Market snapshot - Smart Mobility Norway

Business Sweden
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BUSINESS SWEDEN
THE SWEDISH TRADE & INVEST COUNCIL

Norway is world-leading in EV implementation capturing almost 80% of new car sales sept. 2021

Battery electric & plug-in hybrid passenger car market

National targets

- New passenger cars and smaller trucks to be zero emission by 2025

Car fleet

- About 22% of the 2.8 million passenger car fleet in Norway are BEV or PHEV; with the majority being BEV
- The number of BEV & PHEV vehicles has been growing at a GAGR of 37% between 2016-2020

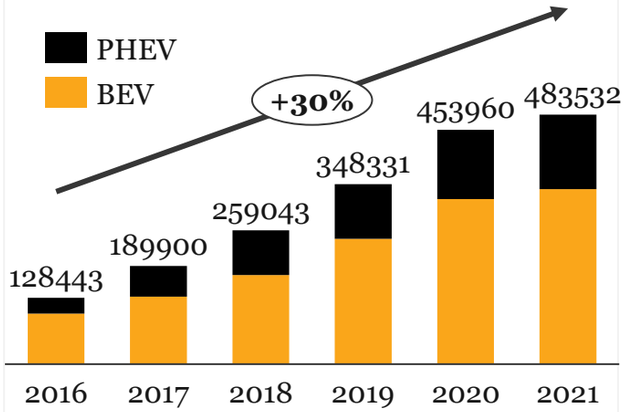
Sales of electric cars

- About 54% of newly registered cars in 2020 were BEV

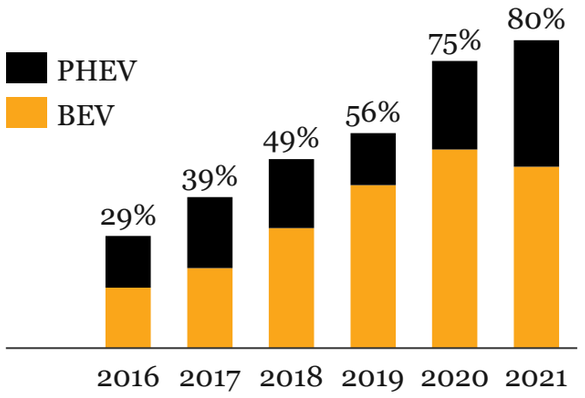
Incentives and Legislation

- EV to pay max 50-percent of what gas cars pay in tolls
- EVs are exempt from VAT on purchases; the exemption has been approved by ESA* until 2022
- EVs pay a maximum of half the price of what petrol and diesel cars pay on national and county ferries
- Companies that purchase electric vans can, depending on the size of the car, receive between NOK 15,000 and 50,000 in support from Enova

Nr. Of BEV & PHEV passenger cars



Yearly registrations of BEV & PHEV



Source: European Alternative Fuels Observatory, Norwegian Government, Elbilforeningen

*The EFTA Surveillance Authority

The Norwegian government aims to cut Co2 emissions in the transport sector in half by 2030

Infrastructure action plan for alternative fuels in transport

This action plan presents policies to meet government targets to cut Co2 emissions in the transport sector by 50-prosent within 2030 compared to 2005

Action plan for green shipping

This action plan presents policies to cut national greenhouse gas emissions to meet the target to reduce Co2 emissions, strengthen the Norwegian maritime industry and contribute to the global technology development

Climate Plan for 2021-2030

A key element in the plan is to cut non-quota emissions (emissions from transport, agriculture and more) by 45 percent by 2030

National Transport Plan (2022-2033)

The plan presents the Norwegian governments transport plan for the next twelve years with 1.2BN NOK state funding planned for the years with 510bn road, 52bn rail, 33bn coastal management, 80bn for measures in cities, 5bn for airports, and 3bn for investments across the transport sectors

2019

2019

2021

2021

Plan for fossil-free public transport in 2025

The plan targets bus, rail, ferries, and speed boats and outlines the actions plan to achieve the goal of fossil-free public transport by 2025

Action Plan for fossil-free construction sites in the transport sector

The government announces in the new action plan, among other things, the start-up of fossil-free pilot projects and the use of public procurement to reduce greenhouse gas emissions at construction sites in the transport sector

Norway is leading in the Nordics for EV charging infrastructure

EV charging infrastructure

National target

- The government believes the construction of infrastructure for alternative fuel should be market driven, but will contribute through Enova where it is not commercially profitable to expand

Current infrastructure

- During 2020 around 300 new charging stations and 3200 new charging points were established; at the end of 2020 there was a total of around 2960 charging stations and 17 000 publicly available charging points for EVs (5219 fast charge)

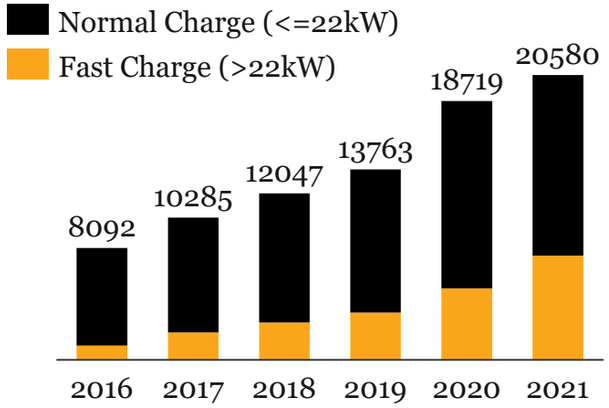
Planned investments in public infrastructure

- Since 2015 Enova has supported the construction of EV infrastructure for NOK 136mn; in 2020 there was a support of NOK 64,5mn for 25 new charging stations in Troms and Finnmark (northern Norway)

Investments in private infrastructure

- Oslo municipality provides grants of up to NOK 1mn per housing association to upgrade or establish infrastructure in housing associations and co-owners to facilitate the establishment of charging stations

Total number of public charging points



Main public infrastructure providers

fortum, mer (Ren energi fra Statkraft), TESLA, BKK, CIRCLE K, IONITY

Source: Handlingsplan for infrastruktur for alternative drivstoff I transport (2019); Klimaplanen 2021-2030, Nasjonal Transportplan 2022-2033

Norway has set the ambition for city busses to be zero emission by 2025

Sustainable public urban transport

National targets

- All new city busses should be zero emission or use biogas in 2025; want to make it a governmental requirement of all public procurements from 2025

Local bus service market structure

- The Norwegian bus service market is structured through regional public transportation companies; where operating companies run on a contract

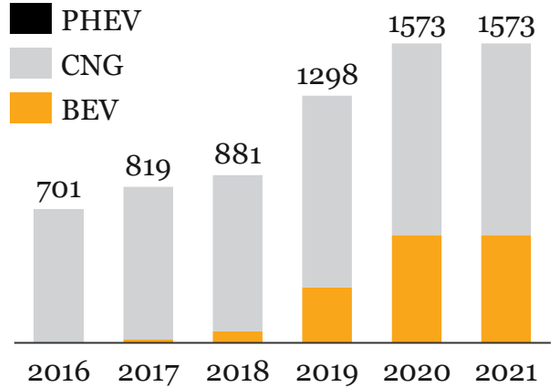
Current situation

- In 2020 over 20-percent of new registered city busses in Norway were zero emission
- In February 2020 Enova supported with NOK 74mn for charging infrastructure for electrical busses in Southern Oslo; creating an opportunity for electric busses in the city

Planned investments

- The government has planned around 26.3Bn NOK for large public urban transportation projects: Fornebubanen in the Oslo area, Bybanen in Bergen, Metrobuss in Trondheim, and Bussveien in Nord-Jæren

Total nr. of electric buses 2016-2021



Local transport authorities

Ruter#, Vestfold og Telemark Fylkeskommune, AtB, Troms fylkestrafikk, Østfold kollektivtrafikk, Innlandstrafikk, AKT, Brakar, FRAM, Nordland fylkeskommune, skyss, Snelandia, Kolumbus

Main bus operators

Nobina, Norgesbuss, tide, VY, Boreal, Unibuss

Source: Nasjonal transportplan, Enova

Norway is leading in electrification of ferries

The Alternative Fuels marine sector in Norway

National targets

- The government's ambition is to halve emissions from shipping and fishing by 2030
- The state currently sets requirements for low- and zero-emission technology in the tenders for the national road ferries
- In Norwegian waters, there are currently several vessels using LNG and batteries, especially in the ferry sector. By 2022 it is expected that 70 ferries will have batteries on board
- This year, 2021, the first vessel to use hydrogen is expected

Current situation

- Norway is today a leader in the development and use of gas-powered ships and battery-powered ferries
- Globally, about 185 vessels with batteries are in operation - more than half of them operate in Norway
- 2015; the world's first electric car and passenger ferry, *Ampere*, went into commercial operation
- 2021; the world's largest battery ferry in operation, Bastø Electric, went into operation
- 2022; the vessel YARA Birkeland will be the world's first fully electric and autonomous container ship, with zero emissions operating

Source: regjeringen.no, enova.no, Kongsberg.com, energiogklima.no

Nr. of electric ferries

- Electric car ferries
  - 35 operating now
  - 24 coming in 2021
  - 27 coming after 2021

Planned Investments

- To date, Enova has supported battery installation and other energy efficiency measures in about 75 vessels with more than NOK 500 million, in addition to a small number of all-electric vessels
- Through seven competitions from 2015 to 2019, Enova have supported 89 shore power projects in over 60 Norwegian ports with more than NOK 600 million

The use of AF trucks is increasing but still accounts for a small part of heavy-vehicles

Heavy-duty & light commercial vehicles

National targets

- By 2030 all new heavy vans, half of new trucks, and 75 percent of new long-distance buses should be zero emission

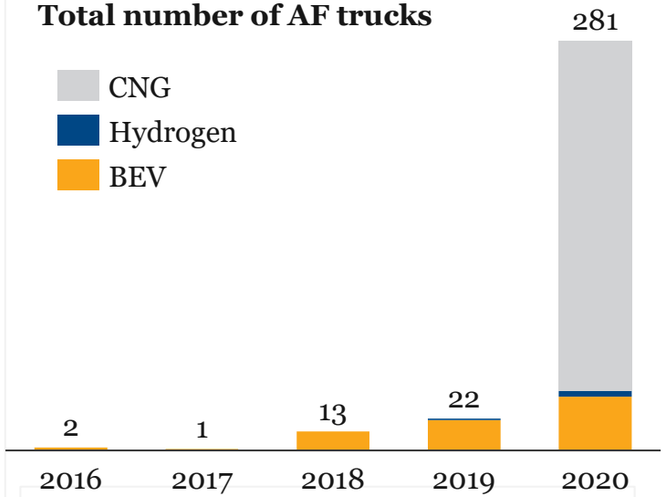
Current situation

- At the end of 2020, hydrogen, CNG, and BEV trucks accounted for 0,40% of all trucks on the road (70 566).
- The share of BEV is increasing each year with a CAGR of 107% for trucks; but still accounts for a small portion of trucks on the road
- For AF light commercial vehicles BEV is the dominant fuel type; accounting for 95-percent in 2020

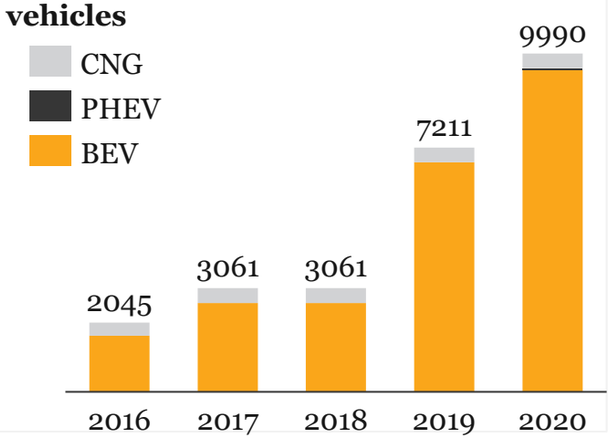
Planned investments

- Enova can cover up to 40-percent of the difference in price between purchasing a new electric vehicle compared to a diesel vehicle when companies purchase heavy electric vehicles such as trucks or tour buses.
- Although AF trucks account for a small part of the fleet; some companies are taking a greater stance towards sustainable transportation. For instance in May 2020 ASKO ordered 55 electric Scania trucks

Total number of AF trucks

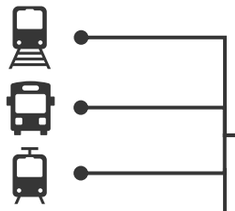


Total number of AF light commercial vehicles



Source: National Transport Plan, SSB * The Statistics Bureau did not separate gass types of fuel until 2020; explaining why CNG is only available for that year

Public transportation system is complemented by a variety of mobility solutions



Mobility as a Service (MaaS)

- Buss, train, tram, are connected to a certain degree through the applications offered by the regional transportation authorities
- The Nordic Open Mobility and Digitalization (NOMAD) project works towards mobility across the Nordics and as a framework for Nordic MaaS

Car sharing

- Car sharing has grown in Norway over the past two decades with over a dozen firms offering a variety of car sharing options
- Remains primarily geographically concentrated in the Oslo area
- The first formal car sharing service provider in Norway was Bilkollektivet, a member-owned cooperative established in 1995 in Oslo
- Move About, established in 2007, was the first service provider in Norway to offer a fleet of 100 percent battery electric vehicles

Providers

HYRE, bilkollektivet, VY, MOVE ABOUT, zipcar, Nabobil by getaround

Bike sharing

- City bike sharing is part of the strategy for biking in several municipalities in Norway, amongst them Oslo, Stavanger, Bergen, and Trondheim
- Kolumbus launched new electric bike-sharing bikes in February 2020
- In April 2021 the electric scooter provider Tier announced it would expand its services from scooters to electrical bikes and placed out 150 electrical bikes for rent in Bærum municipality; with the goal to continue its expansion to more Norwegian cities and European markets in 2021 and future years

Providers

Kolumbus, TIER

Micromobility

- There are seven electric scooter companies operating in the Norwegian capital; but as the municipality has no agreement with the providers new providers may enter the market without the municipalities knowledge.
- In January 2020 Bird acquired the competitor Circ, formerly known as Flash, which had launched in Oslo in mai 2019

Providers

Lime, voi., Bolt, ryde, TIER

Norwegian pilot projects are public-private collaborations focusing on autonomous vehicles and public transportation

Applied Autonomy

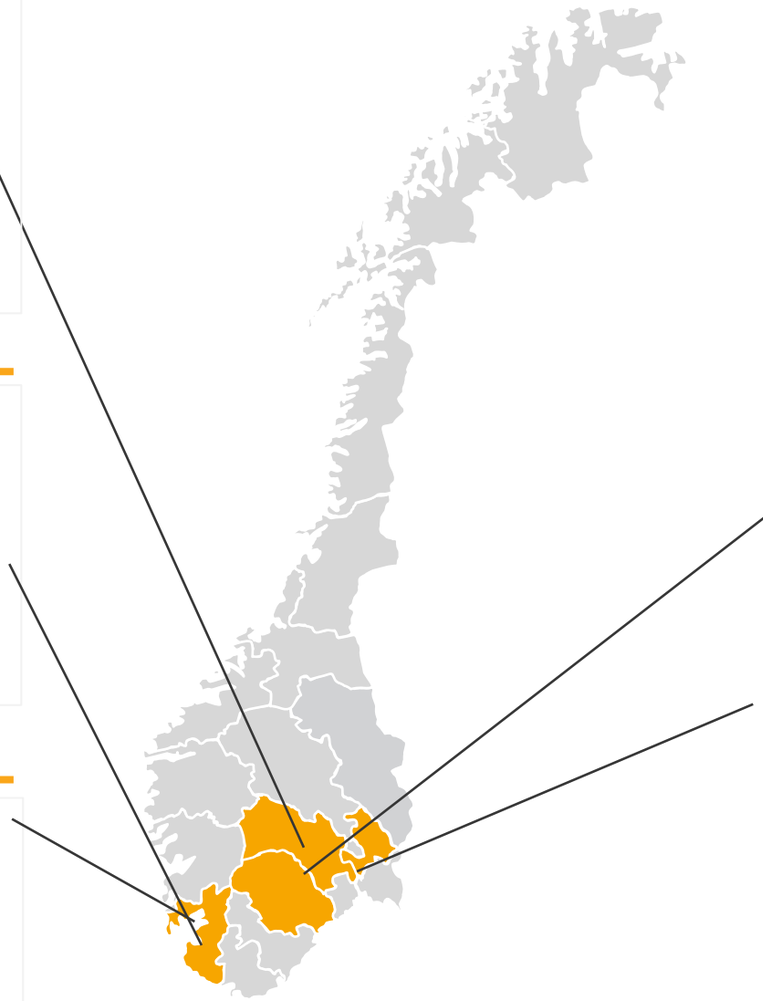
- Applied Autonomy was established by Kongsberg Innovation in 2017 and is today owned by Kongsberg Innovation, Olav Madland and Vy
- The company offers services for piloting and testing of autonomous vehicles as well as developing the control centre systems for autonomous traffic

YAGO

- YAGO is a business cluster for autonomous technologies at Forus
- A central part of the cluster collaboration will be an autonomous test center
- YAGO will create growth and promote local players to showcase the diversity that lies in the region

FABULOUS

- The Finnish self-driving software company Sensible 4 has started pre-pilot preparations at Gjesdal
- This is part of the EU-funded FABULOUS (Future Automated Bus Urban Level Operation Systems) project



SmartFeeder

- SmartFeeder is a pilot project on autonomous minibuses across Norway. The project is owned by the Railway Directorate, lead by SINTEFF and with partners such as the Norwegian Public Road Administration and **Applied Autonomy**
- The project has been in collaboration with 5 minibuses in the private and public sector;
  - Forus (Kolumbus)
  - Fornebu (OBOS)
  - Gjøvik (Gjøvik kommune)
  - Kongsberg (Brakar and Kongsberg kommune)
  - **Ruterpiloten in Oslo (Ruter)**
- The main purpose of the project is to strengthen the public transport offering in Norway

Holo

- Provides mobility with autonomous technology in pilot projects across the Nordics and Baltic region
- Handles applications, training of staff, implementation and supervision of projects with autonomous vehicles
- Holo has facilitated for the agreement between Toyota Motor Europe and **Sensible 4** for one of **Ruter's pilot projects in Ski**

Source: SINTEFF, Applied Autonomy, Fabulous, Holo, yago.no

Norway smart sustainable transportation ecosystem

National government bodies

Ministry of Transport

Statens vegvesen

NyeVeier

Regional & local authorities

VIKEN FYLKESKOMMUNE

Vestfold og Telemark FYLKESKOMMUNE

KONGSBERG KOMMUNE

GJØVIK KOMMUNE

Oslo

Business promotion & innovation

Innovasjon Norge

Forskningsrådet

Siva – Selskapet for industriutvikl

Local transport authorities

Ruter

Vestfold og Telemark FYLKESKOMMUNE

AtB

ØSTFOLD KOLLEKTIVTRAFIKK

Innlandstrafikk

AKT agder kollektivtrafikk as

Brakar

FRAM Møre og Romsdal fylkeskommune

Nordland FYLKESKOMMUNE

Snelandia

KOLUMBUS

TROMS fylkestrafikk

skyss

Initiatives & platforms

ITS Norway

NAF

Universities

NTNU

Universitetet i Sørøst-Norge

UNIVERSITAS BERGENSIS

UNIVERSITETET I AGDER

Test beds

FABULOS

YAGO

Technical research institutions

SINTEF

Teknologirådet

toi

Mobility clusters

SAMS Norway

Norsk elbilforening

Arena

OFV

National users

UNIBUSS

ColorLine

YARA

ASKO

oda

AVINOR

bring

BANE NOR

KONGSBERG

Charging infrastructure

TESLA

BKK

mer – Ren energi fra Statkraft

IONITY

CIRCLE K

fortum

Bus operators

Nobina

NORGESBUSS

BOREAL

UNIBUSS

tide

Mobility service providers

voi.

Lime

bilkollektivet

ryde

Bolt

zipcar

HYRE

Nabobil – getaround

MOVE ABOUT

TIER

Consultants

tieto EVRY

Urbanet Analyse

SWECO

COWI

Smart infrastructure & automated driving

APPLIED AUTONOMY

holo

YETIMOVE

STEER

DISRUPTIVE ENGINEERING

Government

Academia

Industry