LINKING LOCAL ENERGY PLANNING TO NATIONAL ENERGY SYSTEMS

Copenhagen as an Example

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Agenda

- Setting the Framework
 - Smart Energy Systems
 - Local<-> National Energy Planning
- Idea for modelling
- Copenhagen as an example



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SMART ENERGY SYSTEMS

- Heat, electricity and gas grids
- Local renewable energy sources
- Local energy production
- Biomass needed for transport and industry



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LOCAL<->NATIONAL ENERGY PLANNING

• Smart Energy Systems require local planning

Is local planning taking us in the right direction?

• Sub optimisation?

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MODELING A CITY AS PART OF A COUNTRY



Measuring the performance of the local energy system, the remaining national energy system and the total energy system. For instance fuel use (biomass), intermittent renewable energy and demands

- Model a city or municipality as part of a country
- Enable cities to relate to countries
- Improve strategic energy planning
- Make it possible to develop plans that fit with national planning

EXAMPLE OF COPENHAGEN



- Technical analysis
 - Reducing fuel use; not costs

Vork Package

- Modelling the Copenhagen Climate Plan
 - CO₂ neutrality in 2025
- Using the CEESA plan to represent national development
 - Target: 100 % Renewable Energy in 2050

RESULTS



- More but less efficient wind
- More biomass in 2025.
 - Should be less than 60 according to CEESA
- Biomass and changes in transport reduces CO2 emissions
 - Exportable electricity make it CO2 neutral. However increases biomass consumption

CONCLUSIONS

- Shows that CPH2025
 - Lead to higher biomass use
 - More but less efficient wind

• There is a need for a tool that can link local to national energy planning

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QUESTIONS?

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RELEVANT PUBLICATIONS AND REFERENCES

CEESA Report: Lund H, Hvelplund F, Mathiesen BV, Østergaard PA, Christensen P, Connolly D, et al. Coherent Energy and Environmental System Analysis. 2011.

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