The Electric Vehicles Initiative

EV30@30 campaign, Pilot City Programme and GEF project

Pierpaolo Cazzola - International Energy Agency

Pilot City Forum – Helsinki, 28 May 2018

IEA

Clean Energy Ministerial (CEM)

High-level global forum to promote policies and programs that advance clean energy technology, to share lessons learned and best practices, and to encourage the transition to a global clean energy economy.

Three Main Activities

- **High-level policy dialogue at annual ministerial meetings** helps advance international collaboration to accelerate the adoption of clean energy policies and practices.
- **Public-private engagement** builds the industry, government, and civil society cooperation needed to scale up clean energy around the globe.
- Year-round work through action-driven, transformative clean **energy initiatives and campaigns** expands the deployment of clean energy technologies, policies, and practices.

Members

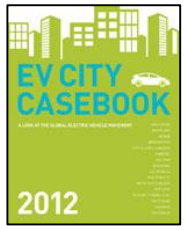
Electric Vehicles Initiative (EVI)

Multi-government policy forum dedicated to conducting collaborative activities that support the design and implementation of domestic electric vehicle (EV) deployment policies and programs

In 2010, EVI was one of several initiatives launched under the CEM

Currently co-chaired by Canada and China, and coordinated by the IEA

Released several analytical publications, demonstrating leadership to strengthen the understanding of the opportunities offered by electric mobility to meet multiple policy goals



Instrumental to mobilize action and commitments (Paris Declaration on Electro-Mobility and Climate Change at COP21, Government Fleet Declaration at COP22)

Launched the EV30@30 Campaign in June 2017

Now launching the **Pilot City Programme**

Members

in 2018

EV30@30 Campaign

Designed to accelerate the global deployment of electric vehicles

Sets a collective aspirational goal to reach 30% sales share for EVs by 2030

Launched at the 8th CEM meeting, in Beijing, by China's Minister of Science and Technology Wan Gang

Implementing actions include:

- Supporting the **deployment of chargers** and tracking its progress,
- Galvanising public and private sector commitments for electric vehicle (EV) uptake in company and supplier **fleets**
- Scaling up **policy research** and information exchanges
- Supporting governments in need of policy and technical assistance through training and **capacity building**
- Establishing the **Global EV Pilot City Programme**, aiming to achieve 100 EV-Friendly Cities over five years

Members

Supported by several partners

Pilot City Programme

Aims to accelerate the global deployment of electric vehicles in cities

Inspired by China's Pilot City network and the leading role of cities for innovation

Launched at the 9th CEM meeting, in Copenhagen, by Finland's Minister of Environment Kimmo Tiilikainen and China's Deputy Minister of Science and Technology Li Meng

30+ cities engaged at the launch, aiming for 100+ cities in 5 years

Country	Cities
Canada	Calgary, Halifax Regional Municipality, Montréal, Stratford, Surrey, Richmond, Winnipeg
China	Beijing, Rugao, Shanghai, Shenzhen, Yancheng
Finland	Helsinki, Espoo, Oulu, Tampere, Vantaa
Japan	Aichi, Kanagawa and Kyoto Prefectures; Tokyo Metropolitan Government
Netherlands	Metropolitan Region Amsterdam and G4 Cities (Utrecht, Amsterdam, the Hague, Rotterdam)
New Zealand	Christchurch (upcoming)
Norway	Bergen (upcoming), Oslo
Sweden	Stockholm
Thailand	Betong (interested), Nonthaburi (interested)
United Kingdom	Dundee, London
United States	New York City

Pilot City Programme - Activities

- Provide **support** to municipal governments
  - Opportunities for advanced pilot projects/ test of concepts (coopetition)
  - Opportunities to city to gain more visibility on their actions leveraging on the attention given to EVI and the visibility of EVI products
  - Thematic webinars (by topic/issue)
  - EV hub, virtual sharepoint (tools, discussion forum)
- Support greater **dialogue**
  - Opportunities to engage with peers in municipal governments
  - Opportunity to liaise with national governments (unique advantage of EVI)
- **Monitor and report** progress: data and information sharing
  - Establish common indicators to monitor EV-related developments, such as number of vehicles, vehicle travel activity, and number and type of chargers
- Identify **good practices**
  - Leverage on knowledge base of EVI, the information collected from PCP cities (monitoring & reporting tools) and other networks (e.g. C40)
  - Innovative/virtual best practice "city case book"
- Facilitate their **replication** and improvement
  - Contacts with private sector (utilities, vehicle manufacturers, service providers)
- Organize of the **Pilot City Forum**
  - Key instrument to facilitate exchanges between cities and with private sector

Topics/Themes

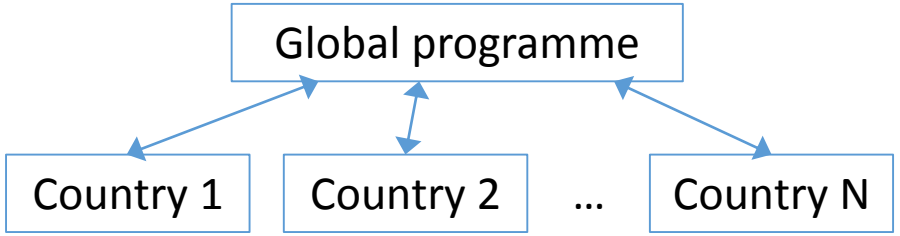
- Standards (includes connectors, communication protocols) – need to focus on implementation and need to enable interoperability
  - ABB: EU project exists for pantograph charging (allowing interoperability)
  - ENSTO: EU standard fro car charging are sorted out already
  - BYD: need for combined package for chargers and buses
  - Amsterdam Met. Region: need to ensure open acces sin the future ot market (no technology lock-in)
- Types of chargers (private & publicly accessible, slow or fast)
- How to deal with EV penetration for individuals not haveing access to private parking
- New financing instrument to bridge the cost gap
  - ABB: banks ae willing to finance this
- Park and ride facilities, other parking policies (differentiated parking fees)
- Procurement (EV prioritization or mandates)
- Road tolls (differentiated rates for EVs)
- Mandates for EV charging capacibilities in parking spaces (residential) – also covered by EU Directive
- Environmental Zones
- HOV lanes
- Street parking
- Enforcement/coexistence of EVs and ICEs
- How cities monitor public opinion (preventing bubble effect)
- EV & public transport
  - Temptation to say EVs are good enough
  - Effect of MaaS/Autonomous vehicles
- Policy transition from phase I to phase II
  - E.g. access to bus lanes, free parking... What to do once you have many EVs on the road?
  - Japan: reluctant to introduce advantages difficult to lift up at a later stage (tax incetives, enviromental zones)

Other ideas

- Themes could be good to define topics of webinars
  - Canada: cities to share information of what they would like to dicuss
- Build a repository of contacts by area of competence as an asset for all cities
- Data collection methods: sharing experiences on how cities monitor EV uptake
- Leverage other types of collaborative projects
  - HEV Technology collaboration programme (including DOE)
- Opening up the programme to other countries/cities/jurisdictions
- Projects to be conducted together: maybe call for project proposal at each PCF?
- Collective targets for the cities?

GEF project

- EVI involved in the development of a programme aiming to support policy development on e-mobility
- Focused on low and middle income countries
- Supported from the Global Environment Facility (GEF)
- Budget envelope could be significant (pending approval by GEF)
- Project structure includes a global programme supporting national projects
  - Global component to develop tools and methodologies to help countries introduce electric mobility, working groups focusing on different policy options (policy matrix) and training and awareness at global and regional level
  - Country project focused on the development of policy tools at the national and/or local scale
- Relevance for the EVI (and the PCP) is the expansion in scope and increased dialogue with cities in the developing world



	Vehicles	Chargers	Grid
National			
Local			

The Global EV Outlook 2018

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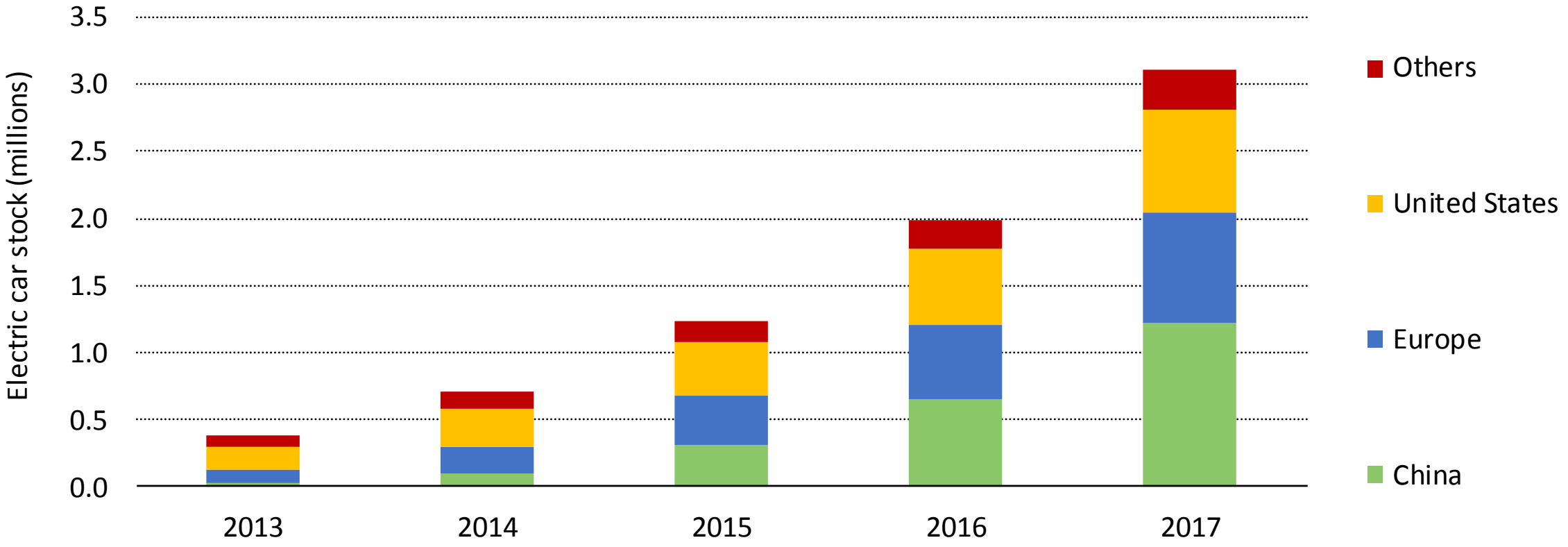
IEA

Global EV Outlook 2018

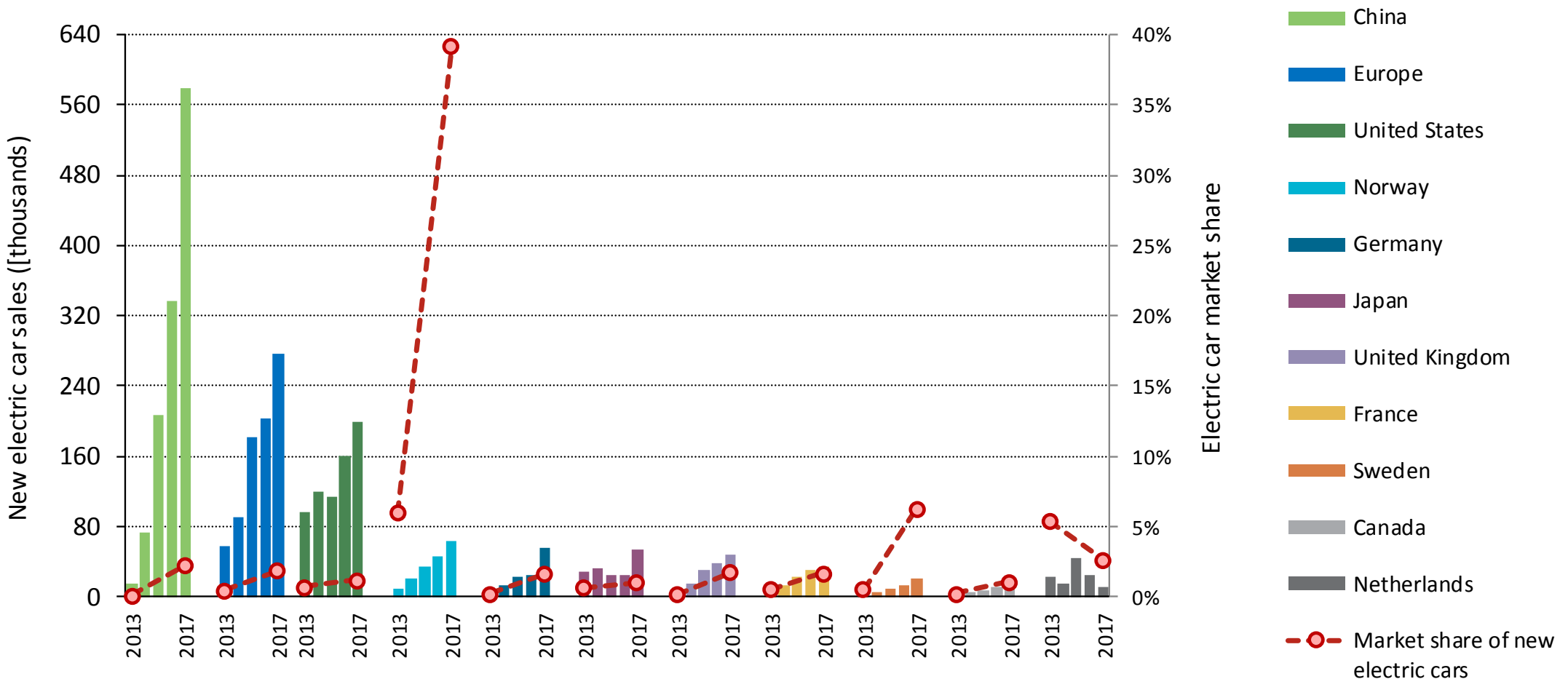
- EVI flagship report by the IEA
- 2018 edition includes
  - Data reporting (EV stock, sales, EVSE, battery costs)
  - Overview of existing policies
  - Battery technology and cost assessment
  - Implications on the TCO of road vehicles
  - Role of EVs in low carbon scenarios (2030 timeframe)
  - Electricity demand, oil displacement and GHG emission mitigation
  - Material demand
  - Policy recommendations
- 2018 edition also paired with the Nordic EV Outlook 2018
  - Focus on one of the most dynamic global regions for EV uptake
  - Opportunity to learn on policy efficacy and consumer behaviour

The number of electric cars on the road also continues to grow



The electric car stock exceeded 3 million in 2017
However, electric cars still only represent 0.3% of the global car fleet

Electric car sales are on the rise in all major car markets



China is the largest electric car market globally, followed by Europe and the US
Norway is the global leader in terms of market share, with 40% in 2017

Electric mobility is not limited to cars

Electric 2-wheelers: major phenomenon in China, where there are 250 million in the rolling stock and 30 million sales per year

Low Speed Electric Vehicles: estimated at 4 million units in China (sales above 1 million). Not favoured by policy support but by cost and practicality (small size, no driving license/registration required)

Buses: 360 000 in China. Close to 90 000 sales in 2017 . Stimulated by policy support.

Growing interest in C40 cities (better economics: not only pollution and climate-driven phenomenon)

EV uptake is still largely driven by the policy environment

- All 10 leading countries in electric vehicle adoption have a range of policies in place to promote the uptake of electric cars

- Policies have been instrumental to make electric vehicles more appealing to customers, reduce risks for investors and encourage manufacturers to scale up production

- Key instruments deployed by local and national governments for supporting EV deployment:
  - public procurement
  - financial incentives facilitating the acquisition of EVs and reducing their usage cost (e.g. by offering free parking)
  - financial incentives and direct investment for the deployment of chargers
  - regulatory instruments, such as fuel economy standards and restrictions on the circulation of vehicles based on their tailpipe emissions performance

National and local announcements for EVs and towards the end of ICEs

Table 2.3 • Announced sales bans for ICE vehicles

Country	2025	2030	2032	2040	2045
France				●	
Ireland		●			
Netherlands		●			
Norway	●				
Slovenia		●			
Sri Lanka				●	
Sweden					
Scotland			●		
United Kingdom				●	

● ICE sales ban or 100% ZEV sales target ● Fleet without ICEs

Table 2.4 • Announced access restriction mandates in local jurisdictions

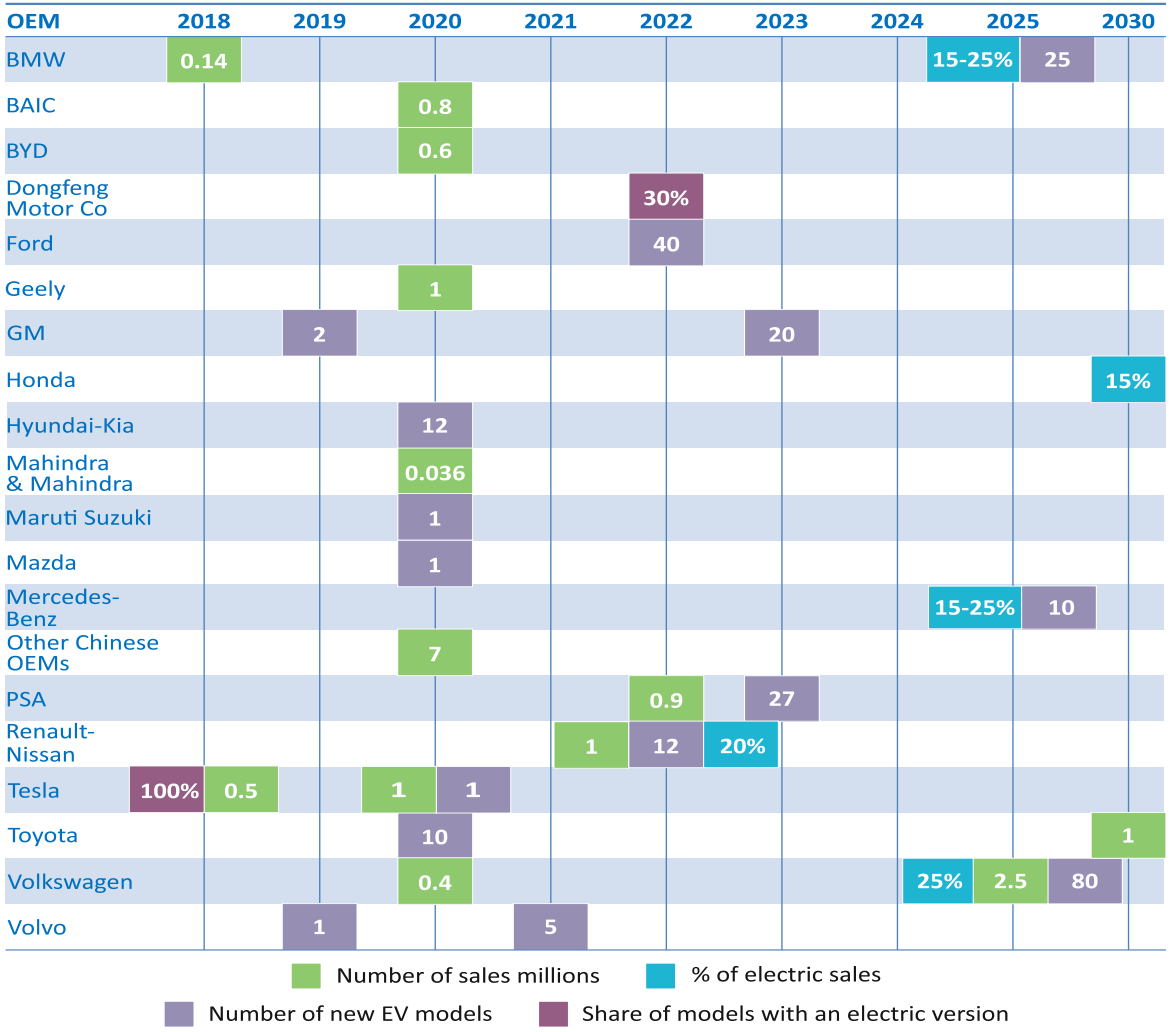
Local jurisdiction	2024	2025	2030	2035	2040
Athens		●			
Auckland			●		
Balearic Islands		●		●	
Barcelona			●		
Cape Town			●		
Chinese Taipei					●
Copenhagen			●		
London			●		
Los Angeles			●		
Madrid		●			
Mexico City		●	●		
Milan			●		
Oxford			●		
Paris	●		● ●		
Quito			●		
Rome	●				
Seattle			●		
Stockholm			●		
Vancouver			●		

● Diesel access restrictions ● ICE access restrictions
● Fossil-Fuel-Free Streets Declaration ● ICE sales ban

+ EV30@30 and country/state-level EV targets

ICE phase-out pledges have been mainly announced in Europe
China has also mentioned that it is considering the ICE phase out

OEM announcements



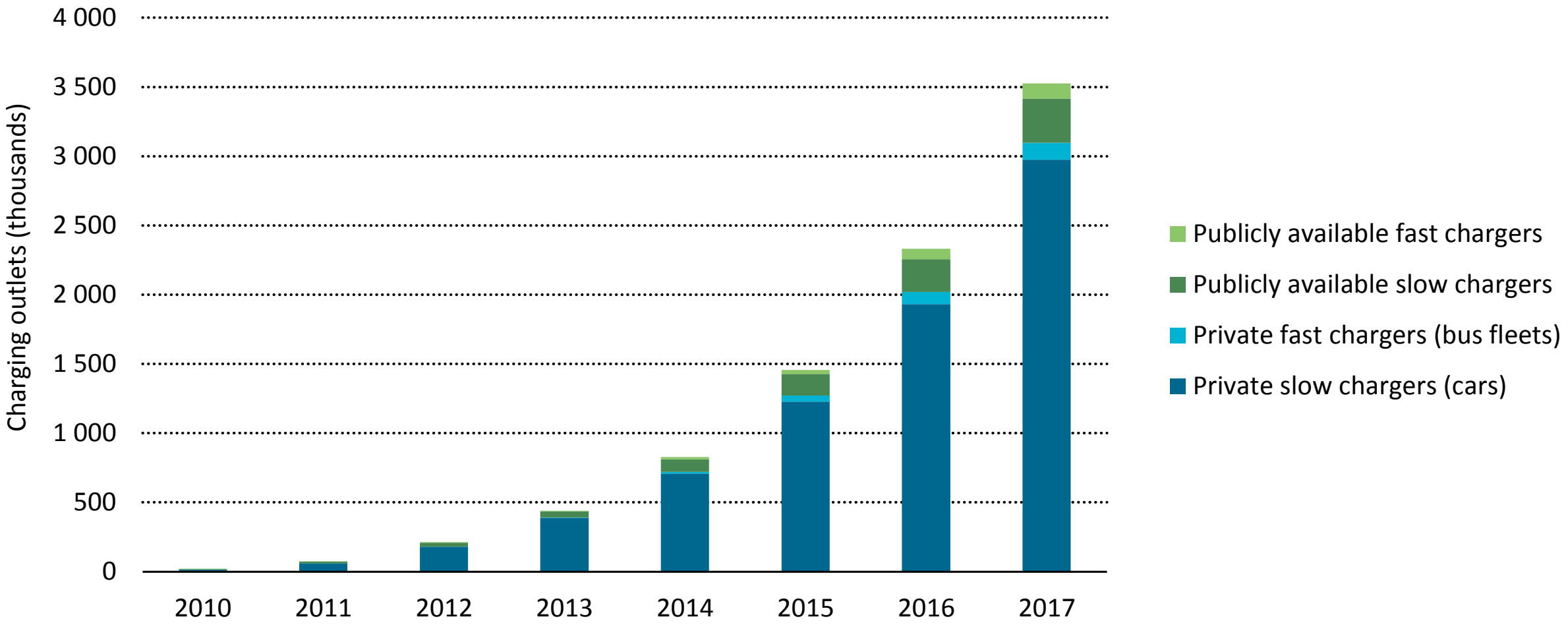
Electric LDV deployment targets

Diesel phase out

OEM	Action
Fiat Chrysler	Phase out diesel across its model line-up as of 2022.
Honda	Discontinue production and sales of a flagship diesel-powered vehicle in Europe.
Porsche	No diesel units for major models of the brand; focus on optimised ICEs, PHEVs and BEVs.
Subaru	Withdraw diesel car production and sales by FY 2020.
Toyota	Stop selling diesel cars in Europe by the end of 2018.
Volvo	Stop developing diesel engines.

These announcements indicate a strong industry commitment to invest in electric mobility and to scale up efforts to advance EV technology in the coming years

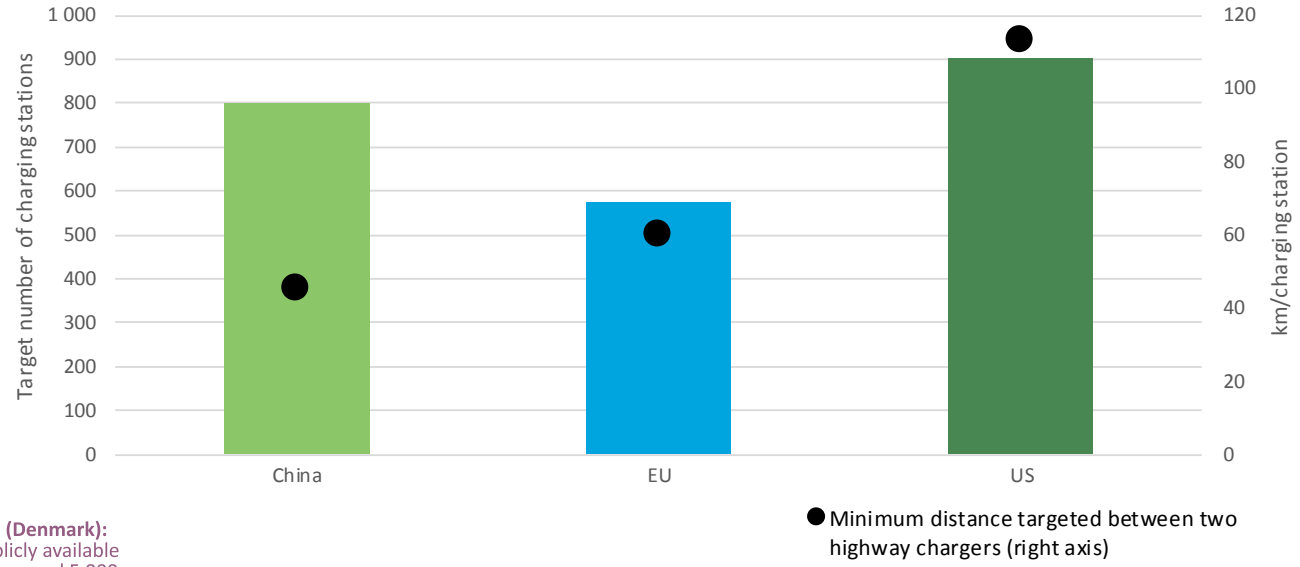
Charger deployment accompanies EV uptake

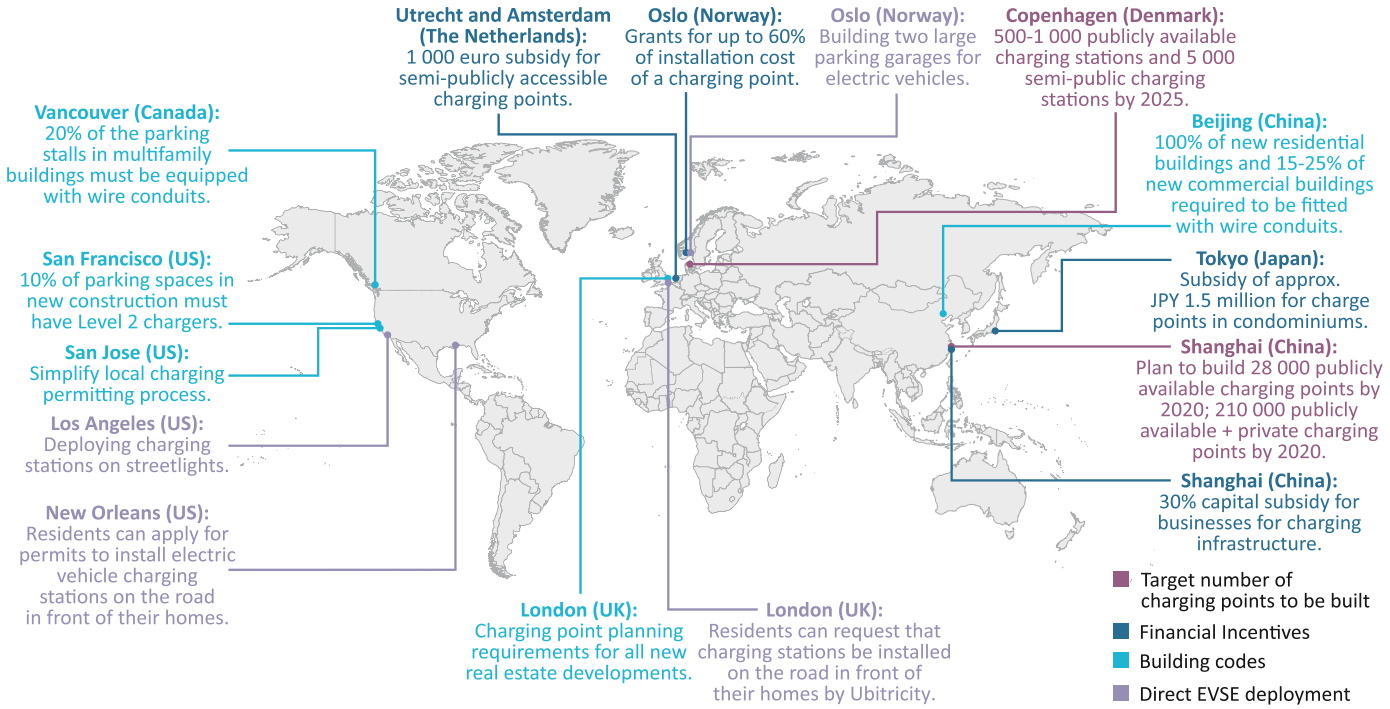


EV owners charge mostly at home or at work: private chargers far exceed publicly accessible ones
Publicly accessible chargers important to ensure EV market expansion, fast chargers essential for buses

Charger deployment also currently supported by policy

Major markets such as China, the European Union and the United States clearly have ramped up their ambition to install fast charging facilities along highways

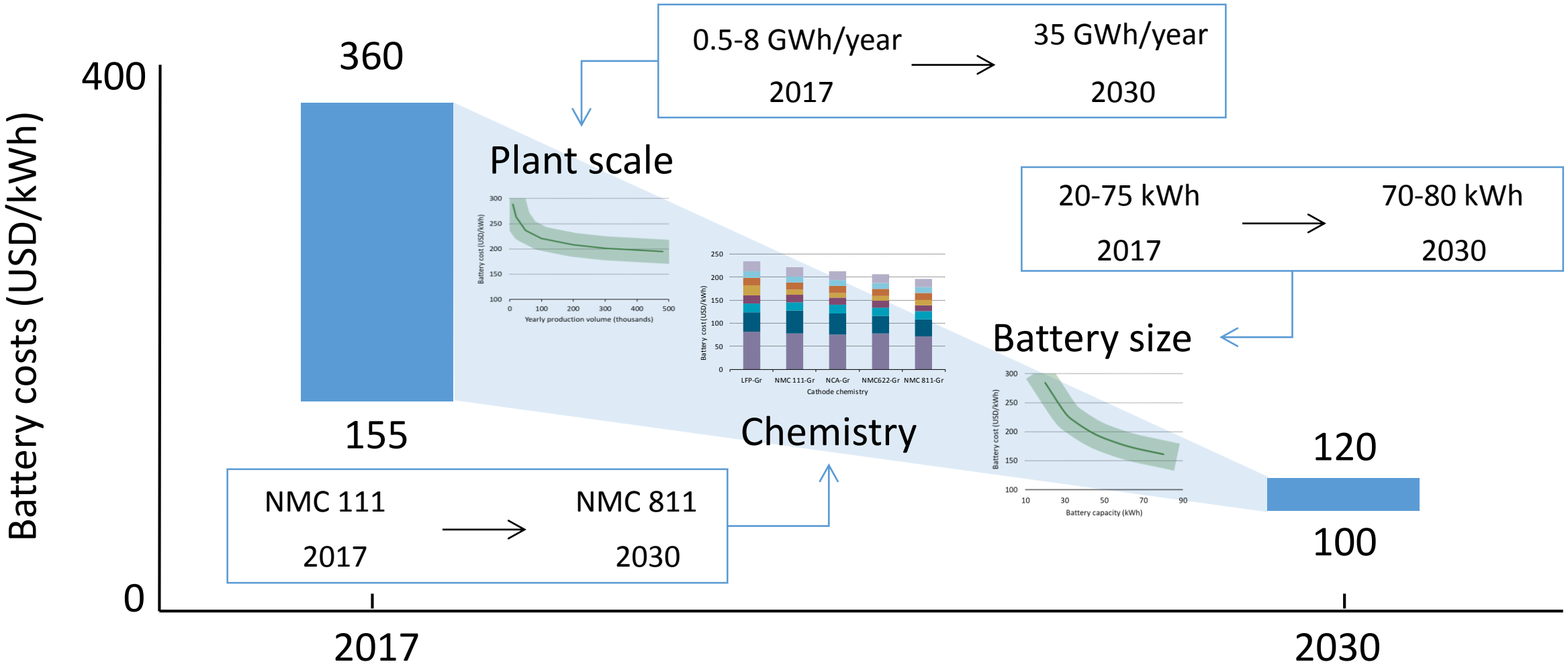




Cities are using a variety of measures to support charger deployment

Four main categories: targets, financial incentives, regulatory requirements (building codes) and direct deployment of chargers

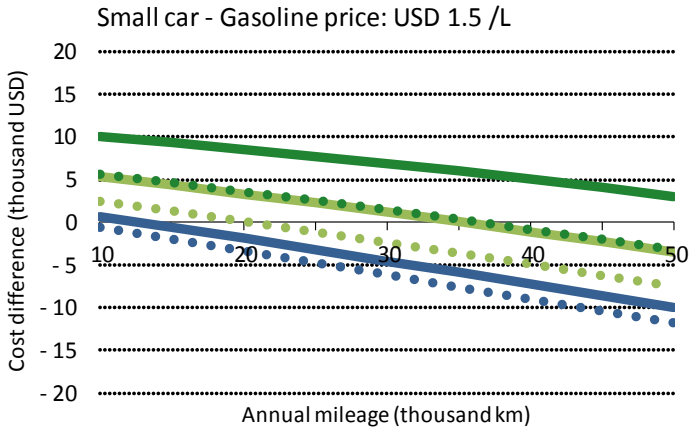
Battery cost already declined significantly and expected to fall…



The combined effect of manufacturing scale up, improved chemistry and increased battery size explain how battery cost can decline significantly in the next 10 to 15 years

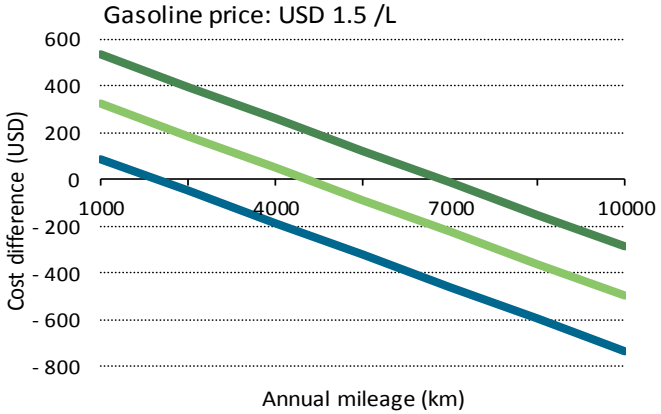
… and this has implications for the cost competitiveness of EVs

LDVs - BEV



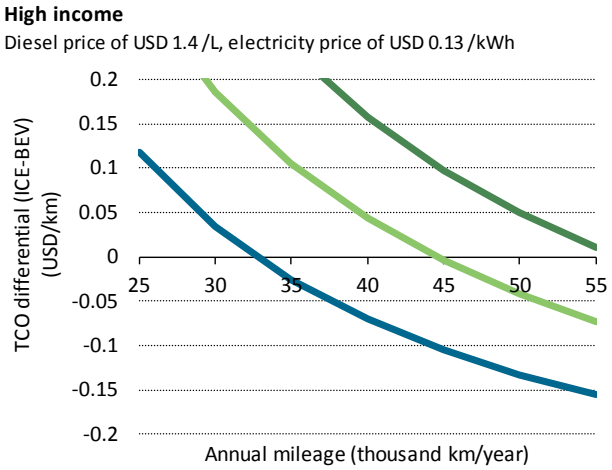
BEVs are most competitive in markets with **high fuel taxes** and at **high mileage** At a USD 120/kWh battery price and with EU gasoline prices, BEV are competitive even at low mileage

2-wheelers



The economic case for electric two-wheelers is strong: in countries with **high fuel taxes** electric two-wheelers **are already cost competitive** with gasoline models

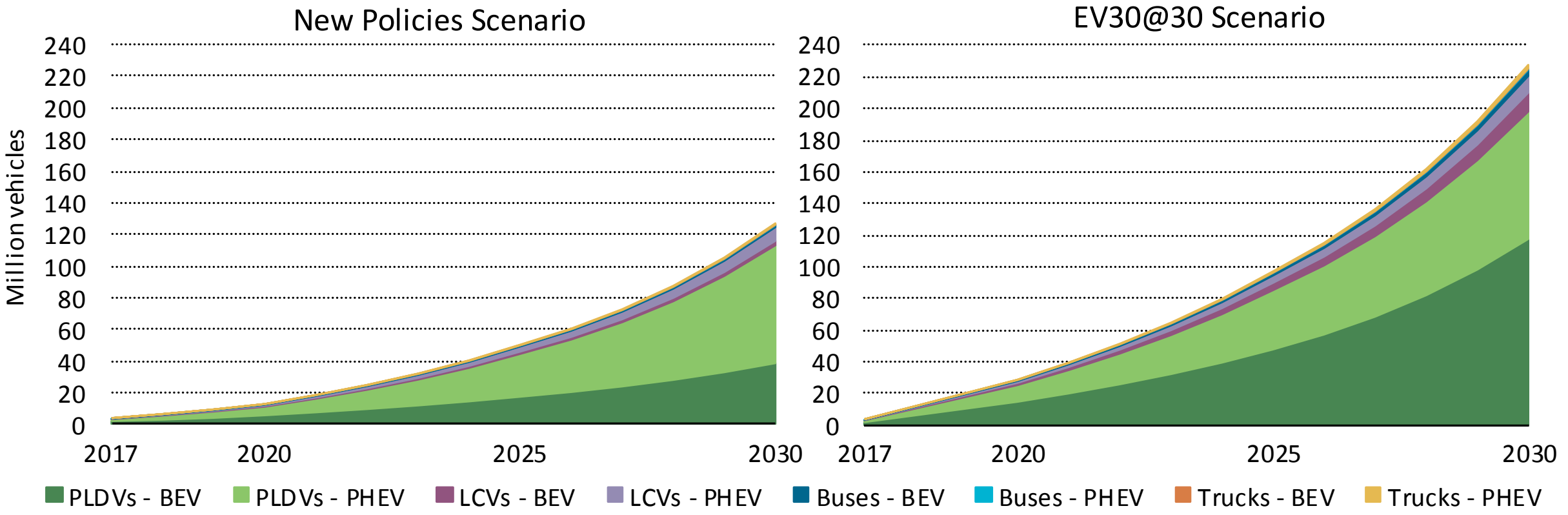
Buses



Electric buses travelling 40 000-50 000 km/year are cost competitive in regions with **high diesel taxation** regimes if battery prices are below USD 260/kWh

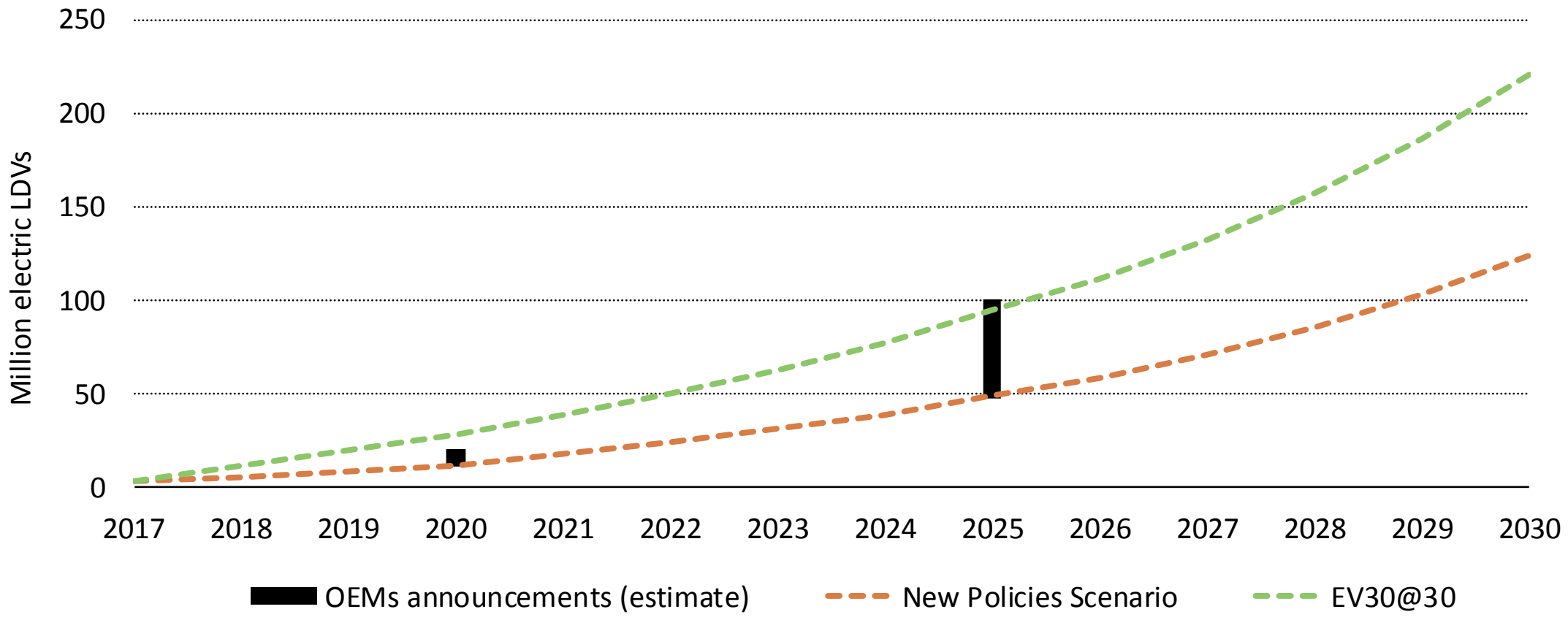
Outlook

Global EV deployment under the NPS and the EV30@30 scenario



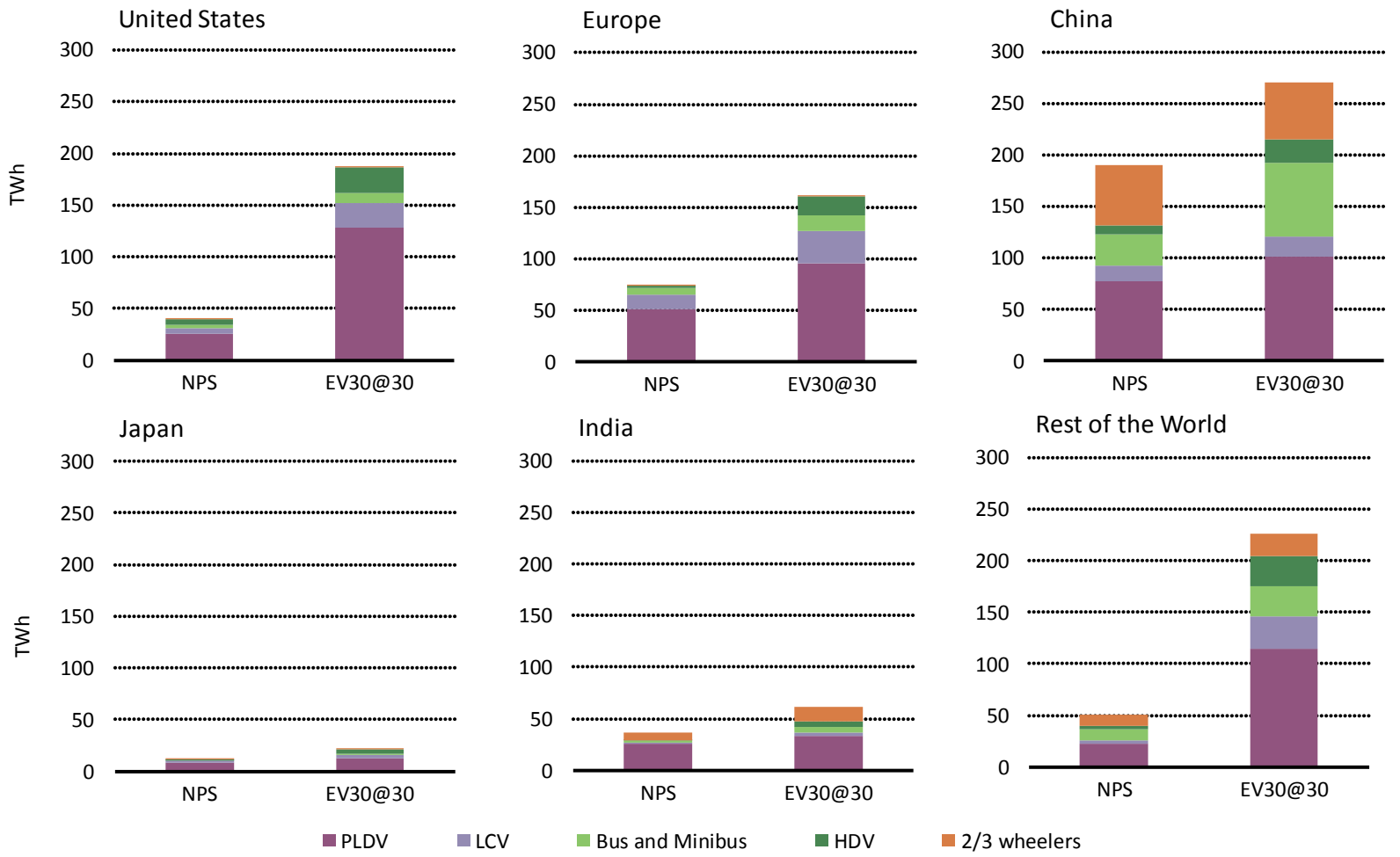
The EV30@30 Scenario sees almost 230 million EVs (excluding two- and three-wheelers), mostly LDVs, on the road by 2030. This is about 100 million more than in the New Policies Scenario

Benchmarking scenario results against OEM targets for PLDVs



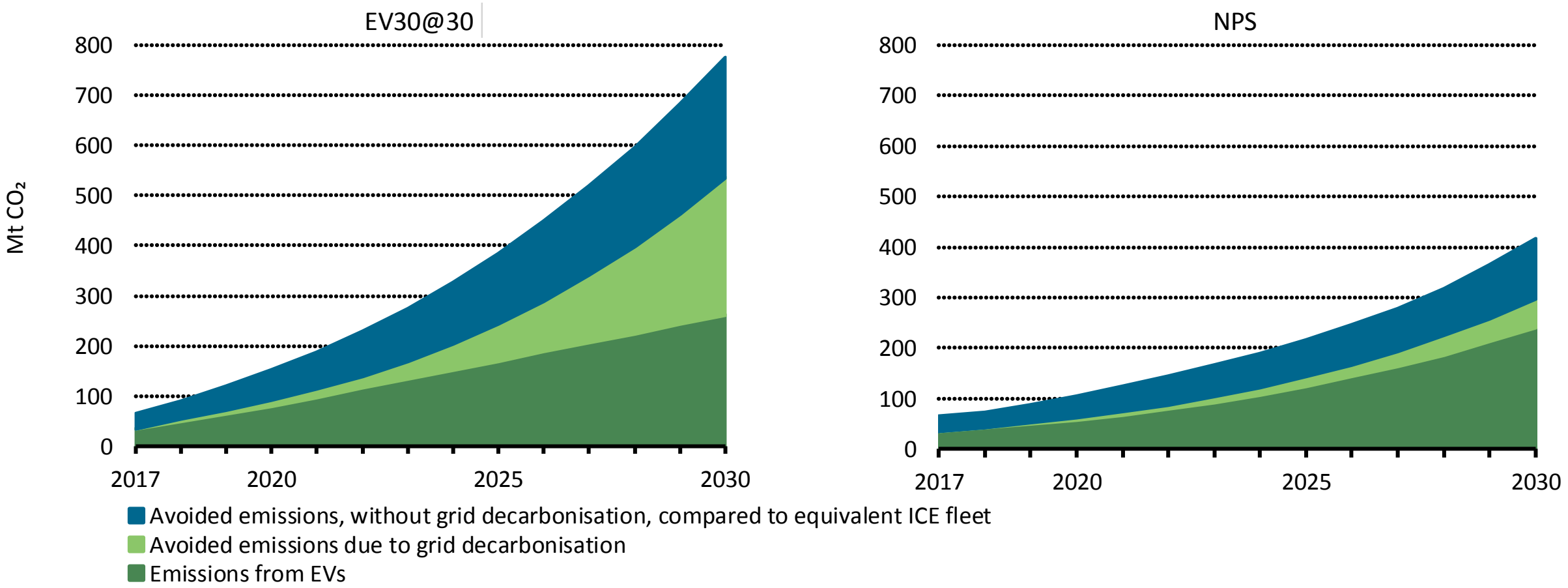
Estimates based on manufacturers' projections suggest an uptake of electric LDVs ranging in-between the New Policies and the EV30@30 scenarios by 2025

Power demand projections



Two-wheeler and bus electricity demand make China the highest consumer of electricity for EVs in both scenarios. In the EV30@30 Scenario, electricity demand for EVs is more geographically widespread

GHG emissions



In 2030, CO_2 emissions associated with the use of EVs is lower than those of equivalent ICE vehicles at a global scale, even if electricity generation does not decarbonise from current levels

Policies favouring the transition to electric mobility

- Carbon pricing of fuels
- Public procurement
- Bridging the price gap
- Emission regulations/fuel economy standards
- Local initiatives to regulate access
- Complementing fuel taxes with road pricing
- Supporting the roll out of private and public chargers
- Achieving demand- and business-driven EVSE development
- Ensuring that EVs are effectively integrated in the electricity grid
- Managing changes in material demand from EV batteries
- Managing the battery end-of-life treatment

Focus on local initiatives (vehicle uptake)

- Public procurement
  - Co-benefits for municipalities and businesses:
    - → Bulk purchase reduces units costs
    - → Helps mobilizing interest from the auto industry
    - → Kick-starts charger deployment
  - Benefits for the public:
    - → Demonstrates the technology to the public, makes EVs familiar in the daily environment
    - → Facilitates charger roll-out and the emergence of publicly accessible infrastructure
  - Relevance for buses
- Setting targets
- Regulating access
  - Low-emission zones: complementary to national-level targets and bans, easier to implement, they can have significant impacts
  - Concerns over “clusterizing” the market: harmonized labelling can provide clarity to both consumers and OEMs
- Supporting/regulating the deployment of chargers
- Integrating electrification with Mobility as a Service