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RESEARCH ARTICLE

Sufficiency in European Climate Policies, four country NECPs analysed

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Abstract

Backgrounds

Sufficiency, a concept acknowledged by the International Panel of Climate Change (IPCC), is often not included in climate-mitigation strategies. Its elements are, however, well known in different policy areas. Thus, there are good reasons to elevate sufficiency to a central element of national and international sustainability strategies.

Methods

This article, 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 shall offer insights into the current status of sufficiency policies and identify the best practices and areas for improvement.

The analysis is based on the studies of sufficiency policies, identifying specific sufficiency measures. This leads to the development of a comprehensive overview and comparative analysis of how the four analysed countries incorporate sufficiency within their NECPs and to proposals for additional national sufficiency policies. The analysis focuses on policies that regulate social, infrastructural, and regulatory conditions that influence individual and collective behaviours.

Results

The article presents a clear and comprehensive analysis of the current tole of sufficiency policies in NECPs and their unused potential. Sufficiency policies are introduced in the countries analysed, but far

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from their potential to mitigate climate change. It also shows that existing sufficiency policies are primarily aiming at changing consumption and not to reduce consumption, such as reduced transport, reduced size of buildings. Another result is that some sufficiency policies are only introduced on local level by municipalities.

Conclusion

The conclusion is that some sufficiency policies are already integrated in national climate policies but their potentials are far from exhausted while other policies are hardly used, in particular policies to reduce consumption. This gives a large potential to increase sufficiency measures to strengthen climate policies and actions.

Plain Language Summary

In this article, we compare the sufficiency policies of four countries, Denmark, France, Germany, and Italy with sufficiency policies analysed by the FULFILL project and other research. The aim is to analyse how sufficiency policies are included in national climate plans, what their potentials are to increase climate mitigation, and with which policies

The policies analysed are promoting the following sufficiency measures, divided in 4 policy areas:

Living in collective housing, cohousing, flat-sharing, limiting holiday homes, reduce requirements for parking places, urban planning for tiny houses, progressive tariffs for water and energy, move to smaller dwelling, lower indoor temperature in winter, reduce heating and light when rooms are not used, move energy use to periods with high renewable energy supply & low demand

Carpooling, using train and public transports, bi-cycling, flying less/ban of short-haul airlines, living closer to services, working from home or a co-working space, low-emission zone for transport in large cities

Sharing products, moderate product sizing, avoiding purchases (household level), reasonable usage/cutting energy waste, better repair opportunities, places for free re-use, packaging tax and regulation, single-use tax and regulation

Eating less meat & dairy (VAT Reduction for plant-based food), vegetarian meals in public canteens, reduce food waste

Of the 30 measures analysed, climate plans included only 7 for Denmark, 10 for France, 5 for Germany, and 9 for Italy. This indicate that there are large potentials to increase sufficiency policies in all four countries.

The FULFILL project is a European project with support from Horizon

2020 and with partners from Denmark, France, Germany, Latvia, and Italy. In the FULFILL we understand the sufficiency principle as creating the social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas emissions. Read more https://fulfill-sufficiency.eu/

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 changing to carbon-neutral energy sources and energy efficiency. Sufficiency is a concept that combines several additional measures. The sufficiency principle is about creating social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas emissions to the extent that they remain within planetary boundaries and simultaneously contribute to societal well-being.

Based on this definition, researchers have identified the sufficiency policies and measures used in this study. In the recent "AR6" report by Intergovernmental Panel on Climate Change (IPCC) from 2022 (IPCC), sufficiency was mentioned for the first time in IPCC reports as a type of climate mitigation measure.

Sufficiency policies were included in the first national climate plans in the EU, the National Energy and Climate Plans (NECPs), in 2019, where a study identified 230 sufficiency measures supported by 281 policy instruments (ENOUGH-FIG2). The research also found that sufficiency played a minor role, and that most of the sufficiency measures were substitution (50%, supporting public transport as an 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) aimed at reducing consumption. Most measures were in the transport sector (54%) and only 7% were in the building sector (ENOUGH-FIG2)[1]. In the 2019 NECP, only two 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. This clearly underlines the late integration of this concept into national policy.

However, since 2019, the concerns about the climate change problems have increased and EU has raised 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 being understood as a potential policy field, as mentioned by the IPCC in 2022. With the increased demand for emission reductions, stronger inclusion of sufficiency policies, including sufficiency as a climate policy field, could help to meet the gap between current trends and emission reduction targets.

Based on the need to increase climate action, this study analyzes the inclusion of sufficiency policies in climate policies in four countries based on the following research questions:

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

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

This study uses research developed during the FULFILL project, which is a Social Science and Humanities (SSH) project supported by the 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 analyzes decarbonization pathways by sufficiency lifestyles using a mixed method approach (qualitative-quantitative), empirically analyzing sufficiency on micro (personal), meso, and macro levels, and analyzing the impacts of 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 results of the FULFILL project to review and assess sufficiency policies in draft National Energy and Climate Plans(NECPs) from 2023 for four selected EU countries studied in the FULFILL project: Denmark, France, Germany, and 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 other relevant research (FULFILL)(IESMOSES).

Through our analysis and subsequent recommendations, the goal of this study 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 following analysis of the four main sectors in each of the four countries was conducted: For each of these 16 national sectors, many sufficiency policies and measures were not used in the national climate plans via the NECP for the country. Finally, we conclude by discussing the extent to which sufficiency is included in national climate plans and the other research questions.

Method

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

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

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

We use these sectors in this study. In contrast to the aforementioned study from 2019, we did not include cross-cutting measures that also support energy efficiency and renewable energy, as they do not directly 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 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 this article.
- **Other sufficiency measures** that are important, but that are not analyzed in the FULFILL project, for instance, because they are well covered by other research and are not included in at least one of the NECPs analyzed. See the list of other research used in the Notes, page 26.

  (FULFILL)(IESMOSES)

The Table 1 lists the main sufficiency measures that we included, organized according to sector (see table section). Each sufficiency measure is supported by one or more policies described by the NECPs.

In the following national chapters, policies supporting sufficiency measures in the above list are underscored 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 Danish NECP's but some of the policies can be categorized as sufficiency policies. From 2019 to 2023, the number of sufficiency policies increased, while some sufficiency policies were discontinued. (ENOUGH-FIG2)(Draft NECP)

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 allowing 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 businesses (SMEs) that provide access to dynamic priced 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 October 1, 2022, were issued through Ministerial Instructions: 1) to lower the temperature to 19 °C, 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 advises on saving energy with behavior.

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

A few Danish municipalities are making urban plans that allow 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 cohousing for both new buildings and renovation of old buildings to reduce the need for dwelling spaces
- Improve policies for sharing dwellings, promoting renting out of rooms, and improving 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 the construction of more holiday homes and reduce the energy use of existing and new ones. In addition, taxes can be applied on holiday homes.
- Reduce requirements for parking in buildings (dwellings, shops, etc.), particularly in urban areas. This reduces the incentive to travel by car and, in parallel, reduces the costs for urban dwellings and shops.
- Promote the construction of tiny houses in well-designed urban plans at the national level in cooperation with municipalities that are in charge of land use planning.
- Introduce progressive taxes for electricity and water use (with examples from Italy) and limit the 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 and comparing expected energy use from energy labels with realized energy use.

Table 1. **Sufficiency measures used for analysis of 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 reuse	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

Mobility

Existing measures in Danish draft NECP 2023 are:

Sufficiency policy: promote bi-cycling:

Bi-cycling 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 by a passenger aviation tax that will be introduced by 2025. One forecast is that it will reduce

aviation by 4%. A smaller part of the revenue will be used to support smaller Danish airports to promote short-haul flights internally (which is against the reduction objective)

Other mobility policies:
In addition, a small budget allocation was set aside for the development of a green mobility model to improve transport planning.

Compared to 2019, the target for the modal shift from cars to public transport was 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:
    - Reverse the planned reduction in busses by increasing public transport budgets in the Danish regions
    - Reverse the planned increase in ticket prices and introduce favourable tickets useful across all local public transport, such as the German 49€ ticket and rebates, which are useful across all forms of public transport.
    - Increase direct trains throughout Denmark, with more destinations in Denmark and neighbouring countries.
    - Improve connectivity between different trains and between trains and buses
    - 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 municipalities. The state budget should be increased to fully co-finance the bicycle infrastructure identified by 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 transportation alternatives in the form of long-distance trains, including night trains. It can also be increased 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 three hours of 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 houses built only when basic facilities are available within 15 min. by bikes (3 km), including shops, kindergartens, schools, and public transport. When possible, the distance to basic facilities should be within 15 minutes. m by foot (1 km). Urban planning should also ensure that soft mobility such as bicycling is safe.
    - Urban planning should prioritize the maintenance or development of basis facilities, so that 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 by allowing office workers and others, where 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 plastic carrier bags as well as a ban on free plastic bags in shops. This includes tripling the tax on carrier bags to 73.46 DKK/kg (10 €) in 2024.
- Bans of plastic bags with material thickness of 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 reuse 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 sell them in their own reuse shops.

Denmark is currently analysing a possible target for the maximal CO_2 footprint in Denmark.

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

- Sharing products can be promoted with promotion of:
    - Local sharing centres as libraries, cultural houses etc.
    - stronger support for repair-cafés 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
- Purchases can be avoided by promoting better repair facilities, including volunteer repair workshops and cafés, as well as information systems for repair options.
- Introducing labelling of repairability 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 have yet been adopted.

The government has partnered with other actors to conduct research on 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 taxes)
- Promote more plant-based food in public canteens, building on local initiatives in several municipalities
- Reduce food waste through campaigns and strategies in cooperation with shops and other actors.

France

France embraced the concept of sufficiency, using the French term "sobrietë." Sobriety has been widely perceived as a sustainable and effective solution. Sobriety has been widely accepted. It can be applied at all levels and in all activity sectors. 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 a 15% reduction in gas demand. More details on these sobriety plans can be found in the buildings section below. (Draft NECP, p.69)

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

- Continue to mobilize 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 Sobrieté 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% by 2030. In the tertiary sector, the objectives of the tertiary eco-energy schemes also lead to sobriety measures with reduction of 10-15% in 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 sufficiency policies. The specific sufficiency policies are as follows:

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

- 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 lead to lower heating and cooling consumption, facilitated by the rapid spread of smart control systems for buildings (thermostat type) in all dwellings and tertiary areas. The target temperature was 19°C in winter for heating and 26°C in summer for air conditioning. (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)

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

- Smart meters enable consumers to better control their consumption. They will help optimize 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 regulations, favourable loans, and promotion, aiming at reducing the need for heated and airconditioned space

- Promoting the sharing of dwellings with better regulation and promotion of renting out rooms and better conditions for joint ownership of dwellings, including loans on equal terms with dwellings with single ownership. This also aims to reduce the need for heated and air-conditioned spaces.
- Limiting holiday homes with planning, with requirements for high energy efficiency and eventually with taxes.
- Reduce requirements for parking in buildings (dwellings, shops, etc.), particularly 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 and comparing expected energy use from energy labels with realized 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-funding 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 will provide EUR 900 million to finance clean collective transport projects, including better trains on smaller lines and multimodal exchange hubs. This new network significantly improves movement from the periphery to the periphery and unloads the existing network. The aim is to phase all lines between 2019 and 2030.
    - At the regional level, regional express train services have been strongly developed. The State contributes to financing network regeneration and maintenance investment. Regeneration of rail networks for daily transport is a priority.
    - 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 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 and cycling), urban densification around structural public transport routes, urban policies aimed at functional mix and community-based services for a short-distance city, and 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 for 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 that allows all private and public employers to contribute to the costs of commuting by car sharing or the cycling of their employees.
- Co-funding Ecological bonuses for the purchase of ‘electrically assisted bicycles’ and ‘cargo bikes’ and 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 motorized 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 a home with the same ceiling per bicycle.
- Obligation to place secure bicycle parking in new residential and office buildings, and when work is carried out in car parks
- sustainable mobility package allows 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 bicycling routes within communities, targeting particular discontinuities of routes and ensuring the safety of all users. The first cycling plan, created in 2018, was 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 Transport Service Users Providers of transportation 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 by allowing office workers and others, where possible, two days per week work from home.
- Including the ban on 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.(PARIS-15-MIN)

Products and packaging

Among waste reduction policies are better consumption with the development of reuse and repair, and extension of product lifespan. (Draft NECP p.12)

Sufficiency policy: single-use tax and regulation

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

Sufficiency policy: support better repair opportunities:

- France has a repair label that classifies products based on their ease of 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 1, 2023, claims of carbon neutrality of products and services have been strongly framed by Article 12 of the Climate and Resilience Law. Therefore, these claims must comply with a strict regulatory framework 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-cafés 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 by scaling up the proposed policies for increased repair facilities, including volunteer repair workshops and cafés, and 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 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 a support mechanism through a national network of TAPs. Strongly supported by the Recovery Plan, the deployment of TAP has grown significantly in recent years. On 1st April 1, 2023, almost 430 TAPs were recognized by the Ministry of Agriculture and Food, the majority of which are in an emerging phase, requiring substantial support to broaden their operational scope.

  (Draft NECP p. 97–99)

- The implementation of environmental labelling of food products, following an experiment involving 18 projects in 2020 and 2021, as provided for in the AGEC law and subsequently the Climate and Resilience Law. This initial work is intended to continue the development of a methodology to better integrate carbon storage and production models. The purpose of this display is to compare (i) 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 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 fertilizers and that the environmental performance of products is considered when awarding contracts. In addition, products from farms benefit 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 the effect of 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 to encourage the development of a local French supply to meet this growing demand.

Sufficiency policy: promote reduction of food waste

- The objective is to halve 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 AGEC laws, the prohibition on rendering foodstuffs unfit for consumption and the obligation to propose a donation agreement to an authorized association (for structures above a certain threshold) applies to the agri-food industry, distributors, wholesalers, and mass catering sectors. Diagnosis and approaches to combating food waste are mandatory for mass catering and the agri-food industry. Finally, a national 'food waste' label was introduced by the AGEC law in 2020, with effective implementation in 2022 for local GMS and shops, wholesalers and mouth trades. In addition, an experiment has been conducted 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 a 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 January 1, 2023, a renovated version of the HVE benchmark (version 4 of November 2022) has been implemented to increase environmental ambition.
- A target of 8% of utilized 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 food decarbonization, 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 National Nutrition Health. (Draft NECP p. 92)
- The National Food and NutritionProgramme36 (2019–2023) provides for the rebalancing of plant and animal proteins in diets. In this context, EGalim Law37 introduced a 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 provided 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 also concerns 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, introduces a new comprehensive food governance that is being developed through broad stakeholder consultation (no specific policies yet).

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

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

Germany

Germany has several policies that support sufficiency, but it is not a policy area (Draft NECP).

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. Energy advice services include advice and awareness raising on how to use energy efficiently and save energy with behavioural changes.

- Germany has special programs for energy advice, with energy-saving checks for tenants and 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 saving thermal energy, water, and electricity. The aim was to reduce CO_2 emissions and energy costs for households and public authorities. (Fraft NECP)

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 electricity consumption on an hourly basis to make it possible to provide electricity bills based on 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 sufficient policies that are not part of the German NECP. One is to reduce or eliminate the requirements for parking spaces. In Berlin, these requirements have been eliminated (PARK STANDARD).
- 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 regulations, favourable loans, and promotion, with the aim of reducing the need for heated and airconditioned spaces
- Promoting the sharing of dwellings with better regulation and promotion of renting out rooms and 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 eventually. with taxes.
- Reduce requirements for parking in buildings (dwellings, shops, etc.), particularly in urban areas. This has already been introduced in some German cities but can be promoted at the 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 has already been done in some German cities, but it can be promoted at the national level.
- In public buildings, moderate temperatures (19°C in winter, up to 25°C in summer) and reduced 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 and comparing expected energy use from energy labels with realized 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 financing up to 2030, including the own shares of the Länder and municipalities, and the distribution of federal funds.
- Regionalization funds will steadily increase 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, reliability, establishing more frequent connections, and increasing comfort and safety. Last but not least, the consistent digitalization of local public transport
- Introduction of 49€ ticket for local public transport in 2023.
- Tax-exempt job ticket for public transport The package of measures focuses on the reduction of CO_2 through a modal shift to rail, which should be significantly strengthened.

(Draft NECP pp.62, 94 and 97).

Sufficiency policy Support of bi-cycling:

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

      (Draft NECP p. 97–98)

<u>Sufficiency policy: Promote less flying</u>

- Germany has an air passenger tax that was increased by 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 include the pro-rata promotion of track access charges in rail freight transport and incentives for enforcing investment from the sector in optimizing, automating, and improving vehicle technology in freight transport. Track improvements can also aid rail freight. In addition, inland waterway freight has an expansion target, an IWT masterplan, and supports modernization and more shore-side electricity in ports.
- VAT for train tickets was reduced from 19% to 7% by 2020. This measure is not included in other NECPs, but the 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)
- Digitalization can significantly improve existing traffic routines, and the Federal Government will continue to 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. (Draft NECP p.91)

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 nearby city centres with less than three hours of train travel between them.
- Living closer to services can be promoted in a number of ways, inspired, among others, by Paris 15-min city:
    - Urban planning should include houses built only when basic facilities are available within 15 min. by bikes (3 km), including shops, kindergartens, schools, and public transport. When possible, the distance to basic facilities should be within 15 minutes by foot (1 km). The planning should also include soft mobility, as cycling is safe.
    - Urban planning should prioritize the maintenance or development of basis facilities, so that 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%
- Work from home or co-working space can be promoted by allowing office workers and others, where possible, two days per week work from home.

Products and packaging

Germany's 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 a 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 by the promotion of local sharing centres such as libraries and repair shops, and by an information system for volunteer and commercial sharing (renting) of products.
- Promoting moderate product sizing with taxes
- Purchases can be avoided by promoting better repair facilities, including volunteer repair workshops and repair cafés.
- Establishing places for free reuse of used products, for instance, 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 such as single-use tableware.

Diets, food

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

- The Federal Government is preparing a nutritional strategy to promote healthy and sustainable diets (NECP, p.65).
- The Federal Government bases its agricultural support on the rule that livestock farming is limited to no more than two livestock units per hectare. (NECP p.65). This indirectly reduces the meat 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 for some days and as one of the more options for the other days of the week.
- Change VAT, increasing VAT on meat to 19%, and reducing VAT on vegetables to 0% from current basis of 7%. Compensation for low-income families and information campaigns should be included in 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, particularly mobility, but the country still has many opportunities to strengthen climate action through more and stronger sufficiency policies.

Sufficiency is not a special policy area in Italy, but the Italian NECP concludes that there will 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.(Draft NECP)

Buildings

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

- For heating and cooling, energy reduction will be promoted by appropriate means to raise consumer awareness and their active role, for example, with the use of home automation, network digitalization, 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 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 through communication campaigns at the 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 tariffs that vary from hour to hour, the role of the consumer is changing from taxable to active, that is, it is able to change its consumption in response to price changes in the market and, under certain conditions, to self-produce and offer network services. New smart meters have played an important role in this process. In the electricity sector, the replacement of existing digital meters with second-generation smart meters is considered essential for conveying 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 were not included in the analysis in this study.

- In addition, the issue of monitoring savings generated by awareness-raising policies will be deepened to provide more robust support for decisions in this area, as well as to achieve energy efficiency targets. (Draft NECP p. 238)
- Italy has progressive tariffs for water use, charging more water per volume with higher consumption than with

lower consumption. However, this is not the case for energy and the measure was not included in the draft NECP.

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

- Promoting living in collective housing and cohousing with building regulations, favourable loans, and promotion, aiming at reducing the need for heated and airconditioned space
- Promoting the sharing of dwellings with better regulation and promotion of renting out rooms and 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 eventually with taxes.
- Reduce requirements for parking in buildings (dwellings, shops, etc.), particularly 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, which should be maintained and expanded.
- Promote the movement from larger to smaller dwellings for smaller families in cooperation with municipalities.
- In public buildings, moderate temperatures (19°C in winter, up to 26°C in summer) and reduced heating/cooling and light in rooms when they are not used.
- Introducing a label for energy efficiency behaviour and comparing expected energy use from energy labels with realized energy use. This method can be implemented in public buildings.

Mobility

Italy has implemented 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 rapid mass transport, involves high-capacity power systems (metros, tramways, trolleybuses, and similar systems). Considering 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 program 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 from freight and passenger transport to public transport, including the transport of pupils from and from schools

Sufficiency policy: promote more bi-cycling:

- cargo bike program 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 the last mile.
- a Sustainable Mobility Fund to support the construction of cycle paths.
- The national experimental program 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 cars, and motorcycle sharing);
- Integration between sustainable mobility services (e.g., parking facilities for cycles or services cars 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 nearby city

centres with less than three hours of train travel between them.

- Living closer to services that can be promoted using, among others, inspiration from Paris 15-min. city:
    - Urban planning should include houses built only when basic facilities are available within 15 min. by bikes (3 km), including shops, kindergartens, schools, and public transport. When possible, the distance to basic facilities should be within 15 minutes of walking (1 km). Planning should also include soft mobility, as cycling is safe.
    - Urban planning should prioritize the maintenance or development of basis facilities, so that 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 by allowing office workers and others, where possible, two days per week work from home.

Products, packaging
Italy supports sufficiency in product policies, including:

Sufficiency policy: promote better repair opportunities:

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

Sufficiency policy: promote sharing of products

- Ministerial Decree of February 7, 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
- Purchases can be avoided by promoting 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 reuse of used products, for instance, 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 such 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 for some days and as one of the more options for the other days of the week.
- Change VAT, increasing VAT on meat to 22%, and reducing VAT on vegetables to 4% from current basis of 10%. Compensation for low-income families and information campaigns should be included in 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 included only supporting policies for seven of them for Denmark, ten for France, five for Germany, and nine for Italy. In addition, several sufficiency policies have only been implemented to a smaller degree. These 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 potential to increase climate actions with sufficiency, our analysis shows that less than one-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 sectors, there is substantial potential 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 as follows.

- There are 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.
- Several local sufficiency policies can inspire national policy. Examples of this are the local Danish municipal

plans for Tiny-Houses, Paris' 15-min. city to reduce transport demand and eliminate car-parking requirements in Berlin. These local policies were not included in the national NECPs.

Data availability statement

The draft NECP's quoted are all 2023 versions available from: https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en

The sufficiency measures mentioned are either described in above-mentioned in NECPs or from https://fulfill-sufficiency.eu/ of from:

https://www.inforse.org/europe/Energy-Sufficiency-Project.htm, WP2 report Chapter 5.2 (regarding the measure "Moving to smaller dwellings")

Acknowledgments

We would like to acknowledge Maëlys Renan, who gave valuable advice and proposals, as well as the staff of the partners to the FULFILL project that made our work possible.

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✗

Andrew Weaver
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The authors address the important notion of sufficiency in the NECPs from Denmark, Germany, France and Italy. They initially state that Latvia was to be included but then say they won't include Latvia as their draft NECP wasn't available (I am left wondering why Latvia is mentioned at all).

The authors purport to use a qualitative-quantitative approach, but there is really no quantitative analysis. For example, the plethora of policy measures discussed are not weighted or judged by their a) ability to reduce GHGs or b) their practicality in terms of implementation.

The paper should have really started with a clear and concise definition of "sufficiency" in terms of how it was to be used in the paper.

This piece was submitted as a research article but I struggle to understand what research has been conducted. The article is written as a bulleted list of various policies from each country. The authors then advocate for sufficiency policies (without citations as to why, how or what the effect would be in terms of cost or GHG reduction) that they believe are missing.

In essence, the paper is written with a structure like this:

Country X has policies 1 to n in their NECP.
Countries can do a lot more if they included sufficiency policies 1 to m.

This approach is not helpful for policy deliberations as priorities, costs and benefits need to be assessed. For example, why spend a large amount of money implementing a policy that will have negligible effect on emissions and will meet huge pubic resistance while ignoring other policies that could be easily implemented and have a greater effect (with many co benefits).

The listed sufficiency policies are simply asserted as being important. Where did the list come from? Why were some and not others chosen?

Unfortunately I cannot recommend indexing of this article. The article does little more than reproduce parts of country NECPs and assert what sufficiency policies would make them better. I am sorry I could not be more positive.

Is the work clearly and accurately presented and does it engage with the current literature?
No

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

Are all the source data and materials underlying the results available?
Yes

If applicable, is the statistical analysis and its interpretation appropriate?
Not applicable

Are the conclusions drawn adequately supported by the results?
No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Climate science, climate policy, climate communication

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Reviewer Report 31 October 2024

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Carina Zell-Ziegler
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Thank you for this interesting analysis of four draft NECPs on sufficiency. The topic is really important, as you describe, because sufficiency is a crucial strategy to ensure we can reach climate neutrality and strong sustainability. As this strategy is underrepresented in most studies and policy plans, as e.g. the cited analysis of all 2019 NECPs showed, it is very valuable to get a more up-to-date view on the status of sufficiency in the current NECPs.

I would like to make some suggestions on how the manuscript can be improved to ensure scientific standards, to make the message clearer and to enhance the understanding of the method that you used.
Some general, more broad and relevant aspects first:

- The introduction is missing literature backing especially in the first and 4th paragraph. Please add literature here.
- Also the conclusion is missing a link to other literature: did you confirm other studies or are your results contradictory? How do the results relate to the literature on sufficiency policy. Please discuss.
- In the Introduction I miss a paragraph on NECPs: What are they for? Who writes them? What ambition level do they have etc. - please add.
- In the method section, I am completely missing the process of your analysis: How did you proceed (which steps)? How many people conducted the analysis? Did you review the other's results? In which language did you read the NECPs? Are you country experts for DK? Did you also consult other country experts? Was it always straight-forward or were there limitation (I expected a discussion of limitations also after the results but this is missing, unfortunately). And I was also wondering if your analysis was a 2-step process because you added country-specific NECP policies to the list of policies you analysed (the 30), so I guess this was a second step to check these for the other countries, right?
- In the introduction you mention the study I did with colleagues in 2020/2021 but your method is different - you only analyse a part of the sufficiency policies in the NECPs (your list with 30 policies). So I think you should better describe the differences to our study to not confuse readers and to make clear that absolute values are not comparable (in my understanding). I was also confused why you only compare our study results to yours for Denmark but not for the other countries. Please either include it everywhere or exclude it completely.
- In the results part you should keep a more uniformed structure across the countries, e.g.:
    - give the pages in the NECP for all policies found (not mentioned for DK, mostly mentioned for FR)
    - I was sometimes confused if all the information you present in the results chapter is from the NECPs - I assumed so because you do not mention another source you analysed in the methods section) - but especially for France you include a lot about the current legislation on sufficiency and some new announcements. Please state and quote clearly if there are parts in the results that do not come from the NECPs. Some sentences where I wondered:
        - "Sufficiency is not a concept used in Denmark"
        - "Denmark is currently analysing a possible target for the maximal CO2 footprint in Denmark" (is this meant per cap?)
        - "France embraced the concept of sufficiency..."
        - "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." - that is very judgemental; you should first neutrally present your results and afterwards comment on things
        - How is the list about the new announcements in France (you write 5 but you list 6) related to the NECPs? This does not get clear. Furthermore, in the description of the policies you repeat parts of that. Please make more clear

what is written in the NECP and what is knowledge from other literature, media or country experts (which should then be quoted).
        - I also do not get where the "other sufficiency-related policies" in almost all chapters come from - are they part of the NECPs but not in your list of 30 (e.g. the German research program you mention)?
    - for France and product use you write it "can do substantially" more - for all other sectors and countries you do not use weightings. How did you come to this weighting? Why are there no weightings for other countries? For Germany and products you did not find policies but you just state "Germany can introduce" more. This is not harmonised.
- I do not get your counting and think that the presentation of results should happen in table or figure format, not just text. E.g. you mention for France 10 policies. But when counting all policies in the French chapter which are underlined, this makes 12. So, can you please elaborate what exactly did you count? I think it will be easy to expand table 1 (or just the first 2 columns) and add if it was found for all four countries (new columns). Or add a table with columns Country, Sector, Amount of sufficiency policies in NECP and a qualitative answer on how much more could be done (high-medium-low). This would be a great new asset to the text!
- I do not understand how you assessed how strong or weak a national policy is implemented. This first appears in the conclusions without being mentioned before and there is nothing on this assessment in the methods section. So, if you did this assessment, please specify in the methods and results part or if this is just an expert view, write this clearly or back it with literature.

I additionally identified some minor aspect you should consider when revising your manuscript:

- there are some typos, please check the text again
- Abstract, Results: "and their unused potential" - I think you mean "compared to the possible potential"
- Intro: You should also add a sentence on the target group of your analysis.
- Your second and third research questions are not questions, please rephrase.
- Please describe in the methods section how you will answer RQ 2.
- The third last paragraph of the Introduction should be moved to the methods section.
- Is the term "sector" so good? Living space is not a sector, rather a point of intervention - please consider to rename.
- Methods section: "**Many studies**, including the FULFILL study, identify four main sectors where sufficiency policies and measures can have a substantial influence on emissions:" - this needs references.
- top of page 5: our study "Enough. ..." was published in 2021, not 2019.
- Methods page 5, bullet list, last bullet: Which page 26 do you refer to? Which sources did you consider? Did you have a look at the European Sufficiency Policy Database which I guess would be very relevant here? https://energysufficiency.de/en/policy-database-en/
- Table 1: please insert a note that the explanation for the column "Analysis" can be found on page 5. Otherwise, when just looking at the table, readers do not understand it.
- Page 8: what is "in-house mobility"?
- Page 8, buildings chapter: Change framing at the beginning: "The NECP builds on the Sobriété Plan" - you analyse the NECP and not the other plan.
- It was surprising to me that despite so many plans and stuff in France there is still so much

that should be done (long list for buildings for example, as long as for DK where you write that sufficiency does not play a role). Can the authors please explain why?
- Page 9, short haul flights: Why do you mention them as part of the found policies in the NECP and as not found? Please only mention once, this is confusing.
- Page 13: Why do the measures listed for transport only have "indirect" effects? Shifting freight from road to water and reducing VAT for rail are direct sufficiency measures.
- Page 14: "Other sufficiency-related building policies were not included in the analysis in this study." Why? I think from table 1 that you analyse 5 building policies.
- You could add further research need.
- In the conclusion you should point to other policy ideas and lists for sufficiency policies to inspire countries even more, like the mentioned Sufficiency Policy Database: https://energysufficiency.de/en/policy-database-en/

I think the consideration of these aspects will make the manuscript a strong and valuable one. Thank you!

Is the work clearly and accurately presented and does it engage with the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

Are all the source data and materials underlying the results available?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Not applicable

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: energy sufficiency, sufficiency policy, energy and climate policy, evaluation of climate polcies

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.