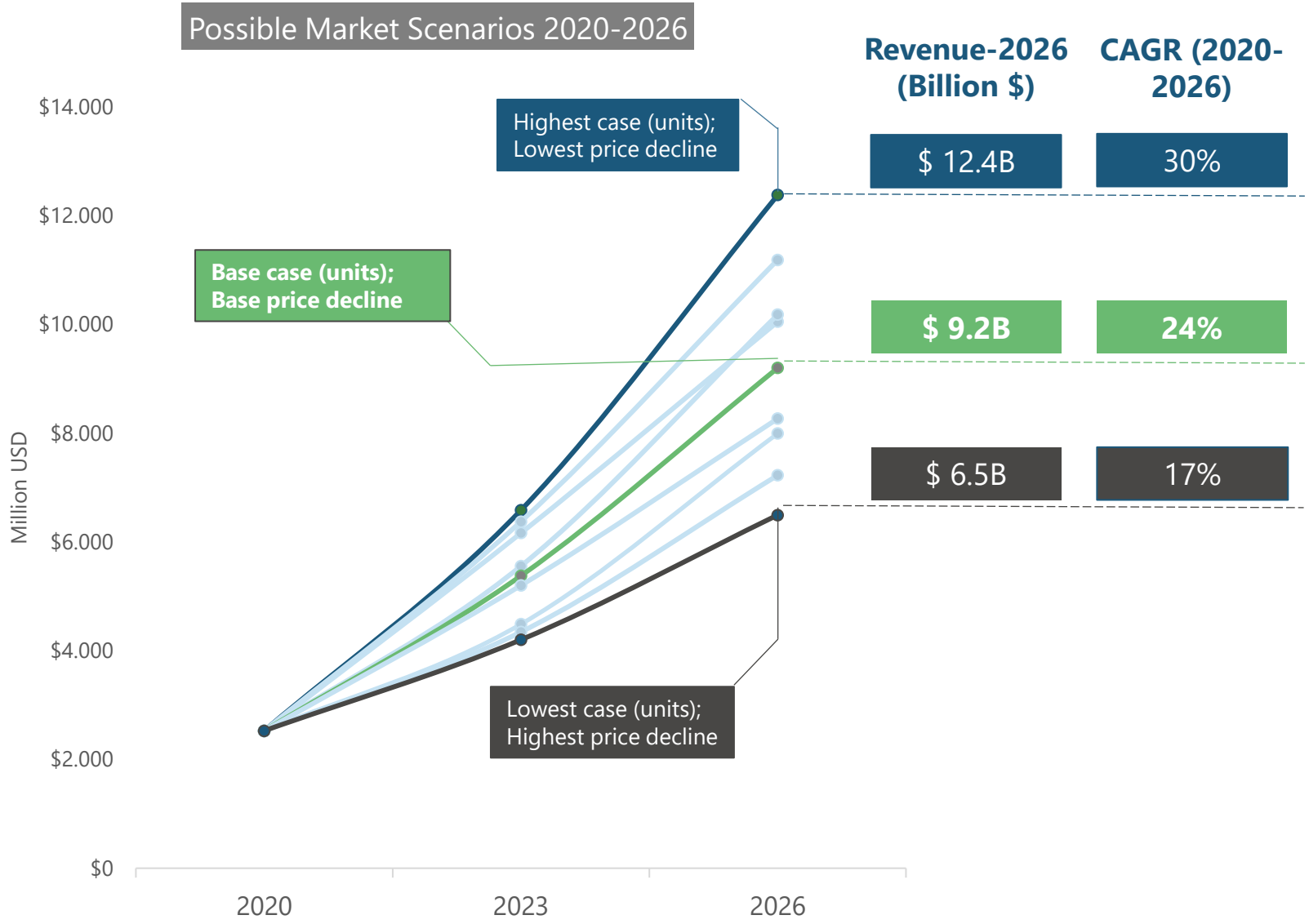
Leading markets

Emerging markets

Undeveloped markets

Volatile forecasts; Implementation of the plans and future price decline can significantly impact the market revenue in the forecast

- Rate of penetration of EVs in the market
- Implementation of government plans and incentives for charging infrastructure
- Price decline of EV chargers



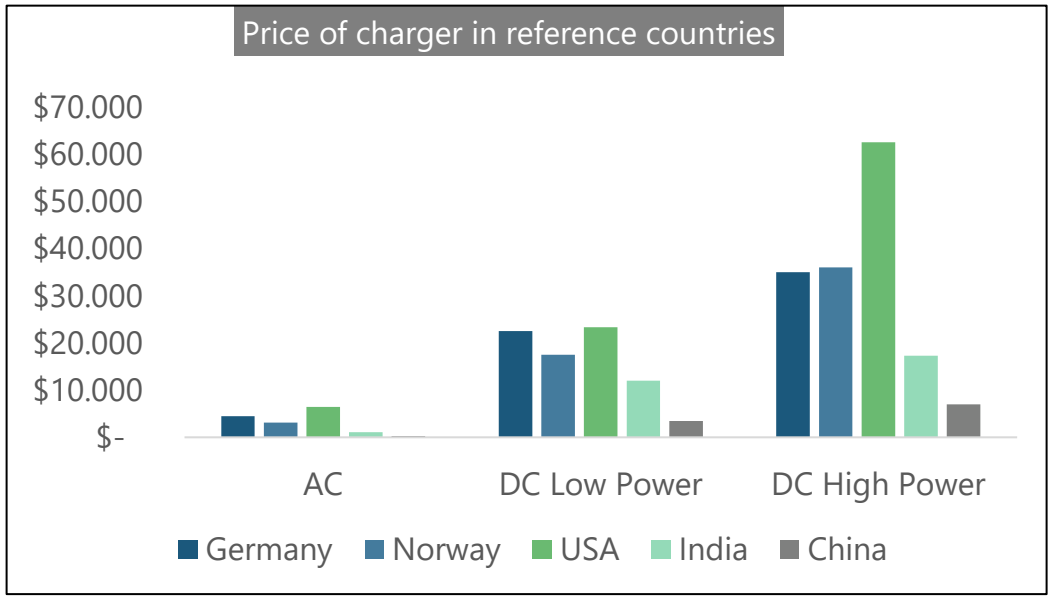
EV charger prices are far from settled as huge price variations exist across different countries

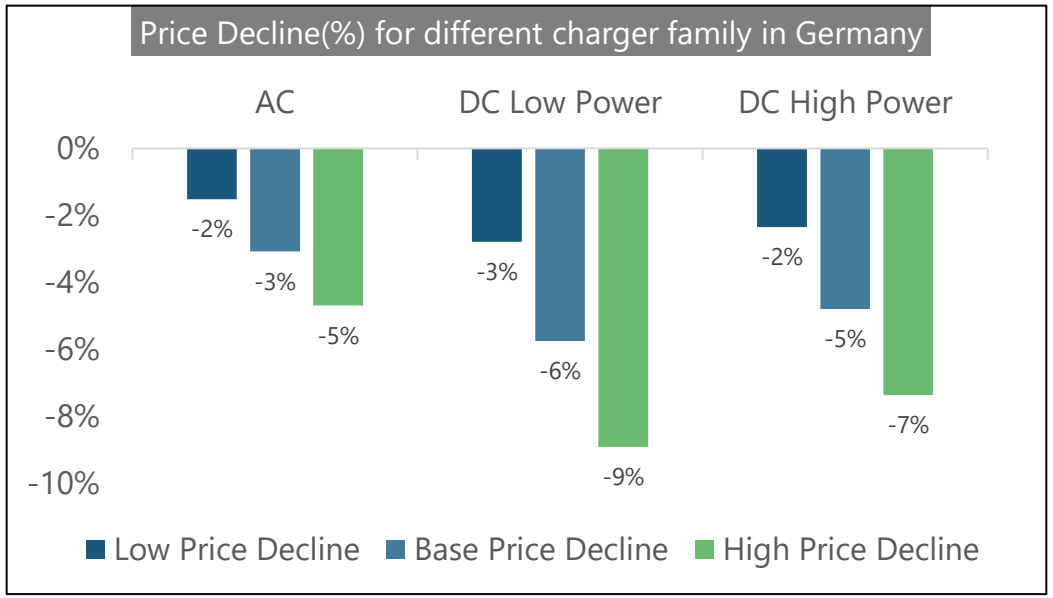
Price Variation

- Country specific product feature requirements
- Varying competition, local players involvement and maturity of market
- Extremely low prices in China due to economies of scale

Price Decline

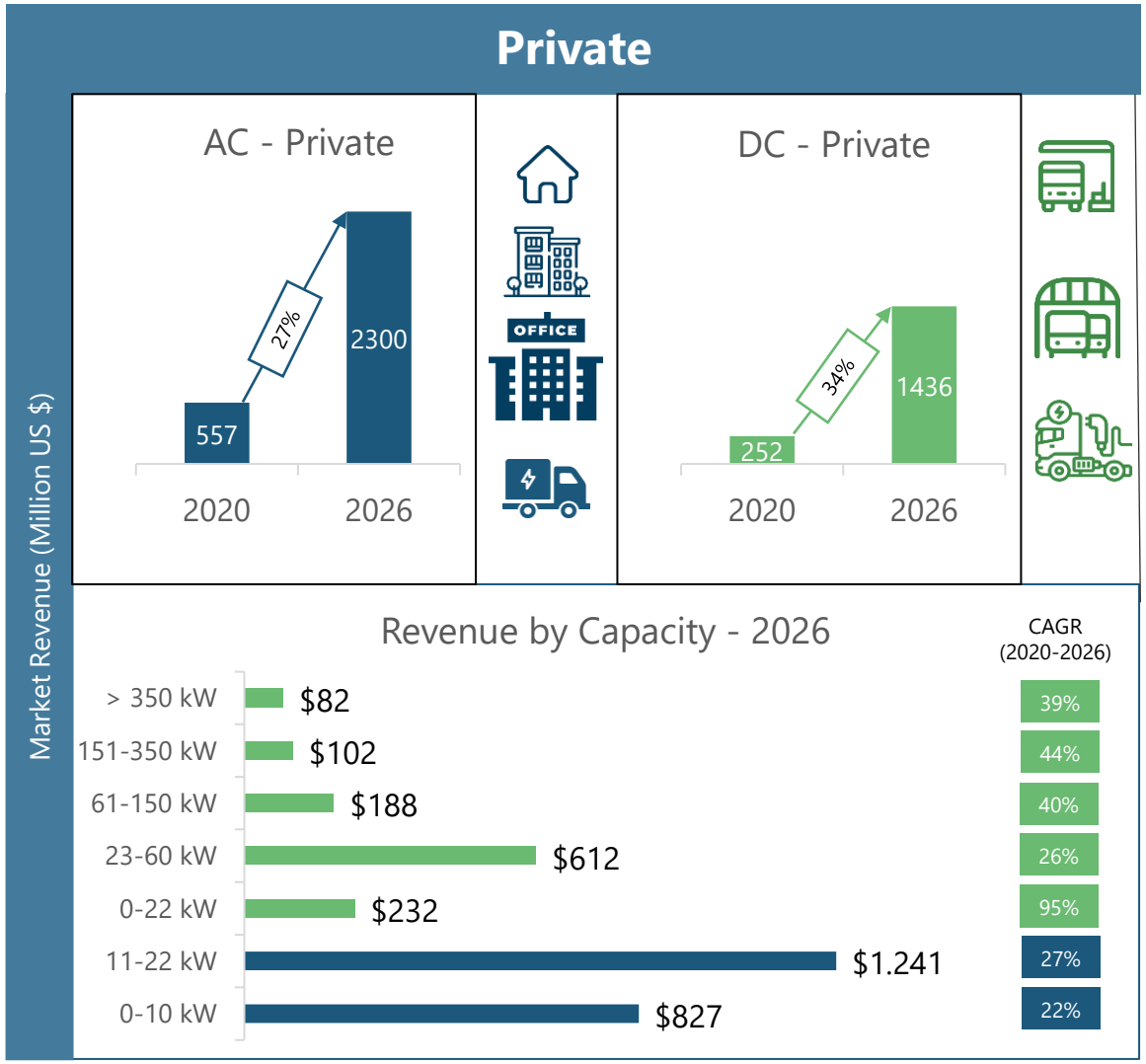
- Due to high sensitivity of prices between products and countries, there is uncertainty about price decline
- AC chargers market more mature than DC chargers, hence lesser price decline is expected.
- Economy of scales and competition will play a major role in determining price decline

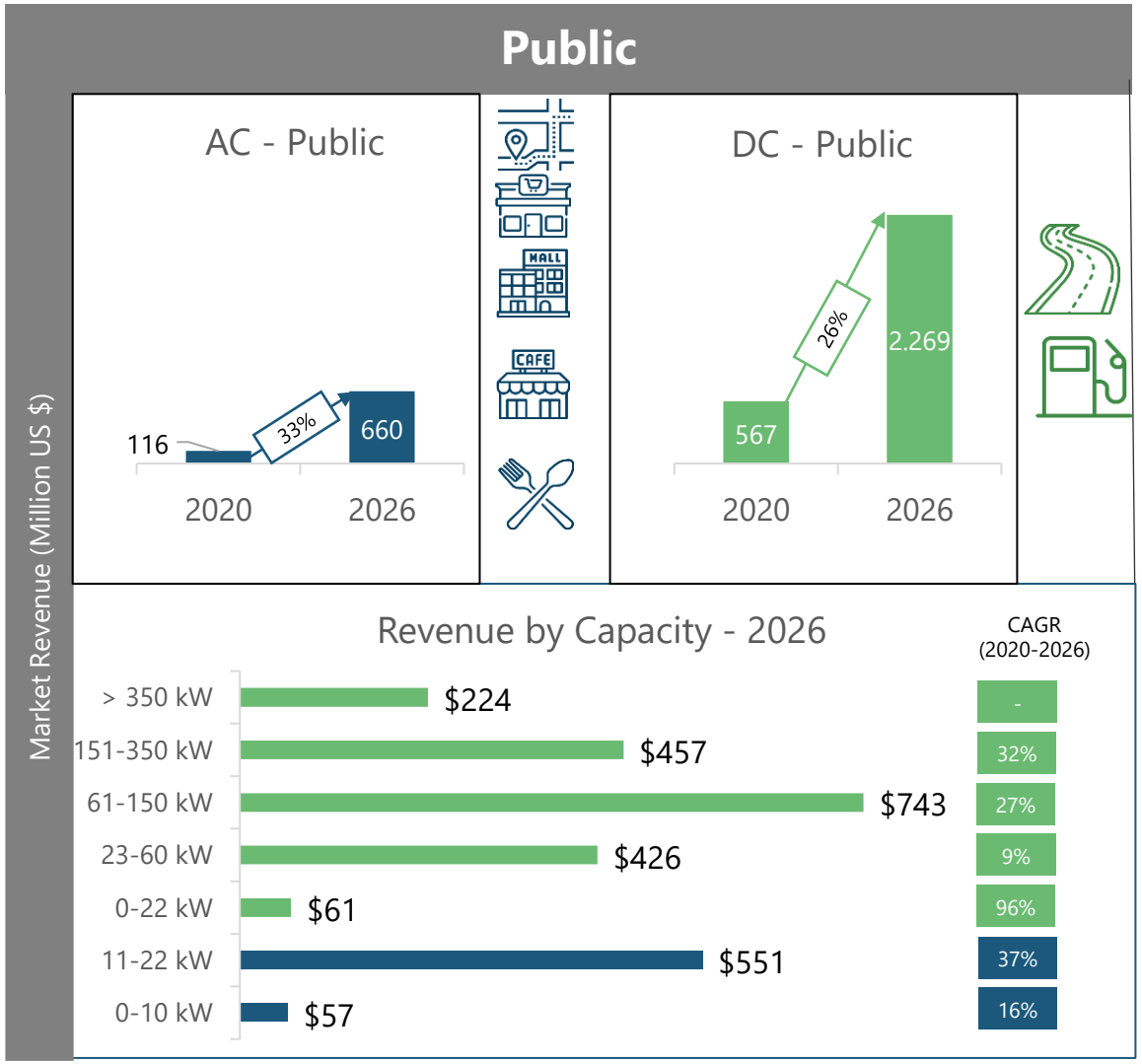




*Prices for 22 kW (AC), 50 kW (DC low power) and 240 kW chargers are used in the graph

Public DC charging moving towards high power (>60 kW) from low power (<60 kW); in **private** applications, despite fast growth of DC high power, low power DC chargers will still have the highest volume (without China)





AC DC

Evolving business models; **M&As** slowly moving E-mobility market towards **consolidation**

Investment in China

- High volume market
- Cheap cost of production with existing big manufacturing facilities
- Opportunity to export chargers from China to other parts of the world

ABB acquired a 67% majority stake in Chargedot

Schneider Electric and CICC invested $125 million in Star Charge

Diversification by businesses

- EVSE start ups and small companies are acquired by energy utilities, large manufacturers and oil giants to strengthen their business.
- Smaller companies, specially maintaining public charging networks are not able to sustain because of low utilization of chargers and cost associated.

360-degree service

- Companies providing **E-Mobility service** are moving towards providing a **360-degree service**. They manufacture chargers, manage and operate charging stations, design management software and function as an electric mobility service provider as well.
  - **Eaton** has acquired **green motion** which provides all the above services
  - **ABB** has partnered with **ChargeLab** which will allow them to offer integrated hardware and software services.
  - **ABB** is also planning to carve out its EV charging business into a separate legal entity.

Q&A Session

Q&A Session

PTR's EVs & EV Charging Service

Country specific analysis of 30 markets around the globe

Market Sizing & Forecast

- Electric Vehicle Active Fleet & Annual Sales
- EV Chargers Market Analysis
- Segmentation by charger size, application & owner
- Country specific pricing and price forecast

Supplier Analysis

- Regional market shares
- Top 10 suppliers for each country
- Detailed global supplier profiles
- Mergers & Acquisitions

Policies, Grants, Incentives & Projects

- Country specific policies, grants and incentives
- Large investment projects

Interactive Output Dashboards

- Interactive PowerBI Dashboards
- Flat excel databases

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