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

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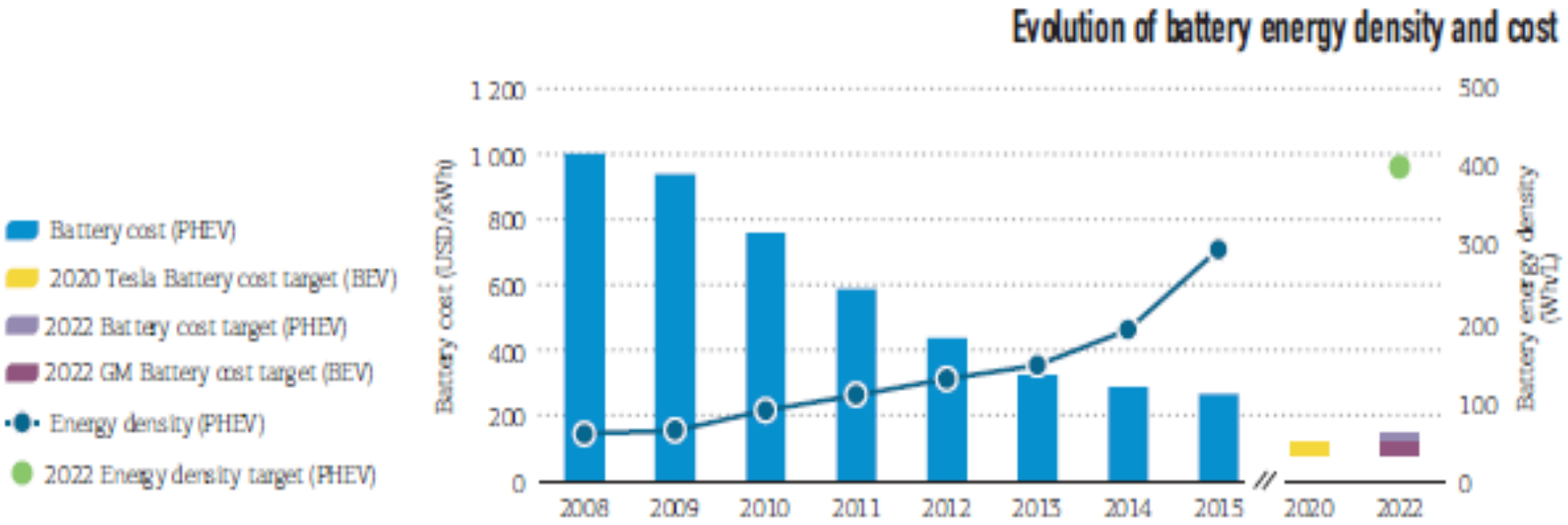
# Context – The good news..

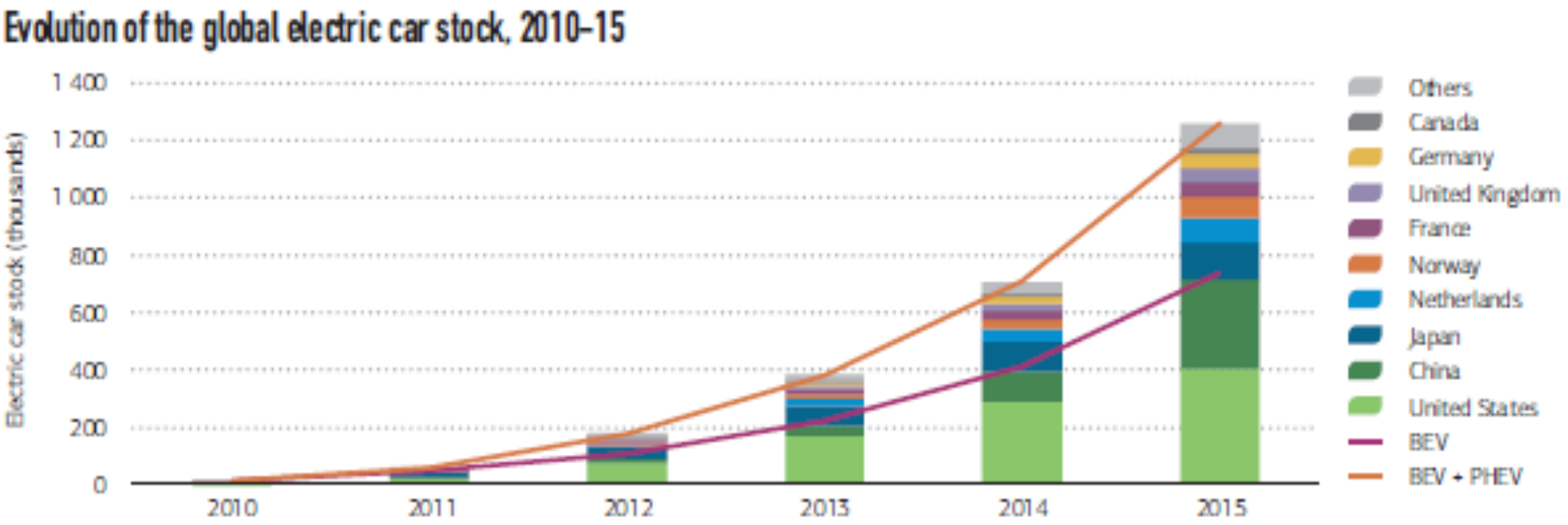



IEA, 2016

**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..




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.

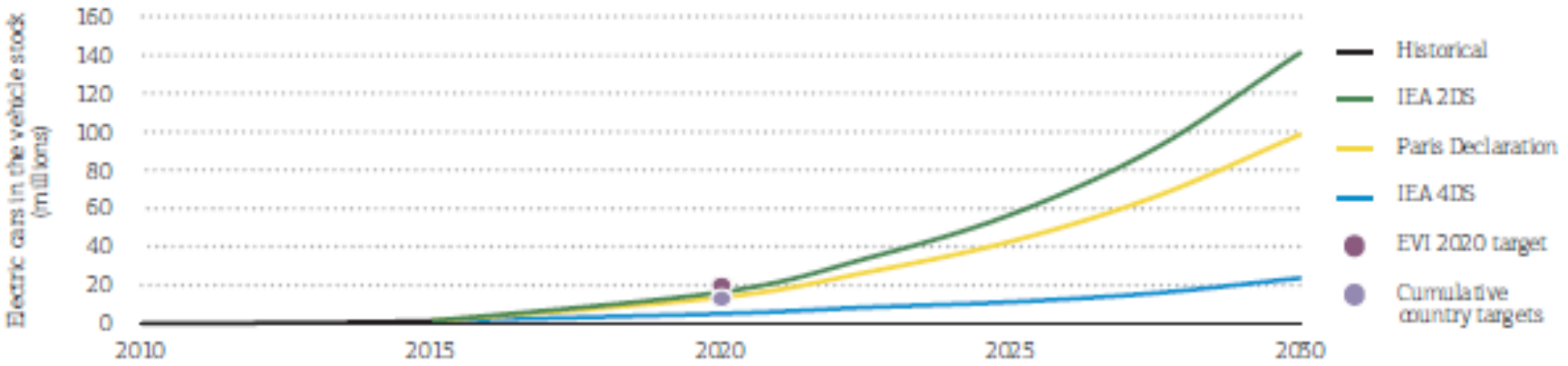
IEA, 2016

**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



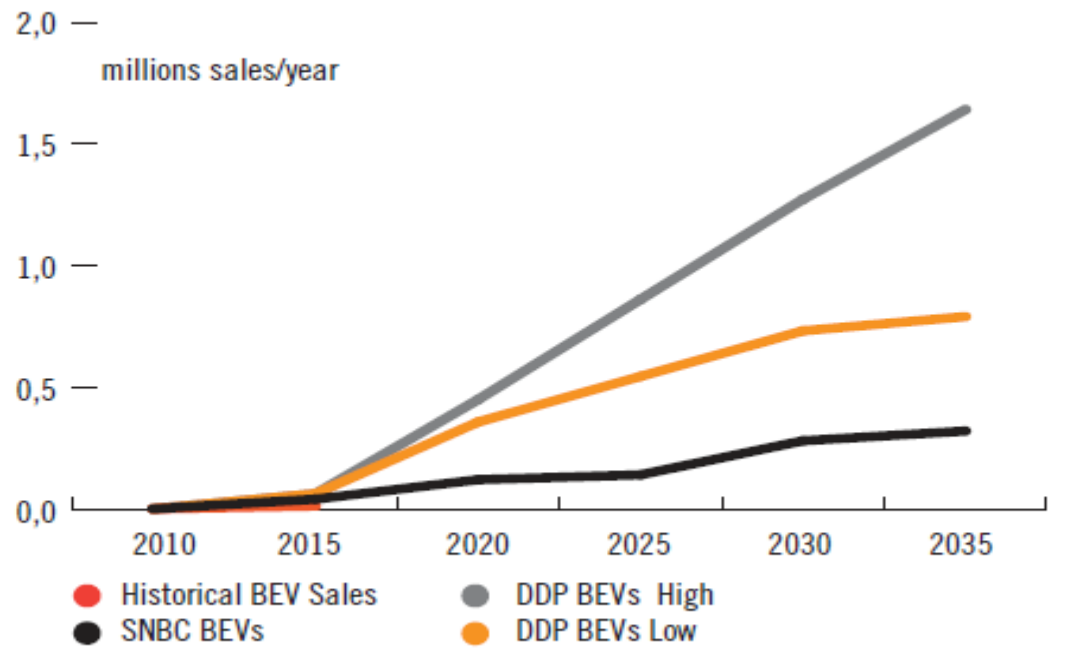

**Key point:** Individual country commitments would bring 13 million electric cars on the road by 2020. The EVI aims at a deployment of 20 million electric cars by 2020. In both cases, reaching 2020 deployment targets for BEVs and PHEVs requires a sizeable growth of the electric car stock. Meeting 2030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

IEA, 2016

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

# Context – The scale of the challenge

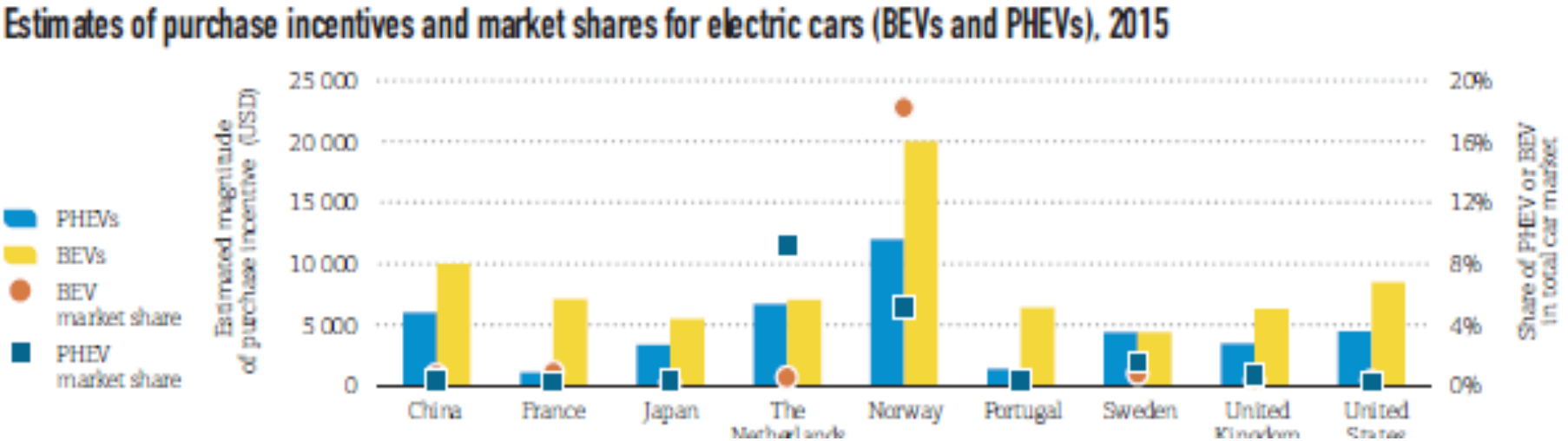
**Figure 1.** BEV sales scenarios




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




**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.**

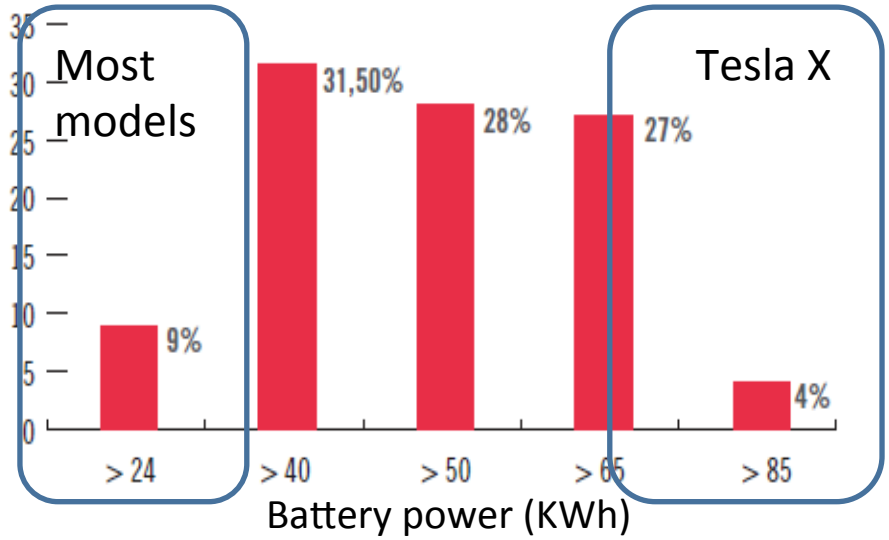
**Conveniently located often means next to home or work.**

**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?**

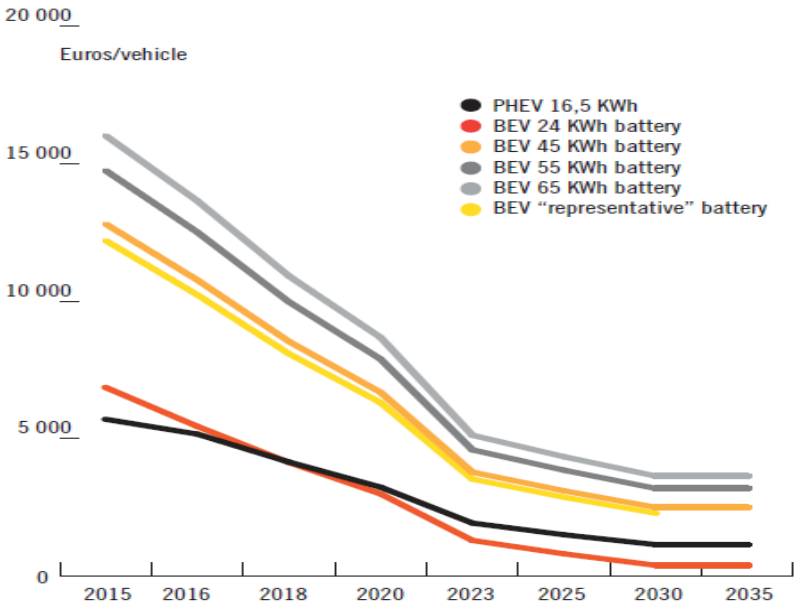
# Limited vehicle choice

**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

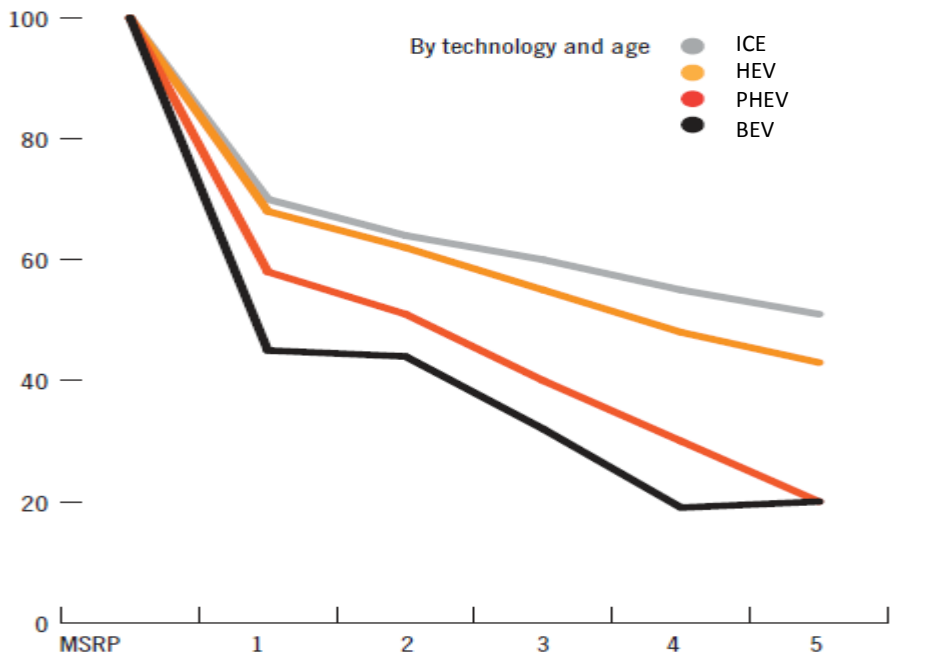



**Needs to be a market for vehicles that are neither small urban vehicles or luxury sports cars**

**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

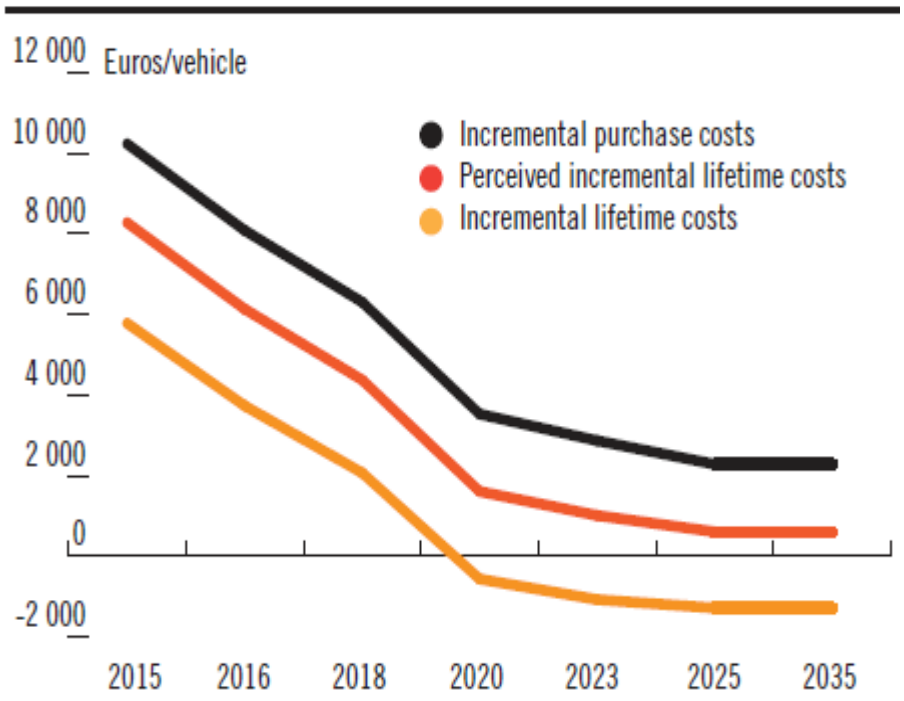
**Given higher upfront costs of EVs, mass deployment is a significant financial challenge**

**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

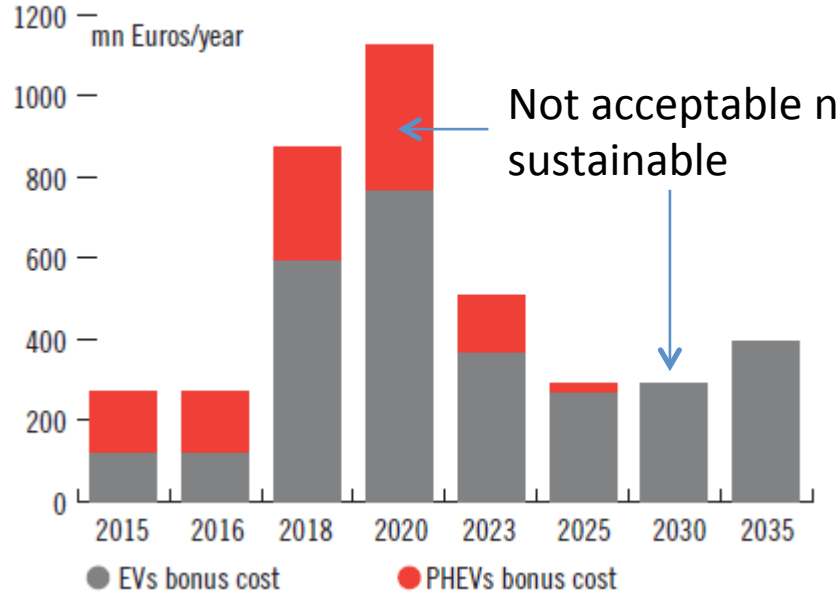
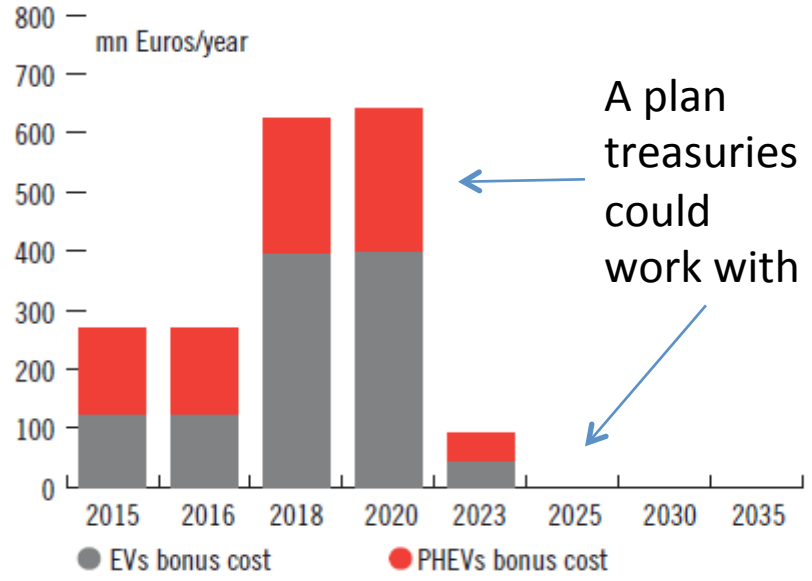



**Figure 9.** Aggregate annual subsidy cost of scenario 3




Source: IDDRI.

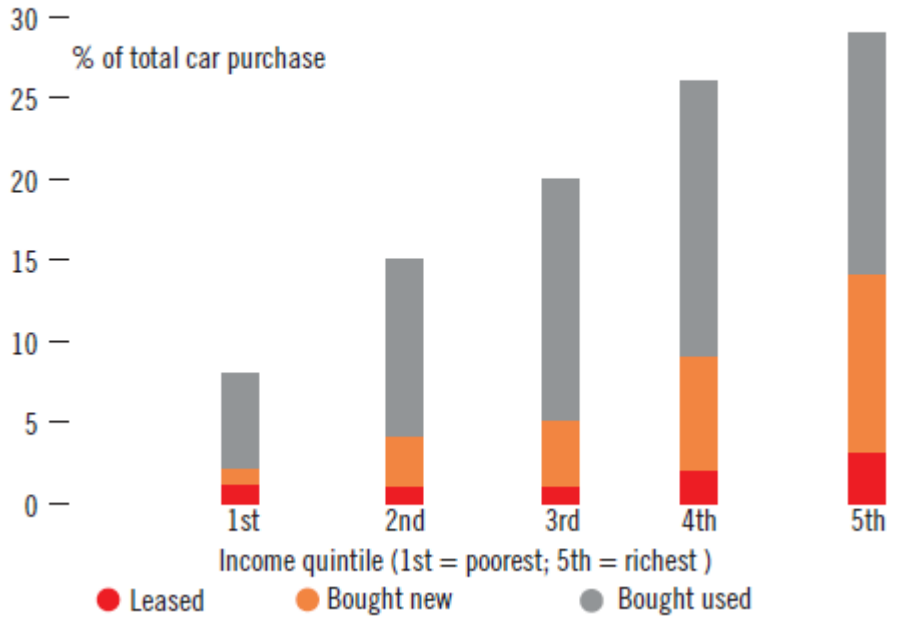
**NB Gross subsidy costs*

**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:**

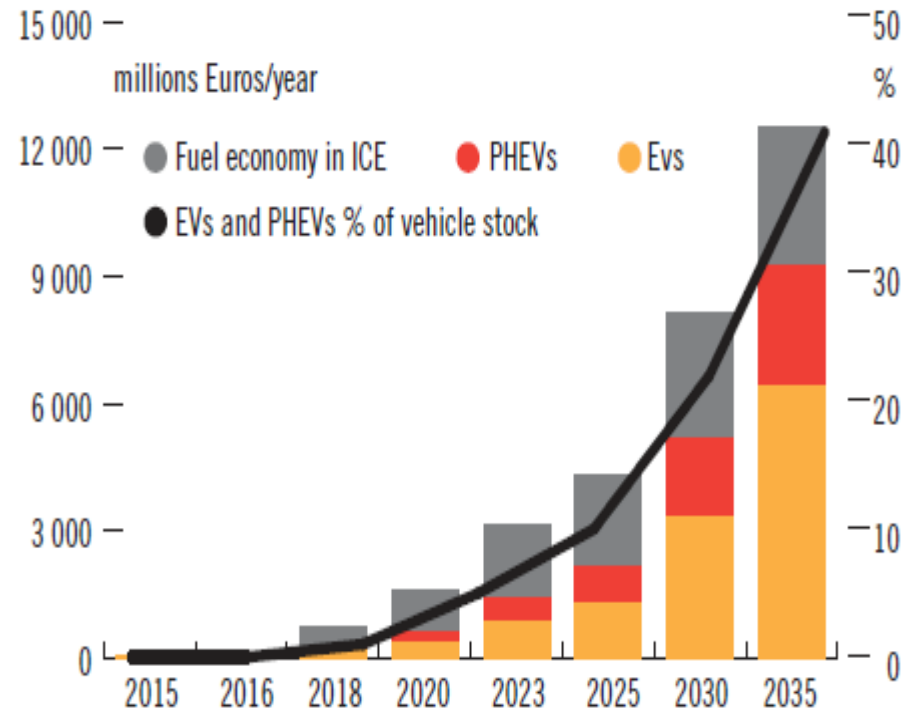
- **EVs need to become attractive to broad range of households**
- **Limit unintended distributional impacts**

**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**

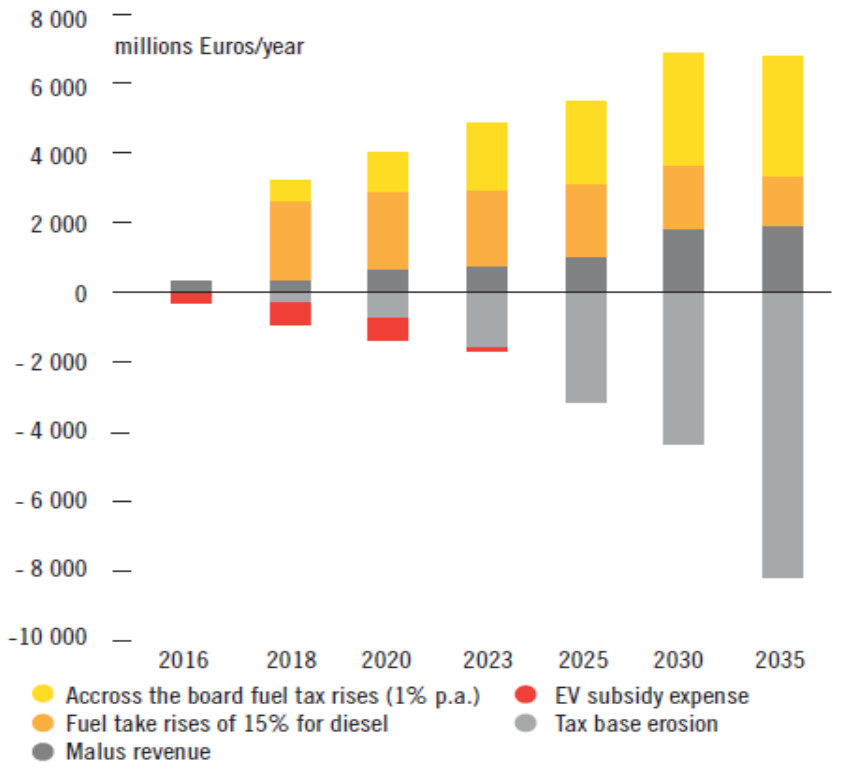
- **Managing the consequences for governments of lower fiscal revenues from reduced ICE use;**

**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..**