WHY Open Day

11th of June 2021 | online

Predicting the Impact of Household Behavior Intervention on Environmental Pollution

EU GREEN WEEK 2021 PARTNER EVENT

ZERO POLLUTION #EUGreenWeek

for healthier people and planet

PANEL DISCUSSION

What can Energy System Models do to help reduce the pollution?

WHY OPEN DAY

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EU GREEN WEEK PARTNER EVENT

#whyh2020 #EuGreenWeek

ONLINE

European Commission | 11. 06. 2021 10:00-13:00 CET

EU GREEN WEEK 2021 PARTNER EVENT

Gniebing Use Case

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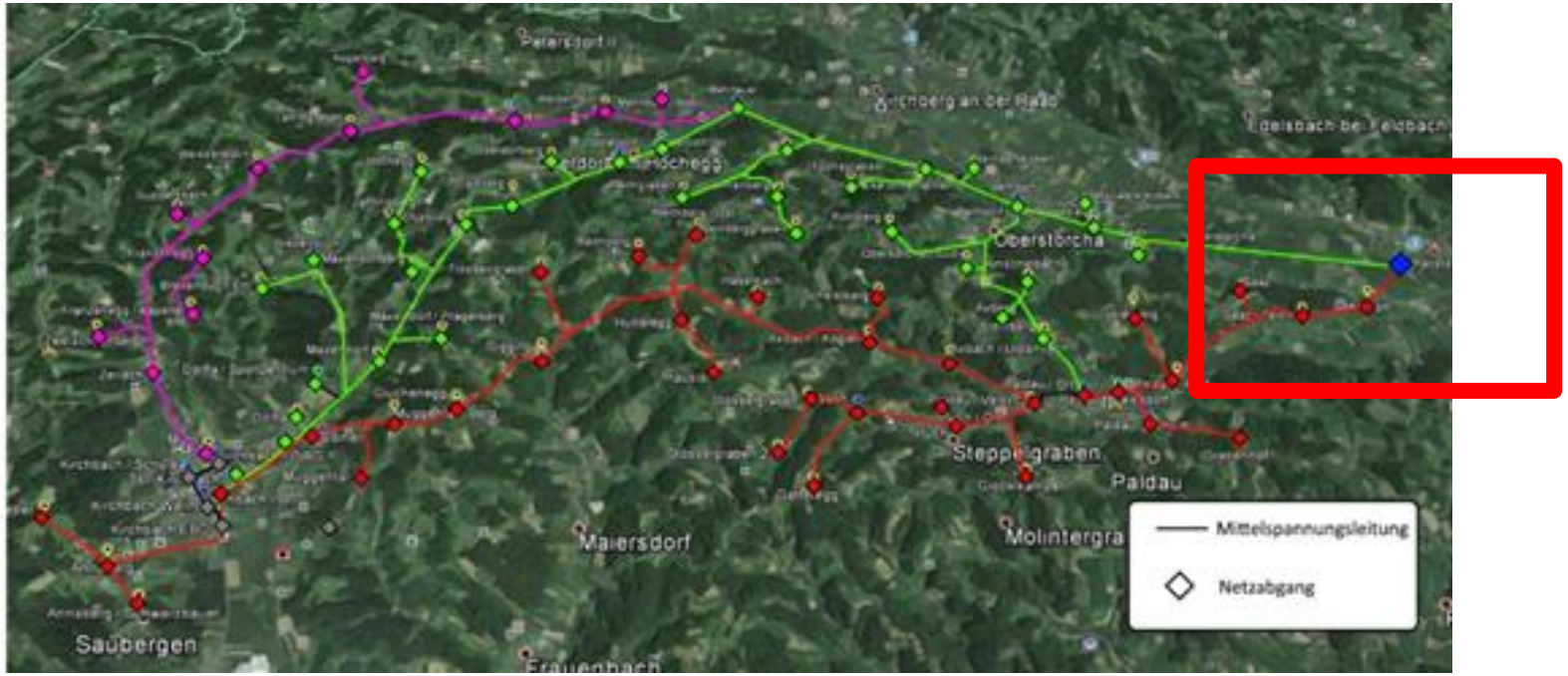
WHY

The Gniebing Use Case

- Inhabitants: 2300
- Buildings: 679
- Area: 15,37 km²
- District of the municipality of Feldbach

The Gniebing Use Case

- Strong local policy incentives toward black out effects mitigation
- Small local not-unbundled Energy Supply Company
  - Local generation (Hydro and PV)
  - Grid Operation (20 kV and low voltage grid)
  - Energy Supplier



Key Objectives

- Research on Black out effects mitigation have been going on in the region for some years now
- Gniebing has a “black-out” plan including grid operation

- Analysis of the required generation capacity and amounts of diesel for supplying the village of Gniebing for X days
- Analysis of acceptance of energy services

Scenarios to test

Policy Interventions:

- Economic and fiscal instruments
- Information and Communication Instruments

Technical Interventions:

- Adaptation of consumption behaviour to minimise consumption
- Turn off or unplug all non-necessary equipment

Expected results

- Aggregated “Black-Out”-consumption load profiles on transformer level
- Required characteristics of generation capacities to support those load profiles
- Grid strain and operational grid parameters
- Diesel consumption for backup generators

- Reaction of local consumers to new energy services provided by the local player

WHY The WHY project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 891943.

Goiener Use Case

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Goiener

WHY

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The GOIENER use case

Goiener is a non-profit citizen energy cooperative

- 14 044 partners
- 17 953 contracts
- 49 workers
- 200 volunteers

POWER TO THE PEOPLE
goiener

Key Objectives

- Assess if a change of electric tariff could lead to:
  - Changes on the time of use of the energy
  - Reduce the power in certain periods
  - Reduction on the overall energy consumption
  - Foster the awareness on energy efficiency, self-consumption and electrification
- If yes, define new tariff that improves the previous factors

Scenarios to test

- A change of tariff towards a:
  - 3 different time of use prices in energy
  - 2 different time of use prices in power
- Overall awareness campaign using only techno economic messages
- Three experimental groups:
  - Techno economic reinforcement awareness campaign
  - Energy efficiency reinforcement awareness campaign
  - Pro-environmental reinforcement awareness campaign
- Comparison with other households that have not changed their tariff

Scenarios to test

- Simulate different tariff structures to foster behaviour change including
  - innovative time of use
  - indexed tariff
  - special tariff to lead the electrification or distributed generation and storage
- Simulate the impact on Goiener wholesale market strategy

Expected results

- A large shift of energy consumption from peak to valley hours on all the experimental condition to the control (and larger than the seen from the external control)
- No significant difference between the “load profile shapes”
- Definition of a new long term market strategy of the cooperative including potentials changes of tariff

Energy Community Use Case

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WHY

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Use Case

- The european legislation is fostering the active participation of citizens in the energy sector
- One of the key instruments are Energy Communities nevertheless there is multitude of different definitions of what they are
  - Only renewables?
  - Only electricity generation?
  - What about energy efficiency, transport or energy as a service
- There is a growing interest in the topic at all policy and stakeholder levels
- Nevertheless, there is a lack of proper tools to tackle them

Key Objectives

Develop a set of tools that allows to plan the set up of an energy community from the technical, economic, environmental and social perspective:

- Who should be involved?
- How to involve them?
- How to size the components?
- What business model / legal entity is the most effective?
- How to manage new contracts and cancellations after the set up?
- What is the best tariff system?
- What is the best control strategy?

Scenarios to test

- **Top - down**: a public authority decide to constitute an energy community.
- **Bottom - up**: a set of citizens wanted to become an active part of the energy system

Expected results

- A best practice guide generated from extensive simulation of scenarios
- A set of easy to use tools to set-up an energy community

European Use Case

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WHY

The EU Use Case

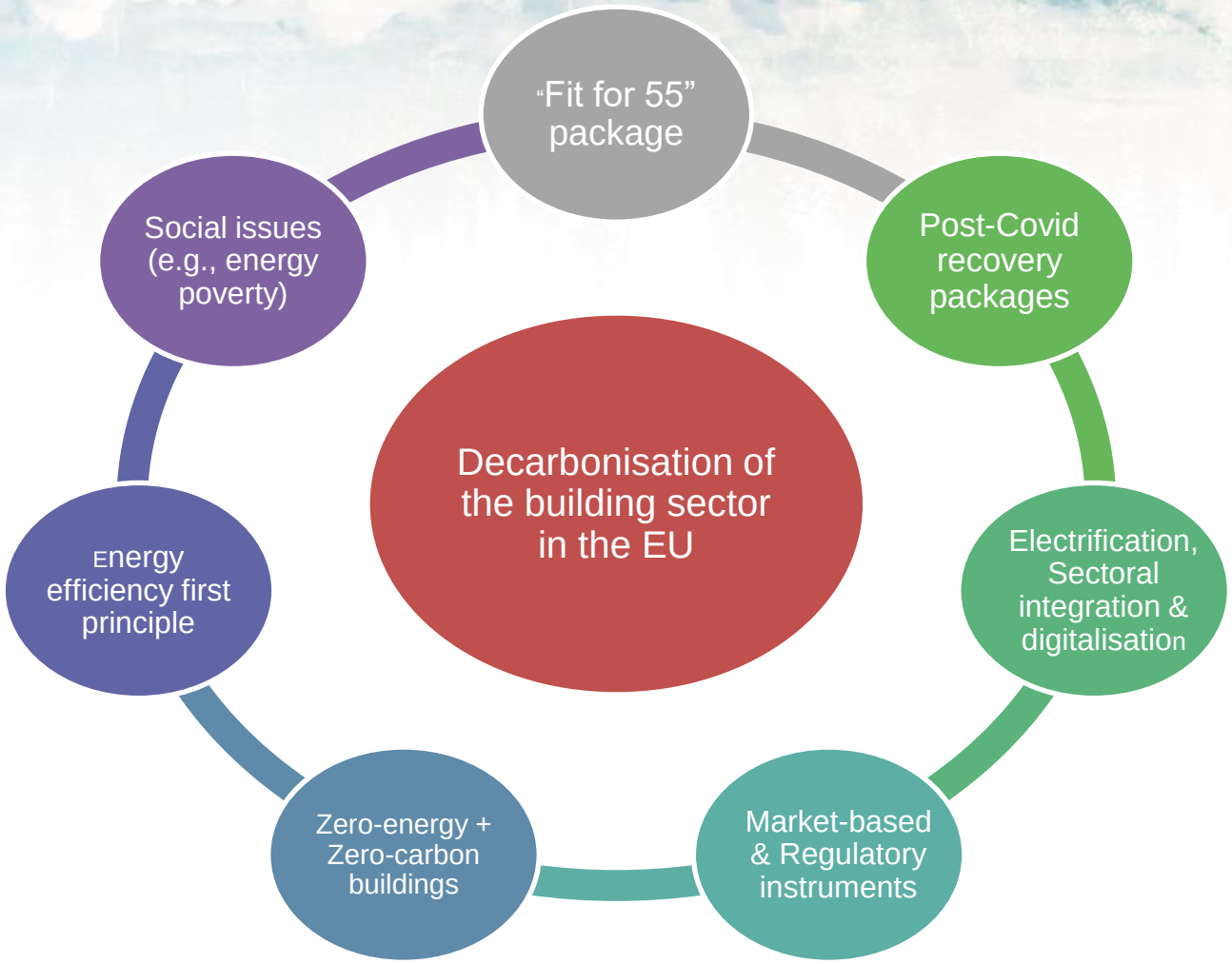
- Ambitious EU climate targets suggested for 2030 and 2050, but it is not clear how specific policy instruments can drive the transition

- Current policies are not sufficient to trigger the transition to climate neutrality, and even the 2030 targets require more ambitious legislation and stronger policy instruments, especially in the buildings sector

- The EU Use Case aims to analyse and prioritise the most important policy interventions to transform the EU building sector which will be assessed quantitatively using the WHY toolkit (linked to PRIMES)

Key Objectives

- Develop a plug-in to soft-link the WHY Toolkit with the PRIMES energy system model, enhancing the modelling of energy demand
- Improve our understanding on the impacts of improved representation of energy demand (EE, DR, EV) on the EU transition to climate neutrality
- Analyse the impacts of various policy instruments and interventions to enhance energy efficiency in EU households


“Fit for 55” package
Post-Covid recovery packages
Electrification, Sectoral integration & digitalisation
Market-based & Regulatory instruments
Zero-energy + Zero-carbon buildings
Energy efficiency first principle
Social issues (e.g., energy poverty)
Decarbonisation of the building sector in the EU

Scenarios to test

Policy Interventions:

- Economic and fiscal instruments
- Regulatory interventions (e.g. standards)
- Subsidies- potentially targeted to low-income households
- Information and Communication Instruments
- Focus on specific mitigation options (e.g. renovation, insulation, heat pumps, H_2, smart appliances)
- Policy mixes (combining options above)

Expected results

- Understand system-level implications of the EU buildings sector transformation towards climate neutrality by 2050
- Examine the feasibility of long-term EU decarbonisation pathways in the context of detailed modelling of buildings
- Re-assess the ambitious EU climate strategies for 2030 (55% GHG emission reduction) and 2050 (transition to climate neutrality)
- Provide new deep decarbonisation pathways, which are more equitable and socially acceptable as minimise hardship to the most vulnerable groups and maximise co-benefits (reduced pollution)

Global Use Case

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WHY

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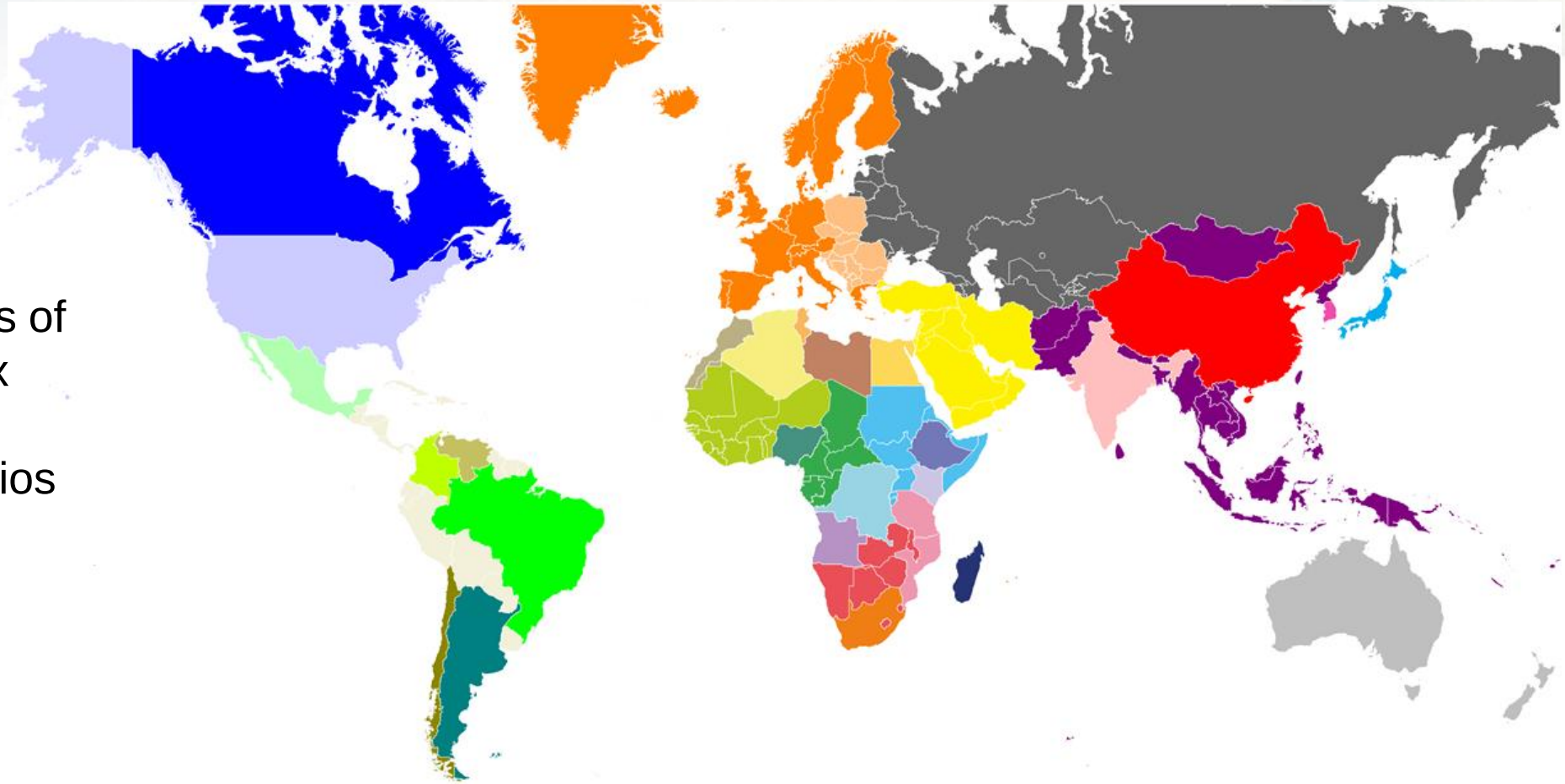
The Global Use Case

- Global integrated assessment models TIAM-ECN and PROMETHEUS
- Long-term projections of the global energy mix
- 2℃ and 1.5℃ scenarios



Key Objectives

- Develop a plug-in to soft-link the WHY Toolkit with TIAM-ECN and PROMETHEUS
- Investigate the effect of the improved representation of energy demand from the built environment on long-term global energy scenarios
- Study the effects of enhanced energy efficiency in the demand sectors, globally and for major economies (e.g. Europe, USA, China)

Scenarios to test

- Stringent emission reduction targets (2℃ and 1.5℃ scenarios)
- Increased energy efficiency in demand sectors
- Targeted recovery packages in major economies

Expected results

Understanding of system-level implications of enhanced efficiency under stringent climate policies:

- Global and regional energy mix;
- Effects on carbon price;
- Additional system costs;
- Regional emissions;
- ...

OPEN DAY

NEXT PANEL:

THE WHY TOOLKIT

LEARN MORE:

WWW.WHY-H2020.EU

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#whyh2020

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