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

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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 decorbonisation 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.



NaWo Award Winners & best practices case studies

Framework and constraints in housing transition

Severe housing depreciation Public spending on housing Wohnungsgemeinnützigkeitsgesetz Social inclusion and affordability Austrian climate & energy strategy Energy prices EU energy policy provisions Social welfare Paris agreement Housing affordability Income at market prices Sustainable development goals Demographic trends Regional & local energy targets Living conditions Policy provisions Housing prices Policy targets Wohnbauförderung Socio-economic context Housing tenures Accumulation of debt Physical constraints Economic conditions Biomass Renewable energy potentials Interest rates District heatingAmbient heat



Social innovation

The socio-ecological transformation in housing requires an **innovative mix of effective governance, participation and co-determination by all stakeholders** to ensure social inclusion. Social Innovations are social in their ends and means, e.g. coworking or co-living of people from diverse social backgrounds and age groups.

Energy efficiency Roof-top PV Green gas Construction sector Roof-top Solar thermal Ownership structure 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

800	■ Initial	■ No Action Total	🖾 Maintenance Total	Renovation Total
008 MIO 800 700	Pellets	No HS Change	Gas	Oil
	Coal	Wood log	Wood chips	
	Electricity	Electricity_hp	District heat	

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**. Drawing on Michael Ball, we employ the concept of *structures of housing provision*. Each structure – while not independent from each other – follows its own internal logic and relates to a **specific set of actors and functions** covering issues of **(re-) production**, **ownership** and **consumption** of **housing**.

For Austria we identify five such main structures:

- (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

Contact and further information

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