

# EV CHARGING IN THE **NORDICS**

**PIONEER** MARKET RESEARCH



# CONTENTS

<b>Analysis</b>	<b>..... 03</b>
Where do you feel the market is heading?	..... 04
How do you see charging providers consolidating?	..... 05
Will your network expand to charging for more than cars?	..... 06
McKinsey (the consultancy) sees in-car purchases as a major opportunity in the short-term future. How are you preparing for this?	..... 07
What is your view on joining an alliance network where you cross-charge between members (star alliance in airlines)	..... 08
What % of your revenue is from energy sales vs sale of data?	..... 09
<b>Summary</b>	<b>..... 10</b>
Summary and Conclusions	..... 11
<b>Disclaimers</b>	<b>..... 13</b>



# Introduction

The rapid expansion of the EV market in the Nordics poses both opportunities and challenges for the development of the EV charging infrastructure. The availability, accessibility and affordability of charging stations are key factors that influence the consumer choice and behavior regarding EVs. Moreover, the integration of EV charging with the electricity grid, the renewable energy sources and the smart technologies can have significant impacts on the energy system, the environment and the society.

This report aims to provide a comprehensive overview of the EV charging market in the Nordics, covering both high-level analysis and detailed insights into key aspects of the market.

By reading this report, you will gain a comprehensive understanding of the EV charging market in the Nordics, as well as its current status, future prospects, opportunities and challenges. You will also learn about the best practices, lessons learned and success stories from the Nordic countries that can inspire other regions to accelerate their transition to electric mobility.

**To give you a glimpse of what this report will cover, here are some facts and figures from various sources that illustrate the Nordic EV charging market:**

- According to Statista, Norway had nearly 19,300 publicly available electric car chargers in 2021, of which about 12,900 were standard chargers and 1,200 were Tesla Superchargers<sup>1</sup>. Norway also had the highest number of public charging stations per 100 kilometers of roadway in 2021, with 47.7 stations<sup>2</sup>.
- According to IEA, Norway also had the highest EV market share in 2020, with 75% of new car sales being electric. Iceland followed with 52%, Sweden with 32%, and Denmark with 22%. Finland had a lower EV market share of 9%, but it increased by 4 percentage points from 2019<sup>3</sup>.
- According to Nordic Energy Research, twice as many car buyers in the Nordic region plan to buy an electric car within the next 12 months compared to 2019. The demand for electric cars is greatest in Norway (30%), followed by Iceland (21%), Denmark (13%), Sweden (11%) and Finland (8%)<sup>4</sup>.
- According to [EV Volumes], Sweden had over 25,000 public charging points in 2020, of which about 3,000 were fast chargers. Sweden also had the largest EV fleet in the Nordics, with over 400,000 vehicles.
- According to [Cleantechnica], Denmark had about 11,000 public charging points in 2020, of which about 1,500 were fast chargers. Denmark also had the highest growth rate of EV sales in the Nordics, with a 157% increase from 2019.

These facts and figures show that the Nordic countries have made significant progress and achievements in the EV and EV charging markets, but they also face different challenges and opportunities for further development and innovation. This report will explore these aspects in more detail in the following chapters.



# ANALYSIS



# Where do you feel the market is heading?

The market is evolving fast and consumer demand and government investment and incentives is helping to drive the market, with VC investments validating the case for further investment.

Consolidation is likely to happen both between operators and across different parts of the value chain, and this is likely to intensify given the pressure to scale, our interviewees told us.

As energy companies enter the space, they are likely to acquire CPOs and hardware providers, and there will be attempts by CPOs and utility companies to own the entire value chain, much like Tesla. This will be driven by the need to reach significant scale to become profitable, as well as the challenge in finding suitable locations, with smaller operators being acquired if they cannot make their offerings profitable.

However, our participants told us that the market faces intense capex pressures, with large upfront investments to find, acquire, establish power to, and then operate charging stations. Given that energy sales are not high-margin sales for CPOs, given the limited mark-up, this means that operators have a long investment horizon, and that other revenue sources are likely to become important.

Charging stations are likely to evolve their offerings to become more like leisure centers or meeting spaces, with cafes, restaurants, and other facilities complementing these sites, both to make additional revenue streams and to capitalize on, and cater to wait times, and food and drink sales will become increasingly important.



# How do you see charging providers consolidating?

Our interviewees all believed that ***consolidation was likely in the medium term.***

Our interviewees agreed that smaller CPOs, though entering the market at a rapid rate, were likely to be acquired by larger operators or utility companies due to the long time to ROI in the market. This is because scale is essential to this market, and even large CPOs or utility companies will be unable to become profitable without scaling. Given that the interviewees told us that this market has a long investment horizon, this incentivises competing players to acquire companies to expedite this process. Many small companies will struggle to become profitable, making them targets for acquisition.

In addition to the need for scale, there is significant effort in finding, acquiring, and establishing key locations. This is exceedingly difficult in the Nordics, making competition for key charge point locations fierce. Utility companies and large CPOs are likely to seek to buy out operators that hold key locations and sites to add to their portfolio to achieve dominance in the market, and smaller companies that cannot find key locations will fail or be acquired.

Energy companies are likely to enter the market and acquire certain parts of the value chain. However, the participants differed in their opinion of their intentions. Utility and oil and gas firms may choose to stay upstream where there are higher revenue possibilities, though our interviewees also felt that they were likely to acquire smaller CPOs.

Hardware companies are likely to acquire some software providers in order to scale their offerings faster, and software companies, too have difficulties monetizing their solutions, making them key targets for companies looking to augment their offerings and revenue streams.

# Will your network expand to charging for more than cars?

All use cases are of interest in the market, the interviewees told us, with virtually all forms of land transport being considered for electrification and charging.

Trucks are of particular interest, as large fleets are a sizable opportunity. CPOs and manufacturers alike are investigating how to make long-haul transportation possible - especially through rapid charging - making this likely to be solved in the medium term, though the participants disagreed as to whether this would happen within after 2030, or within the next 5 years.

Buses are also under consideration, along with car sharing and eMobility solutions. The participants also mentioned that trains and airplanes were being worked on in the market.





# **In-car purchases are forecasted to be a major opportunity in the short-term future. How are you preparing for this?**

Mobile phone apps are more likely to be important, as opposed to in-car purchases, in the opinion of our interviewees.

Given that Apple Carplay and Android Auto already utilize and reflect apps on a users mobile phone, our interviewees predicted that this will be the direction of travel, given that consumers are more comfortable with mobile phones and using these for charging and other purposes. Use cases such as self-service, booking ev charging, ordering food from service station is already either available or in-development, therefore this is more likely to be the platform on which offerings evolve, especially given the limited UX offered by in-car screens currently.

However, the interviewees suggested some important use cases that may evolve in the future including, translation for rental cars and mapping systems. Most notably, a potential use case of in-car purchases would be a car/charger recognition, charging, and billing systems, allowing chargers to recognise a vehicle and automatically bill the user without the need for an app.

A roaming system, such as is standard to the Telco industry, would allow the user to be provider agnostics, and simply plug and charge. Tesla already offer a similar system, therefore rolling this out to the wider market should be in scope. This would, however require OEMs, chargepoint manufactures, and CPOs to co-operate and conform to uniform standards.

Use cases to utilise charging idle-time (such as entertainment or catering) may be of interest to retailers and CPOs as an upsell may also emerge.

# Will EV networks join a common business alliance to support industry standards and cross-charging?

This is essential for the market's development, our interviewees agreed, with the goal being a single payment method for consumers, so they don't need to worry about moving between different operators.

Currently, the user experience is poor, with drivers needing a wide range of apps and subscriptions needed to unlock charging stations - notwithstanding that customers can pay 2-3 times more for charging from CPOs to whom they are not subscribed. Whether it be forced by regulation to prevent excessive charging, or whether operators create a coalition voluntarily, eventually a single solution will emerge.

The interviewees believed that the Telecoms sector set a precedent in terms of roaming that is likely to be followed by EV chargers as a solution to customers using a variety of charge points from different operators without paying an excess, along with a standard pricing system.

The interviewees indicated that CPOs would most likely be willing to join together to offer this in the near future.



# What % of your revenue is from **energy sales vs sale of data?**

Data currently makes up little to no revenue for manufacturers and CPOs, the participants told us, and even software is a low revenue model.

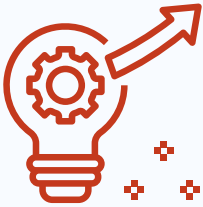
CPOs are more likely to be dependent on other revenue sources (such as food and drinks) as opposed to monetizing data sales.



# SUMMARY



# Summary and Conclusions



## **Rapidly evolving market –**

the market is growing rapidly, however is still immature in terms of number of charging stations and power supporting it. The Nordic regions require more stations, and more power with the supporting transmissions infrastructure to support the growing number of cars. Users are already experiencing difficulties finding charge points and dealing with queues, underlying these problems, as well as the need for rapid charging, which is attracting significant attention and investment.



## **Need for scale –**

the high capex involved with building and operating charging stations in the market, combined with the thin margins on selling energy mean that operators in this market need to achieve significant scale, and wait for many years to realize their ROI. This means that only large, or well diversified companies, are likely to succeed in this market.



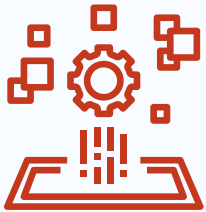
## **Location first –**

even well-funded companies are struggling to enter the market as finding and acquiring locations for charge points is extremely difficult. This battle for key locations is likely to drive higher revenues and values for operators holding key sites, and is likely to lead to major acquisitions and consolidation activity.



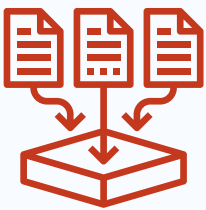
### **Acquisition and consolidation –**

the need for scale, as well as various players in different parts of the value chain entering the market, will lead to mergers and acquisitions within the market.



### **Need for a uniform charging platform –**

the interviewees all agreed that the status quo for users with regards to multiple providers and systems is untenable. Currently, users face different interfaces, apps, and subscriptions, as well as excessive charges for using new platforms or different CPOs, leading to a high cost and a poor user experience. CPOs are likely to unify to create a roaming structure in the near future, much like the communications industry, whether this be by choice or through regulatory pressure to offer a uniform price and offering.



### **Data is not a significant part of the market, and in-car technology is not a major focus –**

our interviewees confirmed that data was not part of their offering or revenue streams, and that mobile applications were a higher priority than in-car technology



# Disclaimers

## Disclaimers & Disclosures

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