

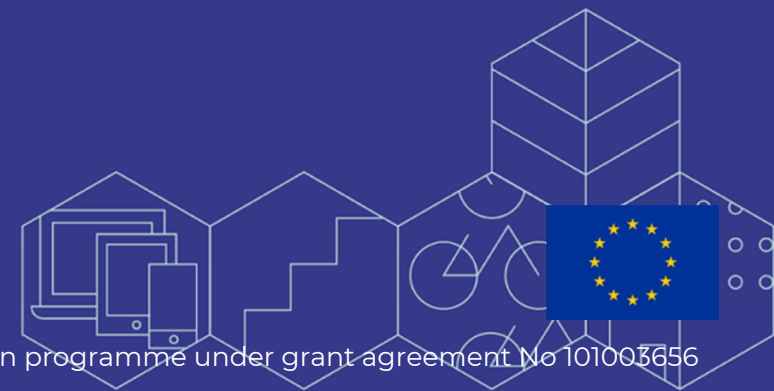
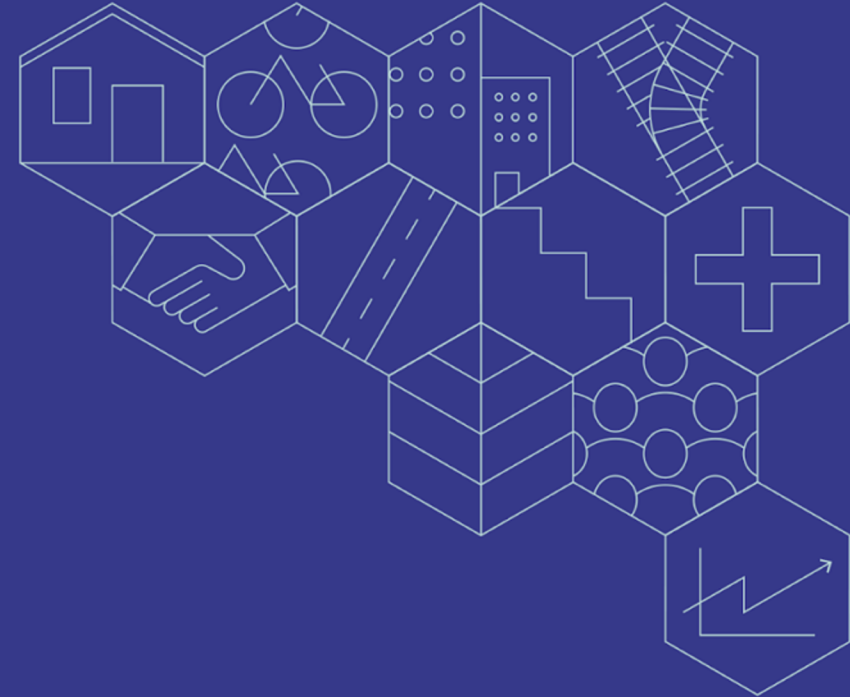


**Fundamental decarbonisation  
through sufficiency by lifestyle changes**

# Final Event

Fiona Breucker, Jacques Delors Institute; Dr. Elisabeth Dütschke, Fraunhofer ISI  
Mélanie Bourgeois, Energy Cities; Yves Maignac, Association Négawatt  
Gunnar Olsen, Inforse Europe; Wolfram Sparber, Eurac Research  
Manuel Bickel, Wuppertal Institute

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003656



# FULFILL

Fundamental decarbonisation  
through sufficiency by lifestyle changes



Research conducted in 5 EU countries + India



**>21000**  
citizens surveyed



**50**  
sufficiency citizen initiatives studied



**3**  
citizen science workshops carried out



Input-output models used to quantify effects of sufficiency measures



**160**  
interviews conducted



**16**  
sufficiency policies analysed



**4**  
countries' NECPs analysed



**>30**  
project publications

# FULFILL

*Fundamental decarbonisation through sufficiency by lifestyle changes*



<https://fulfill-sufficiency.eu/our-research/>

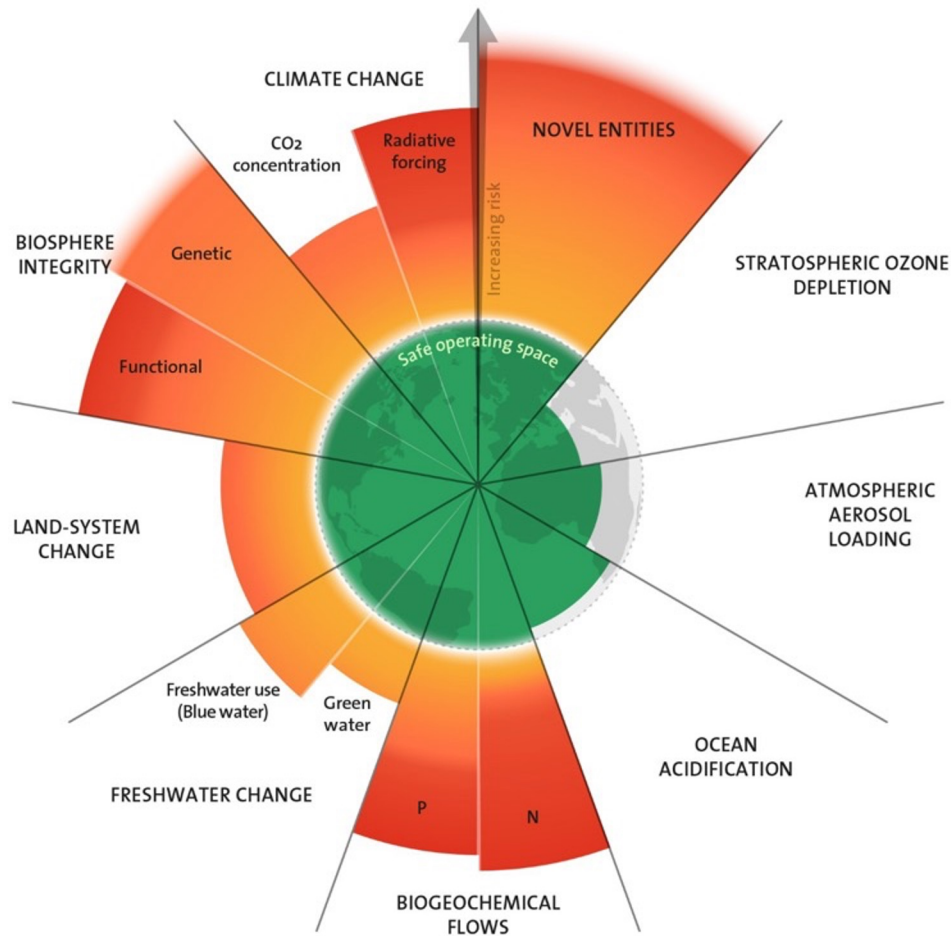


# Agenda

- 15.00-15.10 **Introduction to FULFILL and Sufficiency** | Fiona Breucker, *Jacques Delors Institute*
- 15.10-15.20 **Citizens' views on sufficiency** | Elisabeth Dütschke, *Fraunhofer ISI*
- 15.20-15.25 **Slido: Audience Engagement**
- 15.25-15.30 **Local Drivers of Sufficiency** | Fiona Breucker, *Jacques Delors Institute*
- 15.30-15.40 **Sufficiency at the Local level** | Mélanie Bourgeois, *Energy Cities*
- 15.40-15.50 **Sufficiency Policies** | Yves Marignac, *Association négaWatt*
- 15.50-16.00 **Sufficiency in the NECPs** | Gunnar Boye Olesen, *INFORSE-Europe*
- 16.00-16.05 **Slido: Audience Engagement**
- 16.05-16.20 **Quantification of sufficiency measures and contribution to European climate targets** | Wolfram Sparber, *EURAC Research*
- 16.20-16.25 **Slido: Audience Engagement**
- 16.25-16.35 **Social Impact Assessment** | Manuel Bickel, *Wuppertal Institute*
- 16.35-16.55 **Q&A**
- 16.55-17.00 **Closing words** | Fiona Breucker, *Jacques Delors Institute*

# Why is this important?

crossing planetary boundaries threatens ecosystems and human societies.



## Climate Change



- Floods, droughts, heatwaves, and other climate hazards are becoming more intense, longer, and more frequent.



- Extreme weather events caused 85,000 to 145,000 fatalities in Europe over the past 40 years (over 85% due to heatwaves).

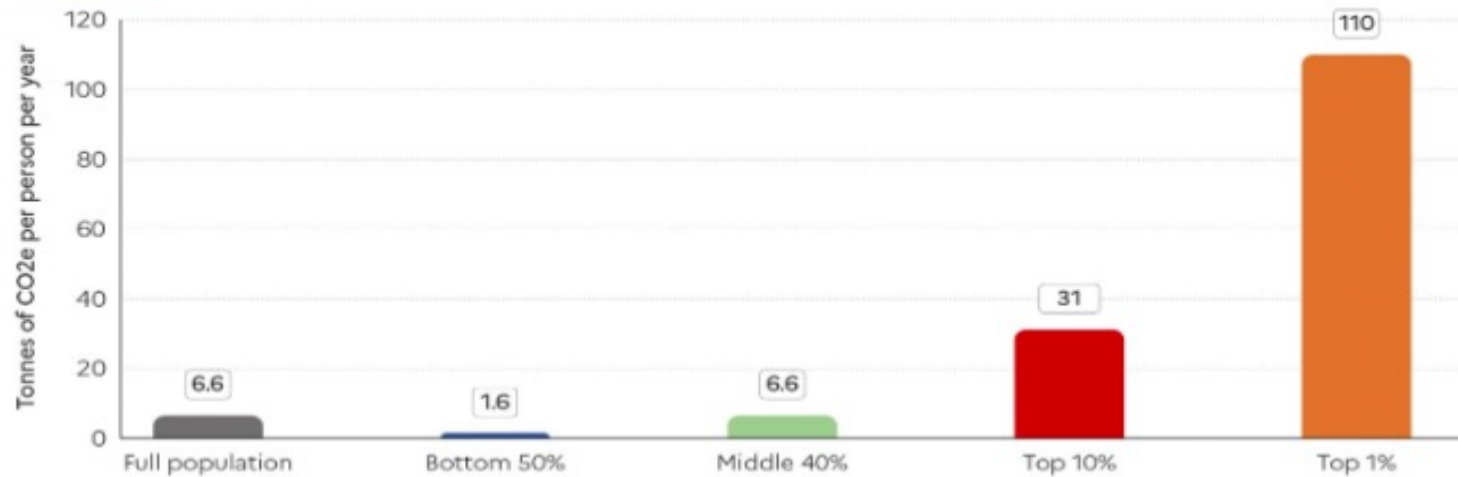


- Weather and climate-related events led to €500 billion in economic losses

# Carbon Inequalities

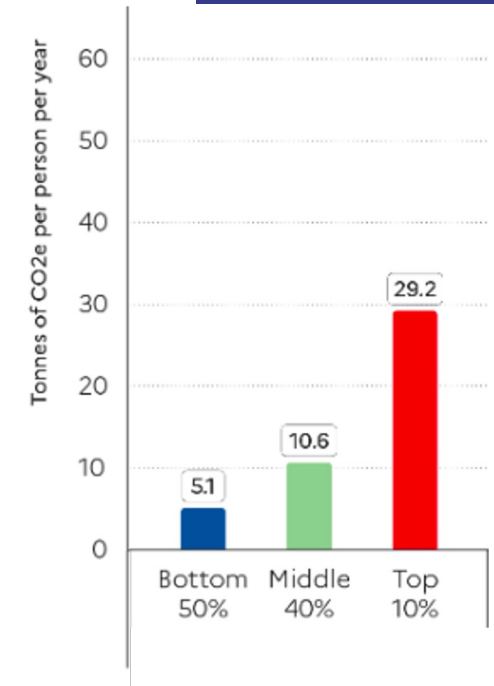
## Global carbon emissions worldwide by group, 2019

Figure 6.5a Global carbon inequality, 2019: emissions by group



**Interpretation:** Personal carbon footprints include emissions from domestic consumption, public and private investments as well as imports and exports of carbon embedded in goods and services traded with the rest of the world. Modeled estimates based on systemic combination of tax data, household surveys and input-output tables. Emissions split equally within households.

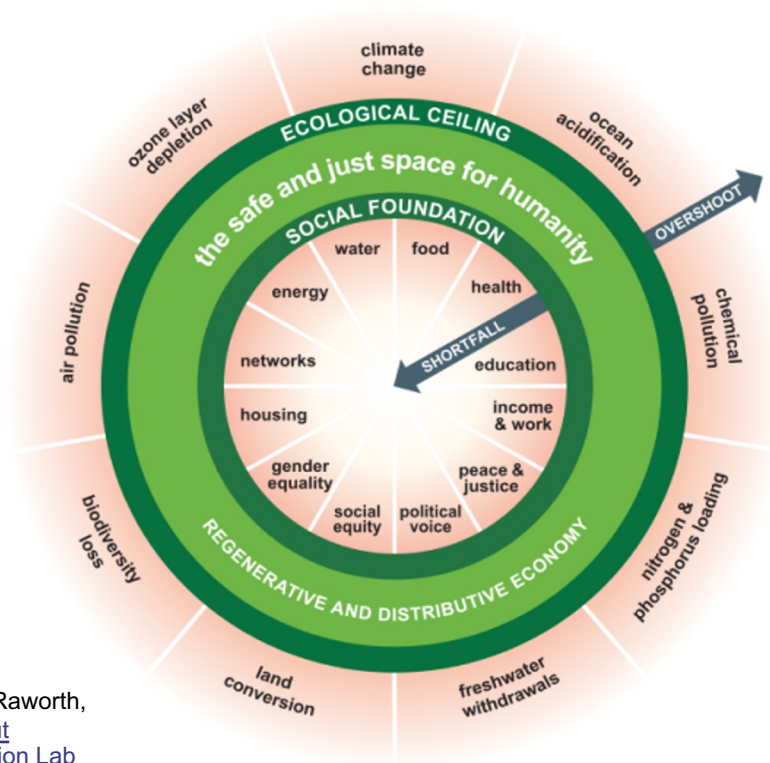
## Per capita emissions, Europe, 2019



**Source:** Chancel, L., Piketty, T., Saez, E., Zucman, G. et al. World Inequality Report 2022, World Inequality Lab [wir2022.wid.world](http://wir2022.wid.world)

# The potential of sufficiency

*Wellbeing for all within planetary boundaries*



Source: Kate Raworth, 2012, [Doughnut Economics Action Lab](#)



- a more resilient Europe



- less costs and more competitiveness

- reduce energy system costs



- facilitated achievement of our climate and energy targets



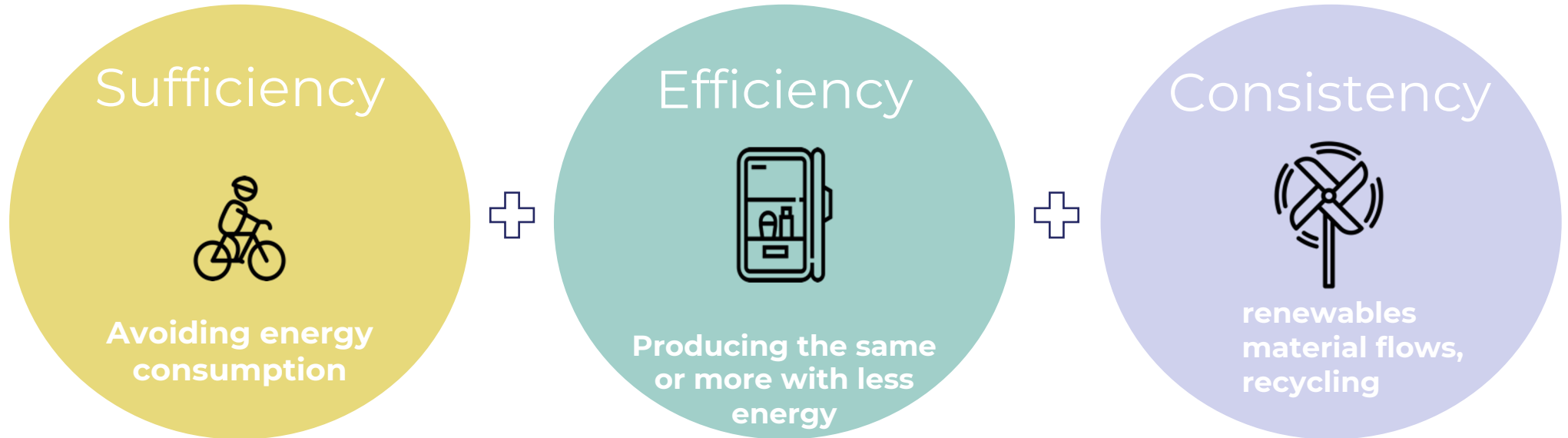
- healthier ecosystems



- a better quality of life for all

- Healthier diets
- More active lifestyles
- Improved air quality
- Decreased loneliness...

# Sustainability strategies



## Examples

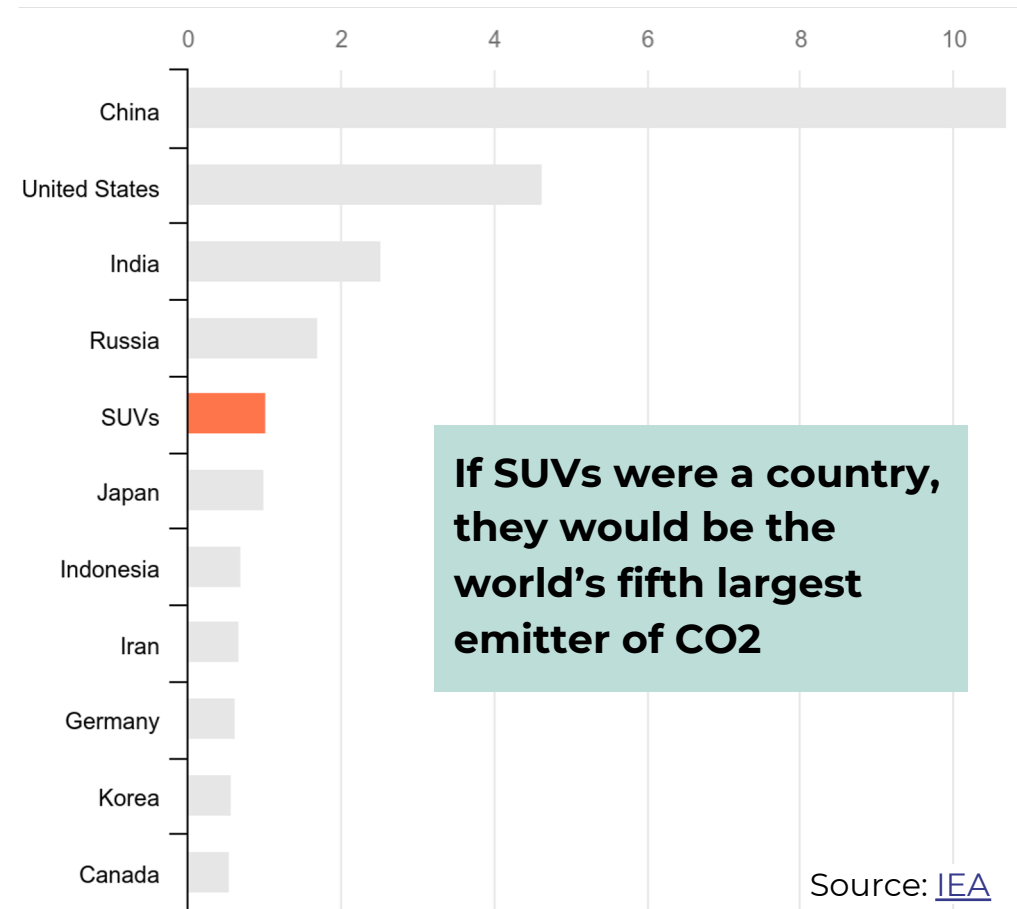
Take the car with combustion engine	cycling, public transport, car sharing, work from home	electric car	electric car with renewable electricity
Heat all rooms at 22°C with fossil fuel boiler	put the heating to 19°C , heat less rooms	invest in building renovation	install a renewable heating system (e.g. heat pumps)

# Why do we need sufficiency?

- SUVs accounted for 48% of global car sales in 2023.
- **Trend towards heavier, less efficient vehicles largely nullifies recent global gains in car emissions and energy use.**
- SUV's: responsible for over 20% of the growth in global energy-related CO2 emissions in 2023
  - ~ 20% more emissions than an average medium-sized car
  - more critical materials and parking space in constrained urban areas
  - pedestrian safety



Source: [Pexels](#)



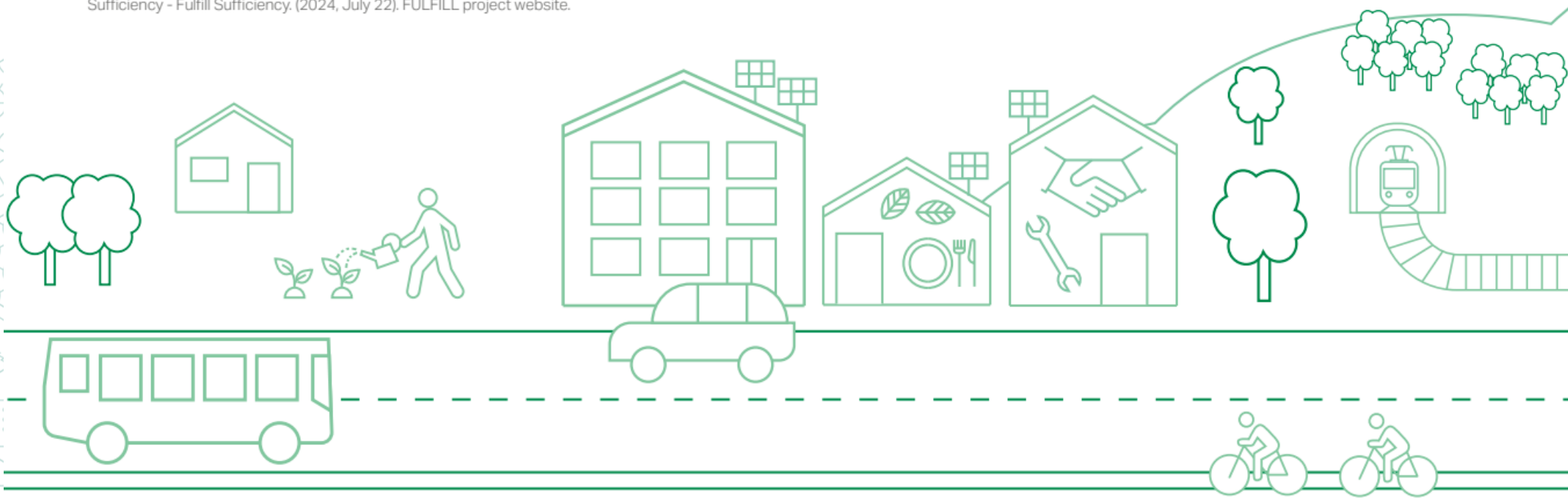
**If SUVs were a country, they would be the world's fifth largest emitter of CO2**

Source: [IEA](#)



**Sufficiency** 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 wellbeing**.

Sufficiency - Fulfill Sufficiency. (2024, July 22). FULFILL project website.





**“Sufficiency policies** are a set of **measures and daily practices** that **avoid demand** for energy, materials, land and water while **delivering** human **well-being** for all within planetary boundaries.”

(IPCC 2022. Summary for Policymakers, p. 41)

# Sufficiency needs policies and infrastructures

Policies, infrastructure, regulatory conditions, social norms

## Individual level

-  choosing plant-based diets
-  Biking and using public transport
-  repairing and sharing goods
-  reconsidering consumption demands

100

- Policies and infrastructures often favour unsustainable consumption patterns
- A sufficient lifestyle under current conditions requires time and money
- Revised regulations and improved infrastructure has the potential to **make low-carbon behavior attractive and accessible to all**



## Changing infrastructures



Source: @EmmanuelSPV



Source: @CarlosMorenoFr



Source: Franceinfo

# Sufficiency Video





Fundamental decarbonisation  
through sufficiency by lifestyle changes

## Citizens' views on sufficiency

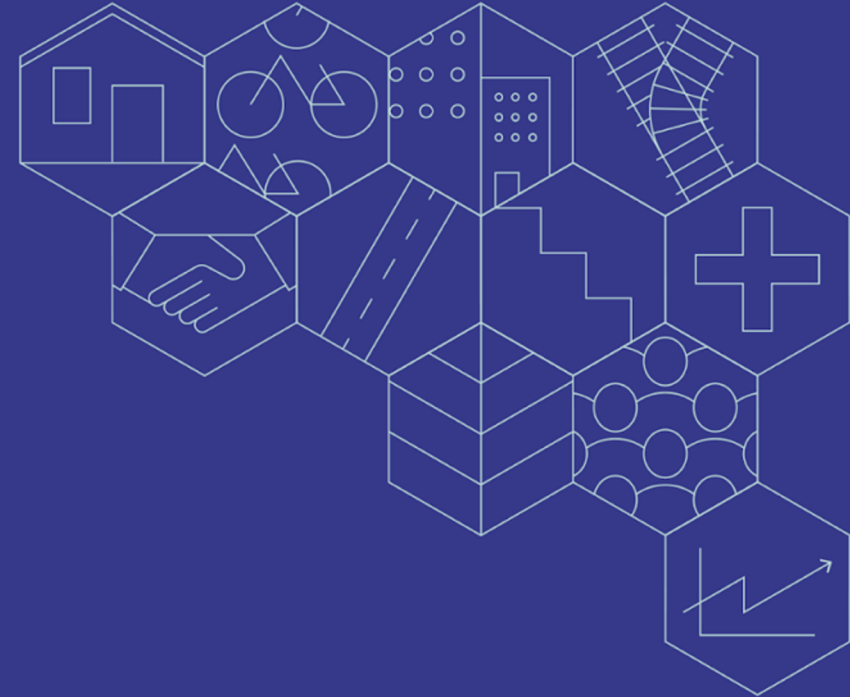
Elisabeth Dütschke, Fraunhofer ISI

[elisabeth.duetschke@isi.fraunhofer.de](mailto:elisabeth.duetschke@isi.fraunhofer.de)

18/09/2024



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# Examining citizens' perspectives on sufficiency



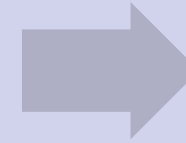
## Task 1: Sufficiency lifestyles in current societies

- 9500 EU-participants and 1000 from India in representative **surveys** on **lifestyles** incl. carbon footprint calculator and well-being measure
- *Reported in D3.1*



## Task 2: In-depth understanding of sufficiency lifestyles

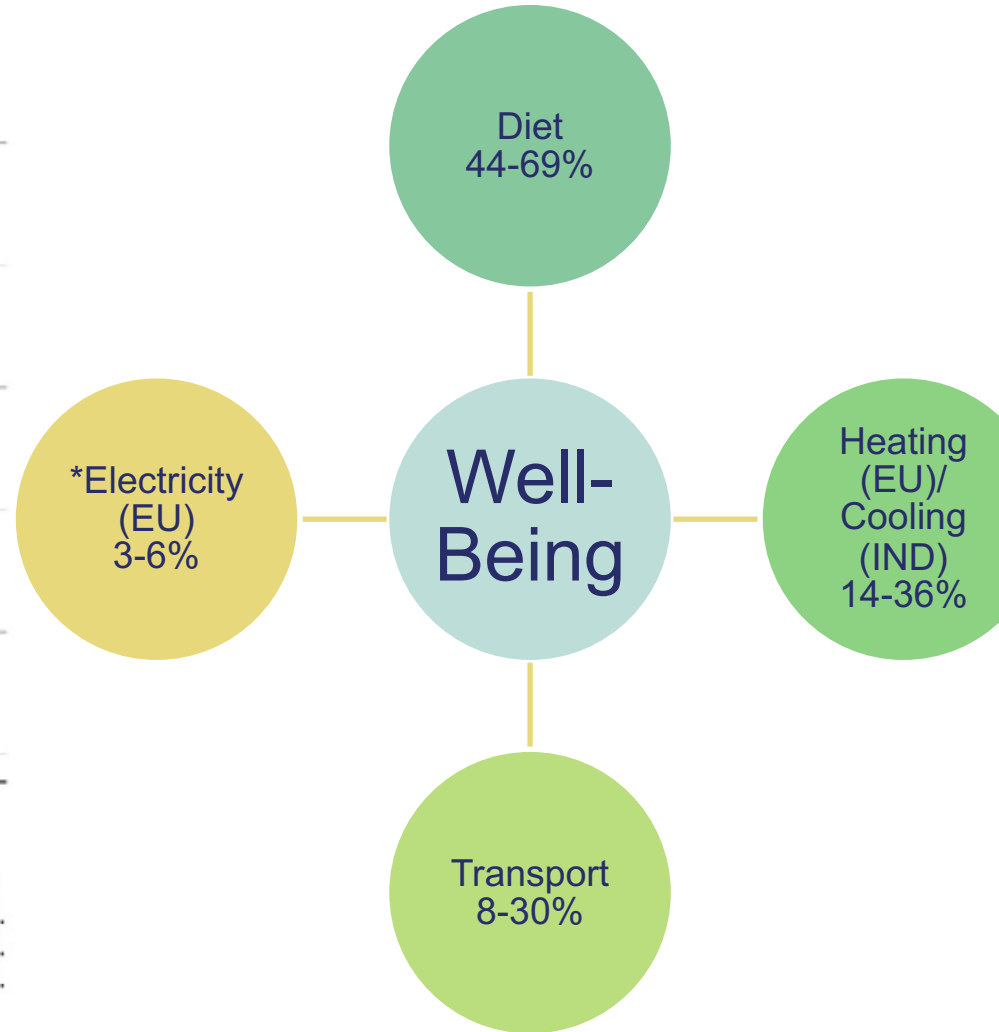
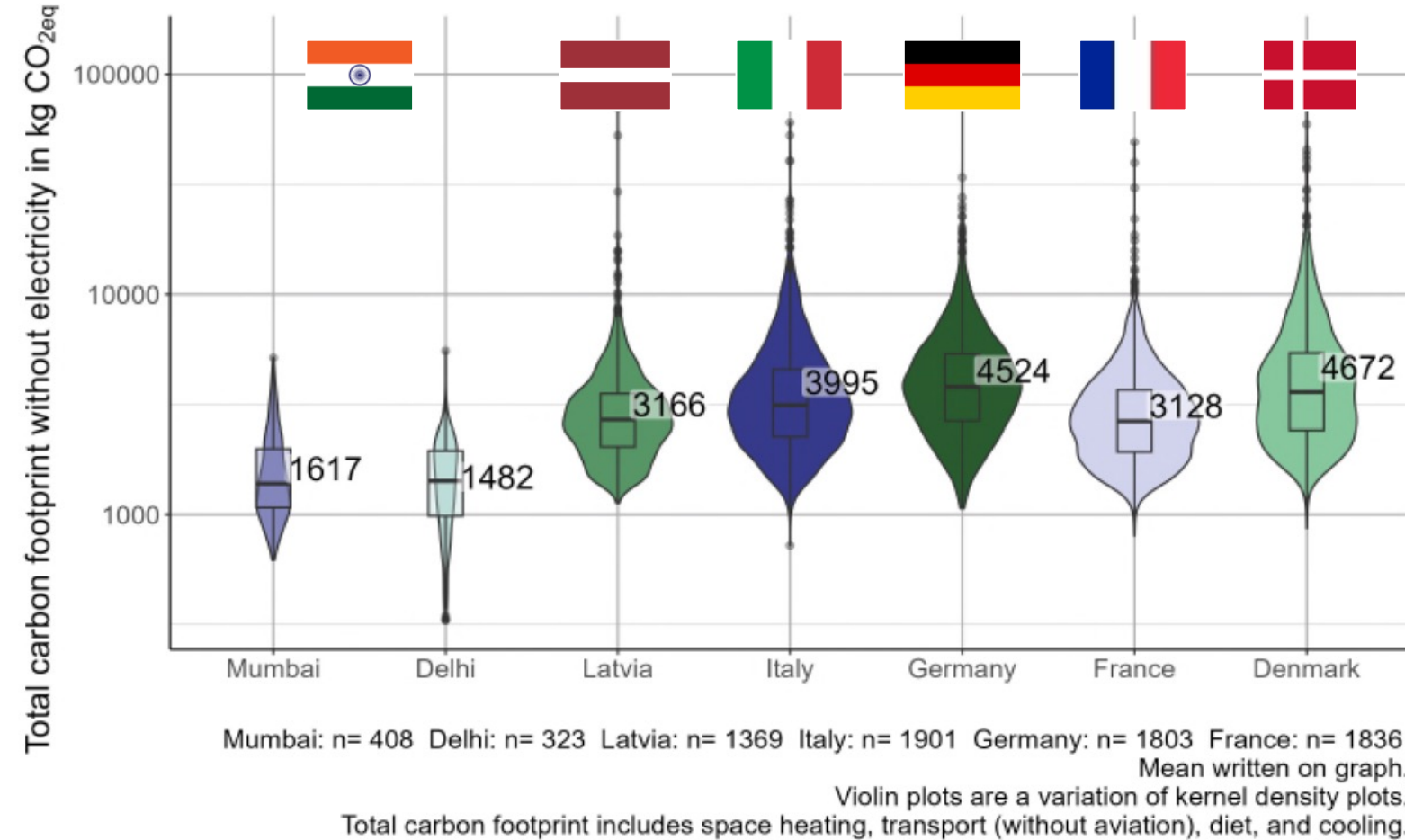
- 160 **interviews** with average citizens and people engaged in initiatives on housing, diet, goods, and ecovillages
- *Reported in D3.2*



## Task 3: Pathways to sufficiency lifestyles

- 9900 EU-participants in experimental **surveys** and **longitudinal** study on **policy measures** and 1000 respondents from India on the same topics
- *Reported in D3.3*

# Identifying sufficiency: current lifestyles



# European citizens and sufficiency - everyday experience

## Very sufficient 3-4% per country

Very low in emissions in all behavioural domains and high in well-being

Female, higher income, supporting sufficiency-oriented lifestyles and environmental identity

## Partly sufficient 8-9% per country

Very low in emissions in some behavioural domains and below average overall as well as high in well-being

Eco-friendly, support for environmental policies

## Deprived 12-14% per country

Very low in emissions in all domains and low in well-being

More often female, low income, not working full-time

*"I always say that participating to this initiative gives me a lot of energy". (Woman, 47, Italy, reduced consumption)*

*Living in a tiny house allows me to be less a slave to work." (Woman, 25, France, tiny house)*

Well-being as consequence and motivator

Time availability

Income and affluence

Sufficiency as a side-effect in joining initiatives and unknown as a concept

Perceived as a potential threat among low-income



No or weak link between well-being and sufficiency



# European citizens and sufficiency - perceptions on policies



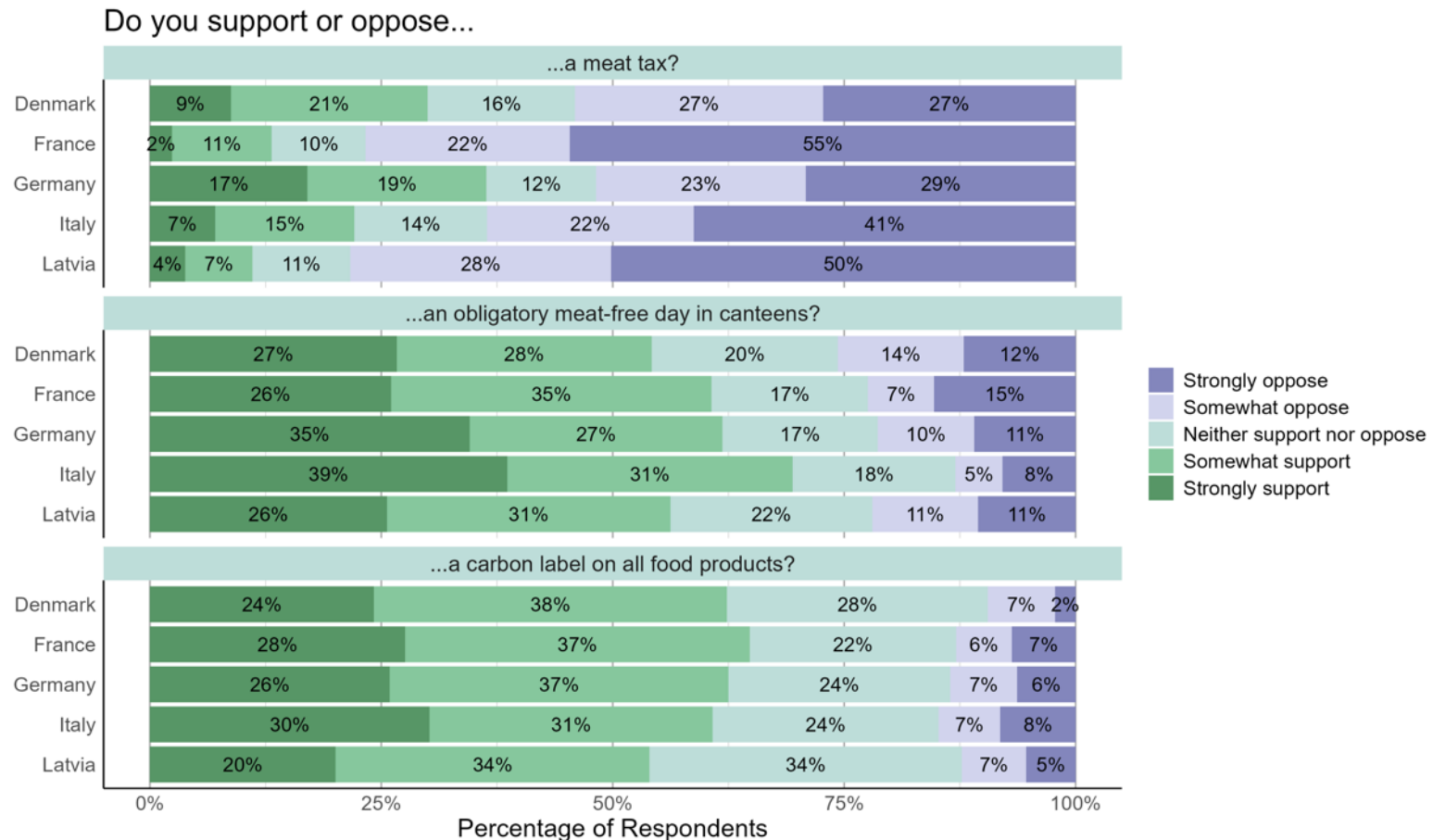
Few supporters

Many undecided

More opposed

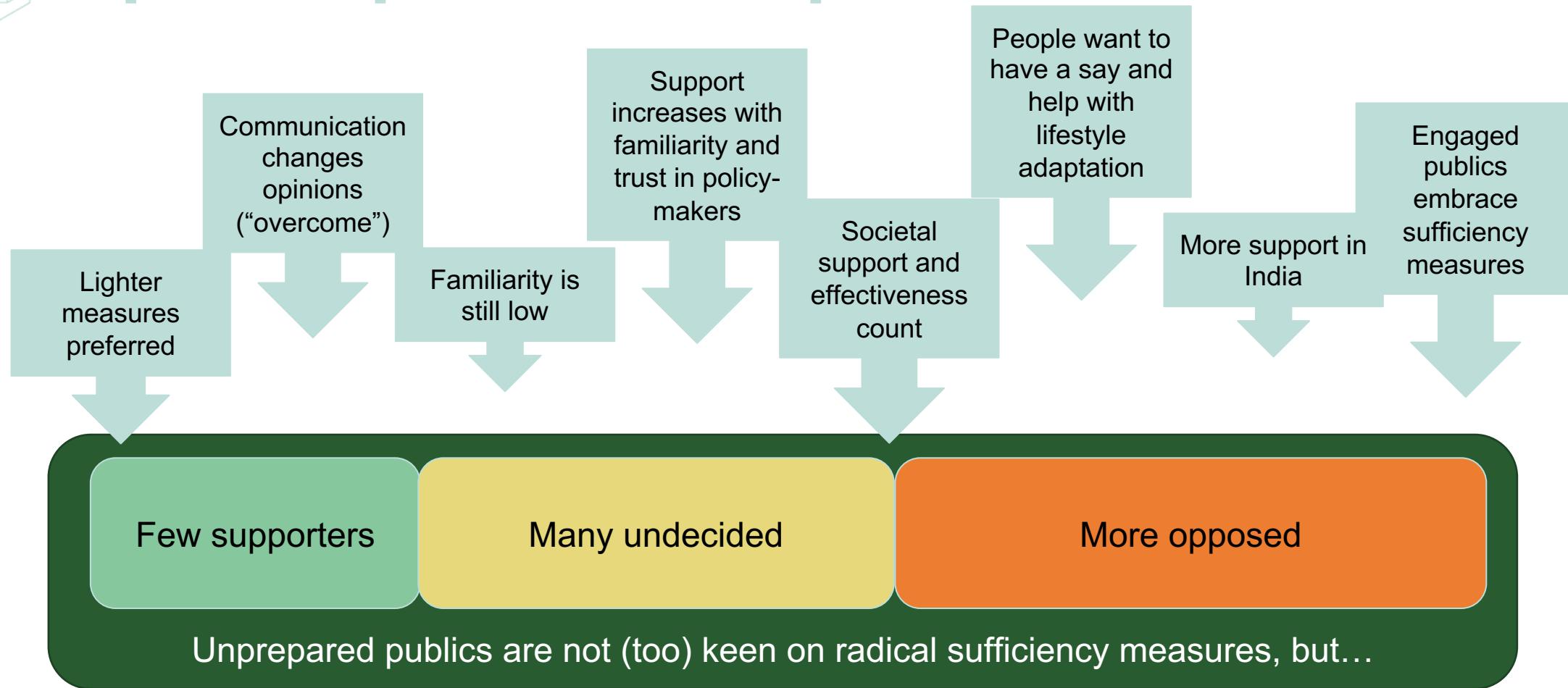
Unprepared publics are not (too) keen on **radical** sufficiency measures, but...

# European citizens and sufficiency - perceptions on policies



Housing policies: DK: n=786, FR: n=784, DE: n=763, IT: n=774 and LV: n=535  
Diet policies: DK: n=810, FR: n=798, DE: n=776, IT: n=824 and LV: n=578

# European citizens and sufficiency - perceptions on policies



And now it's your turn!



**Or go to:  
[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)**

# How many people in Europe are familiar with the concept of sustainable housing?



[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)

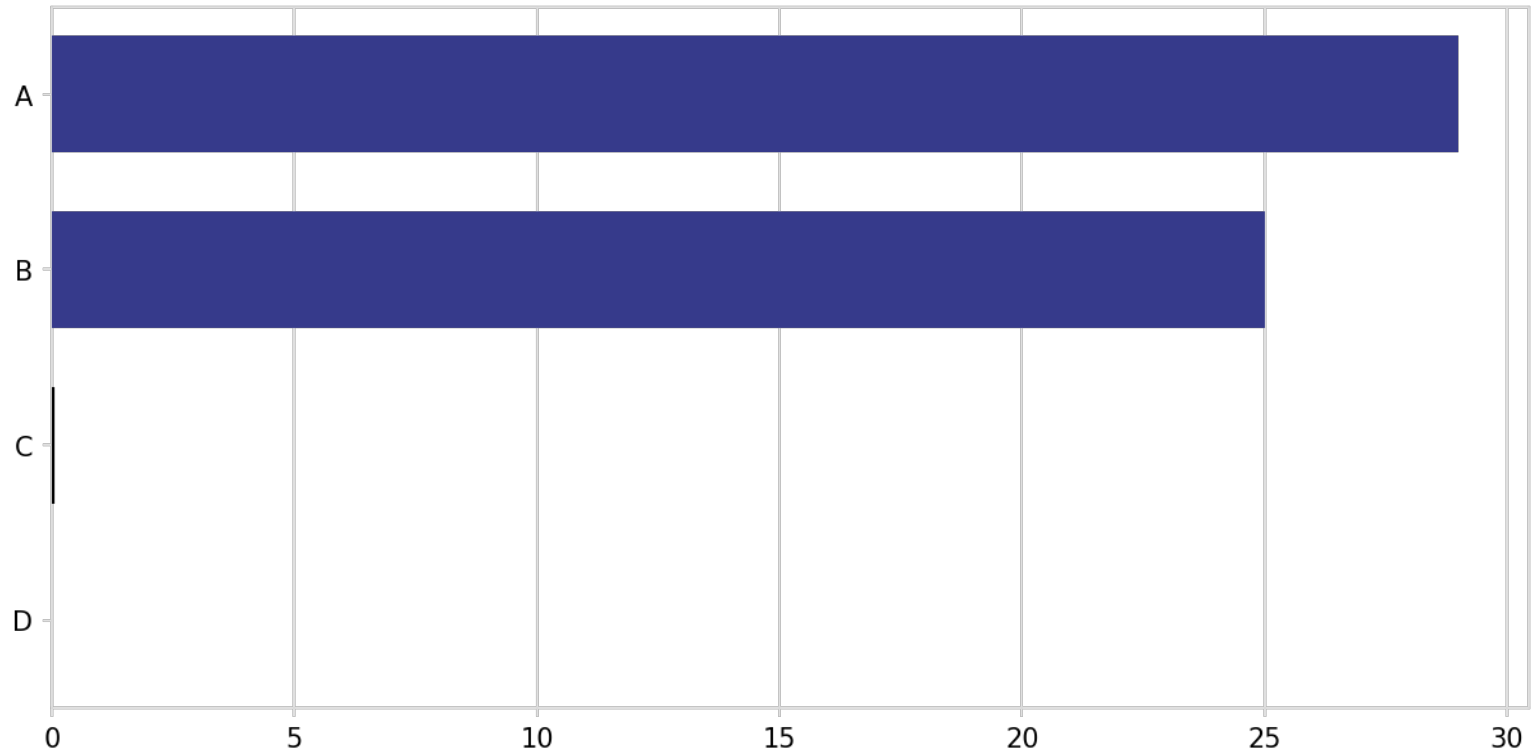
Responses:

A: less than 20%

B: 20-50%

C: 50-80%

D: more than 80%



ID = ISI78  
54 participants / Poll closed

# Which European country has the highest diet related emissions according to citizens' responses?



[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)

Responses:

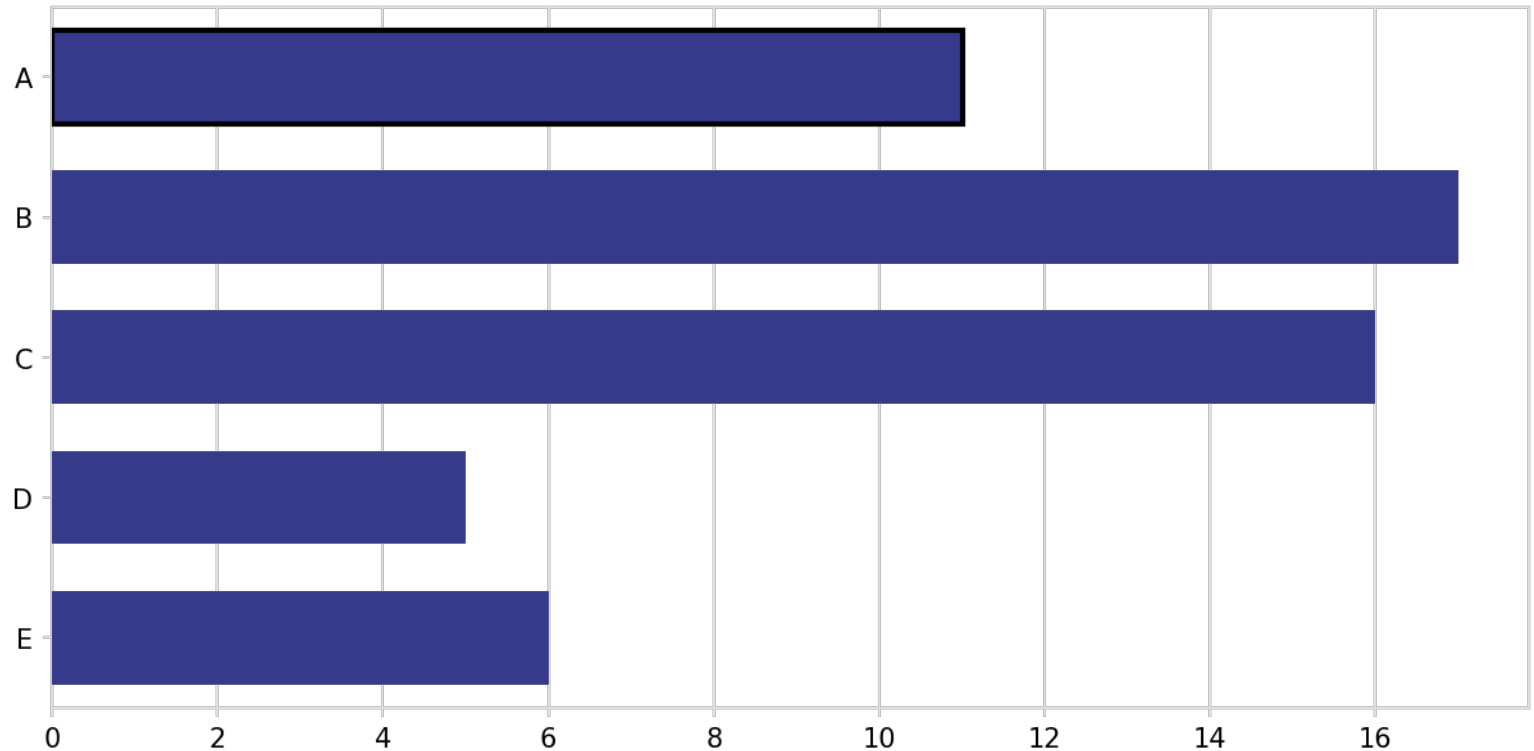
A: Denmark

B: France

C: Germany

D: Italy

E: Latvia



ID = ISI78  
55 participants / Poll closed



vote.ac/?id=ISI78

# What is your favourite vegan (or vegetarian) dish?









**Fundamental decarbonisation  
through sufficiency by lifestyle changes**

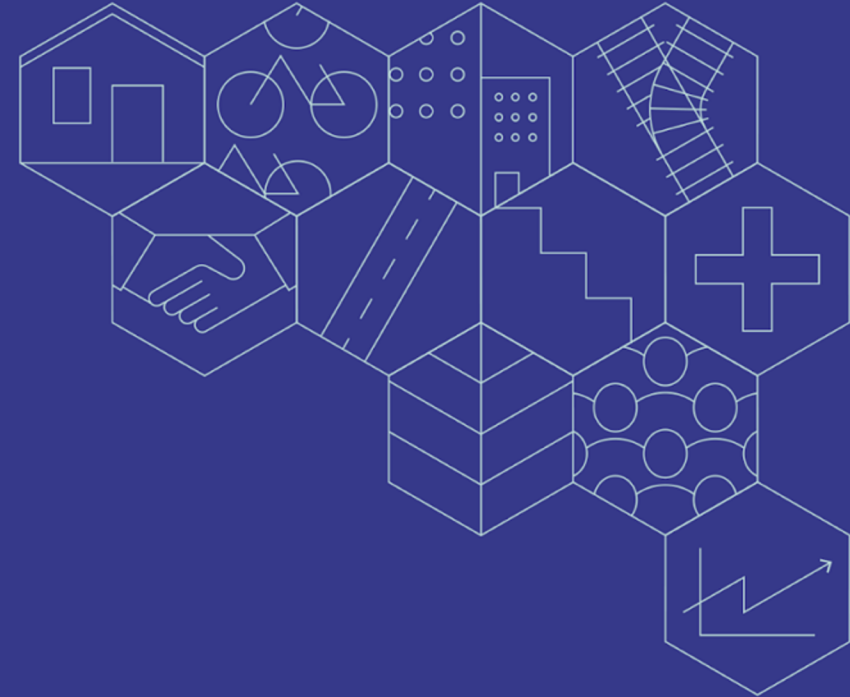
## Sufficiency at the Local Level

Fiona Breucker, Jacques Delors Institute  
Mélanie Bourgeois, Energy Cities

18/09/2024



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003656



# Mobility



Bike / Cargo-Bike Rentals  
Car-Free Living  
Ride-Sharing  
Car-Sharing  
Public Transport  
Culture  
Transition Town

# Food



Food Sharing  
Urban Gardening  
Packaging  
Community Supported  
Agriculture  
Food Saving

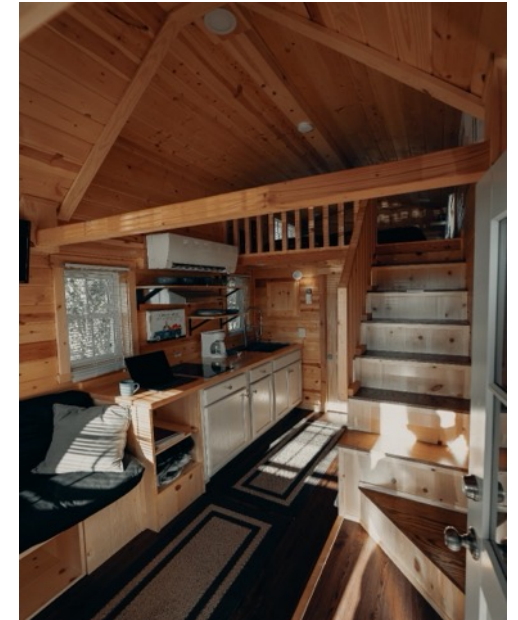
Justice  
Environmental education  
Health  
Co2 Reduction

# Consumption



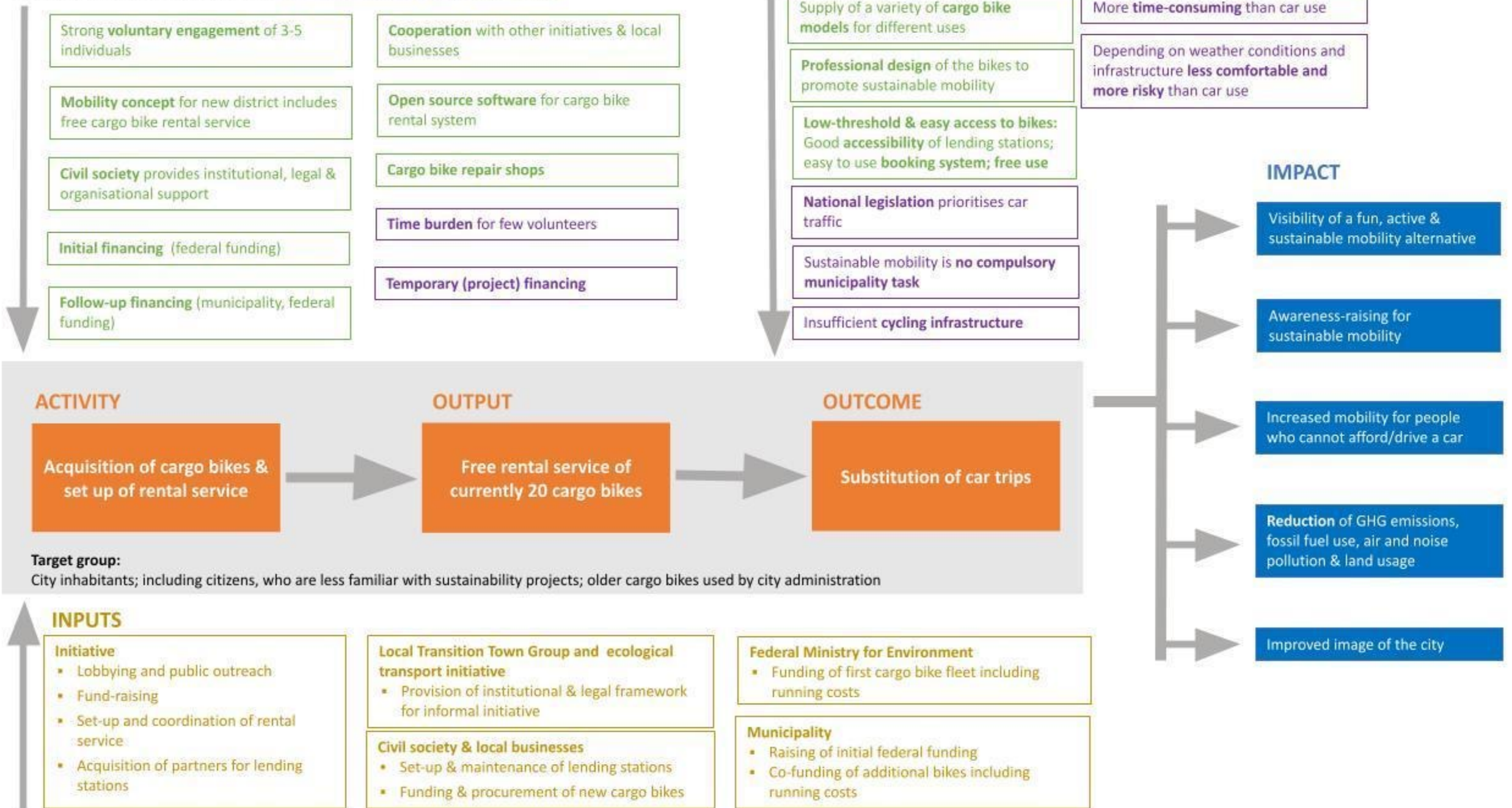
Repairing (Repair Café etc.)  
Re-Use  
For-Free-Shops  
Sharing

# Housing



Building refurbishment  
Conversion  
Housing projects  
Communal Living  
Ecovillage  
Tiny Houses  
Low Tech  
Energy Consumption  
Transition Town

## FRAMEWORK CONDITIONS: SUCCESS FACTORS, BARRIERS



# Sufficiency Initiatives

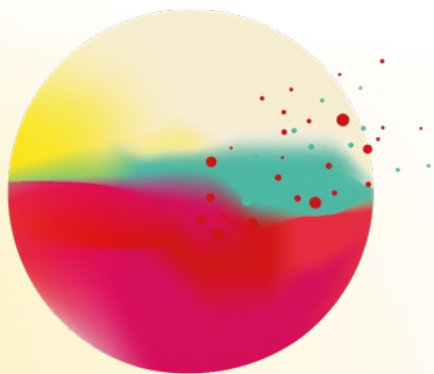


**Positive  
Impact**

- **provision of infrastructure (small scale)**
- **offer multiple benefits for those involved**
  - health benefits, education, skills, sense of belonging, financial advantages
- **influence on social norms and values**

**Yet,  
limited  
support**

- **BUT: at odds with current systems**
- **Need of formal support, resources, legitimacy**
  - overcoming regulatory and legal hurdles
  - aligning goals



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# Local governments & sufficiency policies

**Speaker:**

Mélanie Bourgeois

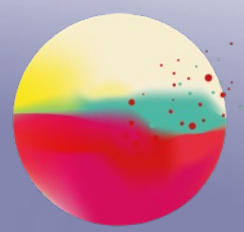
Melanie.bourgeois@energy-cities.eu

**Fulfill Final event**  
**18/09/2024**

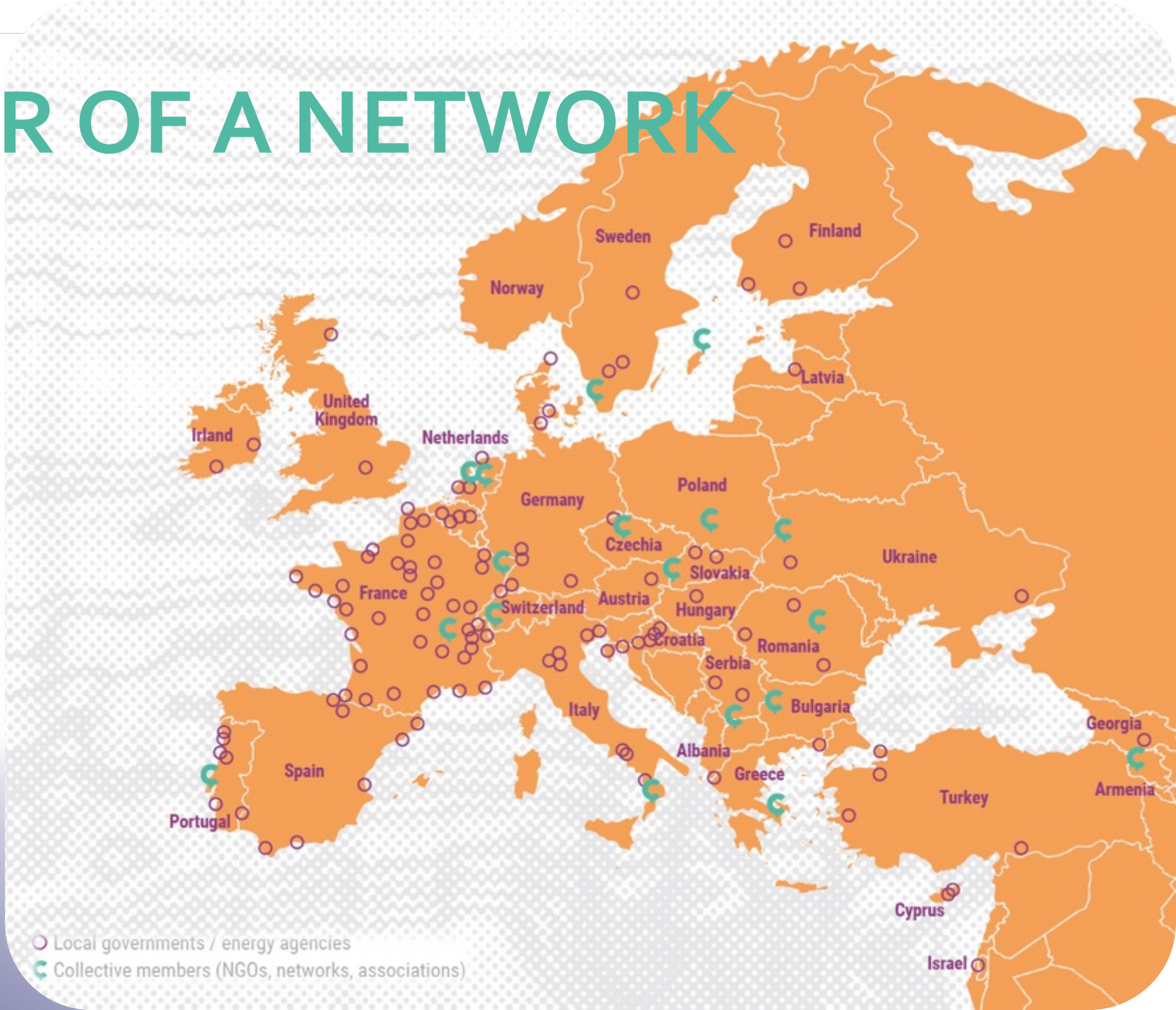
# THE POWER OF A NETWORK

1000+  
members

30+  
Countries

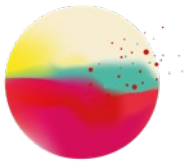


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# Sufficiency in our network





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# Brussels (BE): Shifting economy



shifting  
economy.brussels   
ENSEMBLE, VERS L'ÉCONOMIE DE DEMAIN

# Freiburg (DE): Flat exchange scheme

**WIE UND WARUM TAUSCHEN?**

 <p><b>Dauerhafter Tausch</b> Wir bieten nur dauerhafte Tauschangebote an. Kein Urlaubstausch.</p>	 <p><b>Größer gegen Kleiner</b> Sie haben ein Zimmer zu viel? Andere haben ein oder mehr Zimmer zu wenig.</p>	 <p><b>Kleiner gegen Größer</b> Sie haben ein Zimmer zu wenig? Andere haben ein oder mehr Zimmer zu viel.</p>	 <p><b>Gleich gegen Gleich</b> Sie wollen endlich einen Tapetenwechsel? Das wollen andere auch.</p>	 <p><b>Innerh</b> Viell Tauschp St</p>
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[JETZT TAUSCHEN](#)





# Metropole of Lyon (FR)



## Water

- Progressive pricing
  - Reduce leaks
- Reduce by 50% water supply



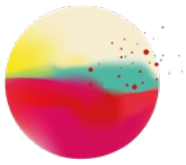
## Energy

- New energy performance contracts
- Lower temperature in building & reduce public lights
- Urban densification



## Ads & materials

- End of outdoor and metro advertising screens
- 75% reduction in the size and number of advertisements



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## Food focus

- **Helsinki (FI):** Halve the use of meat and dairy in municipal procurement by 2025.
- **Liege (BE):** Green Deal Cantine Durable & Ceinture Aliment-terre Liégoise since 2015.

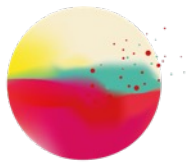


In the 24 communes of the Liège Metropole, 38 organisations (schools, crèches, hospitals, businesses) have signed up to the Green Deal for Sustainable Canteens, representing a total of **11,240 lunch meals served every day.**



**MANGER  
DEMAIN**

**GREEN DEAL**  
Cantines Durables



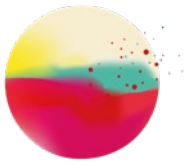
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**Most of our members do not use the word  
« sufficiency »**



What can the EU do to support cities in adopting a sufficiency approach ?





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# Resilient and Resource wise Europe manifesto

- An EU strategy for sufficiency
- Dedicated section in the future National Energy and Climate Plans & Governance regulation
- Sectoral measures: mobility, building, urban planning, materials and waste, water, fiscal rules...



The manifesto is still open for new signatories and signatories have foreseen further common activities.





Mélanie Bourgeois (melanie.bourgeois@energy-cities.eu) is signed in

## We are energy addicts who need rehab

Panel discussion: "Rethinking our need", Heidelberg, Lyon, Riga, and Vitoria-Gasteiz explored the necessity to consume less and shared inspiring sufficiency best practices

Fair economies

22/07/2024

Planet Earth is begging us to respect its boundaries. Some cities are already running out of water, even in wintertime. Energy prices have soared. Urban [...]

Urban planning & Vision Lifestyle & Behaviour

Quality of life Climate neutrality

Citizen engagement +



## Are EU countries following the "no-net-land take in 2050" recommendation?

Despite non-binding targets, some countries and regions are taking action to limit urban sprawling

Fair economies

02/05/2024

In 2011, the European Commission announced the objective of 'no-net-land take in 2050' as a recommendation to preserve soil, protect biodiversity, and enhance everyone's quality [...]

Agriculture European policies Green spaces

Policy measures Quality of life



## How the EU can help cities reduce ads

European cities are taking action to regulate citizens' exposure to ads, but they need clear and harmonised regulations to support their efforts

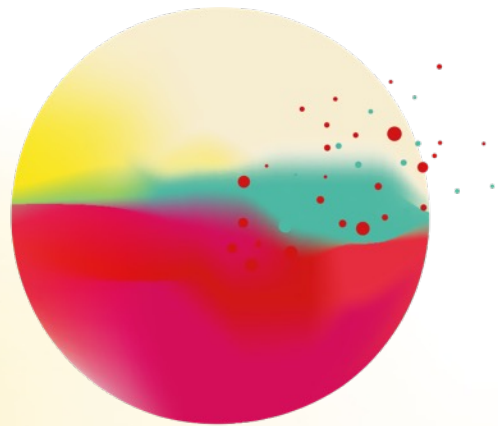
Fair economies

05/09/2024

Can we regulate advertising at the EU level? What is the current state of affairs? As more and more European cities feel the need to [...]

Urban planning & Vision European policies

Energy savings Sufficiency



ENERGY **CITIES**

Thank you



**Fundamental decarbonisation  
through sufficiency by lifestyle changes**

## Sufficiency policies

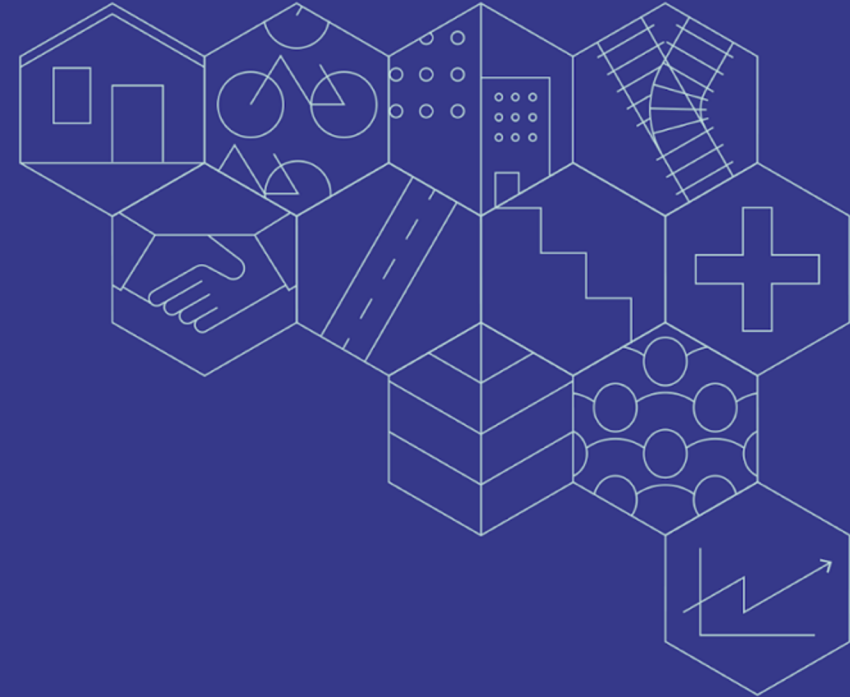
Yves Marignac, Association négaWatt

**Energy expert and spokesperson**  
yves.marignac@negawatt.org

18/09/2024



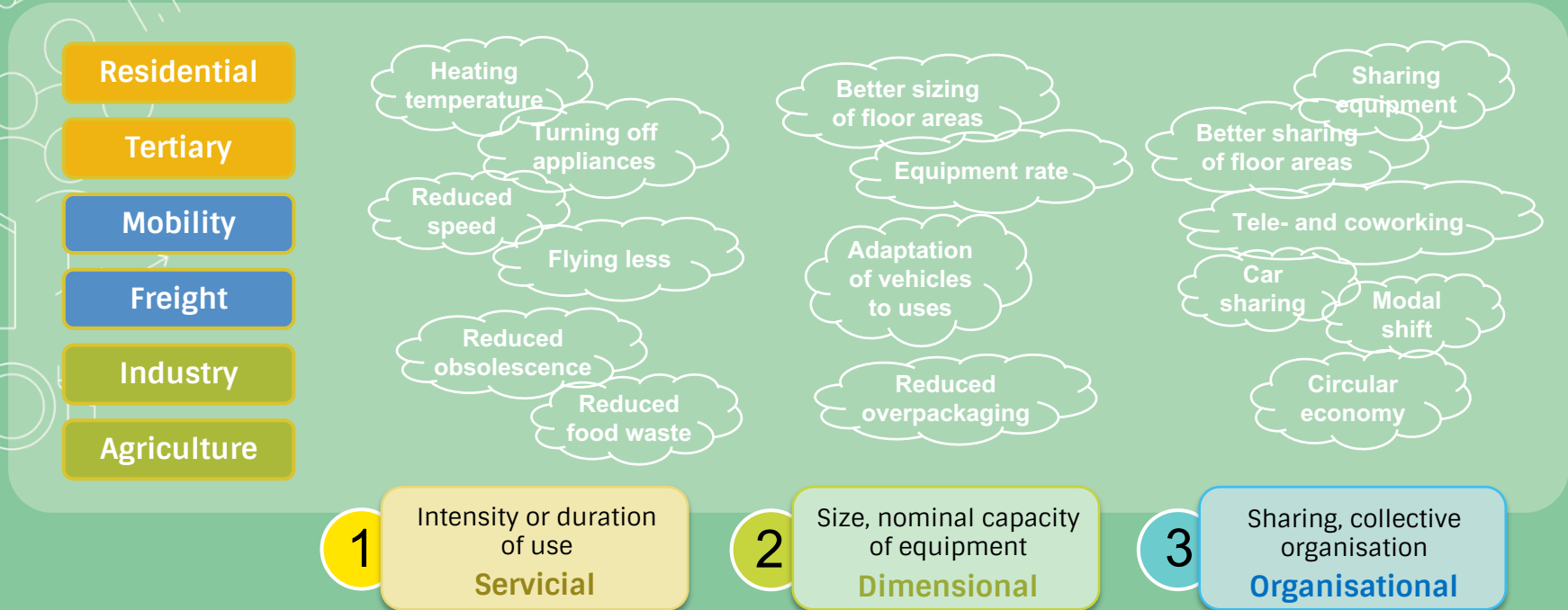
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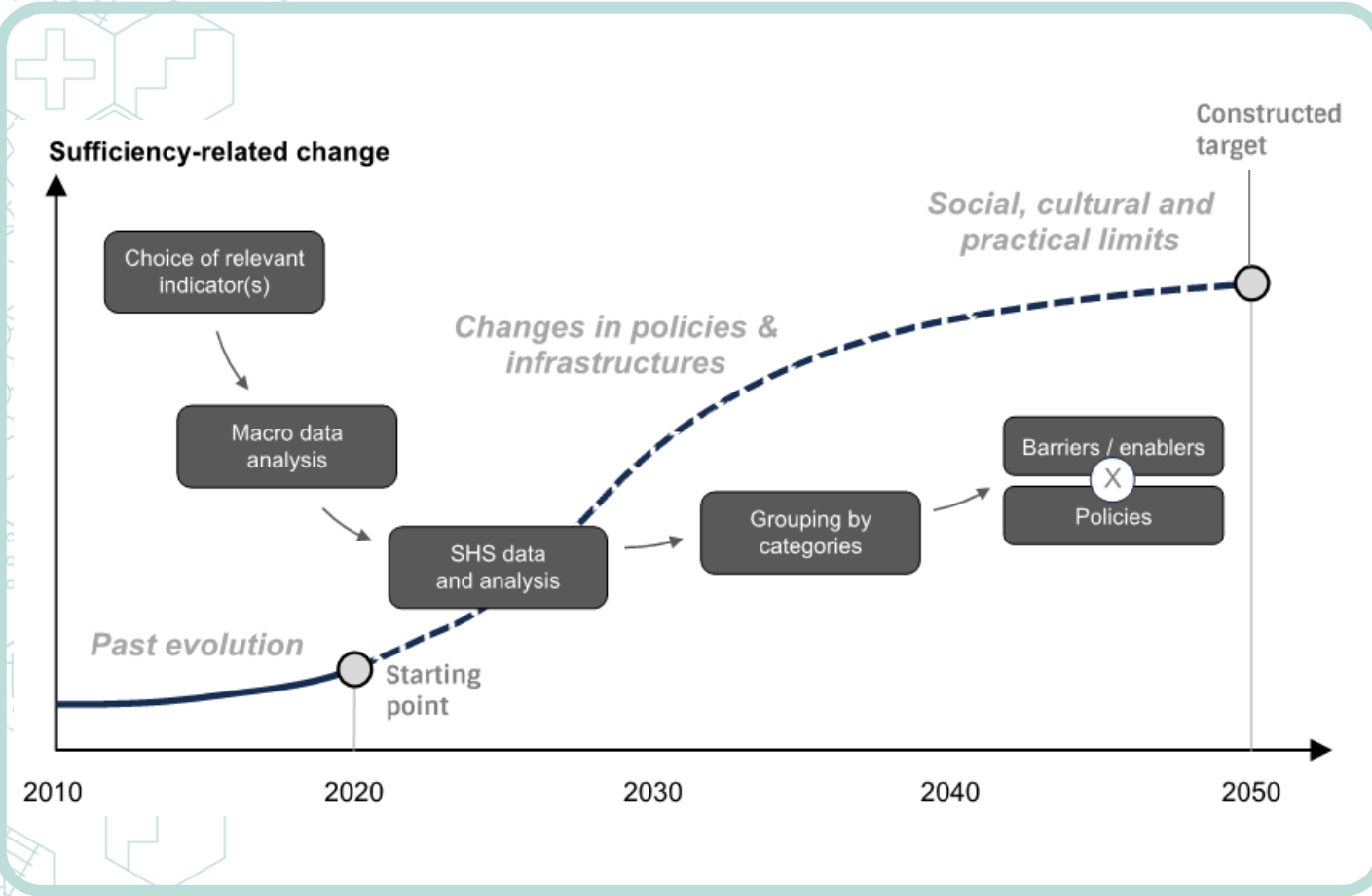
# Sufficiency needs policies and measures as any energy and climate-related lever

What sufficiency means in FULFILL: *“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 are within planetary boundaries, and simultaneously contributes to societal well-being”*







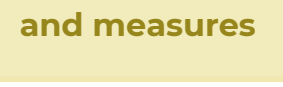
- Informing & supporting actions
- Guiding & regulating innovation and markets
- Changing social norms & practices
- Regulating & adapting infrastructures

# Sufficiency policies and measures can be discussed in relation with projected dynamics of possible change



-  **Sharing space in housing**  
*Focus on people aged 65+*
-  **Cohousing**
-  **Sharing products**  
*Focus on washing machines*
-  **Reduced car sizing**
-  **Biking more**  
*Focus on daily trips*
-  **Flying less**
-  **Change in diet**

## Selection and analysis

- 1 **Sufficiency-oriented change**  

- 2 **Detailed related levers**  

- 3 **Corresponding targets (end-users, players...)**  

- 4 **Identified and perceived enablers / barriers**  

- 5 **Policies and measures**  




# Sufficiency policies: car sizing

Car industry manufacturers

Car fleet users

Households (≠ categories)

Market  
Increasing share targets

Labels  
Life cycle CO2 & energy labelling

Regul.  
Weight / size targets in fleets

Tarifs  
Progressive motorway toll

Sub.  
Support car-sharing schemes

Info.  
Raise awareness re. weight impact

Market  
Standards re. material contents

Labels  
Weight / size criteria

Fiscal.  
Weight / size malus-bonus

Tarifs  
Progressive parking toll

Sub.  
Support EU micro-car EV industry

Info.  
Build breaking positive narrative

+ EU/national goals for greening vehicles

+ Increasing pressure re. material resources

+ Social awareness re. climate / greening

+ Urban / spatial planning constraints

+ Need to transform funding schemes

## Enablers

+ Individual / social priority re. road safety

+ High cost of EVs re. just transition

+ Influence of advertisement

## Mixed

- Complex calculation and traceability

- Lock-in of a tailpipe CO<sub>2</sub> free only prism

- World trade rules, free market

## Barriers

- Lobby of car industry (business models)

- Lack of awareness on weight/size impacts

- Link to social status, freedom, masculinity...

# Sufficiency policies: change in diet

## Six case studies of local / national policies and the related dynamics

- Denmark
  - Plant based/climate friendly meals in public kitchens and canteens
- France
  - Vegetarian menus in schools and public cafeterias
- Germany
  - Veggie-Day
  - VAT reduction
- Italy
  - Green Mondays: Vegan Menu at Bolzano's Hospital Canteen
- Latvia
  - Policies supporting vegetarian diets at schools

- Background:** what drives/hinders the policy
- Policy:** nature, objectives and status
- Context:** policy consistency and adequacy, policy enforcement, public participation
- Evaluation:** climate and cobenefits, transformative power, social acceptance

### Potential

### Policies

### Enablers and barriers

- Low Short term** Labels informing on nutrition and environment
- Low Short term** Campaigns to promote healthy & sustainable diets
- Medium Short term** Implement food & climate education in schools
- Low Mid term** Train professions in contact with the public to inform
- Mid term** Free nutritionist check-up once a year
- Medium Long term** Access to healthy and sustainable food in social protection systems
- Medium Short term** Implement vegetarian options in catering
- Medium Mid term** Regulate food marketing and advertisement
- Mid term** Environmental objectives for food industries
- Mid term** Redirect subsidies towards alternatives
- Strong Long term** Fair taxation and redistribution on food



# Sufficiency policies: change in diet

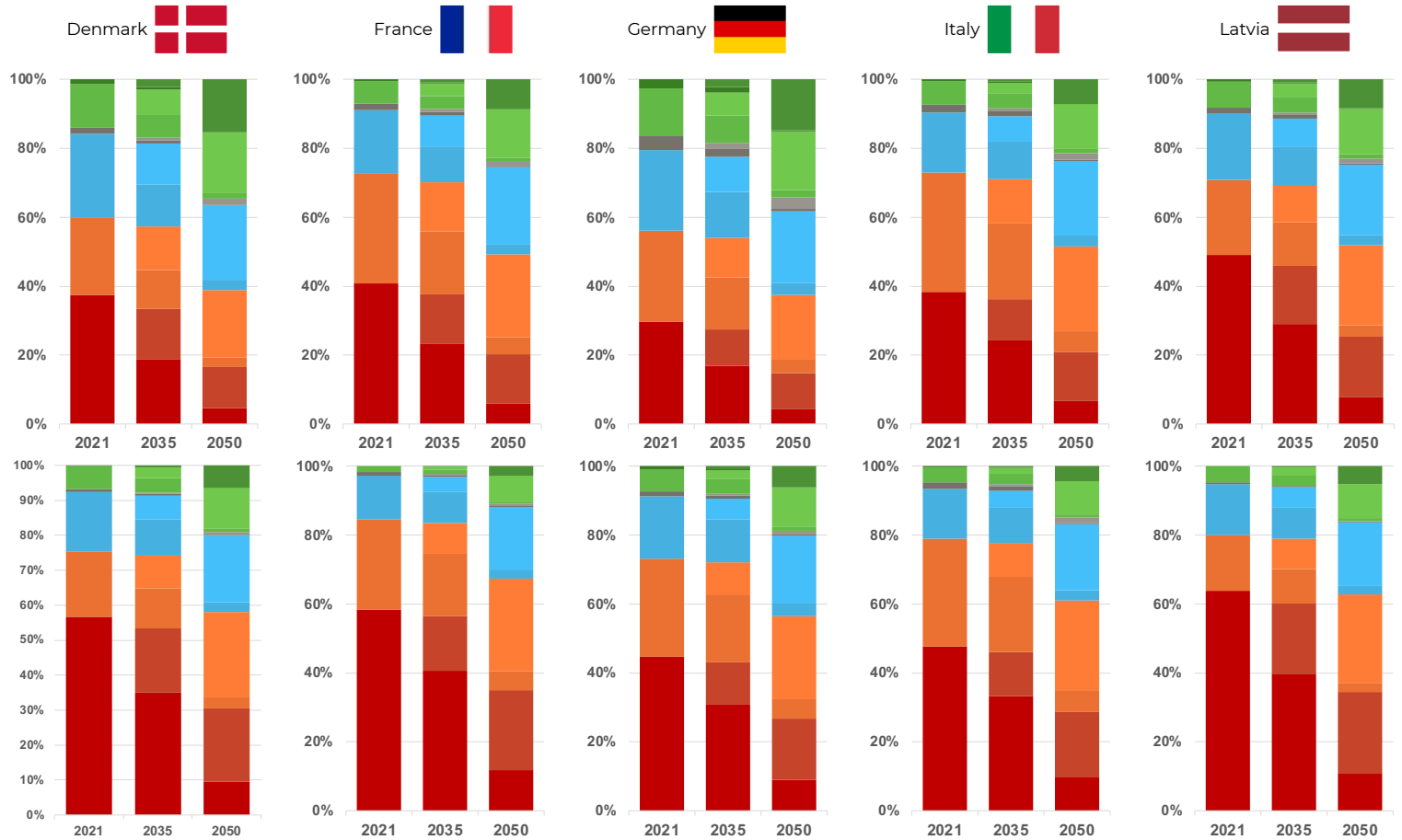
♀ Women

♂ Men

**2020-type diets**

**2050-type diets**

- Vegan  Vegan
- Vegetarian  Vegetarian
- Pescetarian  Pescetarian
- Flexitarian (30g)  Flexitarian (20g)
- Omnivore - low (75g)  Omnivore - low (45g)
- Omnivore - high (170g)  Omnivore - high (100g)



18/09/2024

Yves Maignac – Association négaWatt • Sufficiency Policies



## Identified sufficiency policies exist that allow to target all sectors, players and uses

*It is important to understand the **social determinants** at play in the transformation of lifestyles towards sufficiency and to consider the **barriers and enablers** for sufficiency policies. This preliminary step allows, by identifying the targets more clearly, to better define the policy objectives and thus to design more tailored and effective policy instruments.*

*The suggested approach enables the elaboration of **relevant narratives** because it forces to describe precisely the social and political dynamics at work throughout the trajectory. This can contribute to making sufficiency policies more tangible.*

*With more detailed policy work, the methodology developed would make it possible to **outline a policy strategy by articulating policies and measures for the short, medium and long term**. Integrating this temporal articulation of policies directly into the process of constructing the quantified trajectory matters both **to strengthen the scenario assumption** and **to give a clear direction to policy makers**. This interdisciplinary work seems of interest to **reinforce the political credibility of sufficiency scenarios**.*

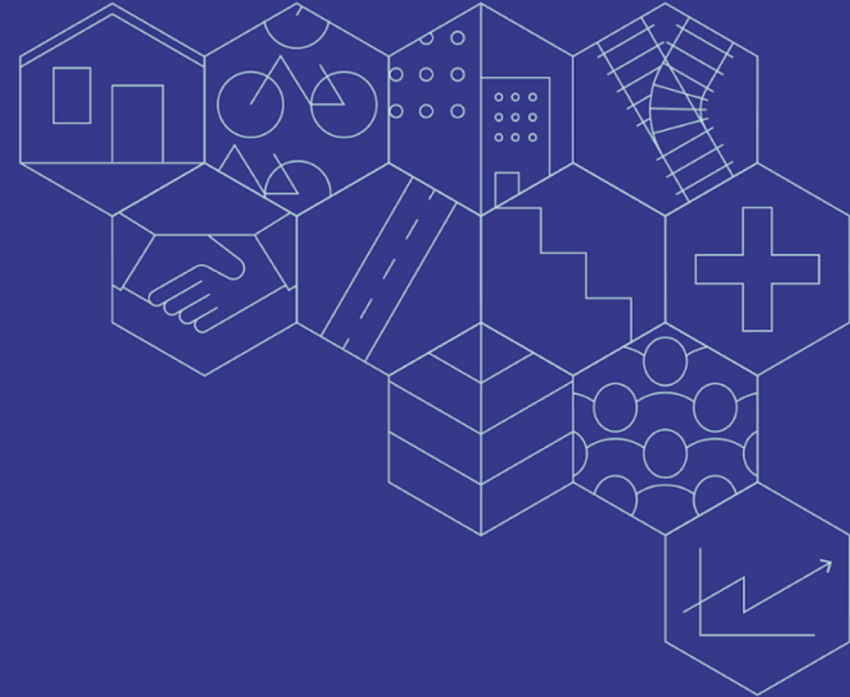


Fundamental decarbonisation  
through sufficiency by lifestyle changes

## Sufficiency in the NECPs

- analysis covering four EU countries

Gunnar Boye Olesen, INFORSE-Europe





**EU is developing one NDC (National Determined Contribution) for the Paris Agreement.**

The NDC for 2035 with update for 2030 is to be submitted 9-12 months before COP30 in 2025 (before March 2025)

**Each of the 27 EU countries (+Ukraine) are developing their own NECP (National Energy & Climate Plan),**

The NECPs shall add up to the EU NDC.  
Drafts NECPs were ready in 2023, final versions submitted (from) June 30, 2024



# The 4 countries and the sectors analysed for sufficiency in NECPs

NECPs of
Denmark
France
Germany
Italy

Activities
Buildings 
Mobility 
Products 
Diets 

Policies for 30 sufficiency measures searched in NECPs

# Sufficiency in National Energy & Climate Policies (NECPs), 4 countries

Country	Sufficiency in NECP 2024
<ul style="list-style-type: none"><li>● <b>Denmark</b></li></ul>	<p><b>Buildings:</b> Moving electricity use in time Energy advice including behavioural change</p> <p><b>Mobility:</b> Bicycling paths, Aviation tax</p> <p><b>Products:</b> Packaging tax, Direct re-use station requirement</p> <p><b>Diets:</b> (none)</p>
<ul style="list-style-type: none"><li>● <b>France</b></li></ul>	<p><b>Buildings:</b> temperature regulation, limit light, move el. use</p> <p><b>Mobility:</b> Employer pgm, carpooling, train support, aviation tax and limits, bicycles support, bicycle paths, support rail freight, speed limits</p> <p><b>Products:</b> green claims reg., repair label</p> <p><b>Diets:</b> plant protein promotion, vegy choice in canteens. 20% organic food in canteens, halving food waste, 8% vegetable farming</p>

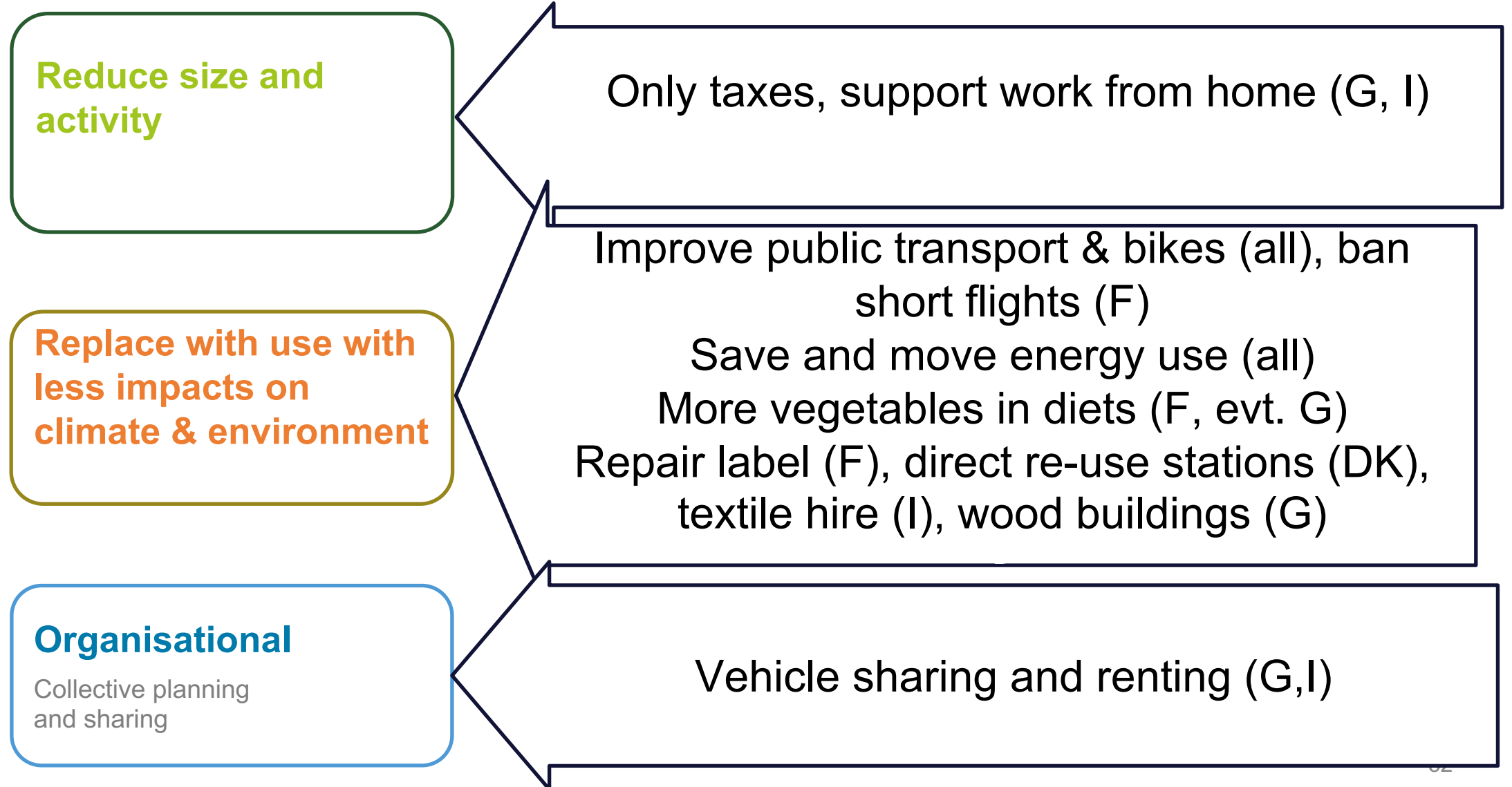
# Sufficiency in National Energy & Climate Policies (NECPs)

Country	Sufficiency in NECP 2024
<ul style="list-style-type: none"><li>● <b>Germany</b></li></ul>	<p><b>Buildings:</b> Energy saving campaign with advise on behavioural change, electricity check low income people, dynamic tariffs to move electricity use in time</p> <p><b>Mobility</b> Public transport expansion, favourable tickets (49€), tax relief for rental bicycles, bicycling paths, promote rail freight aviation tax, Gigabit strategy to improve work from home</p> <p><b>Products:</b> Promote timber buildings</p> <p><b>Diets:</b> preparing sustainable nutrition strategy</p>
<ul style="list-style-type: none"><li>● <b>Italy</b></li></ul>	<p><b>Buildings:</b> Energy saving campaign with advise on behavioural change, dynamic tariffs to move electricity use in time (dynamic tariffs on water)</p> <p><b>Mobility</b> Public transport expansion, tax credits for cargo bicycles, bicycling paths, promote work from home, car pooling, shared vehicles (cars, bicycles etc.)</p> <p><b>Products:</b> Right to re-use and repair, promote hire of textile products</p> <p><b>Diets:</b> (none)</p>

# What is New in 2024 NECPs

- **Denmark:** 11 new and amended policies, none on sufficiency, several sufficiency policies not quantified
- **France:** Policies still the same, but sufficiency included in scenario with additional measures (e.g. 6,6 MtCO<sub>2</sub> out of 51,6 MtCO<sub>2</sub> reduction of transport emissions)
- **Germany:** New energy change campaign including energy change dialogues with citizens
- **Italy:** Action Plan on Sustainable Consumption and Production (NAP) under preparation, but other new policies do not include sufficiency

# Sufficiency policies in NECPs, overview



# Overview of sufficiency in NECPs

- Of 30 types of sufficiency policies identified, 7 used in Denmark, 10 in France, 5 in Germany, 9 in Italy
- Many sufficiency policies not strongly implemented
- Local sufficiency regulations can inspire new national policies
- National sufficiency policies are quite different and countries can inspire each other
- With less than 1/3 of sufficiency policies used, there is a big potential for increased climate action with more and stronger sufficiency policies



# Sufficiency in NECP vs. Proposals: German Buildings

German NECP, 2024	Proposals for more sufficiency
<p><b>REDUCE</b> (no measures to reduce building or dwelling sizes)</p>	<ul style="list-style-type: none"><li>● Promote co-housing</li><li>● Promote sharing dwelling, renting rooms</li><li>● Assist moving to smaller dwellings</li><li>● Promote well planned tiny house developments</li></ul>
<p><b>LOWER IMPACT</b></p> <ul style="list-style-type: none"><li>● Energy Advice services</li><li>● Low-income energy advice, electricity</li></ul>	<ul style="list-style-type: none"><li>● Label for energy efficient behaviour</li><li>● Moderate temp in public buildings</li><li>● Lifeline tariffs of energy</li></ul>
<ul style="list-style-type: none"><li>● Dynamic electricity tariffs to move electricity use in time</li></ul>	
<p>(Local limits of parking in cities)</p>	<ul style="list-style-type: none"><li>● Reduce requirements for parking</li></ul>



# Sufficiency in NECP vs. Proposals: German Diets

German NECP, draft 2023	Proposals for more sufficiency
<p><b>REDUCE</b> (no measures to reduce food use)</p>	<ul style="list-style-type: none"><li>● Strategy to reduce food waste</li></ul>
<p><b>LOWER IMPACT</b></p> <ul style="list-style-type: none"><li>● Prepare nutrition strategy for sustainable diets</li></ul>	<ul style="list-style-type: none"><li>● Promote plant based diets, information, campaigns</li><li>● Vegetarian meals in canteens, one option always and some days as only option</li><li>● 19% VAT on meat, 0% VAT on vegetables</li></ul>
<ul style="list-style-type: none"><li>● Limit livestock to 2/ha</li></ul>	





# 2023 NECP drafts were not adding up to EU 55% target

**EU 2030 target is 55% GHG reductions 1990-2030**

**NECPs (2023 drafts) are adding up to 51% reduction 1990-2030 (European.Commission)**

**Sufficiency policies can help EU meeting the emission gap**

And now it's your turn!



**Or go to:  
[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)**

# We analysed 6 sufficiency measures: Which are the two most important ones in your opinion?



[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)

Responses:

A: Reducing the quantity of animal-based products in diets

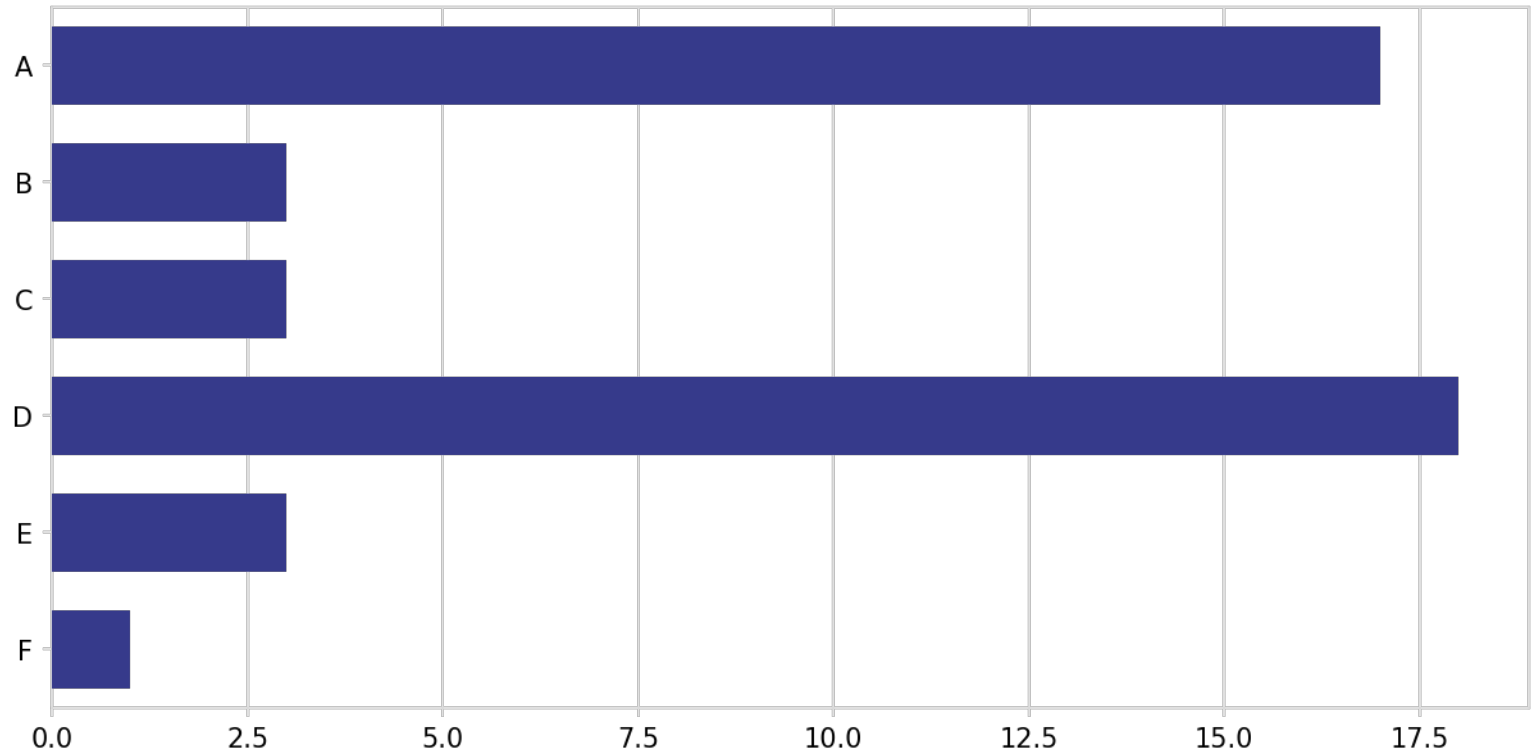
B: Choosing moderately sized cars

C: Cycling

D: Flying less

E: Sharing living spaces

F: Sharing products



ID = ISI78  
45 participants / Poll closed

58



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003656



**Fundamental decarbonisation  
through sufficiency by lifestyle changes**

# Quantification of sufficiency measures and contribution to EU climate targets

Wolfram Sparber, E. Schau, M.G. Prina, F. Beltrami  
N. Golinucci, L. Rinaldi, F. Tonini, M.V. Rocco,

Eurac Research, Politecnico di Milano  
18th September 2024, Brussels





# Objective

## **Specific goal -1**

To quantify the effects of sufficiency on greenhouse gas emissions, macroeconomic indicators, energy use, and resource consumption using an **input/output model** (related to report 6.2\*)

## **Specific goal – 2**

To analyze the impact of sufficiency on the **National Energy and Climate Plans (NECPs)** (related to report 6.5\*)

\*Available online at <https://fulfill-sufficiency.eu/our-research/>

# Single measures in single countries have been considered in detail

Input data provided by Negawatt:  
**6 sufficiency measures for 5 countries**

- Diets
- Sharing spaces in housing
- Moderate car sizing
- Sharing products\*
- Biking
- Flying less

- Italy
- France
- Germany
- Latvia
- Denmark

\*only washing machines are considered

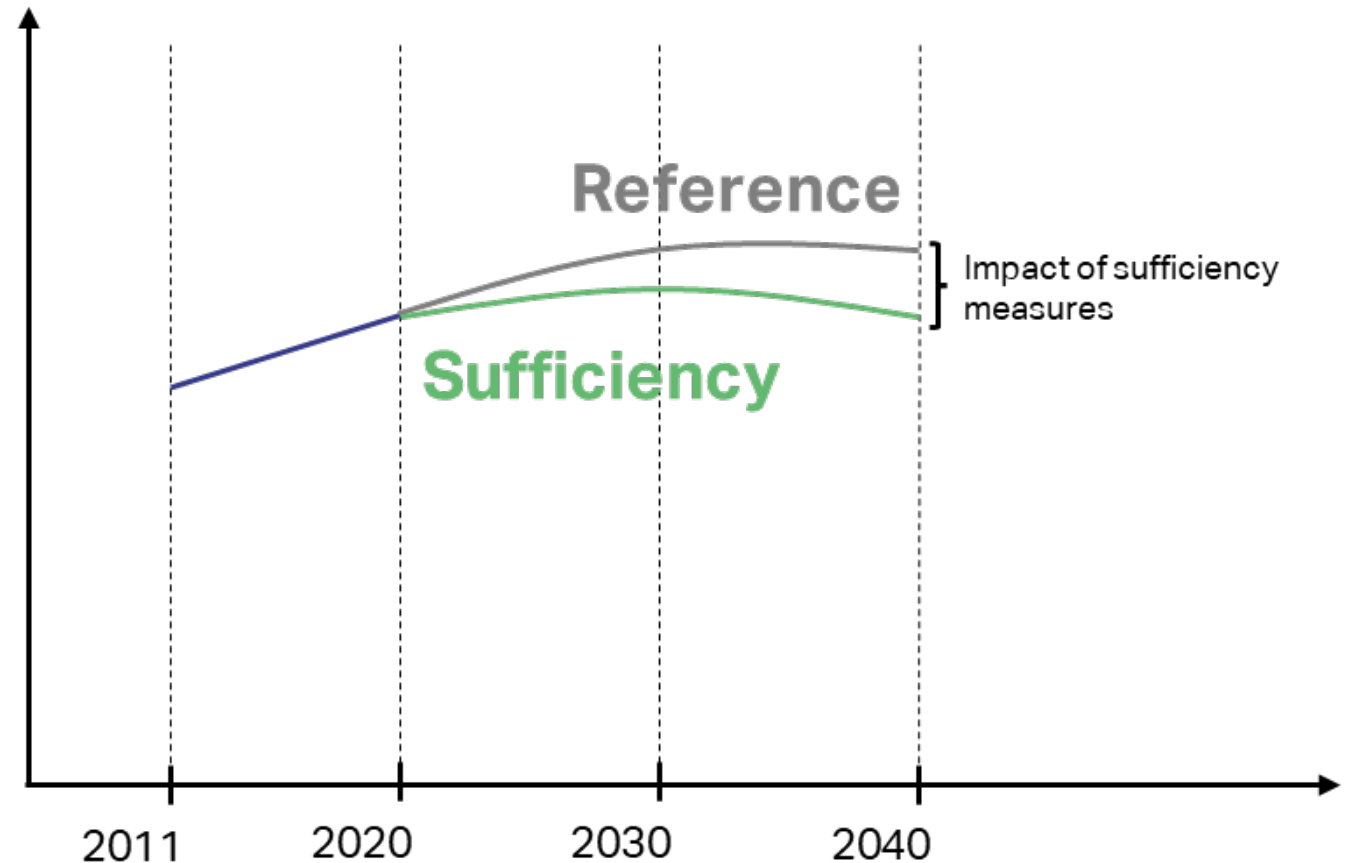
# Sufficiency versus Reference scenario



Qualitative representation of how impact assessment results are reported for each sufficiency measure.

Emissions in sufficiency scenario are lower than in the reference scenario but might be higher or lower of the status quo today in dependence of the development trend over the last years

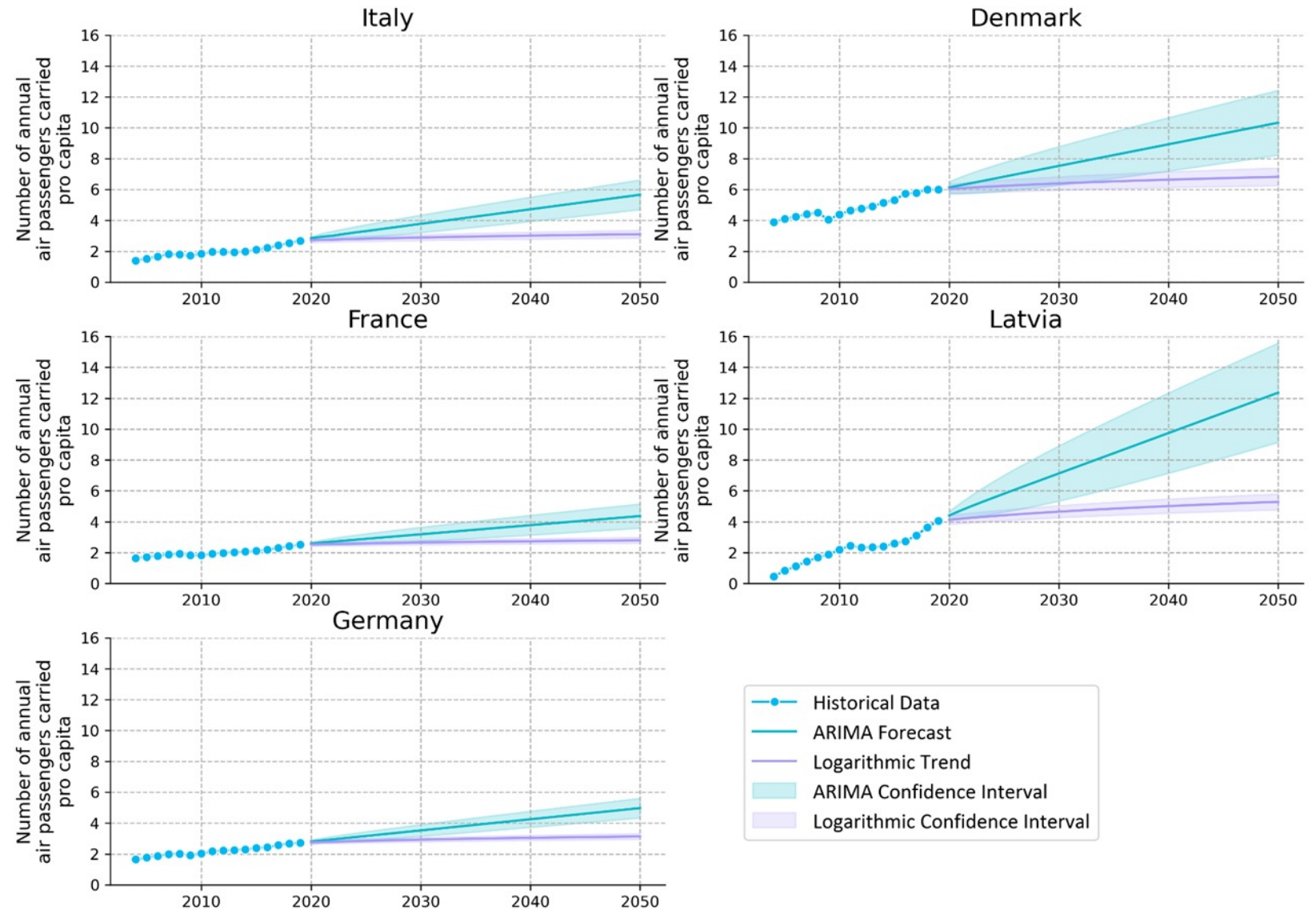
Global GHG [Gton]



# Reference scenarios - example flying less



Data source: Eurostat, Annual air passenger carried pro capita by reporting country.  
Link: [Statistics | Eurostat \(europa.eu\)](https://statistics.eurostat.eu)

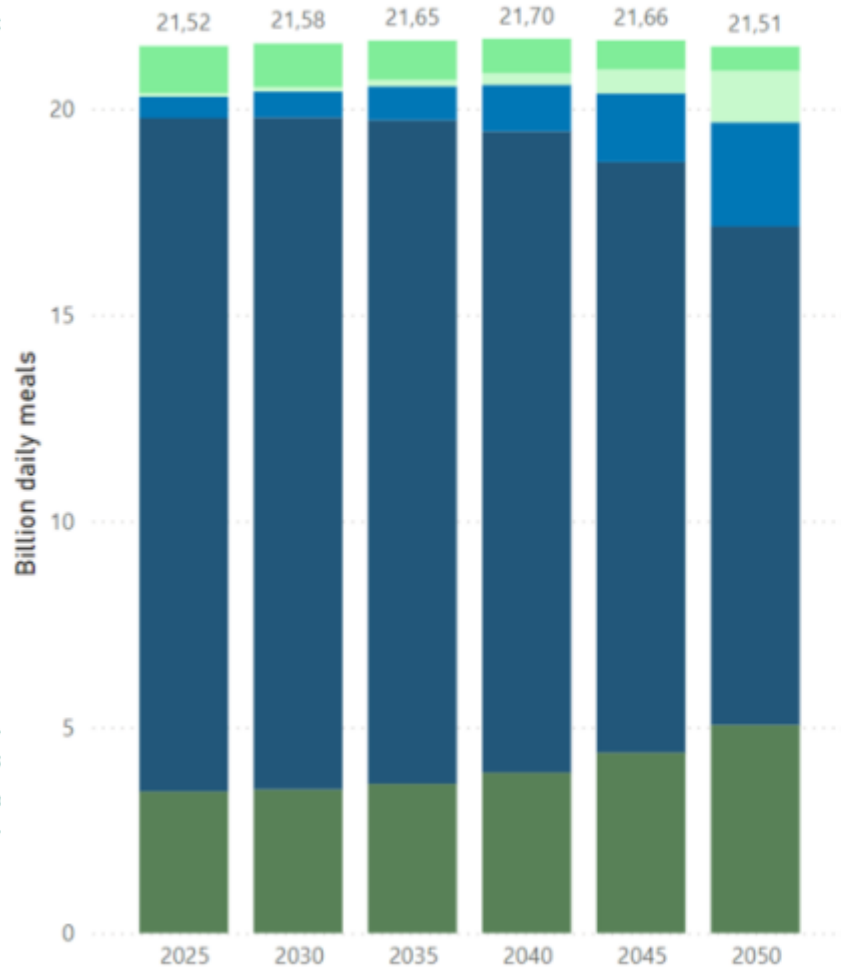


\*



# Future sufficiency development – example diets

Daily meals volume in EU by diet and year



Diet mix shares in EU by diet and year

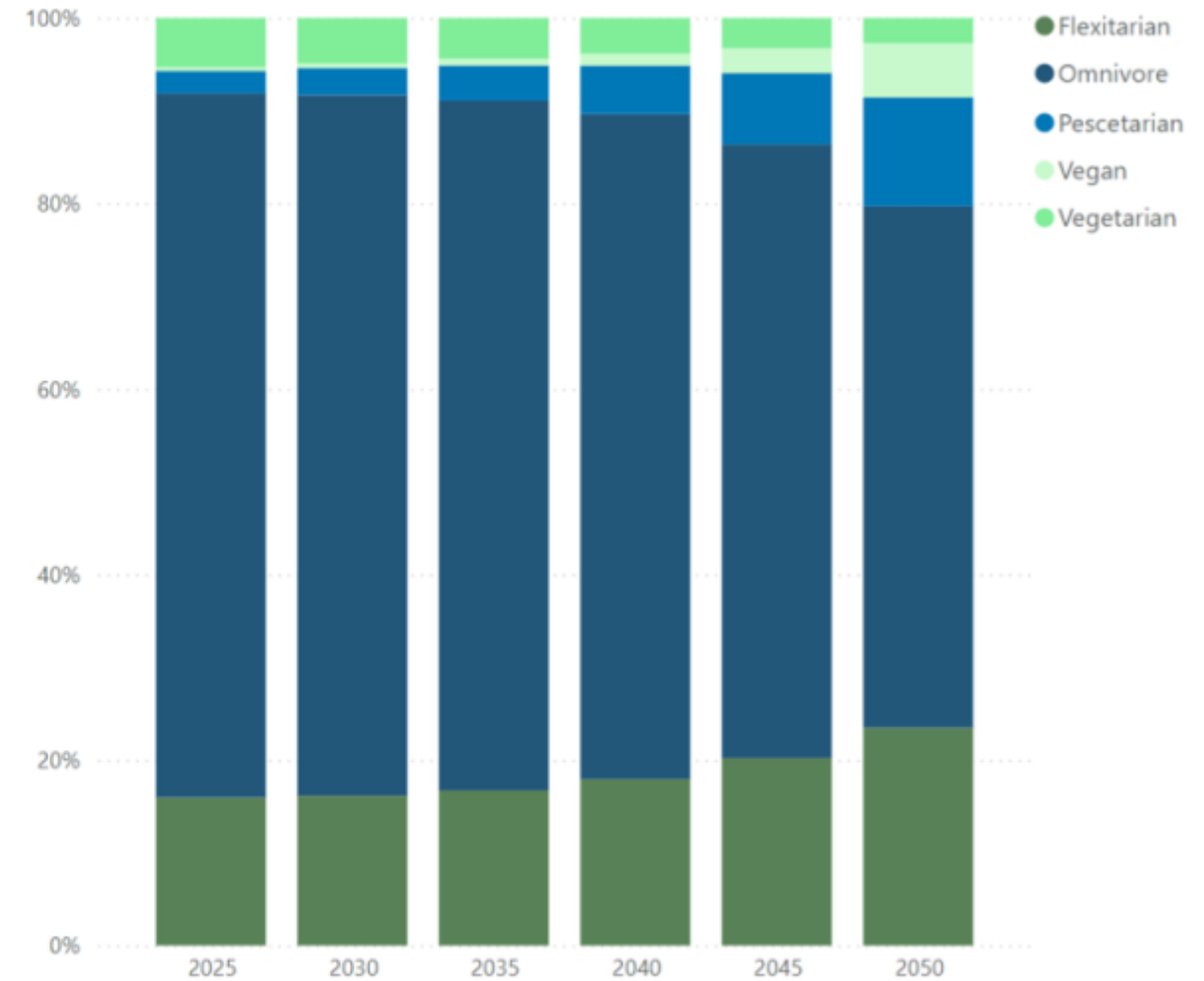
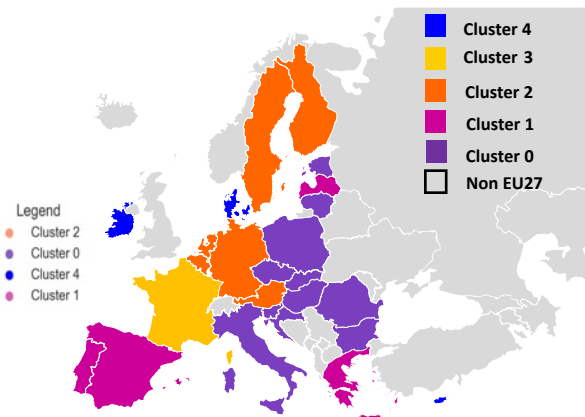
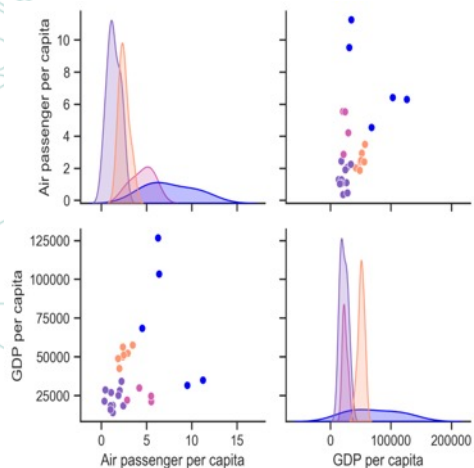
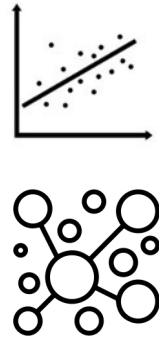


Figure 4 – Daily meals volumes (on the left) and diet mix (on the right) in EU by year assumed in this study.

# Methods and materials

## Preprocessing of data for MARIO

- Sufficiency trends for 5 countries (Italy, France, Germany, Latvia, Denmark)
- Evaluation of reference trends for 5 countries
- Clustering analysis to extend results to all EU countries



## Input/output Macro-economic modelling

### INPUT

- Input-Output (IO) database
- Description of sufficiency measure
- Additional information on scenarios



MARIO:  
Open Python-based  
objective programming  
for easing IO analysis

### PROCESSING

Automatizing the application of each  
sufficiency measure in multiple scenarios

### OUTPUT

- Aggregated results (products, activities, regions, ...)
- Results visualization



Economic indicators



Use of energy and  
resources



Emissions of  
greenhouse gases

# Results – GHG reduction relative to reference

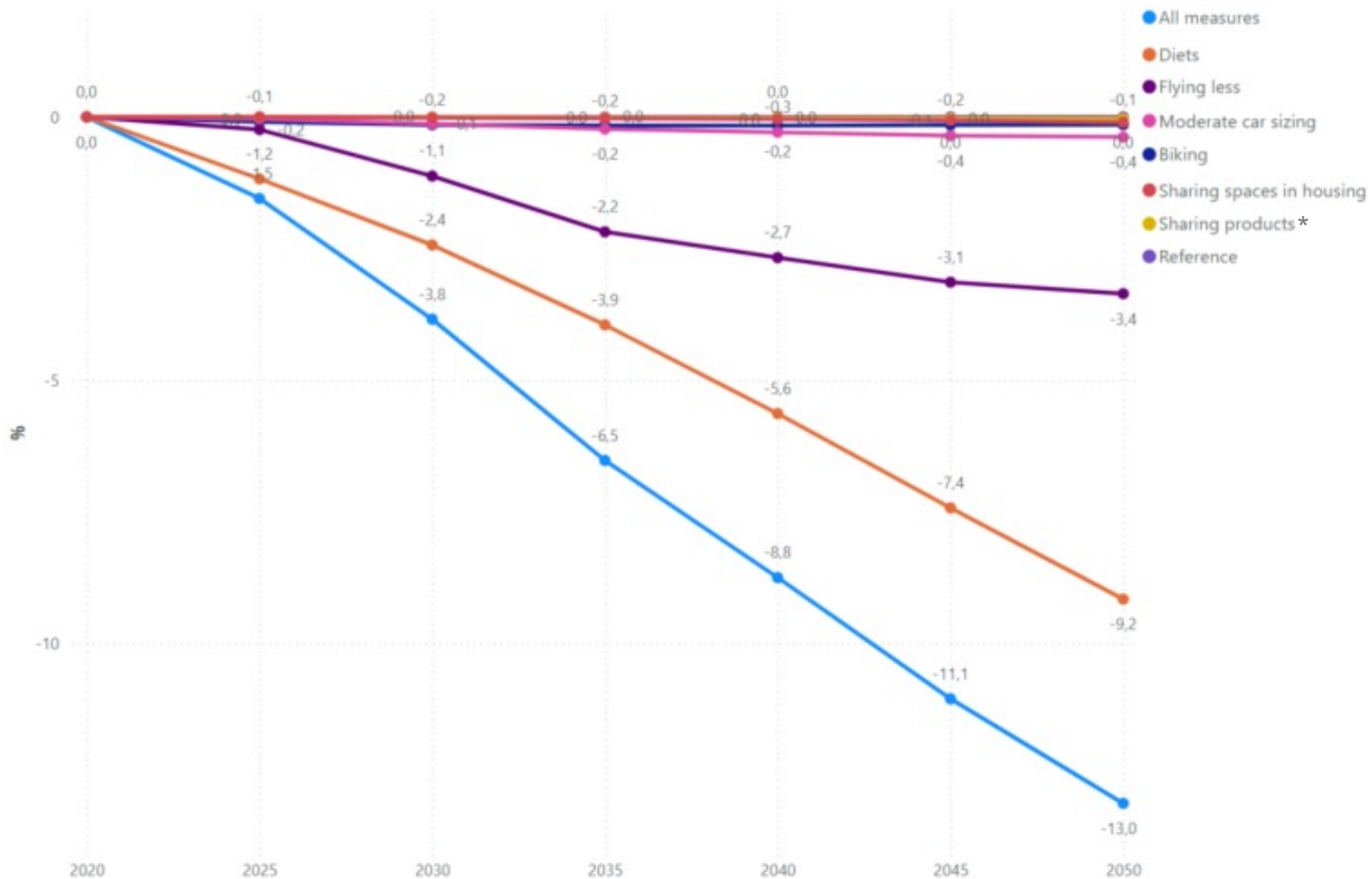


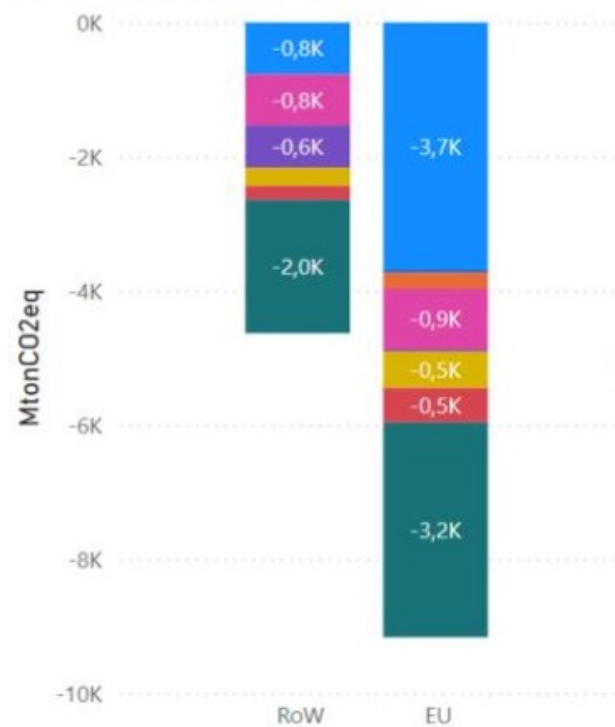
Figure 29. Relative reduction of GHG emissions brought by each sufficiency scenario assumption in the EU with respect to Reference scenario

\*only washing machines are considered

# Impact on GHG, GDP, employment

Considering ONLY the direct impact. E.g. money not spent on one measure is not considered to be spent in other sectors

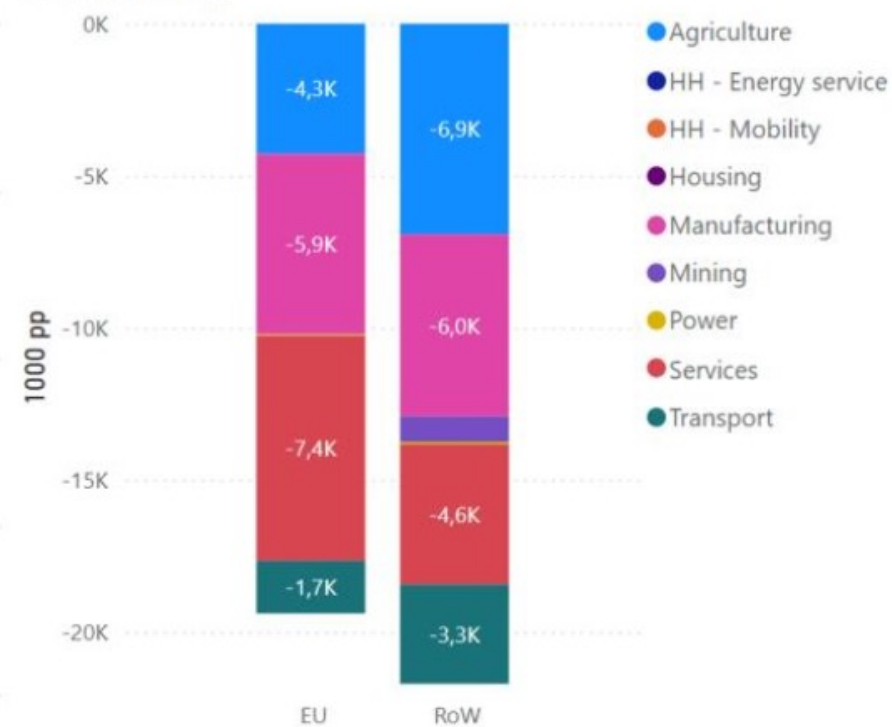
a. Cumulative GHG emissions



b. GDP



c. Employment



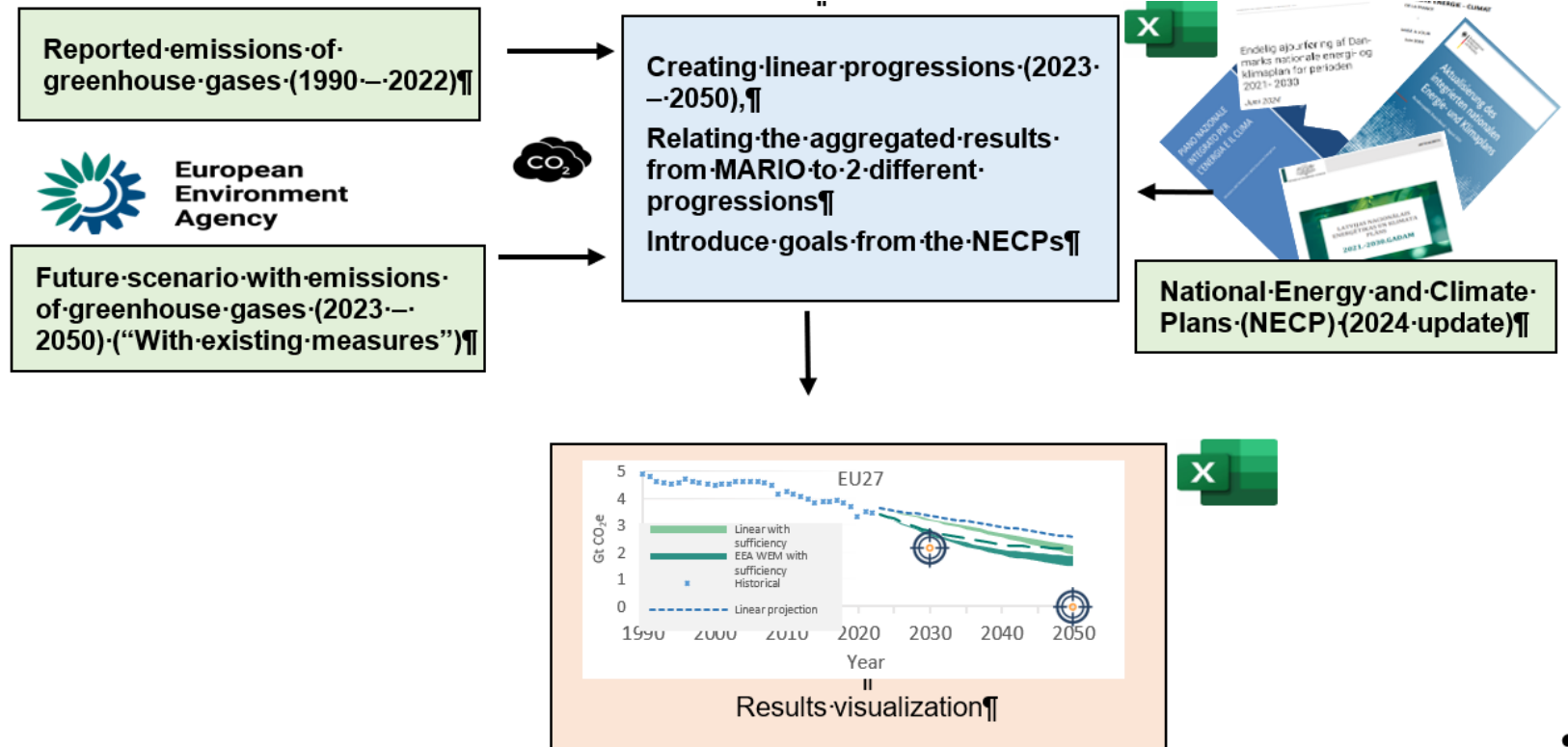
from Reference	Absolute change	Relative change
EU	-9'166	-5.67%
RoW	-4'633	-0.28%
<b>World</b>	<b>-13'799</b>	<b>-0.75%</b>

Absolute change	Relative change
-774	-4.03%
-204	-0.23%
<b>-978</b>	<b>-0.90%</b>

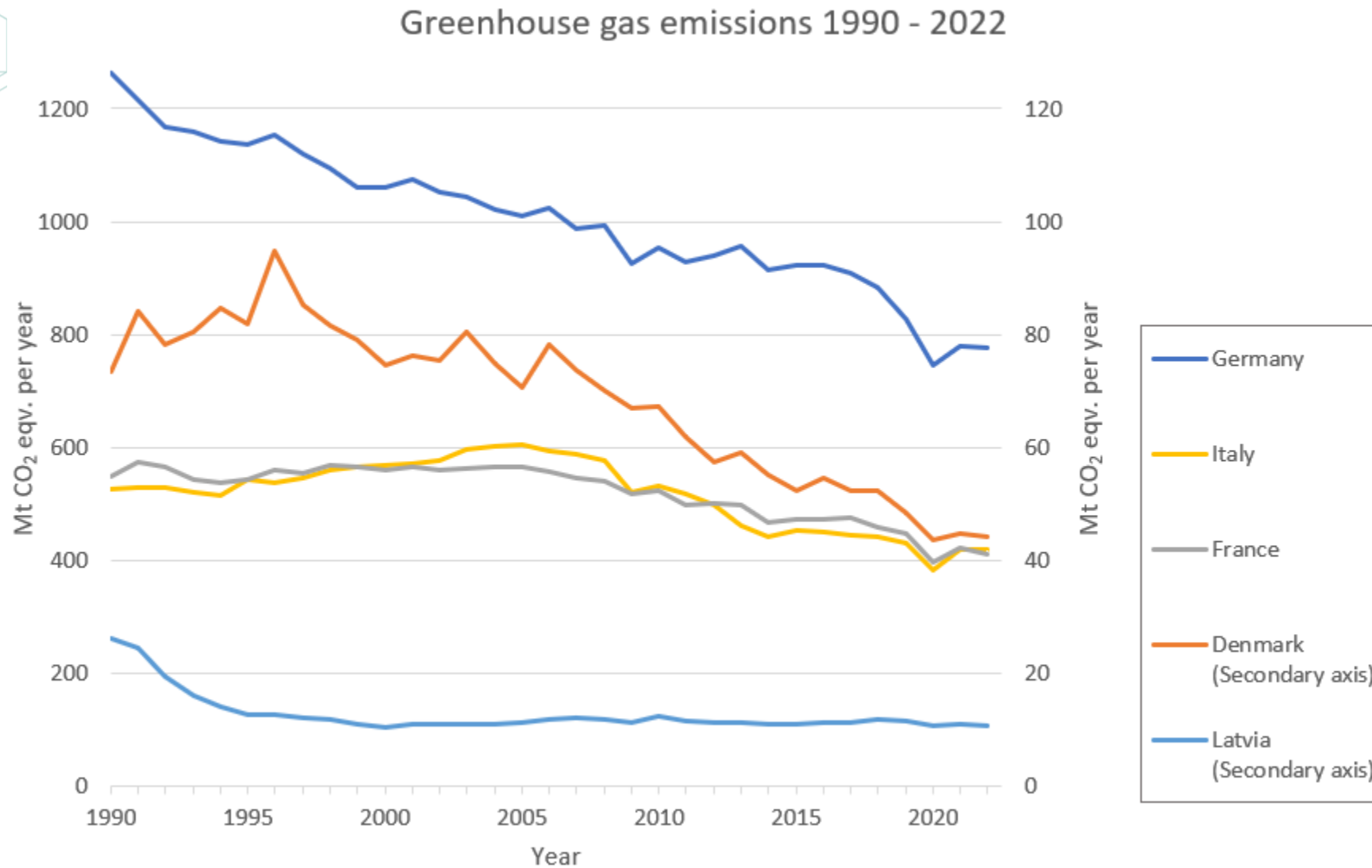
Absolute change	Relative change
-19'396	-4.99%
-21'710	-0.17%
<b>-41'106</b>	<b>-0.32%</b>

# Sufficiency in NECPs

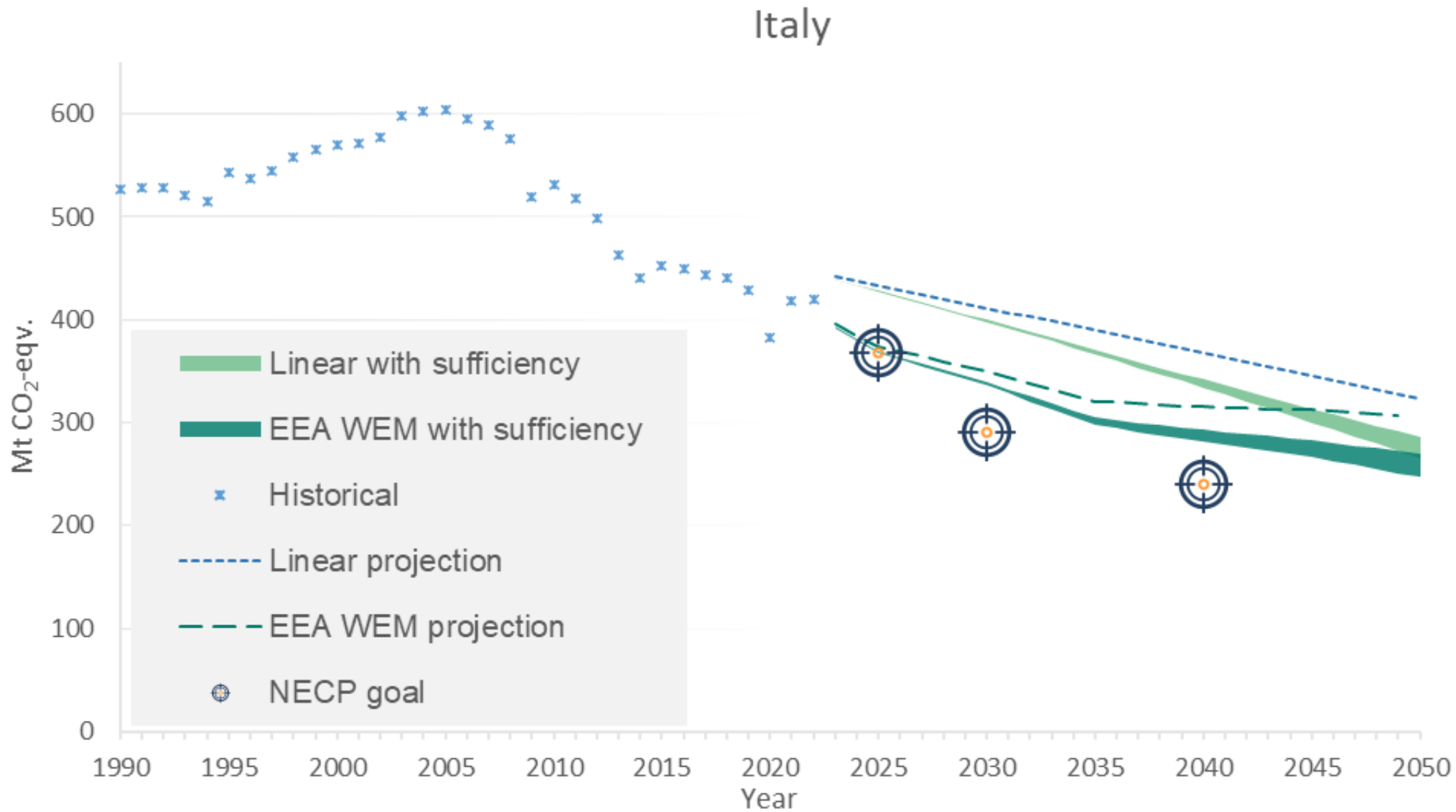
- Evaluation of NECPs
- Most NECPs do not include quantitative contributions of sufficiency
- Process:



# GHG emissions 1990 – 2022 in 5 countries



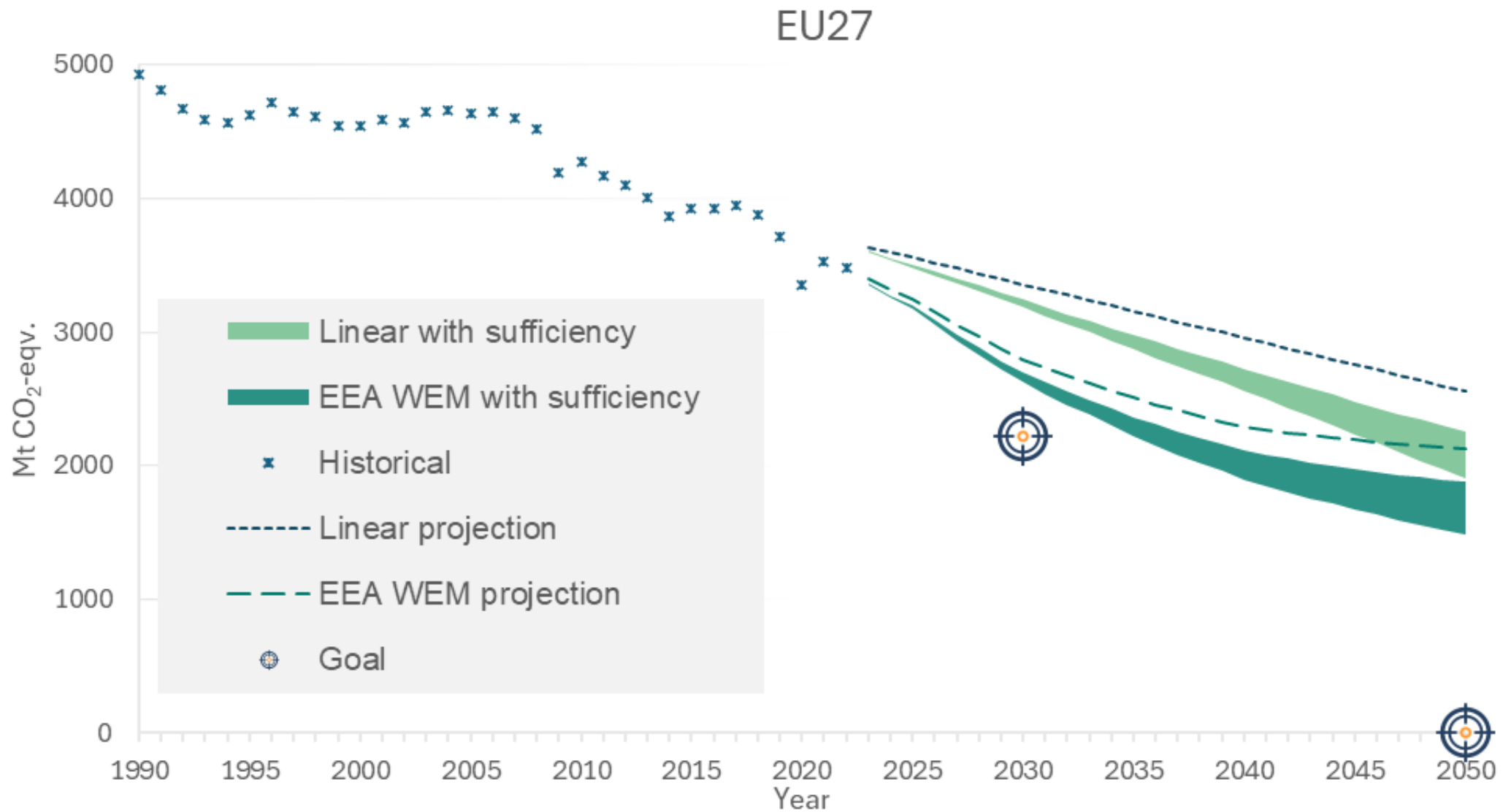
# Results – Example Italy







# Results – EU 27





# Conclusions

- **6 sufficiency measures** have been selected and elaborated **for 5 countries**
- Reference scenarios based on past trends have been elaborated and data have been extended through clustering to EU 27
- **I/O analysis** with software tool MARIO have been elaborated for EU27 + rest of the world
- **Diets** turn out to be **the most important single measure**, even if assumed changes are not drastic
  
- **NECP** set goals of 5 countries have been analyzed and compared to linear and EEA WEM projections
- Absolute and relative impact of sufficiency measures have been added to linear and EEA projections
- **Sufficiency measures have a visible impact in all countries.**
- The impact is **especially relevant** when pathways come **close to climate neutrality**

And now it's your turn!



Or go to:  
[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)

Compared to non-vegetarians, long-term vegetarians have a higher expected lifespan.

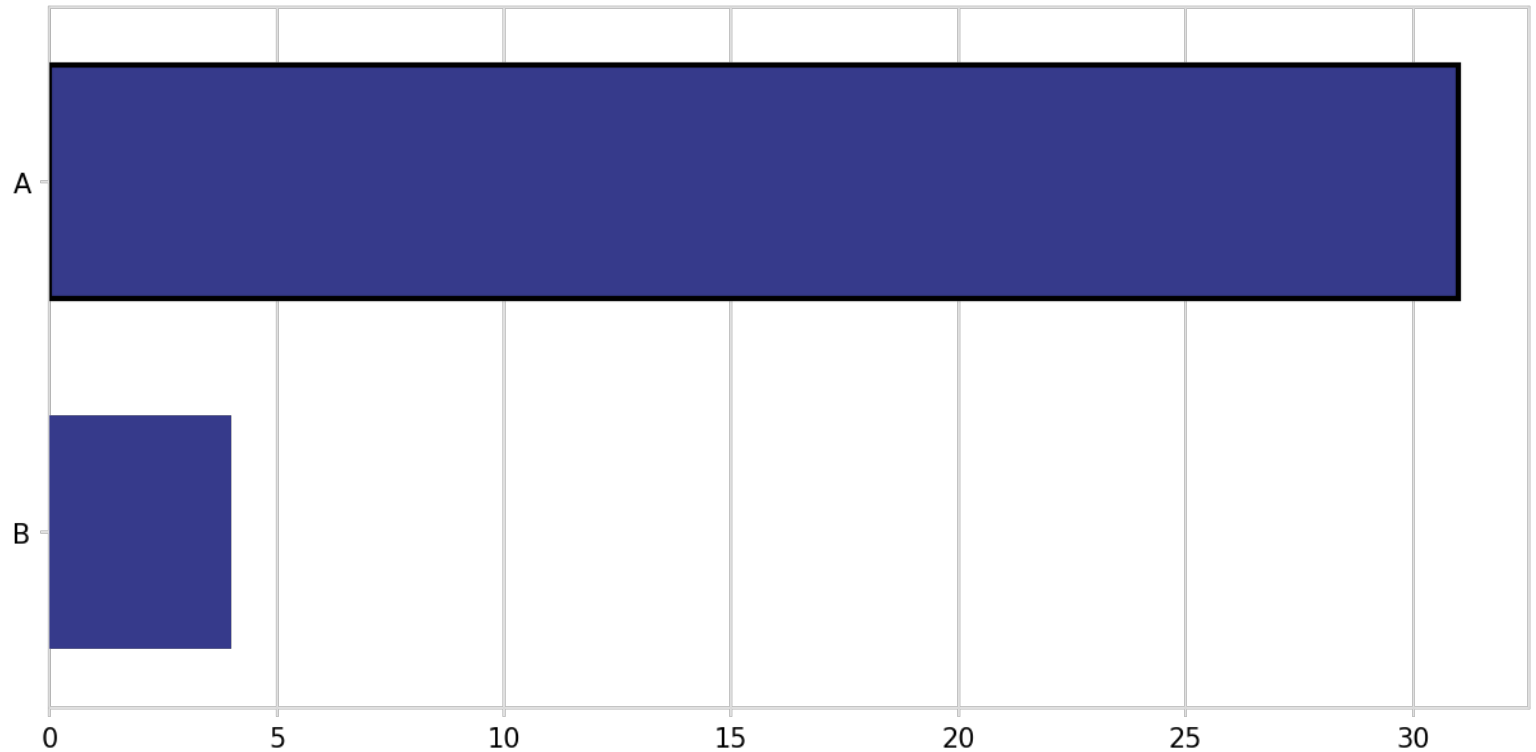


[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)

Responses:

A: True

B: False



ID = ISI78  
35 participants / Poll closed

75

# Even a balanced vegetarian diet will lead to negative health effects.

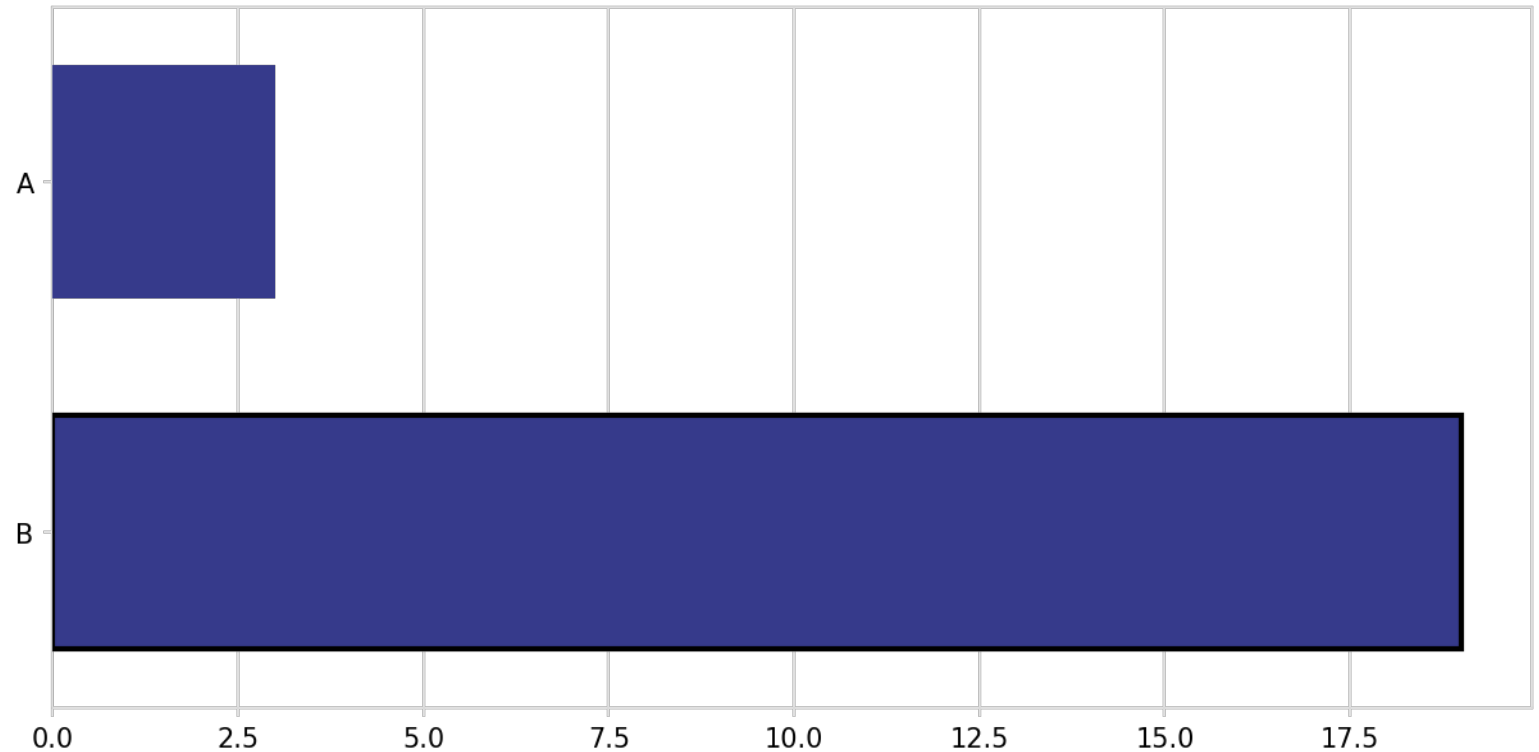


[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)

Responses:

A: True

B: False



ID = ISI78  
23 participants / Poll closed

76

Compared to non-vegetarians, long-term vegetarians are less likely to develop heart disease.

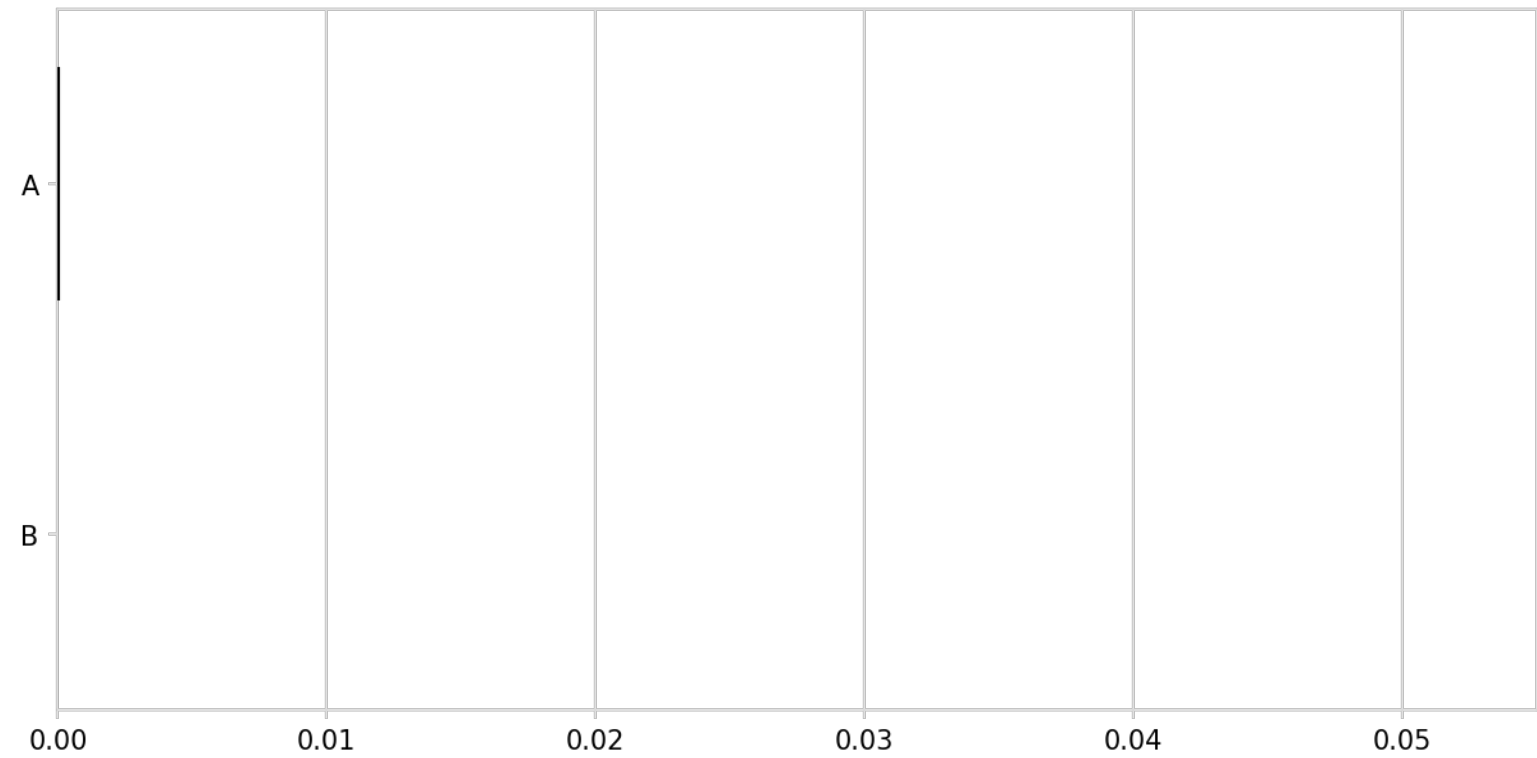


[vote.ac/?id=ISI78](https://vote.ac/?id=ISI78)

Responses:

A: True

B: False





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**Fundamental decarbonisation  
through sufficiency by lifestyle changes**

# Social Impact Assessment

**Risks & Benefits from implementing sufficiency policies**

**Dr. Manuel Bickel, Wuppertal Institute**

**18<sup>th</sup> of September 2024**





# Social Impact Assessment: Tasks (D6.3)

## Goal (from proposal)

- “...to achieve a semi-quantitative view of social impacts of up-scaled sufficiency action at the European level” [sic]

## Realization

- **Qualitative assessment of benefits** to ‘Health’ and ‘Poverty Mitigation’ from 8 sufficiency assumptions (e.g. more cycling, smaller cars, working less, eating less meat)
- **Quantitative assessment of contributions** to positive ‘Health’ outcomes for Europe from ‘Cycling’, ‘Car-Sizing’, ‘Eating Less Meat & Dairy’
- **Qualitative assessment of risks** (barriers & target conflicts) of 8 sufficiency assumptions for ‘Health’, ‘Poverty Mitigation’, ‘Gender Equality’, ‘Time-Use’, ‘Just Transition’





# Social Impact Assessment: Methodology

- Heuristics based on Literature, Theories-of-Change, abductive Reasoning, Bayesian Epistemology
- Truth-Conditioning of sufficiency assumptions (*projected pathways*) from other tasks in the project (assumed to be true and actualized)
- Formulation of causal predictions for desired outcomes (shortlink ToC) and credence assessment on the plausibility of these claims (Bayesian Reasoning)
- Bottom-up modelling of quantified benefits based on simple, linear empirical relationships (e.g. reduced ACM from physical activity) as well as Input Data from Task 5.3 (Sufficiency Assumptions for decarbonisation pathways) and 6.2 (Quantitative evaluation of macroeconomic impacts)
- Identification and “scoring” of risks against European social strategies and key objectives with help of decision-trees



# Results: Benefits from Sufficiency

## Benefits to 'Health'

- **Increase in 'Cycling'** partially sufficient for **reduced mortality**, if it increases physical activity and/or reduces use of cars with internal combustion engines
- **Car-pooling** sufficient and **smaller car-sizes** partially sufficient for **reduced mortality** if they decrease or replace fossil fuelled mobility
- **Reducing meat consumption** partially sufficient for **reduced mortality**, if it leads to a more balanced diet
- **Worktime reductions** partially sufficient for **reduced mortality** if it reduces stress and/or long working hours for vulnerable groups

## Benefits to 'Poverty Mitigation'

- **Increase in cycling** and **car-pooling** partially sufficient for **poverty mitigation** if it reduces transport-related expenditures of low-income households
- **Sharing of products** or **space** partially sufficient for **poverty mitigation** if they reduce the monthly expenditures for housing (including capital costs) among low-income households



# Results: Risks from Sufficiency

## Main Insights

- The **broad and non-targeted implementation** of policies towards ‘**Cycling**’, ‘**Eating Less Meat & Dairy**’ and ‘**Working Less**’ might lead to the **exclusion of vulnerable groups**. Especially women with children and low-income households might not be able to participate for economic, but also more pragmatic reasons. This is why the **needs, preferences, and economic capabilities** of these groups **should be taken into account** for policy design.
- Similarly, policies towards ‘**Flying Less**’ and ‘**Product-Sharing**’ require **less intervention** but would **benefit from a similar policy design**. Especially the former is also associated with indirect economic losses for the tourism sector.
- **Car-pooling, car-sizing** and **space-sharing** are associated with **the fewest risks** regarding any of the five dimensions, with some of the risks considered to be non-avoidable (such as disease transmission during car-pooling).




# Main Insights

- Sufficiency policies with strong decarbonisation impacts also usually more beneficial to ‘Health’ and ‘Poverty Mitigation’
  - but associated with more and more severe risks (e.g. Cycling)
- Sufficiency policies with weak decarbonisation effects also usually less beneficial to society overall
  - but associated with less and less severe risks (e.g. ‘Space-Sharing’)
- Barriers are more prevalent than target conflicts and many of these barriers could be overcome by accounting for the needs and preferences of relevant target groups (poor, elderly, women with children)



# Let's keep in touch!



@FULFILLeu  
[www. fulfill-sufficiency.eu](http://www. fulfill-sufficiency.eu)



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