

Norway as the laboratory for zero-emission mobility

Per Stensland, Invest in Norway

22 August, 2017

MISSION

- Innovation Norway's objective is to be the State and the county authorities' instrument for achieving value-creating business development throughout the country.
- Innovation Norway's main purpose is to trigger business development that is profitable from both a commercial and a socio-economic perspective, and to help different regions to realize their potential for business development.

SERVICES

- Innovation Norway's services aim to create more successful entrepreneurs, more companies with growth potential and more innovative business environments.
- Our target groups range from entrepreneurs, entrepreneurs in the early start-up phase and small businesses to large corporations with a capacity for growth in the whole range of sectors and industries.

Ownership

- Innovation Norway is owned by the Ministry of Trade, Industry and Fisheries (51%) and the county authorities (49 percent).
- Innovation Norway services 42 official clients: four ministries, the county councils/authorities and the county governors. All our assignments target enterprises and require business development expertise.

Close to the businesses
where they are ...



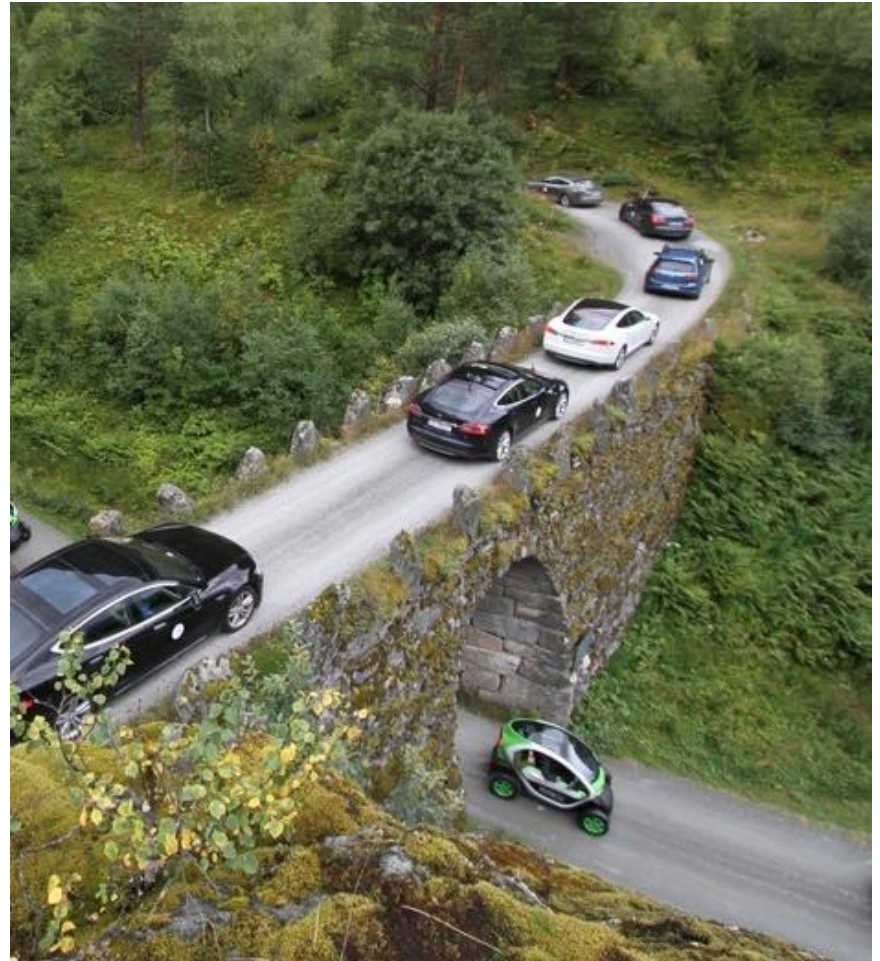
... and represented where Norwegian companies do their businesses



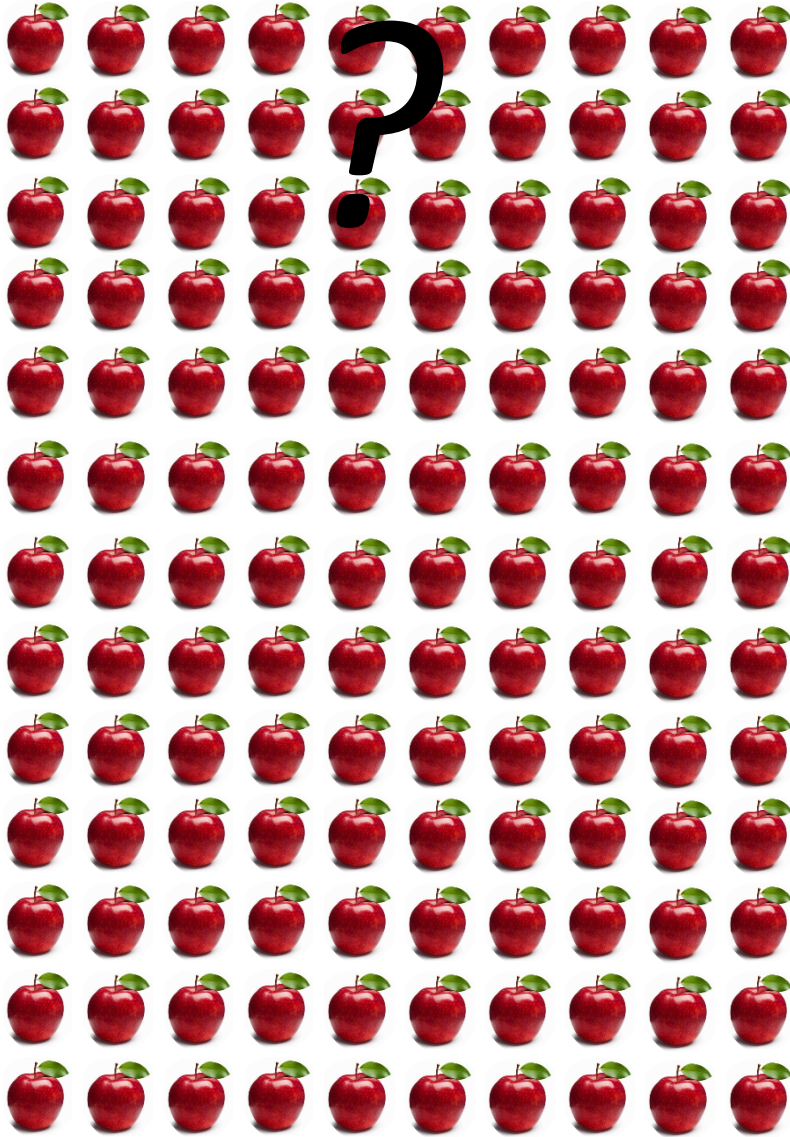
Norway to become the most electrified country in the world

- Cut CO2 emissions with 40% within 2030
- Increased emissions since 1990, despite heavy cuts in the industry.
- The transport sector to cut 40-60%
- The maritim sector aims at zero-emissions on near shore within 2050
- Norway's biggest public company, Ruter, with Fossil free 2020 ambition.
- Ban on combustion engines from 2025 is discussed in the Parliament

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Rally for electric vehicles in Norwegian mountains.
Foto: elbil.no

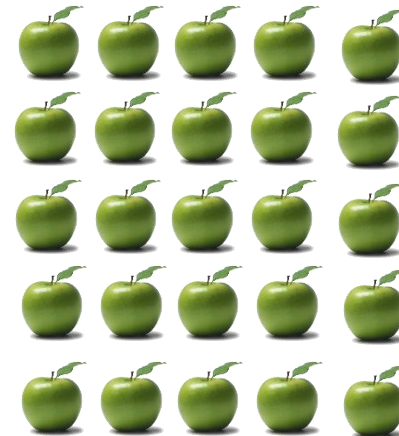


Norwegian Hydropower:

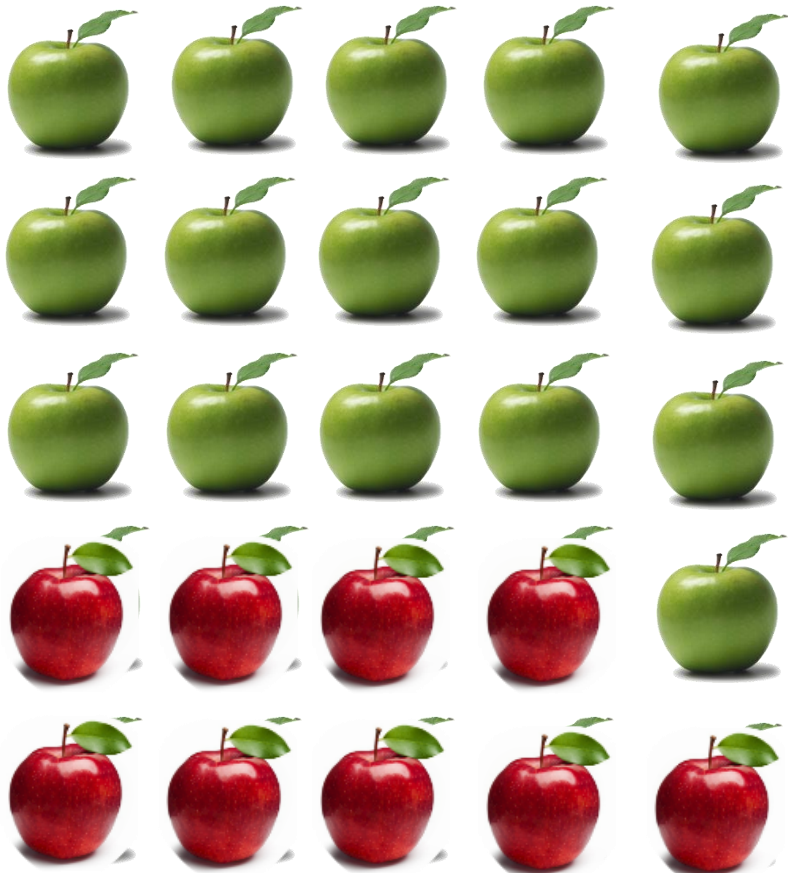
135 TWh

Surplus 2020- :

25 TWh



***For export or value creation
in Norway***



Phase out
residential
oil heating **1 TWh**



Electrify the
shelf **2 TWh**



All cars
electric

6 TWh



The background of the slide is a photograph of a snowy, mountainous landscape. Several high-voltage power lines stretch across the frame, supported by metal pylons. The sky is a clear, pale blue. The overall scene suggests a focus on energy infrastructure in a cold, northern environment.

Why did Norway take the lead?

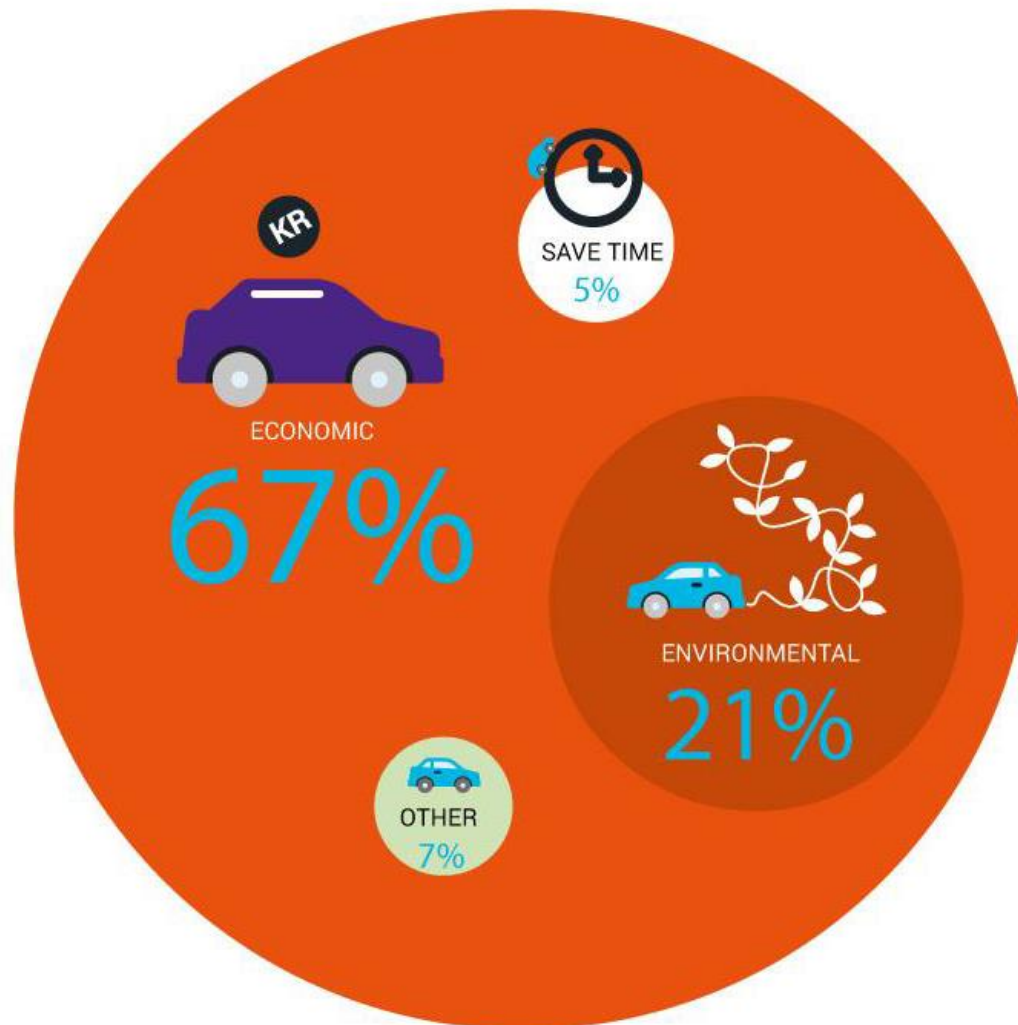
- Political will
- Incentives
- Normal (combustion) cars heavily taxed
- 100% renewable energy to low prices

The incentive package

- No purchase taxes
(extremely high for ordinary cars)
- Exemption from 25% VAT on purchase and leasing
- Low annual road tax
- No charges on toll roads or ferries
- Free municipal parking
- Access to bus lanes
- 50 % reduced company car tax

Suggested that no new fossil cars can be sold after 2025.

Economy is the most important reason to choose an electric car

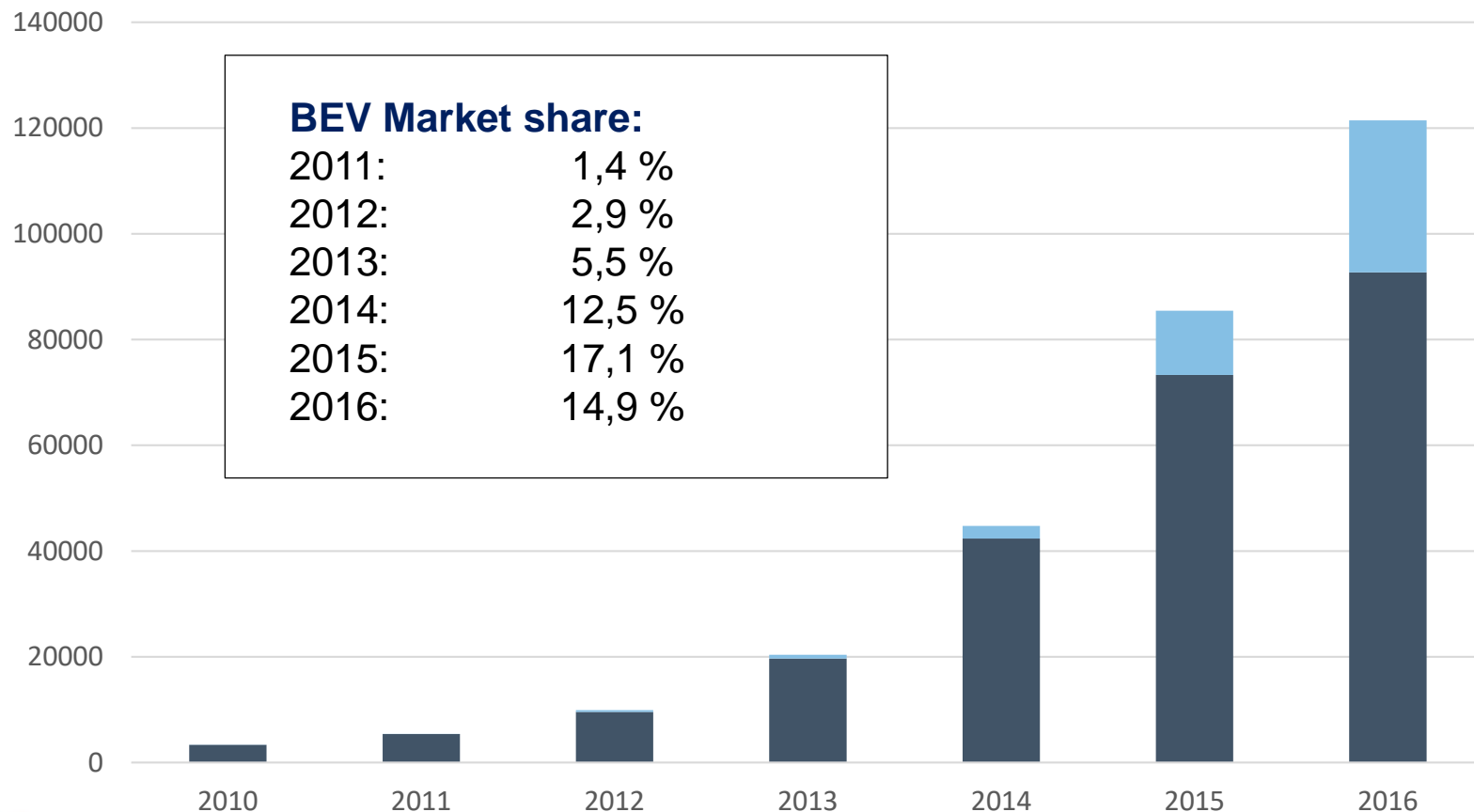


The Norwegian EV owner survey 2016: Most important reason to choose an electric car



Norwegian
EV Association

Over 100.000 EVs in Norway



Source: OFV. October 1th 2016



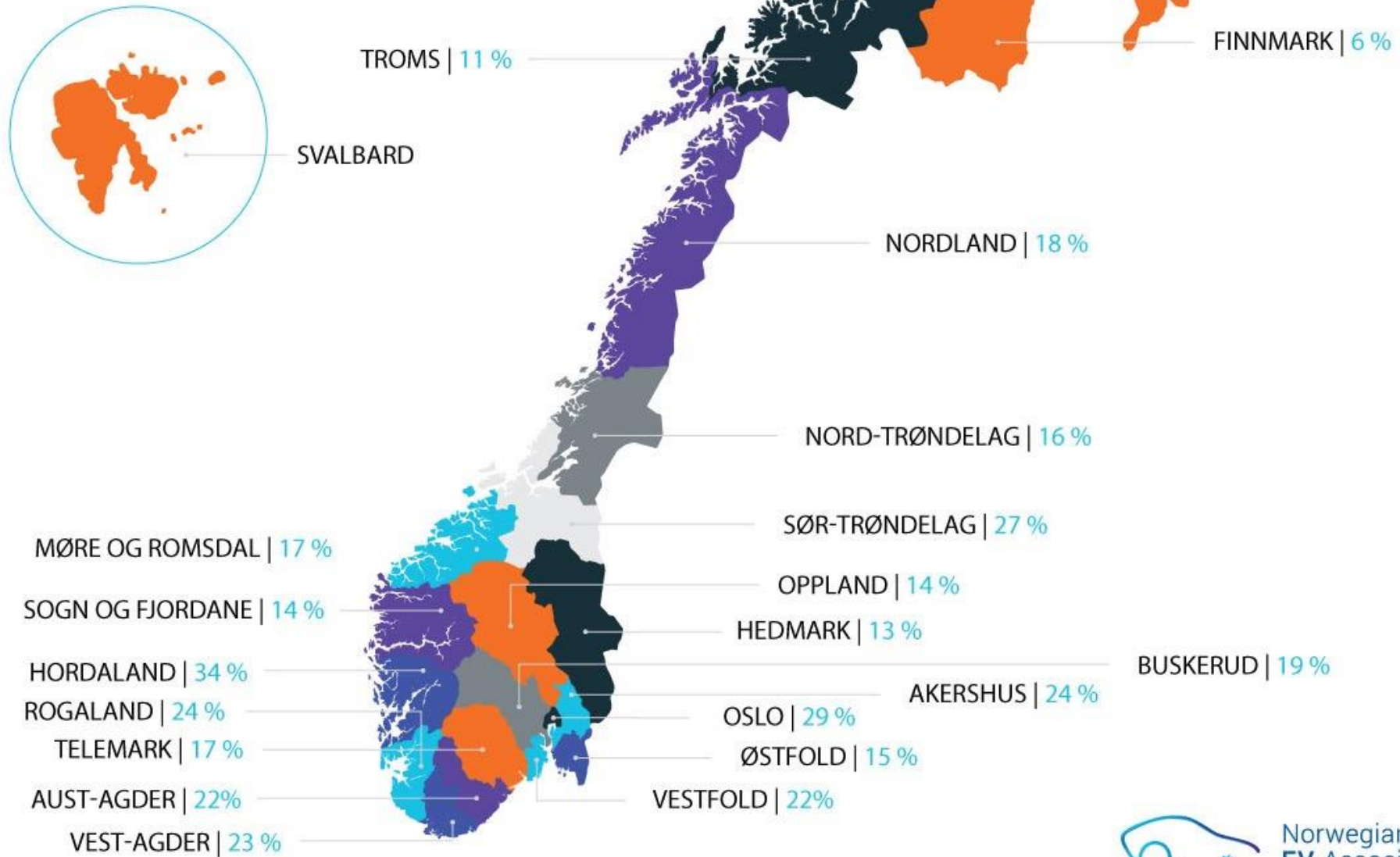
Norwegian
EV Association

■ BEV ■ PHEV

elbil.no

Electric cars spread all over Norway

NORWEGIAN EV MARKET SHARE 2015



Norwegian
EV Association

Drive-in cinema for Norwegian EV-owners





The Norwegian EV industry

What about industrial development

EVI summary: On a global perspective, China is currently the country with most dynamic development with respect to electric vehicles

JULY 2016

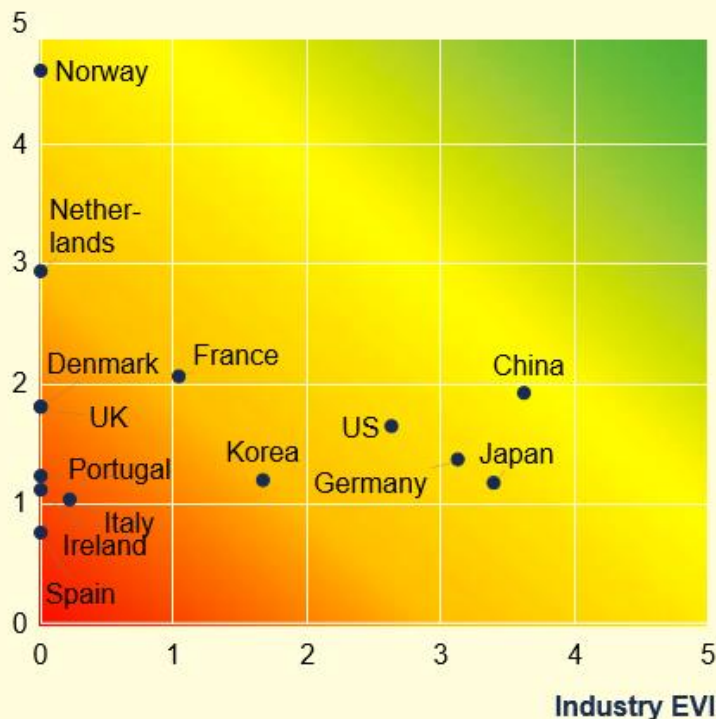
EVI summary

Market EVI








Rank	Country
1	 Norway
2	 Netherlands
3	 France
4	 China
5	 Denmark
6	 UK
7	 US
8	 Germany
9	 Portugal
10	 South Korea
11	 Japan
12	 Ireland
13	 Italy
14	 Spain

Overall result

Market EVI



Industry EVI

Rank	Country
1	 China
2	 Japan
3	 Germany
4	 US
5	 South Korea
6	 France
7	 Italy



buddy

It started over
25 years ago.

TH!NK





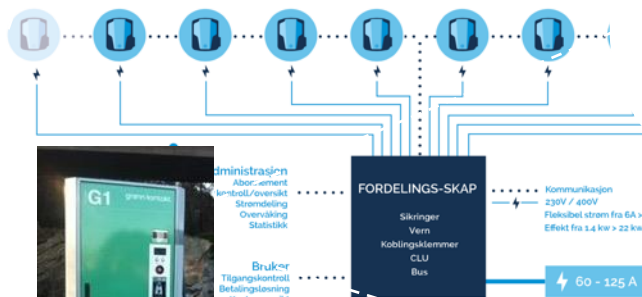
ITS



Transport
Services

Salto Anlegg

For anlegg med flere ladeuttak: som i borettslag, sameier, bedrifter, parkeringsanlegg eller kjøpesentre er "SALTO anlegg" løsningen. SALTO anlegg er et komplett, fleksibelt system med funksjoner som: fordeling av tilgjengelig strøm, brukerkontroll/ betaling, feilvarsling, overvåking og statistikk. Anlegget spesialtilpasses til hver enkelt prosjekt/lokasjon og leveres som komplett pakke. Ta kontakt for mer informasjon.



Technology
and
production



Batteries
Chargers
Grid

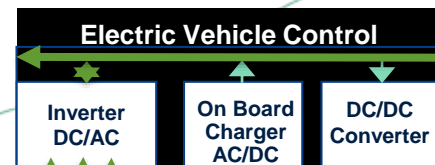


Administrasjon
Abonnement
Kontroll/oversikt
Strømdeling
Overvåking
Statistikk

Bruker
Tilgangskontroll
Betalingsløsning
Konto oversikt

FORDELINGS-SKAP
Sikringer
Værm kablingsklemmer
CLU Bus

Kommunikasjon
230V / 400V
Fleksibel strøm fra 6A > 32A
Effekt fra 1.4 kW > 22 kW



High voltage (72-750V)





electric mobility norway



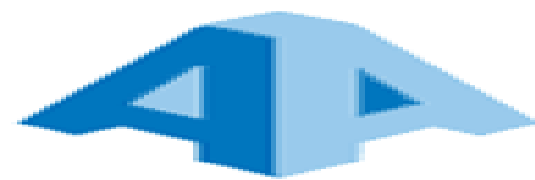
Norsk
elbilforening

Siemens starts battery development in Norway



Ampere, world's first electric ferry





Ship of the Year 2016.

> PICTURE: SVERRE HJØRNEVIK



Rolls-Royce



KONGSBERG



Test site for autonomous ships in Trondheim

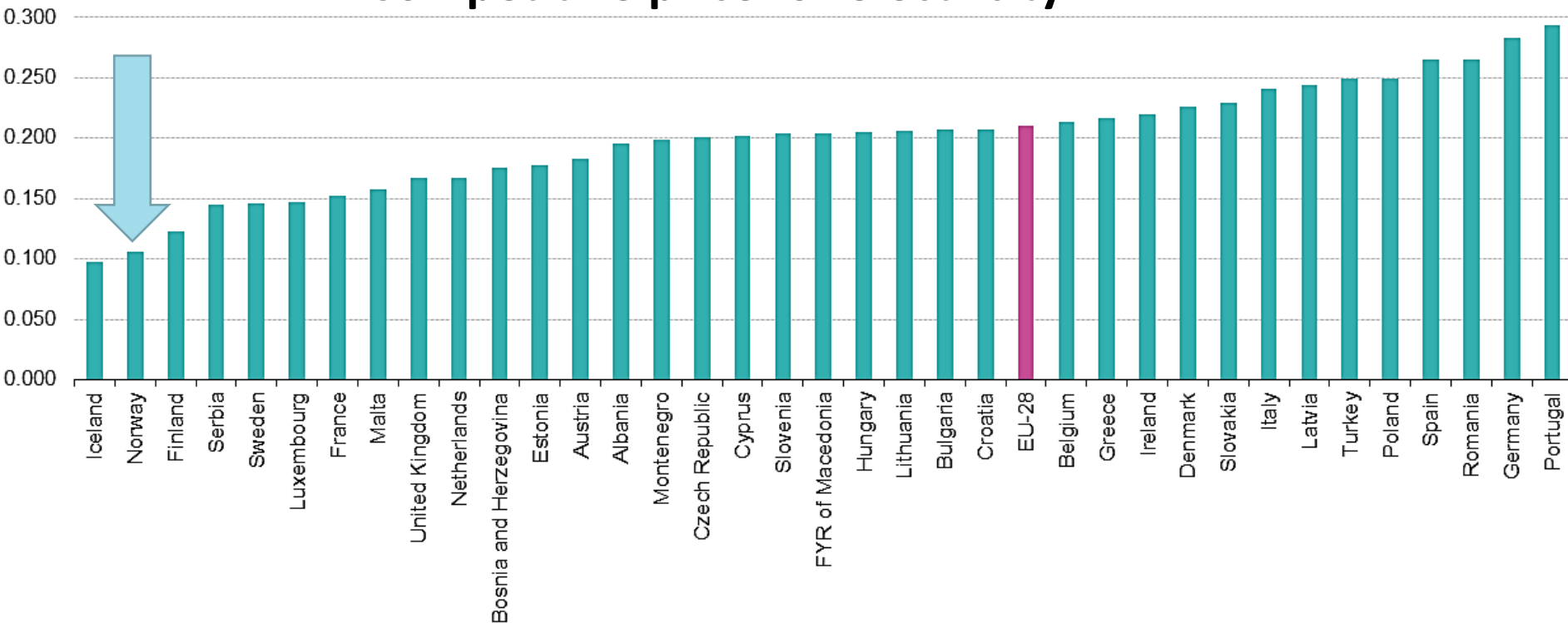


Electrification based on hydropower



Foto: Hafslund

Competitive price for electricity






PPP not available for Liechtenstein, Kosovo and Moldova.

Source: Eurostat (online data code: nrg_pc_204)

Norwegian hydropower

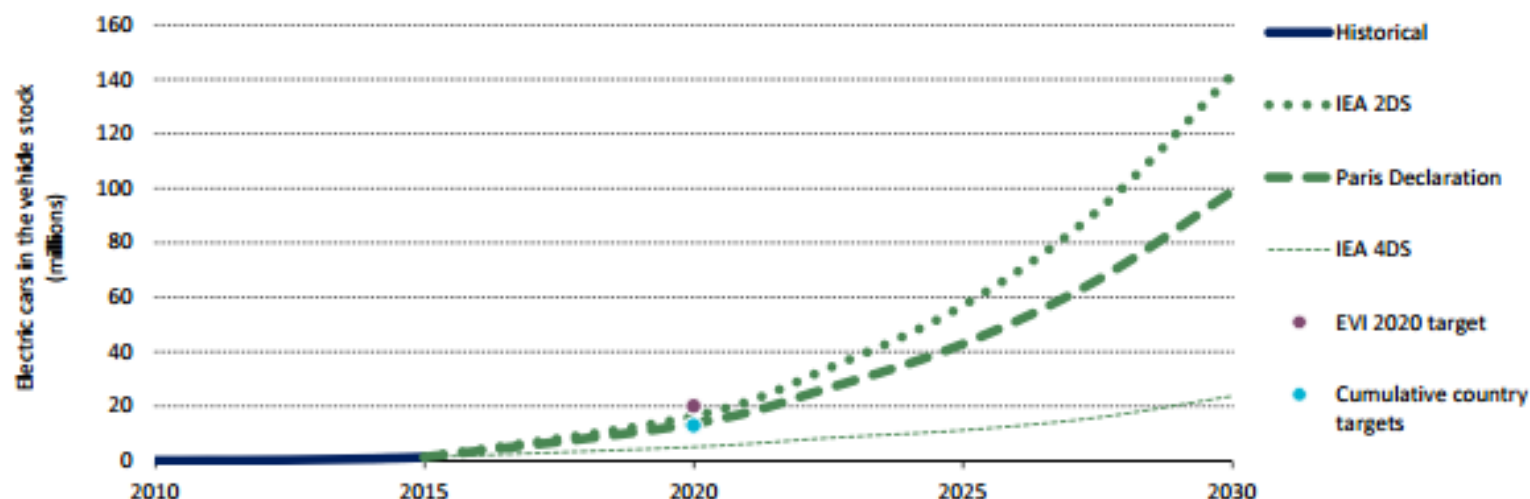
- 135 TWh total production
- 25 TWh surplus in 2020
- 6 TWh could be used to electrify all cars in Norway





**Norway can be the worlds
laboratorium for
electrification of transport**

Figure 3 • Deployment scenarios for the stock of electric cars to 2030



Note: 2DS ■ 2°C Scenario; 4DS ■ 4°C Scenario.

Sources: IEA analysis based on IEA (2016), UNFCCC (2015b), the EVI 2020 target and the country targets assessment made in Table 3.

Key point • 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.

Competitive advantage for Norway

- The most mature and advanced market, both for EV and maritime
- A national strategy and political will
- 100% renewable energy to a low cost
- An energy nation, including Europe's biggest producer of renewable energy
- A national program for chargers
- A complete maritime cluster
- Large process industry, with weight on metals and materials
- Industrial infrastructure incl deep water ports
- More available labour and a better currency situation
- Strong R&D capacity Including a national center for zero-emission transport

We welcome other countries to be a partner to develop industry on the electrification on transport

- We have the market, the will and the energy-
- and we are seeking industrial partners.





Thank you!
www.innovationnorway.no