

# RE-ENERGISING EUROPE

Discussions, high-level panels, poster session and field visit  
organised by 7 EU-funded projects!

24 October 2023

Atelier 29, Brussels (Belgium)

#REenergisingEurope



These projects have received funding from the European Union's Horizon 2020 research programme. The sole responsibility for the content of this event lies with the BECoop, MICAT, newTRENDS, NRG2peers, NUDGE, UP-STAIRS and W4RES projects and does not necessarily reflect the opinion of the European Union.

# RE-ENERGISING EUROPE

## Agenda October 24

Event moderated by Heike Brugger, Fraunhofer ISI

10.30 – 10.45 - **Registration & welcome coffee**

10.45 - 11.00 - **Welcome and introduction** - Heike Brugger, Fraunhofer ISI

### First part - Modelling, nudging and assessing future energy demand patterns

11.00 - 11.15 - **Scientific keynote** - Nives Della Valle, European Commission Joint Research Centre, Directorate of Energy, Transport and Climate - Unit of Energy Efficiency and Renewables

11.15 - 13.00 - **Modelling, nudging and assessing future energy demand patterns** - In-depth presentation of the projects' methods and findings, tools and models to understand and reduce energy demand.

Scientific audience, including Q&A - For more information about the projects, posters about tools, pilots and more will be hung in the event room.

Moderation: *Filippos Anagnostopoulos, IEECP*

- Meta Thurid Lotz, Fraunhofer ISI (representing newTRENDS)
- Philipp Mascherbauer, TU Wien (representing newTRENDS)
- Peter Conradie, Senior Researcher, IMEC (representing NUDGE)
- Anne Kesselring, Fraunhofer ISI (representing NUDGE)
- Frederic Berger, Fraunhofer ISI (representing MICAT)
- Felix Suerkemper, Wuppertal Institute (representing MICAT)

13.00 - 14.30 - **Networking lunch**, including poster sessions

### Second part - Multiple benefits, behavioural change and new societal trends - Contributions to energy policy.

14.30 - 14.45 - **Keynote** - Margot Pinault, DG ENER, European Commission

14.45 - 15.45 - **Policy learnings from the projects**

Moderation: *Giulia Pizzini, IEECP*

- MICAT: Barbara Schlomann, Fraunhofer ISI
- NUDGE: Heike Brugger, Fraunhofer ISI
- newTRENDS: Maksymilian Kochanski, RIC

15.45 - 16.00 - **The Necessary Evolution of Energy Efficiency Policies for Inclusive Transitions** – Emma Mooney, International Energy Agency

16.00 - 17.00 - **Panel - The way forward for energy policy**

Moderation: *Giulia Pizzini, IEECP*

- Nives Della Valle, European Commission, Joint Research Centre, Directorate of Energy, Transport and Climate - Unit of Energy Efficiency and Renewables
- Emma Mooney, International Energy Agency
- Roland Gladushenko, EURIMA
- Heleen Schockaert, RESCoop.eu
- Indra Van Sande, Gent city
- Alessandro Mostaccio, President of Movimento Consumatori, EESC Member and Board Member of the European Consumer Union (ECU)

17.00-18.30 - **Cocktail reception**

#REenergisingEurope



# RE-ENERGISING EUROPE

Welcome & introduction

October 24, 2023 - From 10.45 to 11.00



**Heike Brugger**  
Fraunhofer ISI/NUDGE

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# RE-ENERGISING EUROPE

First Part: Modelling, nudging and assessing future energy demand patterns

October 24, 2023 - From 11.00 to 11.15



**Nives Della Valle**

European Commission Joint Research Centre, Directorate of Energy,  
Transport and Climate - Unit of Energy Efficiency and Renewables

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# Fostering Citizen Action for a Just Energy Transition

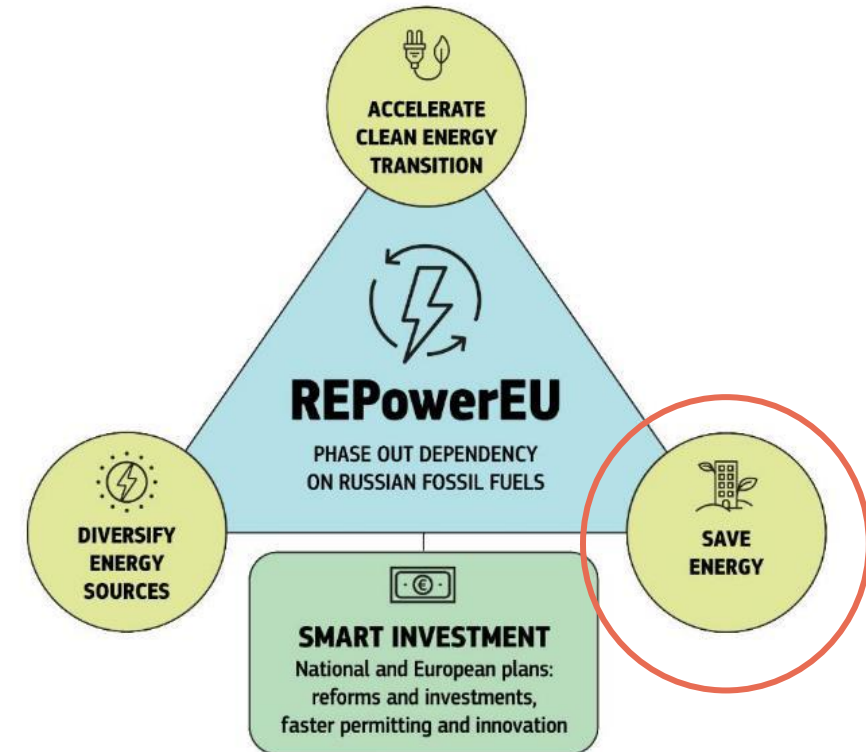
Dr Nives Della Valle – European Commission Joint Research Centre

RE-energising Europe  
Brussels, 24<sup>th</sup> October 2023

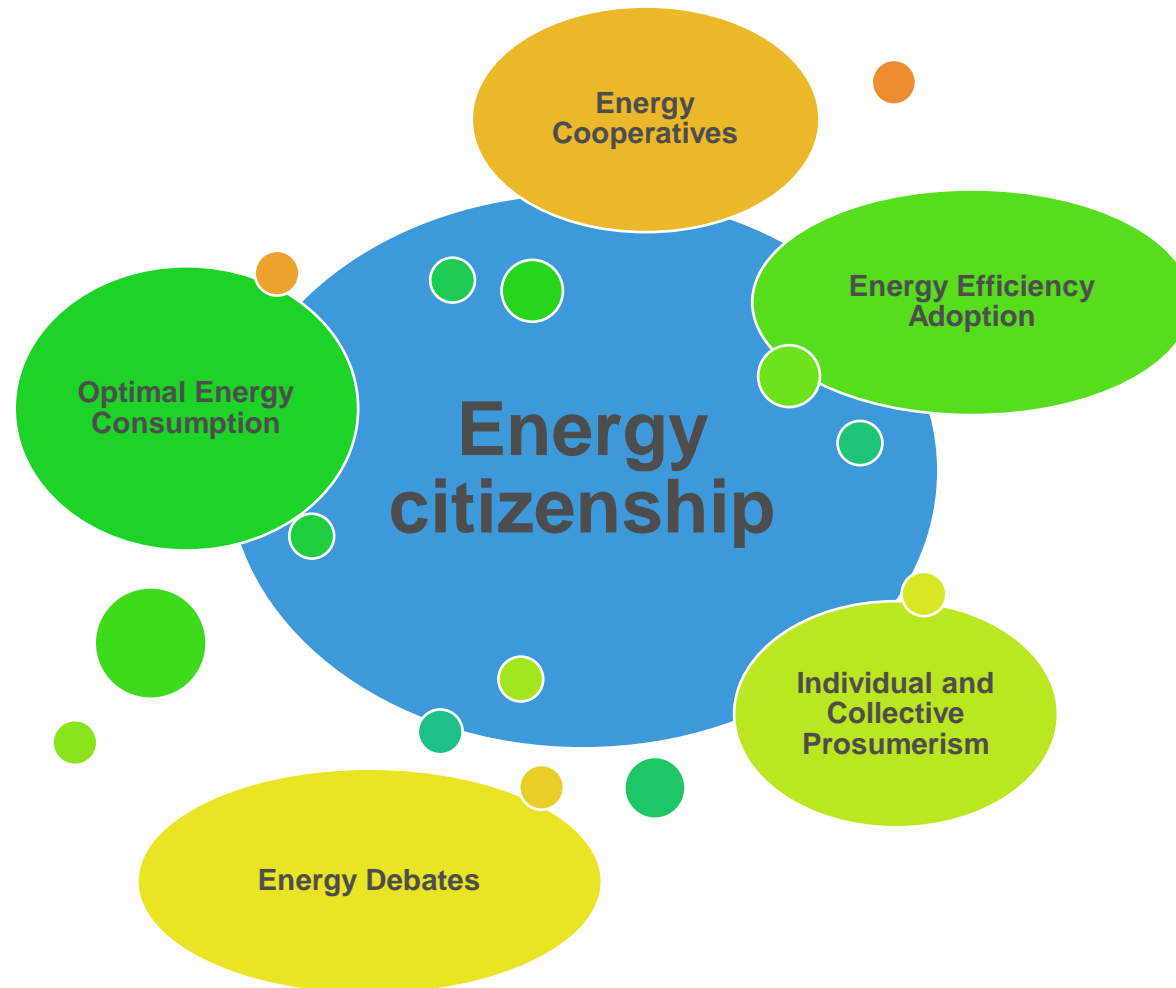
# Climate change & the energy crisis



- No net emissions of greenhouse gases by 2050
- Economic growth decoupled from resource use
- No person and no place left behind



# Empowering Energy Citizenship



# Can we foster a just transition through energy citizenship?

To accomplish this,  
we must:



Understand the **DRIVERS**  
and **BARRIERS** of energy  
citizenship behaviours



Identify **EFFECTIVE**  
**INSTRUMENTS** to empower  
these behaviours



# Understanding drivers and barriers

September 2023



The revised directive was published in the [EU Official Journal](#).

November 2012



Directive on Energy Efficiency 2012/27/EU

- Behavioural barriers
- Behaviour change measures



JRC SCIENCE FOR POLICY REPORT

Mobilising citizens to invest in energy efficiency

*An overview of concepts and approaches for encouraging decisions to invest in energy efficiency*

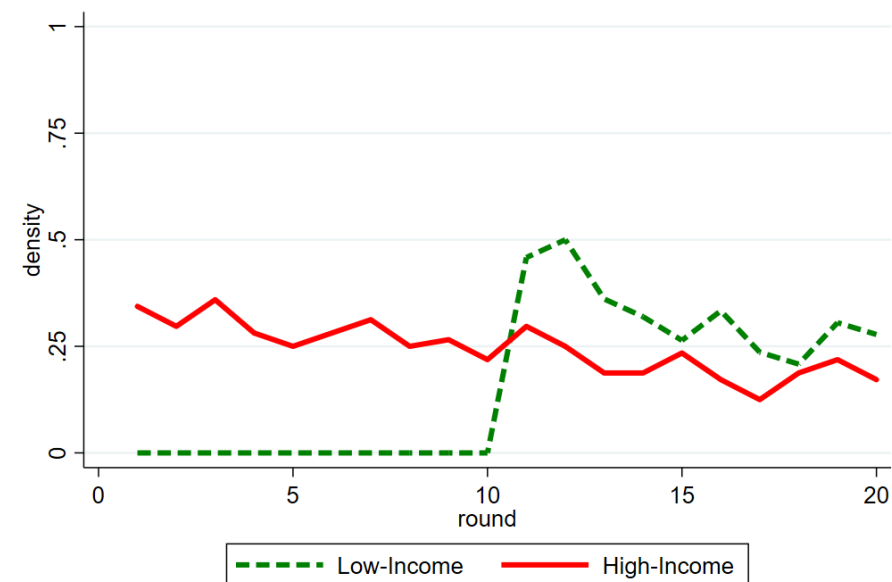
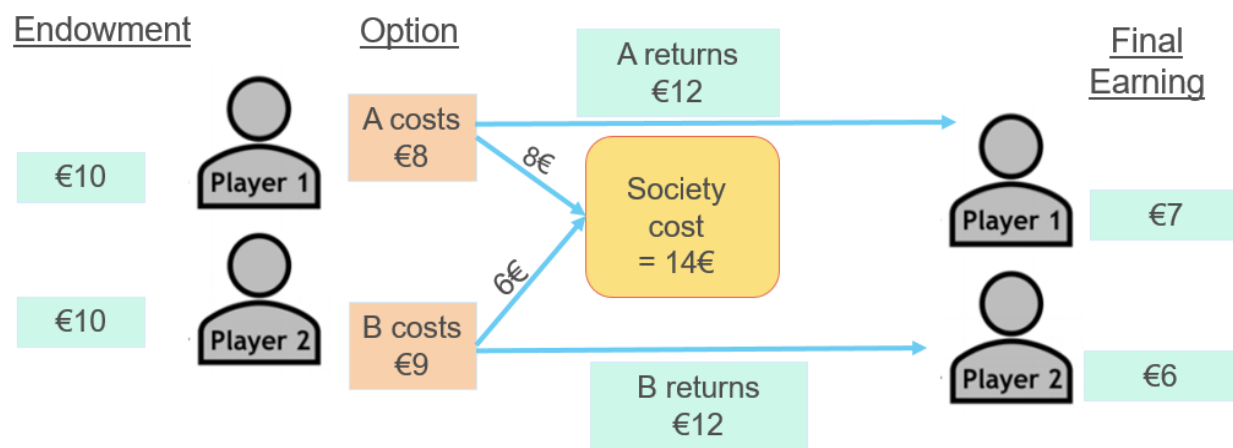
Della Valle, Nives  
Bertoldi, Paolo

2021



# Drivers and barriers among vulnerable groups

## ➤ Public Bad Game



- Lab Experiment with two groups:
- High-income and Low-income with a financial intervention
- 284 participants

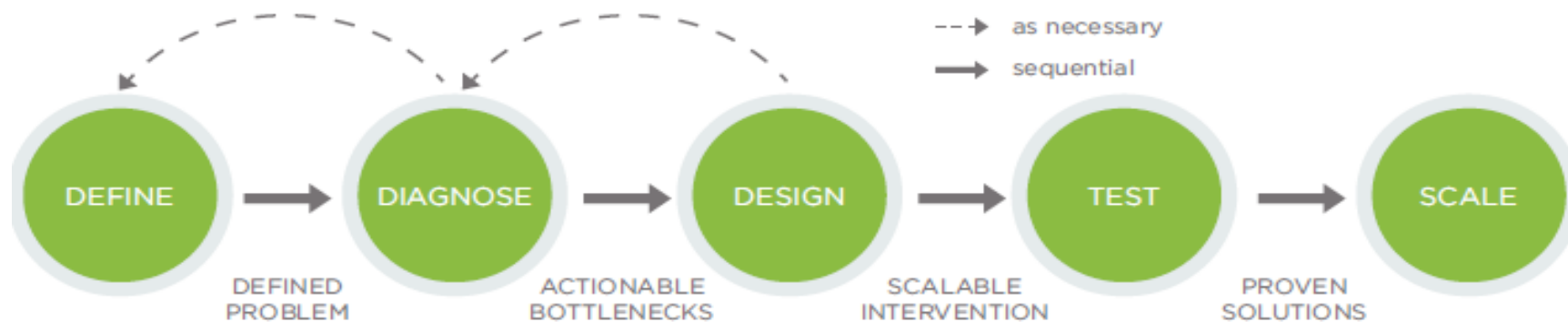
# Drivers and barriers in the twin transition

- Smart Meters provide real-time data for users and optimize energy consumption:
  - (+) Simplify tasks,
  - (-) Raise privacy concerns and reduce agency.
- Key questions on drivers and barriers of energy citizenship behaviours.
- Study used Italy's **smart meter roll-out**.
- **Interviews** with experts and citizens.
- Content analysis based on different **disciplinary lenses**:
  - (+) trust with intermediaries,
  - (-) digital literacy gap, risk, fairness concerns.



# What works?

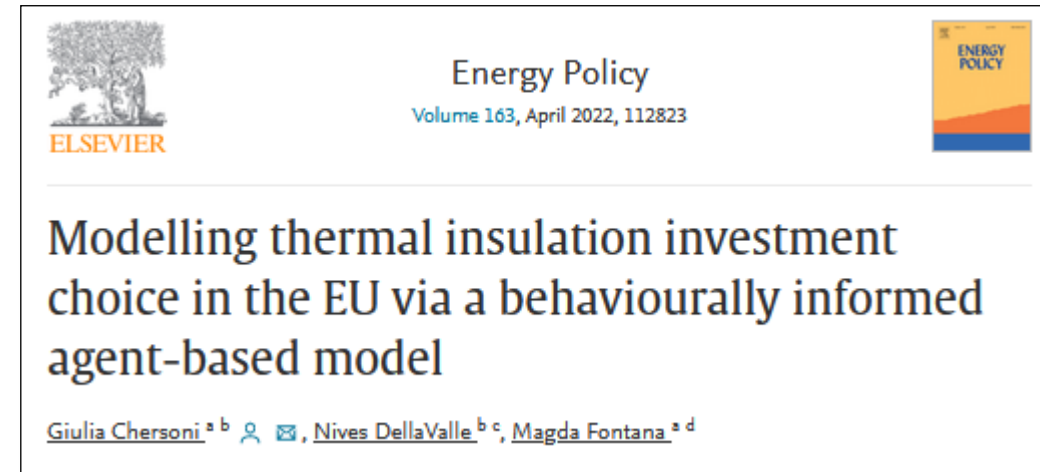
*'We need to be able to rely on social sciences and social scientists to tell us what works and why and what types of policy initiatives are likely to be most effective'* (Young et al, 2002)



Source: Ideas 42

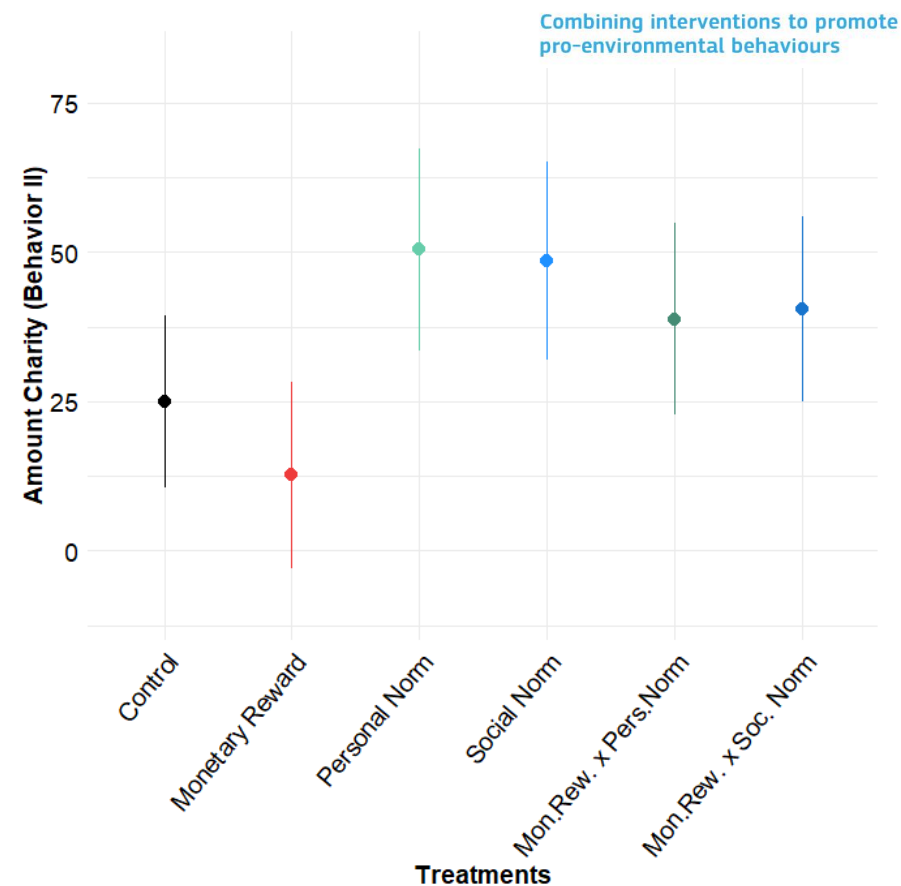
# Evaluating Intervention Efficacy through ABM

- **Renovation decision** modelled as a function of *social, behavioural and economic* motives.
- Test effect of norm-interventions and pro-environmental campaigns.
- **Pro-environmental campaigns** have limited effect on promoting adoption within those who are already intrinsically motivated.
- **Norm-interventions** (target the most central nodes in the social network) should be preceded by a collective identity intervention.



# Evaluating Intervention Efficacy through experiments

- Can **policy mixes** induce lasting behavioural change?
- Online experiment with 4000 participants.
- Policy mixes combining **monetary reward** and **norm-nudges** outperformed monetary reward alone.
- Policy mixes can mitigate *motivation crowding* induced by monetary reward.



# Conclusions

- Promoting **energy citizenship**, including **energy-efficiency adoption** and **optimal energy consumption**, is crucial in addressing today's challenges.
- We already possess substantial knowledge to design effective instruments, various methods to test their efficacy, and diverse lenses for designing them more effectively.
- However, many questions are still open.
  1. **Energy citizenship encompasses also social and political behaviours: what do we know about their drivers and barriers?**
  2. **The policy toolbox is much richer ('boosts,' 'nudge+ ', and 'thinks'): what do we know about their efficacy?**
- Addressing these questions requires collaboration across **methodologies** and **disciplines**.

# Thank you and keep in touch



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# RE-ENERGISING EUROPE

First Part: Modelling, nudging and assessing future energy demand patterns

"Modelling, nudging and assessing future energy demand patterns"

October 24, 2023 - From 11.15 to 13.00



**Felix Suerkemper**  
Wuppertal Institute/MICAT



**Frederic Berger**  
Fraunhofer ISI/ MICAT



**Meta Thurid Lotz**  
Fraunhofer ISI/newTRENDS



**Filippos Anagnostopoulos**  
IEECP



**Philipp Mascherbauer**  
TU Wien/newTRENDS



**Peter Conradie**  
IMEC/NUDGE



**Anne Kesselring**  
Fraunhofer ISI/NUDGE

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# newTRENDS

## New trends in energy demand modelling

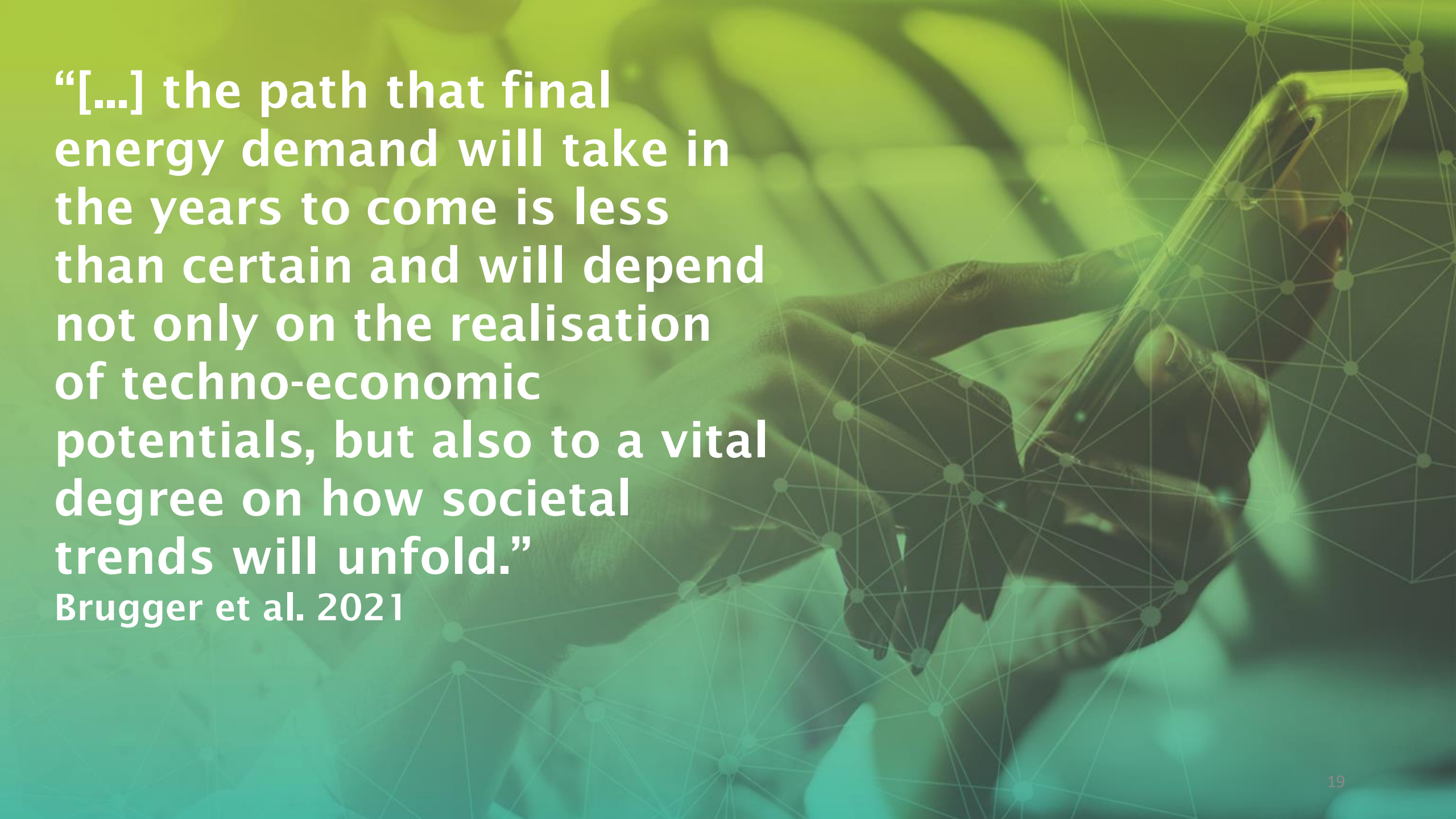
Meta Thurid Lotz | Fraunhofer ISI

Philipp Mascherbauer | TU Wien



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 893311.



A person's hands are shown holding a smartphone. The image is overlaid with a green tint and a network diagram consisting of interconnected nodes and lines. The text is positioned on the left side of the image.

**“[...] the path that final energy demand will take in the years to come is less than certain and will depend not only on the realisation of techno-economic potentials, but also to a vital degree on how societal trends will unfold.”**

**Brugger et al. 2021**

**Which trends are relevant in the future?**

**What is the role of policies?**

**What impact do they have?**

**What could the future look like?**



Combined Foresight methods  
with quantitative model runs

## Project aim and approach

Used empirical information on  
consumption patterns and  
policy impacts

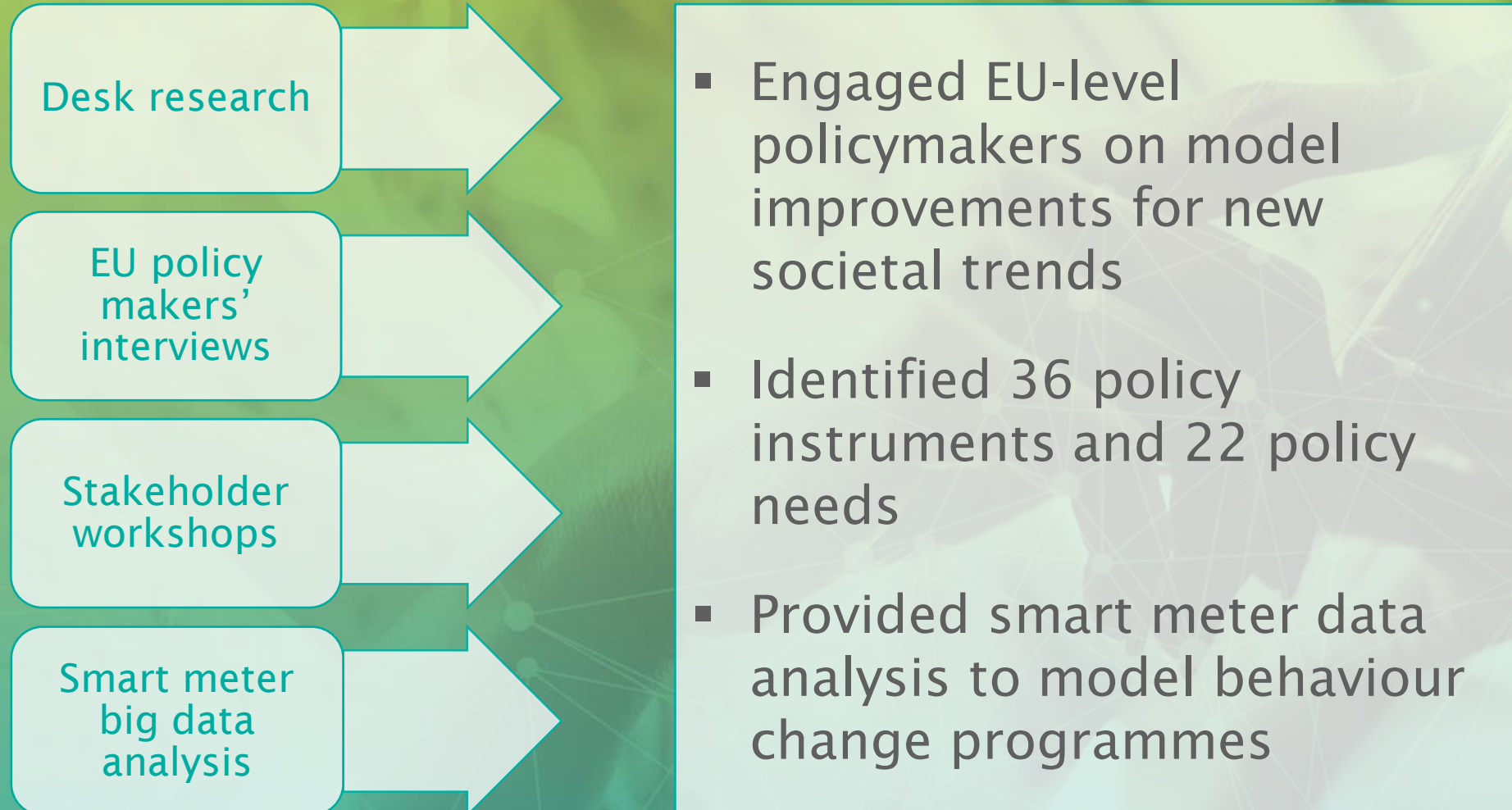
Developed the analytical basis for a  
**2050 energy efficiency vision**  
considering new societal trends

# Which trends are relevant in the future?



- Societal trends vary in impact on energy demand across micro, meso, and macro levels
- Consider new societal trends in policy making to effectively reach EU climate targets
- For a full view, consider cross-sectoral impacts of new societal trends on energy demand

# What is the role of policies?



## Gap analysis

Are the trends and policy (needs) considered in energy demand models?

# Improving energy demand models

## Model improvement

How can we close the identified gaps in energy demand models?

## Scenario calculation

What impact do they have?



# Four in-depth studies



**Towards a circular economy and a low-carbon industry**

**Digitalisation of the economy and private life**



**Transition from consumers to prosumagers**

**Towards a shared economy**





Towards a circular economy and a low-carbon industry

## Model improvement

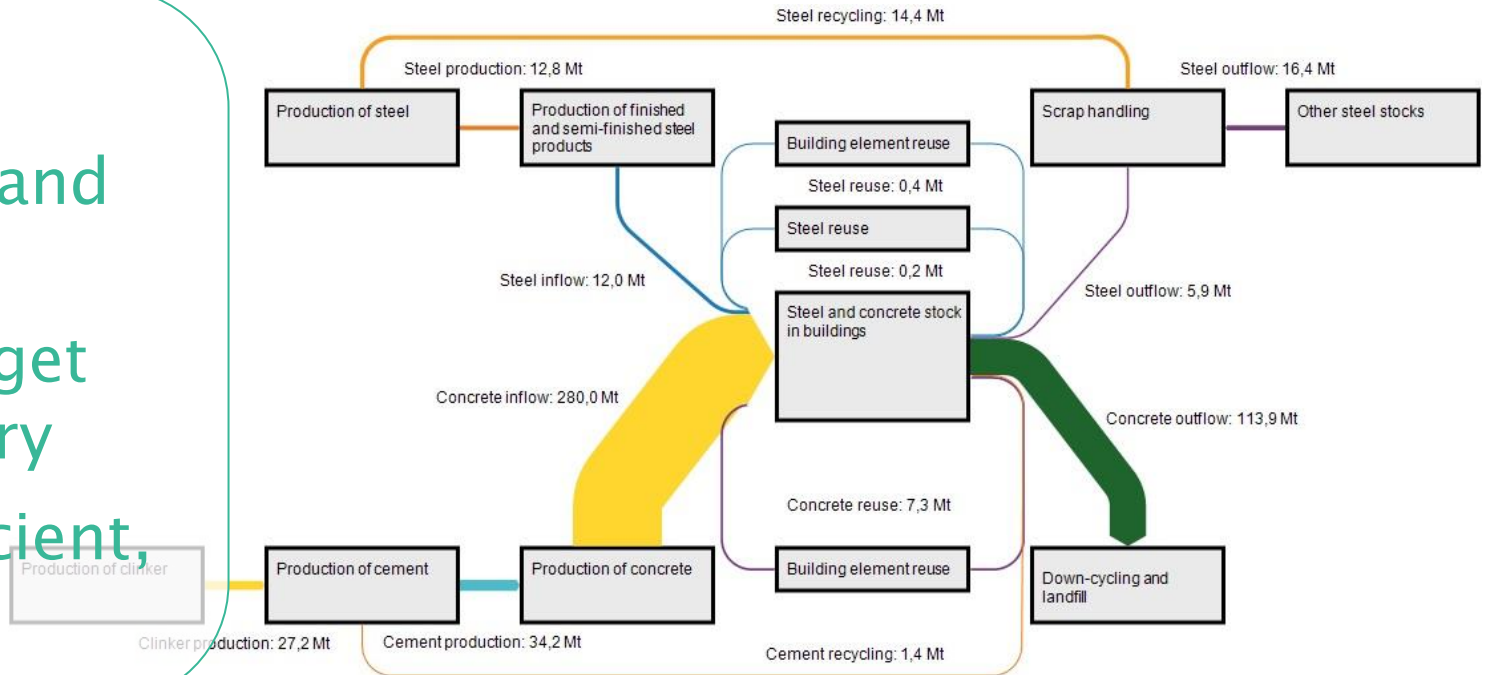
Bottom-up material flows model for endogenous modelling of circularity in EU buildings, input for FORECAST

## Scenario calculations

Reduce steel/cement demand by 38%/26% in 2050

Contributes to climate target achievement in the industry

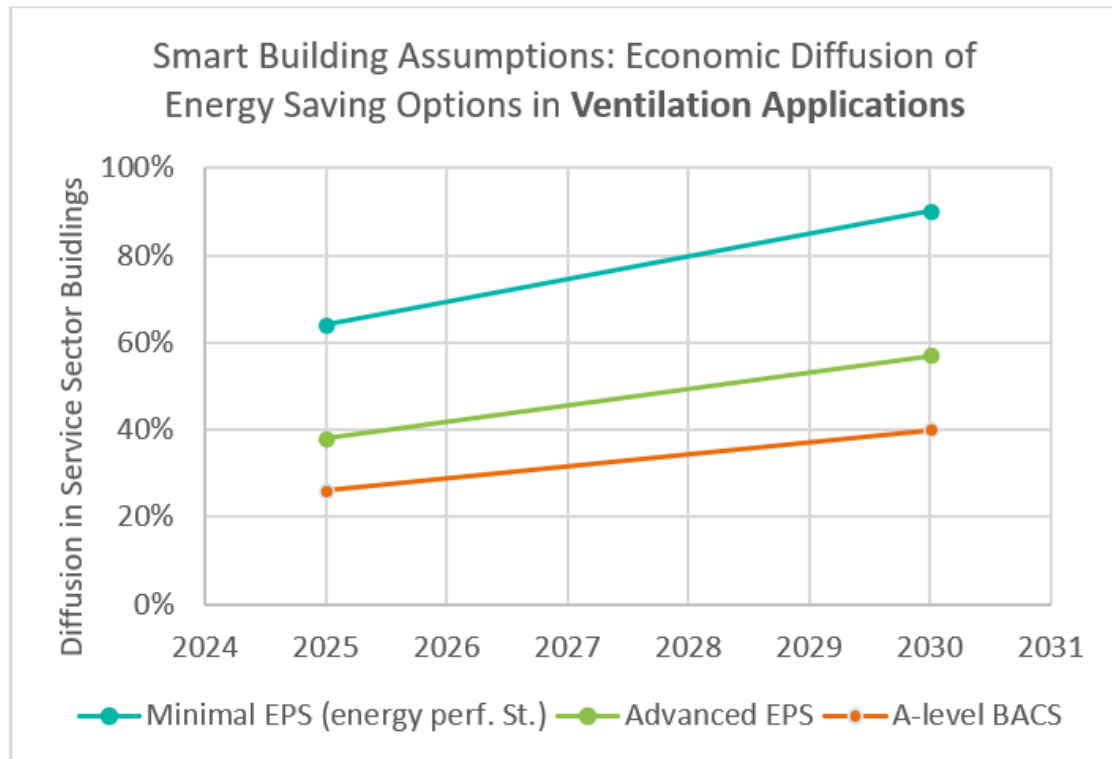
Current policy mix insufficient, central role of GPP





## Model improvement

Expanded the FORECAST model with three digitalisation trends affecting the service sector



## Scenario calculations

*Smart Buildings* can save 2-3% final energy demand

*Data Centres* = significant factor increasing future energy demand (+12%)

Trade-off between *e-commerce* and conventional trading (-17%)



## Model improvement

PRIMES and Invert model expanded by prosumer trend

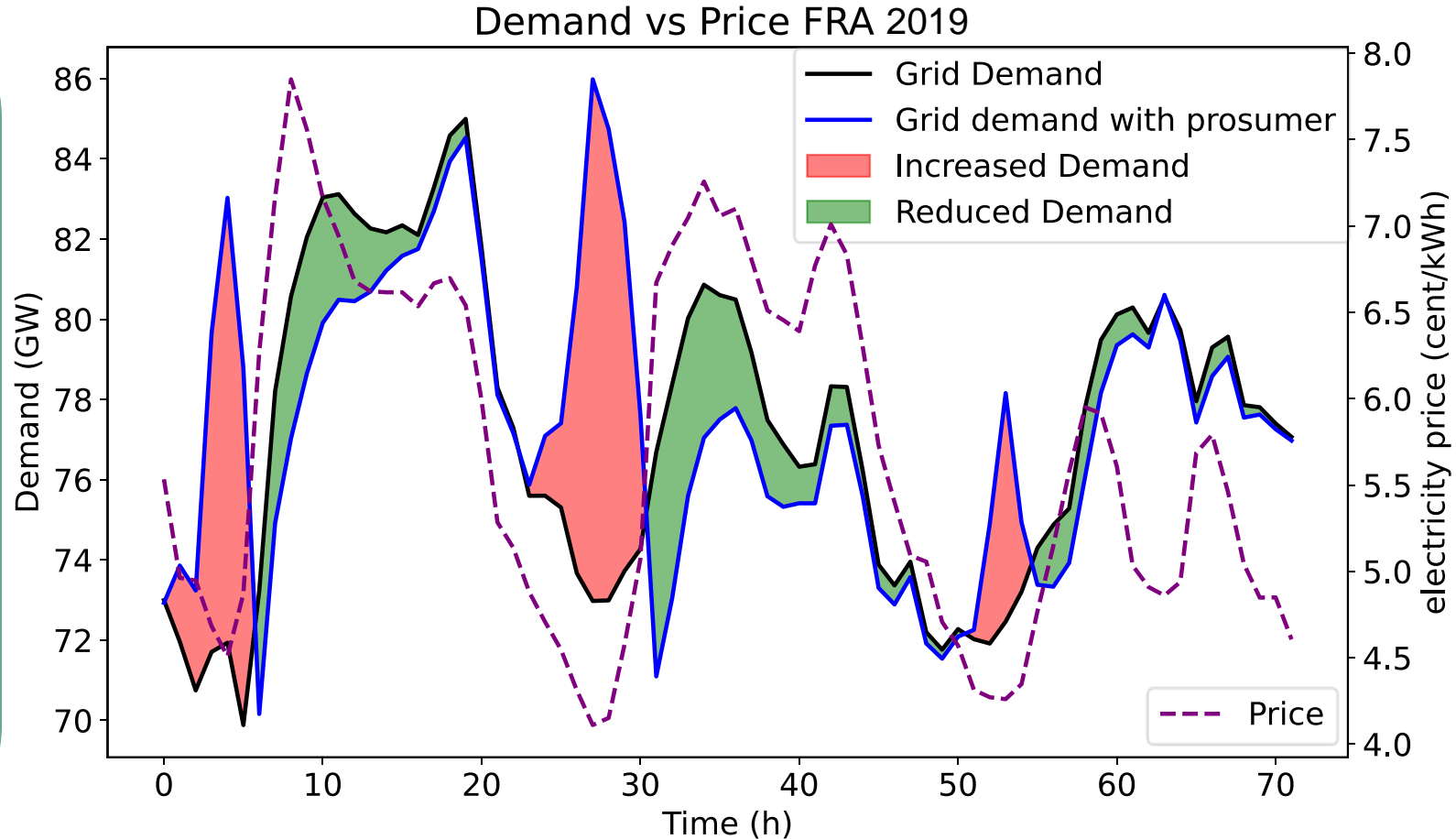
Transition from consumers to prosumers

### Scenario calculations

Models focus on consumption pattern and investment decisions respectively

Potential of the building stock to shift electricity demand is substantial

Variable electricity tariffs are effective to incentivise load shifting

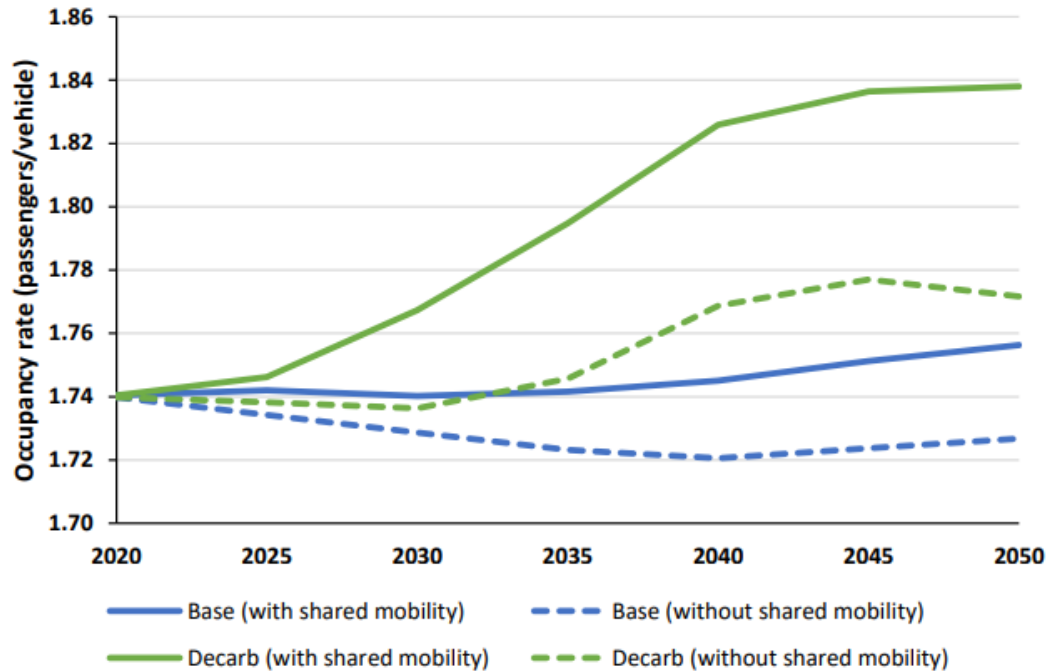




## Model improvement

New satellite model PRIMES-SHAREM

FORECAST model expanded by new work trends



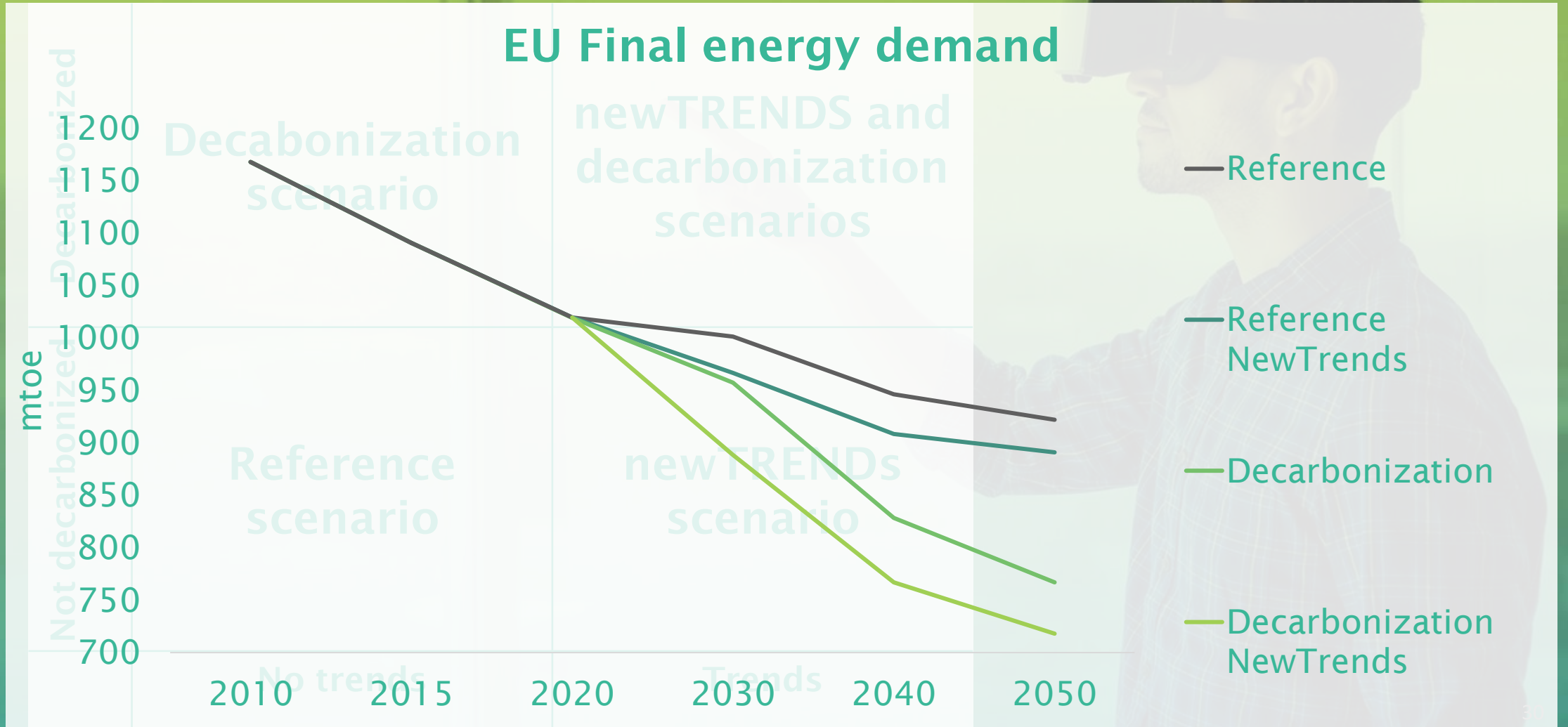
## Scenario calculations

First choice of shared mobility option:

- Short term: car-pooling
- Long term: car-sharing

Teleworking and shared spaces reduce energy in the service sector (-4 to -8%), increasing residential demand (+1%)

# What could the future look like?



# What could the future look like?

## Circular economy

Positive impact on GDP and employment



## Digitalisation

Net neutral impact on GDP and employment

## Prosumaging

Small but negative impact on GDP and employment



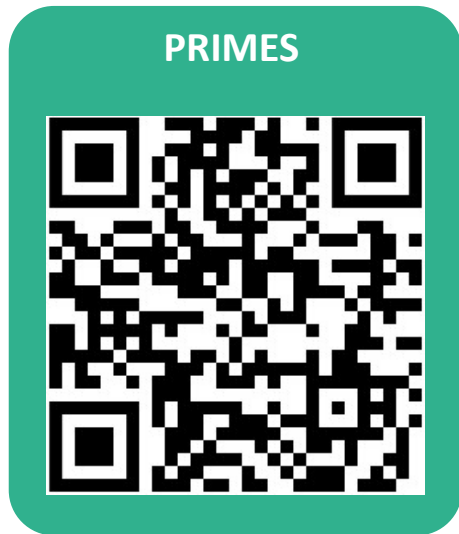
## Shared mobility

Small positive impact on GDP and employment

Positive effect on GDP (0,1% - 0,7%) and employment (0,0% - 0,1%)

# Want to know more?

Models and data sets developed within the project



Check also the newTRENDS website for further publications: <https://newtrends2020.eu/>



**Follow the project:**

<https://newtrends2020.eu/>

<https://www.linkedin.com/company/newtrendseu>

[https://twitter.com/newtrends\\_EU](https://twitter.com/newtrends_EU)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 893311.





Nudging consumers towards energy efficiency through behavioural science



NUDGE has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 957012.

# Nudging consumers towards energy efficiency through behavioral science



**10 partners from 7 European countries implemented and evaluated different behavioural interventions for energy efficiency across 5 pilots in different EU states.**



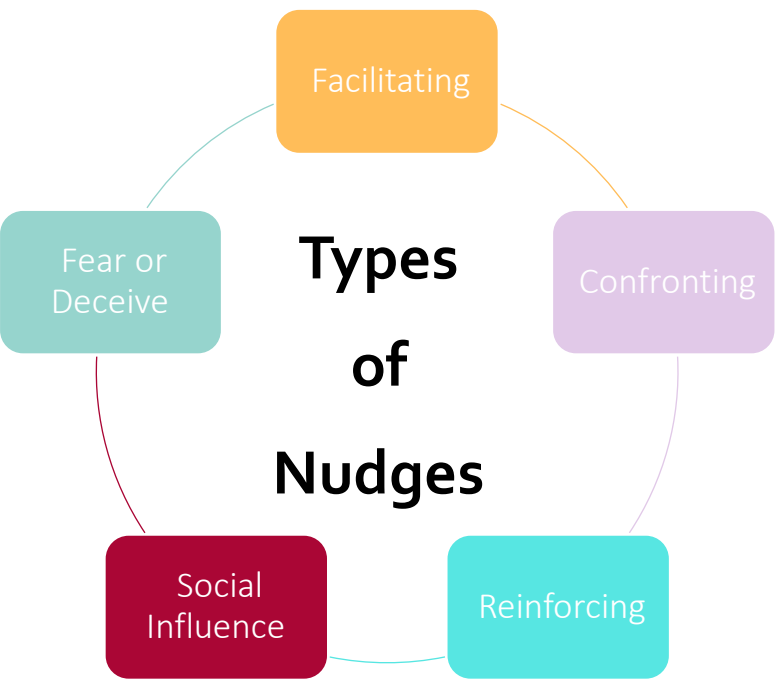
**@NUDGEH2020**

**[www.nudgeproject.eu](http://www.nudgeproject.eu)**

# Definition: Nudging in the behavioural sciences

*Nudging: any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any option or significantly changing their economic incentives.*

[R. Thaler, and C. Sunstein. Nudge: Improving Decisions About Health, Wealth, and Happiness. Penguin Books, 2009.]



## Health



## Nutrition



# Point of Departure: The project's objectives

01

## Intervention design tailored to context

using digital mediation platforms + advanced data

04

## Policy Recommendations

consolidate and convey findings



02

## Field trials in 5 pilots

mix of interventions:  
classic and novel nudges combined

03

## Systematic research protocol

continuous measurement of energy-related behavior

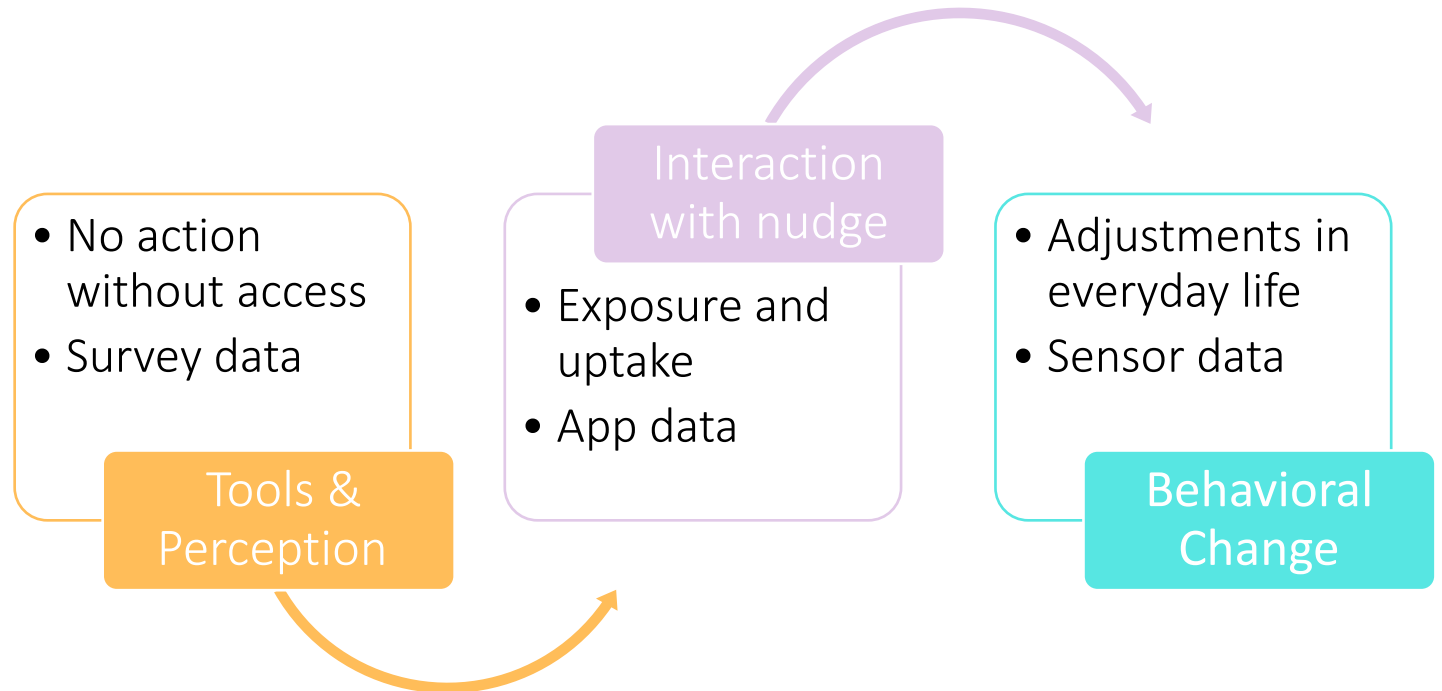


# Nudging in the Data: The long road from recruitment to outcome

## Nudging Intervention Channel

1. Consumers need tools that deliver information as a pre-condition
2. *Given* the tools, consumers need to actually use the delivery mode
3. *Given* 1+2, energy behaviour needs to be realised in the context of daily life

➔ Effectiveness depends on channel from intention/motivation to behavioral change

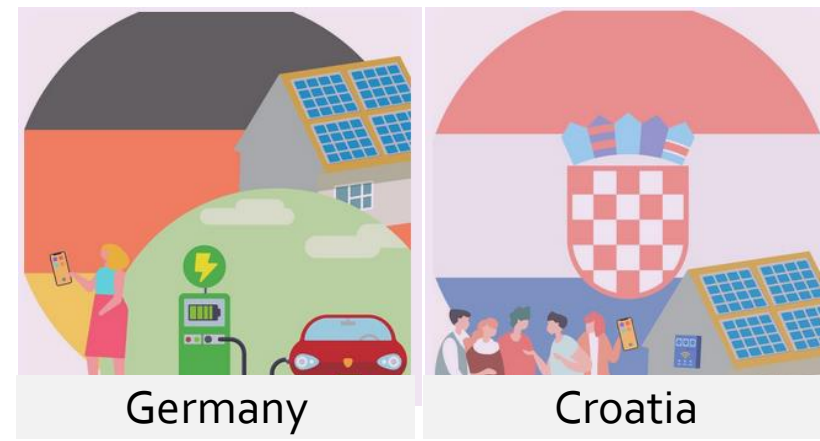


# NUDGE: experimental evidence from 5 countries

Heating consumption ↓



Self-consumption ↑



Education → energy



**Delivery**

Smart phone app, web dashboards & smart devices

School courses

**Intervention**

3 nudging interventions

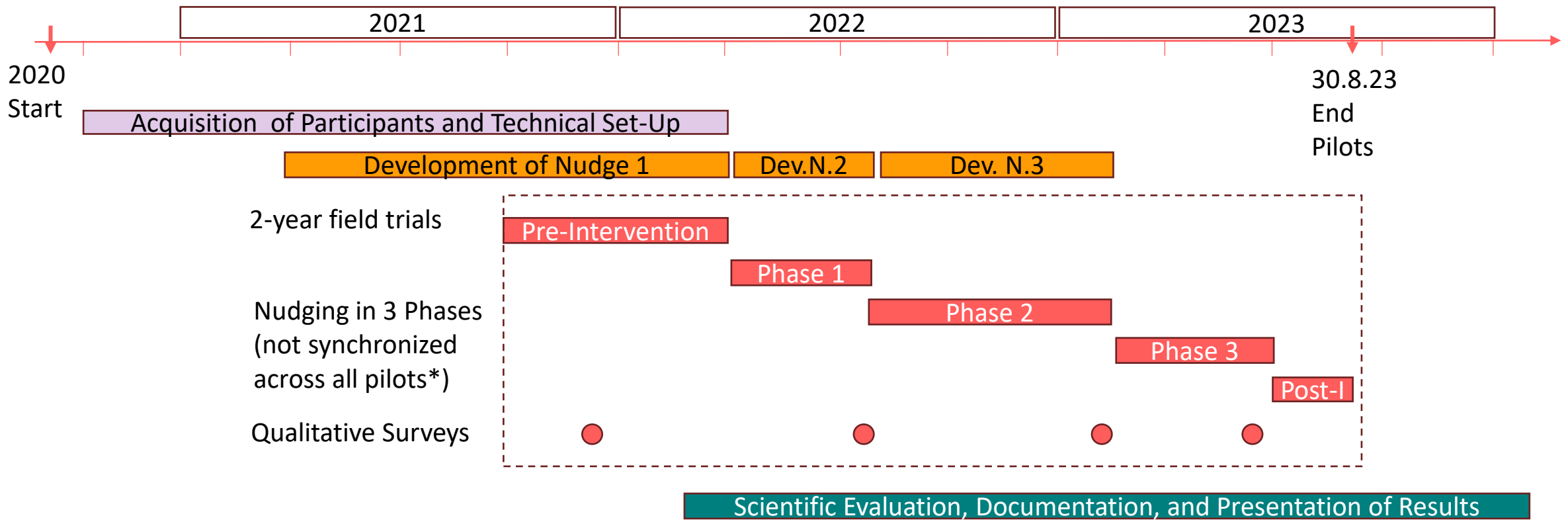
2 cohorts

**Data**

Sensor data (e.g. energy consumption) + survey data + device data








# Project Timeline: 3 years of work, 2 years of data, a pandemic and a global energy crisis



(\*) timeline is tailored to German pilot as an example



# Overview of Nudging Interventions

	Germany 	Croatia 	Belgium 	Greece 	Portugal 
<b>Nudge 1</b>	Feedback & awareness	Instigating empathy	Educational nudges & pupils as multipliers for two school cohorts	Feedback & awareness	Feedback & awareness
<b>Nudge 2</b>	Gamification & target setting	Feedback & awareness		Push-notifications	Just-in-time prompts
<b>Nudge 3</b>	Default	Gamification & target setting		Push-notifications, feedback & awareness	Push-notifications





# Delivery of nudging Digitally through mobile apps and web tools



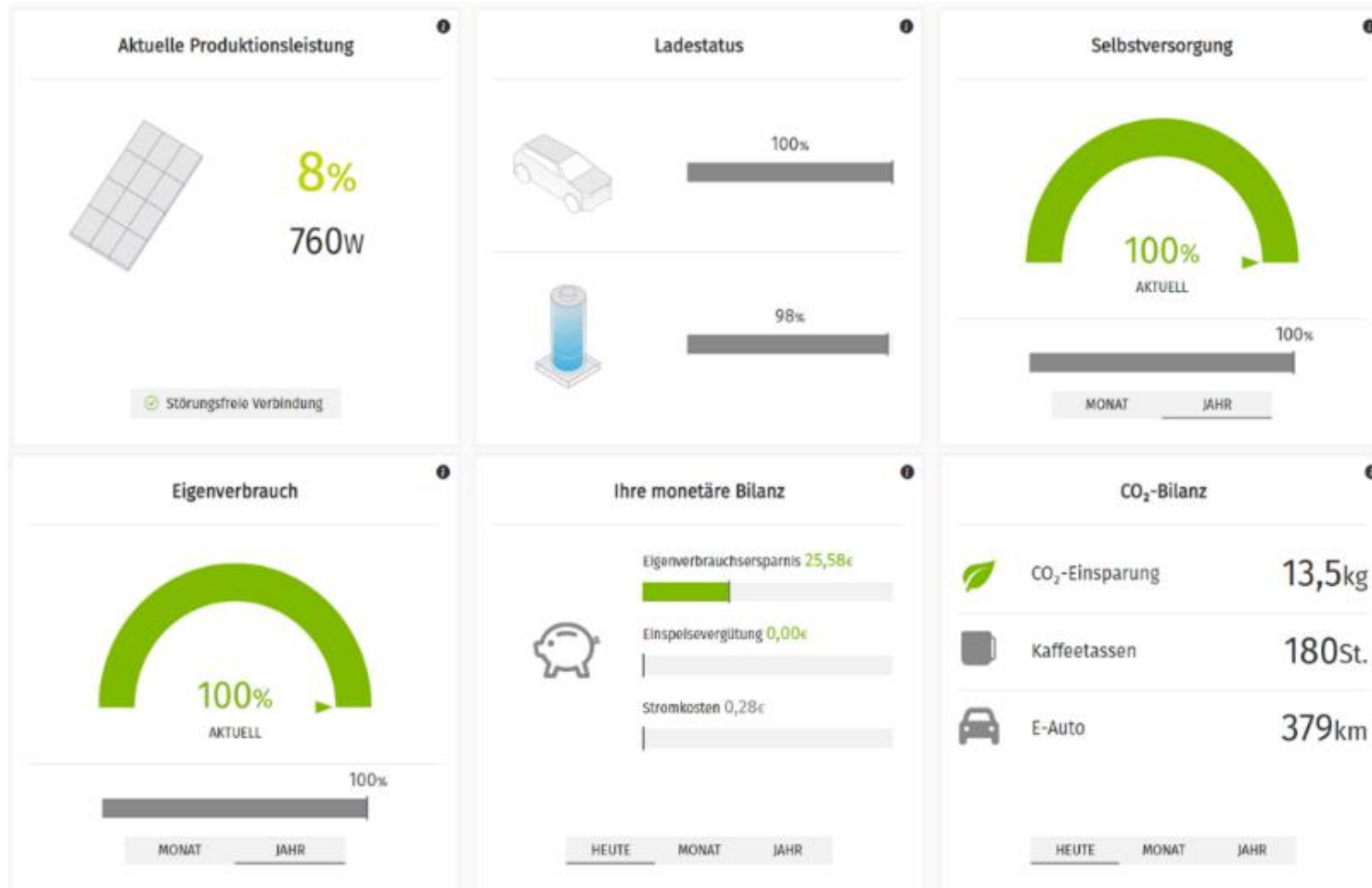
## Nudge 1 Croatia

Instigating empathy:

Illustrating the CO<sub>2</sub> emissions  
as polluted earth



# Delivery of Nudging Digitally through mobile apps and web tools

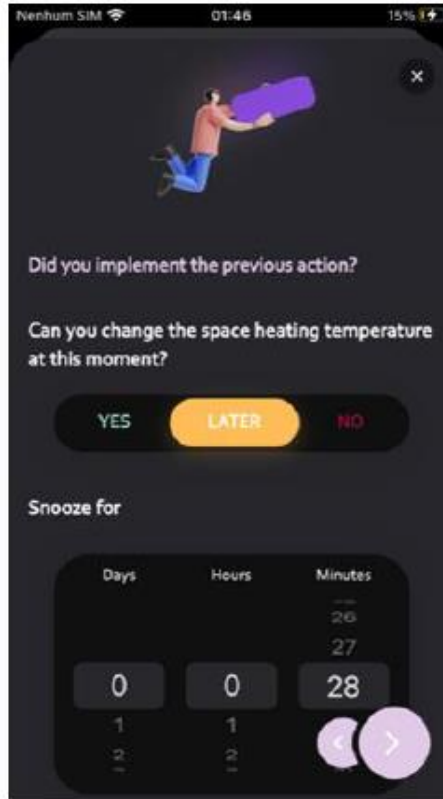


## Nudge 1 Germany

Feedback:

Information with signaling  
colors, simple indicators,  
reference values

# Delivery of Nudging Digitally through mobile apps and web tools

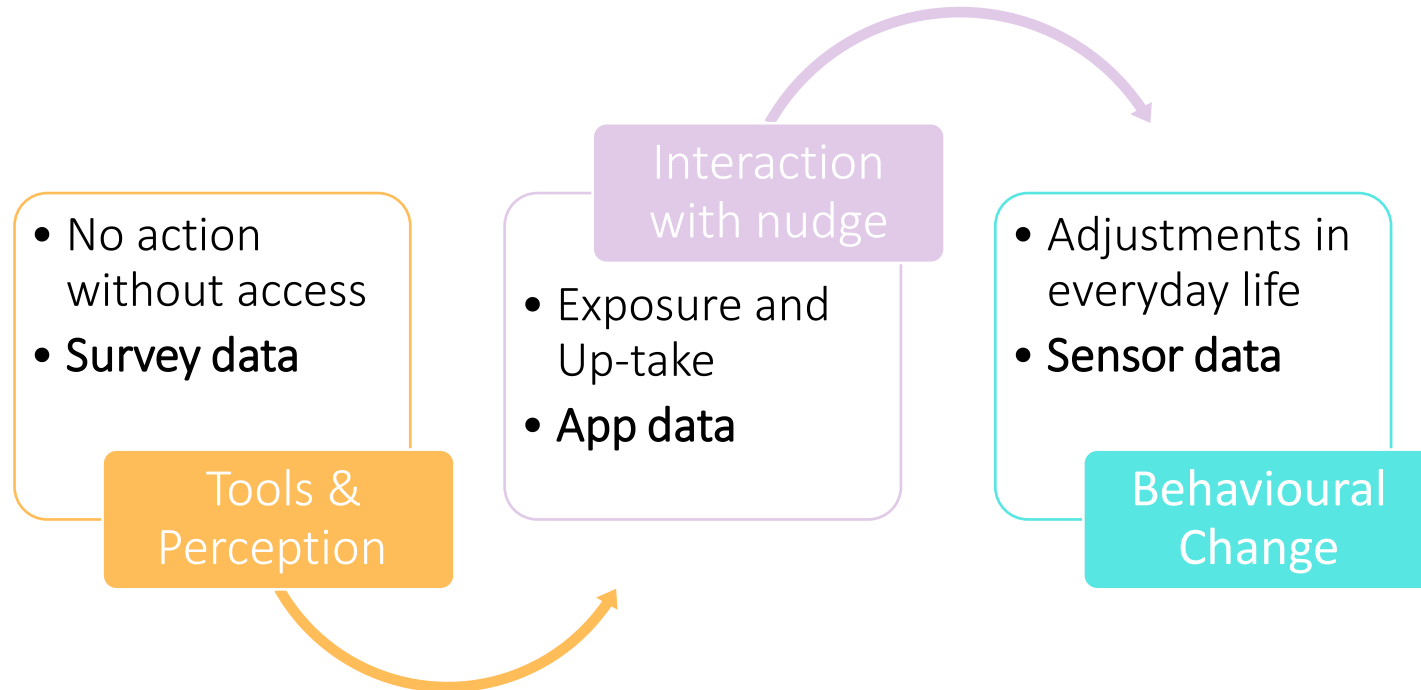


## Nudge 3 Portugal

Push notifications:

Prompts to adjust the operational settings of indoor environment

# Results: 3 broadly defined types of results from different data sources



## Results Part 1: Survey data

- **People's perceived ability to reduce consumption strongly predicts intent to do so**
  - Providing consumers **with access to personal consumption data** empowers informed decisions and increases feeling of control over energy use and improves **energy knowledge**.
- **Social norms remain important:**
  - **Emphasising normative values** can support reduced consumption
- **Balancing attitude and comfort:**
  - Focus on influencing attitudes, particularly environmental concerns, and emphasize strategies that reduce energy use without compromising comfort, such as improved insulation.

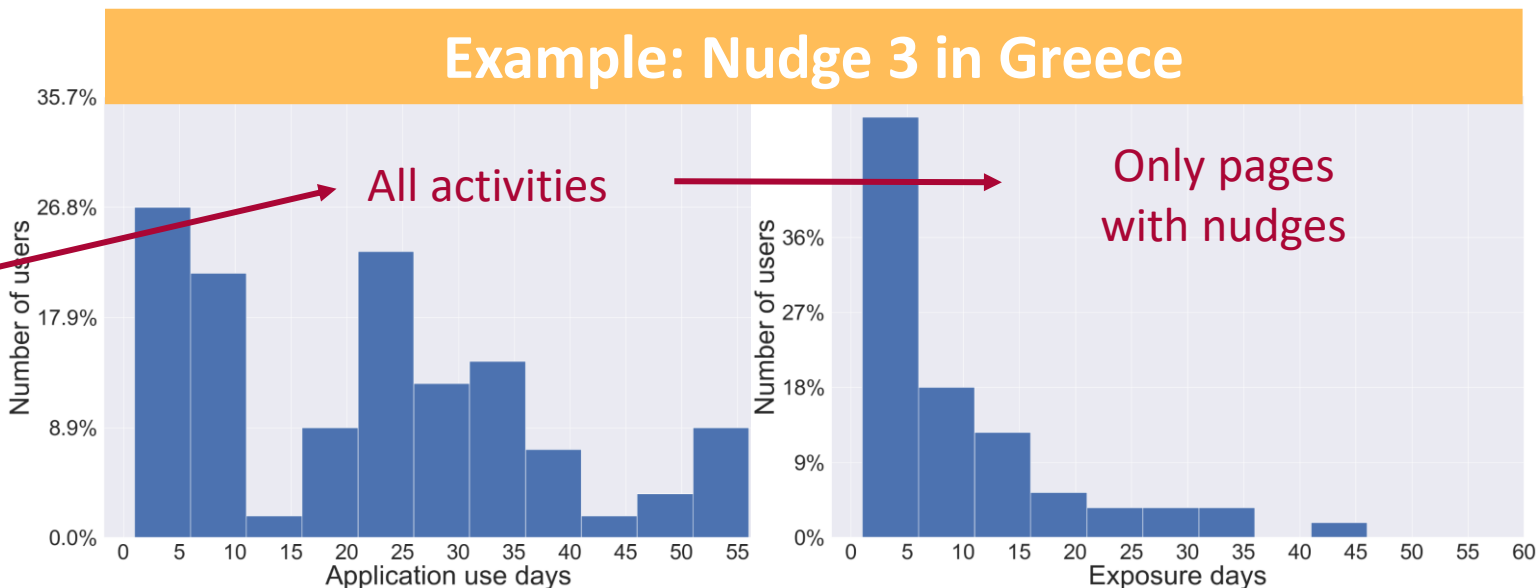


# Results Part 2: App data show limited and heterogenous usage patterns

## Uptake of nudging tools differs across consumer types

- Non-respondents: ranging from 5-25% of participants
- Wide distribution of usage, e.g., for GR: 33% 2-4 days per week, 20% participants less than once a week
- Not every app activity means exposure to nudging, e.g., for GR: 65% check 1 time per week

Participants who used the app			
	Nudge 1	Nudge 2	Nudge 3
GR	-	77%	76%
PT	88%	85%	75%
DE	-	95%	77%



# Results Part 3: Smart-meter data reveal mixed results regarding effectiveness

- **Some effective interventions – ranging from 0.4 – 3.5 % savings, up to 15 % in the case of default nudge with smart EV charging**
- **No consistent evidence for the effectiveness of nudges across all pilots**
  - Low interaction with the mobile apps mediating the nudges despite high intention and motivation
  - Effects are sensitive and easily dominated by external factors
  - Contradicting regulatory incentives can dominate behavioral interventions
- **Contribution to behavioral science**
  - 1.5 years of panel data from field trials with control groups
  - Statistical evaluation considers external environment
  - Insights from combination of data sources: sensor + survey + app

## Nudges are effective in...

...increasing the self-consumption



...reducing the electricity consumption



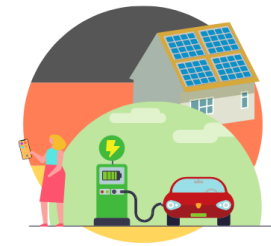
...reducing the heat consumption



...improving the energy knowledge level



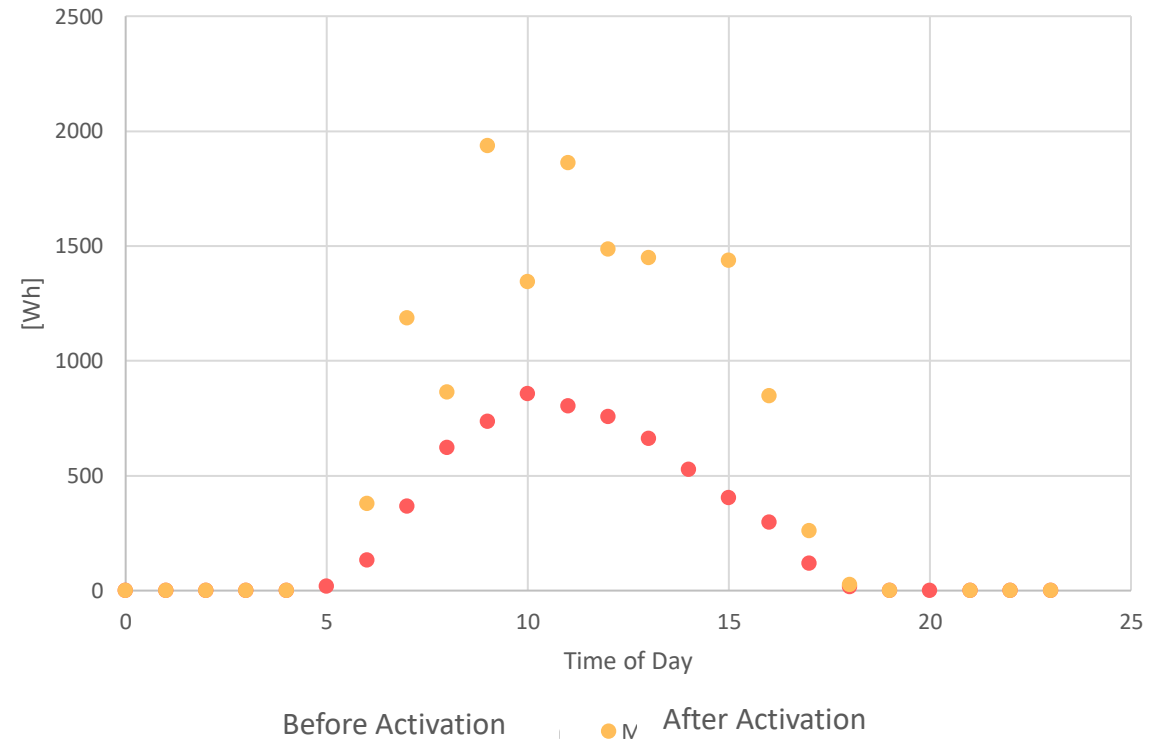
# Example: Nudge 3 in Germany



## Raw Data

## Statistical Analysis

Self-Consumption of Participant 10



Shift into the mid-day solar peak with the smart charging nudge

+ 15% self-consumption for those consumers who actively use the nudge in EV group 1

50% of eligible households in this group do *not* activate the nudge

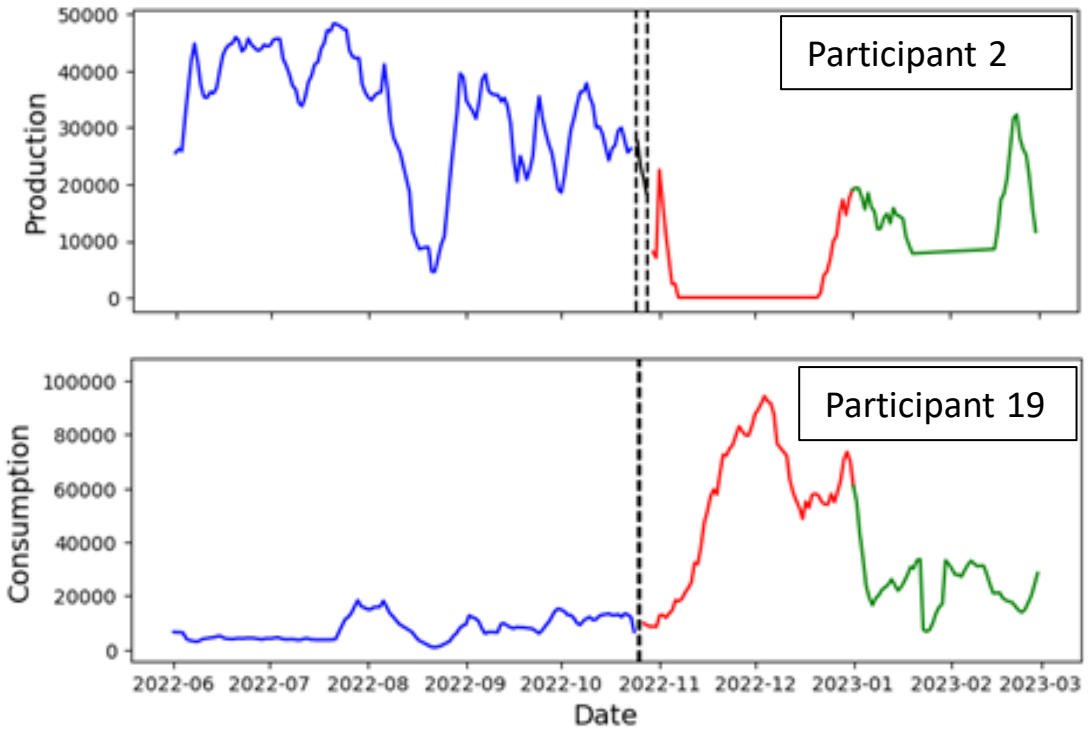




# Example: Nudge 2 in Croatia



## Raw Data



## Statistical Analysis

Regulation defines prosumer status based on surplus at year end

Strong incentive to reduce surplus

- Option 1: reduce production
- Option 2: increase consumption

Nudge tools create transparency and allow tailored adjustment

➤ Nudging dominated by regulation

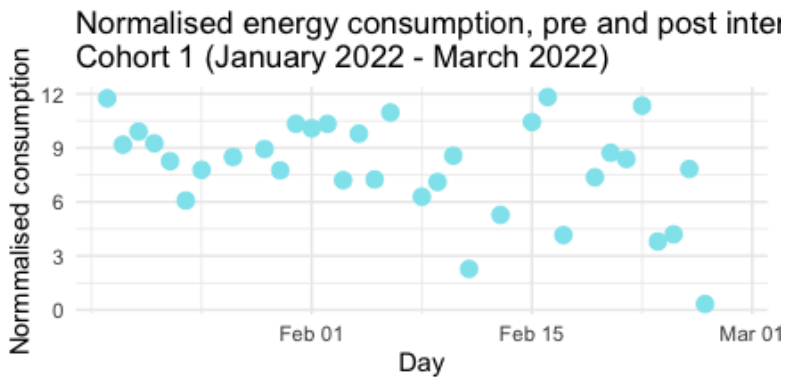


# Example Data Belgium

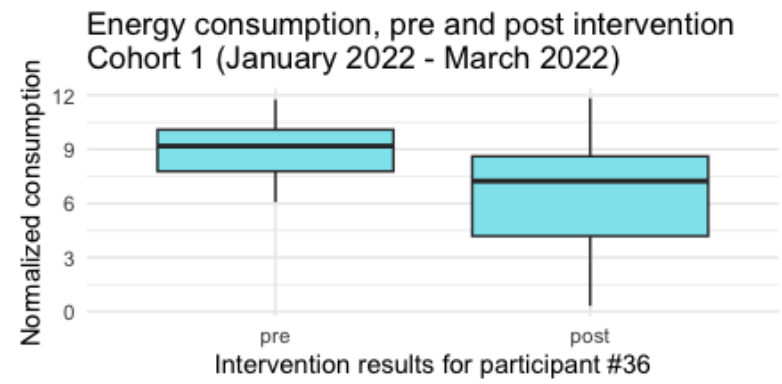


## Raw Data

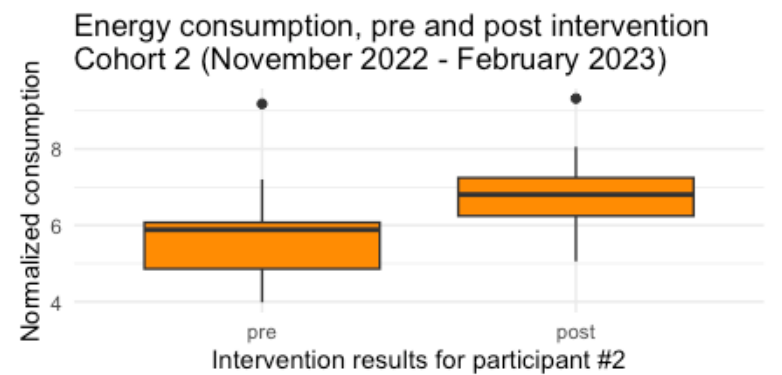
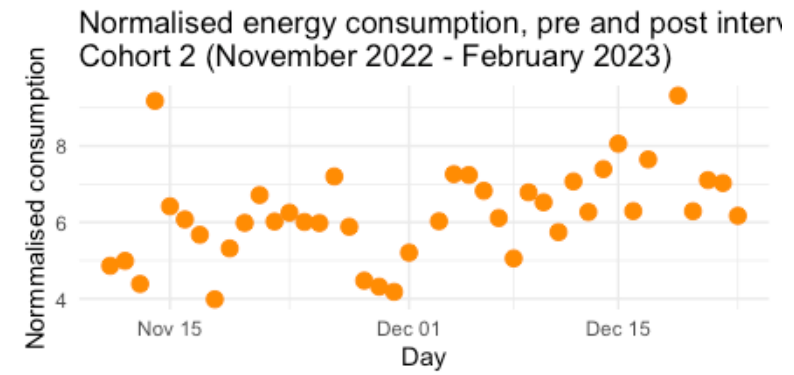
Cohort 1



## Statistical Analysis



Cohort 2



## Recalling the concept

“Choice-preserving, low-cost tools” [Sunstein and Thaler, 2008]

1. **Choice-preserving** is a big appeal, but it easily gets lost in everyday life
2. **Low-cost** remains a major benefit: conditional on smart metering and digital data sharing
3. **Behavioral interventions work**, but nudging cannot substitute for other instruments as a blanket (one-size-fits-all) measure





NUDGE has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 957012.

# Thanks for your attention!





Multiple Impacts Calculation Tool

# The Multiple Impacts of Energy Efficiency: The MICAT project and the MICATool

Felix Suerkemper, *Wuppertal Institute*

Frederic Berger, *Fraunhofer ISI*



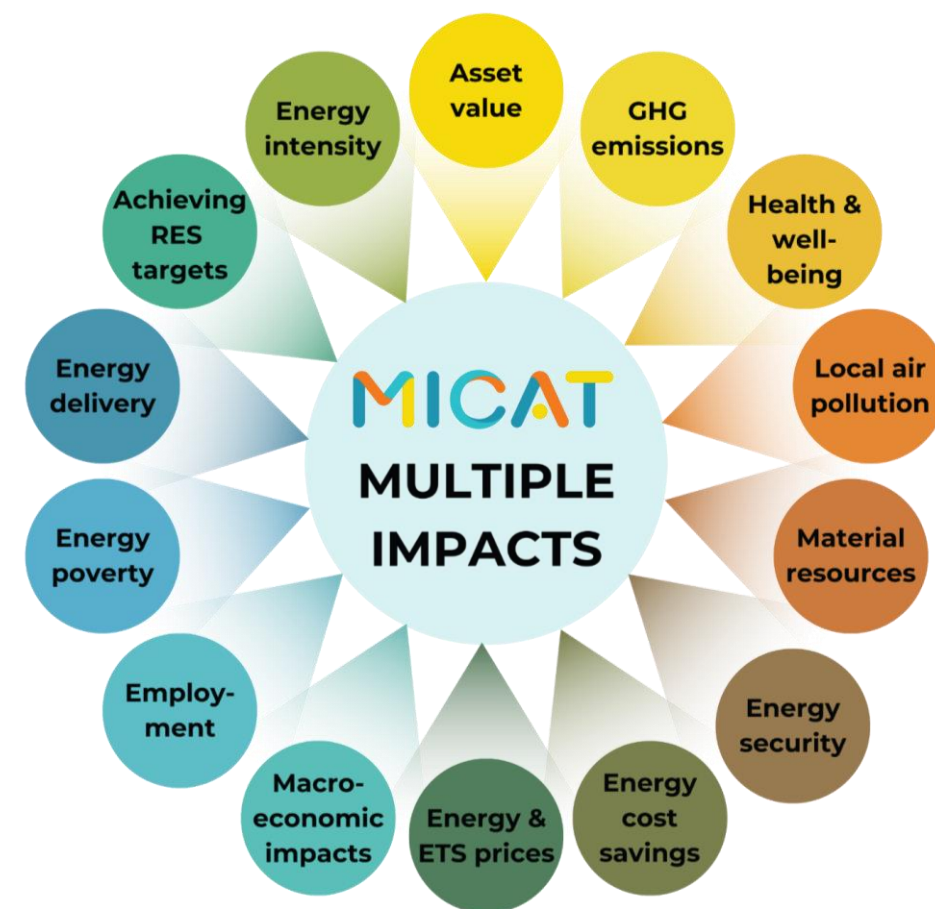
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000132.

# What are multiple impacts?

- also known as multiple benefits, co-benefits, ancillary benefits, non-energy benefits
- accompany energy efficiency projects and provide additional arguments to implement energy efficiency measures, but are rarely reported
- explicitly mentioned in EC's policy-making (e.g. EPBD, EED) and reporting (Art. 3 recast EED, NECPs) but rarely quantified

Art. 3 of recast EED (EE1st):

*"... Member States shall promote and, where cost-benefit assessments are required, ensure the application of cost-benefit methodologies that allow proper assessment of wider benefits of energy efficiency solutions from the societal perspective."*



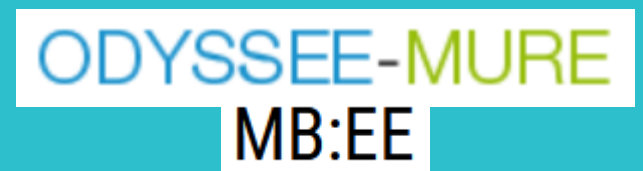
Based on IEA (2014)

# The MICAT project

Development of a comprehensive approach to estimate Multiple Impacts of Energy Efficiency by providing a publicly available and easily usable online tool.

- **Improve scientific knowledge** and methods to quantify Multiple Impacts
- Underline the **importance of MIs** in policy evaluations
- **Facilitate assessment of MI** of policies at EU, national, and local levels
  - **Quantification and monetisation** of different categories of multiple impacts
  - **Go beyond the approaches** of earlier MB-Tools, such as Odyssee-Mure MB:EE and COMBI
  - Cover several **key scenarios**, allow evaluation of customised scenarios and policy measures
  - **Maximise usefulness** for a large target group (including companies) and cover a wide range of use cases

MICAT: **M**ultiple Impacts **C**alculation **T**ool



# Comprehensive stakeholder involvement

Maximisation of the tool's usefulness using their input:

- Large target group/wide range of use-cases: **input and validation** data from case studies on the three governmental levels
  - Simple applications predominantly using default data
  - Comprehensive applications with available parameters and other data
  - Integration of the MICATool's core in scientific modelling via API-interface
- **Familiarise stakeholders** with the tool and approach & get direct feedback

3 Workshops on **three governance levels**: local, national, and EU level



**1. Analyse underlying assumptions and methodology** | Introduction of the project and indicator preferences

**2. Embedding of the tool** | Discussion of an advanced mock-up to enable adjustments



**3. Implementation & Training** | Presentation and introduction into the use of the MICATool



# The MICAT project team



Fraunhofer ISI is the project coordinator and in charge of WPs 3 (assessment) and WP4 (tool development). Mainly in charge of **economic indicators**



WI is COMBI's former coordinator. Mainly in charge of WP 2 (Framework) with a major role in WPs 3 and 4 (assessment & tool development). Mainly in charge of indicators on **social indicators** within WP2.



E3M owns PRIMES and GEM-E3 models and has a major role in the framework development of the empirical basis of **economic indicators** within WP2.



IIASA's role is mainly in the framework development of the empirical basis of **environmental indicators** within WP2 (Framework) and supporting WP3 (assessment).



In charge of **stakeholders engagement** on national and EU level, policy feedback and **communication and dissemination**.

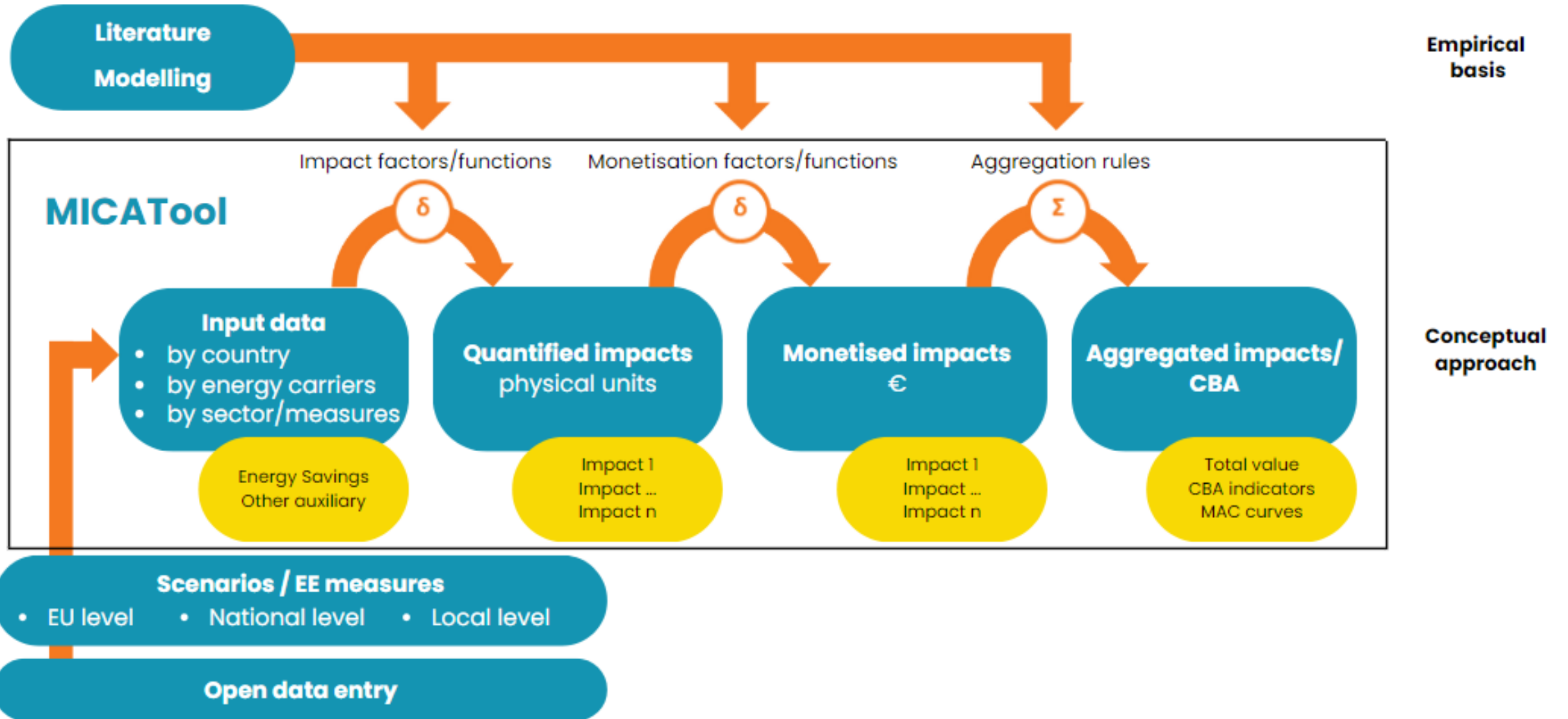


ICLEI's role is mainly in WP5, leading the **stakeholder engagement on a local level**, and WP6 contributing to the overall conclusions and recommendations.



WISE is mainly supporting IEECP in **communication and dissemination**

# Overall quantification framework of MICAT



**Overall aim:** Applicability for a broad target group and coverage of a wide range of use-cases (e.g., customised scenarios and policy measures)

## MICAT approach:

- Impact quantification based on **factors or functional relationships linked to energy savings**
- Input/modification of further **optional parameters** (e.g., investments, energy prices, fuel split) possible to **increase accuracy** of results

- Facilitate assessment & reporting of MI at EU, national and local levels
- Support target groups (e.g., public authorities in MS) with limited capacities in their assessment and reporting of MI
- Replace detailed modelling of MI and impact assessments of policy measures

## Input

Energy savings  
(mandatory)

Further  
parameters  
(optional)



## Output

**Multiple impacts**

*Quantification*

*Monetisation*

*Cost-benefit analysis*

## Monetisation of impacts:

- Conversion of MI into monetary values (€): to compare their magnitude, for aggregation and integration into CBA
- Monetary value of MI: often higher than energy cost savings → MI can significantly change the results of a CBA
- Aim: gain a more complete overview of the real value of energy efficiency

## MICAT approach:

- Applying **monetisation factors** to physical values, e.g. societal costs of carbon, Value of Statistical Life (VSL), value of a work day
- Provision of **default values** for monetisation factors in the tool; modification by tool users possible



# Impact aggregation and Cost-Benefit Analysis in the MICATool

## Impact aggregation:

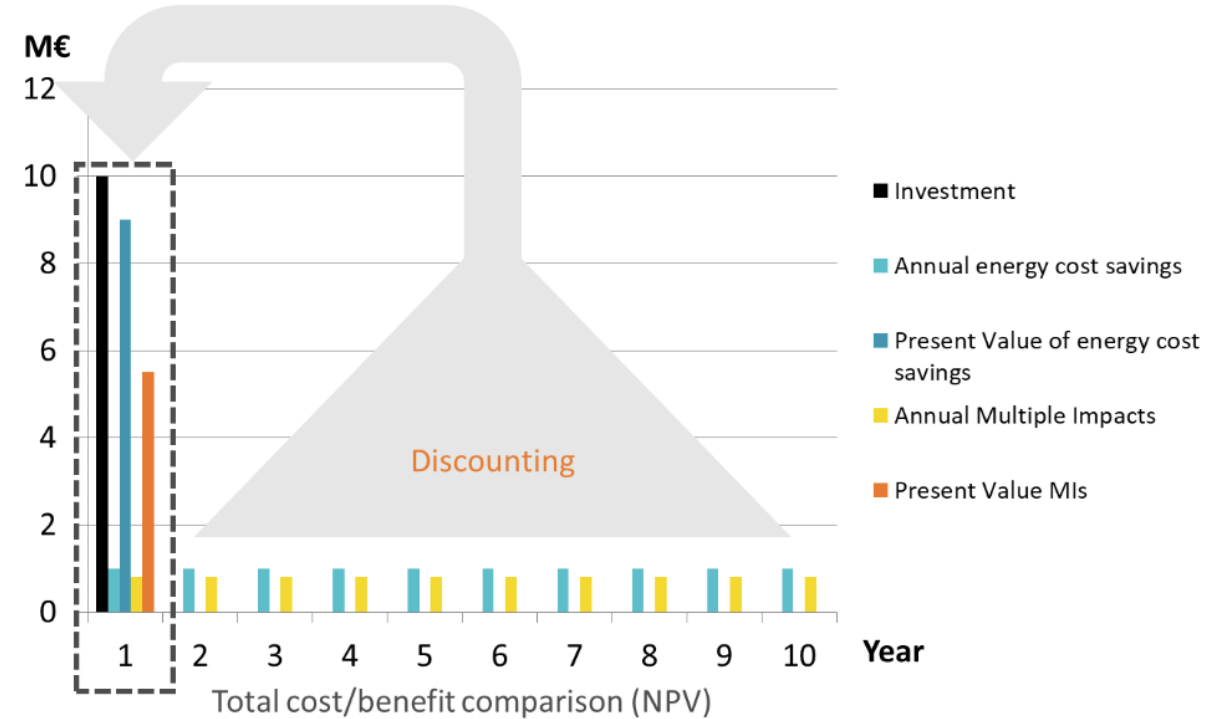
- Monetary impacts only aggregated and included in the CBA, when there is **no risk of double-counting** (conservative approach)
- Some monetary impacts: not aggregated due to double-counting, i.e. only presented in the monetary tool mode (e.g., GDP, public budget)

## Included impacts in the CBA mode:

- Energy cost savings
- GHG emission reductions
- Impact on RES targets
- Avoided investments in additional energy supply capacity
- Additional work days due to reduced air pollution
- Reduced mortality due to reduced air pollution
- Reduced mortality due to improved indoor climate
- Avoided asthma cases due to improved indoor climate

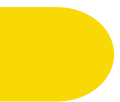
## Sensitivity analysis by adjustment of

- Discount rates
- Energy prices
- Investments
- Monetisation factors and lifetimes (via optional parameters)



## CBA indicators in the MICATool:

- Net present value (NPV)
- Benefit-cost ratio / cost-benefit ratio
- Annuity
- Levelised costs of saved energy (€/kWh) / GHG emissions (€/tCO<sub>2</sub>)
- Marginal cost curves



## Assess the impacts of energy efficiency projects

Select a suitable scenario from the world of energy efficiency, optionally add your own values and receive a comprehensive analysis for your region.

Select your use case

Time frame ⓘ

**PAST**  
(ex-post)

**FUTURE**  
(ex-ante)

Region ⓘ

European Union



Unit ⓘ

ktoe (tonne of oil equivalent)



**START**

**LEARN MORE**

# A practical example: renovating the institutions



**Council of the European Union**

# A practical example: renovating the institutions



**Council of the European Union**

**European Commission**



# A practical example: renovating the institutions



**Council of the European Union**

**European Commission**

**European Parliament**

# A practical example: renovating the institutions



**Council of the European Union**

**European Commission**

**European Parliament**



# A practical example: renovating the institutions



**Council of the European Union**

**European Commission**

**European Parliament**

2025  
*0.35 ktoe*

# A practical example: renovating the institutions



**Council of the European Union**

2025  
*0.35 ktoe*

**European Commission**

2027  
*1.2 ktoe*

**European Parliament**

# A practical example: renovating the institutions



**Council of the European Union**

2025  
*0.35 ktoe*

**European Commission**

2027  
*1.2 ktoe*

**European Parliament**

2030  
*3.3 ktoe*

## Assess the impacts of energy efficiency projects

Select a suitable scenario from the world of energy efficiency, optionally add your own values and receive a comprehensive analysis for your region.

*Select your use case*

Time frame ⓘ  PAST (ex-post)  FUTURE (ex-ante)

Region ⓘ Belgium ▼

Whole country  
 Municipality with  inhabitants

Unit ⓘ ktoe (tonne of oil equivalent) ▼

[START](#) [LEARN MORE](#)

# Specifying the examined years

## Options

Time frame ⓘ

PAST  
(ex-post)

FUTURE  
(ex-ante)

Region ⓘ

Belgium ▼

Whole country

Municipality with 100000 ▾ inhab.

Unit ⓘ

ktoe (tonne of oil equivalent) ▼

## Time frame ⓘ

2023 🗑️

2025 🗑️

2027 🗑️

2030 🗑️

2017 ▼



⌫ RESET

Program 1

Subsector ⓘ

Select subsector ▼

Select improvement ⓘ

2023

0 ▾

2025

0 ▾

2027

0 ▾

2030

0 ▾



+ ADD PROGRAM

ANALYZE

# Specifying the kind of measure

## Options

Time frame ⓘ

PAST  
(ex-post)

FUTURE  
(ex-ante)

Region ⓘ

Belgium ▼

Whole country

Municipality with  inhab.

Unit ⓘ

ktoe (tonne of oil equivalent) ▼

## Time frame ⓘ

2023



2025



2027



2030



2016 ▼



⌫ RESET

RenovateEU

Subsector ⓘ

Average tertiary ▼

Building envelope insulation (Windows, in ⓘ)

2023

0



2025

0



2027

0



2030

0



+ ADD PROGRAM

ANALYZE



# Entering the expected total annual savings

## Options

Time frame ⓘ

PAST  
(ex-post)

FUTURE  
(ex-ante)

Region ⓘ

Belgium ▼

Whole country

Municipality with 100000 ▾ inhab.

Unit ⓘ

ktoe (tonne of oil equivalent) ▼

## Time frame ⓘ

2023



2025



2027



2030



2016 ▼



✕ RESET

RenovateEU

Subsector ⓘ

Average tertiary ▼

Building envelope insulation (Windows; in ⓘ)

2023

0 ▾

2025

0.35 ▾

2027

1.55 ▾

2030

4.85 ▾



+ ADD PROGRAM

ANALYZE

# Results: social indicators

[back to the entries](#)

**Quantification**  
physical values

**Monetization**  
monetary values

**Aggregation**  
monetary values per year

**Cost-benefit analysis**  
cost effectiveness

**Social**

**Economic**

**Ecologic**

**Avoided premature mortality due to air pollution** ✓

**Avoided lost working days due to air pollution** ✖

**Energy poverty** ✖

**Health indoor climate (Asthma)** ✖

**Indoor health II** ✖

**Avoided premature mortality due to air pollution**

This indicator assesses the avoided number of premature death cases thanks to energy efficiency measures resulting in declining air pollution levels. It is based on IASA's GAINS model, taking air pollution reductions, national health data, and other factors into account.

Mortality\_AP

Year	Reduction in casualties
2023	0
2025	0,0015
2027	0,0065
2030	0,0195

# Results: economic indicators

[back to the entries](#)

**Quantification**  
physical values

**Monetization**  
monetary values

**Aggregation**  
monetary values per year

**Cost-benefit analysis**  
cost effectiveness

Social

Economic

Ecologic

Impact on energy intensity

Impact on import dependency

Impact on gross domestic product

Additional employments

Added asset value of buildings ✓

Change in unit costs of production

Turnover of energy efficiency goods

Change in supplier diversity by energy efficiency impact

**Added asset value of buildings**

A variety of studies has found a positive impact of energy efficiency on the real estate value of buildings. This indicator shows the additional value of commercial, office, and residential buildings. The calculation is based on the capitalisation rates for real estate investments in residential and tertiary buildings, which stem from surveys among actors in the property market.

Value in ME

50 Mio.

45 Mio.

40 Mio.

35 Mio.

30 Mio.

25 Mio.

20 Mio.

15 Mio.

10 Mio.

5 Mio.

0

2023 2025 2027 2030

Tertiary Residential

Year	Tertiary (ME)	Residential (ME)
2023	0	0
2025	~3	0
2027	~15	0
2030	~45	0

# Results: ecologic indicators

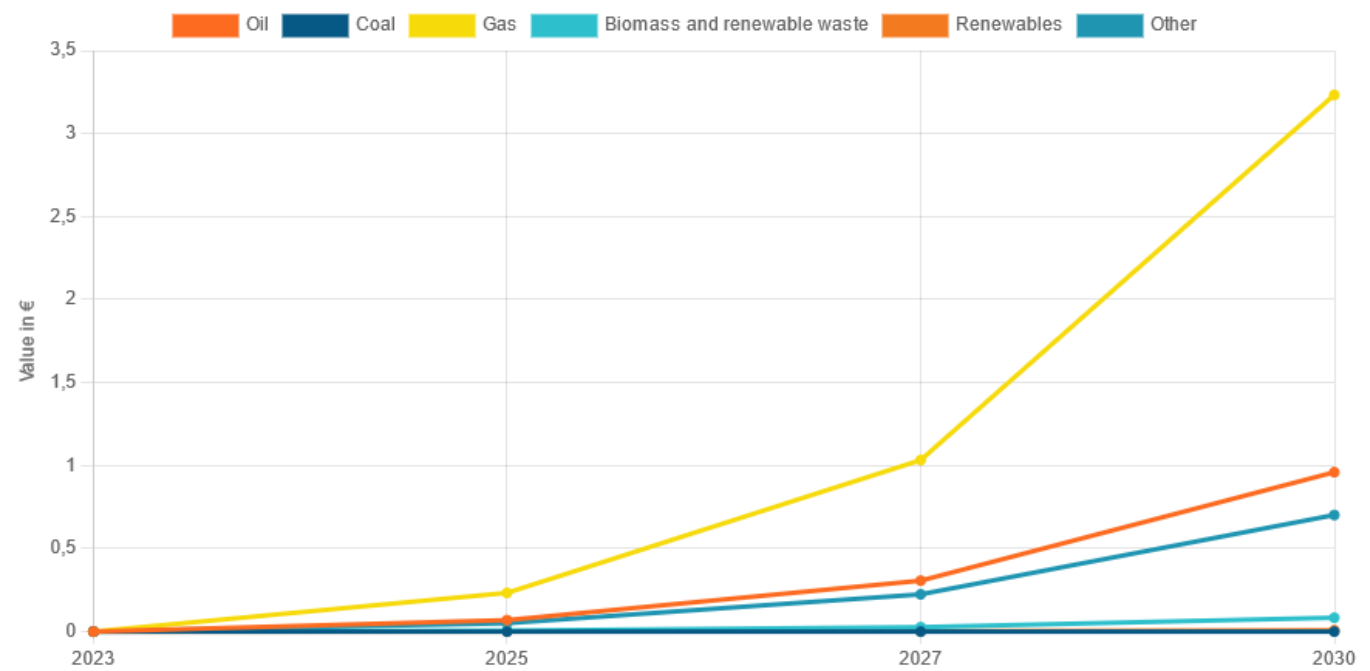
[back to the entries](#)

- Quantification**  
physical values
- Monetization**  
monetary values
- Aggregation**  
monetary values per year
- Cost-benefit analysis**  
cost effectiveness

- Social
- Economic
- Ecologic**

- Primary savings by fuel** ✓
- Reduction in air pollution ✖
- Reduction in greenhouse gas emissions ✖
- Impact on RES targets ✖
- Reduction of additional capacities in grid ✖

**Primary savings by fuel**  
This indicator describes the energy saved in terms of primary energy carriers with the proposed measures. The conversion processes necessary for the generation of hydrogen and synthetic fuels, electricity, and heat are taken into account. The energy mix of these conversion processes comes from past data from Eurostat and projections from PRIMES.



# Results: monetisation

[back to the entries](#)

Quantification physical values

Monetization monetary values

Aggregation monetary values per year

Cost-benefit analysis cost effectiveness

Social

Economic

Ecologic

Reduction of energy costs ✓

Premature deaths due to air pollution ✖

Avoided lost working days due to air pollution ✖

Reduction of greenhouse gas emissions ✖

Impact on RES targets ✖

Reduction of additional capacities ✖

Health indoor climate (Asthma) ✖

Indoor health II ✖

**Reduction of energy costs**

This indicator describes the reduction in energy costs for end users to be expected from energy saving measures. It is calculated from final energy savings, differentiating between energy carriers and sectors, taking lower taxes and rates for commerce and industry into account. In case the energy mix has not been specified in the measure specific parameters, it is calculated from Eurostat and PRIMES data, accounting for the higher prevalence of certain energy carriers in specific improvement actions.

Electricity Oil Coal Gas Biomass and Waste Heat H2 and e-fuels

Year	Electricity	Oil	Coal	Gas	Biomass and Waste	Heat	H2 and e-fuels
2023	0	0	0	0	0	0	0
2025	~50,000	~50,000	~10,000	~100,000	~10,000	~10,000	~10,000
2027	~200,000	~100,000	~10,000	~500,000	~10,000	~10,000	~10,000
2030	~700,000	~300,000	~10,000	~1,600,000	~10,000	~10,000	~10,000

# Results: cost-benefit analysis

[back to the entries](#)

**Quantification**  
physical values

**Monetization**  
monetary values

**Aggregation**  
monetary values per year

**Cost-benefit analysis**  
cost effectiveness

**Social**

**Economic**

**Ecologic**

**Indicators**

- Reduction of energy costs ✓
- Premature deaths due to air pollution ✓
- Avoided lost working days due to air pollution ✓
- Reduction of greenhouse gas emissions ✓
- Impact on RES targets ✓
- Reduction of additional capacities ✓
- Health indoor climate (Asthma) ✓
- Indoor health II ✓
- Reduction in air pollution ✓

**Parameters**

Energy price sensitivity ⓘ  100%

Investments sensitivity ⓘ  100%

Discount rate ⓘ  3%

**Cost benefit analysis facility**

- Net present value
- Cost benefit ratio
- Levelised costs
- Funding efficiency
- Marginal cost curves

**New energy savings**

Time	Energy Savings (€)
1	0.4
2	0.6
3	0.6
4	1.1
5	1.1
6	1.1
7	1.1
8	1.1
9	1.1
10	1.1



Multiple Impacts Calculation Tool

# THANK YOU

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Frederic Berger, Fraunhofer ISI  
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# RE-ENERGISING EUROPE

First Part: Modelling, nudging and assessing future energy demand patterns

"Modelling, nudging and assessing future energy demand patterns"

October 24, 2023 - From 11.15 to 13.00



**Felix Suerkemper**  
Wuppertal Institute/MICAT



**Frederic Berger**  
Fraunhofer ISI/ MICAT



**Meta Thurid Lotz**  
Fraunhofer ISI/newTRENDS



**Filippos Anagnostopoulos**  
IEECP



**Philipp Mascherbauer**  
TU Wien/newTRENDS



**Peter Conradie**  
IMEC/NUDGE



**Anne Kesselring**  
Fraunhofer ISI/NUDGE

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# RE-ENERGISING EUROPE

## Networking lunch & Poster sessions

#REenergisingEurope



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# RE-ENERGISING EUROPE

Second Part: Multiple benefits, behavioural change and new societal trends

October 24, 2023 - From 14.30 to 14.45



**Margot Pinault**  
DG ENER, European Commission

#REenergisingEurope



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# Fit for 55

## EU Energy Efficiency policy

*Margot Pinault, Energy Efficiency Unit,  
ENER.B2, European Commission*

# Policy context - Overview

- **European Green Deal** - Overarching policy

EU to be climate neutral by 2050 and cut GHG emissions by at least 55% by 2030



- **Fit for 55 package** - Delivering the Green Deal

Set of interconnected proposals, including revision of key legislation  
**EED, EPBD, RED**

+ **REPowerEU**, call on co-legislators to make the "Fit for 55" package more ambitious and speed up its adoption and implementation

# The Energy Efficiency Directive recast

- **Adoption** of the final text on 13 September 2023
- **Publication** in the Official Journal on 20 September 2023:

## **Directive (EU) 2023/1791**

- **Entry into force** on 10 October 2023
- Transposition period of 2 years

# The Energy Performance of Buildings Directive recast

- **EPBD proposal adopted on 15 December 2021**
- Council agreed on its **General approach in October 2022**
- **On 14 March 2023, EP plenary adopted its position** on the EPBD and grants mandate to ITRE for dialogues
- First two political dialogues took place **on 06 June & 31 August 2023 (next one on 12 October)**

## Two-fold objective:

- Contribute to **reducing buildings' GHG emissions and final energy consumption** by 2030
- Provide a **long-term vision** for buildings and ensure an adequate contribution to achieving **climate neutrality in 2050**

# Main elements of the EED revision

Binding and increased EU energy efficiency target & indicative national contributions

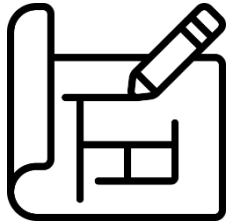
'Energy Efficiency First' Principle – making it an integral part of policy and investment decisions

Strengthened energy savings obligation in end-use

Stronger exemplary role of public sector

Increased focus on alleviating energy poverty and consumer empowerment

# Article 3 EED: Energy Efficiency First Principle

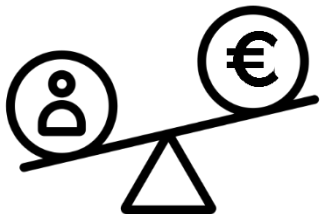


Apply EE1st in **planning, policy and major investment decisions\*** in energy systems & non-energy sectors with significant impact on energy consumption

\* more than €100 million each and €175 million for transport infrastructure



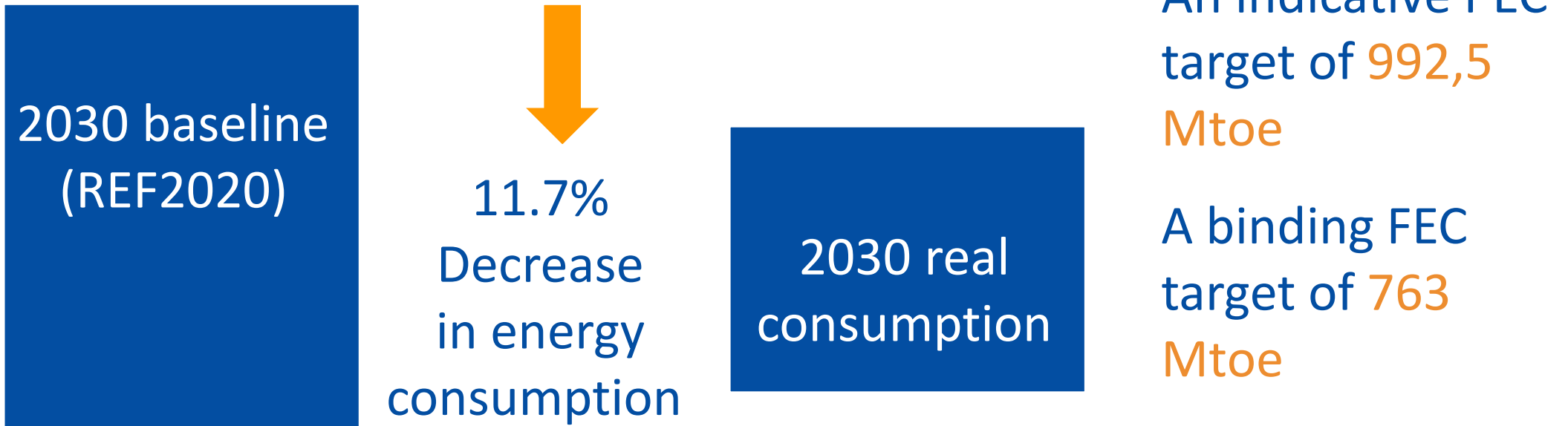
**Monitor** the application of EE1st (identify a monitoring entity or entities)



Promote and apply **cost-benefit methodologies** (wider benefits of energy efficiency, societal perspective)



# Article 4 EED: EU ambition & targets

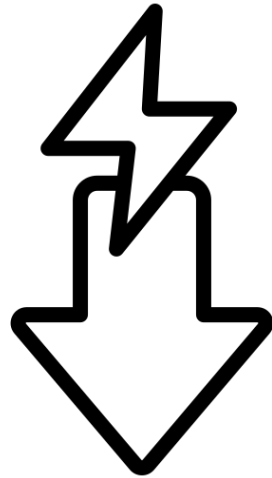


Member States shall set indicative national targets

An “ambition gap” mechanism will ensure that the national targets sum up to the EU targets

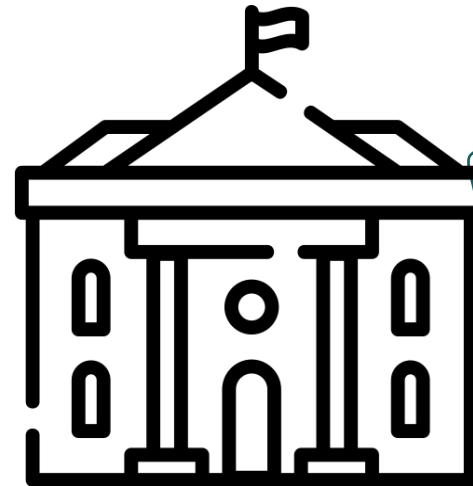
# Articles 5 – 7 EED: Exemplary role of public sector

Reduce total  
final energy consumption  
of all public bodies



1.9% each year

Renovate  
heated / cooled buildings  
owned by public bodies



NZEB

Zero-emission

3% each year

Purchase



High energy efficiency  
performance

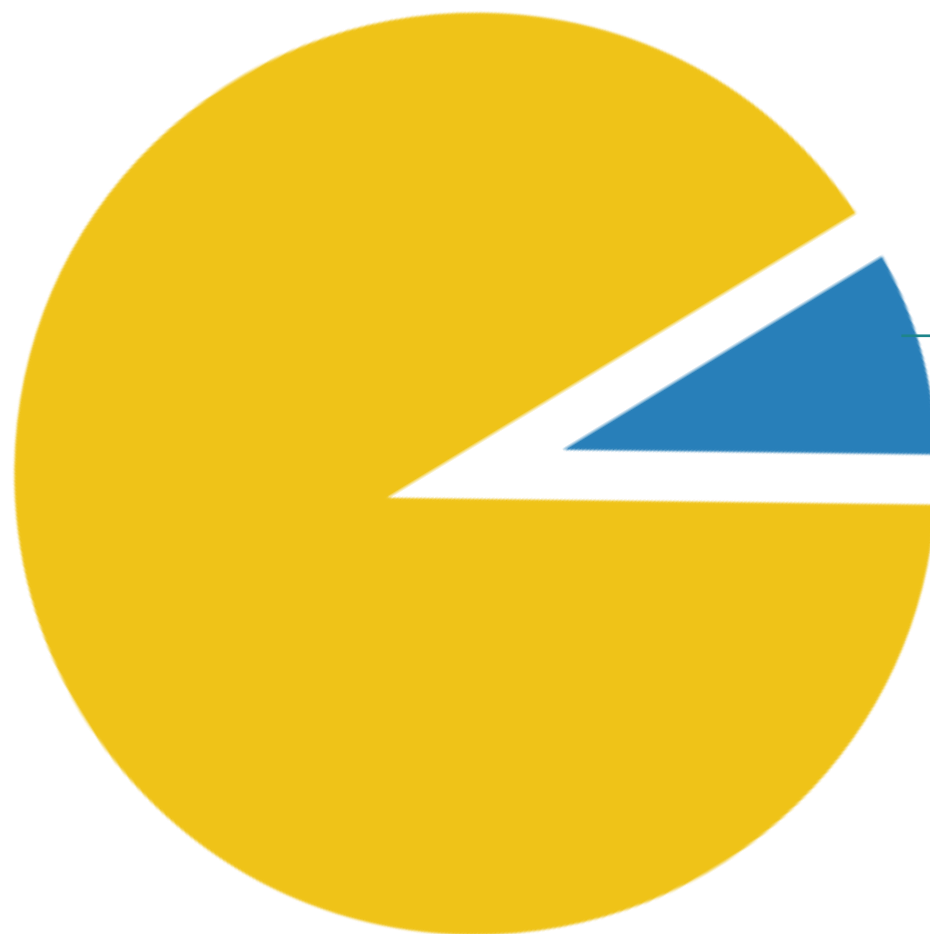
# Article 8 EED: Energy savings obligation

Stepwise increase  
in annual cumulative  
energy savings  
obligation in end use:

**1.3% as of 2024**

**1.5% as of 2026**

**1.9% as of 2028**



## Just transition sub-target:

Achieve share of the  
total amount of energy  
savings among  
vulnerable customers  
and energy poor

**Member  
States to  
define**

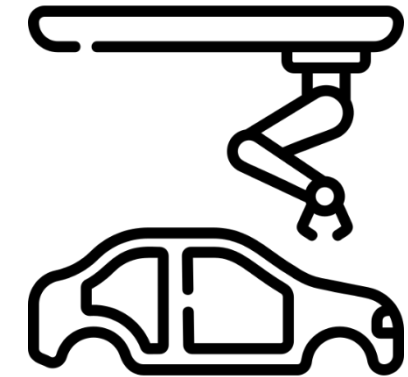
Savings coming from direct fossil fuel combustion progressively  
excluded

# Article 11: Energy efficiency in industry

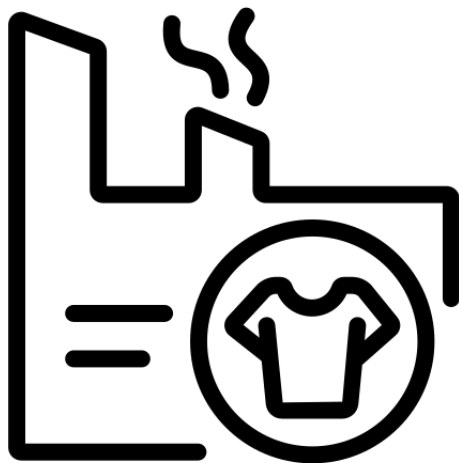
## Energy management system

Enterprises with an average annual consumption higher than **85TJ** of energy over the previous 3 years and taking all energy carriers together

Main criterion: energy consumption



ACTION PLAN!



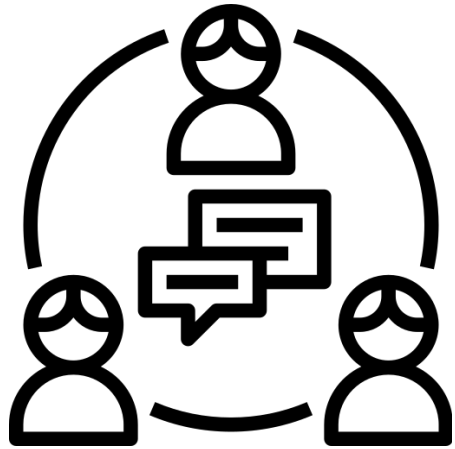
## Energy audit

Enterprises with an average annual consumption higher than **10TJ** of energy over the previous 3 years and taking all energy carriers together that do not implement an energy management system



# Article 22: Information and awareness raising

## One-stop shops



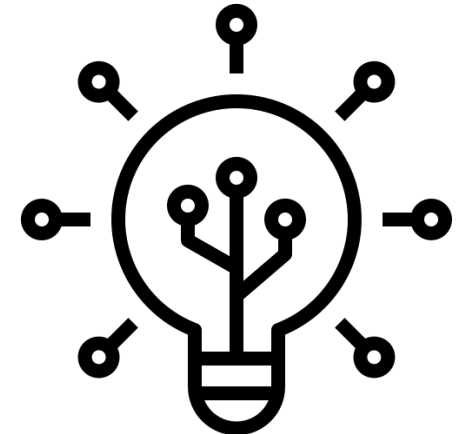
Disseminate **information** on available energy efficiency improvement measures, individual actions and financial and legal frameworks to all relevant market actors

Ensure access to simple, fair, transparent, independent, effective and efficient **out-of-court** mechanisms for the settlement of disputes

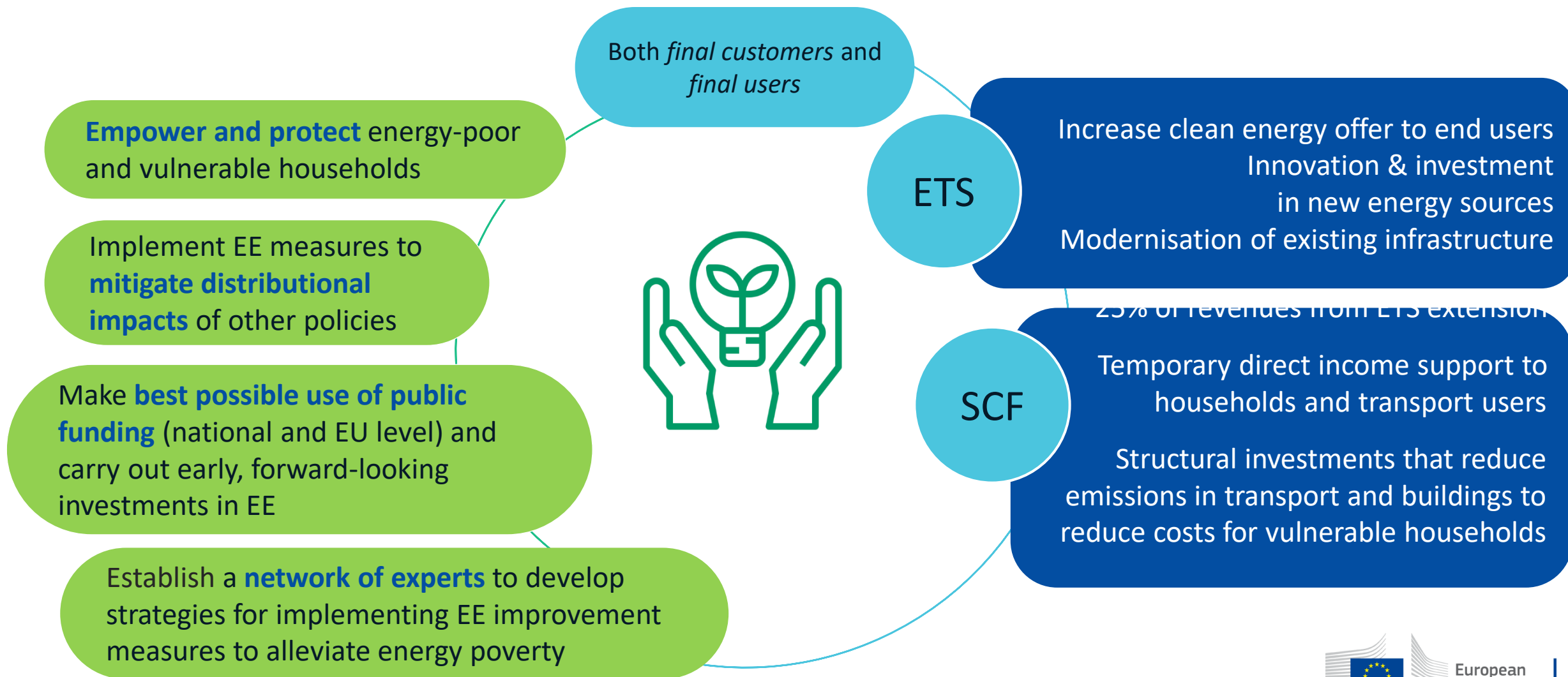
Remove regulatory and non-regulatory barriers to energy efficiency due to **split of incentives** between owners and tenants



**Single point of contact**  
information on rights, applicable law and dispute settlement mechanisms



# Article 24: Empower and protect vulnerable groups

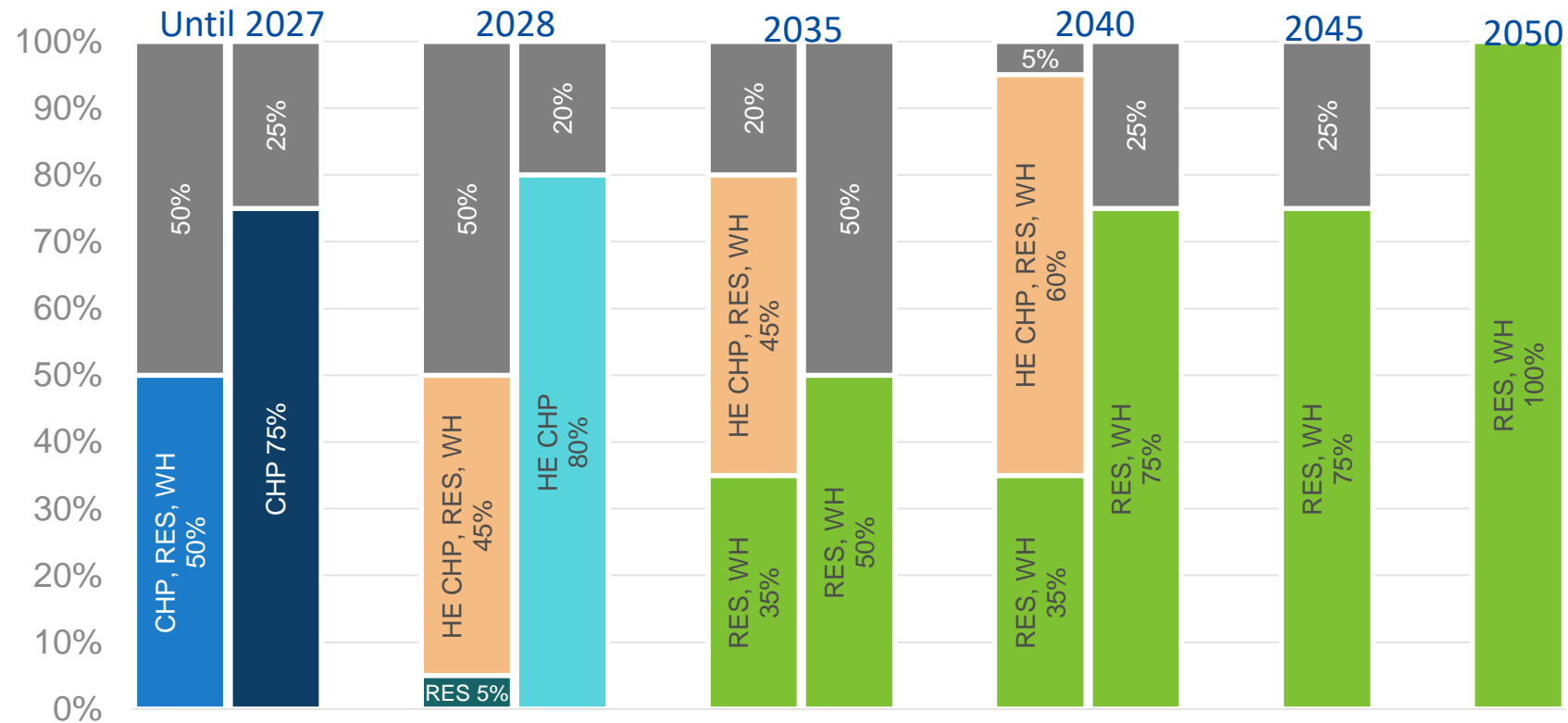


# Articles 25 & 26: Heating and cooling

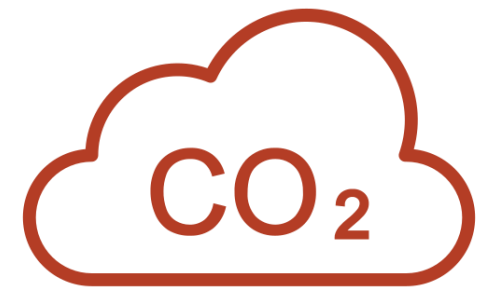
Comprehensive heating and cooling assessment in NECPs

Local heating and cooling plans (municipalities above **45.000 inhabitants**)

Evolution of efficient district heating and cooling



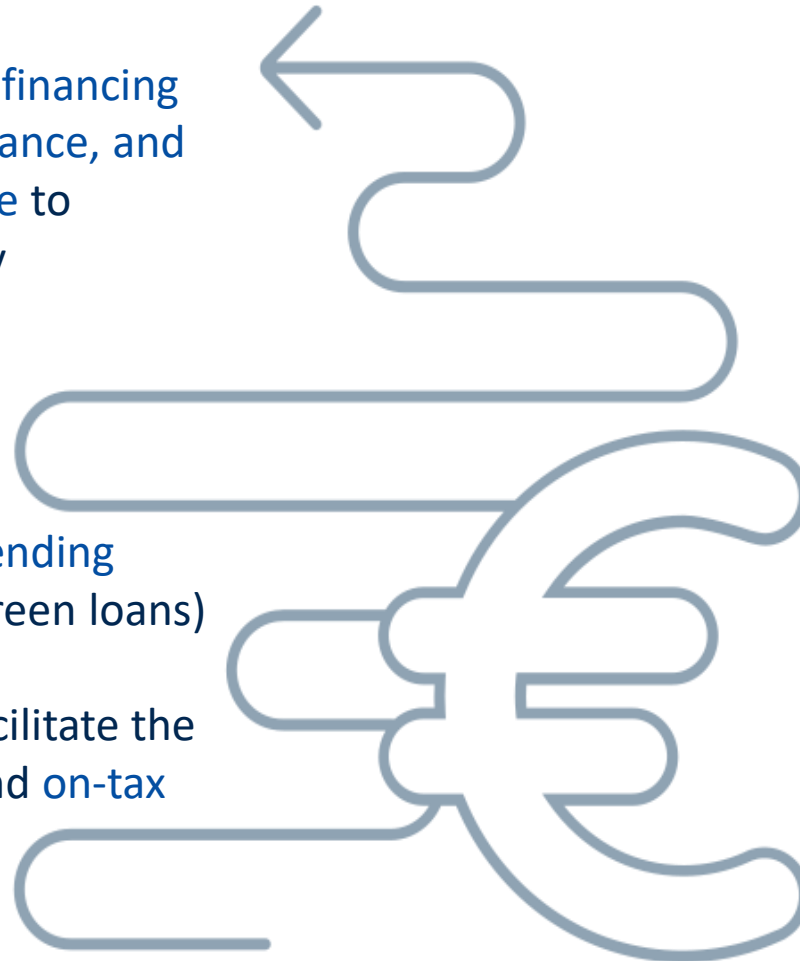
Alternative approach



# Article 30 EED: Financing energy efficiency

- Facilitate the establishment of financing facilities, increase access to finance, and project development assistance to mobilise investments in energy efficiency in different sectors

- Promote energy efficiency lending products (EE mortgages & green loans) by ensuring a wide and non-discriminatory offer, and facilitate the implementation of on-bill and on-tax financing schemes



- Strengthen cooperation and dialogue with private and public financial institutions to mobilise private investments in energy efficiency measures and energy renovations

Regulate the voluntary National Energy Efficiency Fund set up by Member States

- Introduce reporting requirements on energy efficiency financing (volume, leverage factor, lending products)





Thank you

# RE-ENERGISING EUROPE

Second Part: Multiple benefits, behavioural change and new societal trends

October 24, 2023 - From 14.30 to 14.45



**Margot Pinault**  
DG ENER, European Commission

#REenergisingEurope



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# RE-ENERGISING EUROPE

Second Part: Multiple benefits, behavioural change and new societal trends

"Policy learnings from the projects"

October 24, 2023 - From 14.45 to 15.45



Barbara Schломann  
Fraunhofer ISI/MICAT



Maksymilian Kochanski  
RIC/newTRENDS



Heike Brugger  
Fraunhofer ISI/NUDGE



Giulia Pizzini  
IEECP

#REenergisingEurope



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Multiple Impacts Calculation Tool

RE-energising Europe - Sharing ideas and knowledge  
*Policy Learnings from the MICAT project*

*Barbara Schlomann, Fraunhofer ISI  
24 October 2023, Brussels,*

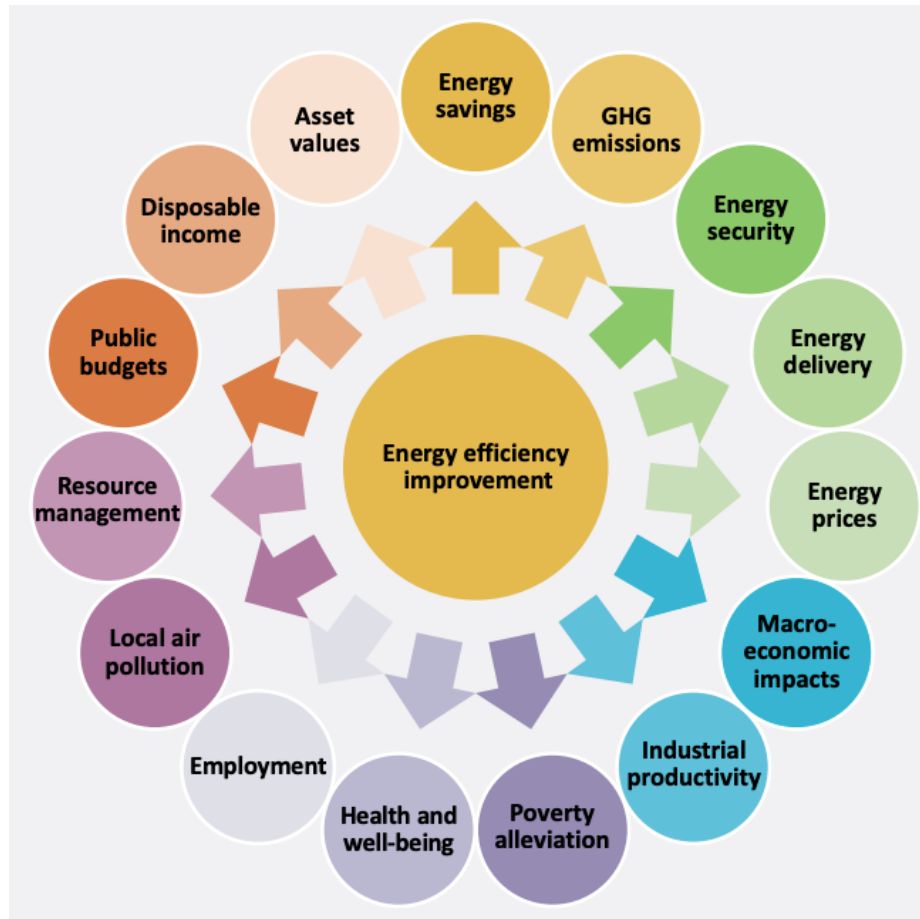


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000132.

# Why are multiple benefits so important for energy efficiency and climate policy making?

- Multiple benefits (also known as co-benefits, non-energy benefits or multiple impacts) have been **widely discussed during the last decade both at the policy level and at the level of companies.**
- Multiple benefits accompany energy efficiency projects and provide additional arguments to implement energy efficiency measures, but are **rarely reported.**
- Multiple benefits are more and more mentioned at international and European level to justify ambitious energy efficiency targets and policies, but are **rarely quantified or even monetised.**
- **Multiple benefits must be considered to decide which climate neutrality pathways are best suited to reach the long-term climate neutrality target.**

# The fundamental IEA work on multiple benefits of energy efficiency



Source: Ryan, L. and N. Campbell (2012), "Spreading the Net: The Multiple Benefits of Energy Efficiency Improvements", IEA Energy Papers, No. 2012/08, OECD Publishing, Paris, <https://doi.org/10.1787/5k9crzjbpkcc-en>.

At the IEA Global Conference on Energy Efficiency in June 2023, 45 governments endorsed the goal of doubling global energy efficiency progress by 2030.



Forty-five governments from around the world have endorsed the goal of doubling the average global rate of energy efficiency improvements by the end of the decade to foster sustainable economic growth and help put the world on a secure and affordable path towards net zero emissions.

In a ministerial statement released today following the IEA's 8th Global Conference on Energy Efficiency in Versailles, France, governments from across Africa, the Americas, Asia and Europe highlighted the critical role that energy efficiency can play in improving living standards and energy security – and in accelerating the clean energy transition toward reaching net zero emissions by 2050.

**This means ramping up annual energy efficiency progress from 2.2% today to over 4% annually by 2030 in a move that would create jobs, expand energy access, reduce energy bills, decrease air pollution, and diminish countries' reliance on fossil fuel imports – among other social and economic benefits.**

Source: IEA's Global Conference on Energy Efficiency in Versailles, June 6-8 2023  
<https://www.iea.org/news/at-iaa-conference-45-governments-endorse-goal-of-doubling-global-energy-efficiency-progress-by-2030>

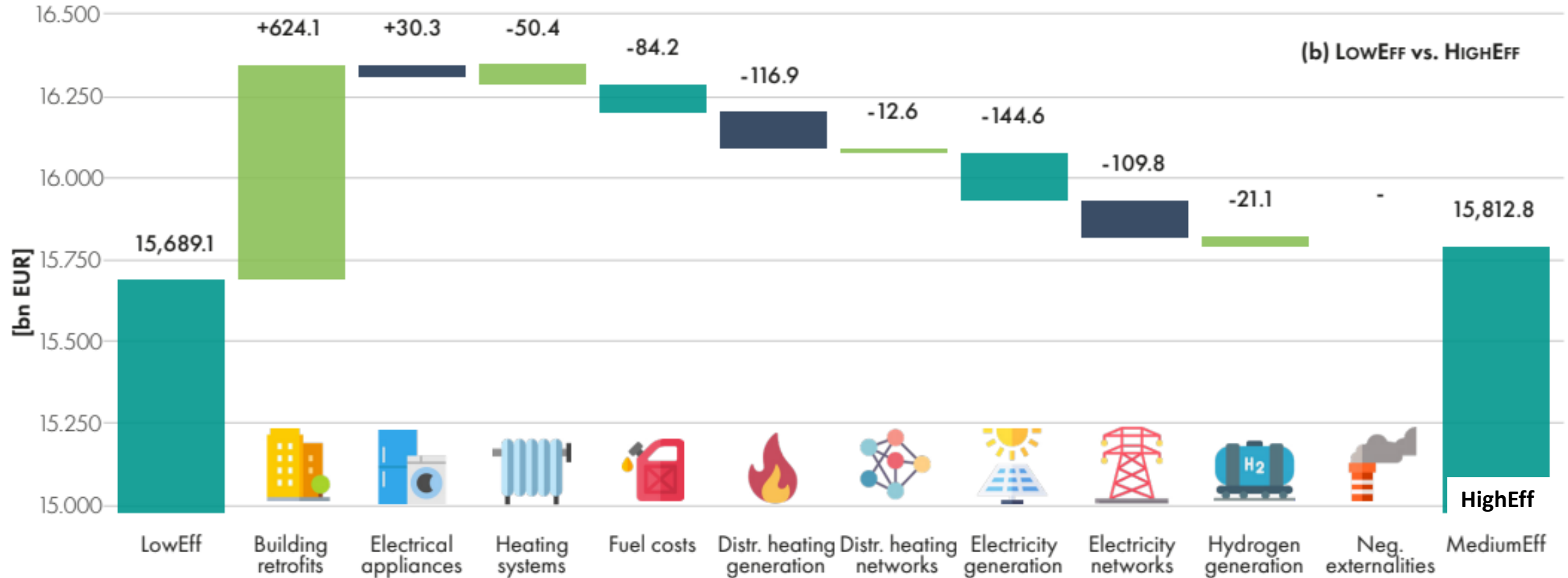
# The importance of multiple benefits for the implementation of the «Energy Efficiency First» Principle

- The revised Energy Efficiency Directive (EED 2023) entered into force on 10 October 2023.
- Article 3 of the revised Directive establishes “Energy Efficiency First (EE1)” as a fundamental principle of EU energy policy → energy efficiency must be considered by EU Member States in all relevant policy and major investment decisions taken in the energy and non-energy sectors.
- Cost-benefit analyses are needed taking wider benefits of energy efficiency solutions into account beyond pure energy and energy cost savings.

## Article 3(5a) of the EED 2023:

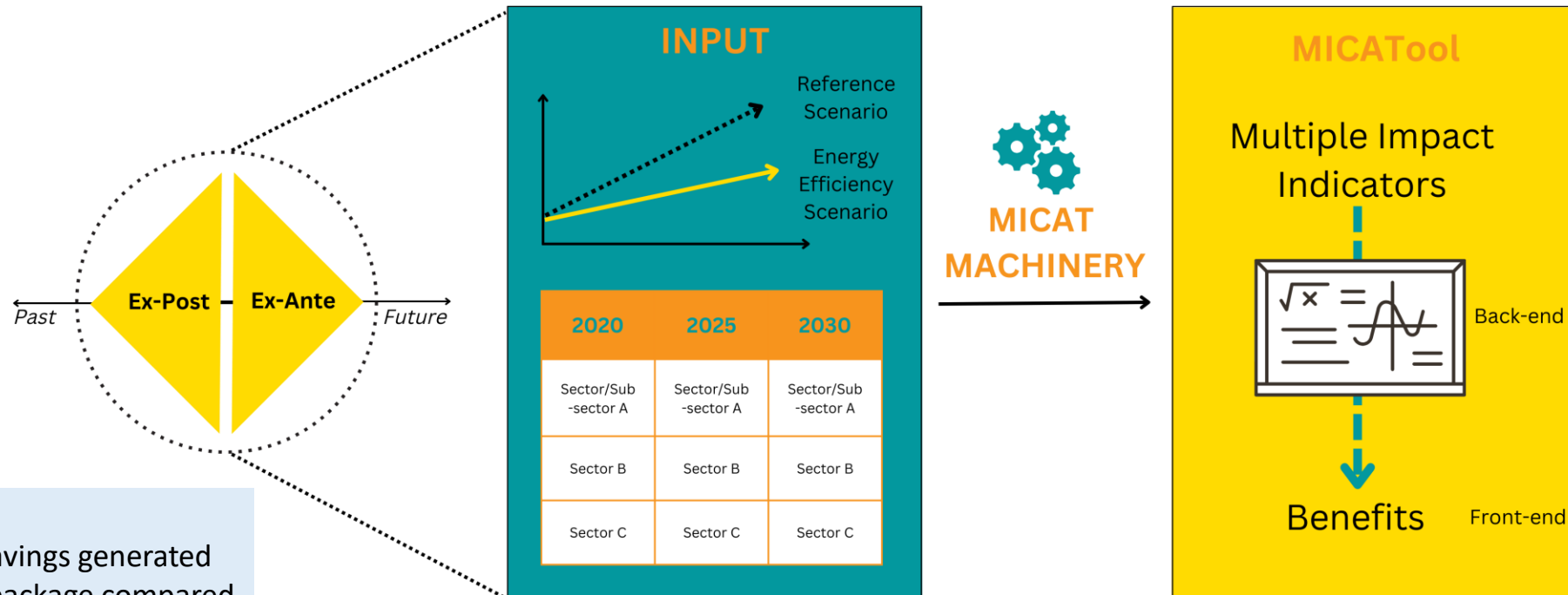
*“In applying the energy efficiency first principle, Member States shall promote and, where cost-benefit analyses are required, ensure the application of, and make publicly available, cost-benefit methodologies that allow proper assessment of the wider benefits of energy efficiency solutions where appropriate, taking into account the entire life cycle and long-term perspective, system and cost efficiency, security of supply and quantification from the societal, health, economic and climate neutrality perspectives, sustainability and circular economy principles in transition to climate neutrality.”*

# Energy System Cost 2020-2050 - alone not a clear argument for Energy Efficiency First



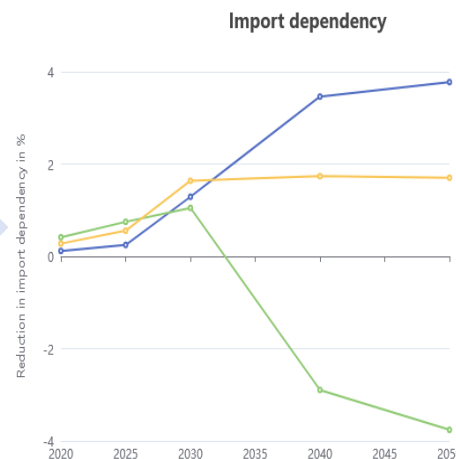
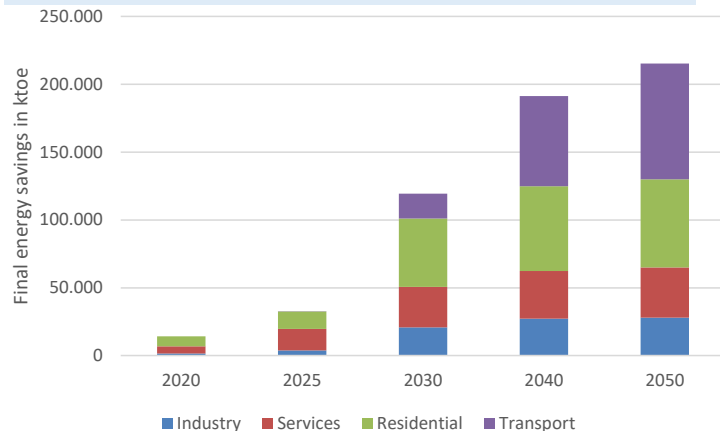


# Functioning of MICATool for the quantification and montisation of multiple impact indicators



## Example EU:

Additional final energy savings generated through the „Fit for 55“ package compared to the EU Reference scenario 2020



# SEED MICAT – The follow-up project for MICAT

- **Support Energy Efficiency Deployment with MICATool**
  - Follow up project for MICAT, starting December 2023
  - SEED MICAT supports EU and Member States at national, regional, and local governance levels in including Multiple Impacts of carbon neutrality pathways in their operationalisation and implementation of the Energy Efficiency First (EE1) principle, thus "sowing the seeds" for a broad application of the principle
- **How will MICAT and the MICATool be further developed in SEED MICAT?**
  - Extending the scope of and improving the MICATool to allow the analysis of potentially competing or complementary paths and options to climate neutrality
    - Extending the multiple impacts framework to renewable energy sources and integrating a policy module
  - Supporting a further integration Multiple Impacts in political processes at European, national, regional, and local governance levels
    - Providing a basis for reporting on Multiple Impacts of climate neutrality pathways in the light of the EE1 principle

# Contributions of MICAT and SEED MICAT for a broader consideration of Multiple Benefits - Summary

- Serving stakeholder needs to better characterise future climate neutrality pathways and to decide which pathways are best suited.
- Supporting the implementation of the Energy Efficiency First Principle under Article 3 of the EED 2023.
- Simplified approach based on indicators linked to energy savings.
- Providing a publicly available and easily usable online tool for the quantification and monetisation of multiple benefits of energy efficiency policies.
- Final aim: broad consideration of multiple benefits in policy-making at European, national and local level.



Multiple Impacts Calculation Tool

<https://micatool.eu/>

**THANK YOU**  
*The MICAT Team*



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000132.

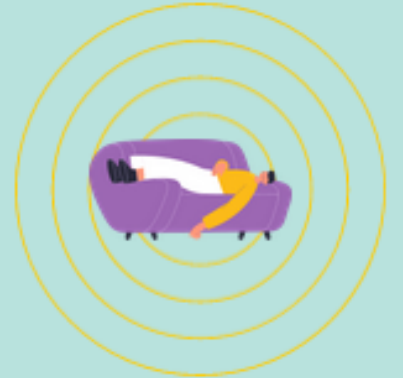
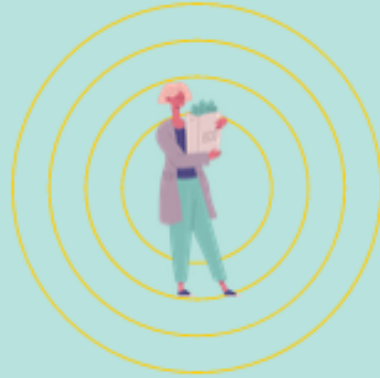


Nudging consumers  
towards energy efficiency  
through behavioural science



NUDGE has received funding  
from the European Union's  
Horizon 2020 Research and  
innovation programme under  
grant agreement No 957012.

# Empowering Consumers Through Raising Awareness: Policy learnings from the NUDGE project



Dr. Heike Brugger  
Fraunhofer ISI



@NUDGEH2020

[www.nudgeproject.eu](http://www.nudgeproject.eu)

# How and what can we learn for policy recommendations from pilot studies?

- Pilots are very context specific
- Care must be taken with generalisation
- Yet, allowed for an in-depth understanding of underlying behavioural mechanisms



Interdisciplinary project-based education on home energy consumption for children in **Belgium**



Efficient control of heating and hot water preparation for natural gas boilers in **Greece**



Optimization of electric Vehicle charging with self-produced PV power in **Germany**



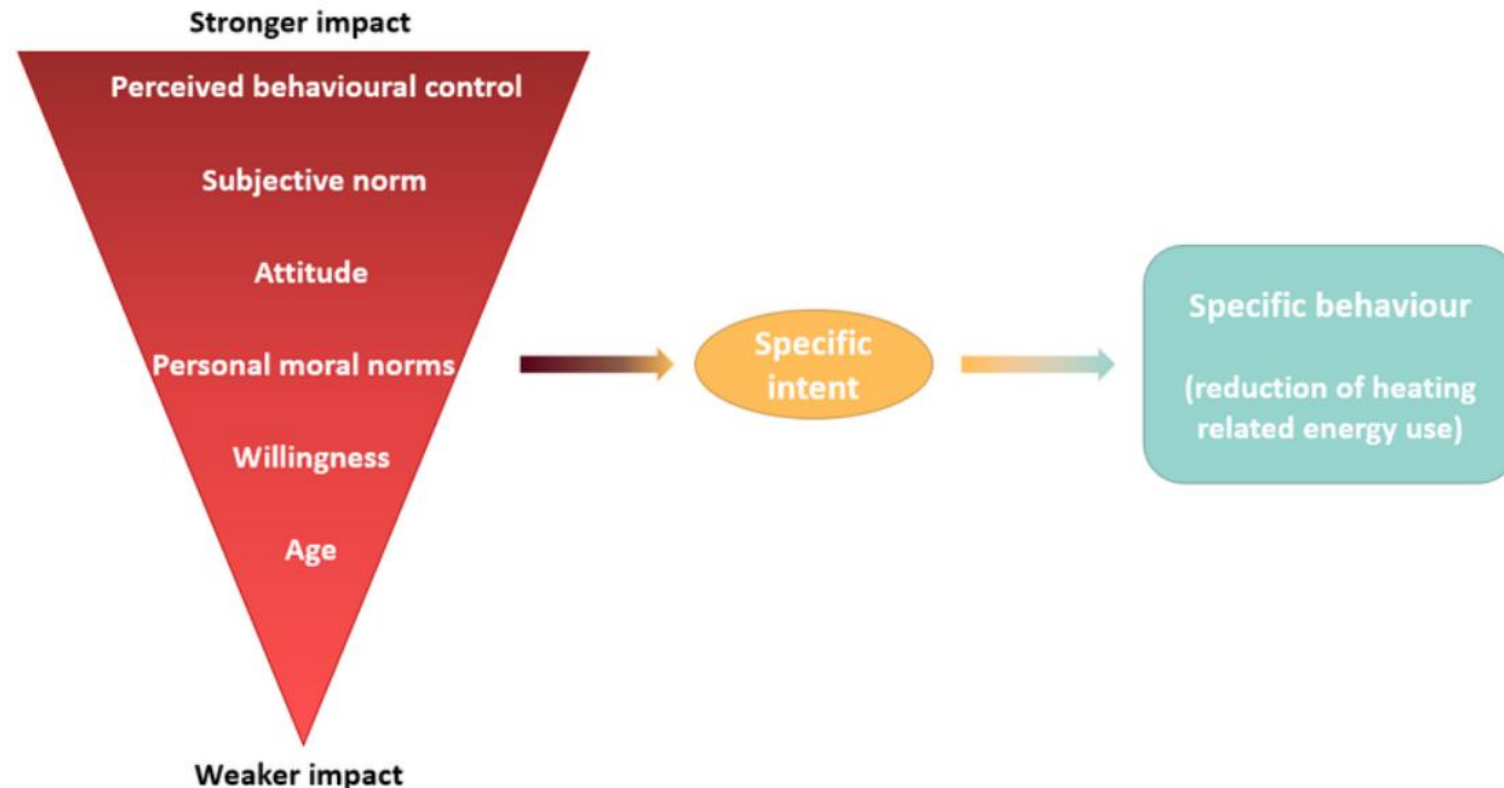
Healthy homes for long-lasting energy efficiency behaviour in **Portugal**



Promoting distributed self-production for local energy communities in **Croatia**

# How can we understand the drivers of behavioural change?

- To derive policy recommendations addressing behavior, it is crucial to have an indepth understanding of the drivers



# How could policies impact behavioural changes in general (without bans or financial incentives)?

## Improving perceived behavioural control



- Designing information campaigns and policies that directly address the customers
- Use policy measures to address intermediary actors (such as energy service companies or energy utilities) and to hold them responsible, where practicable
- Consumption data must be available in a timely and accessible manner

- Address fears of a loss of comfort

## Improving attitudes



- Closely link energy-saving behaviour with the individual's contribution to this goal

## Improving the impact of subjective norms

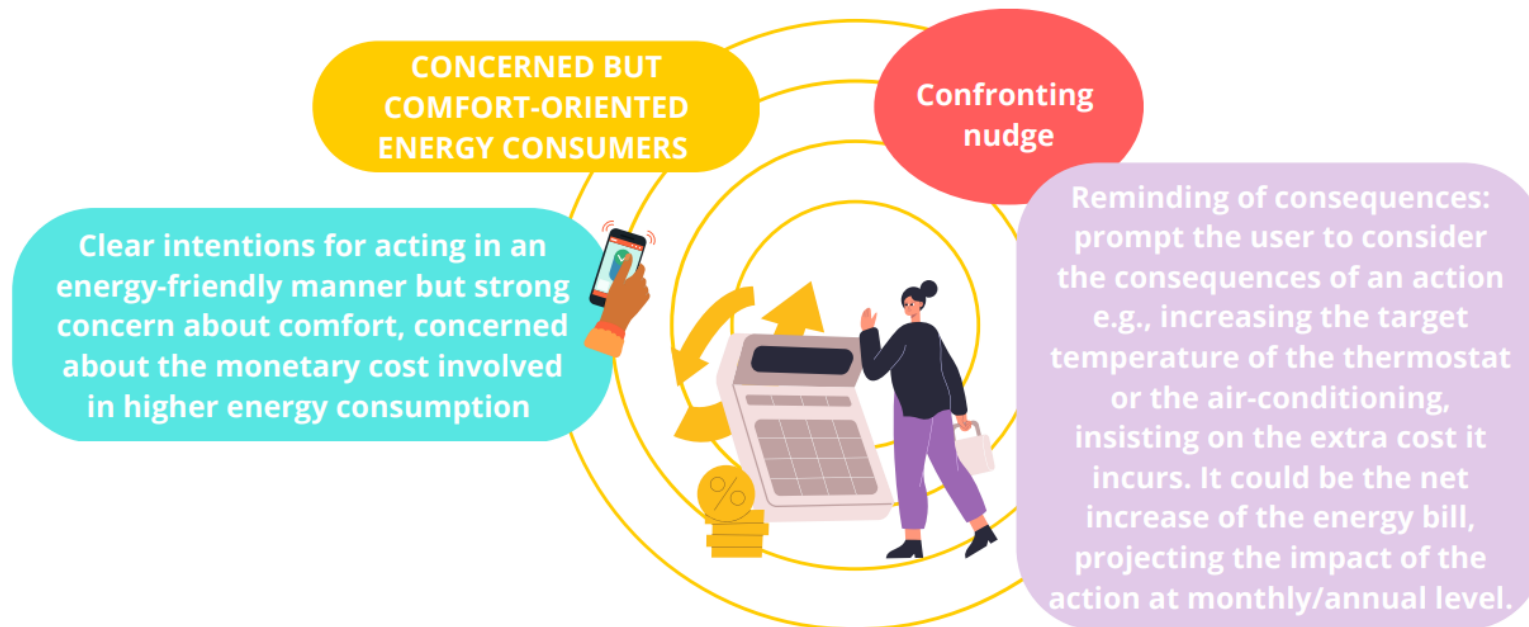




# How to nudge effectively?

Be aware of different energy user profiles:

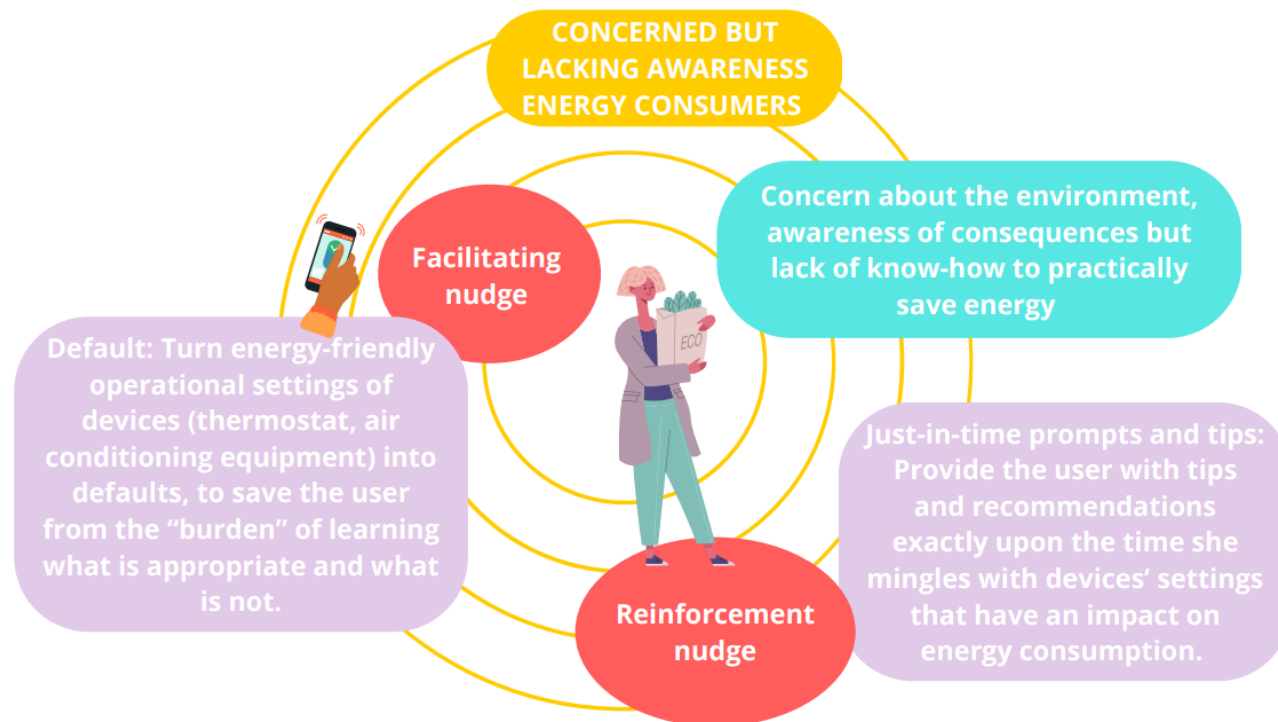
- People differ in their energy consumption profiles (including their motivations to use or save energy)
- Different approaches may be appropriate to nudge them towards energy efficiency.



# How to nudge effectively?

Be aware of different energy user profiles:

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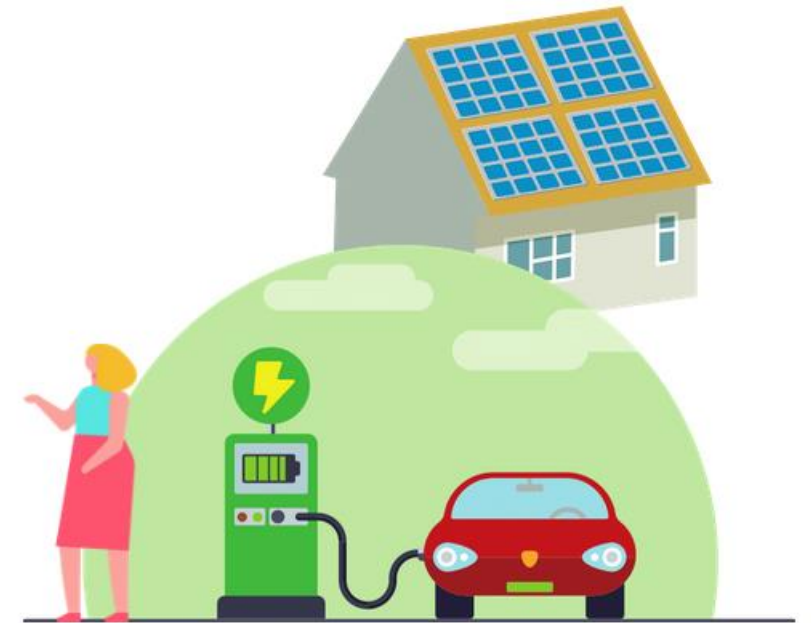


## How to nudge effectively?



- Offer users real-time insights into their energy consumption
- Use default settings and/or naturally occurring situations to nudge people as effectively as possible

- Nudges are more effective when new behaviours are formed instead of improving existing ones
- Ethical considerations, consumer protection and data protection are of paramount importance and include issues such as informed consent, transparency and respect for autonomy



# How can nudges contribute to awareness raising and energy literacy to empower consumers?

## Raising awareness and increasing energy is essential:

- Key-enabler:
  - Pushing the roll-out of smart-meters and other digital infrastructure
  - Ensure that easy to understand and easy to use dashboards are included to visualise the measured energy consumption.



## Understand the younger generation as an integral part of the energy transition:

- Teaching on energy should be strengthened
- Use non-educational channels to raise awareness and to empower consumer to understand their own energy consumption
- Encourage interpersonal communication about energy (to foster intergenerational learning and replication potentials)

# Which role do external conditions such as regulatory frameworks play?

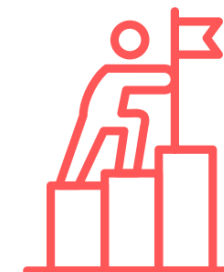


**Problem:** External conditions (regulatory framework, prices) can have much stronger impacts on energy consumption behaviour!

- Nudges are effective in reinforcing policy-based incentives but not reversing disincentives



- Behavioural interventions/nudges need to be aligned with external conditions



- Accompanying regulatory frameworks with digital tools and information can have a positive impact

## And how to monitor behaviour change?



**Problem:** Due to the strong impact of other external factors, a careful and informed approach to monitoring and analysing behaviour change is essential!

- Strong link between nudge and energy-saving rationale
- Use of digital infrastructure to allow long-term monitoring
- Monitor not only positive but also possible negative effects
- Cooperation and knowledge sharing



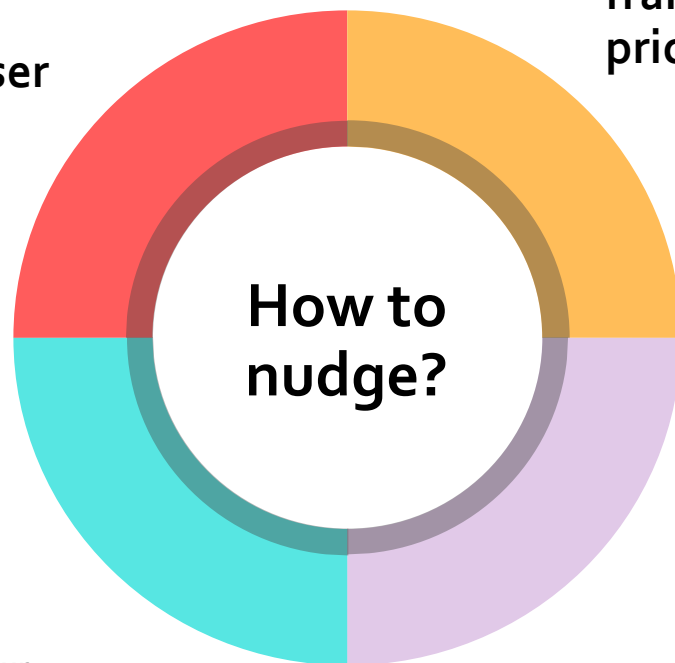
## Understand energy consumption behaviour and different energy user profiles

- Mix of different nudges to be able to target all energy consumers
- Understand and address the role of the younger generation

## 04

### Keep it simple!

- Use existing infrastructure
- Use default nudges
- Strong link between nudge and intended behaviour change



## 02

### Understand the impact of the regulatory framework and other external factors (e.g., price) on energy consumption behaviour

- Investigate the interplay between behaviour, nudge and regulatory/external conditions
- Investigate not only positive but also negative effects
- Adapt your nudges regularly

## 03

### Use the technological development

- Target new behaviour
- Use digital infrastructure to deliver information and nudges
- Establish long term monitoring (see also 02)





Nudging consumers towards energy efficiency through behavioural science



NUDGE has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 957012.







# Policy learnings from newTRENDS

**Dr. Max Kochanski**  
Research and Innovation Centre Pro-Akademia



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 893311.

# AGENDA

Opportunities  
and challenges for  
policy making  
triggered by the  
new societal  
trends

## Policy learnings from newTRENDS focus studies on

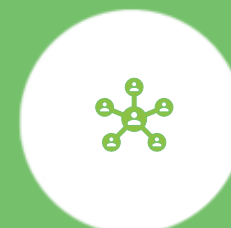


Transition  
from  
consumers to  
prosumagers

Digitalisation of  
the economy  
and private life



Towards  
a shared  
economy

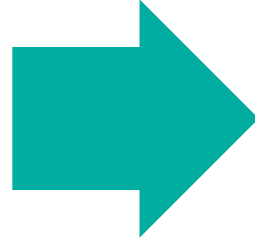


Towards  
a circular economy  
and  
a low-carbon  
industry



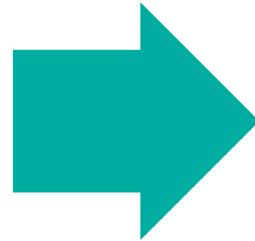
# OPPORTUNITIES AND CHALLENGES FOR POLICY MAKING TRIGGERED BY THE NEW SOCIETAL TRENDS

Disruptive  
potentials



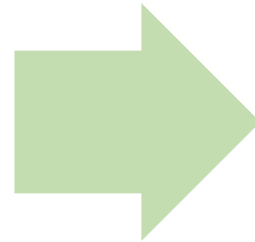
What does it mean for policy making?

Controversial  
impacts



What does it mean for policy making?

Inter-  
relationships

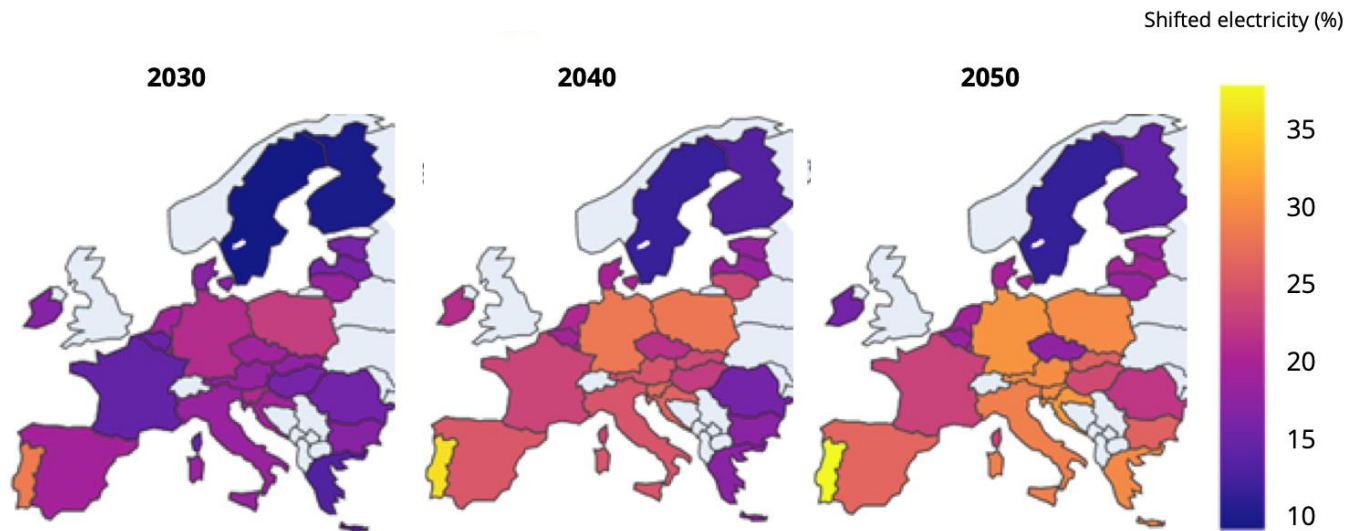


What does it mean for policy making?



# POLICY LEARNINGS FROM NEWTRENDS FOCUS STUDY: TRANSITION FROM CONSUMERS TO PROSUMAGERS

## Disruptive potentials:



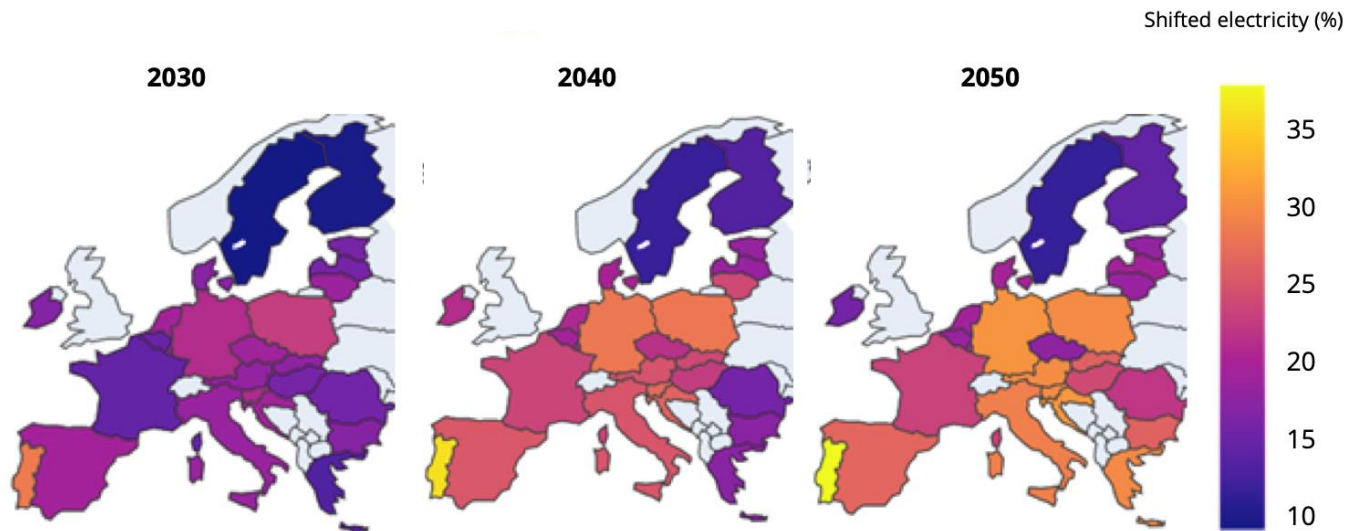
Projected percentages of electricity demand that residential prosumers with electrified heating systems can shift in the years 2030, 2040, and 2050

Source: NewTrends Policy Brief: Flexing the residential energy demand, P. Mascherbauer & L. Kranzl, TU Wien



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Enhanced and new policy instruments needed to reap the benefits of these potentials:

Local and dynamic electricity tariffs combined with a faster roll-out of smart meters

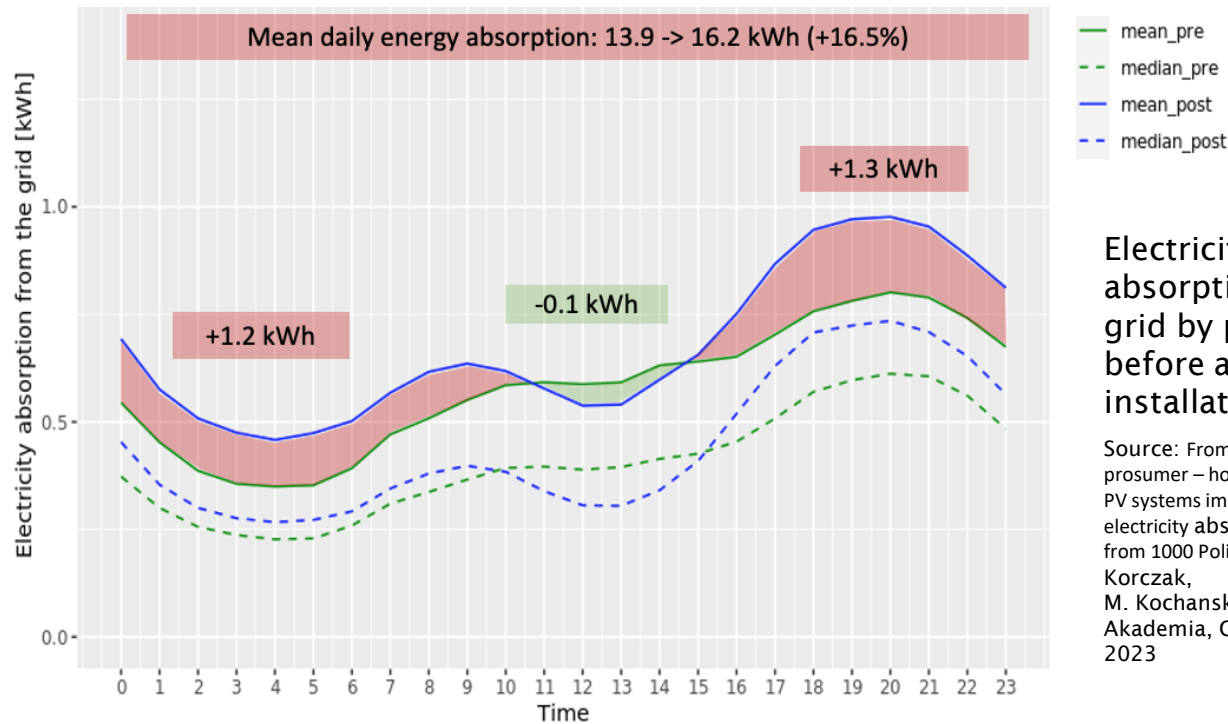
Policy instruments to protect vulnerable consumers

Standardisation to enforce heat pumps controllability through external signals



# POLICY LEARNINGS FROM NEWTRENDS FOCUS STUDY: TRANSITION FROM CONSUMERS TO PROSUMAGERS

## Controversial impacts:



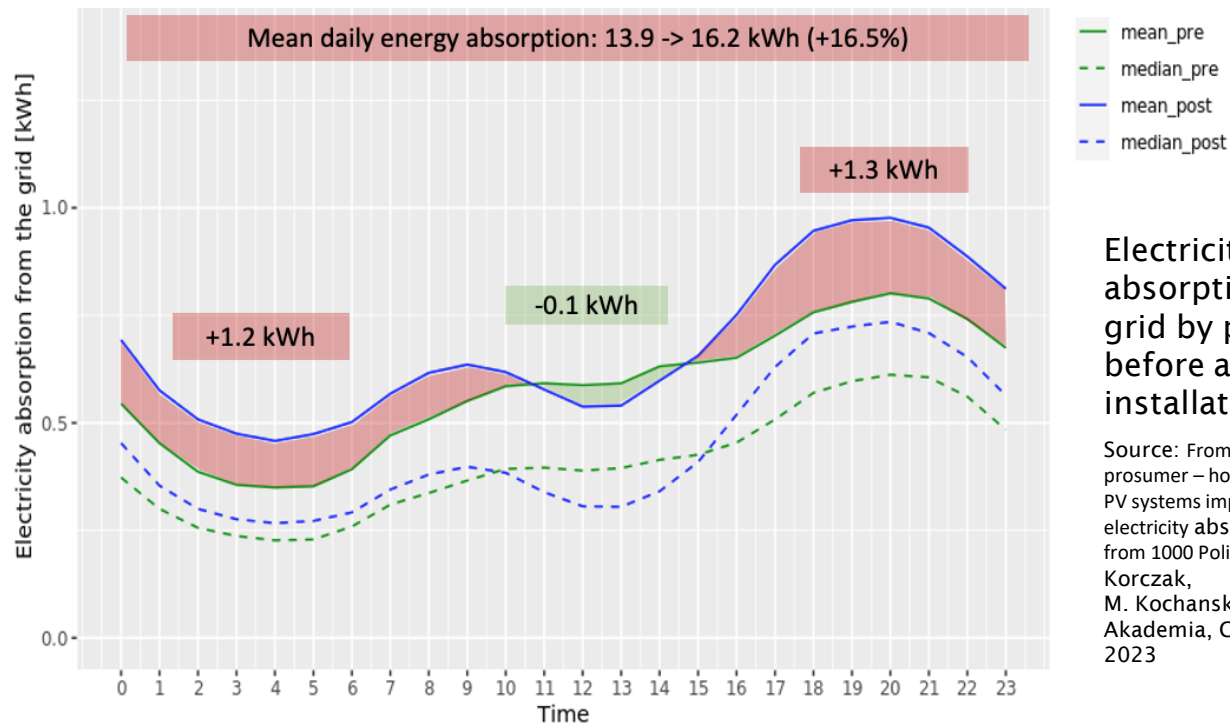
### Electricity absorption from the grid by prosumers before and after PV installation (Jan-Feb)

Source: From consumer to prosumer – how installation of small PV systems impacts household electricity absorption? Evidence from 1000 Polish prosumers, K. Korczak, M. Kochanski, RIC Pro-Akademia, C4E Forum, May 2023



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Prevent potential negative effects in policy design and improve policy coordination:



Adapted from: <https://politicaldictionary.com/words/its-the-economy-stupid/>

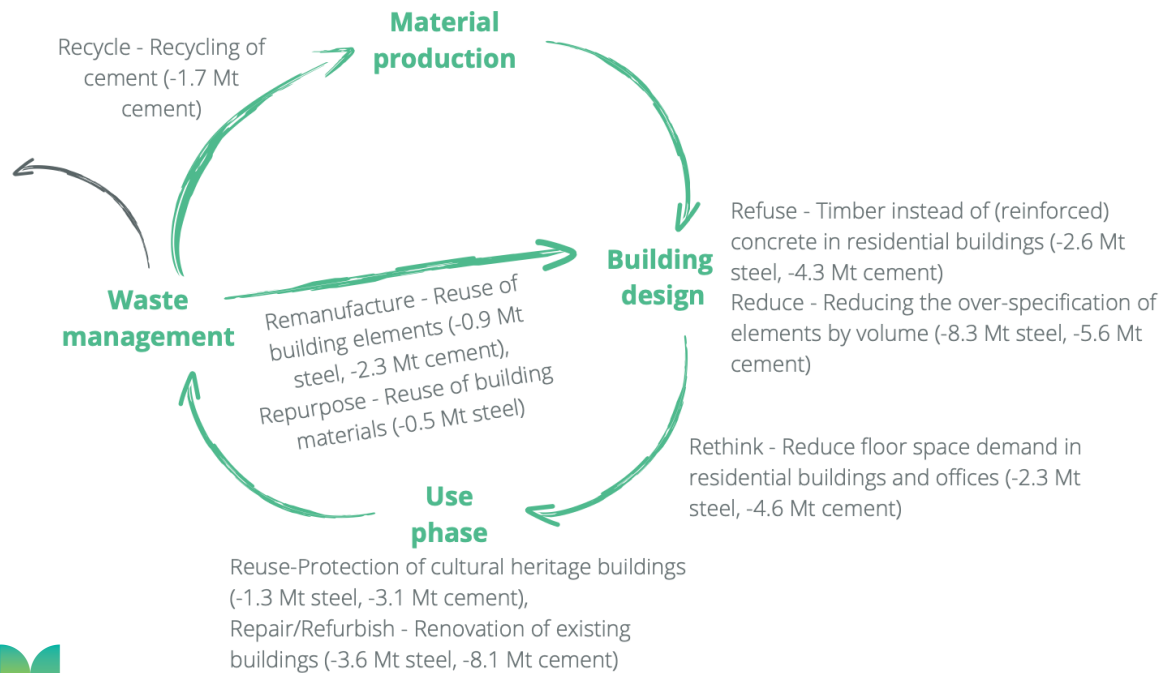


# POLICY LEARNINGS FROM NEWTRENDS FOCUS STUDY: TOWARDS A CIRCULAR ECONOMY AND A LOW-CARBON INDUSTRY

## Disruptive potentials:



### From a linear... to a circular economy for buildings



### Impact of Circular Economy actions on steel and cement demand in EU buildings

Source: NewTrends Policy Brief: Circular buildings: Paving the way to a net-zero industry, M. T. Lotz, A.Herbst, Fraunhofer ISI

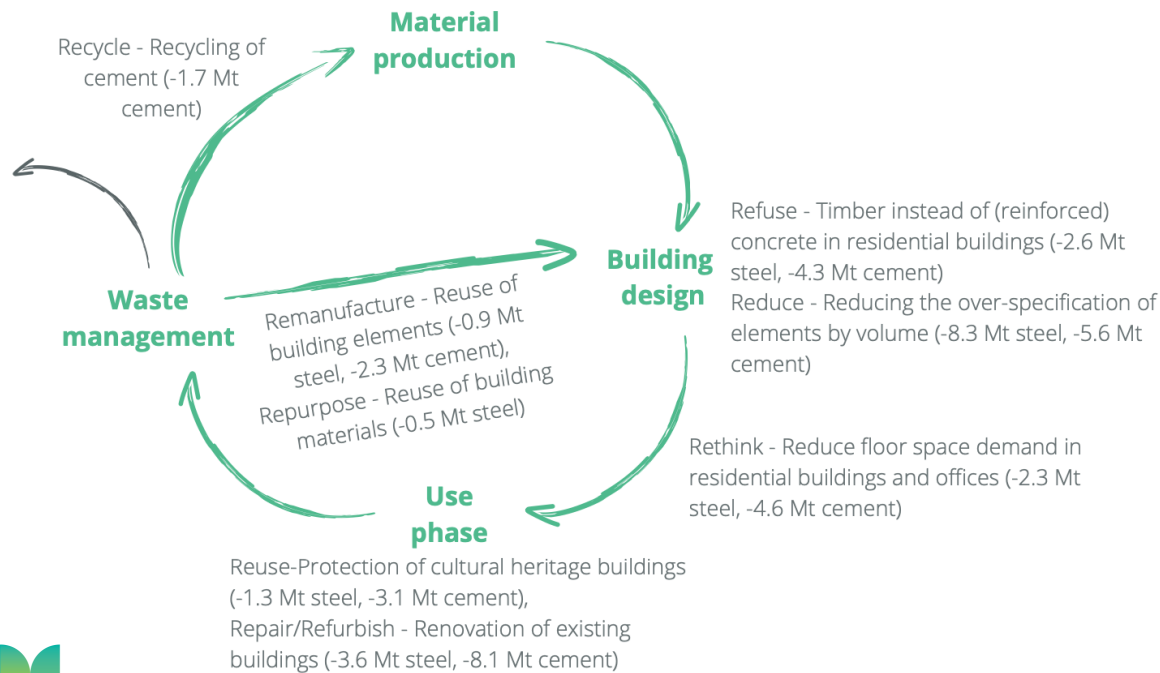




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Enhanced and new policy instruments needed to reap the benefits of these potentials:

Address all stages of a building's lifecycle well-balanced and without contradictions

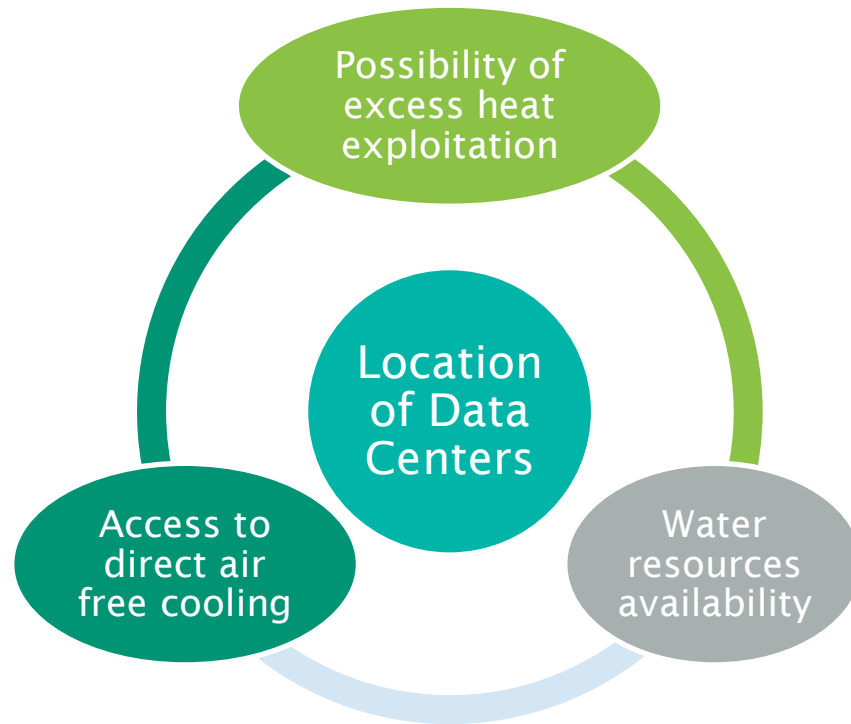
Broaden the scope of understanding the circular economy: beyond the cycling of materials

Integrate CE in Green Public Procurement



# POLICY LEARNINGS FROM NEWTRENDS FOCUS STUDY: DIGITALISATION OF THE ECONOMY AND PRIVATE LIFE

Controversial impacts & interrelationships:



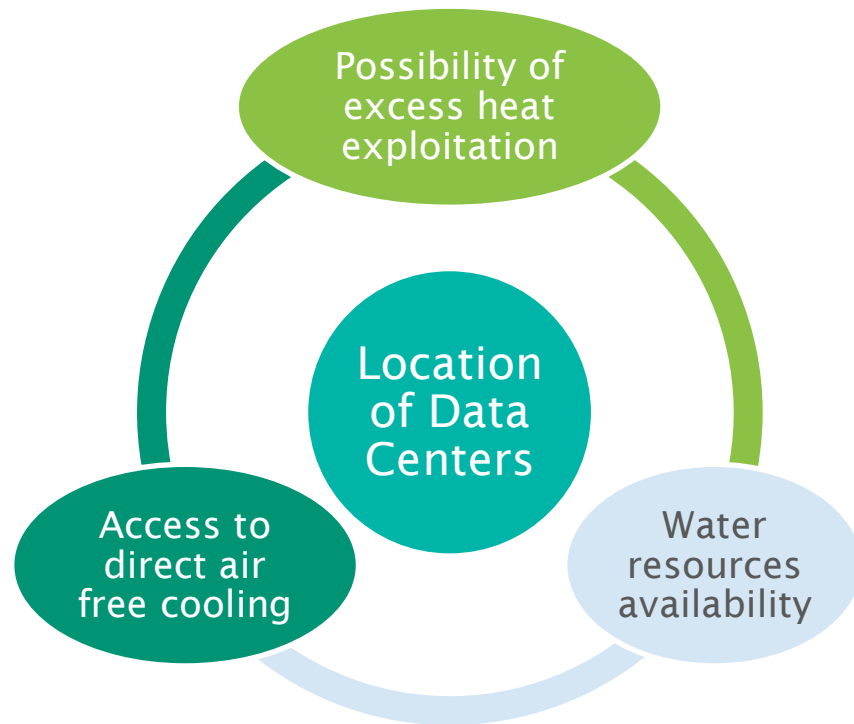
Factors affecting climate neutrality of data centers

Source: Based on NewTRENDS D4.4, Recommendations for better design of energy-demand modeling based on policy makers' needs, A. Miłobędzka et al., WISE



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**Stronger policy coordination between policy areas and policy levels is needed**

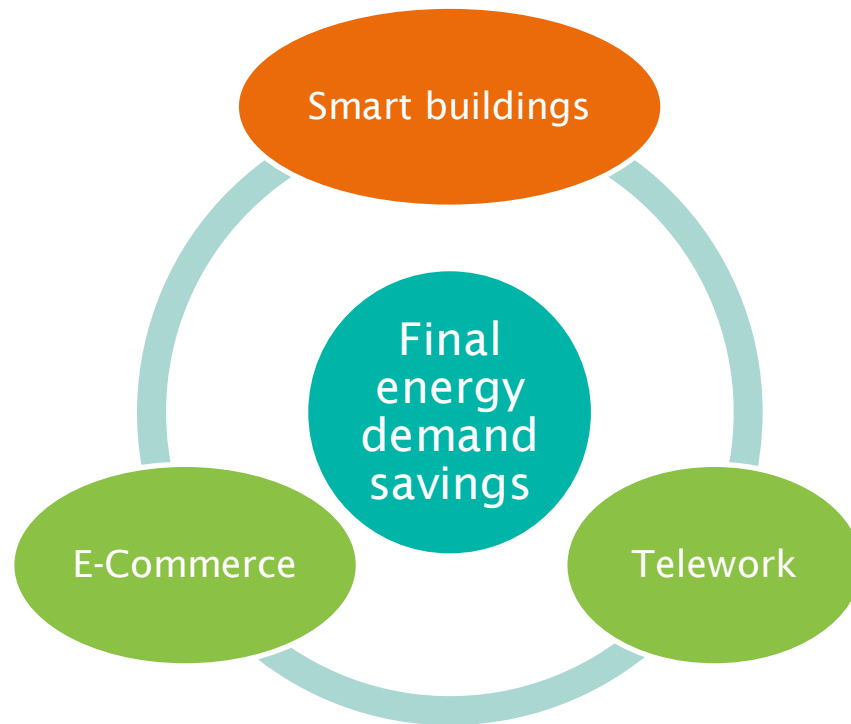
Climate neutrality of data centers vs. EU Taxonomy for sustainable activities

Climate neutrality of data centers vs. EU ERDF and RRF regulations



# POLICY LEARNINGS FROM NEWTRENDS FOCUS STUDY: DIGITALISATION OF THE SERVICE SECTOR

Disruptive potentials and interrelationships:



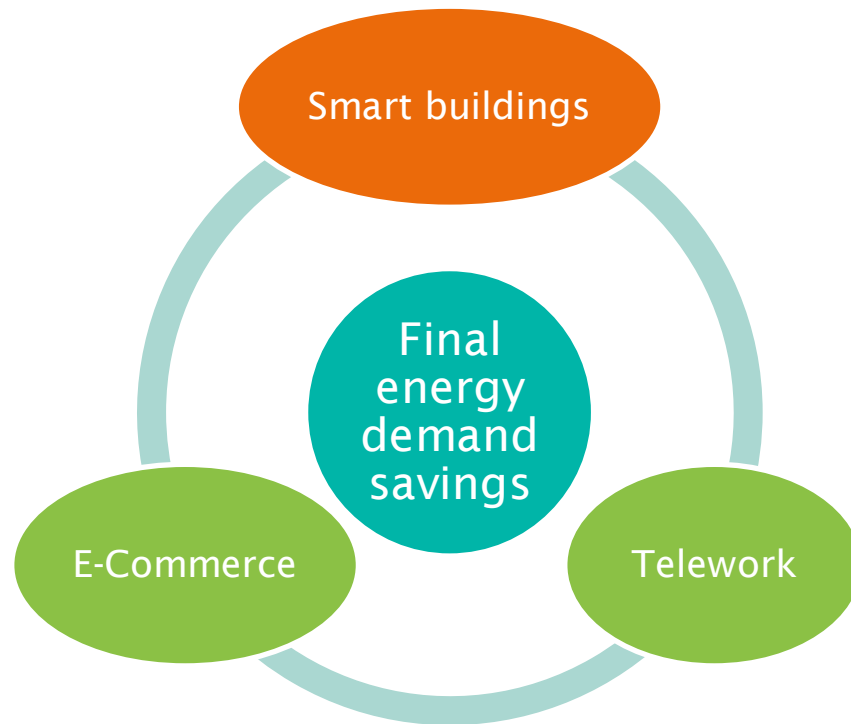
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# POLICY LEARNINGS FROM NEWTRENDS FOCUS STUDY: DIGITALISATION OF THE SERVICE SECTOR

Disruptive potentials and interrelationships:



Energy Saving potentials in tertiary sector areas

Actual potential depends on scenarios, and are partly compensated in residential sector (e.g. through teleworking)

Sources: NT D6.3, NT D7.2 and D7.3 (in prep.), NT D3.3, D6.2, TEP

Enhanced and new policy instruments needed to reap the benefits of these potentials:

Economic potentials covered by the existing building directive

More savings possible with additional support

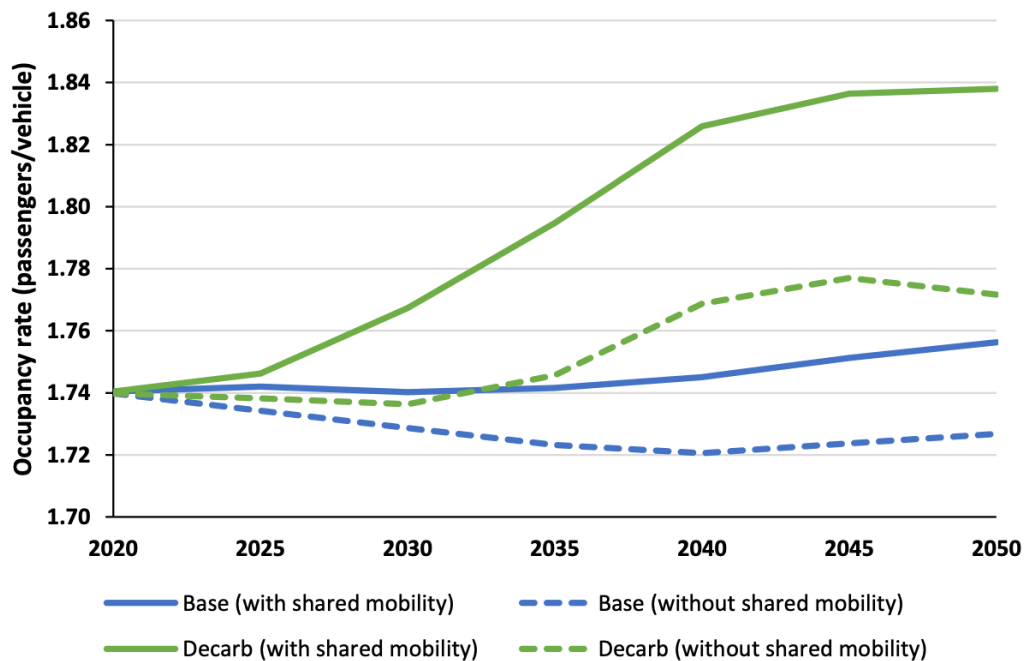
Consider focusing on subsectors with high potentials

Policies for employee protection may be essential



# POLICY LEARNINGS FROM NEWTRENDS FOCUS STUDY: TOWARDS A SHARED ECONOMY

## Disruptive potentials:



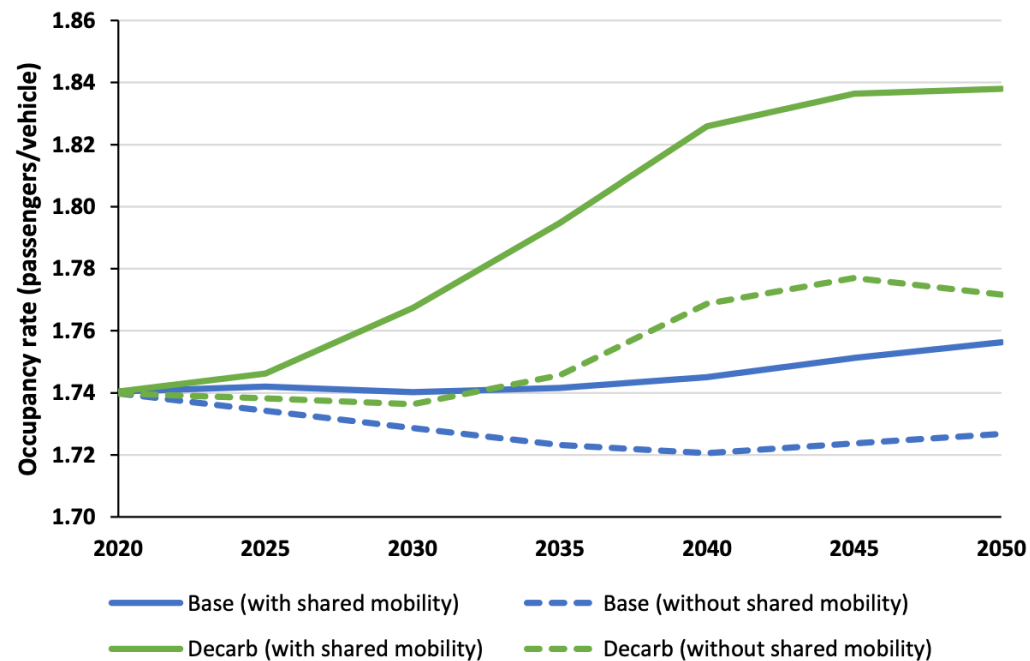
Average occupancy rate of cars across scenarios with and without shared mobility options

Source: NewTrends D7.1, Model developments to simulate sharing economy in transport, P. Karkatsoulis, V. M. Sourtzi, L. Paroussos, I. Tsiropoulos, E3M



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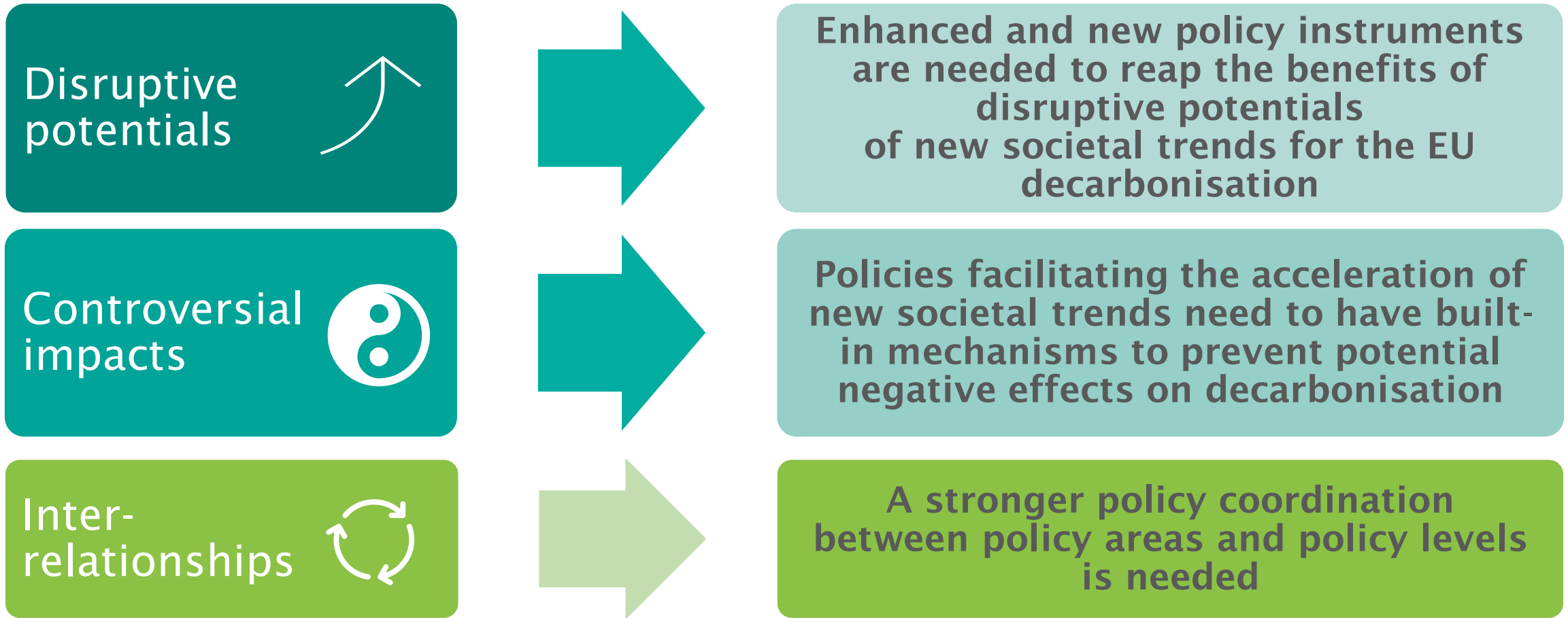
Effective carbon tax in transport

More stringent CO<sub>2</sub> standards for cars and vans

Increased availability of alternative fuel infrastructure



# CONCLUSION







# Thank you for your attention!



**Dr. Max Kochanski**

Research and Innovation Centre  
Pro-Akademia

[maksymilian.Kochanski@proakademia.eu](mailto:maksymilian.Kochanski@proakademia.eu)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 893311.

# RE-ENERGISING EUROPE

Second Part: Multiple benefits, behavioural change and new societal trends

"Policy learnings from the projects"

October 24, 2023 - From 14.45 to 15.45



Barbara Schlomann  
Fraunhofer ISI/MICAT



Maksymilian Kochanski  
RIC/newTRENDS



Heike Brugger  
Fraunhofer ISI/NUDGE



Giulia Pizzini  
IEECP

#REenergisingEurope



These projects have received funding from the European Union's Horizon 2020 research programme. The sole responsibility for the content of this event lies with the BECOOP, MICAT, newTRENDS, NRG2peers, NUDGE, UP-STAIRS and W4RES projects and does not necessarily reflect the opinion of the European Union.

# RE-ENERGISING EUROPE

Second Part: Multiple benefits, behavioural change and new societal trends

“The Necessary Evolution of Energy Efficiency Policies for Inclusive Transitions”

October 24, 2023 - From 15.45 to 16.00



**Emma Mooney**

International Energy Agency

#REenergisingEurope



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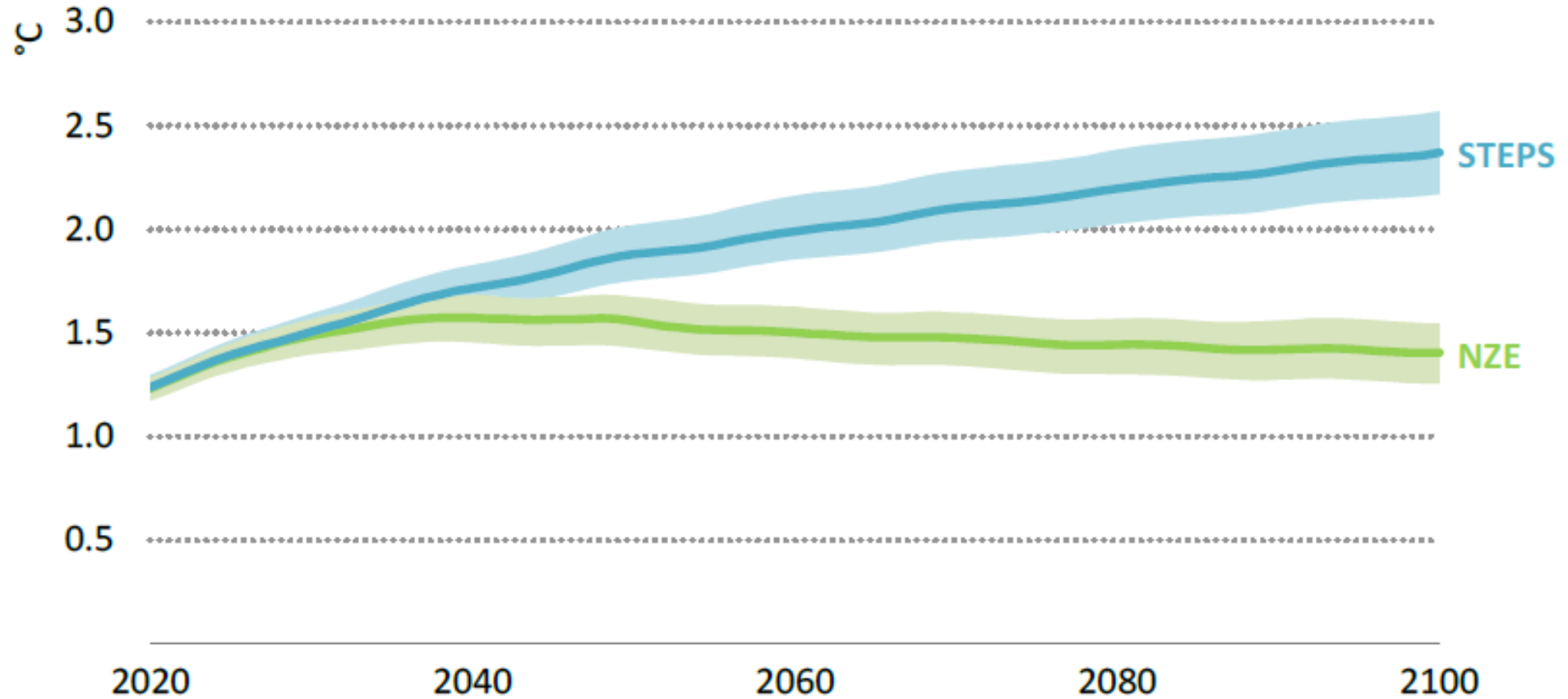
# **The Necessary Evolution of Energy Efficiency Policies for Inclusive Transitions**

Emma Mooney, Office of Energy Efficiency and Inclusive Transitions

Brussels, 24<sup>th</sup> October 2023

# The path to achieving 1.5°C has narrowed

Median warming in the STEPS and NZE Scenario, 2020 - 2100

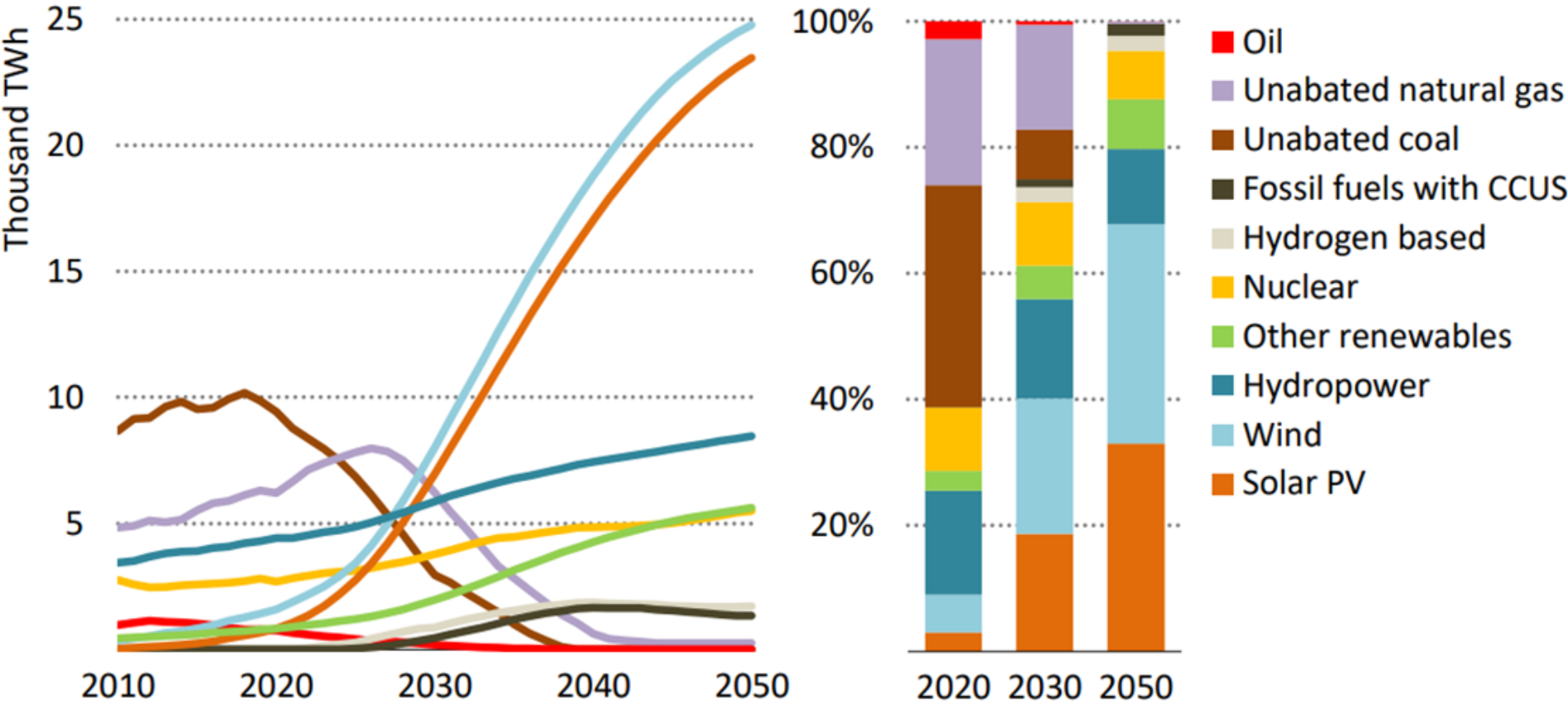


IEA. CC BY 4.0.

**Rapid emission cuts moderate warming below 1.5 °C by 2100 with low overshoot in the NZE Scenario, while temperatures in STEPS reach 2.4 °C by 2100 and continue rising**

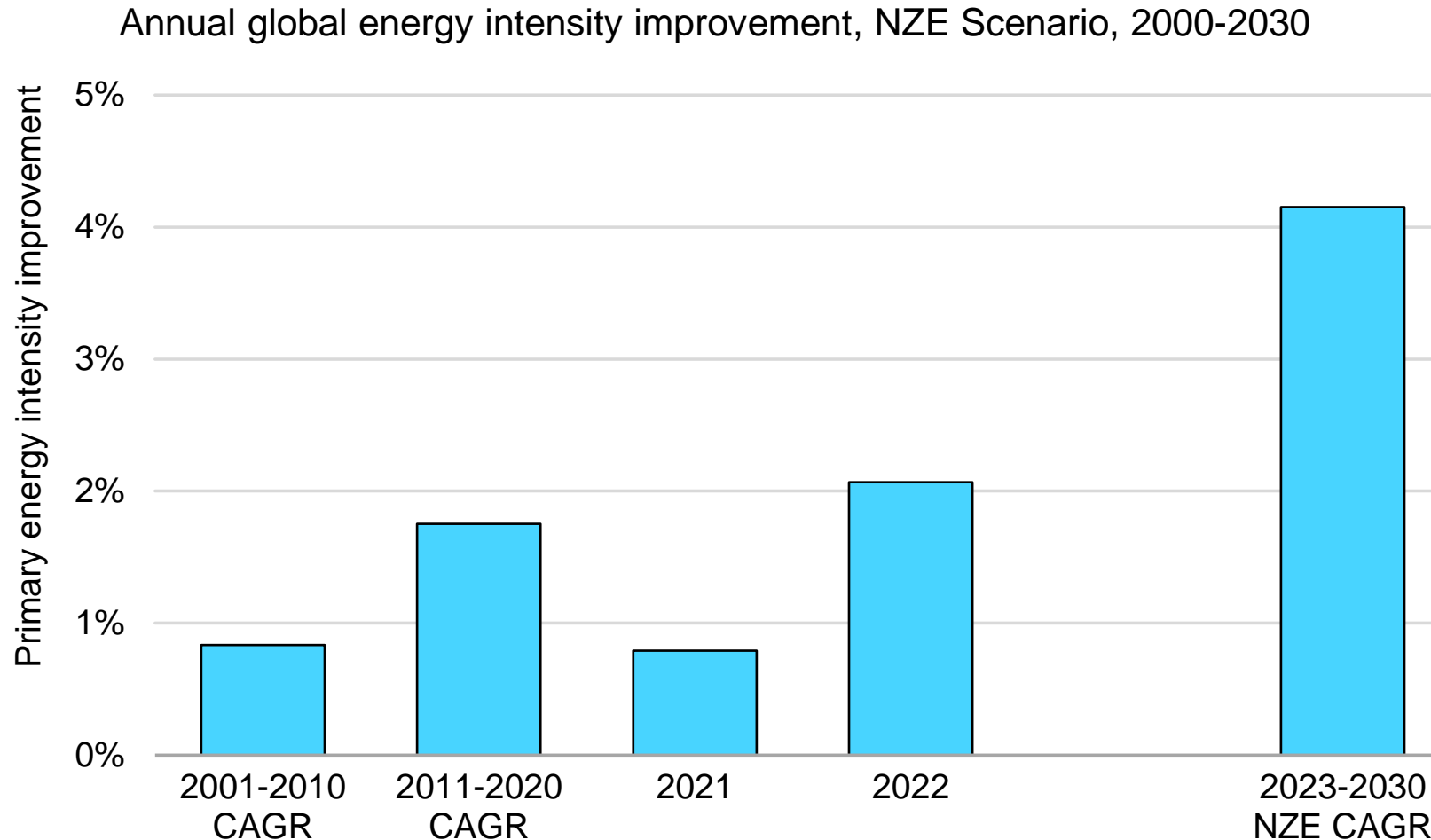
# Electrification, Renewable Energy and Flexibility

Global energy generation by source in the Net Zero Scenario



**Variable renewables, especially wind and solar, are set to become the largest capacity on the electricity grid, and the key electricity source in the NZE Scenario. Flexible demand will be essential for system optimisation.**

# A goal to double energy efficiency progress between now and 2030



**An improvement in global energy intensity in 2022 of over just over 2% was twice the average over the previous 4 years, yet only half of what is required to meet the IEA's net zero emissions by 2050 scenario.**

<b>Decent Jobs</b>	<b>Skills &amp; Training</b>	<b>Social Dialogue &amp; Stakeholder Engagement</b>	<b>Socio-economic Development</b>
<b>Universal Energy Access</b>	<b>Energy Security, Affordability &amp; Resilience</b>	<b>Gender, Equality &amp; Social Inclusion</b>	<b>Fair Distribution of Benefits</b>
<b>Youth in Decision Making</b>	<b>Behavioural Change</b>	<b>Public Participation</b>	<b>International Collaboration</b>

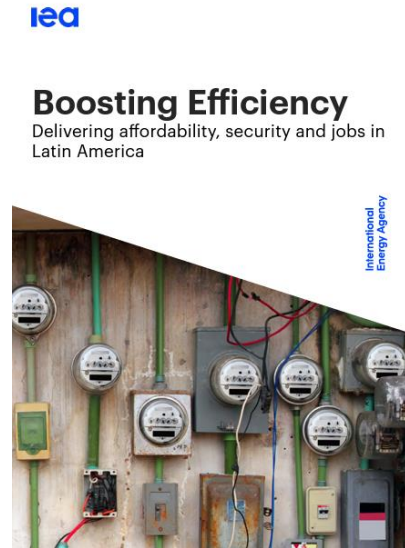
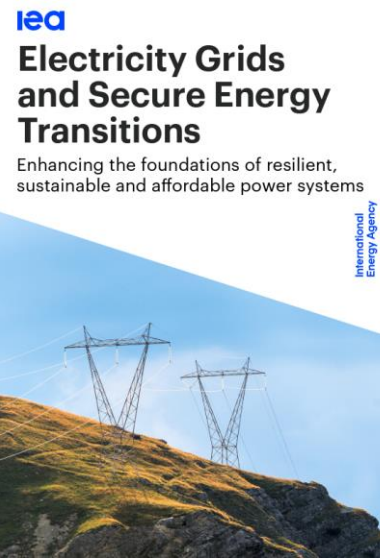
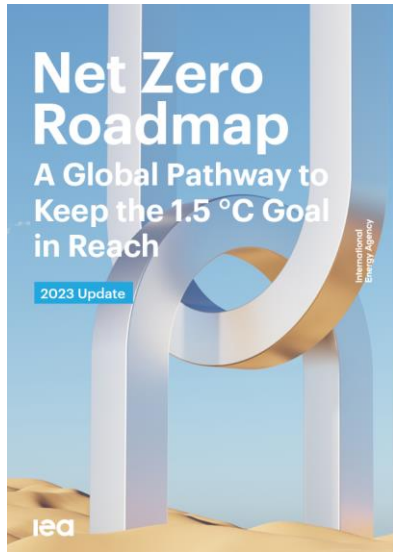


## Flexibility

- Monitoring, data collection and analysis.
- Digitalisation.
- Demand response ready assets.
- Intelligent flexibility requirements.
- Frameworks that enable asset management.
- Data standardisation and interoperability of devices and systems and data.

## Action - based

- Capacity building measures.
- Operation and maintenance.
- Consumer friendly energy related information.
- Choice architecture.
- Behavioural insights.
- The sharing of best practices and approaches.



Keeping cool in a hotter world is using more energy, making efficiency more important than ever

Energy Efficiency: The Decade for Action  
The IEA's 8th Annual Global Conference on Energy Efficiency

Report — June 2023



Commentary — 21 July 2023

## Efficient Grid-Interactive Buildings

Future of buildings in ASEAN

Report — October 2023

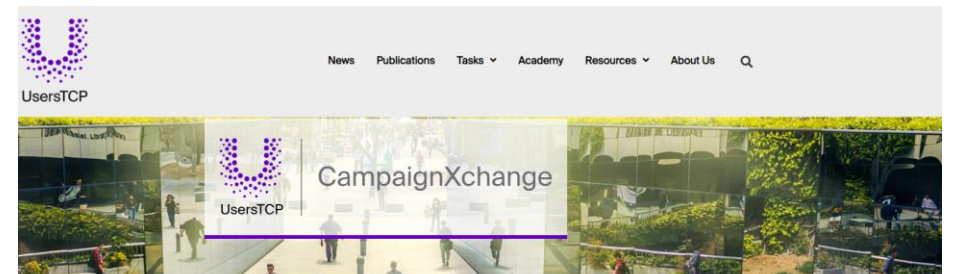


## The evolution of energy efficiency policy to support clean energy transitions

Policy report — April 2023



## Energy Efficiency 2022



CampaignXchange Task

### Overview

**Task Duration:**  
1 June 2023 – 31 May 2024

**Participating Countries:**  
Australia, Belgium, Canada, Finland, Ireland, Netherlands, Sweden, Switzerland, United Kingdom

**Task Leaders:**  
International Energy Agency, Energy Efficiency Division

**Contact:**  
For more information on the Task, please contact:



**iea**

# RE-ENERGISING EUROPE

Second Part: Multiple benefits, behavioural change and new societal trends

“The Necessary Evolution of Energy Efficiency Policies for Inclusive Transitions”

October 24, 2023 - From 15.45 to 16.00



**Emma Mooney**

International Energy Agency

#REenergisingEurope



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# RE-ENERGISING EUROPE

Second Part: Multiple benefits, behavioural change and new societal trends  
"The way forward for energy policy"

October 24, 2023 - From 16.00 to 17.00

Moderated by:



**Nives Della Valle**  
European Commission  
Joint Research Centre



**Heleen Schockaert**  
RESCoop



**Indra Van Sande**  
Gent City



**Alessandro Mostaccio**  
Movimento Consumatori



**Emma Mooney**  
International Energy Agency



**Giulia Pizzini**  
IEECP



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# RE-ENERGISING EUROPE

THANK YOU!

And see you tomorrow!

#REenergisingEurope



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