Report

Mapping of Alternative Fuels

in public transport and other transport services in
the Baltic Sea Region
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About the report

Collection of data
This report has been put together based on responses received via a questionnaire that was sent out to key contacts in member regions of the CPMR Baltic Sea Commission Transport Working Group. The questionnaire was sent out in batches and the responses were collected between the autumn 2021 and spring 2022.

Responses were received from the following organisations:

- Gävle Municipality (SE)
- Helsinki-Uusimaa Region (FI)
- Oulu Region (FI)
- Region Norrbotten (SE)
- Region Örebro County (SE)
- Region Östergötland (SE)
- Region Southwest Finland (FI)
- Region Stockholm (SE)
The aim of the mapping is to collect information from the member regions of the CPMR Baltic Sea Commission Transport Working Group about initiatives, investments, and projects in the transition to a fossil-free society based on the work with alternative fuels to achieve the goals of the European Green Deal.

This information will then serve to increase the knowledge of important investments regarding the Baltic Sea Region, which could be used in dialogues with decision-makers at national and EU levels.

The results have been gathered in this report – Mapping of alternative fuels in the BSR – and will be shared within the Baltic Sea Commission Transport Working Group as well as with other relevant stakeholders at EU and national level.

The report will be presented during Baltic Sea Commission Transport Working Group meetings and at other relevant meetings and events with decision-makers on national and EU level as well as organisations working with these issues.

1. Descriptions of regions and organisations responsible for the regional development

Gävle municipality (SE) is located 170 km north of Stockholm with around 100,000 inhabitants. Gävle port is one of the largest ports in Sweden and Gävle is therefore an important junction for freight. Large industries in the iron and forest sector are situated in the nearby region.

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Helsinki-Uusimaa Region (FI) is located in the very south of Finland and it has some 230 km of Baltic Sea coastline. Although only covering three percent (9,440 km²) of the national land area, the Region is home to around 1.7 million inhabitants, which is about a third of the country’s total population. Thanks to migration, Helsinki-Uusimaa is one of the fastest growing regions in Europe. The Region is the driver of Finland’s international competitiveness, research, and development.

The Helsinki-Uusimaa Regional Council is a joint authority for Helsinki-Uusimaa with 26 member municipalities, including the capital Helsinki. It is one of the 18 regional councils in Finland that are mandated in law, receiving funding mainly from the member municipalities. The Council’s main operational tasks are regional and land-use planning, as well as the promotion of local and regional interests. The Council articulates common regional needs, long-term development goals, and conditions for sustainable development.

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Oulu Region (also known as Northern Ostrobothnia) (FI) is located on the shore of the Bothnian Bay. The region has 30 municipalities and shares the borders with five Finnish regions as well as the Russian Republic of Karelia. It has a population of 412,000 out of which roughly half are located around the region’s capital, the city of Oulu. Our organisation, the Council of Oulu Region, is a regional development and planning organisation acting on behalf of its member municipalities and coordinating EU funding programmes in the region.
Region Norrbotten (SE) is the uppermost region in Sweden. It makes up 25 percent of Sweden and approximately 2.5 percent of the country’s inhabitants live in the region. The Region is responsible for health care and regional development issues. The mining industry and steel processing are important pillars supporting the economy, as are the forestry, wood, and paper industries. Natural geographic conditions are cultivated such as bioenergy and hydropower as well as the growing wind power. Raw materials (e.g., forest, iron ore, and hydroelectric power) are of major importance in the region. For example, 90 percent of all iron ore produced in the EU comes from Norrbotten.

Region Örebro County (SE) is located at the heart of Sweden and is a well-known transport region where infrastructure at local, regional, national, and international levels meet. The county is part of the TEN-T ScanMed-corridor which runs through the region. The region has just over 300,000 inhabitants divided over 12 municipalities, with Örebro as the capital city. Region Örebro County is one of northern Europe’s most important logistical hubs, with a strong multimodal offering. In the town of Hallsberg there are extensive railway-related operations where, in addition to an intermodal freight terminal, the largest marshalling yard in northern Europe is located, where more than 500,000 train carriages are shifted to and from trains every year. Örebro Airport is one of Sweden’s largest cargo airports as well as a national emergency preparedness node. The highways (E18 and E20) as well as the national roads 50 and 51 are strong freight routes for road transport. The region holds a strong logistics cluster that drives the development forward with established cooperation between the business community, the public sector, and Örebro University. The sustainability dimension forms the basis for the region’s multimodal offering and several different initiatives are underway within the region and in cooperation with external organisations and authorities. There is a clear focus on developing long-distance multimodal freight chains, which includes the transfer of goods from road to railway, a green freight airport and innovative freight transport by road such as high-capacity transports (HCT) and electric road.

The organisation, Region Örebro County, is responsible for organising and providing health care for the region’s inhabitants as well as public transport, infrastructure planning, logistics, energy, environment, and regional growth. Region Örebro County takes its responsibility in transport policy and aims to be fossil independent by 2030.

Region Östergötland (SE) is situated in south-eastern Sweden around 1,5-2-hour travel from Stockholm. The region has around 460,000 inhabitants in 13 municipalities. The area is sparsely populated (40 inhabitants/km²), with exceptions around the two larger cities, Linköping and Norrköping. Region Östergötland’s objective is to create a healthy and safe society with attractive living environments and good health. Our main task is to offer our inhabitants high quality healthcare. We lead the work for long-term and sustainable development in the region within fields such as trade and industry, culture, infrastructure, rural areas, and public health. The region also has the role of developing an attractive and efficient public transport system in the county. With over 13,000 employees in 100 different professions, Region Östergötland is the region’s largest employer.

Regional Council of Southwest Finland (FI) is a public organisation owned by the region’s 27 municipalities. The region functions as an authority for regional development and as an organisation
for planning and promoting of regional interests. It is situated on the southwest coastline of Finland and in the heart of the Baltic Sea. It is the home of more than 483,000 inhabitants. Out of the population, 5.7 percent has Swedish as their mother tongue. Turku is the oldest city of Finland and the former capital city. The region has a unique archipelago that is the largest in the world.

Region Stockholm (SE) encompasses 26 municipalities with a total land area of 6,500 km², of which 8.3 percent is protected nature. There are 630 km² of lakes and streams and Lake Mälaren, which together provides the county’s inhabitants, companies, and agriculture with water. The sea area is 9,400 km². In 2018, the population was just over 2.3 million inhabitants. On a daily basis, there are 1.2 million paid employees in the region, many working in one of the 318,000 companies and organisations in the county, which together generate 32 percent of Sweden’s gross domestic product. There are also almost 100,000 students and postgraduate students, of which 9,000 are international students studying at one of the county’s many higher education institutions. In one day, 2.9 million passengers board public transport in the region, with 1.3 million using the metro and 1.1 million taking the bus. Car ownership amounts to 402 cars per 1,000 inhabitants, of which 272 are owned by private individuals. In 2016, 13.5 million overnight visitors came to Stockholm County, with 4.7 million coming from abroad.

Region Stockholm is responsible for all publicly financed healthcare and public transport in the Stockholm County. The Region Stockholm Assembly is also responsible for other overall issues within the county, such as regional growth and development. This means that the Region will create the best conditions for the Stockholm region to remain a leading, innovative, attractive, and sustainable region. Region Stockholm’s responsibilities also include the Stockholm region’s Regional Development Plan, RUFS 2050, and the County Plan for Transport Infrastructure. Region Stockholm’s mission also includes being a voice for the county’s residents, and the collective force for the county’s other stakeholders: municipalities, trade and industry, academia, government bodies, and civil society.
2. Regional plans, strategies, objectives, and measures to stimulate the uptake of alternative fuels in the transport sector

Gävle municipality (SE) has defined ways that they can stimulate the market in. First, the vehicles owned by the municipality as well as all the transportation procurements are going to be fossil-free by 2023. Secondly, guidelines for charging infrastructure have been developed to define the municipality’s role as a public organisation in this development as well as how and where private companies can establish electric chargers. The energy company owned by the municipality is also taking an active part in establishing public charging stations.

The municipality has also built a large plant to produce biogas from food waste, which is running at full capacity. The gas produced in the plant is mainly used in the transportation sector.

The municipality is also investigating if more land is needed for the establishment of new actors in the fuel market offering alternative fuels. Ideally, already established actors should take the lead because they are already established in the best locations but so far, no initiatives have occurred.

Helsinki-Uusimaa Region (FI) is aiming at climate neutrality by 2030, in line with the forerunner municipalities of the region. The Helsinki-Uusimaa Regional Climate Roadmap 2030 guides the climate work and supports the municipalities and other actors in the implementation of their mitigation goals.

The Regional Climate Roadmap includes six focus areas for climate change mitigation, which have been chosen as the most vital and urgent themes for climate neutrality. Five of these have the objective to mitigate climate change and to support the green transition and they represent the largest sources of emissions in the region. The focus of the mitigation is concentrated on climate smart land use and construction, smart and emission-free mobility, fast and fair energy transition, climate neutral circular economy, together with sustainable consumption and production. The sixth focus area aims to strengthen regional carbon sinks and storages, and to compensate for any residual emissions.

Finnish cities and municipalities are very autonomous and thus in a key position when it comes to enabling a climate neutral region. All large cities in our metropolitan region, as well as many smaller member municipalities, already have action programmes of their own.

At the strategic level in Finland and in the Uusimaa Region, the electrification of road transport and the distribution of alternative fuels is currently being highly promoted. At the regional level, there have so far been no precise plans, but the objective has been agreed and promoted in principle. This has been done mainly in land use planning, allowing land use for progressing alternative fuel deployment related activities and encouraging municipalities to do the same.

The Council of Oulu Region (FI) has acknowledged the rapid change in the usage of alternative fuels around transportation sector. Cities in the region are investing in electric vehicle charging stations and the council is taking part in projects where with targets to accelerate the change to alternative fuels in the transport sector. However, more concrete long-term plans and strategies are lacking at the

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There is a clear need to develop ways to measure the uptake of alternative fuels, which is something that the Council has brought to the governmental authorities’ attention.

In Region Norrbotten (SE) the goal for alternative fuels is the same as at national level. It is an indirect goal as the target is measured through the decrease of greenhouse gas emissions rather than in percentage of used or produced renewable fuels. Therefore, the greenhouse gas emissions from the transport sector should decrease by 70 percent from 2010 to 2030. At the regional level, this is stated in both the regional development strategy and in the climate and energy strategy. There is also a special plan, which the County administrative board is responsible for, but the Region participated in the development of the plan, for the plans for electric charging stations in the region. Region Norrbotten also supports initiatives by funding projects.

Region Örebro (SE) follows to the Swedish national clime target of reducing greenhouse gas emissions from domestic transports (excluding aviation) by 70 percent until 2030 compared to 2010 levels. This is reflected in Region Örebro County’s energy and climate programme, which states that transports in Örebro County should be fossil independent by 2030. The aim to make public transport run on completely fossil-free fuels has already been achieved. The energy and climate programme also includes additional goals regarding increasing the proportion of renewable fuels, mainly electricity, hydrogen, and biofuels as well as increasing the proportion of sustainable traveling in Örebro County. In addition to this, Region Örebro County have an action plan for sustainable transportation. The action plan includes a list of activities that Region Örebro County together with twelve municipalities have agreed upon in order to decrease climate gases from transportation. The action plan also includes a fuel prioritisation for the county based on the fuel’s effect on the climate as well as other social and environmental goals. The prioritised fuels are the following:

1. Biogas, electricity, and hydrogen
2. Ethanol
3. Biodiesel
4. Fossil fuel with a mix of renewable fuel

Region Östergötland’s (SE) regional energy and climate strategy stipulates that the transport sector should be fossil independent by 2030 and that local production of alternative fuels shall be encouraged. Region Östergötland’s fuel strategy for transport purchases requires that fossil fuels shall be phased out and that biogas is the first-hand replacement. Public transport already runs on 100 percent fossil-free fuels, which has resulted in significantly reduced climate-affecting emissions from public transport. The goal is to further reduce the climate

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1. https://www.lansstyrelsen.se/download/18.4a4eb7416faedec1251e974/1580983411596/Climate%20and%20energy%20strategy%20for%20the%20county%20of%20Norrbotten%202020-2024.pdf
impact by halving emissions by 2030 compared with 2019 emission levels. The goal is also to reduce energy consumption in urban traffic by 80 percent by 2030.

The Regional Council of Southwest Finland (FI) has a Regional Climate roadmap 2030 that includes a section on transport and mobility, alternative fuels are one part with the following actions:

- Public transport use 100 percent of renewable fuels
- Public authorities are forerunners in zero emission vehicles
- Companies prefer zero emission vehicles
- Promotion and increased production of renewable fuels and fuelling/charging stations both public and private

The measurements include:

- volume of low emission vehicles and average CO\textsubscript{2} emissions of vehicles in Southwest Finland
- number of gas/charging station in Southwest Finland

The city of Turku also has its Climate Plan 2029\textsuperscript{6} with references to alternative fuels:

- Car traffic emissions are reduced by investing in electric motoring and developing adequate conditions for it
- Public transport in Turku will be turned into a carbon neutral service by 2029
- In terms of urban traffic in Turku, carbon neutrality will be reached already by 2025
- Electrification of lines proceeds at the pace enabled by technical development and competitive tendering and electrification is complemented with biofuel solutions

Region Stockholm (SE)'s regional development plan, RUFS 2050\textsuperscript{7}, expresses the collective interests of the region and one of its goals is for the Stockholm region to be a resource-efficient resilient region, with no greenhouse gas emissions. As part of this goal, Stockholm has made it a priority to increase electric-powered passenger and freight transports. As part of the regional development plan, a climate roadmap was adopted in 2018 (Klimatfärdplan 2050\textsuperscript{8}). It is based on the same goals, targets, and regional priorities as RUFS 2050, but it also consists of suggested actions within multiple sectors. The aim of the roadmap is to guide different organisations, both private and public, in the Stockholm region to the most efficient way to reduce their climate impact. The transport sector is well covered by the climate roadmap, with suggested actions ranging from electrification of vehicle fleets and increased regional production of fossil-free fuels, to mobility management and increased logistics efficiency.

As part of RUFS 2050 a freight strategy\textsuperscript{9} was adopted in 2019. The aim of the strategy is to act as guidance for freight organisations in Stockholm, as well as the public sector that needs to plan for efficient freight systems. Amongst the suggested actions, it highlights the need of increased electricity

\textsuperscript{6} https://www.turku.fi/sites/default/files/atoms/files/turku_climate_plan_2029.pdf

\textsuperscript{7} http://www.ruf.se/publikationer/2018/ruf-2050/

\textsuperscript{8}https://www.regionstockholm.se/globalassets/6.-om-landstinget/styrande-dokument/2-verksamhetsstod/regional-utveckling/klimatfardplan_2019_webb.pdf

\textsuperscript{9}https://www.regionstockholm.se/globalassets/4.-regional-utveckling/utvecklingsplaner-och-strategier/godsstrategin/godsstrategi-for-stockholmsregionen.pdf
supply and infrastructure for an increasingly electrified vehicle fleet, as well as creating opportunities for technological innovation.

The Stockholm County Administrative Board (Länsstyrelsen) adopted a climate and energy strategy in 2020. This strategy also includes the transport sector and highlights for example that infrastructure development is required for increased usage of biofuels and electricity in vehicles.

3. Current use of alternative fuels for public transportation and service vehicles (biofuels, electricity, hydrogen, LNG, hybrid etc.)

In Gävle municipality (SE) the goal of 100 percent fossil-free fuels in the organisation’s own vehicle fleet has almost been achieved. The fuels used are a mix of HVO, biogas, and electricity where the fuels make up almost a third each.

In the Helsinki Metropolitan Region (FI), electric buses are used on a line-by-line basis and there is an ongoing special programme to increase them year by year. When the operating contract is renewed, electricity is always required from the fleet on a line-by-line basis. However, it is always assessed line-by-line whether an electric bus is suitable.

Elsewhere in the Helsinki-Uusimaa region (FI), and especially in sparsely populated areas, bus-operating contracts do not yet require electricity or other alternative fuels on a large scale. There are a few cases though, and most likely more to come in the near future.

In the Oulu Region (FI) there are three organisations operating the public transportation system: VR (national authority in charge of trains), Oulu public transport (in charge of bus lines around Oulu area), and the Centre for Economic Development, Transport and the Environment (in charge of bus lines in the region with an exemption from Oulu area). In the Oulu area, most of the bus lines are running with diesel. Two bus lines are running with alternative fuels, one with biogas and one with biodiesel. For regional-level public transportation no alternative fuels are used at the moment.

In railroad transportation, electrifying the railway between the city of Oulu and Laurila, the municipal centre of Keminmaa in the Lapland region, is a major step towards more sustainable railroad transportation. Electrification of railroads is a big step so that diesel-fuelled locomotives would not be necessary in the future.

The expansion of the TEN-T network has been a big push for our region in both railroad and road transport for more sustainable development of the network at regional, national, and international level.

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In **Region Norrbotten (SE)** biofuels have been used in public transport, including regional buses, for several years. Some municipalities in the region also use biogas for their public transportation and service vehicles. There are also some municipalities using electric vehicles for their local buses.

In **Region Örebro (SE)**, biogas is the only renewable fuel produced in the region. This is thanks to the unique conditions in Sweden to produce biofuels from waste, agriculture, and forestry. There are a total of 14 biogas plants in the region. In 2016, the biogas plants in Örebro produced a total of 113 GWh. This corresponds to just over five percent of the total biogas production in Sweden, which amounts to about 2 TWh, distributed over a total of 279 biogas plants. Almost half of the biogas produced in Region Örebro is used within the region and the remaining quantities are delivered to other parts of Sweden.

Today, public transport in the Örebro Region consists of around 300 buses, of which about half are run on biogas and the rest on hydrotreated vegetable oil (HVO) or Fatty Acid Methyl Ester (FAME). A fourth of the fuel for transport in the region is renewable, which is a bit higher compared to the rest of Sweden where the total share amounts to 21.6 percent.

In **Region Östergötland (SE)** public transport is 100 percent fossil-free. City buses primarily use biogas and electricity. Medium-range buses (coaches) use fossil-free biofuels like hydrotreated vegetable oil (HVO) or rapeseed methyl ester (RME). Trains and trams run on electricity from renewable sources. Service vehicles owned by Region Östergötland are fossil-free today, mainly by using HVO.

**Regional Council of Southwest Finland (FI):** Public transportation in the Turku Region (Föli) has 61 electric busses and one third of the Föli traffic – 4.6 million kilometres – are electric. From July 2021, in Föli, approximately 4.6 million kilometres a year will be driven on an emission-free and quiet electric bus, instead of a diesel bus. This equals to 5800 tonnes less CO₂ emissions a year. More electric busses will be in use in 2022. The City of Turku's objective of being carbon-neutral in 2029 steer public transport towards electric vehicles.11

In **Region Stockholm (SE)** public transport has already been largely converted to fossil-free fuels. The goal in Region Stockholm's internal environmental programme is 50 percent until 2021. All rail traffic has been running on renewable electricity for over 15 years. The bus fleet accounts for the absolute majority of fuel use (80 percent). The entire bus fleet has been running on renewable biofuels since 2018, and in 2035, 100 percent of the bus fleet is expected to be electrified. Maritime traffic, which accounts for the second highest fuel use in the Stockholm Region (15 percent), has been running on 50 percent renewable biodiesel since 2020.

• The use of alternative fuels in public transport and service vehicles is overall high in the Baltic Sea Region.
• The degree of which alternative fuels are used varies across the regions, there is also a significant difference in use between urban areas (more) and more sparsely populated areas (less).
• The most frequent alternative fuels used are biofuels (mostly biogas) and electricity.

4. The major challenges to the deployment of alternative fuels and actions to overcome these challenges

Gävle Municipality (SE) acknowledges that deployment of electrification in the transport sector is moving too slow to achieve set environmental goals. Therefore, the current investments need to be complemented with investments in alternative fuels for the vehicle fleet owned by the municipality.

Long-term regulatory frameworks for this are number one for investors to build production sites for alternative fuels. Financing might also be a hurdle, but the general impression is that there is a lot of subsides available.

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In Finland and the Helsinki-Uusimaa Region (FI), the biggest challenge is the slow rate by which the car fleet (public transport and private cars) is electrifying and changing its propulsion power. The major reason is that the change is happening on market terms, and it makes it slow. Only once there is enough alternative fuel supply and demand, the market will also provide distribution. If it is to be accelerated, it would require large subsidies for the purchase of clean vehicles in order to make the purchase attractive. At the same time, the market would respond more strongly to the demand and create more distribution. This process has accelerated in 2021-2022 due to the rising prices of fossil fuels.

Subsidies could also be provided for the implementation of distribution points, but it would not have the same effect on the purchase of electric cars, for example, because their purchase price is quite high in Finland.

The ways to overcome the challenges depend a lot on the national level decisions, such as regulations, financing, and subsidies. The regional level can operate as a facilitator and support the local level in implementation.

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In the Oulu Region (FI) distances between municipal centres can be long and the density of population is sparse. The distribution network for alternative fuels is not yet comprehensive to the extent that regional-level public transport could switch to alternative fuels. Another major challenge is that at the moment, most transport companies do not have a wide selection of alternatively fuelled vehicles. Hopefully this will change in this decade.

The challenge in electrifying the rail network has been to obtain sufficient funding from the national level. With planning and implementation funding in place, the transition to electric trains would be
easier to implement. A good example of this is the new 12-year national transportation plan, and the first draft of it, which did not allocate sufficient funding for the northern regions, making the green transition very challenging.

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For Region Norrbotten (SE) the main challenges are the long distances, the lack of a viable, competitive market for alternative fuels (due to the low density of the population) and the overall scepticism towards the viability of alternative fuels in the population.

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In Region Örebro County (SE), the main challenge is to ensure that the infrastructure is expanded throughout the country and within regions. This is especially true in areas with lower population densities. Other challenges are to have prices that are competitive compared to fossil fuels and to ensure that the supply of renewable fuels is large enough when demand increases. For charging, especially for heavy vehicles, a limiting factor will be whether the effect can be met if fast charging is to take place.

To overcome this, regulation is needed as well as financial support. A lot of initiatives are carried out in Sweden such as electrification pilots12, where financial support will be given to charging and hydrogen initiatives for heavy transports.

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Region Östergötland (SE) sees long-term stable conditions for both fuel producers and vehicle manufacturers as important for the market to develop and provide both sustainable fuels and vehicles that can run on these fuels.

Public transport in Sweden is procured with long contract periods, usually of about 10 years. In order to be able to make demands that reduce climate impact, it is required that the market can offer vehicles for different types of traffic, fuel, and fuelling possibilities in different types of geographies. The total cost is also of great importance for the requirements that can be set.

Long-term political instruments and legal requirements are important prerequisites for achieving this.

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For the Regional Council of Southwest Finland (FI) the infrastructure must enable the transition, and the public sector can in this way speed up the development.

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Region Stockholm (SE) highlighted that the high cost of biofuels in maritime traffic (due to the tax rules at sea) is a challenge to move forward faster. Another challenge is to get enough electricity to our bus depots in connection with electrification of bus traffic (due to an insufficient electricity grid). The solution has been to, by agreement with the grid companies, only charge the electric buses outside the high load in the grid (at night and in the middle of the day).

12https://www.energimyndigheten.se/klimat--miljo/transporter/transporteffektivt-samhalle/regionala-elektrifieringspiloter/
5. Incentives or schemes for alternative fuel vehicles

In both Finland and Sweden, incentives for alternative fuel vehicles are generally implemented at the national level.

In Finland, alternative fuel vehicles are taxed lower but seeing that the sales prices of for example electric cars are quite high, the benefits of this are quite marginal. The Finnish distribution obligation according to which 30 percent of all transport fuels must be biofuels by 2030 is higher than the EU obligation and works to accelerate the shift to alternative fuels.

In Sweden, several national schemes exist to promote biofuels, electrification, and a bonus system for private consumers when buying a new low or zero emission light vehicle. A couple of examples include:

- To encourage use of biofuels in Sweden, the Swedish government has implemented a greenhouse gas reduction mandate for gasoline and diesel. This means that fuel suppliers must reduce greenhouse gas emissions from gasoline and diesel by a certain percentage every year. To reach the required target percentages, fuel suppliers will need to increase the biofuel blend in their gasoline and diesel.

- Sweden has exempted liquid biofuels from energy and CO₂ taxation since 2002. The European Commission has approved the tax exemption until 31 December 2022.

- In July 2018, a so-called bonus-malus system was introduced in Sweden, with the aim of increasing the proportion of environmentally friendly light vehicles in new car sales. Bonuses are given in connection with the time of purchase to certain vehicles with low carbon dioxide emissions, while vehicles with high carbon dioxide emissions receive a burden (malus) in the form of increased tax for three years.

- There is a temporary support for the production of biogas to be used in the transport sector in order to strengthen competitiveness and accelerate the transition to renewable energy sources. In June 2020, the government decided that the support would be extended by adding SEK 120 million for this purpose.

- To accelerate the electrification of heavy road transport the government has set up a support of SEK 400 million for 2021 and for 2022.

In Region Southwest Finland (FI) and in Region Örebro County (SE) there are schemes to facilitate access for public transport and as a result make it a more attractive transport mode. Region Southwest Finland (FI) has implemented traffic light advantages for public transport and reduced fees are used in the Port of Turku. Region Örebro County (SE) on the other hand began the first stage of a bus rapid transit (BRT) system in 2021. This means that public buses will have lanes that are currently used by cars reserved for them. The goal is to reduce the number of cars in the city centre and increase the attractiveness of public transport, and by doing so lower emissions, reduce congestion, and enable the city to grow and accommodate an increasing population.

Free parking spaces and access to public transport lanes for alternative fuel and low-emission vehicles exist in the Helsinki Metropolitan Region (FI). However, the scope of these schemes is limited, and it has therefore not worked to motivate a change to alternative fuels.

In Region Stockholm (SE), the municipalities work in different ways to accelerate the shift to more environmentally friendly vehicles. For example, the City of Stockholm works with environmental requirements in its procurement processes. The city also tests and evaluates new green vehicle technologies and fuels together with companies and organisations, spreads knowledge about green
vehicles and fuels, works to increase the number of charging and fuelling stations, and proactively advocates for rules that benefit the best green cars,

- Incentives and schemes to promote alternative fuels are generally planned at the national level and then implemented at the regional level.
- Several regions have schemes to promote public transport such as separate lanes reserved for buses and traffic light advantages.
- Other incentives such as public procurement, free parking, and access to public transport lanes for alternative fuel vehicles were also mentioned by the regions.

6. Availability of fuelling/charging stations and related facilities and infrastructure in the region

Gävle municipality (SE) was quite early in building a lot of public charging stations across the city and there are several planned by the private sector along the main roads. The municipality is aware that they need to keep the speed up to meet the ongoing development.

There is a need for more refuelling stations for alternative liquid and gas fuels, where one obstacle has been to find suitable land for these establishments. That said, even with land available, the availability of fuels is a real problem at the moment so new production sites need to be developed and deployed.

In the Helsinki-Uusimaa Region (FI), a growing number of charging stations have been created on private parking areas, for example of bigger companies and stores. Stores and other service providers have electricity charging facilities for their customers. Almost all existing facilities are market-based. A growing number of real estate companies as well as private house owners, are planning and implementing better charging facilities.

In Oulu Region (FI) charging stations depend on the market, and as the distances are long, particularly in the rural areas the availability is poor. There are 2-3 biogas stations, and more electric charging stations. At the moment there are investigations into creating more charging stations, especially near existing rest stops and traffic hubs. There is, however, uncertainty whether there is enough demand.

In Region Norrbotten (SE) the availability of alternative fuels, with the exemption of HVO and ethanol, is low. There are several national initiatives aiming at developing the infrastructure of charging stations, such as Klimatklivet\textsuperscript{13}, Elektrifieringspiloter\textsuperscript{14} etc.

\textsuperscript{13} https://www.naturvardsverket.se/bidrag/klimatklivet/
\textsuperscript{14} https://www.energimyndigheten.se/klimat--miljo/transporter/transporteffektivt-samhalle/regionala-elektrifieringspiloter/
In Region Östergötland (SE) bioethanol is at present available in the whole region. Other alternative fuels and charging infrastructure is sparse outside the main cities and transport corridor (E4). The County Administrative Board (Länsstyrelsen) has compiled a plan for infrastructure for alternative fuels\(^{15}\), which includes an analysis of the conditions in the region, an action plan to increase the use of alternative fuels, and prioritised fuels.

To find public charging stations in Region Stockholm (SE), you can, for example, visit the following websites miljofordon.se and uppladdning.nu (electricity, CNG, LNG, LBG).

In Regional Southwest Finland (FI) there are approximately 140 public charging stations and four gas refuelling stations as well as six gas refuelling stations in progress. Information on the recharging and refuelling stations, including the current status and developments, are available on Fintraffic’s website and here.

In Region Örebro (SE) there are currently 75 charging stations for electric vehicles, ten gas stations for HVO, one station for FAME (RME), six gas stations for biogas and 62 gas stations for E85. The infrastructure for charging is for private cars and mainly located on the main roads. Since the majority of the charging of electric vehicles is done at home or at work, public infrastructure for charging is sometimes lacking, especially in less populated areas.

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- In general, the availability of infrastructure for alternative fuels is market-driven.
- There is a significant difference between the availability of infrastructure for alternative fuels across the regions.
- Overall, more populated areas and urban nodes have a higher density of refuelling/recharging stations with ongoing initiatives to expand the infrastructure, while more sparsely populated areas have a lower density.
- Other obstacles include the availability of fuels and the consequent need to increase production as well as available land for new investments.

\(^{15}\)https://www.lansstyrelsen.se/download/18.4a4eb7416faedec125356c3/1582210304163/Infrastruktur%20f%C3%B6r%20elfordon%20och%20f%C3%B6rnybara%20drivmedel_en%20regional%20plan%20f%C3%B6r%20nybara%20drivmedel_%20region_2018.pdf
7. Initiatives from the business community (or others) to introduce/accelerate the use of alternative fuels for freight and passenger transports

In Gävle municipality (SE) the big industries have large transportation needs and now work together with the logistic sector to become fossil-free. They are working together to establish hydrogen production and filling stations in the greater region. This might have a positive effect on passenger transport as well depending on if the filling stations also will be available for them. There are also some private incentives to build multi stations where only alternative fuels will be available. However, they depend on large transportation buyers that can be the bulk to make these stations profitable.

In the Helsinki-Uusimaa Region (FI) electric bus pilots/tests have been carried out in areas outside the Helsinki region in cooperation with municipalities, but nothing large-scale yet.

The Port of Helsinki aims for carbon neutrality in its own operations by 2035. The port has several ongoing pilots to introduce and test alternative fuel vehicles in its internal port area transports. Emissions generated by Port of Helsinki Ltd itself account for only a small portion of the CO₂ emissions of the Port, but they are the easiest for the region to influence. The personnel transportation in the port area is more and more done by electric vehicles. There are also pilots planned on alternative fuels on port work machines, but there are some restrictions due to heavy power needs and winter conditions in Finland.

Forum Virium, the development company of the City of Helsinki, is implementing many alternative fuel related pilot projects and tests, especially in Jätkäsaari district, within the Helsinki Mobility Lab, which is Helsinki’s testbed for smart and digital mobility solutions. These pilot projects are implemented in close cooperation with private businesses.

In the Oulu Region (FI) the acceleration of the usage of alternative fuels can be often seen as a “chicken and egg”-problem, as the business community in some situations highlight the uncertainty regarding the public investments in alternative fuels. On the other hand, public investments may in some cases be held up due to uncertainty regarding the private sector’s eagerness to switch to alternative fuels.

In the summer of 2021, it was decided that Sweden's first permanent electric road for freight transport will be built in the Region Örebro County (SE) between the region's two transport nodes Hallsberg and Örebro. The 30 km long electric road is expected to be built and open for commercial traffic in 2026. The road will be the first part of a large scale national electric road system.

Region Örebro County and Örebro County administrative board launched an energy and climate council in 2021. Around 40 stakeholders are part of the council representing different sectors, from municipalities and companies to the Örebro University. Three main themes have been chosen for continued work: transport, procurement (mainly procurement of transport), and energy systems. A network for discussing the use of hydrogen both for transports and in the industry have also been initiated. The members are thought to be the driving force of the ongoing work within the council.
In Region Östergötland (SE) there is a network of transport dependent businesses – Östgötautmaningen – that aim to lead the development of fossil-free transport solutions with the vision of completely fossil-free transport.\textsuperscript{16}

A selection of initiatives in Region Stockholm (SE):

\textit{Elektrifieringslöftet/Electrification Promise}

The region has adopted a so-called electrification promise for regional freight transport. The promise shows the region's common will and commitment to actively work to achieve the climate goals in the transport sector. The Region Stockholm intends to contribute to the coordination for increased electrification of freight transport in the region and the signing actors undertake to increase their ambitions for electrification with a focus on regional freight transport and to actively participate in the joint regional electrification work. The following participants are behind the Stockholm region's electrification promise: Business community: Einride, Ellevio, Scania, Systembolaget, Volkswagen, Åkeriföretagen; Others: Huddinge Municipality, Järflä Municipality, County Administrative Board of Stockholm County, Nykvarn Municipality, Region Stockholm, Salem Municipality, Södertälje Municipality, Swedish Transport Administration Region Stockholm.

\textit{Elektrifieringspakten/Electrification Pact}

The Electrification Pact is a network-based collaboration between the City of Stockholm and public and private actors and other organisations that can contribute to and accelerate the electrification of the transport sector in the capital region. The founding members are the City of Stockholm, Ellevio, Volkswagen and Scania. The pact aims to accelerate the transition to an electrified transport sector with a 70 percent reduction in carbon dioxide emissions by 2030.

\textit{BioDriv Öst}

BioDriv Öst\textsuperscript{17} is a regional collaboration organisation that brings together six counties in eastern central Sweden and the Stockholm region in the work towards a fossil-free transport sector and sustainable regional development. BioDriv Öst operates in a triple helix perspective and brings together around 40 actors from the public sector, business, and academia.

In Region Southwest Finland (FI), Meriaura Group has verified the usability of 100 percent biofuel made from recycled raw materials in shipping. The biofuel used is manufactured by VG EcoFuel Ltd from recycled oils and by-products from the food industry. The waste-based bio-oil is the most sustainable fuel solution currently available in maritime transport.

The Turku Meyer shipyard constructs LNG-ships and the port of Naantali will in 2023 have two hybrid vessels.

In Region Norrbotten (SE) there are initiatives from vehicle testing companies and organisations to secure a good infrastructure for hydrogen and charging stations. There are also initiatives in the mining industry testing alternative fuels for very heavy vehicles operating on long distances in cold climates.

\textsuperscript{16} https://ostgotautmaningen.se/

\textsuperscript{17} biodrivost.se
8. Ongoing initiatives regarding the introduction of autonomous transport

In Gävle municipality (SE) brief discussions have started on how autonomous vehicles could be introduced as a supplement to public transport in the long term.

In Helsinki-Uusimaa Region (FI) there have been some small pilots/tests of automatic buses like Gacha pilot by Sensible 4 company\(^\text{18}\).

In Oulu Region (FI) there have been some initiatives in the city of Oulu regarding autonomous buses, but at the moment they are not seen as a realistic option. Perhaps creating more lanes only for buses could push forward these initiatives. A few years back the opportunity for trams was researched in the city of Oulu, but they were not seen economically viable.

The ELIN project\textsuperscript{19} in Region Östergötland (SE) consists of two self-driving buses that operate a two-kilometre loop on Linköping University.

In the Land use, Housing and Transport Agreement (MAL) of the urban region of Turku 2020-2023 (Region Southwest Finland (FI)) the municipalities create in co-operation with the national level a plan and digital database for automation of transportation and for the use of new technologies and mobility services.

The possibilities of autonomous busses were researched in the EU project of CIVITAS ECCENTRIC (Munich (Germany), Madrid (Spain), Ruse (Bulgaria), Stockholm (Sweden), and Turku (Finland)).\textsuperscript{20}

On the maritime side, One Sea ecosystem gathering key players of the marine industry aims to lead the way towards an operating autonomous maritime ecosystem by 2025.\textsuperscript{21}

There is also a test area for testing maritime autonomous ships and autonomy related technology in the coastal area of Finland, Eura (Satakunta).\textsuperscript{22}

Turku university of applied sciences has an applied research platform for autonomous systems\textsuperscript{23}.

\textbf{Region Stockholm (SE):} An example of an initiative with autonomous transport is scheduled traffic with autonomous buses in Barkarbystaden outside Stockholm.\textsuperscript{24}

- Initiatives for autonomous vehicles exist across the Baltic Sea Region.
- Most initiatives are related to either public bus traffic or autonomous ships and related technology to the coastal area.
- Within the project ELIN two self-driving buses operates a two-kilometre loop connected to Linköping University in Region Östergötland (SE).
- There is a test area for autonomous ships and autonomy related technology in the coastal area of Eura, Satakunta (FI).
- In Barkarbystaden outside Stockholm (SE) there are regular lines of autonomous buses in public transport.
9. Other initiatives, projects, or investments

**Logistikia**\(^{25}\) (Region Östergötland, SE)
This is a smart specialisation platform for sustainable logistics. The broad and long-term objective is to make Östergötland Sweden’s most attractive and sustainable logistics region. To prioritise initiatives, the platform focuses on three areas: city logistics, construction and building logistics, and climate smart logistics. The transition towards fossil-free fuels is a main part of the climate smart logistics area.

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**Renewable hydrogen production at the Naantali former oil refinery**\(^{26}\) (Region Southwest Finland, FI)
Neste, a Finnish led oil refiner and renewable products major, stopped refining in March 2021 and plans are underway to construct a renewable hydrogen production facility. Turku-based company Green H2UB and Turun Seudun Ennergiantuotanto (TSE) signed a letter of intent in September 2021 to investigate the feasibility of building a green hydrogen plant on the old premises. The project is now in the first pilot phase with an approximate size of 10 MW. The main purpose would be to produce hydrogen for marine and heavy traffic and to use the waste heat generated in the process for district heating.

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**Expanding Turku biogas plant**\(^{27}\) (Region Southwest Finland, FI)
The Gasum biogas plant in the Topinpuisto area of Turku produces liquefied biogas thanks to an expansion and modernisation project finished in 2019. As a result, the production capacity increased and the plant decreased its energy consumption. The plant is the first and only in Finland to liquefy biogas, a fuel well-suited for heavy-duty and maritime transport. Compressed biogas for cars is also produced.

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**Tänk tanken**\(^{28}\) (Region Örebro, SE)
The project has focused on behavioural change and information on how to get more citizens in the region to choose public transport, including try-on campaigns where commuters have been given the opportunity to try public transport for free for a limited period. The campaign was a great success, with over 4000 commuters taking part, of which about 800 chose to continue to use public transports after the trial period.

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**Vägval 2030**\(^{29}\) (Region Örebro, SE)
In this EU funded project “Vägval 2030” a method called back casting (the opposite of forecasting) was used to show which changes would be needed regarding transport to reach the Swedish goal of 70 percent lower emission of greenhouse gases in 2030 compared to 2010. The exercise showed for example that Örebro County would need 9,000 fewer cars and 1,000 fewer light trucks to reach that

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\(^{25}\) [https://logistikia.se](https://logistikia.se)


\(^{28}\) [https://via.tt.se/pressmeddelande/stall-bilen-bli-familjetrampare?publisherId=3235654&releaseId=3260144](https://via.tt.se/pressmeddelande/stall-bilen-bli-familjetrampare?publisherId=3235654&releaseId=3260144)

goal, and that a substantial number of cars, busses, light trucks, and heavy trucks would need to switch from gasoline and diesel to electricity and biogas. It also showed that a more people need to travel by public transportations and use more active modes such as cycling and walking. More carpooling and shorter travel distances would also be needed to reach the goal. Based on the results, an action plan was developed for sustainable travel and transport in Örebro County. The action plan presented several measures to reduce CO₂ emissions from transport. For example, the use of community planning to stimulate travel by bike and by foot, to use procurement as a tool, and to work as an organisation with transport efficiency. Proposals for measures were made to, among others, municipalities, companies, and private individual.

The results from “Vägval 2030” are now being used in two ongoing EU projects: “Fossilfritt 2030 – fordon och drivmedel”30 and “Fossilfritt 2030 – Rena resan”31. The activities in the projects include for example try-on promotions for different types of bikes like electric and folding bikes. The activities are aimed at different target groups and are designed to present alternatives to car commuting.

Cooperation with and between municipalities is also key in the projects. Networks have been formed in specific areas to facilitate collaboration. The project also includes general and individual support for the procurement of vehicles as well as transport intensive procurements. Other areas where work takes place are renewable fuels and infrastructure for charging electric vehicles.

- Several collaborations on clean fuel deployment can be found across the regions.
- The collaborations are often organized within networks, projects, clusters, or newly formed organisations.
- The networks are often based on collaboration between the public sector, academia, and the business community.
- The focus in the work with clean fuels is broad with both concrete changes in the physical infrastructure and energy facilities, introduction of new vehicle types and fuels, including various pilot tests, as well as efforts to achieve behavioural changes in the market.

30 https://projektetfossilfritt2030.se/fordon-drivmedel/
31 https://projektetfossilfritt2030.se/rena-resan/
Annex 1. Questionnaire

Transport Working Group
4 November 2021

**Questionnaire:**

Mapping of alternative fuels

in public transport and other transport services in the Baltic Sea Region

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**Consultation with Member Regions of the Baltic Sea Commission**

**Aim:** Collect information from the BSC Member Regions about initiatives, investments and projects in the transition to a fossil-free society based on the work with alternative fuels to realise the goals of the Green Deal.

**Purpose:** Increased knowledge of important investments in our Member Regions that can be used both for increased understanding in the BSR and in dialogue with decision-makers at national and EU levels.

**Results:** To be gathered in a summary report – **Mapping of alternative fuels in the BSR** - that will be shared within the CPMR as well as with relevant stakeholders at EU and national levels.

**Presentation:** The report and conclusion will be presented during BSC TWG meeting and other relevant meetings and events.

**Please return to the BSC Transport Working Group by 20th December 2021 by email to:**

Dino Keljalic  dino.keljalic@regionorebrolan.se
Anna Tranberg  anna.tranberg@stockholmregion.org
Contact details of the respondent:

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1. Short description of your region and organisation (country, geographical location, population, responsibility etc.):

2. Describe your regions plans, strategies, objectives and measures to stimulate the uptake of alternative fuels in the transport sector:
3. Describe the current use of alternative fuels for public transportation and service vehicles (Bio-fuels, Electricity, Hydrogen, LNG, Hybrid etc.):


4. Describe the major challenges to the deployment of alternative fuels in public transport and other transport services. What are your proposals to overcome these challenges (regulation, financing, subsidies etc...):
5. Describe incentives or schemes applying for alternatively fueled vehicles including exemption from or reduced parking fees/regulations, exception from or reduced congestion charges/toll fares, access to public transport lanes, eco-bonus grants etc.:

6. Availability of filling and charging stations & related facilities and infrastructure in the region:

7. Initiatives from the business community (or others) in the region to introduce/accelerate to use of alternative fuels? Both freight and passenger transports:
8. Are there any on-going initiatives regarding the introduction of autonomous transport:

9. Other on-going initiatives, projects or investments or something else you want to add: