

EVs and fast charger usage in Norway

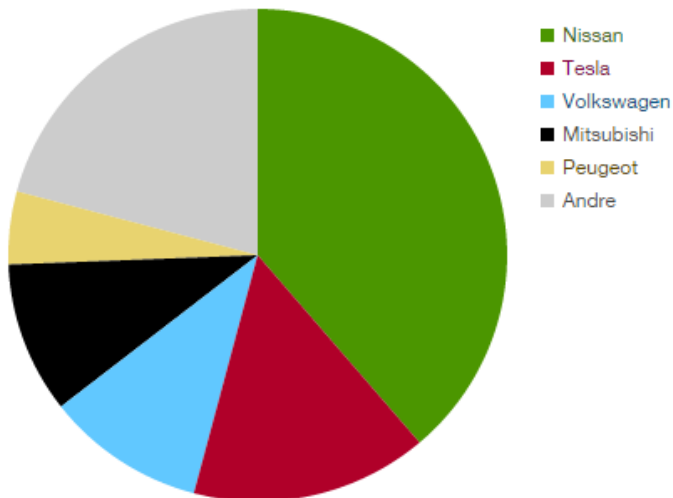
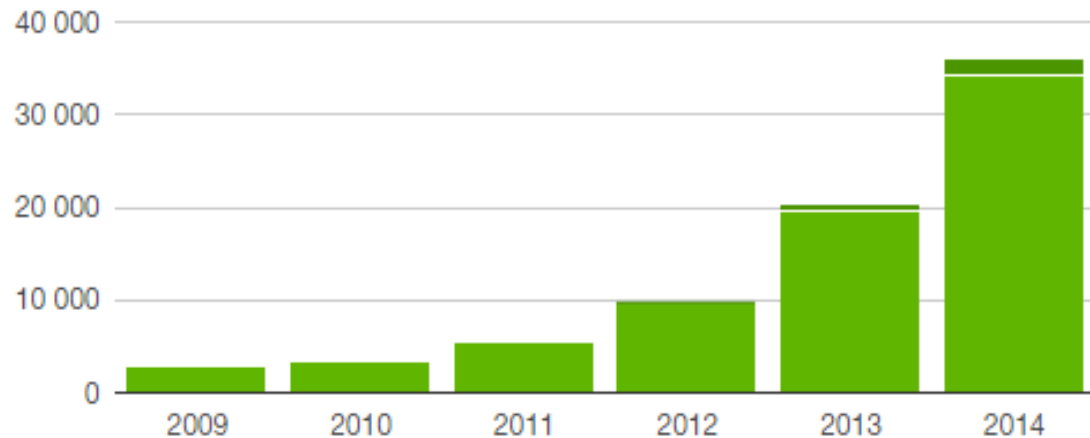


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Increasing numbers of EVs in Norway

■ Elbiler ■ Plug-in hybrid

Sep 2014
El-biler: **35781**
Plug-in hybrid: **2043**
Total: **37824**



Total accumulated number of EVs in use by end of year. For 2014 until 1st of October.

Numbers doubled every year from 2011, and most likely to double also in 2014.

Large majority purely battery electric
Combo increasing fast – more than 20 %

How?

✓ Incentives and infrastructure



A strong incentive package for EVs make them competitive

- ✓ No import tax
- ✓ No VAT
- ✓ Reduced annual vehicle fee (80%)
- ✓ No road tolls
- ✓ Access to bus lanes
- ✓ Free parking (on public parking spaces)
- ✓ Free access to road ferries

- ✓ Guaranteed up to 2017 or until 50 000 EVs on the roads.

Fast charger infrastructure and usage

- 2011-2013 pilot program for fast charger infrastructure – 4 different calls
- Basic principles
 - Private operators partly funded by the government (Transnova) building public accessible infrastructure
 - Dense EV areas/regions prioritized - also corridors
 - Allocation on attractive sites - sustainable business models
 - Payment solutions – power/services not for free
 - Chargers communicating real time data to a central data base (NOBIL – owned by Transnova)
 - Already from 2012 demanding Combo and AC standards

From 2014 a national strategy for EV infrastructure

Proposal for

National Strategy for EV infrastructure

From Transnova to the Ministry of Transport and Communication, April 2014

(not yet decided)

elbiler 

Purpose: reaching Norway's 85 gram emission target

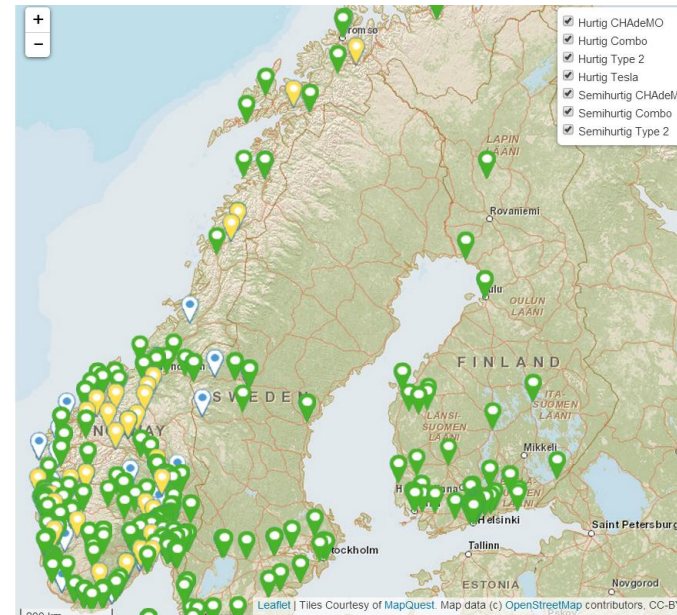


- The charging infrastructure contributes to Norway reaching the goal of average CO₂-emissions from new passenger cars sold in 2020 of 85 grams per kilometer (EU target 95 grams)
- Requires totally 160 000–200 000 chargeable vehicles on the roads in 2020 (EVs and PHEVs)
- 20% sales increase per year adds up to 210 000 EVs in 2020

A well developed infrastructure

Status September 2014

- ✓ Total number of charging points: 5472
- ✓ Charging stations: 1479
- ✓ Fast charging points
 - ✓ CHAdeMO: 107
 - ✓ Combo: 42
 - ✓ AC Type 2: 13
- ✓ Semi-fast charging points
 - ✓ CHAdeMO: 2
 - ✓ Combo: 3
 - ✓ AC Type 2: 147
- ✓ Tesla
 - ✓ 84 charging points
(at 11 charging stations)



- ✓ All in all, 170 fast charging/semi-fast charging stations throughout the country. 67 more under construction
- ✓ Transnova has funded 1800 normal charging points and co-funded most of the fast chargers (not those belonging to Tesla)

Principles in a strategy towards 2020

- Cooperation between private actors and the government
 - General frames set by Transnova
 - Competition among private actors for funding
 - Private and local actors evaluate demand, placements and prices



Principles in a strategy towards 2020

- Multistandard charging stations (CHAdeMO, Combo, AC)
 - As a general rule, exceptions for low-cost single standard chargers
- Open access for all users (requires pay-as-you-go option)
- Real-time communication to the charging station database (Nobil - free to use for anyone for developing ICT charging services)



First phase 2014–2016

- ✓ Urban areas
 - ✓ 325 charging stations
- ✓ Rural corridors
 - ✓ 60 charging stations all over the country up to Tromsø in the north.
Average of 50 km distance, maximum 70 km
 - ✓ Risk assessment mountain pass etc.
- ✓ Evaluation of the use of fast chargers
 - ✓ Improving the knowledge based on the role of fast charging in electromobility for the 2017–2020 strategy



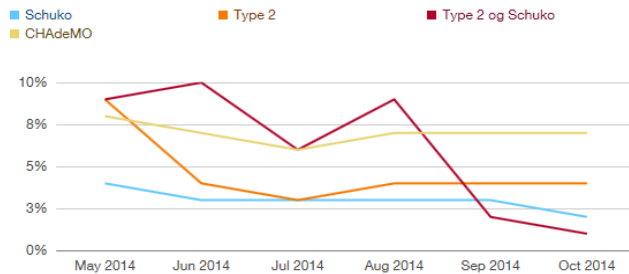
2014-2016

(Transnova proposal to the ministry)

Elements	Number of chargers	Public funding
Urban areas	325	100 mill. NOK (12 mill €)
Rural corridors	60	35 mill. NOK (4,5 mill €)
EV car sharing in cities	?	15 mill. NOK (2 mill €)
All together	app. 400	150 mill. NOK (18,5€)

Utilisation of (fast) chargers

- Average use

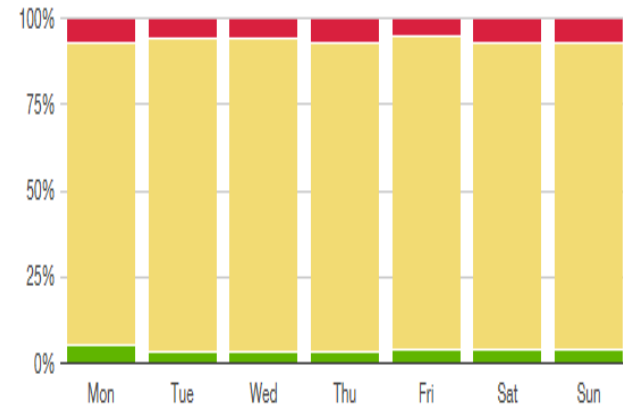


- Time in use

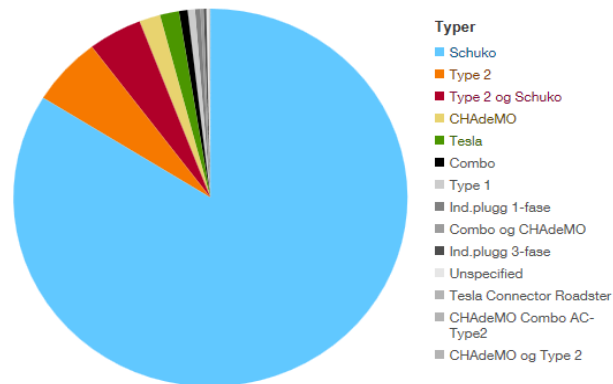
- All charging points reporting data to Nobil

Status, oktober 2014

■ I bruk
 ■ Ledig
 ■ Feil
 ■ Ukjent



Fordeling pluggtype



Some experiences

- Reliable stand alone CHAdeMO chargers
- Dual fast chargers (CHAdeMO and Combo)
 - Frequently operational failure – technology not mature?
 - Charger and EV communication – protocol adaption?
 - User frustration and impatience!
 - Challenging the charger operators and their business
 - Car makers role for fast charging access/infrastructure?
 - Renault and Fortum for AC charging
 - Nissan cooperation with Kiwis grocery chops
 - German car makers?
- Fast charging difficult to make a profitable business!

Final remarks

Ask the EV users and they will demand one common and reliable charging standard!

Thank you!

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