

## Energy relevant aspects of building and future of Housing and Settlement-Structures in Austria



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### Topic

- Resilience
- Lifestyle
- Building
- Resources
- Tourism
- Energy

### Title of the Paper

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### Form of Presentation

- Poster
- Presentation

### Short Description (maximum 2500 characters)

“Urban sprawl”, “Embodied Energy in the building sector” and “Peak oil” are main topics in the field of policy on energy and climate and relevant problem areas communities are forced to deal with. The project analysed causes and effects of urban sprawl, by focusing on public support measures, embodied energy used for buildings and attached infrastructure and financial impacts on private households in consequence of rising energy prices. The consortium primary aimed at generating and enlarging knowledge as well as supporting public and political discussions.

Methodical steps included 1) modelling of single- family homes and multi-storey buildings for the periods 1970, 1990 and 2010, 2) calculation of primary energy utilised and CO2 emissions released during manufacturing, construction and transport processes, 3) linking results to statistical figures in order to obtain data for the Austrian housing sector, 4) qualitative and quantitative examination of support measures and 5) calculation of additional private household expenses as a result of drastic increases in energy prices.

ZERsiedelt revealed the great significance of embodied energy in the housing sector. Whereas in 1970 embodied energy of private buildings in settlement areas required only about 10 % of total energy expenditure, it was 24 to 36 % in 2010. In dispersed settlements it was even higher, with around 50 % of total energy and 60 % of it consumed for infrastructural purposes. Aside from that, single-family homes need about twice as much embodied energy as multi-family houses for the same gross floor area. Since 1970 approximately 440 TWh of primary energy have been utilized for the production of building materials and the construction of residential complexes – this equals to 85 million tons of carbon dioxide.

The examination of public support measures showed appropriation of building land and provision of technical infrastructure as the most significant factors. These support

measures which are mainly provided by the public sector are compelling reasons of urban sprawl.

Assuming that peak oil will lead to an energy crisis, effects of urban sprawl were analysed by defining crude oil price scenarios and exemplary private households. In the 200 \$ scenario Austrian households need to deal with additional costs of approximately 500 to 5000 Euro per year, only considering direct energy consumption. Main impacts appear to be type of fuel, number of car kilometres and heat consumption.