

Sufficiency in European Climate Policies, four country NECPs analysed

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Abstract

Sufficiency, a concept acknowledged by the International Panel of Climate Change (IPCC), is often not included in climate mitigation strategies. While its elements are well known in different policy areas and it can be seen as an important missing element for achieving sustainable lifestyles and realising environmental objectives, recognition of sufficiency remains limited in climate mitigation. This paper, through the lens of the FULFILL project, aims to elucidate sufficiency and evaluate its integration into climate strategies via the National Energy and Climate Plans (NECPs) of four European countries: Denmark, France, Germany, and Italy. This is based on the study of sufficiency policies, which promote sustainable living practices, that are increasingly recognized in academic research as viable climate solutions.

This article provides a comprehensive overview and comparative analysis of how the four analysed countries incorporate sufficiency within their NECPs and proposes additional sufficiency policies that the countries could introduce. The objective is to offer insights into the current status of sufficiency policies and to identify best practices and areas for improvement. The analysis will focus on policies that regulate social, infrastructural, and regulatory conditions within these nations to influence individual and collective behaviours, thereby impacting energy demand and greenhouse gas emissions.

Ultimately, this paper contributes to the discourse on sufficiency by presenting a clear and comprehensive analysis of its current role in NECPs and its potential in shaping effective climate policies in Europe with enhanced NECPs. Through this, it aims to elevate sufficiency from a peripheral concept to a central element of national and international sustainability strategies.

Keywords

Sufficiency, National Energy and Climate Plans, NECP, Mobility, Diet, Buildings, sustainable consumption, sustainable lifestyle,

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Introduction

While the urgency of the climate crisis is ever more apparent, there are increasingly voices calling for additional measures to reduce emissions, in addition to change to carbon neutral energy sources and energy efficiency. Sufficiency is a concept that combine many of these additional measures. The sufficiency principle is about creating the social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas emissions to an extent that they remain within planetary boundaries, and simultaneously contributes to societal well-being.

Based on this definition, researchers have identified sufficiency policies and measures that we used in this article. In the recent “AR6” IPCC report of 2022¹, sufficiency is mentioned for the first time in IPCC reports as a type of climate mitigation measures.

Sufficiency policies were included in the first national climate plans in EU, the NECPs (National Energy and Climate Plans) from 2019, where a study identified 230 sufficiency measures supported by 281 policy instruments². The research also found that sufficiency played a minor role, and that most of the sufficiency measures were substitution (50%, as supporting public transport as alternative to car use) and cross sectorial (27%), such as taxation of fossil fuels, supporting both renewable energy, energy efficiency and sufficiency. Only 27% (61) were aiming at reduction of consumption. Most measures were in the transport sector, 54%, and only 7% were in the building sector³. In the 2019 NECP’s only two of them mentioned the concept of sufficiency while all EU countries had two or more sufficiency measures according to the definition of the researchers behind the study. That underlines clearly the late integration of this concept in national policies.

However, since 2019, the concerns of the climate change problems have increased and EU has risen its reduction target from 40% 1990-2030 to 55% and policy makers are considering a 57% reduction target. In addition, the concept of sufficiency is increasingly known, and understood as a potential policy field, as mentioned by IPCC in 2022. With the increased demand for emission reductions, stronger inclusion of sufficiency policies and including sufficiency as a climate policy field could help meeting the gap between current trends and the emission reduction targets.

Based on the need to increase climate action, this paper analysis the inclusion of sufficiency policies in climate policies in four countries with the research questions of:

- How sufficiency policies are included in existing national climate plans in the four countries Denmark, France, Germany, and Italy,
- What the potentials are to increase climate mitigation with more and, strengthened sufficiency policies in these countries, and
- What specific sufficiency policies this could include.

The article is using research developed during the FULFILL project, is a Social Science and Humanities (SSH)

¹ IPCC AR6, WPIII, Summary for Policy Makers, page 31, par. C.7 (cf. buildings sections.)

<https://www.ipcc.ch/report/ar6/wg3/downloads/>

² Enough? The role of sufficiency in European energy and climate plans, Carina Zell-Ziegler and others, Energy Policy vol. 157, October 2022, par. 4.5

<https://www.sciencedirect.com/science/article/pii/S0301421521003530?via%3Dihub>,

³ Op cit, fig.2, <https://www.sciencedirect.com/science/article/pii/S0301421521003530?via%3Dihub>,

project supported by EU with the Horizon 2020 program. It is coordinated by The Fraunhofer Institute for Systems and Innovation Research (ISI, Germany) and with the partners The Wuppertal Institute (Germany), The applied research center EURAC (Italy), The Jacques Delors Institute (France), International Network for Sustainable Energy (INFORSE) – Europe (Denmark), The Politecnico de Milano University (POLIMI, Italy), The négaWatt Association (France), and Zala Briviba / Green Liberty (Latvia). The project is analysing decarbonisation pathways by sufficiency lifestyles using a mixed method approach (qualitative-quantitative), empirically analysing sufficiency on micro (personal), meso, and macro levels, and analysing impacts from up-scaling lifestyle changes.

To answer the research questions of inclusion of sufficiency policies in existing national climate plans and the potential to increase climate mitigation with more and strengthened sufficiency policies, we used the work and results of the FULFILL project to review and assess sufficiency policies in draft NECP's from 2023 for four selected EU countries studied in the FULFILL project: Denmark, France, Germany, Italy. We compared the proposed sufficiency policies and measures in the draft 2023 NECP's with sufficiency measures and policies identified in the FULFILL project and in other relevant research (see cf. Notes on page 27).

Through our analysis and the subsequent recommendations, our goal with this article is to advance the conversation on sufficiency and promote its adoption as a key component in climate policies.

The article has a methodological section identifying the sectors analysed and sufficiency policies and measures considered in the analysis. The follow analysis of the four main sectors in each of the four countries covered. For each of these 16 national sectors is identified the sufficiency policies and measures not used in the national climate plans via the NECP for the country. At the end is a conclusion, concluding on how far sufficiency is included in the national climate plans and other research questions.

Methodology

The selected countries are Denmark, France, Italy, Germany. They were selected together with Latvia to represent different parts of EU and a large part of the population in EU. Since the draft NECP of Latvia was not available at the time of the study, this article only covers these four countries.

Many studies, also the FULFILL study identify four main sectors, where sufficiency policies and measures can have substantial influence of emissions:

- buildings, living space
- mobility,
- Products, packaging
- diets, food

We use these sectors in this article. Opposite to the above-mentioned study from 2019, we have not included cross-cutting measures that also support energy efficiency and renewable energy, as they are not with a direct focus on promoting sufficiency measures.

The sufficiency measures that will be used for comparison with policies are:

- Sufficiency measures that are **analysed in detail** within FULFILL, including quantification

- Sufficiency measures that have been **proposed for detailed analysis** in FULFILL, but that are not quantified in the project
- Sufficiency measures, where **national actions are analysed** for one or more EU countries in FULFILL
- Sufficiency measures in local **citizen’s initiatives analysed** in FULFILL
- Sufficiency measures **in NECPs**, at least occurring in one of the four NECP’s analysed in for this article.
- **Other sufficiency measures** that are important, but that are not analysed in the FULFILL project, for instance because they are well covered by other research and that are not included in at least one of the NECPs analysed. See list of other research used at Notes, page 26.

The following table lists the main sufficiency measures that we include, organised according to sectors. Each sufficiency measure can be supported by one or more policies described in the NECPs.

Sufficiency measure	SECTOR	Analysis
Living in collective housing	Living space	Analysed in detail in FULFILL
Cohousing	Living space	Analysed in detail in FULFILL
Flat-sharing	Living space	Proposed for detailed analysis
Limiting holiday homes	Living space	Proposed for detailed analysis
Reduce requirements for parking places	Buildings	National actions analysed
Urban planning for tiny houses	Living space	National actions analysed
Progressive tariffs for water, energy	Buildings	National actions analysed
Move to a smaller dwelling	Living space	Other sufficiency measure
Lower indoor temperature in winter	Buildings	In NECPs
Reduced heating and light when rooms are not used	Buildings	In NECPs
Move energy use to periods with high RE, low demand	Buildings	In NECPs
Carpooling and sharing	Mobility	Proposed for detailed analysis
Using train and public transports	Mobility	Proposed for detailed analysis
More bi-cycling	Mobility	Analysed in detail in FULFILL
Flying less	Mobility	Analysed in detail in FULFILL
Ban of short-haul airlines when good train exists	Mobility	National actions analysed

Living closer to services	Mobility	Proposed for detailed analysis
Working from home or a co-working space	Mobility	Proposed for detailed analysis
Low-emission zone for transport, large city	Mobility	National actions analysed
Sharing products	Products	Priority for detailed analysis
Moderate product sizing	Products	Priority for detailed analysis
Avoiding purchases (Household level)	Products	Proposed for detailed analysis
Reasonable usage/Cutting energy waste	Products	Proposed for detailed analysis
Better repair opportunities	Products	Citizen's initiatives analysed
Places for free re-use	Products	Citizen's initiatives analysed
Packaging tax and regulations	Packaging	In NECPs
Single use product tax and regulations	Products	In NECPs
Eating less meat & dairy (VAT Reduction for plant-based food (evt. higher for meat))	Diets	Priority for detailed analysis
Vegetarian meals in public canteens	Diets	National actions analysed
Reduce food waste	Diets/food	In NECPs

In the following national chapters, policies supporting sufficiency measures in above list are highlighted with underscoring when they appear in the NECP in question.

National Chapters for the Four Countries

Denmark

Sufficiency is not a concept used in Denmark or in the Danish NECP's but some of the policies can be categorised as sufficiency policies. From 2019 to 2023, the number of sufficiency policies have increased, while some sufficiency policies have been discontinued.

Buildings, living space

Existing sufficiency policies in Danish draft NECP 2023 are:

Sufficiency policy: Support the movement of energy use to periods with high renewable energy supply, low demand:

- Installation of smart electricity meters for all consumers, allowing hourly reading of data by power companies and consumers and allow all consumers to have tariffs that vary with the electricity pool price
- Electricity distribution tariffs that vary during the day
- Electricity market adjustment for Small and medium sized business (SMEs) that give access to dynamic price products, enabling the use of consumption flexibility activities.

Sufficiency policy: Promote lower indoor temperature in winter and reduced heating and light when rooms are not used

- In the context of the critical energy and supply situation caused by the war in Ukraine, as well as EU action, four requirements for state institutions, with entry into force by 1 October 2022, were issued through Ministerial Instructions; 1) to lower the temperature to 19 degrees; 2) switch off unnecessary lighting; 3) shorten the heating and ventilation season and reduce operating time for heating and ventilation; and 4) launch information campaigns at the workplace on the basis of the Danish Energy Agency's campaign material. (the temperature requirement was discontinued in 2023)
- The government's online advice service on energy efficiency (sparenergi.dk), also advice on saving energy with behaviour.

Sufficiency policy: Urban planning for Tiny-houses (not included in NECP):

A few Danish municipalities are making urban planning that allows tiny houses, which is not mentioned in the Danish NECP.

Denmark can do a lot more climate mitigation with sufficiency policies in buildings:

- Introduce policies that promote collective housing and co-housing for both new buildings and with renovation of old buildings, to reduce the need for dwelling space
- Improve policies for sharing of dwellings, promoting renting of rooms and improve the status and conditions for loans for dwellings owned by more persons jointly, to reduce the need for dwelling space

- Limiting holiday homes, for instance with higher energy requirements, to reduce construction of more holiday homes and reduce energy use of existing and new ones. Also, taxes for holiday homes can be applied.
- Reduce requirements for parking at buildings (dwellings, shops etc.), in particular in urban areas. This will reduce the incentive to travel by car and in parallel reduce the costs for urban dwellings and shops
- Promote the construction of tiny houses in well-designed urban plans, on national level in cooperation with municipalities that are in charge of land-use planning.
- Introduce progressive taxes for electricity and water use (with example from Italy) and limit fixed tariffs
- Promote the movement from larger to smaller dwellings for smaller families, in cooperation with municipalities.
- Continue efforts to improve energy savings in public buildings, for instance introducing a label for energy efficient behaviour, comparing expected energy use from energy labels with realised energy use.

Mobility

Existing measures in Danish draft NECP 2023 are:

Sufficiency policy: promote bi-cycling:

Bi-cykling is promoted with state budget allocations for bicycle paths along state roads, to co-fund municipal bicycle infrastructure, and with a national advice centre for bicycle promotion.

Sufficiency policy: promote less flying:

Flying less is promoted with a passenger aviation tax that will be introduced from 2025. A forecast is that it will reduce aviation with 4%. A smaller part of the revenue will be used to support smaller Danish airports to promote short-haul flights internally in Denmark (which is against the reduction objective)

Other mobility policies:

In addition, a small budget allocation is set aside for development of a green mobility model, to improve transport planning.

Compared with 2019, the target for modal shift from cars to public transport has been removed.

Denmark can do a lot more on climate mitigation with sufficiency policies in mobility:

- Increase use of public transport can be promoted in a number of ways:
 - o Reverse the planned reduction in busses by increasing public transport budgets in the Danish regions
 - o Reverse the planned increase in ticket prices and introduce favourable tickets useful across all local public transport, as the German 49€ ticket and rebates that are useful across all forms of public transport
 - o Increase direct trains throughout Denmark with more destinations in Denmark and also to neighbouring countries.
 - o Improve connectivity between different trains and between trains and buses
 - o Increase the speed of trains, also outside the main lines.
- Bi-cycling:

- The current state budget allocations are much smaller than the demand identified by the municipalities. The state budget should be increased to fully co-finance the bicycle infrastructure identified by the municipalities.
- Cargo-bicycling can be promoted with incentive programs as in France, Germany, and Italy.
- Flying less: The coming aviation tax can be used to support green transport alternatives in the form of long-distance trains, including night trains. It can also be increased, for instance to the German level.
- Ban short-haul flights, where good trains exist: Denmark could ban flight routes, where trains serve the nearby city centres with less than 3 hours train travel from the capital, Copenhagen.
- Living closer to services can be promoted in a number of ways, using inspiration, among others, from the Paris' "15-minute city" and others:
 - Urban planning should include that houses are only built when basic facilities are available within 15 min. by bike (3 km), including shops, kindergarten, school, good public transport. When possible, the distance to basic facilities should be within 15 min. by foot (1 km). The urban planning should also secure that soft mobility, as bicycling, is safe.
 - Urban planning should prioritise that basis facilities are maintained or developed, so they are reachable within 15 min by bike (3 km) from all settlements
 - Support commuters to move closer to work places, in cooperation with municipalities
- Work from home or co-working space can be promoted with allowing office workers and others, where it is possible, two days per week work from home.

Products and packaging

Denmark has a number of sufficiency policies for products and packaging:

Sufficiency policy: Packaging tax and regulation:

- Packaging tax on packaging and on plastic carrier bags, as well as a ban on free plastic bags in shops. This includes a tripling from 2019 of the tax on carrier bags to 73.46 DKK/kg (10 €) in 2024.
- Ban of plastic bags with material thickness 15-30 micro-meter for packaging in shops

Sufficiency policy: single-use products tax and regulation to reduce single-use products:

- Tax on single use tableware and 50% reduction target for single-use tableware and take-away packaging.

Sufficiency policy: Establish places for free re-use of products

- Requirement for direct reuse in municipal recycling stations, where citizens can place products that are still useful. The municipality shall make the reused products available to citizens or volunteer organisations, and can also sell them in own reuse shops.

In addition, Denmark is analysing a possible target for the maximal CO₂ footprint in Denmark.

Denmark can do more to increase sufficiency in use of products:

- Sharing products can be promoted with promotion of:
 - o Local sharing centres as libraries, cultural houses etc.
 - o stronger support for repair-café and workshops
- Information system for volunteer and commercial sharing (renting) of products.
- Information system for repair opportunities, both including volunteer and commercial repairers
- Promoting moderate product sizing with taxes scaled after lifecycle climate effects and resource use
- Avoiding purchases can be promoted with promotion of better repair facilities, including volunteer repair workshops and cafés as well as information systems for repair options.
- Introducing labelling of reparability of products similar to France

Diets

Denmark is preparing a green tax reform on agriculture that can change the food cost for consumers in the direction of more costly animal food and cheaper plant-based food, but no plans are adopted yet.

The government has a partnership with other actors for research in plant-based food.

Denmark can do more to increase sufficiency and reduce climate effects of diets:

- Promotion of more plant-based food and less animal food with taxation (different VAT levels and/or climate tax)
- Promote more plant-based food in public canteens, building on the local initiatives in several municipalities
- Reduce food waste with campaigns and a strategy in cooperation with shops and other actors.

France

France has embraced the concept of sufficiency, using the French term “sobriété”. The use of sobriety is widely perceived as a sustainable and effective solution. Sobriety is broadly accepted. It can be applied at all levels and in all sectors of activity. The future French energy and climate strategy will have to give ‘sobriety’ its full role as a lever for achieving our climate and energy objectives.

France published energy sobriety plans on 6th October 2022 and 20th February 2023 and again on 12th October 2023 in order to keep the energy consumption down over time and, in particular, to achieve the 15 % reduction in gas demand. More details on these sobriety plans can be found under the buildings’ section below. (Draft NECP p.69)

To move further towards a sobriety in everyone’s daily lives, five new announcements were unveiled on 12th October, 2023:

- Continue to mobilise the large French companies by involving the 120 largest companies (those registered in SBF 120),
- Enable French people to better steer their energy consumption with a thermostat plan, as a programmable thermostat allows 15 % energy savings;
- Regulating and clarifying the rules on light pollution in showcases and offices,
- Promoting in-house mobility, in addition to a car-pooling boost
- Car-pooling boost launched in 2023, which already affects 160 000 drivers,
- Offers to enhance energy savings and reduce bills in relation to energy suppliers (e.g. peak-to-mobile offers or “sobriety bonus”).

Buildings

The French sobriété plan is an operational roadmap for energy saving measures to be implemented by the State, public administrations, local and regional authorities and businesses. The plan is extended over time with the aim of reducing energy consumption by 7 % in 2030. In the tertiary sector, the objectives of the tertiary eco-energy schemes also lead to sobriety measures with reduction of 10-15 % of consumption, in addition to (energy) renovation measures. (draft NECP p.139, p.175). The policies in the plan are a combination of energy efficiency and energy sufficiency policies. Some specific sufficiency policies are:

Sufficiency policies: promote lower indoor temperature in winter, reduced heating and light when rooms are not used:

- To move further towards a sobriety in everyone's daily lives, enabling French people to better control their energy consumption, a thermostat plan will include greater support for installing programmable thermostats etc., which allow greater energy savings (15 % savings compared to more conventional devices) (draft NECP p.140)
- Sobriety of heating and cooling of buildings: lifestyle changes shall lead to lower heating and cooling consumption, facilitated by rapid spread of smart control systems for buildings (thermostat type) in all dwellings and tertiary areas. The target temperature is 19 °C in winter for heating and 26 °C in summer for air conditioning use. (draft NECP p. 175)
- Strengthen the regulation on light pollution (excessive use of light) in show rooms and offices, by reducing the hours at which light is allowed, and by increasing the related penalties (draft NECP p. 140)

Sufficiency policy: support the movement of energy use to periods with high renewable energy supply, low demand

- Smart meters shall enable consumers to better control their consumption. They will help optimising the electricity grid and the means of production (by moving loads) (draft NECP p.173)

France can do more on sufficiency in buildings, including:

- Promoting living in collective housing and cohousing with building regulation, favourable loans, and promotion, aiming at reducing the need for heated and airconditioned space
- Promoting sharing of dwellings with better regulation and promotion of renting out rooms and with better conditions for joint ownership of dwellings, including loans on equal terms with dwellings with single ownership. This will also aim at reducing the need for heated and airconditioned space
- Limiting holiday homes with planning, with requirements for high energy efficiency, and evt. with taxes.
- Reduce requirements for parking at buildings (dwellings, shops etc.), in particular in urban areas. This will reduce the incentive to use cars and will also reduce costs for urban dwellings and shops.
- Promote the construction of tiny houses in well-designed urban plans, in cooperation with municipalities that are in charge of land-use planning.
- Introduce progressive taxes for electricity and water use and limit fixed tariffs, using inspiration from Italy
- Promote the movement from larger to smaller dwellings for smaller families, in cooperation with municipalities.

- Continue efforts to improve energy saving in public buildings, for instance introducing a label for energy efficient behaviour, comparing expected energy use from energy labels with realised energy use.

Mobility

France already has a number of policies for sufficiency in mobility:

Sufficiency policy: promote carpooling

- A carpooling plan was launched in 2023, including a premium of EUR 100 for new drivers paid by carpooling platforms to incentivize the start of carpooling; co-fund of car-pools with local authorities (50% co-funding) with a green fund of EUR 50 million in 2023. (draft NECP p.125)

Sufficiency policy: Promote using train and public transport:

- The fourth call for projects, dating from 2021 that will provide EUR 900 million to finance clean collective transport projects, including better trains on smaller lines and multimodal exchange hubs. This new network will significantly improve movements from periphery to periphery and unload the existing network. The aim is for all lines to be phased in between 2019 and 2030.
 - o At regional level, regional express train services have been strongly developed by the regions. The State contributes to the financing of network regeneration and maintenance investments. The regeneration of rail networks for daily transport is a priority.
 - o Better multimodal information (opening mobility data to reach 100 % of the mobility information accessible for a single click journey).
- Support for rail and inland waterway freight transport with improvement of the quality of service of the network and the improvement of the performance of infrastructure enabling the development of rail freight; developing coordination with ports and inland waterways (draft NECP p 127)
- Car advertisements are required to communicate the importance of soft and active modes of travel, and to make the greenhouse gas emissions of vehicles visible. Finally, climate contracts have engaged several companies in responsible communication processes.

Sufficiency policy: promote that inhabitants live closer to services

- Urban planning measures to promote modal shift and demand-side management are also part of a sustainable mobility policy: rebalancing of the living space in favour of active modes (walking, cycling); urban densification around structural public transport routes; urban policies aimed at functional mix and community-based services for a short distance city; inclusion of urban logistics in planning documents. (draft NECP p.128)

Sufficiency policy: promote less flying:

- Air transport is subject to taxation on air tickets (draft NECP p. 129) as well as limits of short haul flights, where train travel is available with up to 2h30m travel time (the limits of short haul flights are not mentioned in the draft NECP).

Sufficiency policy: support bicycling

- The Mobility Guidance Act has created a sustainable mobility package, which allows all private and public employers to contribute to the costs of commuting by car sharing or cycling of their employees.
- Co-funding Ecological bonus for the purchase of 'electrically assisted bicycles' and 'cargo bikes', co-funding with municipalities;
- Co-funding conversion premium for the purchase of a new or second-hand electric or cargo bike, in return for scrapping an old motorised vehicle. In low-emission zones, the State grants an additional premium equivalent to any aid paid by the local authority, up to a maximum of EUR 1 000. The conversion premium is extended to the purchase of one bicycle per person in the home with the same ceiling per bicycle.
- Obligation to put in place secure bicycle parking at new residential and office buildings, and when work is carried out on the car parks,
- Sustainable mobility package allowing employers to finance the use of bicycles by their employees (up to EUR 700 per year); tax reductions for companies providing their employees with a fleet of bicycles free of charge for commuting (up to a maximum of 25 % of the purchase price of the bicycle fleet).
- Creation of bi-cycling routes within communities, targeting in particular discontinuities of routes and ensuring the safety of all users. The first cycling plan created in 2018 is extended and strengthened as part of the 2022-2027 cycling and active mobility plan.
- The development of learning bi-cycling culture at school has been put in place
(draft NECP p.126-127)

Other sufficiency-related transport policy measures included in the French draft NECP:

- Information for users of transport services. Providers of transport of passengers and goods or removal services must provide information on the quantities of greenhouse gases resulting from the services provided on behalf of their customers. (draft NECP p.128)
- Speed reduction, eco-driving promotion (draft NECP p. 131)

In spite of the many activities already in the French draft NECP for sufficiency in mobility, France can still do more, including:

- Work from home or co-working space can be promoted with allowing office workers and others, where it is possible, two days per week work from home.
- Include the ban of short-haul flights, where good trains exist, in the NECP (including this in the NECP will inspire others to follow).
- Further improve urban planning, setting target for "short distance cities", inspired by Paris' "15-minute city" and developing the concept also for smaller towns, suburbs, and large villages.

Products and packaging

Among waste reduction policies are better consumption with development of reuse and repair, extension of product lifespan. (draft NECPp.12)

Sufficiency policy: single-use tax and regulation

- Waste prevention with ban on single-use plastic bags, penalising planned obsolescence etc. (draft NECP p89)

Sufficiency policy: support better repair opportunities:

- France has a repair label, classifying products according to how easy they are to repair.

France also has other sufficiency policies related to consumption of products:

- Several recent regulations provide a framework for marketing communications in the context of the green transition: since 1st January 2023, claims of carbon neutrality of products and services have been strongly framed by Article 12 of the Climate and Resilience Law. In this sense, these claims, in order to be used, must comply with a strict regulatory framework in order to combat greenwashing. (draft NECP p.83)

France can do substantially more for sufficiency in product use:

- Sharing products can be promoted with promotion of local sharing centres as libraries and
- Stronger support for repair-café and workshops
- Information system for volunteer and commercial sharing (renting) of products.
- Information system for repair opportunities, both including volunteer and commercial repairers
- Promoting moderate product sizing with progressive taxes scaled after lifecycle climate effects and resource use
- Avoiding purchases with scaling up the proposed policies for increased repair facilities, including volunteer repair workshops and cafés, as well as information systems for repair options.
- Supporting the establishing of places for free reuse of products
- Limits and taxes on packaging

In addition, France can include its existing repairability labelling in its NECP, to inspire others.

Diets/agriculture

Sufficiency policy: promote eating less meat & dairy:

- The objective of deploying territorial food projects (TAPs), enshrined in the Climate and Resilience Law (Article 266), which lays down a target of at least one TAP per department on 1st January 2023 (achieved from 2022), but also broadens the objectives assigned to TAP and provides for a support mechanism through a national network of TAPs. Strongly supported by the Recovery Plan, the deployment of TAP has grown particularly significantly in recent years. On 1st April 2023, there were almost 430 TAPs recognised by the Ministry of Agriculture and Food, the majority of which are in an emerging phase, requiring substantial support in order to broaden their operational scope. (draft NECP p. 97-99)
- The implementation of environmental labelling on food products, following an experiment involving 18 projects in 2020 and 2021, as provided for in the AGECL law and subsequently the Climate and Resilience Law. This initial work is intended to continue in order to develop the methodology in order to better integrate carbon storage and production models. The purpose of this display is to allow comparison (i) between products of different categories to show the environmental impact of a change in food habits (e.g. increased consumption of plant proteins), and (ii) between products of the same category, in order to illustrate the level of performance of an ecodesign benchmark compared to a similar offer.

Sufficiency policy: introduce vegetarian meals in public canteens:

- The extension of the obligation to supply at least 50 % of sustainable and quality products, including at least 20 % organic products on January 1st 2022 for public catering and public service costs, to all mass restaurants, including those of private companies from 2024 (Article 257 of the Climate and Resilience Law). In particular, this measure ensures an outlet for organic farming that does not use synthetic mineral fertilisers and that the environmental performance of products is taken into account when awarding contracts. In addition, products from farms benefiting from environmental certification at level 2 or level 3 ('high environmental value').
- An obligation for school canteens to offer a vegetarian menu at least once a week, and the obligation for mass restaurants serving more than 200 per day to implement a multiannual plan for the diversification of protein sources; with effect from the enactment of the Climate and Resilience Law, the introduction of experimentation of a daily vegetarian option in school catering services at the expense of voluntary authorities, and from January 1st 2023, an obligation for public catering services to offer a daily vegetarian menu where they usually offer a multiple choice of menus (Article 252 of the Climate and Resilience Law). The aim is to diversify protein intake by eating more legumes in line with the objectives of the National Nutrition Health Plan 2019-202347; The challenge is therefore to encourage the development of a local French supply to meet this growing demand.

Sufficiency policy: promote reduction of food waste

- The objective of halving food waste compared to 2015, in 2025 for distribution and mass catering and in 2030 for other sectors. To this end, through the successive application of the Garot4849, EGAlim and AGECE laws, the prohibition on rendering foodstuffs still consumable unfit for consumption and the obligation to propose a donation agreement to an authorised association (for structures above a certain threshold) applies to the agri-food industries, distributors, wholesalers and mass catering sectors. A diagnosis and an approach to combating food waste are mandatory for mass catering and the agri-food industry. Finally, a national 'food waste' label was introduced by the AGECE law in 2020, with effective implementation in 2022 for local GMS and shops, wholesalers and mouth trades. In addition, an experiment has been carried out since 2022 to assess the effects of food reservation solutions in mass catering on the development of food waste, attendance rates and user satisfaction;

Other sufficiency-related food and agricultural policies in France:

- The number of farms with high environmental value (HVE) increased by more than four times between July 2020 and July 2021. The Climate and Resilience Act shortened the period for taking into account products from farms benefiting from level 2 in order to speed up the transition of farms to level 3 (deadline at the end of 2026 compared to the end of 2029 initially). Since 1 January 2023, a renovated version of the HVE benchmark (version 4 of November 2022) entered into force to increase the environmental ambition;
- A target of 8 % of utilised agricultural area cultivated with legumes by 1st January 2030 (Article 261 of the Climate and Resilience Law).

France has a number of planned policies and measures for the decarbonisation of food, including:

- National Plan for Plant Protein, doubling agricultural areas with leguminous crops (draft NECP p.90)
- Enabling French people to diversify their protein intake by eating dried vegetables produced locally is a priority, in line with the recommendations of the National Nutrition Health (draft NECP p. 92)

- The National Food and Nutrition Programme³⁶ (2019-2023) provides for this rebalancing of plant and animal proteins in diets. In this context, the EGalim Law³⁷ introduces the proposal for a weekly vegetarian menu for mass catering services in an experimental setting. This proposal became mandatory with the Climate and Resilience Act (Article 252), which also provides for a daily proposal for a vegetarian menu, on an experimental basis, for mass catering managed by voluntary local and regional authorities. In the interests of example, the State will offer a vegetarian menu on a daily basis in the event of multiple choices offered to guests in its canteens and those of its national public establishments and public undertakings. This provision will also concern universities (Article 252 of the Climate and Resilience Law). (NECP p. 93)
- The introduction of a new National Strategy for Food, Nutrition and Climate (SNANC), foreseen under Article 265 of the Climate and Resilience Law, which introduces a new comprehensive food governance, which is being developed through broad stakeholder consultation (no specific policies yet).

The actual sufficiency policies in above plans are not yet agreed, and therefore not included in the list of national sufficiency policies in this article.

France can still do more on food and diets. France has lower VAT on food and can further distinguish VAT on food according to climate effects of producing food, for instance with high VAT on meat and lowest level on plant-based food.

Germany

Germany has a number of policies that support sufficiency, but it is not a policy area itself.

Buildings

Sufficiency policy: promote reduced heating and light when rooms are not used

- Germany has a number of policies and measures for energy transition, including the public energy saving campaign “80 million together for energy transitions”, energy advice services, and subsidies for energy efficiency. The energy advice services include advices and awareness raising on how to use energy efficiently and save energy with behavioural changes.
- Germany has special programs for energy advices with energy saving checks for tenants and for low-income households. As part of the energy advice, the Federal Government promotes the energy advice of consumer centres. This includes the ‘Electricity-Chek’ project, where formerly long-term unemployed people specifically advise low-income households on savings in thermal energy, water and electricity. The aim is to reduce CO₂ emissions and also reduce energy costs for households and public authorities.

Sufficiency policy: promote to move energy use to periods with high renewable energy supply & low demand

- Germany has dynamic electricity tariffs with electricity prices varying from hour to hour depending on supply and demand. German consumers have smart meters that can read the electricity consumption on a hourly basis, to make it possible to give electricity bills based in hourly changing electricity prices

Other sufficiency related policies:

- A German research program “ 7th programme: energy consumption reduction” can also include energy sufficiency.
- German cities have sufficiency related policies that are not part of the German NECP. One of them is reducing or eliminating requirements for parking spaces. In Berlin these requirements have been eliminated.
- The German coalition agreement provides for the implementation of a timber building initiative to support regional value chains, see below section on products (draft NECP p.68).

Germany can embrace a number of other policies and measures for sufficiency in buildings:

- Promoting living in collective housing and cohousing with building regulation, favourable loans, and promotion, with the aim of reducing the need for heated and airconditioned space
- Promoting sharing of dwellings with better regulation and promotion of renting out rooms and with better conditions for joint ownership of dwellings, including loans on equal terms with dwellings with single ownership.
- Limiting holiday homes with planning, with requirements for high energy efficiency, and evt. with taxes.
- Reduce requirements for parking at buildings (dwellings, shops etc.), in particular in urban areas. This is already introduced in some Germany cities, but can be promoted on national level
- Promote the construction of tiny houses in well-designed urban plans, in cooperation with municipalities that are in charge of land-use planning.
- Introduce progressive taxes for electricity and water use and limit fixed tariffs,
- Promote the movement from larger to smaller dwellings for smaller families, in cooperation with municipalities. This is already done in some German cities, but it can be promoted on national level
- In public buildings maintain moderate temperatures (19°C in winter, up to 25°C in summer) and reduce heating/cooling and light in rooms, when they are not used.
- Continue efforts to improve energy saving in public buildings, for instance introducing a label for energy efficiency behaviour, comparing expected energy use from energy labels with realised energy use.

Mobility

Sufficiency policy: promote using train and public transports

- In the coming years, the Federal Government will provide significant funding to optimize and expand the rail network, including EUR 12.5 billion for railway infrastructure
- In order to increase the overall attractiveness of local public transport, a pact for expansion and optimization is to be adopted by which the Federal Government, the Länder and municipalities agree, inter alia, on the financing up to 2030, including the own shares of the Länder and municipalities, and the distribution of federal funds.
- Regionalisation funds will be steadily increased over the next few years, which will also serve to strengthen local public transport.
- This will lead to local public transport network expansion and expansion of S-bahn, U-bahn, and trams, improving the quality of supply, improving reliability, establishing more frequent connections, and increasing comfort and safety. Last but not least, a consistent digitalisation of local public transport

- Introduction of 49€ ticket for local public transport in 2023.
- Tax-exempt job ticket for public transport (NECP p. 94)
- The package of measures focuses on the reduction of CO₂ through the modal shift to rail, which should be significantly strengthened to this end.
(draft NECP p.62 and p.97)

Sufficiency policy Support of bi-cycling:

- Germany has several tax reliefs for bi-cycles:
 - o business tax relief for the rental and leasing of electric vehicles (draft NECP p.93).
 - o Extension of the tax exemption for the supply of an industrial bicycle or electric bicycle to the employee
 - o Extension of the exemption for the private use of a business bicycle or electric bicycle (draft NECP p.93-94)
- Germany has a program for extension of cycle paths and bicycle parking facilities; and Improving framework conditions. This includes:
 - o Everyday cycle infrastructure (special urban and rural programme)
 - o Long-distance cycle routes for tourism (Germany's wheel network)
 - o Lighthouse projects (pilot investment projects)
 - o Bicycle parking at railway stations
 - o Equipping heavy-duty vehicles with turning assistance systems (to reduce the hitting of bi-cycles)
 - o Upgrading structures at junctions between railway lines and roads in favour of cycling (support for under-railway crossings with law)
 - o Extension of operational routes on the federal waterways suitable for cycling.
 - o Germany has special depreciation for electric vehicles including electric cargo bikes.
 - o Research, compacts and communication (non-investment model projects implementing the NRVP)
 - o Cycling networks and other training and networking events for civil engineers, transport and urban planners at the Federal Mobility Forum.
 - o The seven Foundation professors of cycling are also an important pillar to ensure sustainable training and research on sustainable mobility.
 - o A draft amendment to the Road Traffic Regulation, which includes, inter alia, extended instructions from the road transport authorities to provide adequate space for running and dormant cycle traffic, was agreed between the departments. A referral from the Bundesrat will be sought in 2023.

Sufficiency policy: Promote less flying

- Germany has an air passenger tax that was increased 2020 and later (draft NECP p. 219-220)

Other sufficiency-related transport including measures with indirect effects on sufficiency:

- Measures to strengthen rail freight to reach a market share of 25 % by 2030 includes the pro-rata promotion of track access charges in rail freight transport and incentives for enforcing investment from the sector in optimize, automation and improve vehicle technology in freight transport. The track improvements will also help rail freight. Also, inland waterway freight has an expansion target, an IWT masterplan and supports with modernisation and more shore-side electricity in ports.

- VAT on train tickets were reduced from 19% to 7% in 2020. This measure is not included in other NECPs, but VAT on public transport is lower in other countries
- The Gigabit Strategy will provide a comprehensive energy- and resource-efficient supply of fibre connections to the home and the latest mobile communications standard, wherever people live, work and travel – including in rural areas. (draft NECP p.92)
- Digitalisation can significantly improve existing traffic routines and the Federal Government will continue and intensify the practical testing of automation, networking and the use of artificial intelligence for mobility in digital test fields and demonstration projects, and will support the transition to normal operations.

In addition to these activities, Germany could introduce several other policies:

- Promotion of car pooling
- Ban short-haul flights, where good trains exist: Germany could ban flight routes, where trains serve the nearby city centres with less than 3 hours train travel between them.
- Living closer to services can be promoted in a number of ways, inspired, among others, by the Paris 15-min city:
 - o Urban planning should include that houses are only built when basic facilities are available within 15 min. by bike (3 km), including shops, kindergarten, school, good public transport. When possible, the distance to basic facilities should be within 15 min by foot (1 km). The planning should also include that soft mobility, as bicycling, is safe.
 - o Urban planning should prioritise that basic facilities are maintained or developed, so they are reachable within 15 min by bike (3 km) from all settlements
 - o Support commuters to move closer to work places, in cooperation with municipalities
- Reduce VAT on public transport to 0%
- Work from home or co-working space can be promoted with allowing office workers and others, where it is possible, two days per week work from home.

Products and packaging

Germany's only product related sufficiency policy is not included in the types of policies analysed in this article: The German coalition agreement provides for the implementation of a timber building initiative to support regional value chains. As part of this, the efficient and climate-friendly use of wood as raw material is promoted through model and demonstration projects, with the Federal Government as a role model and frontrunner in climate and resource-efficient construction. (draft NECP p.68)

Germany can introduce a number of sufficiency policies and measures for products, including:

- Information system for volunteer and commercial sharing (renting) of products.
- Information system for repair opportunities, both including volunteer and commercial repairers
- Sharing products can be promoted with promotion of local sharing centres as libraries and repair-shops and by an information system for volunteer and commercial sharing (renting) of products.
- Promoting moderate product sizing with taxes
- Avoiding purchases can be promoted with promotion of better repair facilities, including volunteer repair workshops and repair cafés.
- Establishing places for free re-use of used products, for instance at places, where citizens can deposit larger items.

- Taxation and limits to packaging, such as plastic bags and single use packing for takeaway food as well as other single use products as single use tableware.

Diets, food

Planned food-related sufficiency policies, no specific policy policies decided yet, but planning of policies is ongoing:

- The Federal Government is preparing a nutrition strategy to promote healthy and sustainable diets (NECP p.65).
- The Federal Government will base its agricultural support on the rule that livestock farming is to be limited to no more than two livestock units per hectare. (NECP p.65). This will indirectly reduce meet supply, which can be a driver for more plant-based food.

Germany can introduce several diet related policies and measures for sufficiency, including:

- Promote more plant-based diets with information and campaigns
- Introduce vegetarian meals in public canteens, as the only option some days and as one of more options the other days of the week.
- Change VAT, increasing VAT on meat to 19% and reduce VAT on vegetables to 0%, from current basis of 7%. Compensation for low-income families and information campaigns should be part of the package to win public support.
- Reduce food waste with a strategy in cooperation with shop owners and other actors.

Italy

Italy has a number of sufficiency related policies, in particular in mobility, but the country still has many opportunities to strengthen climate action with more and stronger sufficiency policies.

Sufficiency is not a special policy area in Italy, but the Italian NECP concludes: There will therefore be a need for a substantial shift in lifestyles and consumption towards behaviours with higher energy efficiency and lower emissions, to which new generations are certainly more sensitive, acting through sources of training and information for the public, combined with forms of promoting/discouraging behaviour according to their sustainability.

Buildings

Sufficiency policy: promote reduced heating and light when rooms are not used

- For heating and cooling, energy reductions will be promoted by appropriate means to raise consumer awareness and their active role, for example, with the use of home automation, network digitalisation and smart metering technologies. The implementation of the provisions already laid down in Legislative Decree No 102/2014 on systems for measuring and billing energy consumption in the residential sector will be completed and, where appropriate, enhanced, in order to provide consumers with accurate and timely information on their own energy consumption, which is necessary to promote more energy savings with behaviour. (draft NECP p.252)

- Local authorities will combat energy poverty with communication campaigns, at local level, (among other issues) to encourage good, energy saving consumption behaviour (draft NECP p.252).

Sufficiency policy: promote to move energy use to periods with high renewable energy supply & low demand

- With smart meters and with tariffs that vary from hour to hour, the role of the consumer is changing from taxable to active, i.e. able to change his consumption in response to price changes on the market and, under certain conditions, to self-produce and offer network services. New smart meters will play an important role. In the electricity sector, the replacement of existing digital meters with second-generation smart meters is considered essential to convey products, and services to be included in new models of distributed generation and consumption, including demand response and smart grids.

Other sufficiency-related building policies, not included in the analysis in this article:

- In addition, the issue of monitoring savings generated by awareness-raising policies will be deepened in order to provide ever more robust support for decisions in this area, as well as for the achievement of energy efficiency targets (draft NECP p. 238)
- Italy has progressive tariffs for water use, charging water more per volume with higher consumption than with lower consumption. This is, however, not the case for energy, not included in draft NECP.

Italy can introduce several other sufficiency related policies in buildings, including:

- Promoting living in collective housing and cohousing with building regulation, favourable loans, and promotion, aiming at reducing the need for heated and airconditioned space
- Promoting sharing of dwellings with better regulation and promotion of renting out rooms and with better conditions for joint ownership of dwellings, including loans on equal terms with dwellings with single ownership.
- Limiting holiday homes with planning, with requirements for high energy efficiency, and evt. with taxes.
- Reduce requirements for parking at buildings (dwellings, shops etc.), in particular in urban areas. This will reduce the incentive to use cars, and will also reduce costs for urban dwellings and shops.
- Promote the construction of tiny houses in well-designed urban plans, in cooperation with municipalities that are in charge of land-use planning.
- Use progressive tariffs and taxes for electricity and water use and limit fixed tariffs. Italy already has progressive tariffs for water use, they shall be maintained and expanded.
- Promote the movement from larger to smaller dwellings for smaller families, in cooperation with municipalities.
- In public buildings maintain moderate temperatures (19°C in winter, up to 26°C in summer) and reduce heating/cooling and light in rooms, when they are not used.
- Introducing a label for energy efficiency behaviour, comparing expected energy use from energy labels with realised energy use. This can be started in public buildings.

Mobility

Italy has a number of strategies and policies to reduce car use and promote public transport.

Sufficiency policy: promote using train and public transports:

- The strategy to support local public transport, which plays a major role in the rapid mass transport, which involves high-capacity power systems (metro, tramways, trolleybuses and similar systems). In the light of these requirements,
- Infrastructure upgrading of regional rail transport and rapid mass transport systems (NRRPs);
- As part of the Plan Complementary to the NRRP, an action programme for the upgrading of railway lines and the simultaneous upgrading and/or renewal of the rolling stock was financed for an amount of EUR 1.550 million. The measure provides for the purchase of 50 new trains to replace an equivalent number of trains by the second half of 2026
- Modal shift freight and passenger transport to public transport, including transport of pupils from and from schools

Sufficiency policy: promote more bi-cycling:

- Cargo bike programme that grants to micro and small enterprises engaged in urban last mile freight transport an annual tax credit, up to a maximum of EUR 2 million for 2021, up to a maximum of 30 % of the costs incurred for the purchase of cargo-bike and cargo-bike assisted cargo
- Development of cycling mobility through cycle paths
- On a trial basis, around EUR 4 million was earmarked for the immediate construction of cycle paths linking universities with the main railway stations, in order to encourage 'soft' transport modes of last mile.
- a Sustainable Mobility Fund to support the construction of cycle paths
- the national experimental programme for sustainable home-school and work-based mobility was established, which co-finances the implementation of projects prepared by local authorities, including in an associated form, relating to a territorial area with a population of more than 100.000 inhabitants (not only for bi-cycle infrastructure)

Sufficiency policy: promote working from home or a co-working space

- Promotion of smart working tools and reduction of working days for equal hours worked;

Sufficiency policy: promote carpooling:

- Promotion of carpooling;

Other policies to reduce car use and support above sufficiency policies are:

- Promote shared vehicles (bikes, low- or zero-emission car and motorcycle sharing); -
- Integration between sustainable mobility services (e.g. parking facilities for cycles or services car and bike sharing near public transport stops) and interchange parking facilities;
- Development of ITS (traffic management, info-mobility, smart roads);

Italy can make additional sufficiency policies and measures in transport, including:

- Ban short-haul flights, where good trains exist: Italy could ban flight routes, where trains serve the nearby city centres with less than 3 hours train travel between them.
- Living closer to services that can be promoted using, among others, inspiration from the Paris 15-min. city:
 - o Urban planning should include that houses are only built when basic facilities are available within 15 min. by bike (3 km), including shops, kindergarten, school, good public transport.

When possible, the distance to basic facilities should be within 15 min walk (1 km). Planning should also include that soft mobility, as bicycling, is safe.

- Urban planning should prioritise that basic facilities are maintained or developed, so they are reachable within 15 min by bike (3 km) from all settlements
- Support commuters to move closer to work places, in cooperation with municipalities
- Reduce VAT on public transport to 0% from currently 10%
- Work from home or co-working space can be promoted with allowing office workers and others, where it is possible, two days per week work from home.

Products, packaging

Italy supports sufficiency in product policies, including:

Sufficiency policy: promote better repair opportunities:

- The Circulate Economy Strategy includes right to reuse and strengthen actions aimed at the upstream of circularity (eco-design, product durability extension, reparability and reuse);
- The right to re-use and repair is becoming legal with Regulation under Article 214-ter (2) of Legislative Decree No 152 of 2006 to encourage re-use and repair, pending publication in the Official Gazette)

Sufficiency policy: promote sharing of products

- Ministerial Decree of 7 February 2023 on CAM – award of contracts for the supply and hire of textile products and for the restyling and finishing service of textile products.

Italy can introduce a number of additional product related policies for sufficiency, including:

- Information system for volunteer and commercial sharing (renting) of products.
- Information system for repair opportunities, both including volunteer and commercial repairers
- Promoting moderate product sizing with taxes
- Avoiding purchases can be promoted with promotion of better repair facilities, including volunteer repair workshops and repair cafés as well as information systems for repair options.
- Sharing products can be promoted with promotion of local sharing centres as libraries and
- Establishing places for free re-use of used products, for instance at places, where citizens can deposit and take larger items.
- Taxation and limits to packaging, such as plastic bags and single use packing for takeaway food as well as other single use products as single use tableware.

Diets, food

There are no food related sufficiency policies in the Italian NECP.

Italy can introduce several diet related policies and measures for sufficiency, including:

- Promote more plant-based diets with information and a campaign
- Introduce vegetarian meals in public canteens, as the only option some days and as one of more options the other days of the week.

- Change VAT, increasing VAT on meat to 22% and reduce VAT on vegetables to 4%, from current basis of 10%. Compensation for low-income families and information campaigns should be part of the package to win public support.
- Reduce food waste with a strategy in cooperation with shop owners and other actors.

Conclusions

Regarding how sufficiency policies are included in existing national climate plans in the four countries, based on the draft NECPs analysed: Of the 30 sufficiency measures analysed, the draft NECPs include only supporting policies for 7 of them for Denmark, 10 for France, 5 for Germany, and 9 for Italy. Besides that, several of the sufficiency policies are only implemented to a smaller degree. The numbers do not mean that for instance Denmark and Italy have stronger sufficiency policies than Germany, as policies are implemented to different degrees.

Identifying the potentials to increase climate actions with sufficiency, our analysis show that less than a third of the sufficiency policies included in the analysis are used in the countries, and many policies are not strongly implemented. This leads to the conclusion that for all countries and for all sectors, there are substantial potentials for increasing climate mitigation by introducing policies to support more types of sufficiency measures, and by strengthening existing policies.

Regarding the specific sufficiency policies that each country could implement, this is described above for each country, but overall, the conclusions are:

- That there is a variety of sufficiency policies in each country and sector, leading to a large potential for countries to be inspired by each other for new sufficiency policies, when developing new climate policies.
- That several local sufficiency policies could inspire national policies. Examples of this are the local Danish municipal plans for Tiny-Houses, Paris' 15-min. city to reduce transport demand, and the elimination of car parking requirements in Berlin. These local policies are not included in the respective national NECPs.

Notes

- CLEVER scenario, policies, coordinated by negaWatt, France <https://clever-energy-scenario.eu/>
- FULFILL project, EU Horizon 2020 Project, Coordinated by Fraunhofer Institute ISI, project ID 101003656 <https://fulfill-sufficiency.eu/>
- Integrating Energy Sufficiency into Modelling of Sustainable Energy Scenarios", publication by the IESMOSES Project: 2020 – 2022, coordinated by Aalborg University, Department of Planning, <https://inforse.org/europe/Energy-Sufficiency-Project.htm>
- National Energy and Climate Plans (NECPs). The NECPs referred to are the draft NECPs 2023, status ultimo December 2023 at: https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en, European Commission, Bruxelles
- Parking standards as a steering instrument in urban and mobility planning - How to make parking standards more sustainable, The Civitas Initiative, Germany, 2021 <https://park4sump.eu/sites/default/files/2021-02/EN%20%28web%29.pdf>
- Why every city can benefit from a '15-minute city' vision (Parsi 15-min. city), C40 Knowledge Hub, Transport and Urban Planning, Strategies to Reduce Vehicle Emissions, Co-Benefits of Sustainable Transport, https://www.c40knowledgehub.org/s/article/Why-every-city-can-benefit-from-a-15-minute-city-vision?language=en_US