



Charging Stations for Electric Cars in Turku

Report on the current status of and future prospects for charging stations of electric cars in the region of Turku

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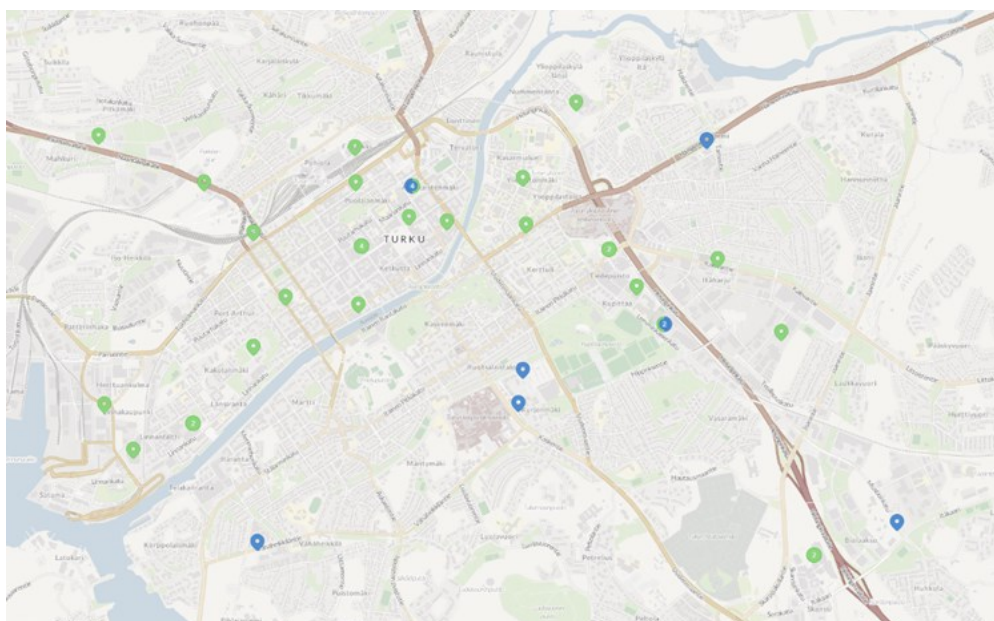


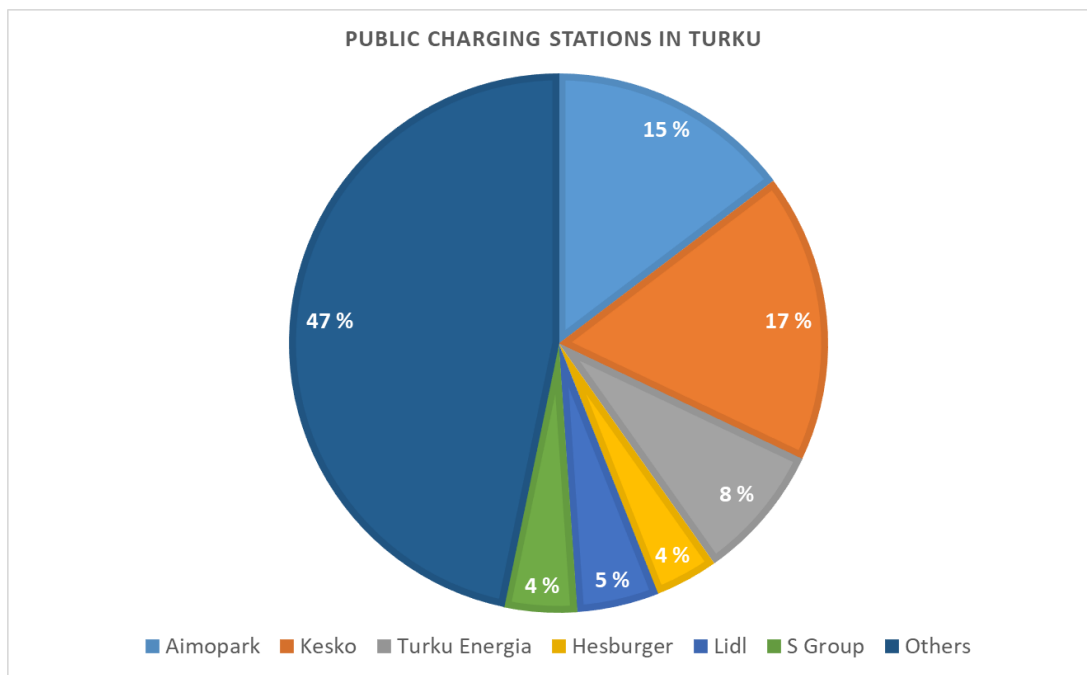
Report on the charging stations for electric cars in Turku

As is the case for most of the biggest cities in Finland, despite some local shortages, the city of Turku has a sufficient number of public charging stations in relation to the number of electric cars and plug-in hybrids in use. On the main entrance ways with busy traffic, fast charging stations can be overcrowded due to, for example, increased taxi traffic. Currently, the most significant bottleneck for wider-scale deployment of electric cars are housing cooperatives which are lacking behind in introducing charging stations, although progress is luckily being made. The introduction of new charging stations is accelerated by the exponential growth of the market for electric cars as well as the new The Land Use and Building Act 733/2020.

Public charging stations in Turku

At the moment of writing this (24.5.2021), there are altogether 185 charging stations situated in 51 different locations in the city Turku. Majority of the charging stations are Type-2 charging points with a maximum power supply of 22kW. However, DC charging stations with power supply of over 50kW are becoming more common, especially among certain operators. Approximately half of the fast-charging stations are equipped with CCS plugs and the other half with CHAdeMO plugs. When it comes to the new fast chargers, most of them are equipped with CCS. Super-fast charging stations with power supply of over 100kW have been introduced to the cityscape within the past few months and they are likely to become more common as newer electric cars are able to utilise faster charging rates.





THE NUMBER AND LOCATION OF CHARGING STATIONS ARE FROM THE WEBSITE LATAUSKARTTA.FI WHICH IS UPDATED BY SÄHKÖAUTOILIJAT RY

In Turku, the largest owners of charging stations are Kesko and Aimo-Park. These companies operate approximately one third of all the charging stations in Turku. Other large owners include Hesburger, Turku Energia, S Group and Lidl. The largest charging station service provider in Turku (and in Finland) is Virta which provides its customers with charging stations and an application for operating the station as well as the payment transactions. While similar services are also provided by Fortum C&D, so far there are not that many of those available in Turku when compared to, for example, Helsinki. Kesko also has its own charging service K-lataus.

Most public charging stations in Turku are not free of charge to use. All the charging station owners interviewed for this report (K-lataus, Aimo Park, Lidl, S Group, Hesburger) considered charging stations as an extra service used largely to attract customers to their other services. For now, Lidl has kept its charging stations free of charge meaning that the company does not receive any revenues from them. However, some operators see fast and super-fast charging stations as an important part of their future business operations. Super-fast charging stations provide a refuelling-like experience for electric cars users, enabling them to charge 50 to 80 % of their battery capacity while having a cup of coffee.

As for the price of charging, there is a lot of local variation, starting from completely free of charge usage to approximately € 0,50 per kilowatt-hour. A driver charging a car does not usually pay for the electricity, rather the payment consists of electricity transfer fees. The quicker the charger used, the more expensive the charging fee usually is. The payment system for quicker chargers is also often dependent on time, resulting in faster turnover rates at charging stations. The biggest variations in pricing are caused by changes in electricity prices and in business models.

Charging stations in housing cooperatives

The status of charging stations in housing cooperatives was explored based on the information received from TVT Rental Housing and VASO as well as the grants awarded by The Housing Finance and Development Centre of Finland (ARA) for charging station installation. Representative of the Finnish Real Estate Federation was also interviewed to get a better idea of the status of charging stations in housing cooperatives. While the amount of data was relatively small, it can be used to make observations and examine the overall picture with reasonable accuracy.

It is natural that the charging speed of charging stations in housing cooperatives is lower than that of public charging stations. In many cases, the first charging point is paid for by the owner of an electric or hybrid car and the charger is installed on a car heating pole. However, this is only a temporary solution as heating poles cannot support multiple charging points with a power supply of over 2kW. This means that a proper power grid supporting charging stations needs to be installed.

The most common output levels for charging stations in housing cooperatives are 1,8 kW, 3,7kW, 7,4kW or 11/22kW (11/22kW refers to a charging point with its own 32A fuse and two charging sockets making it possible to charge two cars at the same time). These charging power levels are sufficient for charging an average electric car overnight for daily commuting. (In the table below, the value for kWh/kilometre is 15kWh/100km based on an estimate on Motiva's website, reference available on the final page).

Fuse	Output power (kW)	Distance (km) 4 hr charging	Distance (km) 10 hr charging
1x8A	1,8	48	120
1x16A	3,7	99	247
1x32A	7,4	197	493
3x32A	22	587	1467

As can be seen from the table, even the lowest output levels can provide enough power to charge a car overnight so that normal commuting is not a problem. However, when charging needs to be completed quickly and for a longer drive, the lowest output powers become insufficient. If a housing cooperative wants to fulfil both needs, it needs to install a high-performing charging station or divide charging points into faster and slower points, making the total investment smaller. A popular choice is to install the majority of charging points with 1,8 or 3,7 kW chargers and a few with 22 kW chargers for shared usage. This makes it possible to keep the costs as well as the electricity connection reasonable. It is also possible to receive an increased grant from The Housing Finance and Development Centre of Finland (ARA) if half of the installed charging points have an output power of 11 kW or more.

While many housing cooperatives could also open-up their charging stations for public usage, this option is hampered by the residents' volition to keep their parking spaces in private use at all times. Consequently, many housing cooperative charging stations remain empty during the daytime when residents are at work with their cars. In addition to shared charging stations, electric cars pave the way for car sharing as there is no need to worry about refuelling.

The development of charging stations in the future

The number of electric cars and charging stations has grown rapidly during the past few years. So far, the development of charging stations has been driven solely by the market. However, recent changes in the Land Use and Building Act (<https://www.finlex.fi/fi/laki/alkup/2020/20200733>) stipulate that new and extensively renovated residential buildings with more than four parking spaces must be built in such way that all parking spaces have a capacity for electric charging points. The law also states that other public and private properties are obliged to install charging stations and charging points to new buildings in relation to the number of parking spaces. Furthermore, all existing buildings with more than 20 parking spaces need to be incorporated with one normal charging point by the end of 2024.

The new law will increase the number of charging points within this decade and support the take-up electric cars in Finland. Before the law was passed, Motiva estimated that the law will increase the number of charging points in Finland by 92 000 units and the capacity for installing charging points by 326 000 units (https://www.eduskunta.fi/FI/vaski/HallituksenEsitys/Sivut/HE_23+2020.aspx). A majority of the capacity will be incorporated into residential buildings and a majority of the new charging points will be installed elsewhere. In the city of Turku, this will account to a new capacity of approximately 12 000 charging points and approximately 3400 new installed charging points. However, these numbers are bare estimates, and the actual final numbers may vary. The charging points will be installed mainly to commercial and office properties with many parking spaces available. In practice, the change in law means that in 2025 every medium and large commercial property will have at least one charging station installed.

It is good that the number of public charging stations is increased, and a network created to support effortless use of electric cars in Finland and in Europe. However, the change in law will mostly increase the number of charging stations in the city and at commercial centres which will not solve the issue of a wider coverage. Most electric cars are charged at home or at work meaning that charging stations are not necessarily needed at every supermarket's car park. On the other hand, it makes sense to charge plug-in hybrids during every stop as their range is shorter than that of electric cars. Significant investments in super-fast charging stations alongside highways are needed for longer inter-city travelling as these stations will make possible to extend the distance travelled to hundreds of kilometres, just like with combustion engine cars. It will be interesting to see how the charging network in Finland and in the region of Turku develops as electric cars become more common and whether there will be major changes in the charging prices in the near future.

The City of Turku is a partner in an EU Horizon 2020 -funded USER-CHI project which creates innovative solutions for the charging of electric cars and light electric vehicles. As part of the project, the City of Turku, VASO and TVT Rental Housing create a masterplan for electric charging in the region of Turku. The purpose of the plan is to direct the development of the charging network in way that serves the needs of the citizens as well as possible. During the project, information on charging stations will be provided to businesses, housing cooperatives and residents. The objective is that charging stations will support the uptake of electric cars and decrease carbon emissions caused by traffic. In addition, as part of the project the City of Turku and the other partners develop services for charging of electric bicycles and V2G charging. More information is available via the links in references.

References:

[Motiva - Sähköautot \(in Finnish\)](#)

[Finlex - Laki rakennusten varustamisesta sähköajoneuvojen latauspisteillä ja latauspistevalmiuksilla sekä automaatio- ja ohjausjärjestelmillä \(in Finnish\)](#)

[Eduskunta - Hallituksen esitys eduskunnalle laeiksi sähköajoneuvojen latauspisteistä ja latauspistevalmiuksista rakennuksissa sekä rakennusten automaatio- ja ohjausjärjestelmistä ja maankäyttö- ja rakennuslain 126 §:n muuttamisesta \(in Finnish\)](#)

[USER-CHI project website](#)

[USER-CHI hanke Turun kaupungin verkkosivuilla \(in Finnish\)](#)

[Varsinais-Suomen Asumisoikeus Oy:n asukaslehti Kotivaso, syksy 2020 \(in Finnish\)](#)