LOCAL EXPECTATIONS OF THE EUROPEAN GREEN DEAL

Camille Gautier, Angélique Tasca and Thea Kristine Vestad (University of Lyon III, University of Bergen). *Report written as part of the ARQUS Twinning Programme on "Local Energy Transitions" between Université Jean Moulin Lyon 3 and University of Bergen spring 2022*

1. Introduction

1.1 The European Green Deal

Climate change and environmental degradation are an existential threat to Lyon, Bergen, Europe and the rest of the world. To overcome these challenges collaborations across nations, different sectors and more local and individual contributions are essential. As a result of this the European Commission delivered a set of policy initiatives called the European Green Deal in 2019.[1]

The European Green Deal is a climate strategy to combat change and environmental degradation. At the same time it shall secure economic growth. Therefore, the European Green Deal has a sustainable focus, including both the society, the economy and the environment. The goal is to transform the EU into the first climate-neutral continent by 2050, and thereby a modern, resource-efficient and competitive economy ensuring no net emissions of greenhouse gases by 2050, economic growth decoupled from resource use and no person and no place left behind. To improve the well-being and health of citizens and future generations, and to become a climate-neutral continent by 2050, action is demanded on several areas. The European Green Deal includes action on climate, energy, agriculture, industry, environment and oceans, transport, finance and regional development as well as research and innovation. This paper will focus on transport.

1.2 The European Green Deal in the transport sector

Transition to greener energy is one of the core issues in the European Green Deal. The transport sector is to a great extent illustrative of this, as it illustrates the combination of decarbonisation, transition to greener transport such as electrical vehicles and bio fuels, as well as both economic, societal and tax considerations. In addition, it affects the consumers in a great manner. Today the transport sector har 5% of the GDP in the EU and employs 10 millions of people.[2] Furthermore, the transport sector stands for 25% of the total emissions of

[1] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#thebenefitsoftheeuropeangreendeal
[2] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en

GHG in the EU.[3] Emissions are expected to increase if no measures are taken, and it is evident that European transport needs to be put on track for the future.

In the European Green Deal the Commission set a, quite ambitious, goal to reduce emissions from transport by 90% by 2050.[4] Another of the goals in the European Green Deal is to make transport sustainable for all.[5] A transition to greener mobility will offer clean, accessible and affordable transport even in the most remote areas. In numbers, there should be a 55% reduction of emissions from cars by 2030, a 50% reduction of emissions from vans by 2030 as well as 0 emissions from new cars by 2035.[6] The Commission promotes the growth of the market for zero- and low-emissions vehicles, in particular to ensure that citizens have the infrastructure they need to charge these vehicles, both for short and longer journeys. From 2026 road transport will be covered by emissions trading, putting a price on pollution, stimulating cleaner fuel use, and re-investing in clean technologies.

1.3 Topic and outline

A main focus of the European Green Deal is the changes on both international, national, regional and local levels as well as all parts of society. The topic of this paper is local expectations of the European Green Deal. The European Green Deal implies to both Norway and France. France, as a founding member of the European Economic Community (EEA) in 1957 and Norway, as a member of the European Free Trade Association (EFTA) since 1960 and through the EEA-agreement of 1994. The question we want to answer is how the green deal and its implementation on the transport sector is affecting existing measures on consumer level. We will examine and compare the local expectations of and measurements of the implementation in France and Norway.

Local expectations will be related to national and regional changes as well as the local ones. Local changes can include changes both initiated by government, communities, different sectors or by locals and each individual. As the topic for this article is local expectations, a comparative analysis both on national and community level is desirable. Therefore, the paper will focus on French and Norwegian legislation and policy, as well as the local expectations of the European Green Deal at different levels in French and Norwegian society.

2. The European Green Deal and belonging measurements

2.1 "Fit for 55" and other measures

[3] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en
[4] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en
[5] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en#making-transport-sustainable-for-all
[6] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en#making-transport-sustainable-for-all

After the European Green Deal the Commission adopted the "Sustainable and Smart Mobility Strategy - putting European transport on track for the future" in December 2020, did changes in the European Climate Law in June 2021 and delivered the Law Package called "Fit for 55" in July 2021.

The Sustainable and Smart Mobility Strategy consists of 82 initiatives to guide the future work of the Union, and lay the foundation to achieve a green and digital transformation. The main goal is still the 90% cut in emissions by 2050, while delivering a smart, competitive, safe, accessible and affordable transport system.[7] The strategy lays down some milestones similar to the European Green Deal. Furthermore, it identifies ten key areas for action to make the vision a reality.[8] Among these, we find 1) boosting the uptake of zero-emission vehicles, renewable and low-carbon fuels and related infrastructure, 2) making interurban and urban mobility healthy and sustainable and 3) pricing carbon and providing better incentives for users under the headline "Sustainable". Under "Smart" actions such as 1) making connected and automated multimodal mobility a reality and 2) boosting innovation and the use of data and AI for smarter mobility. Lastly, to make the sector more "resilient" the Commission commits to make mobility fair and just for all and to step up transport safety and security across all modes.[9]

"Fit for 55" is a set of proposals to revise and update EU legislation in relation to the European Green Deal to make the EUs climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030. Fit for 55 includes several changes in the transport sector implementing the European Green Deal. There is a proposal for alternative fuels infrastructure and proposal for the revision of existing legislation aiming to accelerate the deployment of infrastructure for recharging or refueling vehicles with alternative fuels. In addition, there is proposed to revise rules on CO2 emissions for cars and vans.

In addition, the Commission adopted four proposals to modernize the EUs transport system in December 2021.[10] The four proposals target greater efficiency and more sustainable travel in line with the objectives of the European Green Deal.[11] The proposals include a smart and sustainable TEN-T, increasing long-distance and cross-border rail traffic, intelligent transport services for drivers and cleaner, greener, easier urban mobility.

2.2 Implementation in general

The European Green Deal is primarily a political climate strategy for the European Continent. Firstly, the political changes must be legislated in the European Climate Law. The interconnected proposals include revision to existing laws as well as new proposals within the

[7] https://transport.ec.europa.eu/transport-themes/mobility-strategy_en, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789
[8] https://transport.ec.europa.eu/transport-themes/mobility-strategy_en, see also linked pdf
[9] https://transport.ec.europa.eu/transport-themes/mobility-strategy_en
[10] https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6776
[11] https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6776, see pdf page 1

EU Law. After changes in EU law, the legislation also needs to be incorporated in national law.

In Norway, many of the measures regarding climate and the environment are political as well. The Constitution art. 112 says that every person, in line with human rights, has the right to an environment that is conducive to health and to a natural environment whose productivity and diversity are maintained.[12] Overall, the Climate Change Act of 2018 legislates the climate target for both 2030 and 2050.[13] The purpose of the Act is to promote the implementation of Norway's climate targets as part of its process of transformation to a low-emission society by 2050.[14] Similar wording can be found in the French climate legislation, in accordance with both EU Regulation and the Paris Agreement. In general, France has a lot more regulation through law than Norway. Other than the Climate Law and Constitution Norway has only individual expressions for environmental considerations.[15] Few of these are directly relevant for the transport sector.

3. Passenger cars

As part of the European Green Deal the Commission promotes the growth of the market for zero- and low-emissions vehicles, in particular to ensure that citizens have the infrastructure they need to charge these vehicles, both for short and longer journeys. In Fit for 55 the Commission proposed a regulation on the deployment of alternative fuels infrastructure. The regulation shall secure the roll-out of infrastructure for charging electric cars and filling hydrogen throughout the EU.[16] In this paragraph we will have a look at the current terms and conditions for passenger cars in France and Norway, as well as the challenges central for changes after the European Green Deal.

3.1 The French approach

The renew of the French car fleet to make it more cleaner lead France to adopt various policies and measures which permits to meet the objectives set by the Green deal. First, The French implementation is through a modernisation premium, that is declined by the car bonus system, the vehicle conversion bonus and the electrical retrofit bonus. The first one permits the choice of a vehicle with low CO2 emissions[17]. This is financial assistance granted to any purchaser of a vehicle with a CO2 emission rate of less than or equal to 20 g/km (electric, hydrogen or rechargeable hybrid)[18].

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[12] Cf the unofficial translation of the Norwegian Constitution art. 112, https://lovdata.no/pro/#document/NLE/lov/1814-05-17/a112

[13] Section 3 and 4 of the Climate Change Act, https://lovdata.no/pro/#document/NLE/lov/2017-06-16-60/%C2%A73

[14] Section 1 of the Climate Change Act, https://lovdata.no/pro/#document/NLE/lov/2017-06-16-60/%C2%A71

[15] Such as the Biodiversity Act, the Pollution Control Act, the Procurement Act § 5,

[16] https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52021PC0559

[17] https://www.ecologie.gouv.fr/developper-lautomobile-propre-et-voitures-electriques

[18] https://www.economie.gouv.fr/cedef/bonus-automobile

Then, by the Vehicle conversion bonus, the destruction of certain old vehicles entitles people to the payment of a conversion bonus for the purchase of an electric vehicle. Finally the electrical retrofit bonus permits to the owner of a vehicle to convert his internal combustion engine into an electric motor.

But we can also find a lot of legal obligation which have been established to push people to the purchase of vehicle with low emission. Indeed, the Decree No. 2017-26 of January 12, 2017 relating to charging infrastructure for electric vehicles and carrying various measures (corresponding to the transposition of Directive 2014/94/EU of the European Parliament and of the Council of October 22, 2014 on the deployment of an infrastructure for alternative fuels transposes the electrical part of this directive).

This meta objective poursuits by this Decree is declined in two part, measures concerned "home charging" and measures for deployment of infrastructures open to the public :

Concerning the "home charging part" we can find measures like :

- Individuals can benefit from a tax credit of 75% capped at €300 for the acquisition of a charging point and its installation at home;
- Decree 2020-1696 of December 23, 2020 reinforces the pre-equipment requirements for car parks in new buildings or which are subject to heavy work already in existence since 2010 following the "Grenelle 2" law. The pre-equipment facilitates the subsequent implementation of the charging points (planned cable passages, reservation of the power necessary for the electrical supply, etc.);
- Decree 2020-1720 of December 24, 2020 facilitates the exercise of the right to take by reducing procedural times, clarifying the procedure and extending the system (outdoor car parks, tertiary buildings, tenants or occupants in good faith of a parking space, etc.)

Then concerning the deployment of infrastructures open to the public, we can find measures like :

- The mobility orientation law provides for an increase from 40% to 75% of the maximum rate of coverage of the costs of connection to the electricity network for terminals open to the public until the end of 2021 and for the charging workshops of the affected vehicles public road passenger transport services until the end of 2022;
- The ADVENIR program, financed by energy savings certificates, encourages the installation of charging points.
- As part of the recovery plan, €100 million are dedicated to supporting the development of charging infrastructure in the service areas of the national road network and the motorway network; the objective is to equip all the service areas of the national road network.

Finally, the environmental code includes two main topics. The first one concerned the obligations of private companies, enshrined at artciles L.224-10 to L224-11-1. In that sense, the private companies like Companies that manage a fleet of more than 100 motor vehicles whose total authorized laden weight is less than or equal to 3.5 tonnes are required to include an increasing minimum share of low-emission vehicles in the annual renewals carried out. Since January 1, 2022, at least 10% of vehicles renewed annually must be low-emission vehicles. This minimum share increases to 20% from 2024, 40% from 2027 and 70% from 2030. Moreover, The taxi and VTC reservation centers to which more than 100 drivers are attached are required to connect a minimum share of low-emission vehicles following an increasing trajectory over time. This share is set in Article D. 224-15-12 C of the Environmental Code and is 10% in 2024, 20% from 2027 and 35% from 2029. Finally, from July 1, 2023, delivery platforms with more than 50 workers are required to respect a minimum share, increasing over time, of very low-emission two- or three-wheeled vehicles, bicycles and electrically assisted bicycles for the connection. Pursuant to Article D. 224-15-12 D of the Environment Code, from July 1, 2023 until the end of 2024 this share will be 20%. This transition continues over the following years: 50% from the end of 2025, 80% from the end of 2027 and 100% from the end of 2030.

The second section concerned obligations of public proccurement enshrined at the articles L 224-7 to L 224-8-2. With regard to public procurement, for the State and its public establishments, until the end of 2026, at least 50% of vehicles renewed annually must be low emission vehicles. From 2027, this minimum share is 70%. For local authorities, their groups, and their public establishments : until the end of 2024, at least 30% of vehicles renewed annually must be low emission vehicles. From 2025, this minimum share is 40%. Finally, for all these players, from 2026, 37.4% of renewed vehicles will have to be ultra low emission vehicles.

Then, the multi annual Energy programme[19] sets for the next decade the action priorities for the energy policy that will enable France to achieve carbon neutrality by 2050, this includes that all territories benefit from alternative mobility services to individual car use. The purpose is also to develop low-emission vehicles (including river, sea and air) and improve the energy efficiency of the fleet by relying on the alternative fuels market.

The national strategy of low carbon[20], is a roadmap to achieve carbon neutrality and to reduce the carbon footprint. It describes France's actions to conduct the climate change mitigation policy by defining short- and medium-term GHG emission reduction targets. It formulates more than 40 recommendations covering all sectors of ativity: transport, buildings, agriculture, industry, energy production and waste, but also education, employment or land use planning.

[19] https://www.ecologie.gouv.fr/programmations-pluriannuelles-lenergie-ppe
https://www.ecologie.gouv.fr/sites/default/files/20200422%20Programmation%20pluriannuelle%20de%20l%27énergie.pdf

[20] https://www.ecologie.gouv.fr/strategie-nationale-bas-carbone-snbc
https://ec.europa.eu/clima/sites/lts/lts_fr_fr.pdf

Concerning the transport sector we can find various measures like the reducation of 28% in sector emissions in 2030 compared to 2015, the desire to improve the energy performance of light and heavy vehicles, with a target of 4l/100 km in 2030 for internal thermal vehicles, to decarbonize the energy consumed by vehicles and adapt infrastructures to reach 35% of sales of new electric or hydrogen private vehicles in 2030 and 100% in 2040, the control of the growth in demand for transport by promoting telecommuting, carpooling, short circuits and optimizing the use of vehicles and finally the desire to promote shifting to modes of passenger and goods transport with the lowest emissions (public transport, train) and support active modes (bicycle, etc.).

The city of Lyon is also involved at the local level. Firstly through the Territorial climate air energy Plan 2030 which is said to reduce the share of car travel from 44% to 35% through the emergence of a new relationship with the car, which is less polluting, more shared and less systematic. Furthermore, through a low emission zone (ZFE)[21] in connection with the Law of December 24, 2019 on the orientation of mobility.[22] This includes an area in which old and polluting vehicles are not allowed to drive or park. It aims to encourage the circulation of the cleanest vehicles by supporting companies in their desire to transfer their fleet to clean vehicles. From September 1, 2022, Crit'Air 5 and unclassified vehicles will be prohibited in this zone: these are diesel vehicles that are over 20 years old (registered before January 1, 2001) and petrol vehicles that are over 23 years old (registered before January 1, 1997). The major objective of the second stage is the phase-out of diesel by 2026 throughout the perimeter. A gradual reduction of authorized vehicles will be in place, with a ban on Crit'Air 4, 3 then 2.

3.2 The Norwegian approach

3.2.1 Status on electrical passenger cars and existing measurements

Like the French approach, Norway also has several measures in store for reaching the objectives of the European Green Deal. For several years, Norway has been one of the leading countries in transition to electrical vehicles. Norway has the highest number of electrical vehicles per inhabitant, and in 2021 as many as 64,5% of newly registered cars were solely electric.[23] So far in 2022 the share of Norwegian-registered passenger cars that are zero-emission vehicles is 77.8 percent.[24] With increasing numbers of electrical vehicles, the number of electrical vehicles in the Norwegian car park will soon reach 20 percent.[25] This is in line with the National transport plan (NTP) for 2018-2029 where the following target figures were laid down: New passenger cars should be zero-emission by 2025. The goal is

[21] https://www.vie-publique.fr/loi/20809-loi-du-24-decembre-2019-dorientation-des-mobilites-lom
[22] https://www.vie-publique.fr/loi/20809-loi-du-24-decembre-2019-dorientation-des-mobilites-lom
[23] https://www.ssb.no/transport-og-reiseliv/landtransport/statistikk/bilparken/artikler/to-av-tre-nye-personbiler-er-elbiler, https://ofv.no/aktuelt/2022/2021-ble-tidens-rekord%C3%A5r-for-nybilregistreringer, https://www.regjeringen.no/no/tema/transport-og-kommunikasjon/veg_og_vegtrafikk/faktaartikler-vei-og-ts/norge-er-elektrisk/id2677481/
[24] https://www.vegvesen.no/en/fag/fokusomrader/miljovennlig-transport/zero-emission-targets/?lang=en, numbers as of 27.06.2022. Zero-emission vehicles are vehicles that are either fully electrical or run on hydrogen.
[25] https://ofv.no/aktuelt/2022/2021-ble-tidens-rekord%C3%A5r-for-nybilregistreringer

dependent on technological development making zero emission technologies competitive with the internal combustion engine.[26]

The main reason for the high penetration of electrical vehicles is a combination of taxation rules and incentives initiated by the Government. Firstly, buyers for electrical vehicles are under an exemption of purchase tax and VAT.[27] This makes it economically favorable to buy electrical passenger cars and provide a large financial incentive for potential buyers. Furthermore, electric passenger cars have several other benefits in trafic. Electric vehicles can get free parking on some public parking spaces, have free or reduced fees on ferries as well as the use of bus lanes. In addition, they don't pay road tolls. Taxation rules and incentives are existing measures in Norway for transitioning to low emission transport for consumers.

Another existing measure in Norwegian law is the Directive 2009/28/EC on the promotion of the use of energy from renewable sources. The Directive sets a common, binding national target of 20% share of energy from renewable consumption by 2020. Because the energy mix of different Member States vary, the total increase in the use of energy from renewables should be shared to reach the target of 20%. In contrast, the 10% energy target from renewables in the transport sector should be at the same level for each Member State.[28] In Norway a part of the Directive is illustrated by Product Regulations. The § 3-3 of the regulation regulates standards for the sale of biofuels regarding mass, sustainability, GHG emission reductions and area of production of the biomass.[29] When it comes to the electricity for electric cars, almost all of Norway's domestic energy comes from hydropower.[30] Because the electricity is based on a renewable source, the switch to electrical vehicles is even greener than countries whose electricity comes from other non-renewable or more high-polluting sources. As Norway is a producer of hydropower, electricity has also been quite cheap compared to other European countries.

The existing measures and development from fossil fuel to electric vehicles, especially the number of electric passenger cars and green electricity, are already taking care of the goals set out in the European Green Deal to a large extent. Unlike the French approach with a lot of legal regulation, a lot of the current Norwegian incentives and regulations are based on political will and policy. One of the questions is if the implementation of the European Green Deal will affect this and make the Norwegian Government more bound by law. As of now, there are few legal changes that can be traced directly back to the European Green Deal.

3.2.2 Challenges and local expectations to the European Green Deal

[26] https://www.regjeringen.no/en/topics/transport-and-communications/veg/faktaartikler-vei-og-ts/norway-is-electric/id2677481/
[27] https://www.regjeringen.no/no/tema/transport-og-kommunikasjon/veg_og_vegtrafikk/faktaartikler-vei-og-ts/norge-er-elektrisk/id2677481/
[28] Directive 2009/28/EC Preamble (15)
[29] https://lovdata.no/pro/#document/SF/forskrift/2004-06-01-922/%C2%A73-3
[30] https://www.statkraft.com/what-we-do/hydropower/, https://www.regjeringen.no/en/topics/energy/renewable-energy/the-history-of-norwegian-hydropower-in-5-minutes/id2346106/

Whilst the existing measures and incentives have been effective, they also come at a cost. Estimated to be almost 19,2 billion NOK per year, the incentives make up a substantial part of the governmental budget.[31] Therefore, along with the fact that the desired effect of the incentives is partially achieved, incentives have gradually started to change. Local authorities can now introduce payments on toll roads and ferries as well as parking fees and restricted access to bus lanes.[3233] However, they must comply with a national binding standard stating minimum advantages for electrical vehicles. These standards state that fees for electric cars shall not exceed 50 percent of the fee for conventional cars.[34] One of the questions in light of the European Green Deal will be if the existing measures are sufficient, both as they are and with future changes.

Even if the number of electric passenger cars are increasing, so are the number of passenger cars in general. This applies for both Norway, France and is a challenge both for the EU and globally from an environmental perspective. Furthermore, analysis shows that the usage patterns of owners of electrical vehicles are different. In a survey conducted in 2015 electrical cars in Trondheim passed the toll ring three times more than other cars.[35] In Norway, the economic incentives have resulted in a particular challenge. Data from the Vehicle Register compared to the income and wealth statistics for households shows that electric car purchases are more common in high-income households than in low-income households.[36] While high-income households can afford to have more than one car and therefore leverage on the incentives, lower income households can't afford to change a car before they need to. Therefore, lower income households are not able to leverage on the momentum of incentives before they gradually start to change. A challenge of the economic incentives is therefore both the fear of increased consumption as well as social imbalance.[37] Therefore, a local expectation for Norway would be to make changes to reach the goal in European Green Deal of making transport sustainable for all.

Although Norwegian electricity makes the electric vehicles more green, the challenge with production of batteries for electrical vehicles is a common challenge. Another challenge with the growth of electrical vehicles is regional distribution and infrastructure. Norway is an elongated country with a belonging coast line, a lot of mountains, fjords and tough weather conditions. This means that the use of electrical vehicles on longer distances depends on

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[31] https://www.regjeringen.no/en/topics/transport-and-communications/veg/faktaartikler-vei-og-ts/norway-is-electric/id2677481/

[32] https://www.regjeringen.no/en/topics/transport-and-communications/veg/faktaartikler-vei-og-ts/norway-is-electric/id2677481/

[33] the Norwegian Road Traffic Act § 8 as well as Prop.L (2018-2019) chapter 3

[34] Decision no.108 (2016–2017), point 2c, 5 December 2016 cf. Prop.S 87 S (2017-2018) chapter 7

[35] https://www.regjeringen.no/contentassets/7c52fd2938ca42209e4286fe86bb28bd/no/pdfs/stm201620170033000dddpdfs.pdf section 8.3.5 page 155

[36] https://www.ssb.no/transport-og-reiseliv/landtransport/artikler/de-rikeste-kjopte-hver-femte-elbil

[37] https://www.ssb.no/transport-og-reiseliv/landtransport/artikler/de-rikeste-kjopte-hver-femte-elbil, https://www.ssb.no/transport-og-reiseliv/artikler-og-publikasjoner/dei-rikaste-kjopte-4-av-10-elbilar and https://www.ssb.no/transport-og-reiseliv/artikler-og-publikasjoner/kvart-sjette-av-dei-rikaste-hushalda-har-elbil

reliable means of transport and good solutions for infrastructure. Enough charging points with considerations to mountain passes, different temperatures, the range of electric vehicles and number of cars in need of charging is an important issue for the future of electric passenger cars. For Norway it will be of high importance that the proposal for regulation on the deployment of alternative fuels infrastructure takes into account the local conditions and geographical peculiarities making the regulation as effective as possible.

4. Alternative to cars, with focus on public transport

As mentioned, one of the main goals of the European Green Deal is to make transport sustainable for all.[38] A transition to greener mobility will offer clean, accessible and affordable transport even in the most remote areas. In line with the new proposal of december 2021 about cleaner, greener, easier urban mobility this also includes walking and biking. The main focus of the Sustainable Urban Mobility Plans is public transport, walking and cycling, but ideas for urban fleets are also included.[39] This means car sharing, carpools and other options to make traveling more effective, affordable and green.

4.1 Buses, subways and trams

4.1.1 The French approach

In Lyon, a lot of measures have been taken to provide locals alternatives to cars, in terms of public transport. Indeed, we should first mention the Territorial climate air energy Plan 2030[40] which is a planning process, both strategic and operational, that applies to all sectors of activity. Its two main objectives are first mitigation -limit the impact of the territory on the climate by reducing GHG emissions- and second adaptation -reducing the territory's vulnerability to impacts climate change that cannot be avoided-. In this Plan, we can clearly notice that energy is the main lever of action in the fight against climate change and air pollution. In particular, the 3 areas of work are: energy sobriety, improvement of energy efficiency and the development of renewable energies.

Based on it, the *Grand Lyon* decided to focus notably on the improvement of the performance and attractiveness of public transport. The aim is to increase the share of trips by public transport from 19% to 22% in 2030, to invest €1 billion into public transport and to reach a 3% per year increase in rail traffic.

In 2021, the city of Lyon made a Progress Report[41], which is a document published on the occasion of each Energy Climate Conference, biennial and high point of the Territorial Climate Air Energy Plan approach. It presents the most recent data for the territory (greenhouse gas

[38] Delivering the European Green Deal | European Commission (europa.eu)
[39] https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6776
[40] https://blogs.grandlyon.com/plan-climat/wp-content/blogs.dir/8/files/2020/09/01-PCAET_MetropoleDeLyon_2019-2030-VersionMAJ.pdf.pdf
[41] https://www.grandlyon.com/fileadmin/user_upload/media/pdf/environnement/20220223_pcaet_point-etape.pdf

emissions, energy consumption and production, etc.), it reports on the actions carried out by the partners and the Métropole de Lyon and aims to show concrete progress for the climate.
More specifically, this report demonstrates the strengthening of the urban public transport network and the consultations relating to the creation of new infrastructures (tramway, high-level bus service, cable transport, etc.).

Indeed, the public authority organizing mobility, the Sytral, which takes care of all the public transports at the scale of an enlarged mobility zone, comprises 13 local authorities in the Rhône, leads to 263 municipalities in a territory of more than 1.8 million inhabitants.
In total, it provides 4 metro lines, 2 funicular lines, 7 tram lines and more than 120 bus lines, serving more than 3,000 stops.

In Lyon, electrical energy is already used for the metro, trams and funiculars but buses, on the other hand, run on diesel. Sytral has chosen a policy of renewing its fleet of buses. Several solutions have been adopted for the energy transition. To replace the diesel buses, Sytral has opted for an energy mix, by ordering buses running on natural gas (BioNGV) and battery-powered electric buses. By 2026, 400 gas or electric buses will be in service. To accommodate those buses, 4 of the 9 depots will be refurbished and equipped with recharging facilities.

Sytral is also interested in hydrogen, which offers greater autonomy than battery-powered electric buses. It was considered the purchase of 2 hydrogen buses. These buses can be fueled with hydrogen at the Quai des Energies, an existing multi-renewable energy station.

In the Multi-year investment program of Lyon, the city decided to provide €95 million to public transport. Indeed, this budget is dedicated to finance the requalification of public spaces around the creation of new lines of tramway and buses. Also, the support of Sytral will result in the development of ten priority corridors for buses.

As a result to encourage people to use public transport, a single metropolitan TER-TCL tariff will be put in place this year to facilitate journeys between the 35 stations in the metropolitan territory. Several bicycle and car parks and rides will be created or developed near TCL stations and stops and/or train stations.

Moreover, the Multi-year investment program of Lyon[42] represents an ambitious tool to develop alternatives to cars. Its objective is less polluting travel for better air quality. To do this, it is necessary to facilitate travel on foot and by bicycle and the development of public transport with Sytral. And this is what this mandate is about.

Regarding public transport, 95 million euros are allocated to it. Indeed, this budget is to finance the requalification of public spaces around the creation of 3 new tram lines. Next to that, two other strong bus lines will be co-financed.

[42] https://www.grandlyon.com/actions/2021-2026-relance-ecologique-et-solidaire.html

Then, according to this program, the support of Sytral will also result in the development of ten priority corridors for buses and encouraging locals to use the network. In 2022, a single metropolitan TER-TCL tariff will be put in place to facilitate journeys between the 35 stations in the metropolitan territory. Several bicycle and car parks and rides will be created or developed near TCL stations and stops and/or TER stations.

4.1.2 The Norwegian Approach

In light of the challenges illustrated in 3.2.2 it is evident that a good system of public transport is important for good and greener mobility for all. This includes both those who can't afford investing in electric passenger cars, those who need to travel longer distances and to stop the increasing number of passenger cars. To deal with the environmental challenges public transport needs to be a real and reliable alternative for commuting to work in both the smaller and the bigger cities, and travel longer distances both for purposes purely necessary as well as for recreational and leisure time. This is also the political view in Norway according to the National Transport Plan that defines good mobility as something that ensures an easier everyday life and freedom to settle wherever you wish, with access to goods and services, education opportunities, employment and recreational activities.[43]

The National Transport Plan (NTP) is the main document for the Government's transport goals and strategies in a long-term perspective. The NTP describes how the Norwegian transport sector will work towards the main overall objective both for passenger cars and public transport.Like the proposal about cleaner, greener, easier urban mobility the NTP highlights cycling and walking as part of the investment in mobility. While developing infrastructure good accessibility for all actors are important. Both the European Green Deal and the NTP also highlight the safety of all means of transportation.

One of the main issues in the NTP is the “Zero Growth Target”. The expectation of increased population and economic growth also includes an expectation of increased passenger transport. The “Zero Growth Target” is a reaction to this, and implies that the growth in passenger traffic in urban areas shall be absorbed by public transport, cycling and walking.[44] To reach this target the State contributes with funds and financing in agreements with the county and municipalities. In addition to regular funds, a reward scheme is established as an incentive to reach the “Zero Growth Target”.[45]

Another of the goals in NTP is that all new city buses should be zero-emission or use biogas by 2025.[46] Today Norwegian buses run on a mix of biofuel, hydrogen, hybrids and electric.

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[43] National Transport Plan (meld.st.33 (2016-2017)) point 4.1 page 13, https://www.regjeringen.no/contentassets/7c52fd2938ca42209e4286fe86bb28bd/no/pdfs/stm201620170033000dddpdfs.pdf

[44] https://www.miljodirektoratet.no/tjenester/klimatiltak/klimatiltak-for-ikke-kvotepliktige-utslipp-mot-2030/transport/nullvekstmal-for-personbiltransporten/

[45] https://www.regjeringen.no/no/tema/transport-og-kommunikasjon/kollektivtransport/belonningsordningen-bymiljoavtaler-og-byvekstavtaler/id2571977/

[46] https://www.regjeringen.no/en/topics/transport-and-communications/veg/faktaartikler-vei-og-ts/norway-is-electric/id2677481/

Most of the public transport done by buses are solutions with low emissions. There are also several pilot projects with electricity and hydrogen, mostly in the bigger cities. The solutions differ from the bigger cities to long-distance transport. While electric buses are good for urban transport with shorter distances and possibility to charge at end stops, biofuel might be more suited for bus transport on suburban and longer bus routes. In light of the green deal's focus on economic solutions, this might also be more cost efficient. The solutions and strategies also differ from different companies and municipalities.

Unlike France, the development of subways is far less developed. The capital, Oslo, is the only city to have a subway. Oslo is also the only city to have trams, while Bergen has the light rail running with 27 stations from the City Centre to the airport.

4.2 Railways

A part of the European Green Deal and the new transport proposals of December 2021 is a smart and sustainable TEN-T Network of rail and a goal of increasing long-distance and cross-border rail traffic. One of the goals is to double the passenger traffic with high-speed railway by 2030, and tripled by 2050. To make this possible the TEN-T network needs to be completed with passenger rail lines that allow trains to travel at 160 km/h or faster.[47] As an example, this will make passengers able to travel between Copenhagen and Hamburg in 2.5 hours by train, instead of the 4.5 hours required today.[48]

4.2.1 The French Approach

Next to buses, subways and trams, trains are also quite developed in France, including in Lyon. In order to meet all needs, the network uses a wide range of energies : electricity (53%), off-road diesel (13%), road diesel (22%) and natural gas (7%). The goal is to increase their energy performance by 20% while reducing their carbon emissions by 25% by 2025.

How to get out of diesel, when it is still responsible for 61% of CO2 emissions from regional trains, on the non-electrified parts of the rail network? One of the avenues being considered is to replace diesel engines with lithium batteries. Indeed, 38 million has been invested in the battery by the regions, including Lyon. Up to 20% energy savings are expected with these modifications.

4.2.2 The Norwegian Approach

Around 80 per cent of transport by train in Norway is electrified.[49] The electromotor is also quite energy effective, and the trains can generate electrical energy when they brake. Nearly 20% of the electrical energy a modern train receives from the overhead contact line can be fed back to the grid by backfeed.[50] When the breaking-energy is fed back to the overhead

[47] https://transport.ec.europa.eu/news/efficient-and-green-mobility-2021-12-14_en
[48] https://transport.ec.europa.eu/news/efficient-and-green-mobility-2021-12-14_en
[49] https://www.banenor.no/contentassets/b9ade1303f42474eabf16099c7dd2182/slik-fungerer-jernbanen-versjon-191213.pdf page 12
[50] https://www.banenor.no/mertog/europa-ser-til-bane-nor-for-en-barekraftig-utvikling/, https://www.vy.no/vygruppen/baerekraft-og-samfunnsansvar

contact line system it can be used by other trains, and is therefore a way of recycling the energy. In light of existing technology and the European Green Deal a local expectation would be to electrify longer stretches or use combined trains for the stretches that are not electrified. This includes more use of hydrogen, battery or biofuel.

Norway is also a part of the TEN-T Network through EU Law. The TEN-T Network includes both infrastructure, railway and road network to build transport corridors through Europe. For railway Norway is connected to the Continent through Oslo. If you want to go to Lyon from Bergen by train, the journey of 485 km from Bergen to Oslo will take you around seven hours. In comparison, this is the same amount of time that it takes from Hamburg, Germany to Basel, Switzerland, a distance of over 800 km. Again, this can be justified by Norwegian geography. At the same time it illustrates the importance of prioritizing the development of the national railway for trains to be an actual alternative. Even if it will only take 2.5 hours by train from Copenhagen to Hamburg in the future, Norwegians will still spend quite some time taking the train from Oslo through Sweden on their way to Copenhagen. One way to combat this time-consuming challenge is by increasing mobility by plane for the first stretch. Another, and more sustainable, way would be to invest in the car and passenger ferries going from Norway to Denmark. As long as the railway is not expanded or invested in, the main point will be to find other solutions to shorten the distance from Norway to the rest of Europe in other ways than taking a plane. The need for such investment is substantiated by the fact that except for the railway, we have yet to find transport corridors where Norway is included in the TEN-T Network.[51]

4.3 Ferries

4.3.1 France

Next to all of the other public transportation, there is in Lyon a shuttle that is available for the locals as a means of transport to get to work or, for tourists, to sail along the water. This boat is equipped with a hybrid electric and diesel engine which saves 40% of diesel fuel.

4.3.2 Norway

In Norway car ferries are quite common because of the distinctiveness of Norwegian nature. Either you're traveling by passenger cars or buses, ferries might be a necessary means of transport to reach your destination. In fact there are over 100 ferry connections in Norway distributed on national, county and municipal roads.[52] As per July 2022 there are 58 electrical ferries in operation in Norway.[53] Additional 14 ferries are expected during 2022 and 14 new electrical ferries will follow after 2022.[54] Like the need for charging points for electrical vehicles, the grid needs to be updated to deliver enough electricity for buses and ferries.[55]

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[51] Trans-European Transport Network TENTEC - Maps - European Commission (europa.eu)
[52] https://www.vegvesen.no/fag/trafikk/ferje/markedsoversikt/
[53] https://energiogklima.no/elektriske-bilferger-i-norge/
[54] https://energiogklima.no/elektriske-bilferger-i-norge/
[55] https://www.nve.no/nytt-fra-nve/nyheter-energi/elektriske-biler-busser-og-ferger-gir-okte-nettinvesteringer/

Well-functioning infrastructure is therefore crucial to reach the objectives of the European Green Deal.

As well as the development in electrical ferries Norway has the first ferry in the world to run on hydrogen. Hydra has two hydrogen-powered fuel cells as well as a battery pack which can be charged by the fuel cells as well as in the port.[56] Local expectations for the future would be more of the same development and to strengthen it. At the same time it would be natural to demand stricter requirements as part of developing new technology. As an example, the hydrogen for the Hydra-ferry is currently imported and transported from Germany with heavy transport.[57] This is not sustainable in the long run. A possible improvement would be to produce the hydrogen more locally or transport it for shorter distances before use.

In light of the discussion around railway and Norways connection to the rest of the continent, further development and investment in ferries are welcomed. The development of the Norwegian ferries should be applicable for more and further stretches, making it an alternative to reach the continent more effectively than by trains and without having to catch a flight.

5. Concluding remarks

As we have seen, the transport sector is of importance for several reasons. The sector is both employing more than 10 million people, contributing around 5% to EU GDP and crucial for people to get around. At the same time transport emissions represent around 25% of the total greenhouse gas emissions of the EU.[58] To reach the goals of the European Green Deal is therefore important to combat climate change and environmental degradation.

The main goal is to achieve a 90% reduction in transport-related greenhouse gas emissions by 2050 while at the same time providing efficient, safe and environmentally friendly transport and promoting economic growth. One of the issues is to secure sustainable transport for all. This includes accommodating daily needs in all parts of every country, for every person in the European Union. The freedom of movement is essential. As we have seen, the development of infrastructure is key. There need to be enough charging points for electrical passenger cars to be practical and feasible. At the same time public transport needs to have enough departures, stations and reasonable tickets. Junctions for transitions are also important to facilitate seamless travel chains.

Although the European Green Deal illustrates a holistic view of the challenges ahead, another expectation would be to look at the total emissions related to the transport sector as well as changes done in the sector. While the transition from fossil fuel to electrical vehicles is

[56] Hydra – verdens første hydrogenferje | Maritimt Magasin
[57] https://www.sdir.no/aktuelt/nyheter/batterihybrid-blir-verdens-forste-hydrogenferje/
[58] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en

important, so is the usage of the electrical vehicles, the electricity used in charging and the production and disposal of the cars.

Even though there are some similarities, France and Norway have different geographical and urban challenges. This justifies the differences in development and types of public transport. The local expectations, especially for Norway, is that policies and legislation takes into account the geographical differences to make mobility both sustainable and smart. Whether these considerations need to be taken account to from the Commission or in the national and local implementation are unsure.

France also has a lot more legislation where Norway leans on political will and policies. Although the European Green Deal includes a law package, new proposals as well as changes in the Climate Law and revision to existing law, it is mainly a political strategy. It can be discussed whether legislation is needed for change. On one side it is important that both the Union, member states and government can be kept responsible. Legislation can be more tangible and with bigger consequences than breach of political promises. It also lasts through different governments. On the other hand, legislation can lead to more elaborate processes. Either way, the most important expectation to the European Green Deal is that the focus remains on the changes that need to take place and that measurements are implemented quickly. Furthermore, they need to be followed up in a conscientious manner to secure the effectiveness towards the set targets.