CITIES

WP1 – Energy services and demand

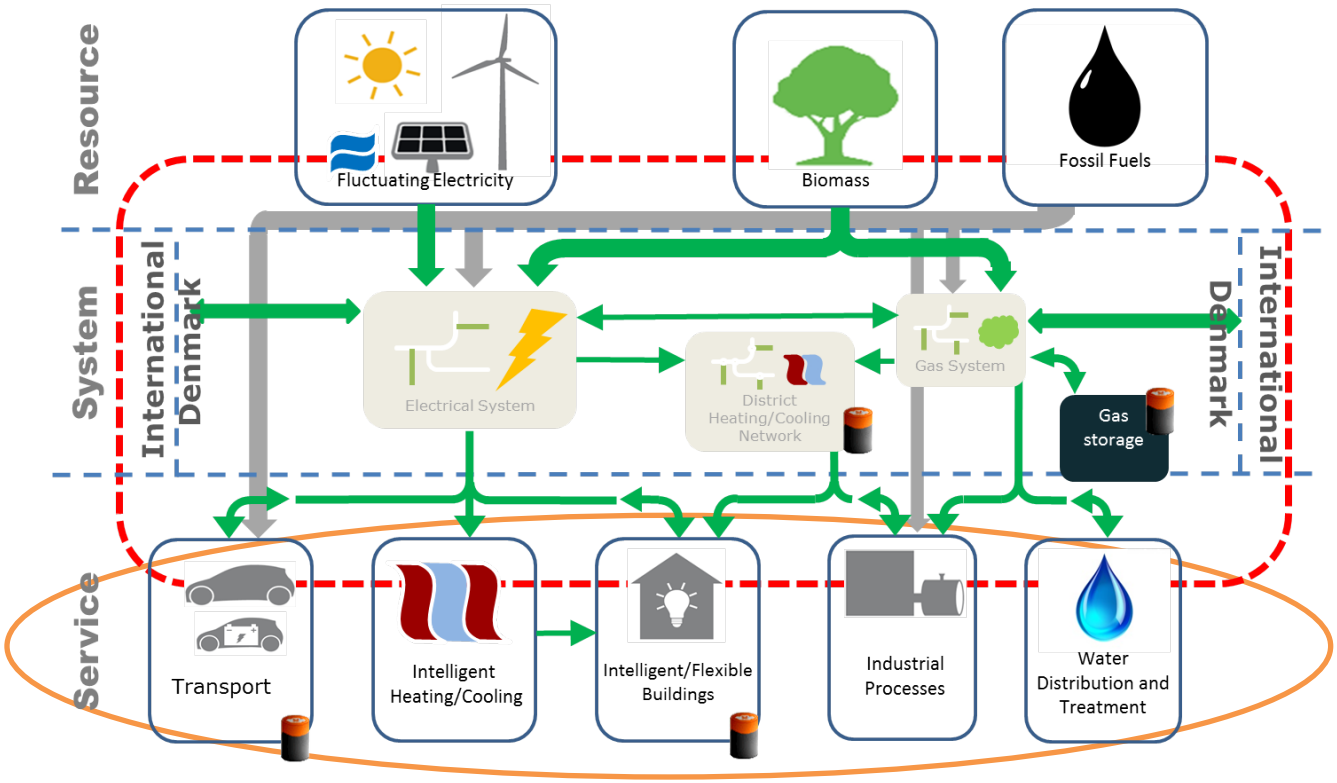
- state of the art
- 29/1/1014

Agenda

- What should we end up with
- Sate of the art - Energy services and demand
- Input and partners
- Ideas and focus area: aim, tasks, subtasks

Concept

Integration through the use of intelligence which is made possible by operational and stochastic models



State of the art – energy services and demand

We know

- Energy consumption is going down (higher efficiency)
- But new appliances introduced
- Energy consumption in cities (due to among other densification) is lower than outside of the cities (15%)
- 40% of energy consumption is in buildings (2/3 residential and 1/3 commercial/industrial)

State of the art – energy services and demand

Modelling energy services and demand residential

- Passive energy consumption: construction material, windows,
- Active energy consumption: Variables: size of living areas, size of household, demography, gender, awareness, income?
- Prosumption: solar PV, solar heating, microgeneration, (energy storage?)
- Energy demand profiles
- New data, information, communications and controls

State of the art – energy services and demand

- Smart meters are being installed – what are the opportunities?
- How much can they tell about the energy consumption, how much can they help reducing or shifting demand,
- Only large consumers can participate in the market – do the small consumers like to participate?
- New data, information, communications and controls

Budget

- A 3 years PhD grant
- A 2 years Post Doc grant
- 11 partners who have indicated they are interested in participating in WP1 (in-kind, data, case studies, demonstration, etc)
- 2 months of senior time

Danish Partners

Danfoss

DI Dansk Industri

Fjernvarme Fyn

RAMBØLL

Dansk Fjernvarme

Frederikssund Forsyning

LEAN ENERGY CLUSTER

GRUNDFOS

Bright Green Business ProjectZero

International Partners

WP1- Energy Services and Demand

Aim: WP1 is responsible for characterizing and modelling energy services and demand.

- Smart meter reading,
- Socio-economic data,
- Energy informatics,
- Detailed building models will be employed to quantify and characterize energy consumption in cities,
- The potential for consumers to participate actively in the energy system through consumption flexibility and storage, and
- The spatiotemporal variations in energy consumption in cities across all consumer groups.

WP1- Energy Services and Demand

Aim: Characterise and model energy services and demand in cities, and their geographical and temporal variations

WP1.1: Examination existing data, models and demonstration projects to identify forms of energy demand, its variations and primary characteristics (magnitude, dynamics, uncertainty, potential for flexibility and storage)

WP1.2: Establish of a datahub for energy related data to facilitate systems integration studies in cities through easily accessible data. Data security will be of the highest priority here, guarding against unauthorised access, manipulation of sensitive data and privacy breaches.

WP1- Energy Services and Demand

Aim: Characterise and model energy services and demand in cities, and their geographical and temporal variations

WP1.3: Develop models of energy demand at the component (building) level, primarily using energy informatics based techniques (combining physical and statistical information) and focussing on the role of intelligent demand and prosumers in the future energy system

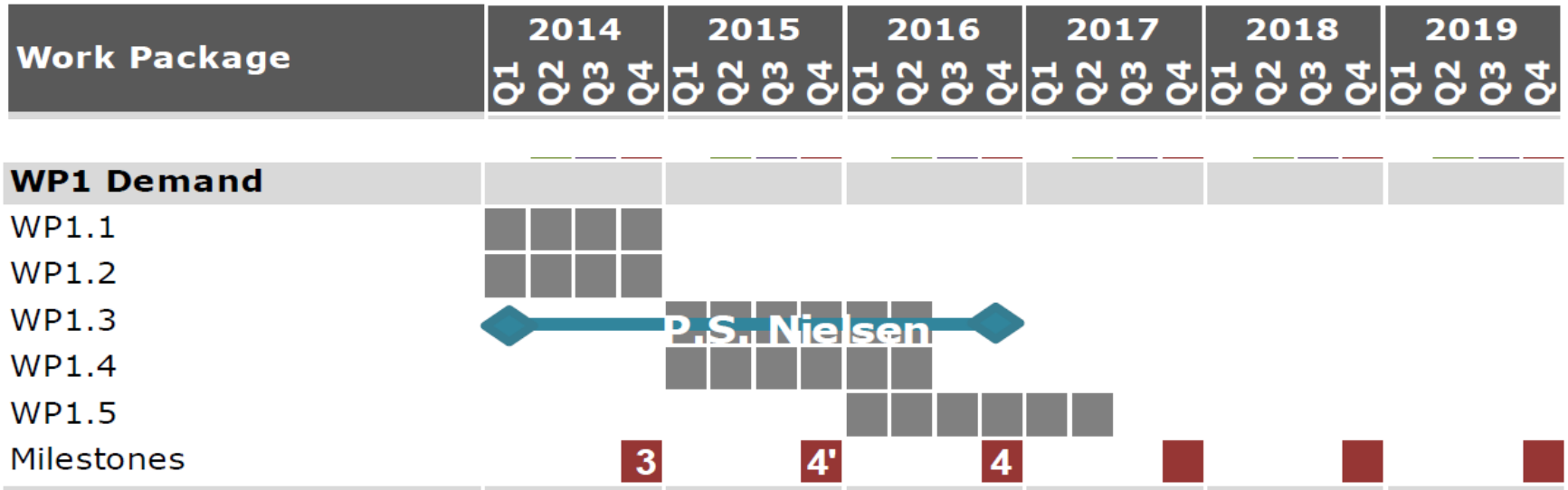
WP1.4: Develop of tools for identifying energy performance characteristics of future buildings. These tools can be used to generate building ratings, and to identify and screen for optimal opportunities for energy savings and improved consumer flexibility.

WP1.5: Examine of the relationship between consumption characteristics and profiles, and socio-economic data.

PhD programme – as of DSF application

- Analyse relationships between energy demand and various socio-economic and technical characteristics of energy consumption in smart cities.
- Supervisor: Per Sieverts Nielsen
- Co-Supervisor: Henrik Madsen

Time schedule



- Milestone 3: First annual conference
- Milestone 4’:Delivery of preliminary demand models
- Milestone 4: Delivery of final demand models

Concrete tasks

- Employ PhD student
- Discuss case studies and evaluation of demonstration projects with partners - (WP1 workshop/meeting)?
- Design case studies