A method for linking TIMES and EnergyPLAN energy system models

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Agenda

• Background
• Aim: Combining strengths of different models
• Work Process
Heat Roadmap Europe

- Three preceding projects
  - Increasing level of details
- Heating and cooling in Europe
- Current project (HRE4):
  - 14 member states (90% heat demand)
  - Scenarios for 2050
  - 24 contributing partner organisations

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 695989.
Combining the Strengths of Different Energy Models
Combining the Strengths of Different Energy Models

Heating & Cooling (Creating Data)

Energy System (Creating Scenarios)

Peta

FORECAST
FOREcasting Energy Consumption Analysis and Simulation Tool

The JRC-EU-TIMES model

Energy PLAN Advanced energy system analysis computer model
Combining the Strengths of Different Energy Models

- Heating & Cooling (Creating Data)
  - Location of Heating & Cooling
  - Profile of Heating & Cooling

- Energy System (Creating Scenarios)
  - Energy System Transition
    - The JRC-EU-TIMES model
  - Energy System Operation
    - Advanced energy system analysis computer model

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Connecting Energy Models
Using the Strengths of Each One

JRC-EU-TIMES
Tells us what happens between now and 2050

EnergyPLAN
Explains what is going on in each hour of the year

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JRC-EU-TIMES
Energy System Transition

- Long-term transition
- Cost optimisation
- EU directives
- EU28 (+3) interconnected

Figure 21 – Evolution of final energy consumption in EU28 from JRC-EU-TIMES for the studied scenarios
(values for 2005 are taken from Eurostat)
EnergyPLAN - Hourly Operation in a Smart Energy System

- Hourly resolution
- One year operation
- Interaction between sectors
- Detailed system dynamics
Work Process

Initial alignment

• Terminology
  • Baseline, CHP, industrial excess heat
• Measuring points
  • Final energy, primary energy, losses…
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Work Process

1. Develop TIMES baseline model
2. Convert data to EnergyPLAN format
3. Run the model
4. Identify imbalances
5. Implement calibration measures
6. Final validation of model
7. Evaluate feasibility of this method
Future Work

• Baseline scenarios for 14 EU-MS
  • 2015 to 2050
• Development of HRs for 2050
  • Heat savings
  • District heating and cooling
  • Renewable energy
Thank you for the attention

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