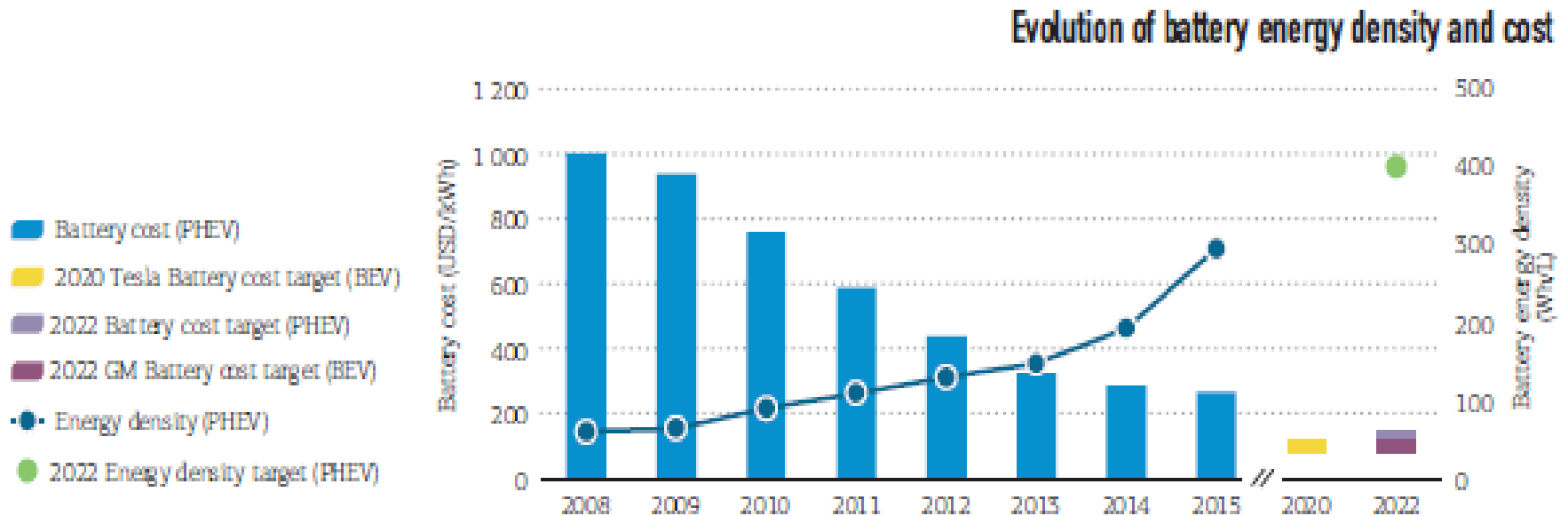




Mass electrification of the vehicle fleet: overcoming obstacles to ambitious roll-out

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Context – The good news..



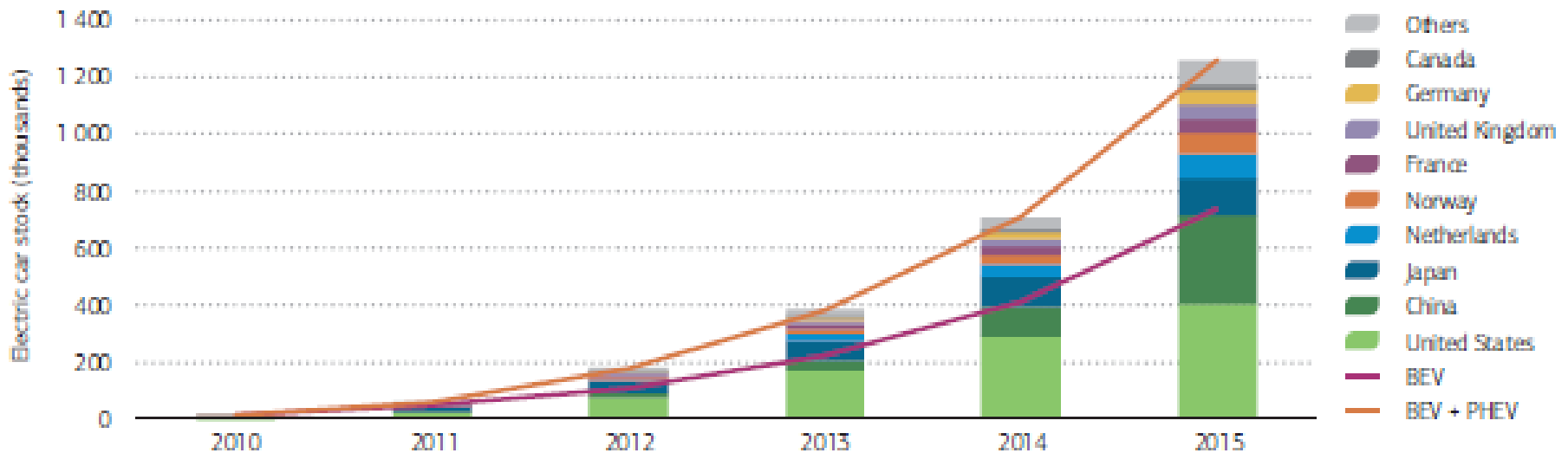
IEA, 2016

Significant hype around electric vehicles.

Past trends and company announcements suggest EVs could be capable of mass market penetration during 2020s

Context – The good news..

Evolution of the global electric car stock, 2010-15



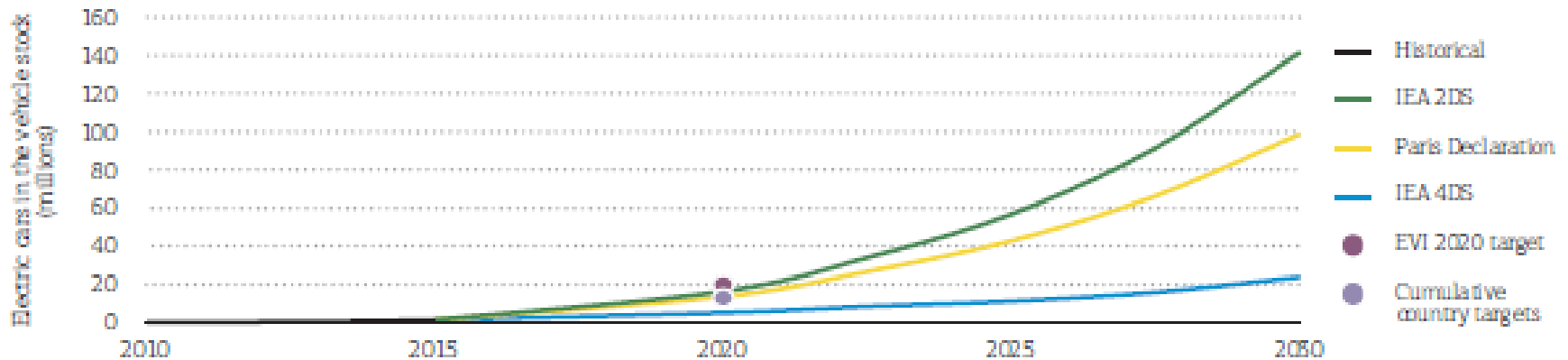
Key point: The uptake of electric cars has been growing since 2010, with a BEV uptake slightly ahead of PHEV uptake. 80% of the electric cars on road worldwide are located in the United States, China, Japan, the Netherlands and Norway.

IEA, 2016

A global dynamic, with strong growth in China and US, among others
Responds to numerous policy objectives for governments

Context – The scale of the challenge

Deployment scenarios for the stock of electric cars to 2030



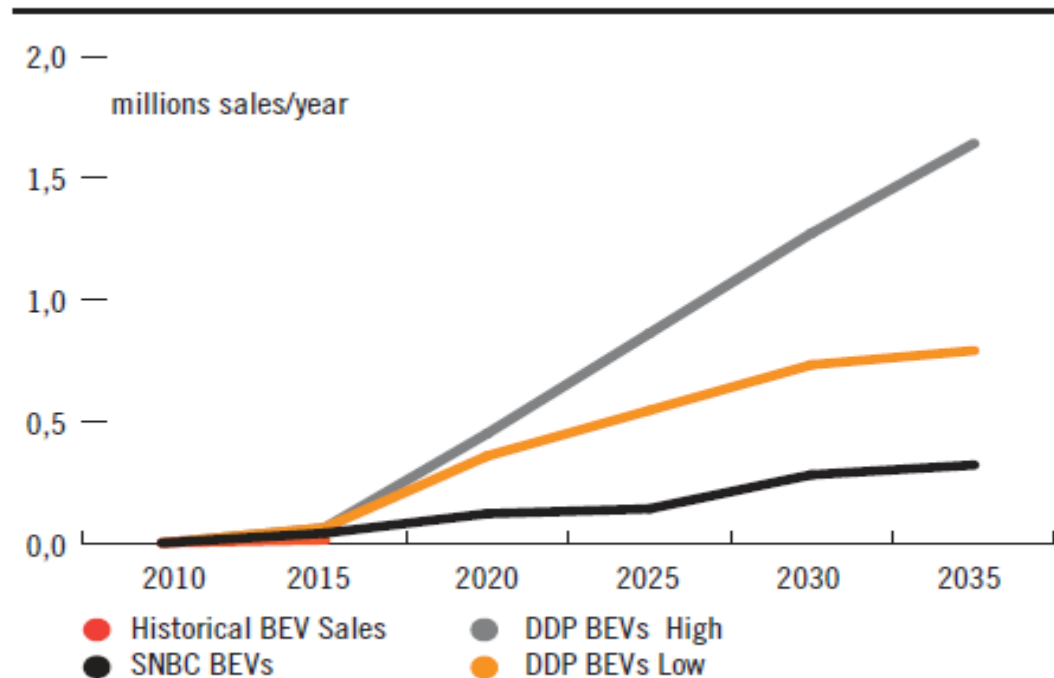
Key point: Individual country commitments would bring 13 million electric cars on the road by 2020. The EVI aims at a deployment of 20 million electric cars by 2020. In both cases, reaching 2020 deployment targets for BEVs and PHEVs requires a sizeable growth of the electric car stock. Meeting 2030 decarbonisation and sustainability goals requires a major deployment of electric cars in the 2020s.

IEA, 2016

Very rapid scale up requirement before and during 2020s to significantly decarbonise transport in line with Paris Agreement / 2DS.

Context – The scale of the challenge

Figure 1. BEV sales scenarios

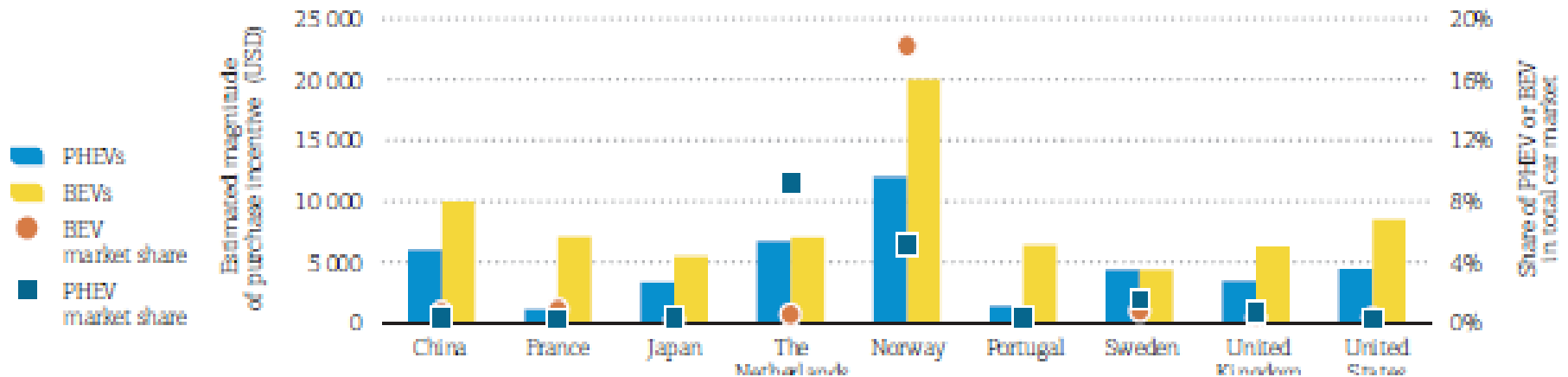


Source: IDDRI based on data from DDPP, MEDEM,¹ Automobile-propre.com

Similar story in France...

Current barriers to faster EV roll out in France

Estimates of purchase incentives and market shares for electric cars (BEVs and PHEVs), 2015



France, like a handful of other OECD countries (and China), has generous subsidies for EVs

- E.g; éco-bonus + super bonus + bonus-malus on ICE vehicles.

But other barriers remain..

Policy needs to focus on removing these other barriers (not just subsidies).

Insufficient charging infrastructure

Absence of conveniently located charging stations limits attractiveness of EVs.

Depending on circumstances, 1 to 8 hour charge for L2 charging station.

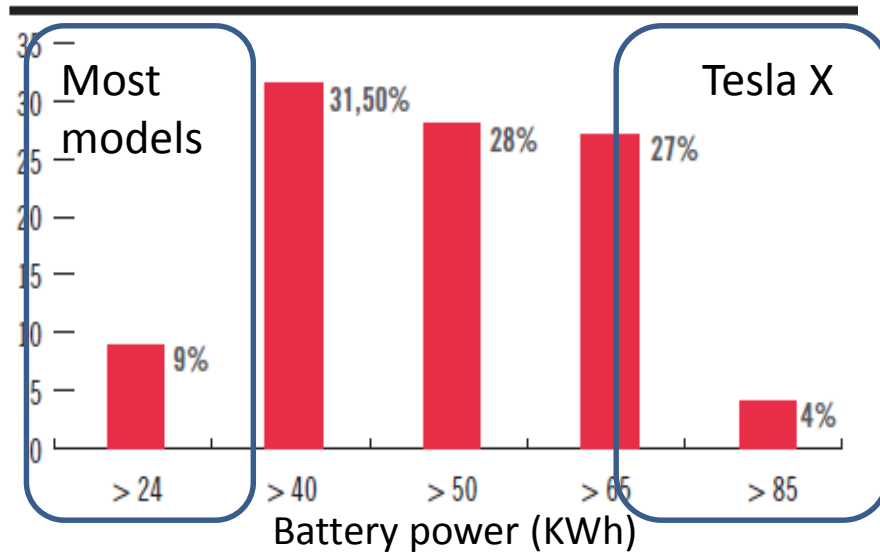
Conveniently located often means next to home or work.

Raises three issues:

- Where to place charging stations?**
- Who owns/pays for charging stations?**
- How to optimise roll out and use of public charging stations?**

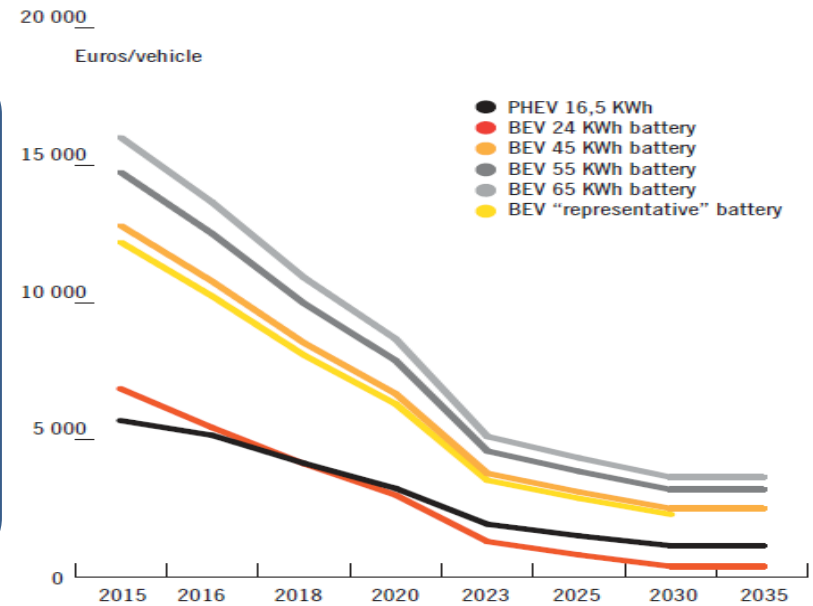
Limited vehicle choice

Figure 5. Battery sizes that may be necessary to meet performance requirements (as % of vehicle sales)



Source: IDDRI

Figure 4. Incremental purchase cost of BEV and PHEV vehicle purchase with different battery sizes

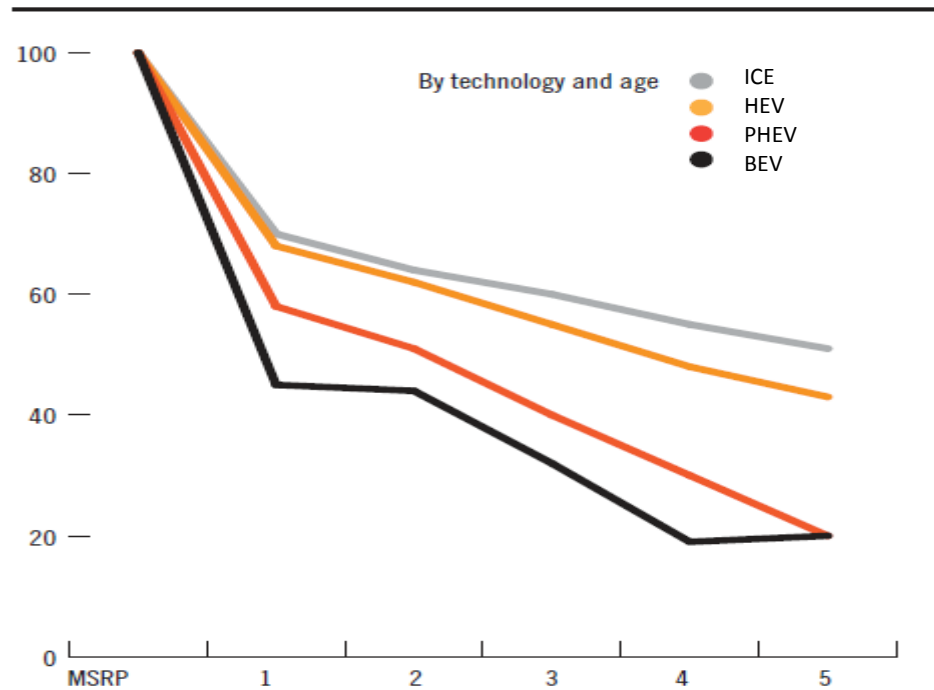


Needs to be a market for vehicles that are neither small urban vehicles or luxury sports cars

This will be helped by an overall decline in battery cost and size, rising costs of ICE. But issue of how to create diversity until then...

Residual value

Figure 13. How the residual value of EVs compares to ICEs



- Leasing of EVs currently faces significant challenges due to low residual value of vehicle...

Financing the move from niche to mass deployment

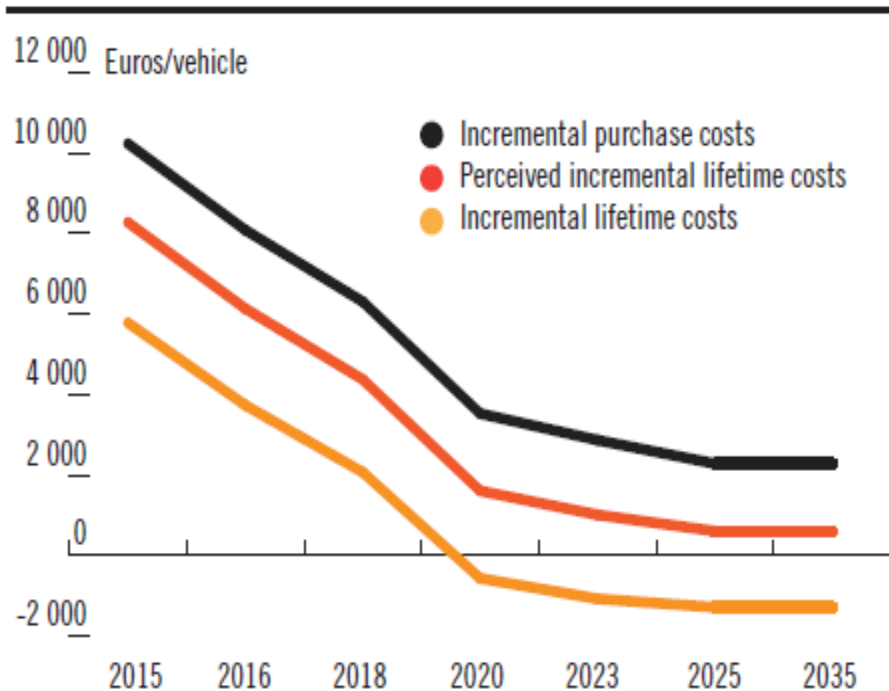
Given higher upfront costs of EVs, mass deployment is a significant financial challenge

How should this challenge be managed?

Key challenges for governments:

- Managing costs of subsidy schemes
- ICE Vehicle & fuel taxation
- Fuel tax revenue base erosion
- Distributional implications

Phase 1: Financing tech learning & create niche market



Source: IDDRI.

Objectives of this phase:

- Subsidise current incremental technology cost of EVs until costs plateau.

Key policy implications:

- Subsidise tech learning cost
- Gradually increase taxation/ regulation on ICEs / fuels
- Remove bottlenecks (see earlier)

Phase 1: Managing fiscal cost of support for mass roll out scenarios

Figure 7. Aggregate annual subsidy cost of scenario 1

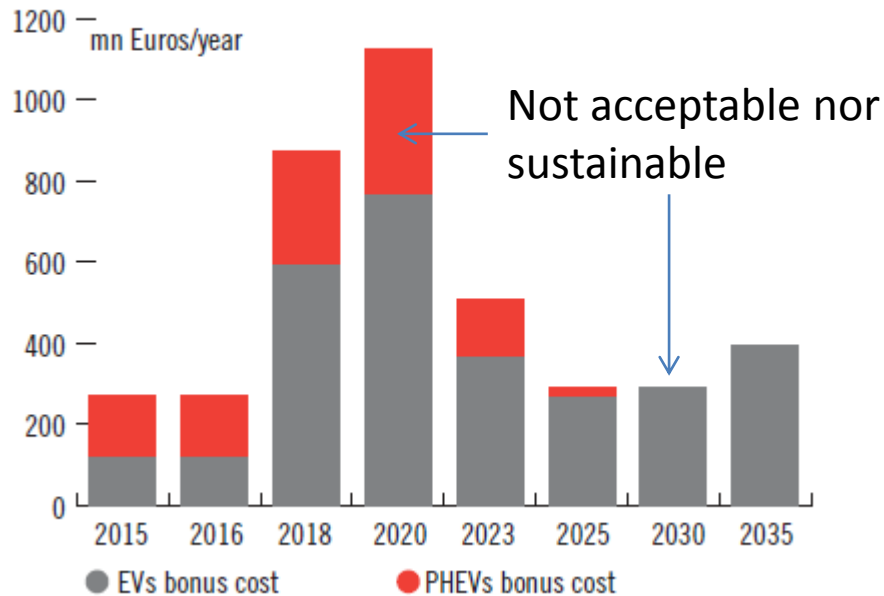
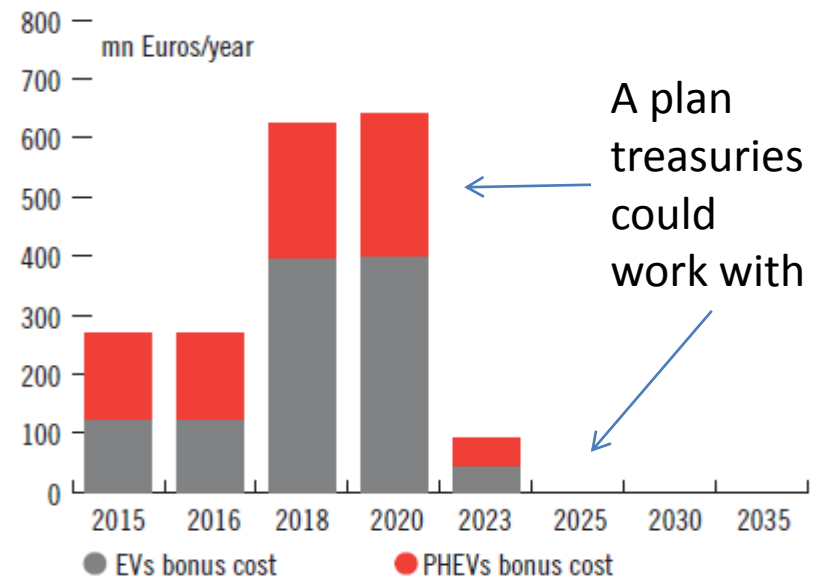


Figure 9. Aggregate annual subsidy cost of scenario 3



Source: IDDRI.

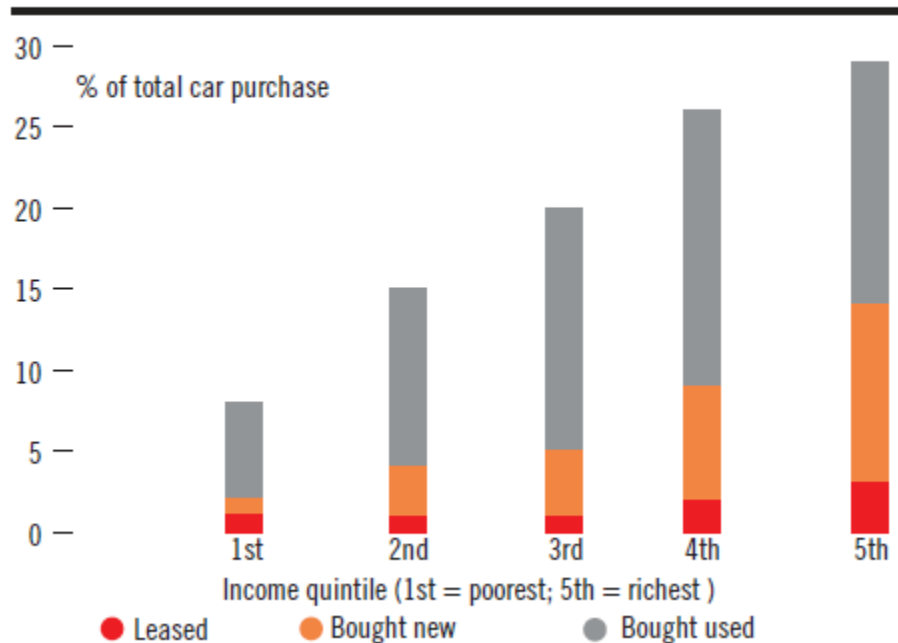
**NB Gross subsidy costs*

Important to only support tech learning cost & phase out quickly

Use other measures to limit and offset subsidy cost (e.g. deisel prices)

Phase 2: Get incentives right for mass-market uptake

Figure 11. Percentage of total vehicle purchases by income quintile



Key objectives:

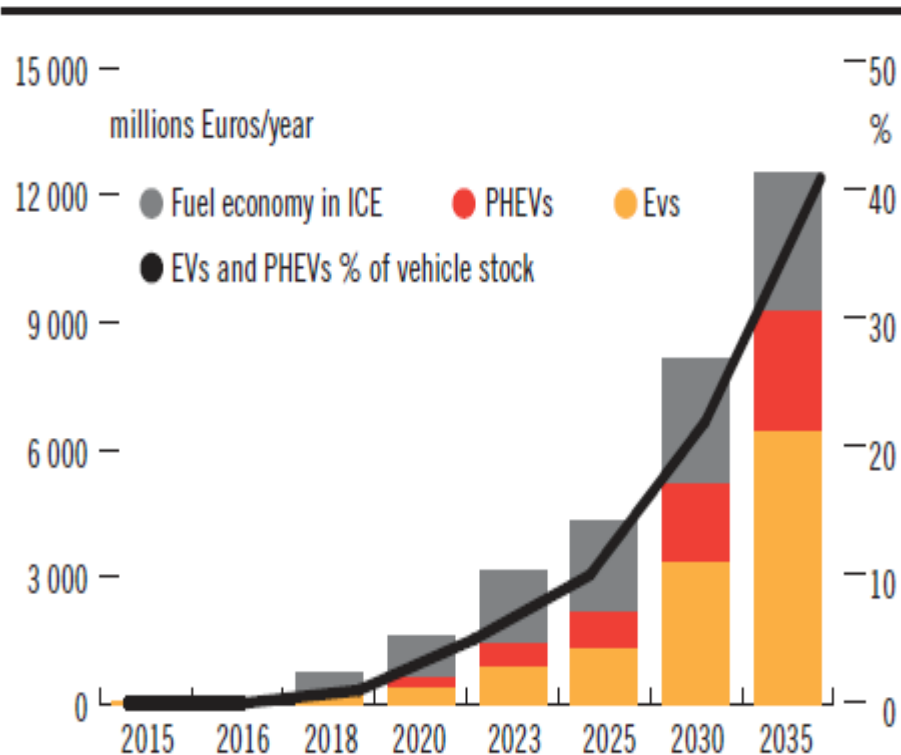
- EVs need to become attractive to broad range of households
- Limit unintended distributional impacts

Implications for policy

- Subsidies need to be phased out
- Incremental cost eliminated by higher taxes / regul. ICE and fuel.
- Create competitive credit/leasing markets
- Coordinate social welfare, roll-out support and tax policies

Phase 3: Managing consequences of phasing out of ICE vehicles

Figure 16. Foregone motor fuel tax revenues in France with rising EV penetration



Source: IDDRI.

Main objective

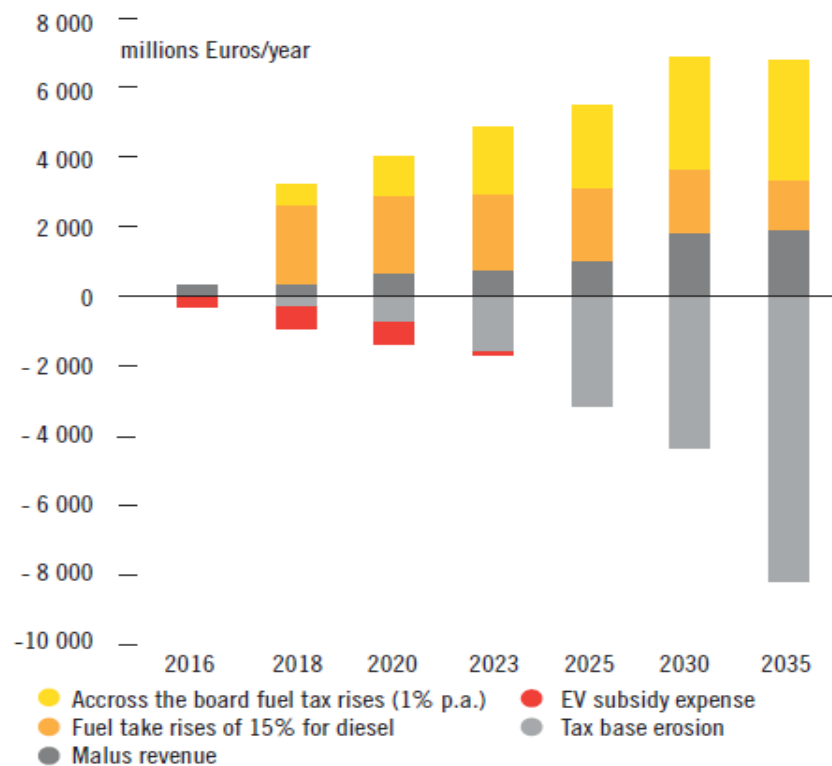
- Managing the consequences for governments of lower fiscal revenues from reduced ICE use;

Key policy implications

- Shifting tax burden gradually to other equivalently attractive alternatives
- A paradigm shift in medium term? (km-based charging?)

Need for a medium/LT fiscal strategy

Figure 17. Integrated analysis of fiscal impacts of the EV support strategy



Different fiscal issues have different time horizons.

The effectiveness of certain measures changes over time due to changes in the revenue base.

Need for anticipation and an integrated view

A 15c rise in diesel prices + 1% yr fuel tax increase would go a long way..