

A European perspective

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Regulatory drivers: US v EU

US

- Local air quality focus
- Right to access to cheap energy
- Global climate change responsibility not at the expense of US citizens
- Environment is responsibility of government and industry

EU

- Global air quality focus
- Energy rationing
- Global climate change responsibility
- Environment is individual responsibility

EU

Lagging behind in EVs, because:

Efficient diesel gives lower overall CO2 emissions for generating mix in most member states

Local air quality only a recent priority.

...despite some interesting experiments...



EV experiments & SNM*

- **La Rochelle** (F): experiment supported by PSA, involved issuing 50 citizens with EVs and providing charging points through the town
- **Mendrisio** (CH): experiment to turn the whole town into an EV-prioritised environment
- ...and several others.



*= strategic niche management

CO2 is the primary policy driver in the EU

EU CO2 Regulation History

- **1994**: proposal by then German minister *Angela Merkel* for 120g/km; Target date set for 2005
- **1996**: target date moved to 2010
- **1997**: Kyoto Protocol
- **1998**: ***voluntary agreement***: 140 g/km by 2008 (CEC-ACEA), 120 g/km target moved to 2012
- **2007**: 2012 target changed to 130 g/km
- **2007**: *weight-based* targets per manufacturer
- **2007**: *penalty* system proposed
- **1/9/2008**: EU parliament industry committee votes to postpone deadline to 2015
- **3/9/2008**: EU parliament environment committee votes for increasing penalties and speeding up phase-in
- **2009**: April, EU Regulation 443/2009
- **2012-2015**: introduction of 443/2009 culminating in 130g/km average for all new cars sold in EU by 2015
- **2020**: 95 g/km suggested by EU Commission

Industry's response

Make, Model	CO ₂ (g/km)	Powertrain/fuel
Citroën C3, DS3 1.6hdi	99	Diesel
Ford Fiesta 1.6 TDCi econetic	98	Diesel
Opel Corsa 1.3 CDTi 95 eco	98	Diesel
Peugeot 207 1.6 Hdi 90 FAP eco	99	Diesel
SEAT Ibiza 1.4 TDI ecomotive	98	Diesel
SEAT Leon 1.6 TDI ecomotive	89	Diesel
Smart Fortwo 0.8 cdi	89	Diesel
Toyota IQ 1.0	99	Petrol
Toyota Prius 1.8	89-92	Petrol-electric hybrid
VW Polo 1.2 TDI bluemotion	91	Diesel
VW Golf 1.6 TDI bluemotion	99	Diesel
Volvo C30 1.6 DRIVe start-stop	99	Diesel

But only 1 with electric drive

EV is still not seen as the obvious answer...

Loremo LS (Germany)

Fuel consumption: 1.5l/100km

CO2: 41g/km

Weight: 450kg

Fuel: Diesel (EV to follow)

Power: 20 PS

Top speed: 160 km/h

Chassis: aluminium

Body: PU



Gordon Murray Design (UK)

T25:
small 3-seater urban car
Small petrol engine (660cc)
Lightweight materials
Vehicle weight: 450 kg

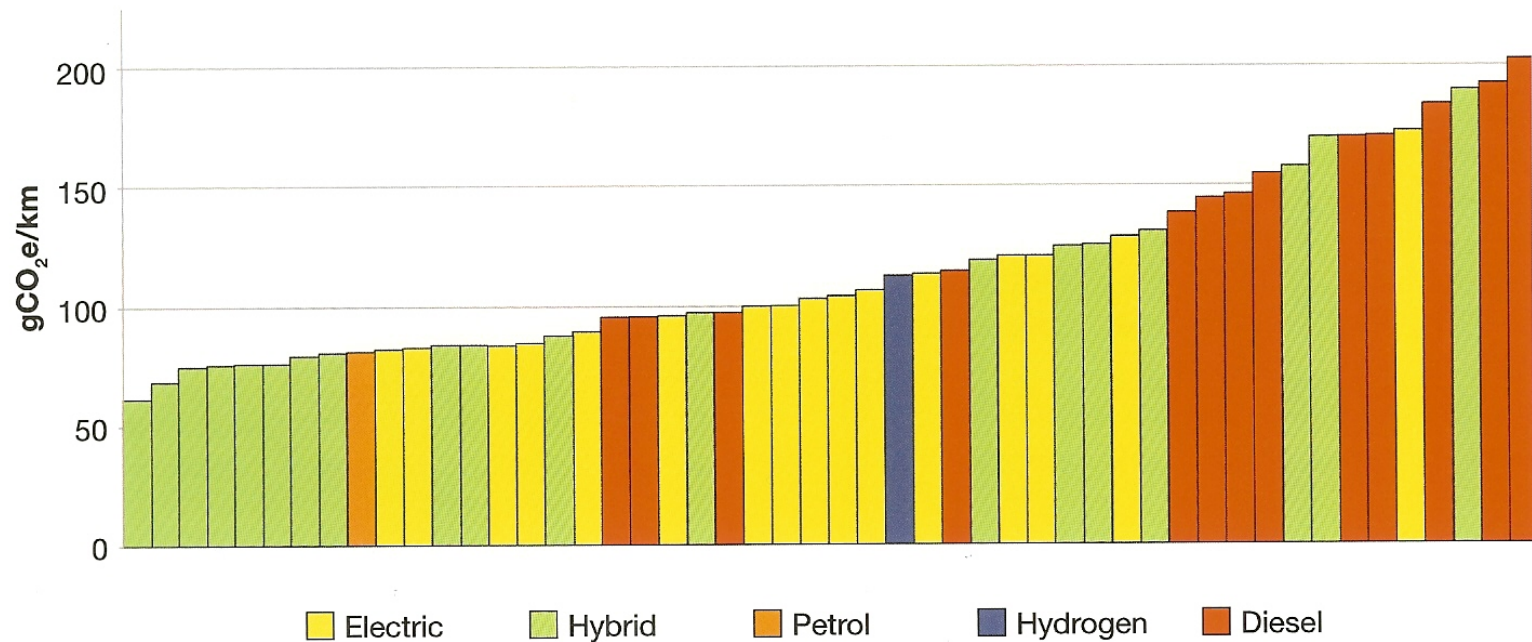
T27: electric version



EV v IC

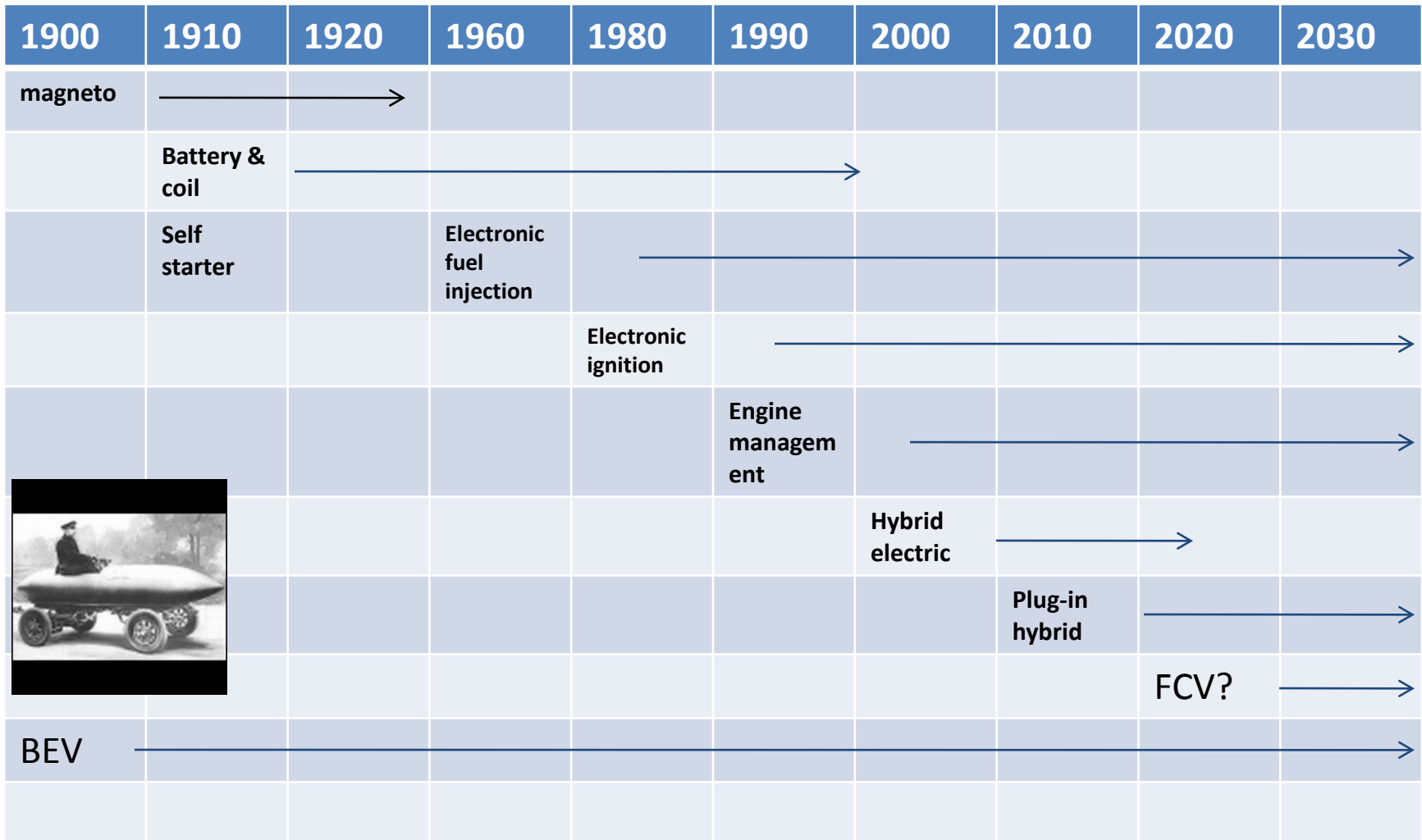
Results from RAC Future Challenge 2010 (UK generating mix)

Figure 4: Well-to-wheel CO₂e emissions using government conversion factors



Electrification of the car – path dependence?

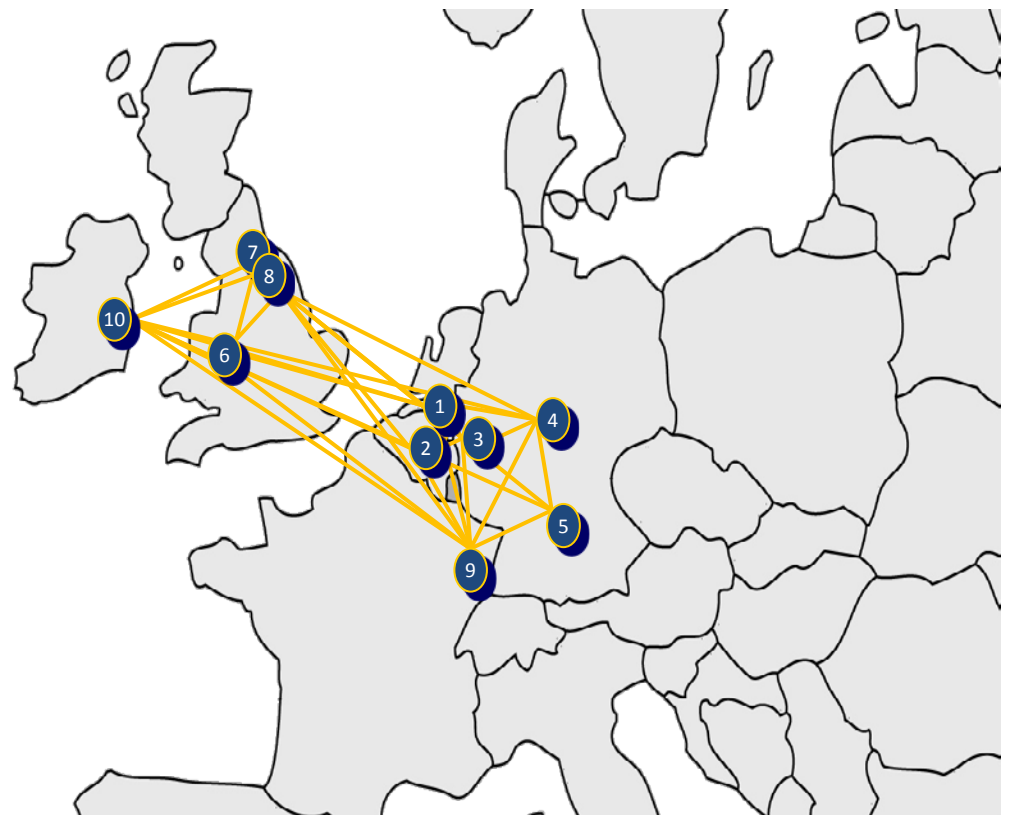
e.g.: powertrain developments



ENEVATE

Accelerating E-Mobility

EU Interreg IVB project trying to capture lessons from the various EV experiments taking place in NW Europe.



The case of Norway

Europe's largest private EV market is
an artificial, incentive-driven
market...(CO2 is the main driver)

The question at Grønnbill Norge:

How to reduce incentives without
losing the EV market?

Oslo

Oslo has around 12 years experience of private electric vehicle use

EV Incentives in Oslo:

Free entry to city

Free parking

Free charging

No sales tax

No road tax



Norway's EV cluster

Move About – ‘zero hassle, zero emissions’ – EV based fleet management and car sharing schemes in Norway, Sweden, Denmark.

Th!nk – EV maker (production moved to Finland).

El-Bil Norge – maker of the Kewett Buddy EV.

Norsk Hydro –energy, aluminium, automotive components

Kongsberg – automotive supply cluster

Etc.



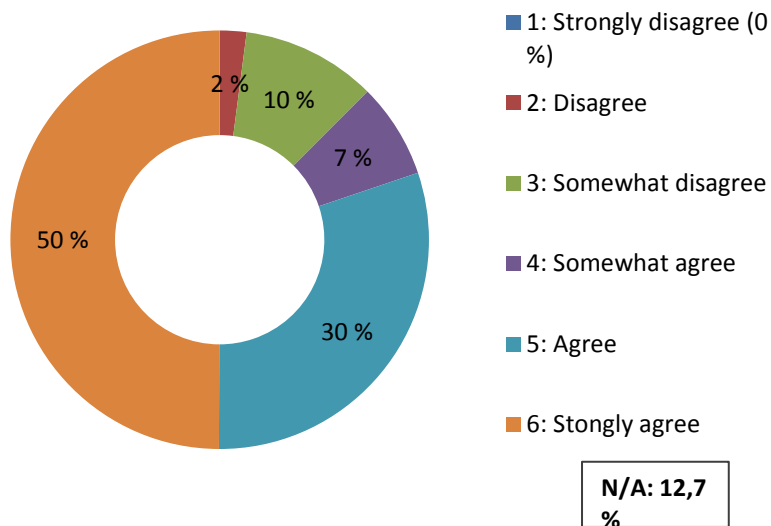
End user views

The Move About survey

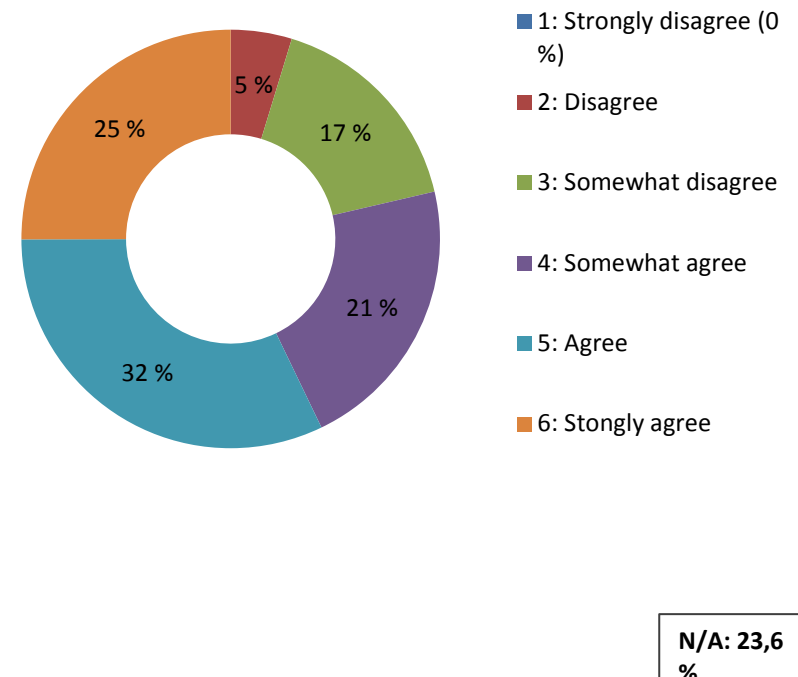
www.moveabout.no

Move About survey results 1:

12. The car fulfills my needs for transport for work purposes

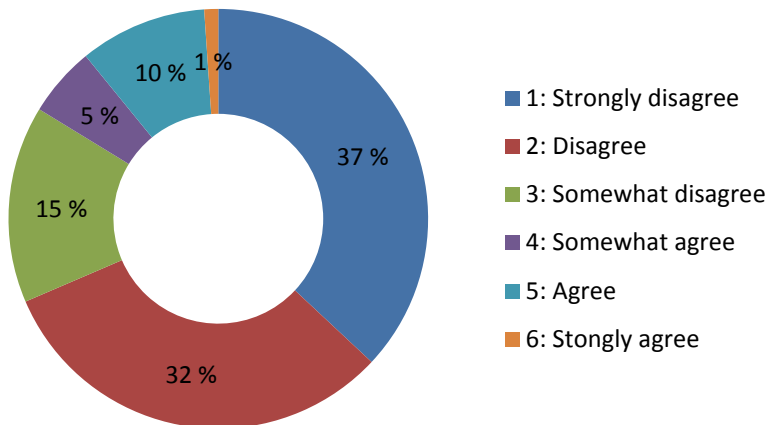


16. The car is suitable for winter use



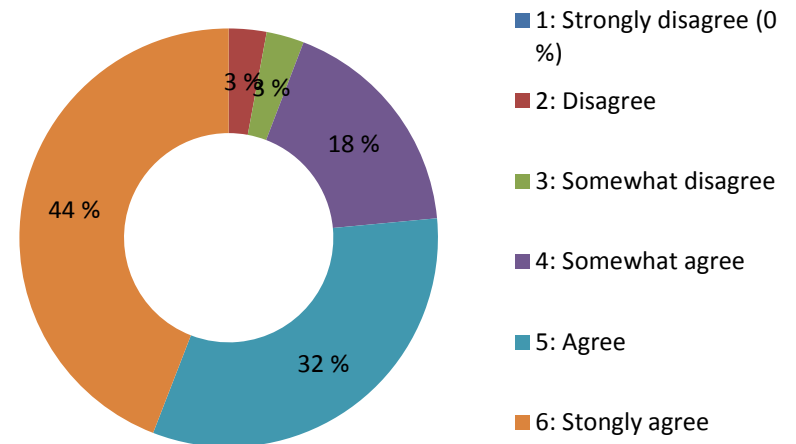
Move About survey results 2:

18. When using the car I am concerned that I will run out of electricity



N/A: 16,4 %

22. I feel proud when using the el-car as it reflects my personal environmental values



N/A: 7,3 %

The barriers to EVs are not, on the whole,
technological...

...they are social, economic,
psychological...

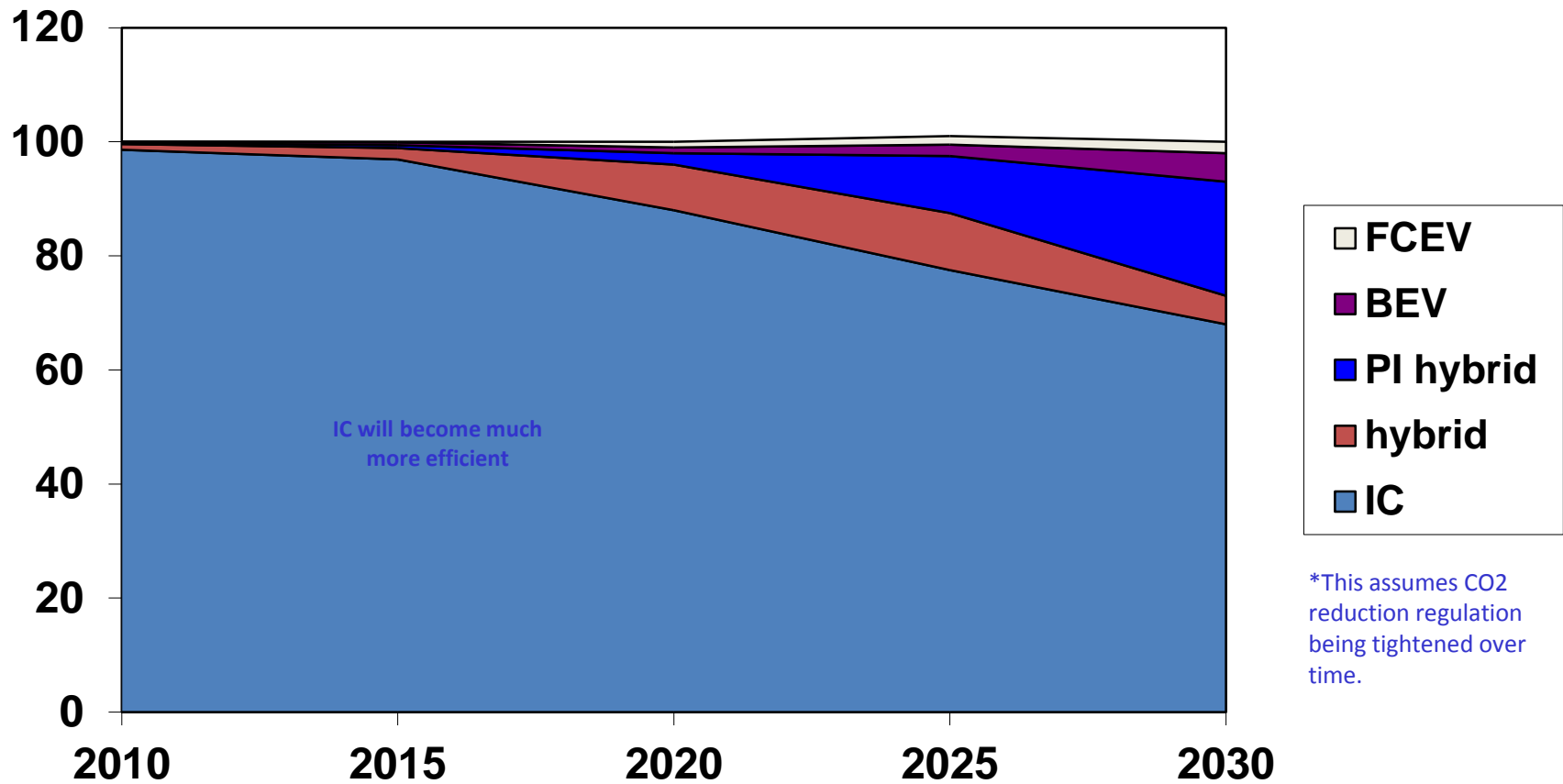
Risk perceptions differ along the value chain

Key player	Main risks
Suppliers	Is the market going to be big enough for me to invest? Will they still need what I make?
Car makers	Why make high risk EVs if IC still sells well? If I go first will I gain an advantage?
Energy suppliers	How big is this market really going to be – is it worth me investing?
End users	Why pay more? Will it get me home? What about residual values? Will I have to pay for a new battery?
Dealers, garages	Can we make money on EVs? Can we do service and repair on them? Will my mechanics get a shock?
Government	Will this create jobs here or abroad?

Conclusions

- Most Europeans do not yet see EV as the logical solution.
- CO2 reduction is the primary regulatory driver in Europe; Europe's generating mix does not always deliver with EV.
- The Norwegian EV experiment deserves more attention; weaning EV users off subsidies is key challenge.
- PHEV will prove popular because of its ability to have your cake and eat it – and reduce CO2.

Forecast powertrain mix: EU new vehicle registrations 2010-2030*



THE END

*Thank you for your
attention*

