Transitioning buildings to full reliance on renewable energy and assuring inclusive and affordable housing

Keywords: Building sector, decarbonisation, affordability, inclusiveness, transformation pathways
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Synopsis
This project focuses on transitioning buildings to full reliance on renewable energy, while assuring inclusive and affordable housing.

The Decarb_Inclusive project combines
(1) techno-economic modelling of decarbonisation scenarios with
(2) an analysis of possible effects on real estate prices and aspects of social inclusion, and
(3) transdisciplinary research on policy options to implement social innovations.

The active engagement of stakeholders and municipalities ensures the targeting of policy makers and academia. To maximise the science-society interface of the project an award (NaWo Award) was designed and tendered to find and select environmentally and socially sustainable housing innovations.

Framework and constraints in housing transition

Severe housing deprivation
Public spending on housing
Wohnungsgemeinnützigkeitsgesetz
Social inclusion and affordability
Austrian climate & energy strategy
Energy prices
EU energy policy provisions
Social welfare
París agreement
Income at market prices
Sustainable development goals
Demographic trends
Regional & local energy targets
Living conditions
Policy provisions
Policy targets
Wohnbauförderung
Socio-economic context
Accumulation of debt
Mietrechtsgeetz
Dwelling types
Physical constraints
Renewable energy potentials
Interest rates
District heating
Energy efficiency
Ambient heat
Roof-top PV
Green gas
Construction sector
Roof-top Solar thermal
Building stock & occupancy

Techno-economic modelling of decarb. pathways

The decarbonisation pathways for the Austrian housing sector are developed with a strongly disaggregated bottom-up model of the Austrian building stock (Invert/EE-Lab). In the following results selection we present the initial annual costs for single family houses with the annual costs after renovation, maintenance and heating system change in 2050.

Figure: Annual costs for heating in the decarbonisation scenario compared to the status quo by initial heating systems and renovation measures carried out

Project timeline

<table>
<thead>
<tr>
<th>Start</th>
<th>NaWo Award</th>
<th>Klimatag</th>
<th>NaWo-Focus Groups</th>
<th>Final Conference</th>
</tr>
</thead>
<tbody>
<tr>
<td>03.2018</td>
<td>04.2019</td>
<td>03.2020</td>
<td></td>
<td>End</td>
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NaWo Award Winners & best practices case studies

Structures of housing provision (SHPs)
Achieving fully decarbonized and affordable housing needs to take into account the historically contingent and heterogeneous nature of housing provision.

For Austria we identify five such main structures of housing provision, all of which following its own internal logic, relating to a specific set of actors and functions covering issues of (re-) production, ownership and consumption of housing:
(1) Owner-occupied detached and semi-detached houses
(2) Owner-occupied flats
(3) Private rental housing
(4) Housing provided by limited-profit housing associations
(5) Municipality or Public housing

Outlook and next steps

• Implementation of structures of housing provisions as agents in the building stock model Invert/EE-Lab
• Analysing the impact of decarbonisation on these agents and different income groups
• Derive recommendations on how to ensure affordability and inclusiveness in the decarbonisation transition pathway of the building stock in Austria

Contact and further information
The research leading to the presented results was performed in the framework of the project Decarb_Inclusive for the ACRP (Austrian Climate Research Program) with the funding number K17AC0K13648 (10th Call, 2017)

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