



Electricity and gas in transport – sustainable alternatives?

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Members – National Electricity Associations



- **Full Members**
 - EU28 & EFTA, (Switzerland, Iceland, Norway, Turkey)
- **European Affiliates**
 - Albania, Serbia, Bosnia & Herzegovina),
 - Russia, Belarus, Moldova, Ukraine
- **Mediterranean Affiliates**
 - Morocco, Tunisia, Algeria, Egypt & Israel
- **Other International Affiliates**
 - Australia, USA, Canada, Japan, China, South Africa, Kazakhstan, Uruguay

EURELECTRIC WG Electro-Mobility: bringing together over 30 electricity stakeholders from 19 European countries





Oil price (\$/bl)



Speculative bubble 2007-2008: Cost for EU transport = 90 bc
North-Africa unrest 2010-2011: Cost for EU transport = 40 bc



Drivers of Energy Transformation

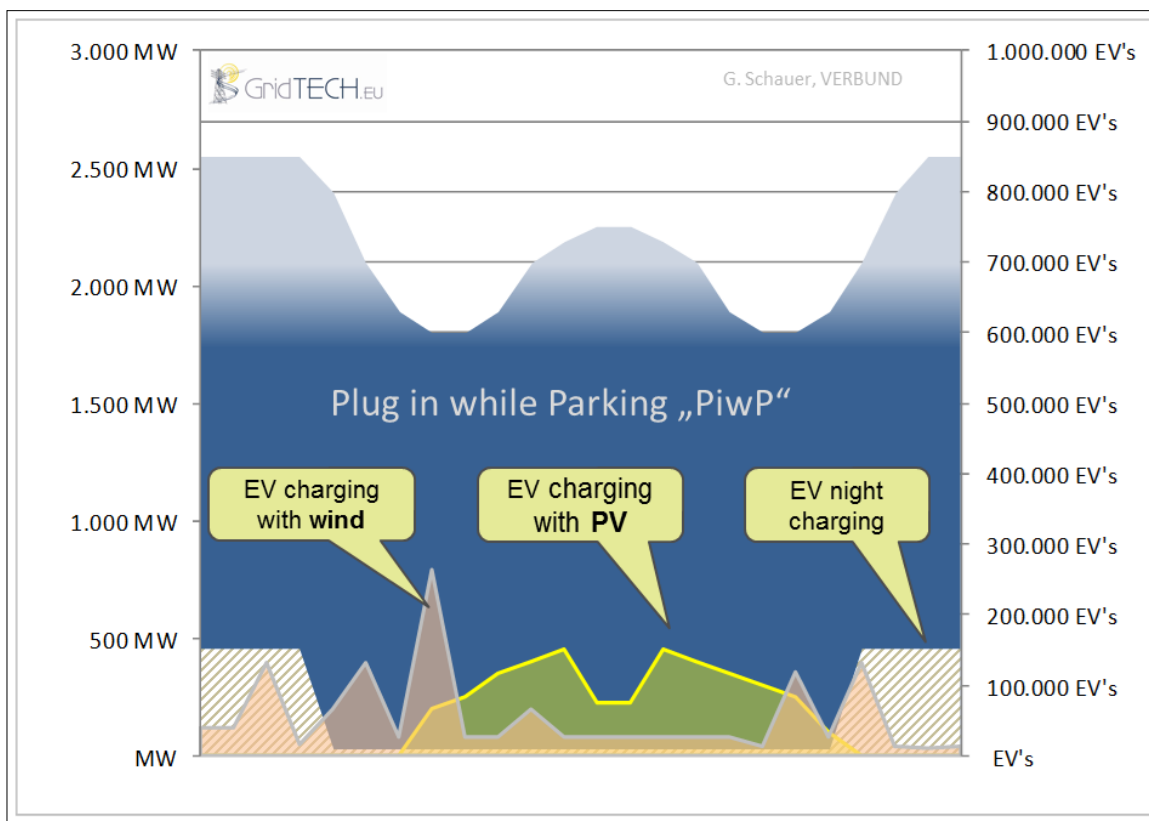
- **Fuel Security**

- Oil accounts for 94% of EU transport and 84 % is imported
- €1 Billion per day (2.5% of EU GDP)
- Fluctuation costs EU drivers and industry and increases uncertainty
- Political issues in producing regions

- **Environmental Factors**

- Climate Change GHG reduction targets
- -30% CO₂ on 2005 agreed at EU Level
- Air Quality Issues (due to transport) significant in many EU cities

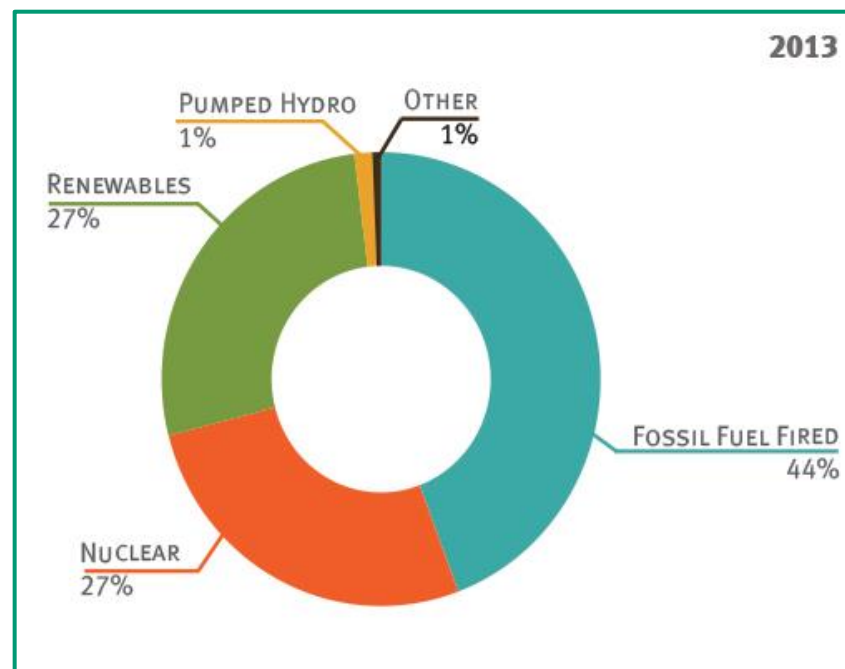
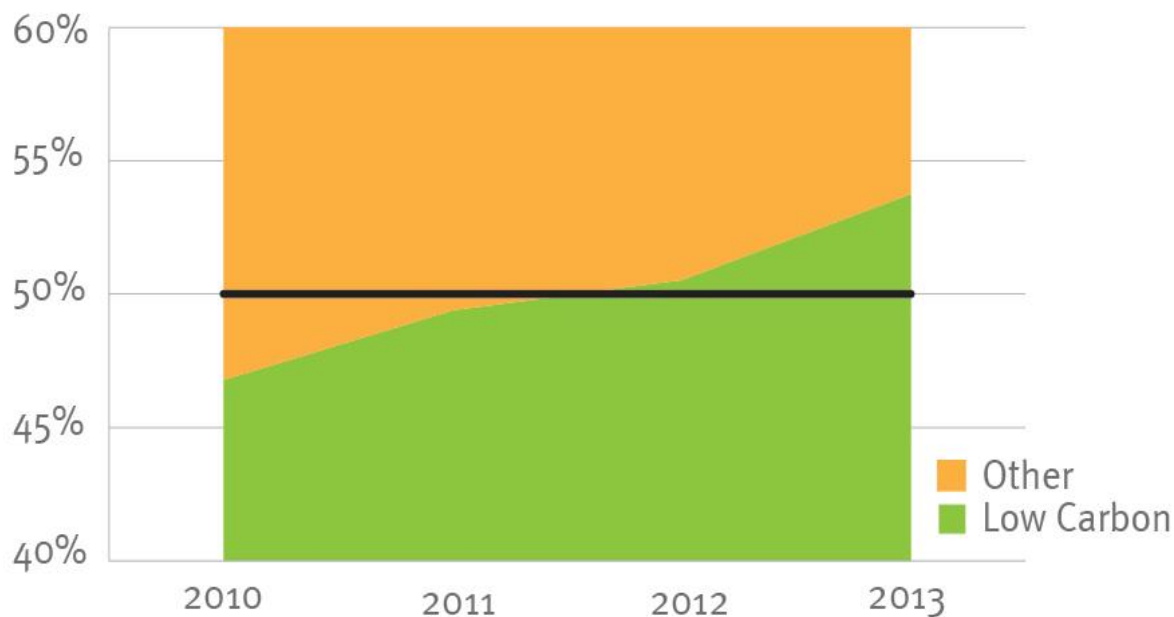
Can the Electricity System Cope with EVs?



GridTech project

- If 100% of cars in EU were electric it would add 24% to total electricity
- Sufficient spare capacity to cope with this without any G&T Investment (in theory)
- Clustering may result in investment in Distribution system but can be limited with smart charging
- Improved asset utilisation will tend to reduce electricity prices for all
- EV charging can take place to coincide with available RES capacity (overnight)

Latest trends: low-carbon generation is leading, capacity goes green

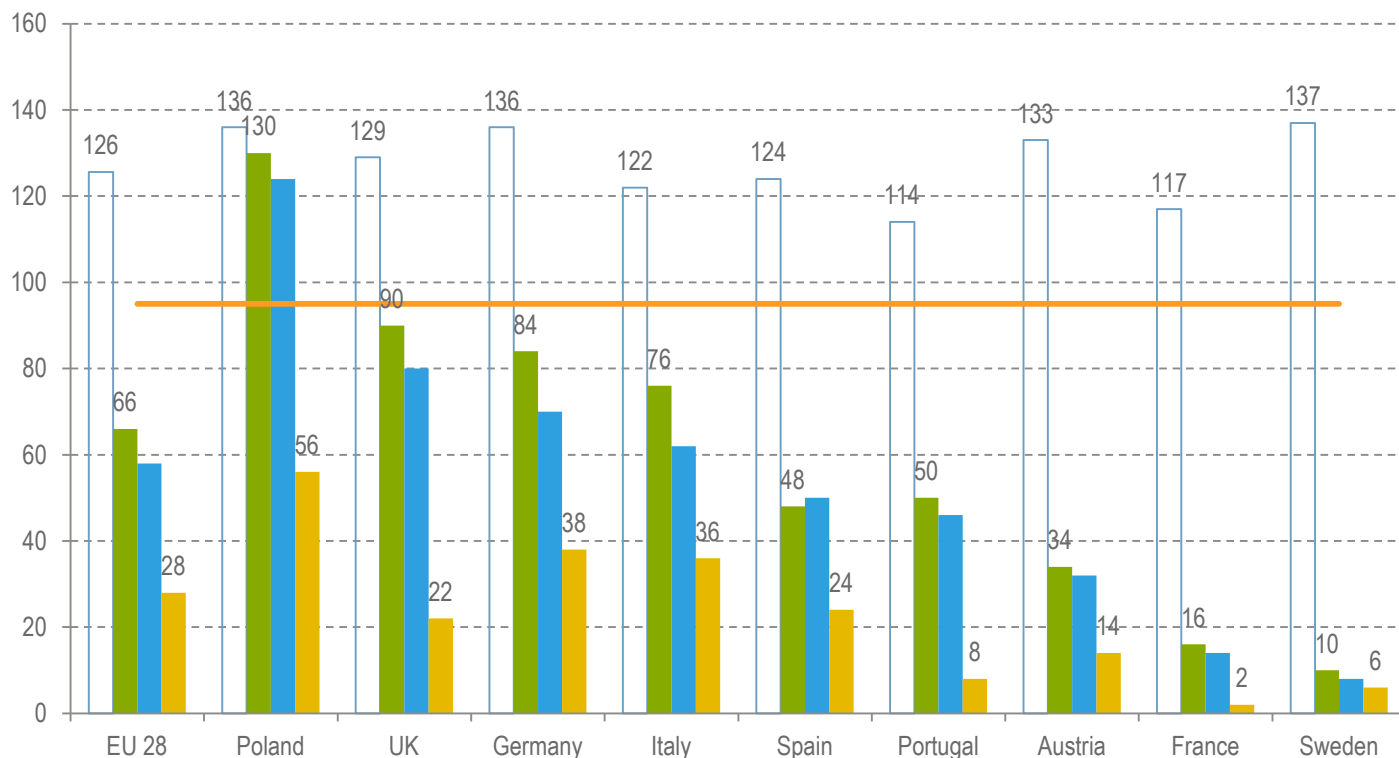


EURELECTRIC Power Statistics 2015

- For the second year in a row, more than half of the electricity generated in Europe in 2013 comes from low-carbon facilities
- More than 70% of the new capacity installed in 2013 was RES



EVs emit less CO2 than conventional cars



EURELECTRIC smart charging paper, 2015

□ Average of CO2 of new cars
 ■ Average of CO2 EVs (2015)
 — 2021 Goal 95 gr

■ Average of CO2 EVs (2010)
 ■ Average of CO2 EVs (2035) Ref Scenario 2013

- With the 2010 carbon intensity, a typical EV emits about 66 g CO2/km
- EVs will be even cleaner in the future as the power sector continues to decarbonise by 2050



EV charging can take place at all locations, infrastructure is expanding

- 90% of the charging is taking place in homes and offices
- Need to address the lack of adequate financing models for public charging

	AC public and semi-public (up to 22 kW)	Fast charge DC public (> 22 kW)
DE	4,800	100
DK	>1,000	115
FR	8,600	130
IE	810	64
NL	8,801	70
NO	5,500	250

> 40,000 recharging points (public and private) *(source: EC)*

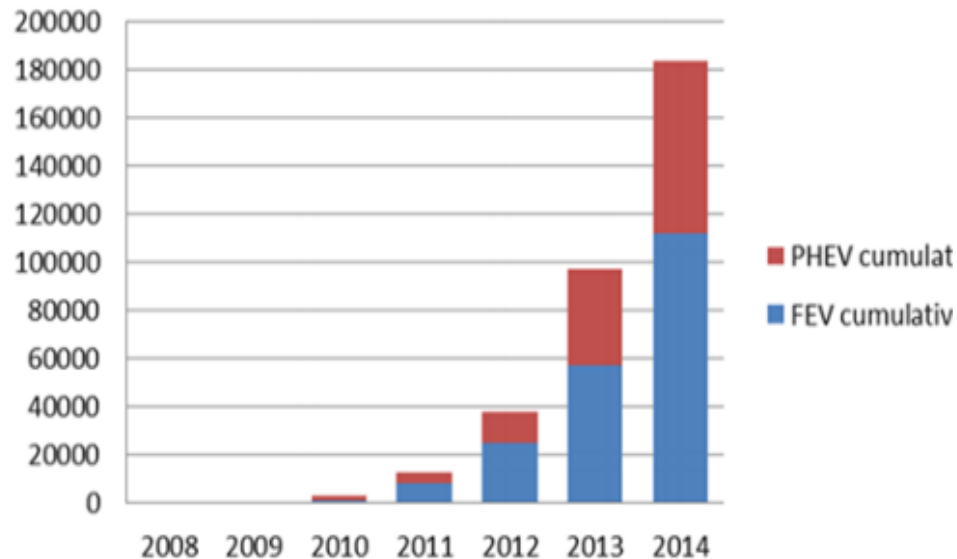




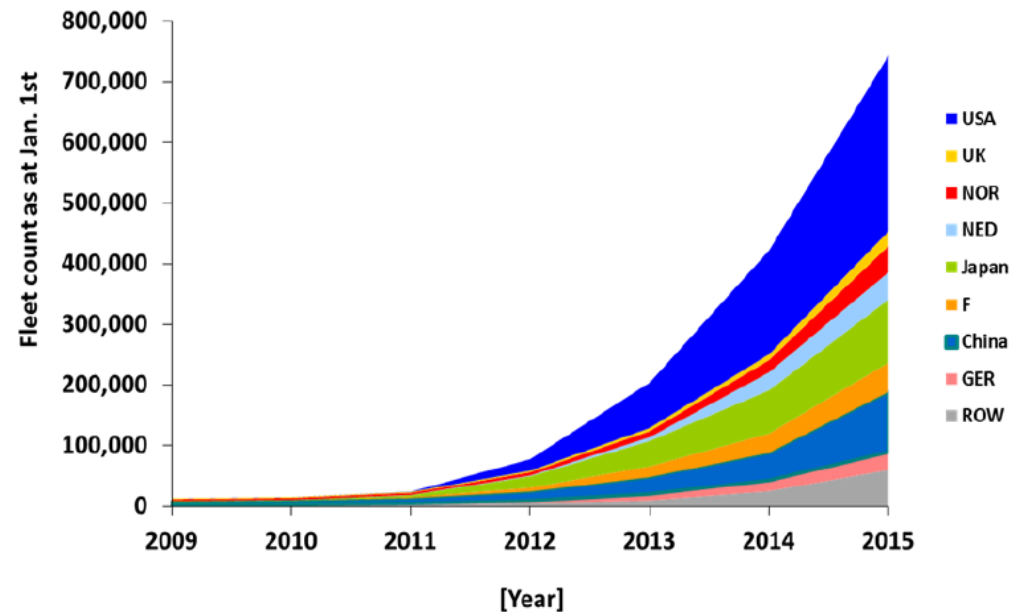
EV market uptake on an upward trend

- EV market experienced fast growth recently after a gradual start
- Battery developments are still needed but costs are declining rapidly (~150 EUR/kWh in 2025)

European EV's on the road: cars (M1)



Source: AVERE



Source: ZSW Zentrum für Sonnenenergie und Wasserstoff
Forschung Baden-Württemberg

Higher ranges for EVs coming closer

- EV models with range >300 km announced by car manufacturers (Tesla, Chevrolet Bolt, Nissan Leaf upgrade, ...)
- Average daily distances below 50 km, within current battery

Chevy confirms the \$30K, 200 mile range Bolt EV has entered testing



Audi CEO Rupert Stadler:
“We will soon have electric cars with
300+ miles range”



Nissan CEO Carlos Ghosn has announced the second generation Leaf will offer a maximum range of 249 miles (400 km).



Filling the gaps: what is needed?

Adopt a comprehensive strategy on e-mobility

- Develop ambitious national plans for electro-mobility
- Adopt a post-2020 approach for transport decarbonisation, including CO2 emissions targets for cars & vans
- Boost customer acceptance through the use of incentives (financial & non financial)
- Lead by example with public procurement

Adopt a system approach to urban mobility and power systems

- Adopt a holistic approach to fully integrating electric-mobility in urban plans
- Expand electrification beyond cars
- Integrate electric mobility in an optimal way in the power system

Prioritise charging infrastructure development

- A combination of both private and public investments to develop successful business models
- Easier permitting and regulation to facilitate charging installation
- Interoperable payment and access systems



Electricity's major role in future transport

- ✓ Electricity system will be carbon free by 2050
- ✓ Will eliminate pollutants & improve urban air quality
- ✓ Infrastructure already virtually all in place
- ✓ With Smart Charging can be done without Capex
- ✓ Will support lowering the cost of renewable generation
- ✓ Will tend to decrease the price of electricity for all customers even those who don't drive an EV

Thank you for your attention!
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