Global EV Outlook 2017

Two million electric vehicles, and counting

Pierpaolo Cazzola

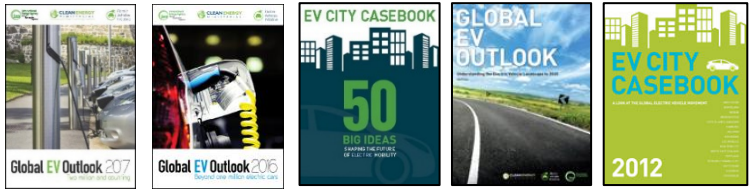
Launch of Chile's electro-mobility strategy
Santiago, 13 December 2017

IEA

Electric Vehicles Initiative (EVI)

- Government-to-government forum comprising 13 countries

- Currently co-chaired by Canada and China, and coordinated by the IEA
- Released several analytical publications (Global EV Outlook, City casebook)



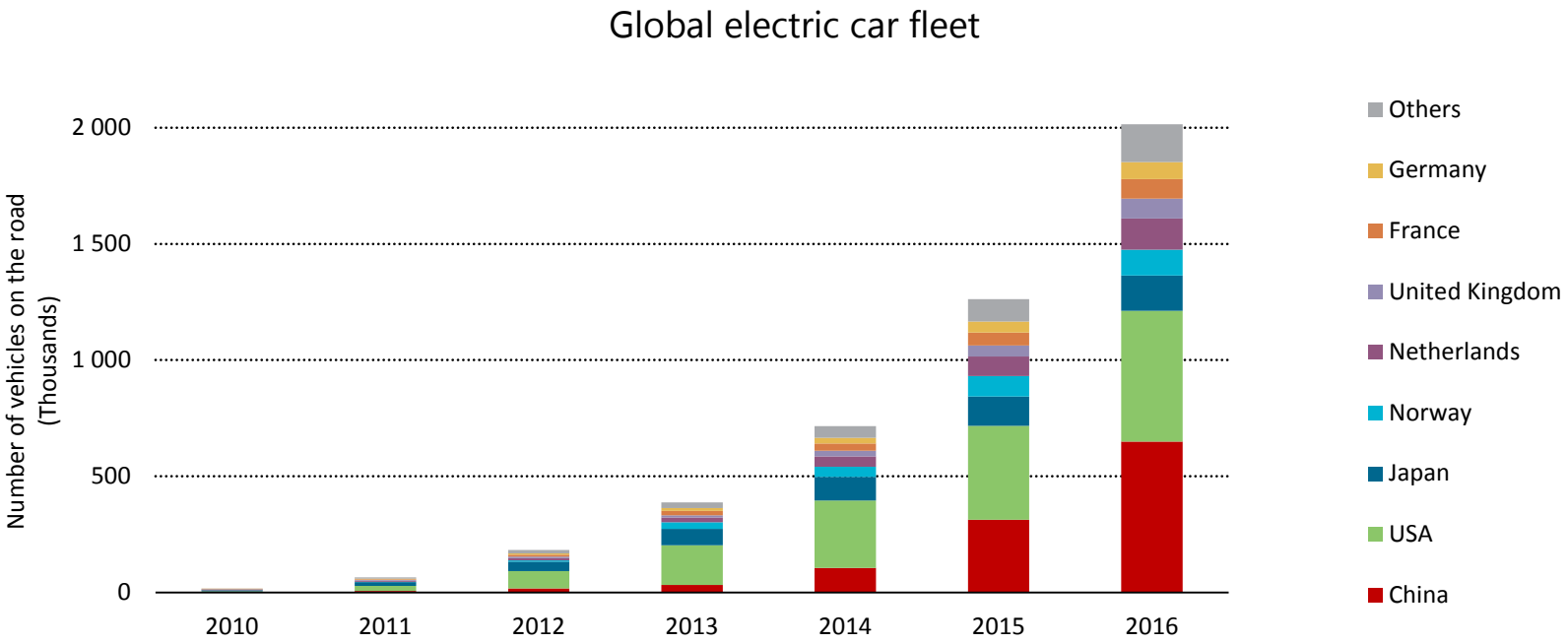
- Engaged stakeholders in high-level roundtables (CEM8 and Pilot City Forum in Beijing, June 2017)
- Instrumental to mobilize action and commitments (Paris Declaration on Electro-Mobility and Climate Change at COP21, Government Fleet Declaration at COP22)
  - **Just launched the EV30@30 Campaign** (aim for a 30% market share for EVs by 2030)

Global EV Outlook 2017

- Annual EVI report drafted at IEA
  - Data reporting (EV stock, sales, EVSE, battery costs)
  - Policy analysis and TCO assessment
  - CO_2 impact and role of EVs in low carbon scenarios (2030 timeframe)
  - Insights on grid integration

- (next reports: Nordic EV Outlook, Global EV Outlook 2018)

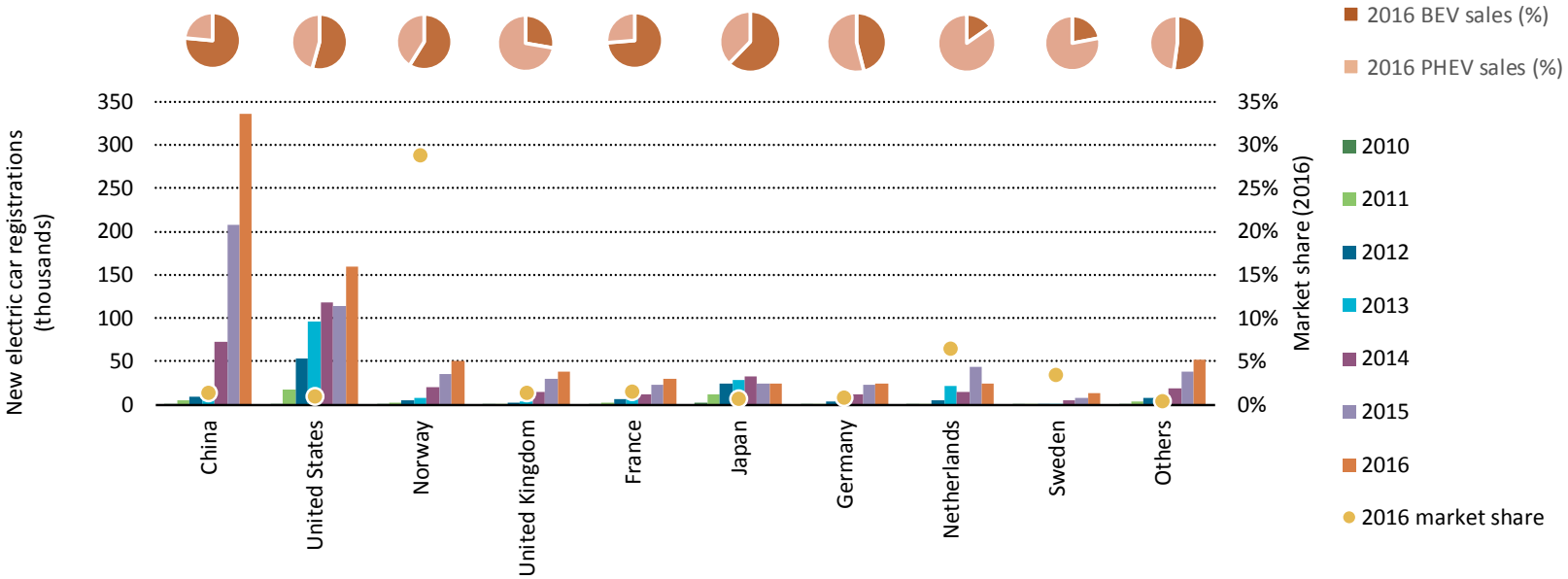
Electric mobility is breaking records, but policy support remains critical



The global electric car fleet reached 2 million units in circulation last year, but sales growth went from 70% in 2015 to 40% in 2016, suggesting an increasing risk of falling off track

New electric car registrations reach 750 000 units in 2016

Electric car sales, market share, and BEV and PHEV sales shares in selected countries, 2010-16



95% of global electric car sales in 2016 took place in 10 countries, and 6 countries had a market share above 1%: Norway, Netherlands, Sweden, France, United Kingdom, China

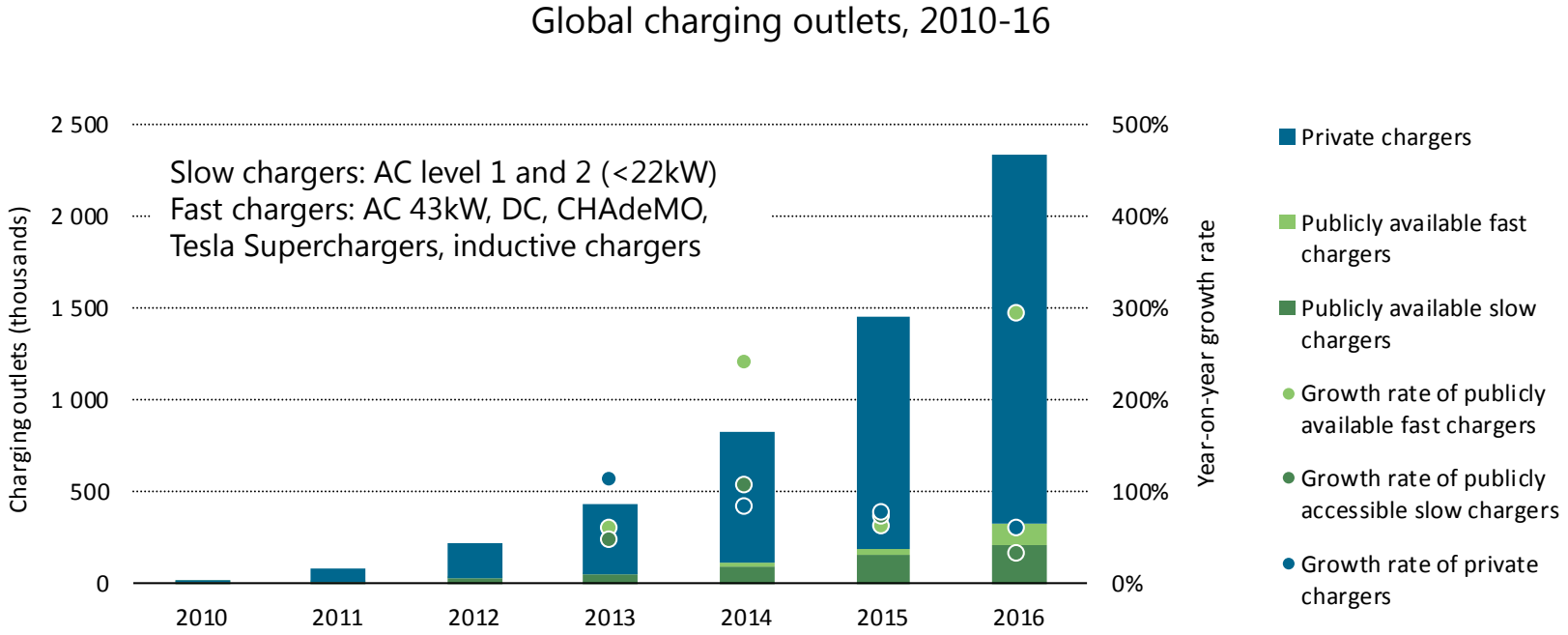
Electric car sales are correlated to changes in EV policies

BEV and PHEV changes in incentives in a selection of countries, 2016

Country	2015 vs. 2016 policy developments		2015 vs. 2016 sales growth		2016 sales	
	BEV	PHEV	BEV	PHEV	BEV	PHEV
China	~		75%	30%	257 000	79 000
United States	~		22%	70%	86 731	72 885
Norway	~	↗	6%	164%	29 520	20 660
United Kingdom	~		4%	42%	10 509	27 403
France	~		26%	36%	21 758	7 749
Japan	~		48%	-34%	15 461	9 390
Germany	~		-6%	20%	11 322	13 290
Netherlands	~	↘	47%	-50%	3 737	20 740
Sweden	~	↘	0%	86%	2 951	10 464
Canada	~		19%	147%	5 220	6 360
Denmark	↘		-71%	-49%	1 218	182
South Korea	~		75%	-40%	5 099	164

Changes in electric car incentives, especially for vehicle purchase, can have an immediate and sizeable impact on electric car sales and steer the market towards either BEV or PHEV preference.

EVSE deployment rates were higher than e-car adoption rates in 2016



Publicly accessible infrastructure is growing to support the emerging EV market, especially publicly accessible fast chargers. This shows encouraging signs in addressing the *chicken-and-egg* issue.

E-mobility is also gaining ground in non-car modes; China leads the way

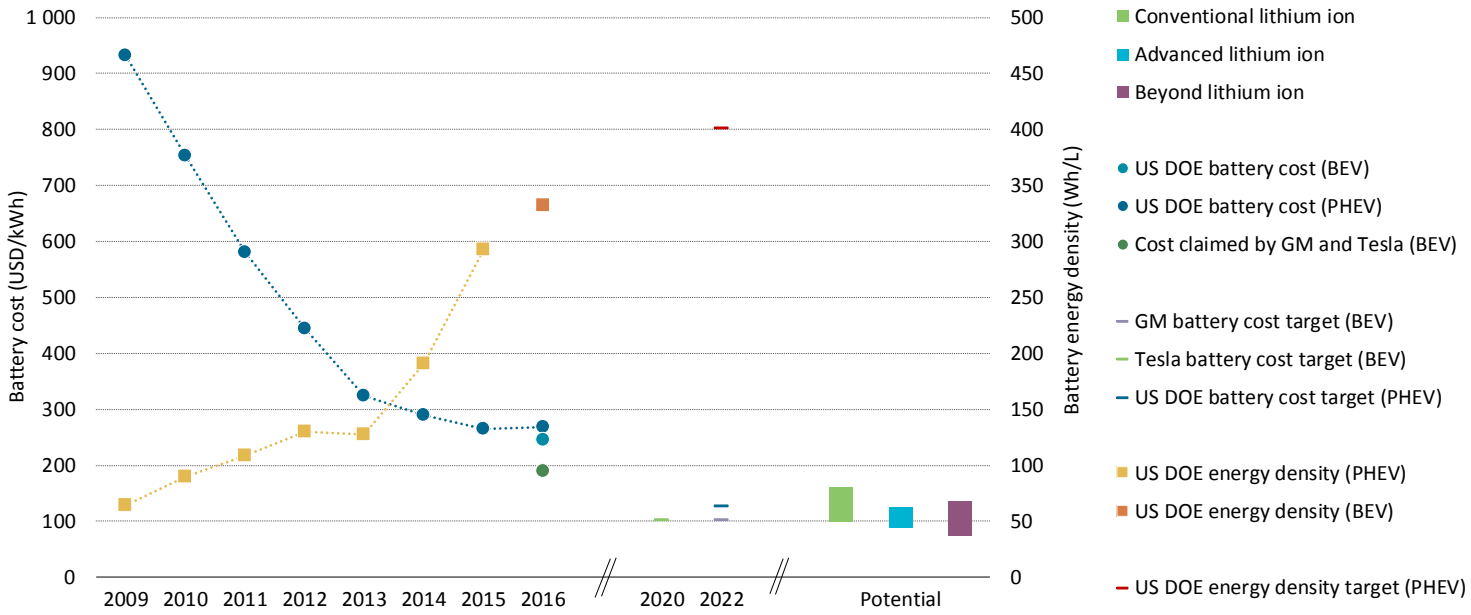
Electric 2-wheelers: > 200 million, mainly in China.
In other countries: ~200 000 in India, ~30 000 in the Netherlands, ~1 000 in the UK

Low-Speed Electric Vehicles: ~4 million in China

Electric buses: 350 000 in China.
In Europe: deployment stage and ambitious procurement plans

Battery costs and range as key factors for the success of e-mobility

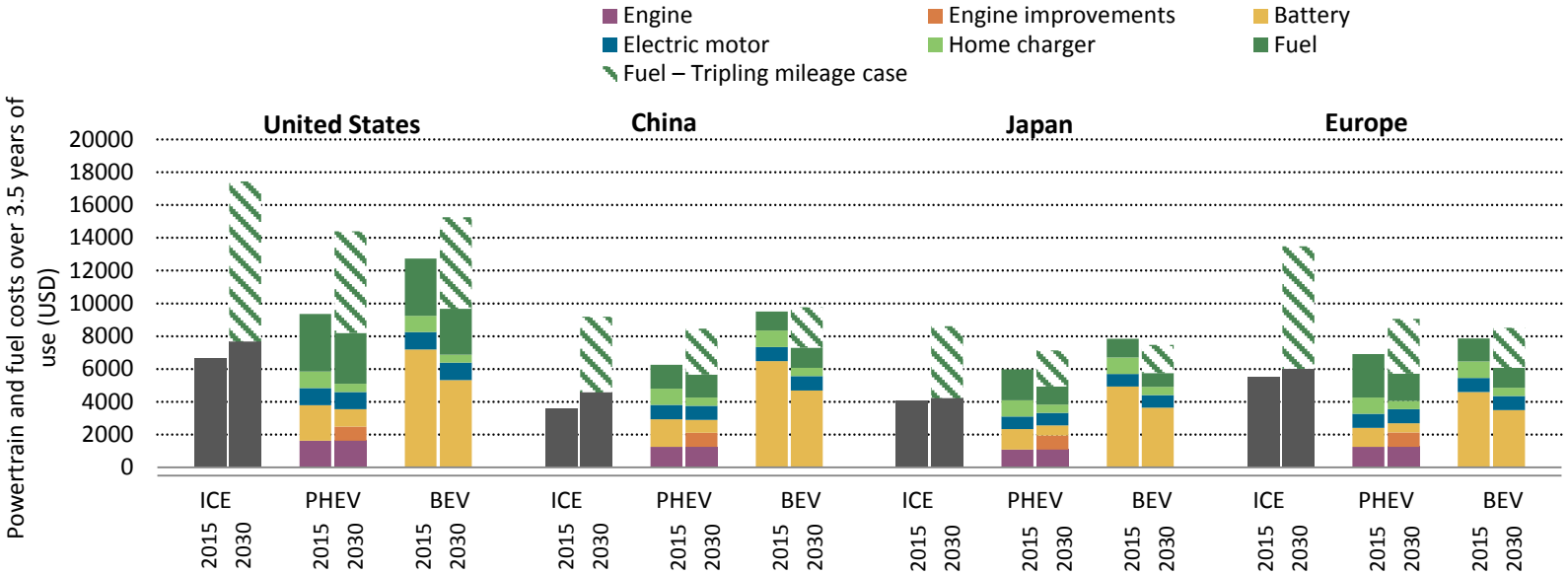
Evolution of battery energy density and cost, 2009-16, and future prospects



Battery costs and energy density progresses are expected to keep delivering positive outcomes. This will further help lowering adoption barriers.

Cost-competitiveness prospects and policy needs

Comparative cost of passenger car technologies by country/region in the 2DS, 2015 and 2030

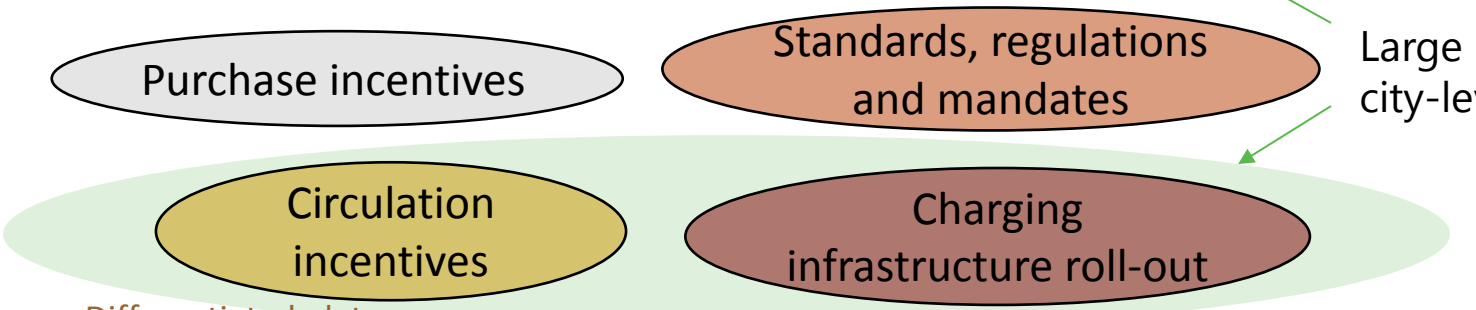


Achieving cost-competitiveness over the next decade will require policy instruments to allow market scale-up, reflect the cost of externalities of ICEs, and encourage synergies with new mobility models.

EV support policies

- CO_2-based, technology-based differentiated taxation and rebates
- Feebates
- VAT exemptions
- …

- Fuel economy standards
- Zero emission vehicle (ZEV) mandates
- Fuel taxes
- Public fleets, taxi fleets initiatives
- …



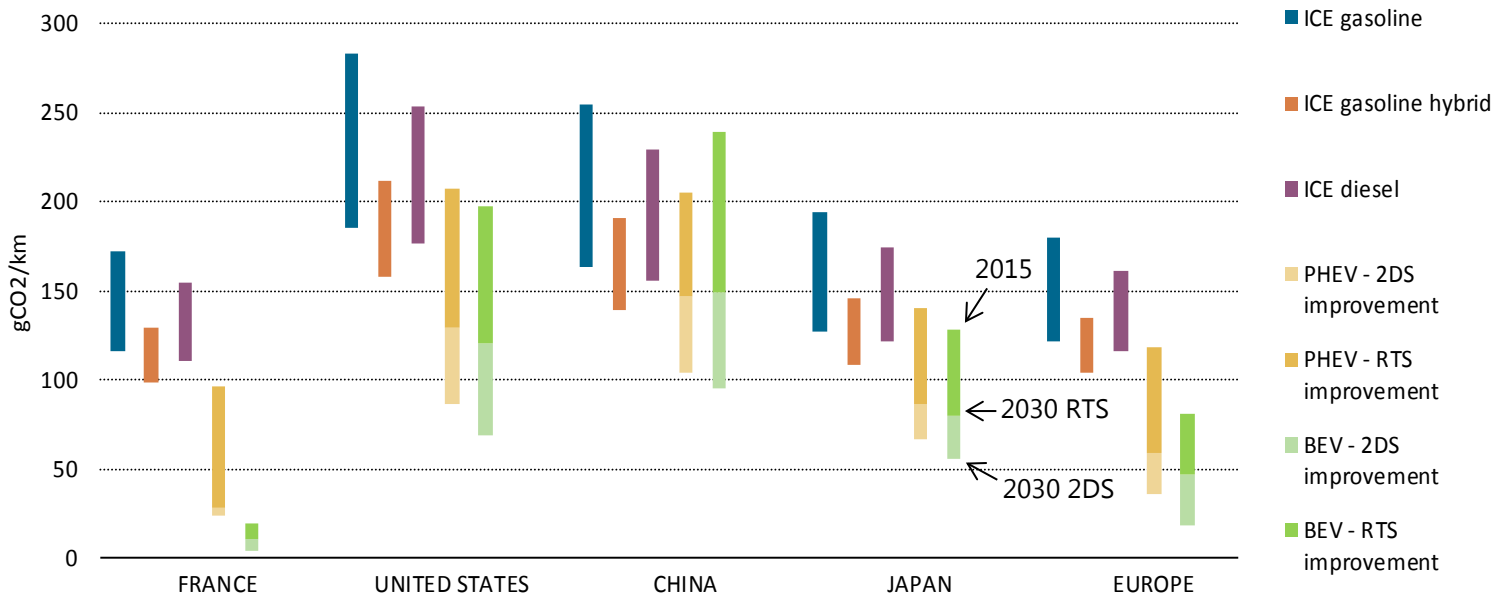
- Differentiated plates
- Access to bus lanes
- Free/dedicated parking
- Circulation/congestion charge exemption
- …

- Direct public investment
- Public-private partnerships
- Charger standards harmonization
- Fast and slow charging network planning
- …

Close monitoring of the effect of EV support policies are paramount to avoid adverse effects

EVs benefit the environment and are essential to CO_2 emissions reduction

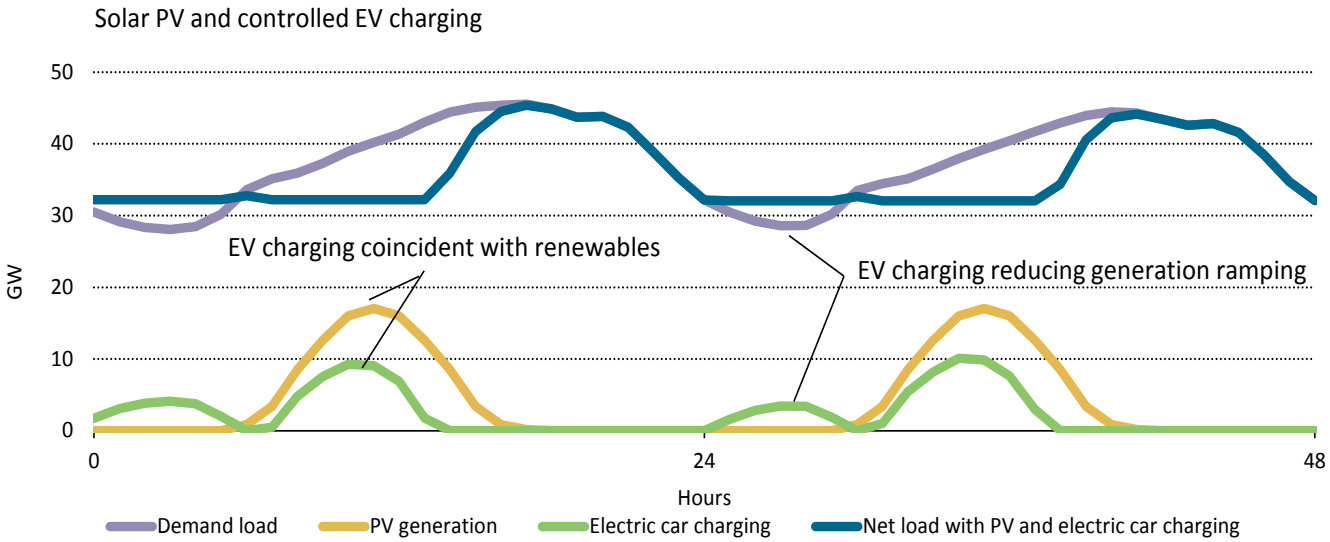
On-road WTW CO_2 emissions for various technologies by country/region, RTS and 2DS, 2015 to 2030



If coupled to low-carbon power, the high energy efficiency of EVs offers prospects for substantial CO_2 emissions reductions. This complements their air quality, energy security and noise reduction benefits.

Grid integration and synergies with variable renewables

Local demand profile and EV charging in the EU on a typical day, B2DS, 2030



Flexible charging will ensure minimal investment needs in grid reinforcements and optimized load synchronization with high shares of variable renewables.

Impacts on the grid? (slow vs. fast charging)

Slow charging:

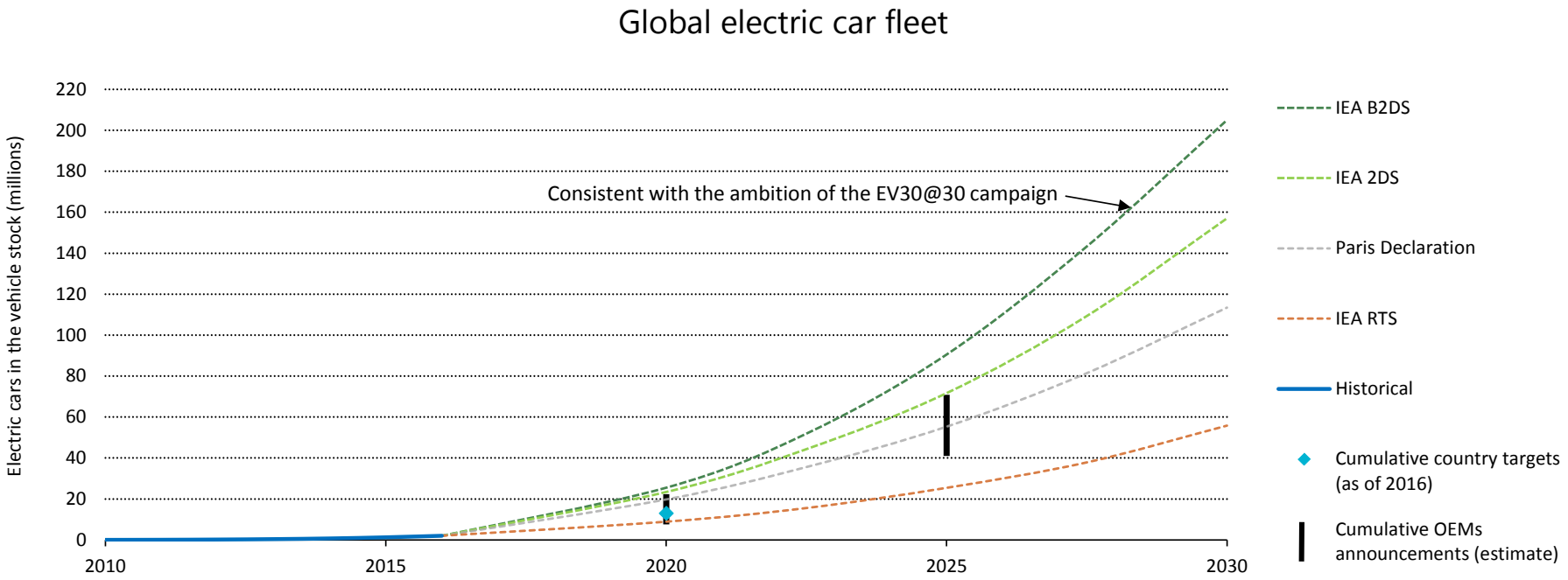
- Potential for flexibility through variable charging: requires price signal, demand-side management tools, but not necessarily “vehicle-to-grid” operations.
- Synergies with the integration of variable renewables

Fast charging:

- Potentially disruptive locally for distribution grids
- Does not offer flexibility
- Business model?
- However, fast charging is not likely to take place in the evening demand peak (home chargers are slow chargers)

The availability of slow and fast chargers must make EV charging easy and convenient to customers, but this deployment must be made in the most cost-effective way possible.

Prospect for EV uptake in different scenarios



EVs will be needed to meet sustainability goals, as suggested by the EV30@30 campaign target. Early action, active government support and industry commitment are essential.