Integrating Policies for Renewables and Energy Efficiency: Comparing Results from Germany, Luxembourg and Northern Ireland

Lukas Kranzl (EEG, TU Wien)

Jacky Pett, Pedro Guertler (ACE)
Anselm Brakhage, Mario Ragwitz (Fraunhofer ISI)
Michael Stadler (LBL & CET, Austria)

Introduction

- 40% of EU energy demand for heating and DHW
- Big potentials for saving energy and using renewable energy carriers
- European policies still do not put the same effort on renewables and energy efficiency for heating and DHW as for electricity and transport biofuels.

Structure and objectives

- Comparative analysis of RES and RUE heat policies in Germany, Luxembourg and Northern Ireland
  - Current situation
  - Prospects
  - Policy options
  - Scenarios up to 2020
- Conclusions regarding the design of RES and RUE heat policies in the building stock and improve building energy performance throughout Europe.

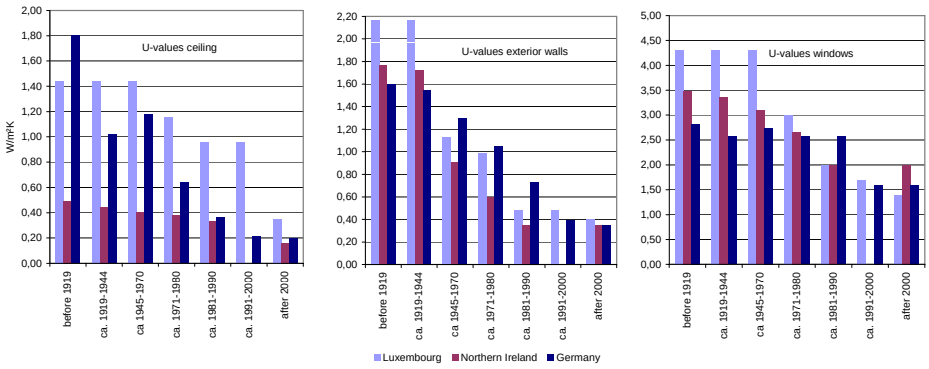
Methodology

- Distinction of building stock and related heating and DHW systems
  - Building categories
  - Construction periods
- Description of these building types
  - Geometry data
  - Building thermal quality (U-values)
  - Distribution of heating and DHW systems
- Invert simulation runs
  - Implementation of building and heating system data
  - Definition of exogenous scenario parameters
  - Simulation runs and impact of various policy options

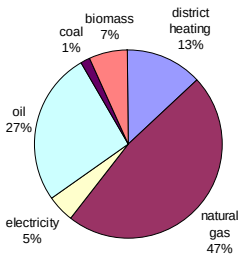
Case studies

- Germany
- Luxembourg
- Northern Ireland

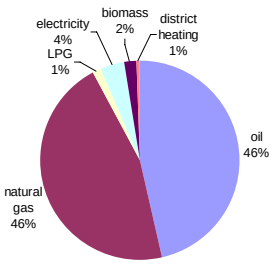
Comparative results (1) – U-values



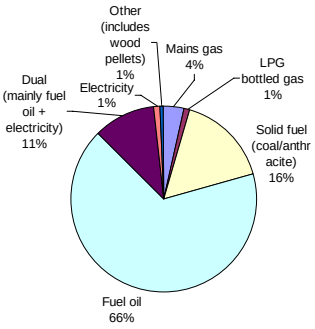
Comparative results (2) – Energy carrier mix for heating



Germany

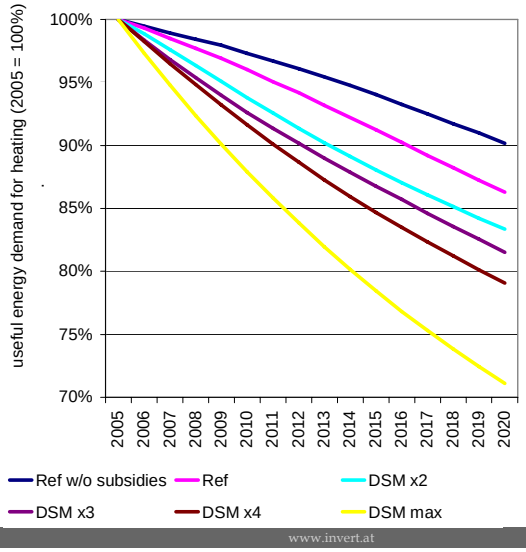


Luxembourg

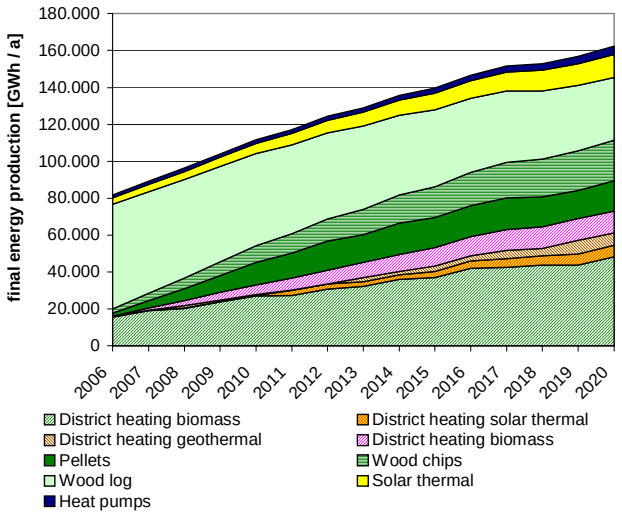


Northern Ireland

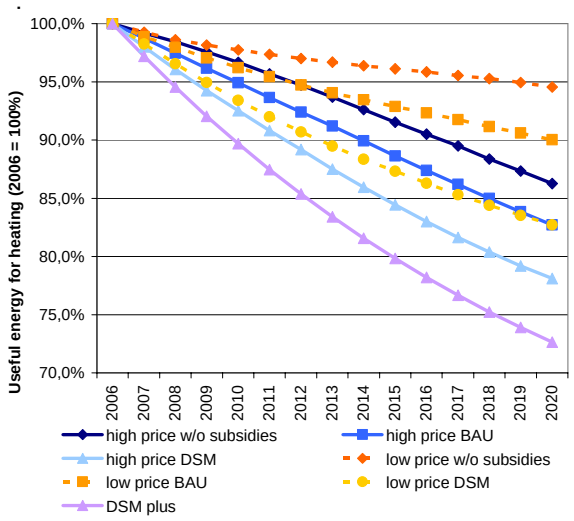
Germany – useful energy demand heating and DHW



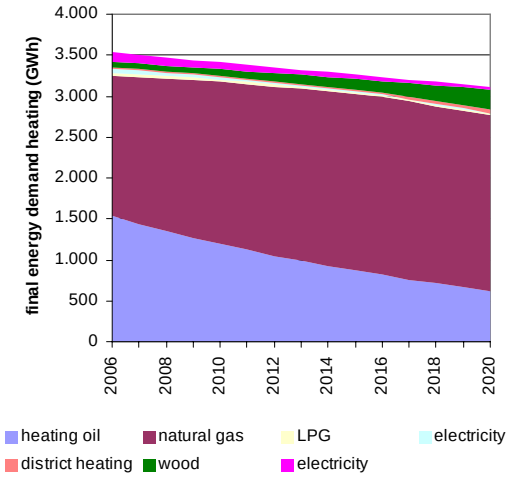
Germany – RES-Heat development „Bonus-Scheme“



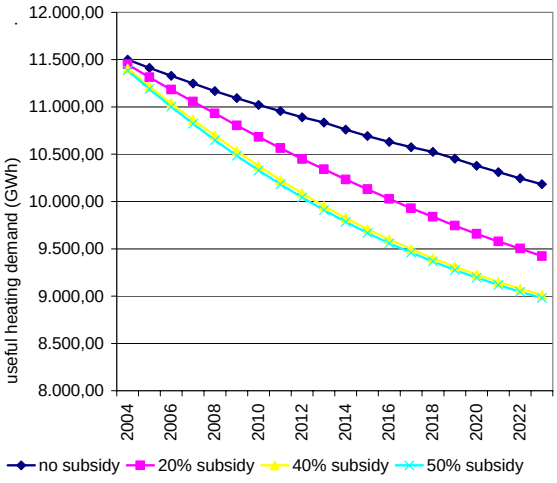
Luxembourg – useful energy demand for heating and DHW



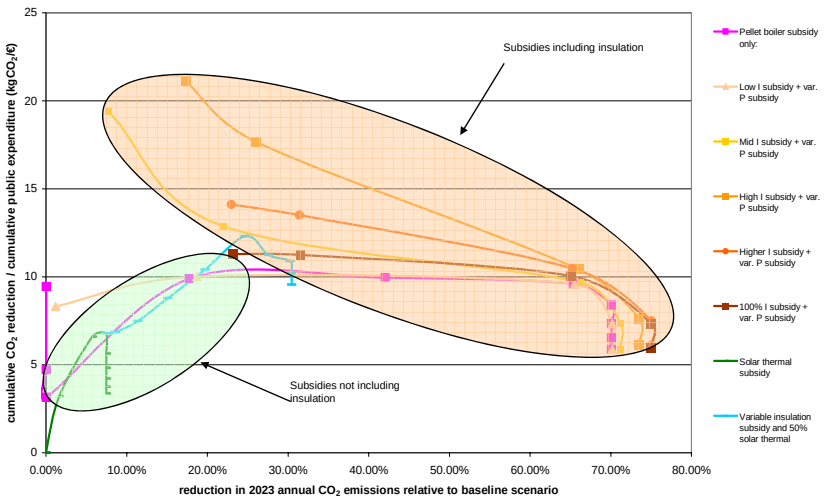
Luxembourg – final energy demand for heating and DHW



Northern Ireland – useful heating demand depending on subsidies for wall and ceiling insulation



Northern Ireland – efficiency CO2 curve



The implication of RES and RUE development

- RES heating systems in general show higher investment costs and lower fuel costs
- For insulated buildings, energy demand decreases and heating systems with lower investment costs and higher fuel costs become more attractive
- Under central European climate conditions, heat load of buildings is expected to decrease in average by about 40-50% up to 2050 (Muller 2006).
- Thus, tendency to adopt electric heating systems (Torakov 2007) partially offsets the positive impact of insulation measures.
- So it is crucial for specific targetted measures for low energy buildings to promote RES-H and protect gains made through insulation

Comparison of policy structure and culture

- Luxembourg:
  - currently low energy taxes for fossil fuels
  - Thus: high levels of subsidies for RES and RUE required
  - But: high administrative barriers for these subsidies
  - Current discussion focus on DSM and options of integrating RES promotion in the energy certificate
- Germany
  - Current RES-heat policies: moderate investment subsidies by the federal government
  - Discussions of transfering the positive experiences with promoting RES-E to the heat sector
  - Integration of RES and RUE is currently under discussion
- Northern Ireland
  - Policies are primarily household and not building related
  - Policies are mainly socially motivated
  - Energy savings obligations by energy suppliers

Conclusions

- In all investigated case studies, substantial uptake of DSM in the building sector
- Trend from oil to gas will continue; high impact of energy prices on this development
- Some part of these savings will be offset by rebound effects, partially due to the trend to low-investment heating system.
- Question: how will RES-H market cope with declining future heat loads?
- Challenge: creating medium and long-term stable attractive conditions for both RES and RUE and combining related promotion schemes (e.g. by the means of the energy certificate for buildings).