Heavy duty charging in the Nordics

A snapshot of drivers, challenges and opportunities

29 August 2024
Nordic Battery Collaboration & ITS Nordic+

This material is based on interviews with Nordic companies and organisations

A material prepared by:

Innovation Norway
BUSINESS FINLAND
BUSINESS SWEDEN
nordic+ connected and sustainable

Supported by:

Nordic Innovation

In collaboration with:

EUROPEAN BATTERY ALLIANCE | EBA250
eit InnoEnergy

Content

The findings in this material are based on interviews with leading players within the Nordic heavy duty electrification ecosystem

About the material

- During May-August 2024, the Nordic Battery Collaboration, consisting of Business Finland, Business Sweden and Innovation Norway, together with ITS Nordic+, conducted interviews with companies and public organizations in the heavy-duty truck charging value chain with the purpose of establishing a common view of the drivers, challenges and possible roadblocks, as well as opportunities for sufficient heavy-duty charging in the Nordics
- The results are compiled in this material and presented in August 2024 during a Nordic Battery Thursday webinar. Nordic Battery Thursdays is a collaborative webinar series that provides in-depth insights on the potential, opportunities and impact of the battery sector within the Nordics
- The results from the interviews will serve as a basis for continued industry dialogues, to highlight and lift opportunities within the market, and as input to improve market conditions. The Nordics have been piloting electrification of transportation, and our common ambition is to support continuous innovation and up-scaling within this area to meet the needs of the global market while simultaneously strengthening the Nordic ecosystem

About the interviews

- The 12 interviews were conducted during early summer & fall 2024 (May-August)
- The information from the specific interviews is confidential. No information in this material can be tracked to a specific interviewee
- Business Sweden, Business Finland, Innovation Norway and ITS Nordic+ take full responsibility for the compilation of the information from the interviews. Although confidential, individual opinions are from the interviewees and not from the above organisations

Acknowledgements

- Business Sweden, Business Finland, Innovation Norway, and ITS Nordic+ would like to express our gratitude to all interviewees for dialogue and support throughout the work with this material

Interviewees

Circle K · Recharge · Kempower · Milence · Kaukokiito · Vattenfall · Caruna · Statens vegvesen · enova · einride · Fount · Erinion

The Nordics play a significant role in advancing the electrification of the heavy-duty industry in Europe

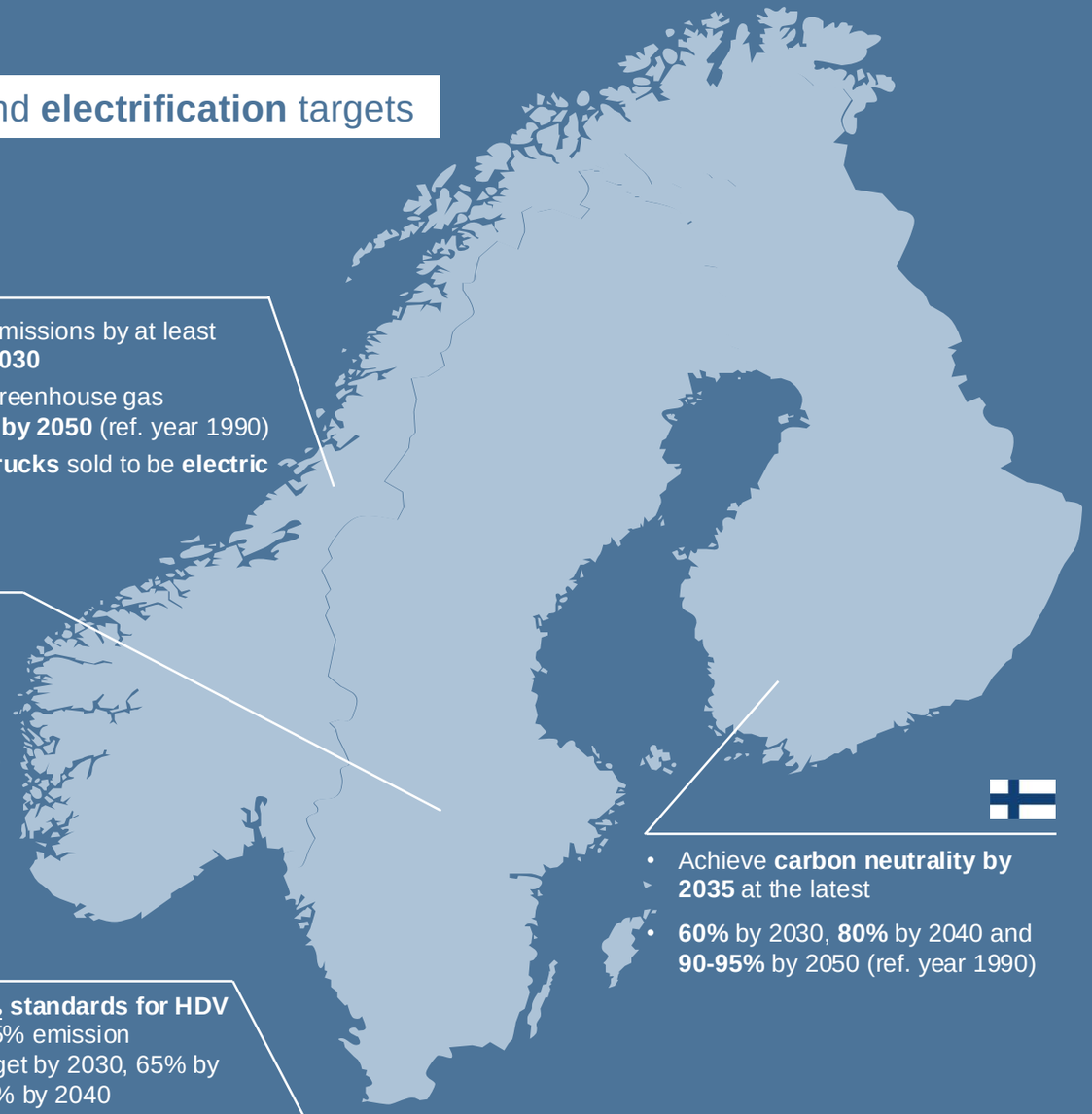
Key industry drivers in **the Nordics**

- Climate targets create a business opportunity for electrification
- Governmental tax subsidies, funding programs and support available
- Innovation and corporate commitment, frontrunners present across value chain
- Availability of green energy at low cost
- Land availability, strategic truck stop locations and good connections to the European road network
- Collaboration between private and public stakeholders

> *"To succeed in this transition, you need a holistic approach that combines infrastructure, digital platforms, and vehicle technology. The Nordics are leading because we are addressing the entire system, not just parts of it."*

> *"There are many challenging factors affecting the speed of electrification including price, service, electricity costs – but at the same time this is a requirement on EU, national, and municipality levels so we have to act"*

Climate neutrality and **electrification** targets



- Reduce emissions by at least **55% by 2030**
- **90-95%** greenhouse gas reduction **by 2050** (ref. year 1990)
- **All new trucks** sold to be **electric** by 2030

- **Net zero** greenhouse gas emissions **by 2045 – 63% by 2030** (ref. year 1990)
- **70% emissions** from domestic **transport** reduced **by 2030** (ref. year 2010)

- **Revised CO_2 standards for HDV in the EU**: 45% emission reduction target by 2030, 65% by 2035 and 90% by 2040

- Achieve **carbon neutrality by 2035** at the latest
- **60%** by 2030, **80%** by 2040 and **90-95%** by 2050 (ref. year 1990)

Source: Interviews with key stakeholders; Nordic Battery Collaboration and ITS Nordic+ analysis; European Commission, Swedish Government Offices, Ministry of Transport and Communications of Finland, Enova, Ministry of Transport of Norway

The Nordics is home to a dynamic ecosystem with small and large players driving the electrification at home and across the European system

Examples of **recent development** in the Nordics

2022: The Swedish Energy Agency distributes 1.4 billion SEK to support regional charging infrastructure projects

November 2023: The first public fast charging station for electric trucks was opened in Tampere, Finland

2023: Electric trucks made up 10% of all new truck sales in Norway

April - July 2024: Milence announces the opening of three charging hubs in Sweden (Varberg, Ödeshög, Åstorp)

June 2023: Port of Oslo, the Urban Environment Agency, and Recharge open public charging station for heavy-duty at the port

2023: OKQ8, Volvo AB and energy utility company Skellefteå Kraft install 26 new super-fast charge stations in Sweden

June 2024: Scania establishes charging solutions company Erinion to strengthen group e-Mobility with 40 000 charging points

July 2024: Public charging site in Oslo, Norway opened by Kempower, Wennstrom and Fastcharge

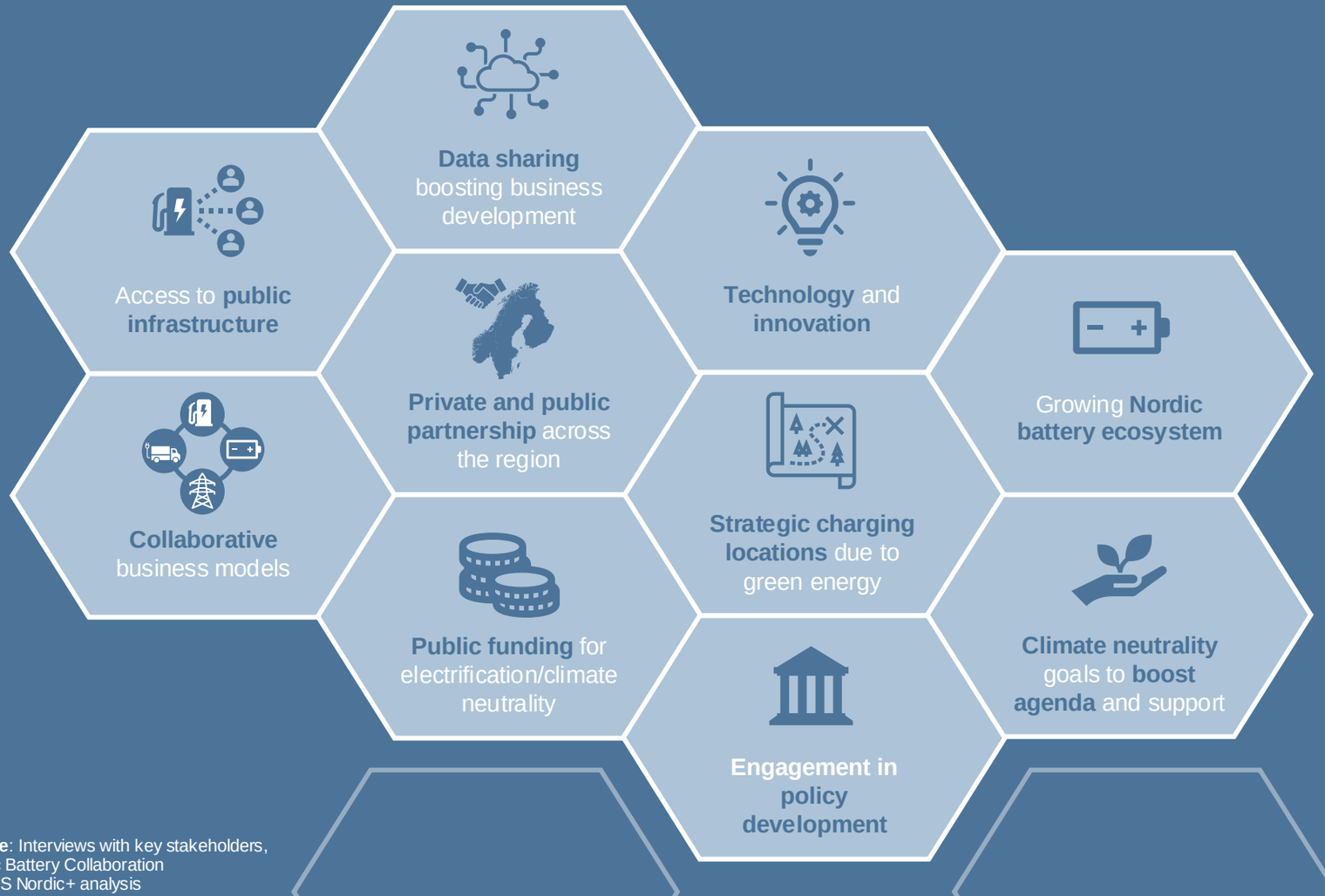
A **growing** electrification ecosystem for heavy-duty*

* Key actors in the Nordic ecosystem (non-exhaustive)

Source: Company websites; Swedish Energy Agency; Ministry of Transport and Communications of Finland; Enova

Interviews show a promising landscape for continued development and growth in the electric heavy-duty sector in the Nordics

Ecosystem dynamics that can be utilised to **boost** the **heavy-duty electrification** in the Nordics



> *"We see a lot of potential in utilizing batteries to optimize energy usage and create new revenue streams for logistics companies."*

> *"The Nordics have a unique opportunity to lead in electric heavy-duty transport by integrating energy solutions and addressing the full spectrum of challenges from vehicle purchase to infrastructure."*

Source: Interviews with key stakeholders, Nordic Battery Collaboration and ITS Nordic+ analysis

Predictability and capacity of the grid recognized as one of the main barriers to building out charging network and utilising land most efficiently

GRID CAPACITY

Challenges

- Limited grid capacity hinders deployment and predictability of charging times
- Time to upgrade grid network is long
- Fluctuating electricity prices

Needs

- Balancing grid load by utilizing batteries, avoiding grid overload and reducing electricity costs
- Collaboration between actors in the value chain to optimize existing electricity supply and demand
- Reliable electricity grid

LAND CONDITIONS

Challenges

- Ensuring the availability of land and system optimization regarding charging time, location and grid connectivity for public infrastructure
- Charging capacity at existing facilities may be limited by total electricity usage
- New land development process takes time

Needs

- Holistic and strategic approach to building out public infrastructure
- Strategic use of land (and grid) to meet needs of customers
- Understanding of customer electrification journey to provide holistic plan

Industry input

- Batteries to balance grid and improve charging point resilience
- Data sharing to boost predictability and make it possible for players across the value chain to collaborate and find solutions to common grid issues
- Utilise different renewable power sources to expand grid
- Vehicle-to-grid technology

- Financing to support land development and network build out to new areas, and to some extent to replace old infrastructure
- Traffic, grid and network coverage data sharing to solve land development planning issues
- Smart usage of the facility's allocated electricity to avoid peaks and related costs

Source: Interviews with key stakeholders, Nordic Battery Collaboration and ITS Nordic+ analysis

Data sharing, collaborative business models and subsidies/grants pin-pointed as key factors to address financial and operational uncertainties for electric trucks

CHARGING AVAILABILITY

Challenges

- Charging network does not match with fleet size
- Long waiting times due to availability
- Lack of public or shared charging stations
- Cold climate affects battery performance in trucks/chargers

Needs

- Strategically plan the expansion of charging infrastructure, avoiding overinvestment while securing the needs of a growing fleet
- Updated maps
- Technology development
- Collaboration and regional needs analysis between actors across the value chain

OPERATIONS & FINANCE

Challenges

- High up-front cost and TCO for electric trucks
- Operational and financial uncertainties due to network limitations, lack of tools for route planning
- Need for logistics companies to change operational patterns when electrifying their fleets

Needs

- Financial support to support the business case for investing in electric trucks and charging infrastructure
- Traffic and infrastructure data sharing to enable efficient route and operational planning
- Logistics companies' customers to adjust expectations during shift to electrification

Industry input

Expanded network of public charging station and data sharing to optimise these

Collaborative business models and joint investments to develop shared charging infrastructure and meet needs and from players across the value chain

Ultra-fast, MW charging technology to make time spent at station shorter and allow for more to use. New technologies can overcome challenges with cold climate

Predictable financial support to counter high initial capital investments and truck roll-out in addition to other financial incentives and mechanisms for operations

Sharing traffic and infrastructure data simplify route and operational planning. Connectivity also improves understanding of customer needs and route planning

Standardization of sub-station connection, payments, metering and measurements and make sure that these are in line with European regulations

Source: Interviews with key stakeholders, Nordic Battery Collaboration and ITS Nordic+ analysis

A strong Nordic innovation ecosystem supports the electrification of the heavy-duty sector and is further boosted by climate neutrality agendas

INNOVATION

Challenges

- Electrification of heavy-duty sector relies on innovation and the availability and development of new technology and solutions
- Bring forward innovations at speed to meet goals

Needs

- Open data to support technology development
- Forums to address joint topics and highlight development
- Complementary technologies to battery technology: hydrogen and biofuel

CLIMATE NEUTRALITY

Challenges

- Strict CO_2 standards for Heavy-Duty Vehicles in the EU with reduction targets pushing speedy transition

Needs

- Commitment and governmental support to realise the decarbonisation of heavy-duty sector
- Streamlined national/regional strategies anchored in industry needs and strategies

Industry input

- European innovation funds can be utilised for heavy-duty related projects
- Collaboration between industry, government, academia and society is strong in the Nordic ecosystem
- Access to data will support technology developers
- Strong commitment and partnership between Nordic countries
- Available funds for projects contributing to the green transition, including the decarbonisation of heavy-duty sector and build out of charging infrastructure
- Innovating towards carbon neutrality is a way to future proof the heavy-duty and logistics industry

Source: Interviews with key stakeholders, Nordic Battery Collaboration and ITS Nordic+ analysis

GET IN TOUCH

The Nordic network is within your reach – it is a hub to support your actions

This material was compiled as a **collaboration between the Nordic Battery Collaboration and ITS Nordic+**

Business Sweden, the Swedish Trade and Invest Council, is commissioned by the Swedish government and industry to help Swedish companies grow global sales and international companies invest and expand in Sweden.

Innovation Norway is the Norwegian Government's instrument for innovation and development of Norwegian enterprises and industry. Innovation Norway supports companies providing financial means, competence, advisory services, promotional services and network services.

Business Finland is Finland's official government agency for innovation funding, trade and investment promotion, travel promotion, and talent attraction.

Nordic+ enables widespread knowledge sharing and collaboration across national borders and domains through the ITS organisations and members in the Nordic and Baltic region