An overview of EU electric and clean vehicle initiatives|

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- Denmark
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PLAN_

Cleaner Vehicles for freight - vehicles with reduced emissions of:

- greenhouse gases (GHG's),
- pollutants and
- noise,

compared with the prevailing fuel of the freight road transport sector – diesel (e.g. 96% of LGV's in the UK).

Two distinct groups, depending on propulsion technology:

- ICE with other fuel (petroleum gases, biofuels and hydrogen)
- electric motor, powered from a battery or by electricity converted from another energy carrier such as petrol or hydrogen._**EV's**

INTRODUCTION_

Cleaner Vehicles for freight with ICE - dual-fuel solutions, with the possibility to switch back from the alternative to diesel/petrol.

Most popular: gas-powered vehicles (LPG, CNG or bio-methane) - mature technology, stagnating numbers.

Their share of the freight market mostly depends on a mixture of economic (conversion cost, fuel price and availability) and fiscal (excise duties, tax relief) parameters (see Italy vs. Sweden)

Compared to petrol and diesel:

- generate fewer CO_2 emissions
- perform substantially better on NO_X and particulates (PM_{10}).

INTRODUCTION_

Electric Vehicles for freight have been receiving a lot of attention in recent years as a result of the following processes/developments:

- Volatile prices of fossil fuels,
- Attempts to eradicate air/noise pollution, particularly in city centres
- Technological advances improving feasibility (range, TCO, payload)

Result: numerous trials and business cases with varying degree of subsidy

THEY STILL CONSTITUTE A NEGLEGIBLE PERCENTAGE OF THE FREIGHT VEHICLES on European roads._

INTRODUCTION_

Weight and cost of batteries still an issue – limiting payload and range.

Most trials involve LGV's and smaller alternatives: mini-vans, micro-vans, tricycles and cargo bikes.

Most trials constrained to the urban domain.

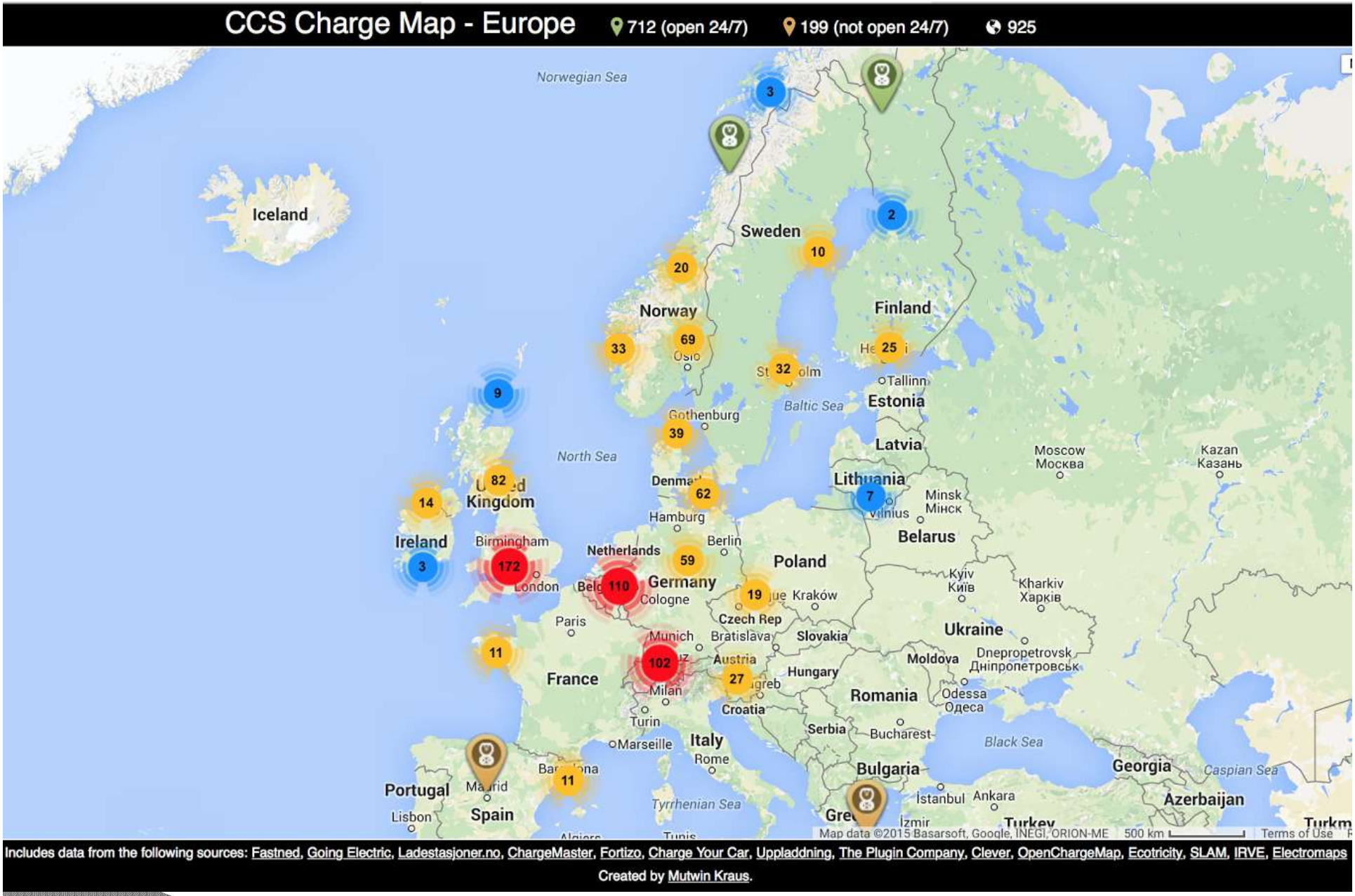
EU – political goal: GHG emissions - 20 by 2020; recently 40 by 2030, all re.1990

EU's incentives and regulation: funding research & testing (IEE, FP-ECG, Structural Funds, EIB loans), forcing vehicle manufacturers to clean-up

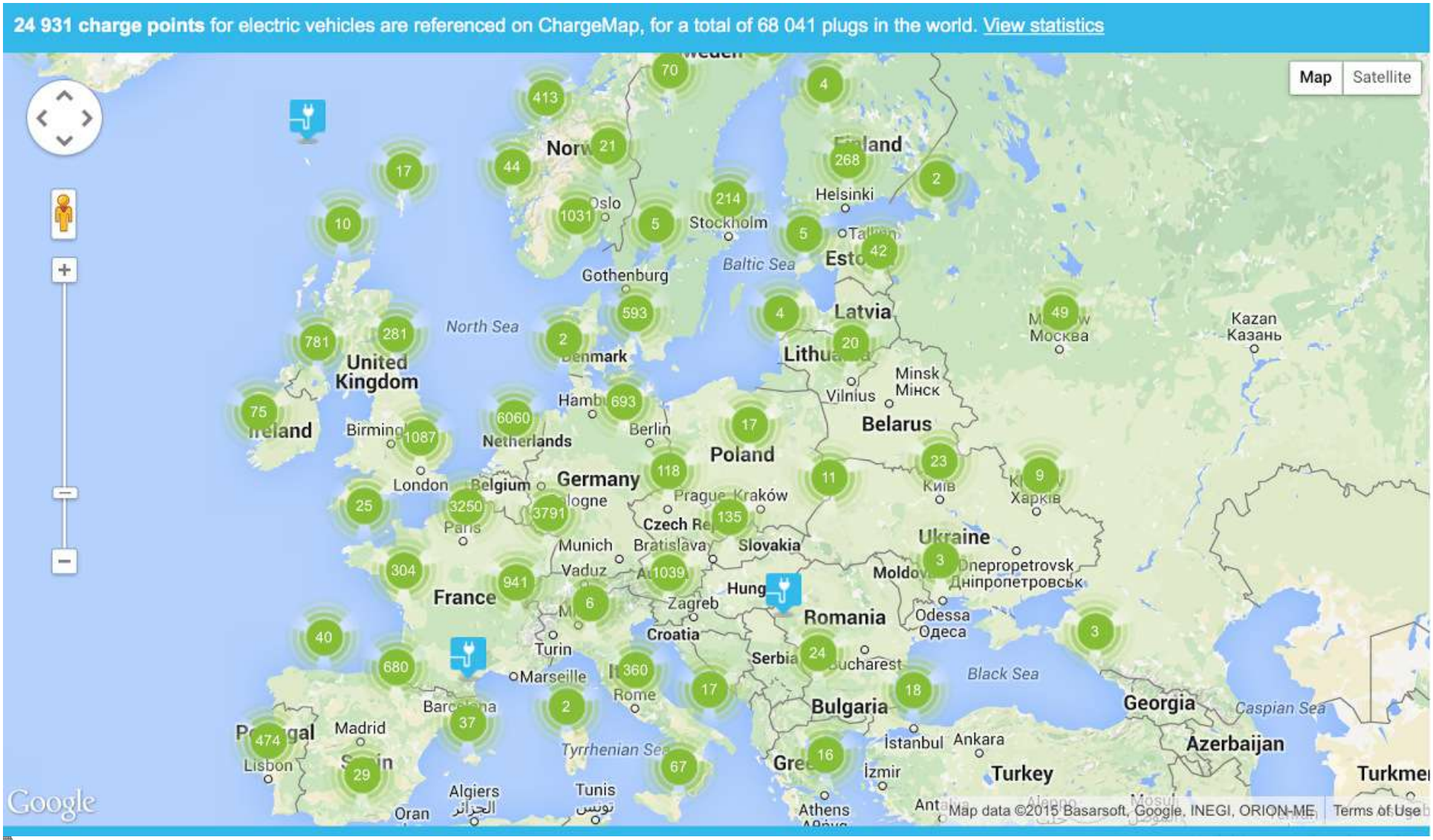
Not just vehicles – charging infrastructure, standards, battery technology

Most EV's are found on this side of the former Iron Curtain_

BASIC FACTS_



Source: http://ccs-map.eu/
Retrieved: 4/5/2015



Source: http://chargemap.com/
Retrieved: 4/5/2015

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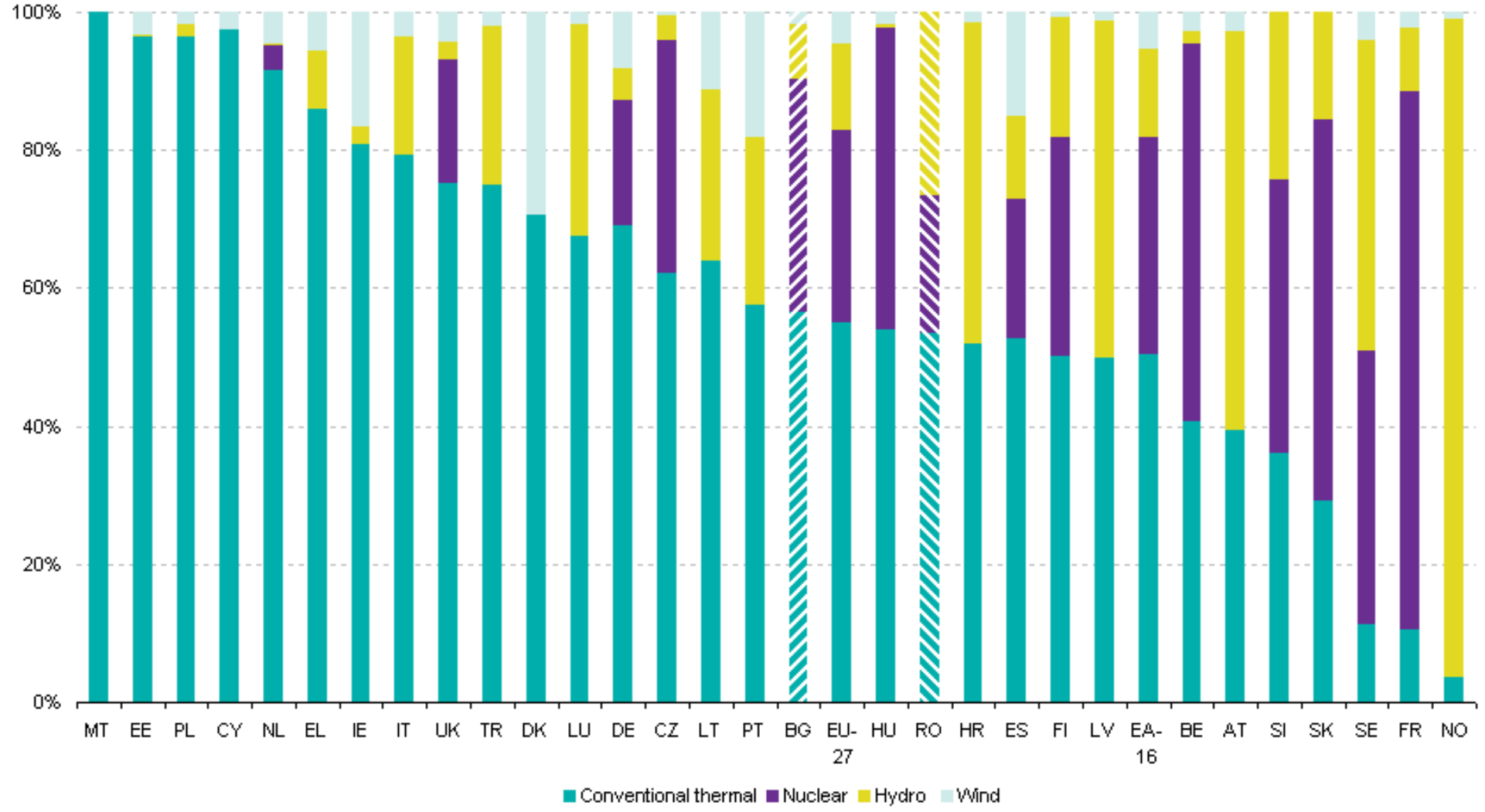
The environmental performance of EV's depends to some degree on the vehicles and their use but also on the electricity generation mix.

This varies from country to country:

- the Scandinavians, Austria, Latvia – renewable sources (wind/hydro)
- France, Slovakia, Belgium, Hungary – nuclear
- Poland, UK, Netherlands, Greece, Italy, Ireland, Germany, Czech Republic – coal & gas.

KEY ASPECT – ELECTRICITY GENERATION_



Source: EUROSTAT, 2011

Renewable sources of electricity are already substantial – 26% from wind (2011) with a goal to increase to 50% by 2020

EV's are exempted from the new car tax which is otherwise 180%, also from the annual green tax, free parking in some municipalities

Many cities have Low Emission Zones

Subsidies for purchase of EV's and charging/fueling infrastructure

Proper winter an issue (heating vs. range)

JUNE 2012 figures: 1160 EV's incl. 165 vans and 9 trucks_

COUNTRY PROFILE - DENMARK_

1. Frederiksburg Municipality (supported by Danish Energy Authority) – since 2009 testing 4 MODEC trucks & FIAT E-Scudo in greenery and road maintenance functionality. 2 MODEC trucks equipped with waste compactor boxes. Average daily drive – 40 km. Municipality happy with MODEC trucks (made in UK, now bankrupt) but unhappy with the converted Scudo. Bought another truck – 26ton waste collection (2012)

2. Copenhagen Municipality (supported by Danish Energy Authority) – fleet incl. 15 FIAT Fiorino E (technical & environmental administration; Fire Brigade), 3 Renault Kangoo Z.E. (service trips) 2 MODEC trucks (roadworks, book transfer between libraries). 2 people were employed to service EV's. Municipality very unhappy with performance of (converted) FIATs – many reliability issues, parts availability. MODEC – OK.

3. Danish Post happy with 2 Mercedes Vito E_

EXAMPLES - DENMARK_

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Electricity from renewable sources – almost 100%

Long history of EV support from the state (1991 excise tax exempt, 1996 free parking, 2001 VAT exempt, 2003 access to bus lanes; also free public ferries, free charging, reduced road tax, reduced company tax)

Result: no 1. in the world in EV ownership per capita (BUT mostly private individuals owning passenger cars) – the goal of 50000 EVs on the road reached 20 APR 2015 (2yrs ahead of plan, 2% of total fleet)

Leasing EV's is less attractive than buying

Low temperatures in winter are an issue

COUNTRY PROFILE - NORWAY_

1. POSTEN – while hailing the fact that 80% of mail goes by train, out of a nearly 6000 vehicle fleet, 350 were EV's and 70 run on biofuels (2011) Purchased more clean vehicles since. Happy with Ford Transit e-Connect but in winter the range drops from 130km to 70 or less – solution: install a fossil fuel heater (@0.5l/day). Also increased variety of vehicle sizes and modes of operation (consolidation in microterminals etc.)

2. ALLKOPI (printed matter distributor) – fleet incl. 5 Ford Transit e-Connect (out of 19 vans in total). Experience shows driving style can decrease the range from 130 to 60km (need for training). The company claims that if range approaches 250km per day they can switch all fleet to EV's_

EXAMPLES - NORWAY_

2009 - a political goal of 1m EV's on the road by 2020 formulated, but their numbers declined until 2010.

Also, ambitious goal of GHG reduction of 40% by 2020 despite de-nuking, 10%less energy used and 35% share of renewables.

A gov body (National Platform for E-mobility) est. 2010, proposing changes in fiscal measures and suport programs for EV's (based on KWh)

Tax exemptions (in place), free parking and use of bus lanes (planned).

R&D programs and regional lighthouse projects (>1bnEUR available).

Transport work performed by road is expected to continue to grow, and the amount of GHG emissions from freight operations too, despite ever stricter EURO standards (+16% by 2025, while passenger cars -13%).

In 2012 1.5k commercial EV's were registered (about 0.06% of total) with 323 between 1 and 2t payload, 261 between 2 and 6t (11 unknown t)

COUNTRY PROFILE - GERMANY_

1. CognE-mobil – 2year, 15mEUR pilot project (50% subsidy); 10 Ford Transit BEV, 10 Ford Transit e-Connect, transporting parcels, waste and greenery with Municipality of Cologne (1m), Ford Company and Energy Supplier all being part of the project. 50kkm driven in almost over 2 years. The trial disproved many myths about reliability, performance, range (actual average 40km per day) etc. The conclusion: sustainable in urban setting, low operational cost make EV's CHEAPER after as little as 3 yrs.
2. DHL parcel service (Berlin, Bonn, Duesseldorf, Hamburg, Rosenheim) started in 2010, as part of GoGreen program aiming at 30% reduction of GHG emissions relative to 2007. EV's: about 110 incl. VW e-Caddy, Ford Transit Connect, Renault Kangoo, Street Scooter Electric Van (<2.3t), Xenova (prototype) VX eT, Mercedes e-Vito (<2.8t), Iveco e-Daily (,3.5t). Spin-off in US (30 vans in NY); actual average 35km/day; verdict: EV's for last mile OK (-payload, -TCO)_

EXAMPLES - GERMANY_

- environmental benefits are clear (BUT depending on energy mix) – often 50% reduction in GHG's
- the business case still dubious, depending on subsidies and other public support (taxation!)
- supply of vehicles problematic:
  - small manufacturers/conversion shops face many issues (technological/servicing/scale/survival)
  - big players slow on take-up (passenger better)
- Human Factor – drivers like the drive but it takes effort/training to switch, servicing = new staff

CONCLUSIONS_

- questions?

THNX_