TECHNISCHE UNIVERSITÄT WIEN

Favourable policy frameworks for renewable heating and district heating. Results from local case studies within the progRESsHEAT project

Richard Büchele

Marcus Hummel, Lukas Kranzl, Marie Münster, Stefan Petrovic, Sara Ben Amer-Allam, Jan Steinbach, Tobias Fleiter, Ali Aydemir, Eftim Popovski

Sept 13th 2017

4DH
4th Generation District Heating Technologies and Systems

3rd International Conference on
Smart Energy Systems and 4th Generation District Heating
12-13 September 2017 · Copenhagen
AALBORG UNIVERSITY DENMARK

Outline

- Introduction to progRESsHEAT
- Local case studies
- Method
  - Modelling Framework
  - Policy Assessment
- Results
- Discussion

Project: progRESsHEAT (2015-2017)

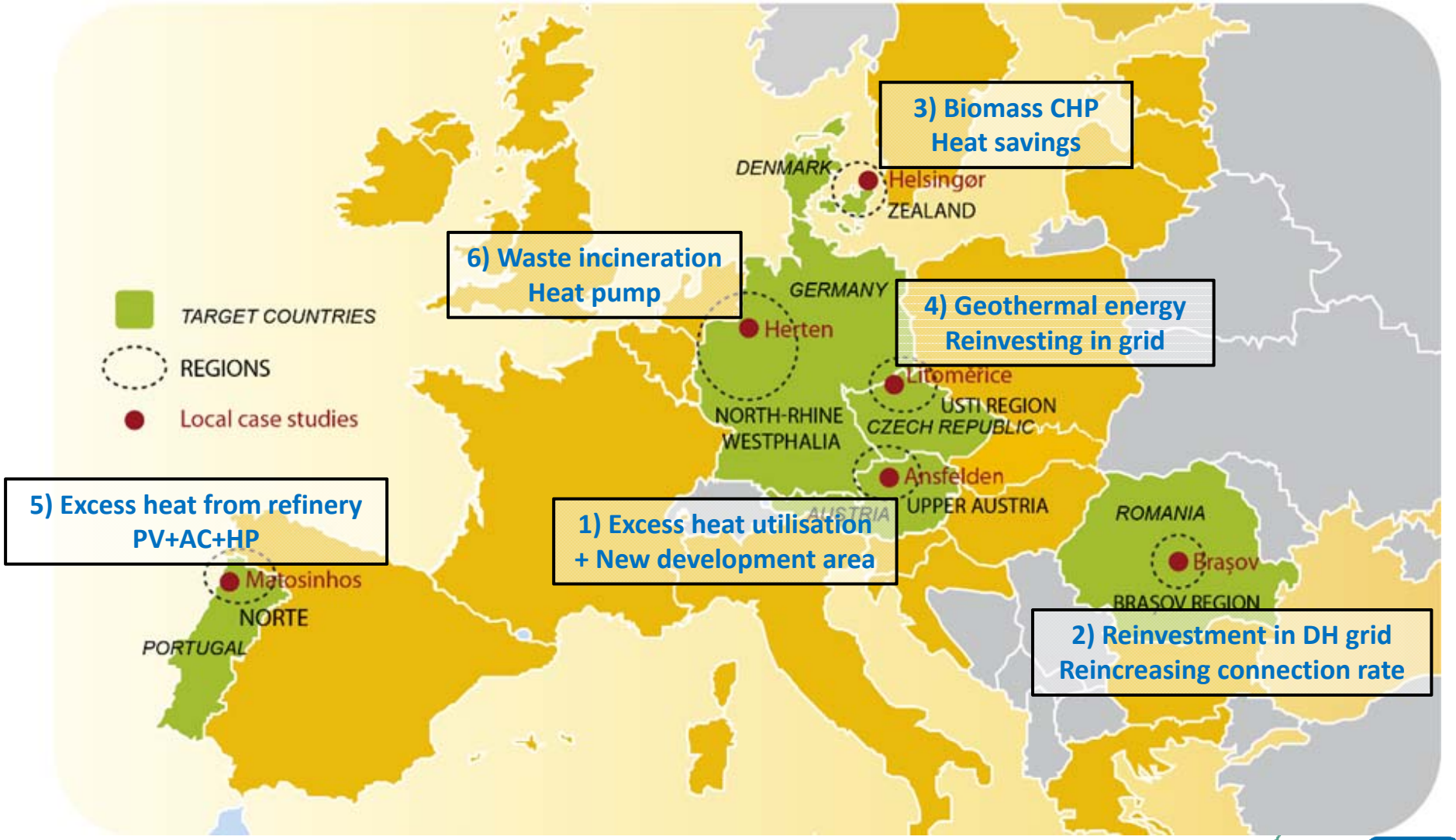
- Aim: Assisting local, regional, national and EU political leaders in developing policies and strategies to ensure a strong and fast deployment of renewable and efficient heating and cooling systems

- Policy assistance process:
  - Policy Groups
  - Policy Workshops
  - Capacity building workshops

- Empirical analysis:
  - interviews & surveys
  - barriers and success factor

- Quantitative analysis:
  - development of modelling frameworks (separate for loc/nat)
  - analysis of current demand and supply + RES potentials
  - economic feasibility of technical solutions / detection of business cases and need for policy

6 Local case studies



Modelling Framework on local level

Idea: Find cost optimal combination between

Heat savings

- Minimization of investments into building envelope (windows, roof, basement, walls) to achieve 8 different levels of heat savings
- Heat saving potential and levelized costs (EUR/kWh saved) derived for 30 different building classes (10 categories + 3 construction periods) in Invert/EE-Lab model[1)]

→ All put together in "Least Cost Tool"
→ Choose heat saving level that is most economic with supply option
→ Iterations to calculate new levelized costs of heat after renovation

Heat supply options

- Individual vs.
  - Levelized costs of heat for 5 individual technologies in 30 different building classes
- District heating
  - Individual GIS based analysis: Four different types of areas per case
    - District heating areas
    - Next-to-DH areas
    - Individual areas
    - Scattered Buildings/ Individual buildings
  - Dispatch optimisation model in energyPRO[2)] for DH supply

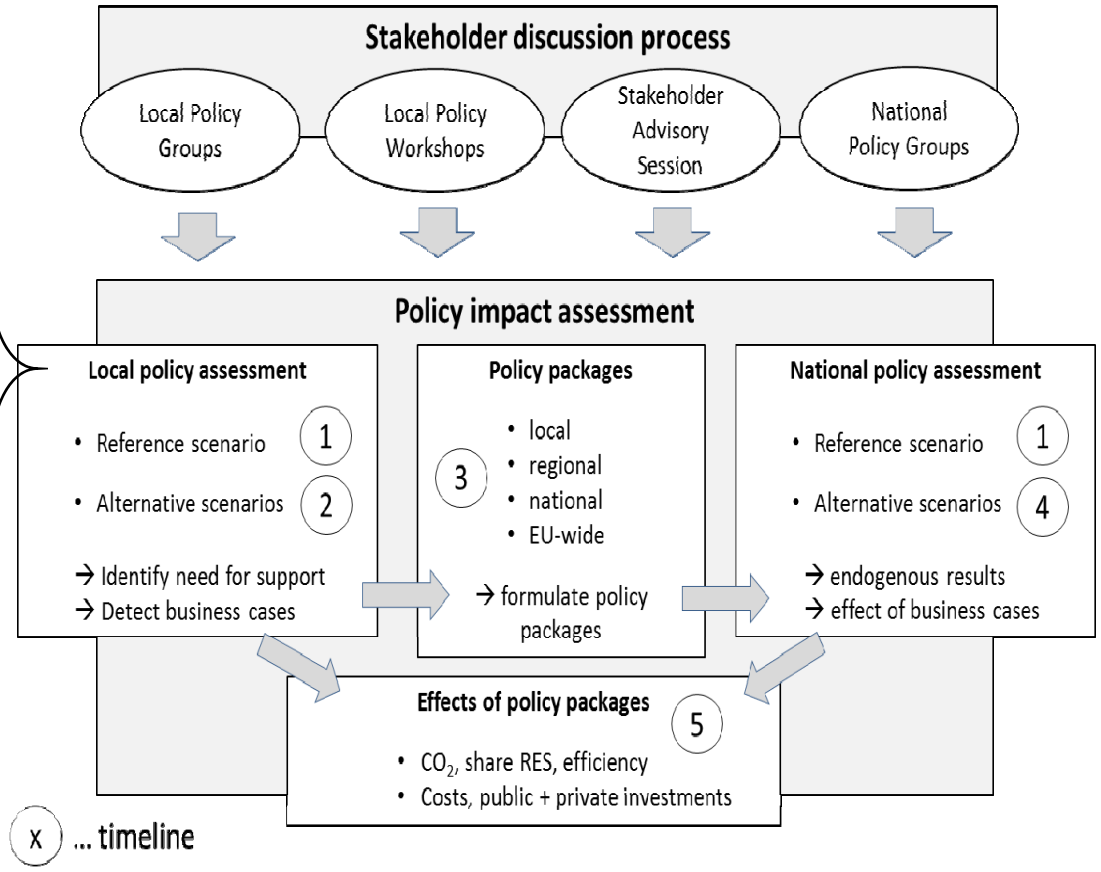
[1)] http://www.invert.at/
[2)] http://www.emd.dk/energypro/

(Local) Policy Assessment

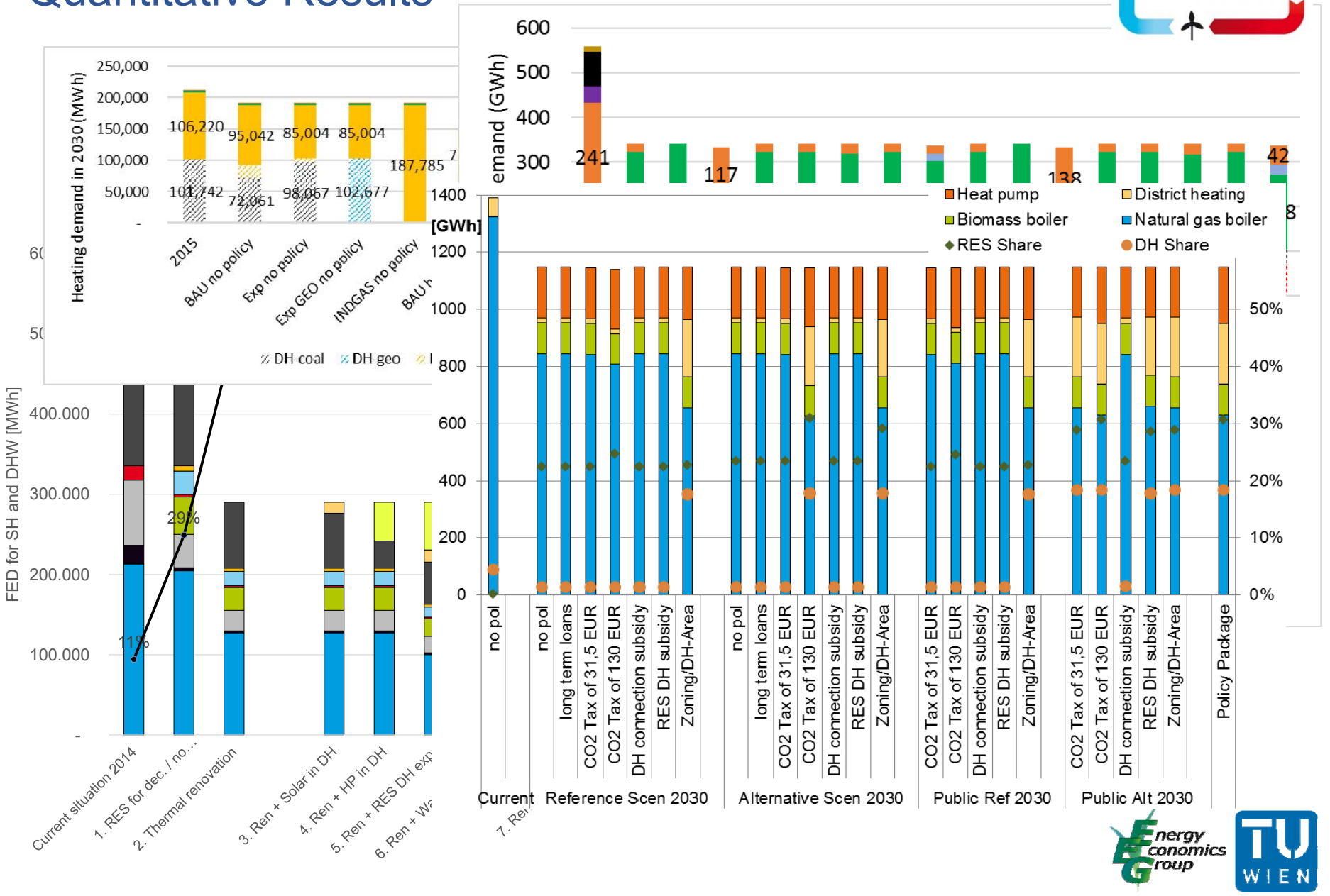
- Technical reference and alternative scenarios for DH (2030/2050)

- Policies on different levels
  - Long term loans
  - Taxes (CO2, PM, electricity)
  - Investment subsidy
  - Zoning (heat planning)

- Indicators
  - Energy demand for SH&DHW
  - CO_2 emissions for SH&DHW
  - Share of RES / district heating
  - Total costs of supply and savings
  - Levelized cost of heat



Quantitative Results



A favourable policy framework should… (1/2)

- "Energy efficiency first"

- Include strategic heating and cooling planning with
  - Binding climate protection targets
    - (long term targets)
  - Institutional setting for long term investments
  - H&C planning as public service task / provide resources

- Raise awareness, skills and competences by
  - Addressing crucial change agents
    - (craftsmen, architects, planners…)
  - Involving local stakeholders and the public (transparency)
  - Communication of local decarbonization strategy

A favourable policy framework should… (2/2)

- Regulate
  - Heat zoning / priority areas
    - (ensure high connection rate)
  - “Ban” of fossil fuel heating system in new installations
    - (e.g. RES obligation in building codes)
  - Implement mandatory energy management system in industry
- Set economic incentives
  - In line with strategic targets
  - Innovative financial schemes
    - (e.g. soft loans, contracting, crowdfunding…)
  - Internalize CO_2 costs

Thank you for your attention!

Richard Büchele

buechele@eeg.tuwien.ac.at