

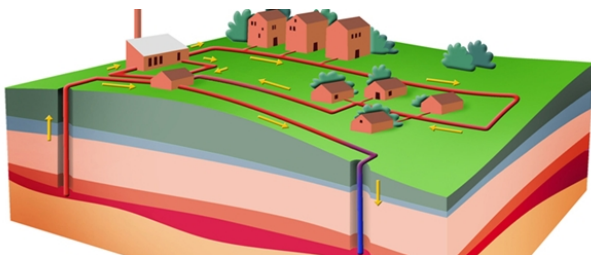
Energy Flexible Buildings

IEA EBC Annex 67

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Seminar on Energy Flexible Buildings
Aalborg, April 4, 2019

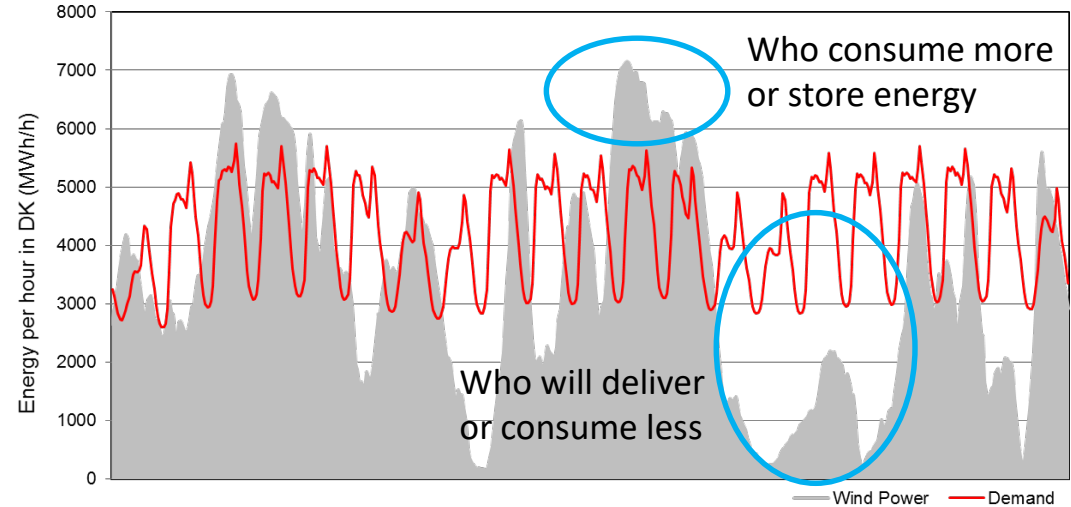
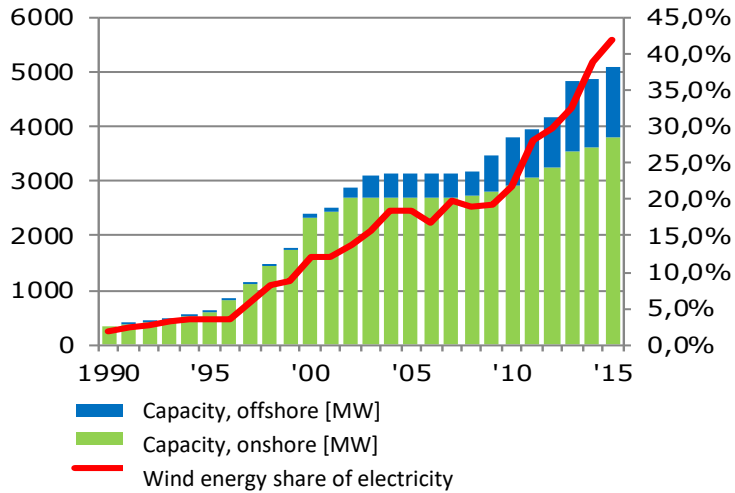
Common understanding that we need to replace fossil fuels with renewable energy



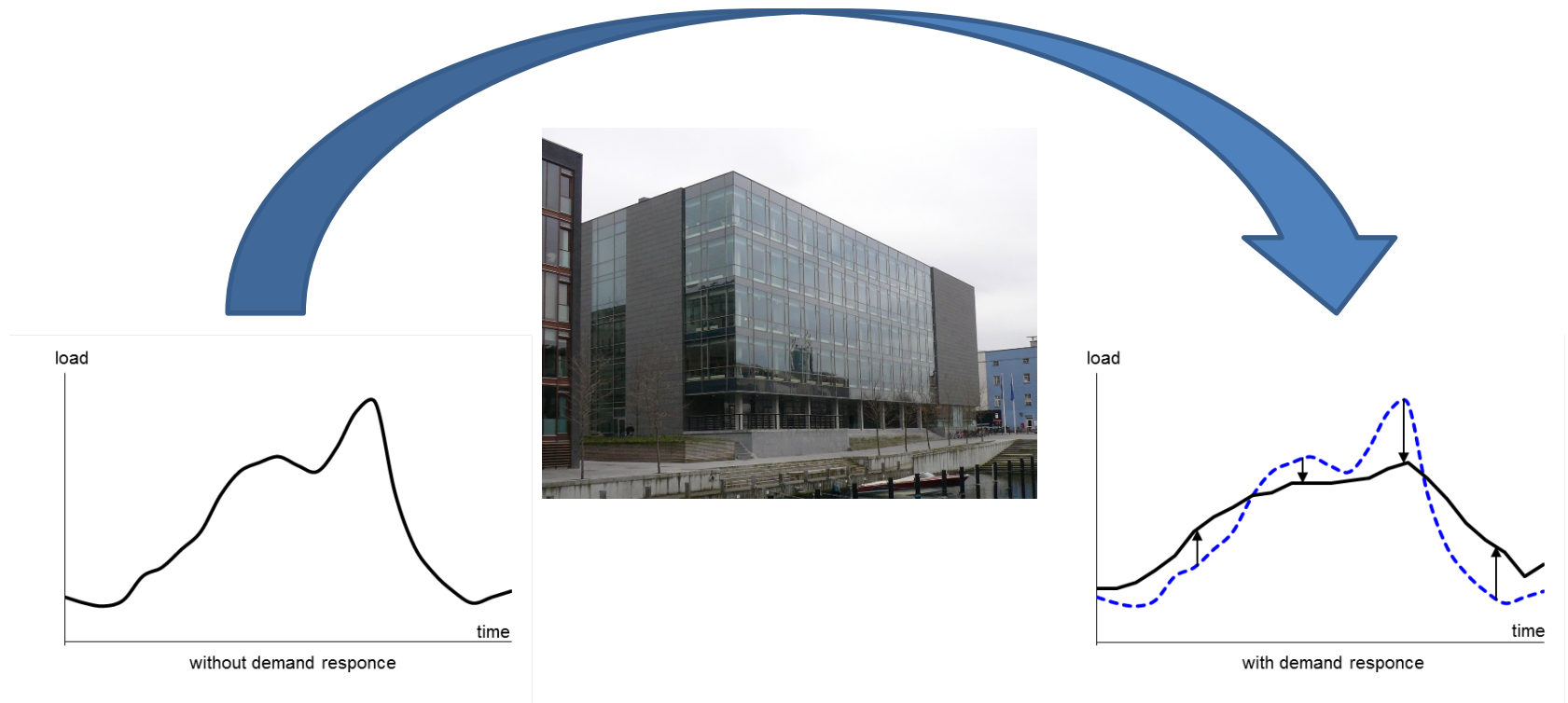
Example: Denmark

Goal: 50 % wind in power grid by 2020 and
only RES in the total energy system by 2050

MW

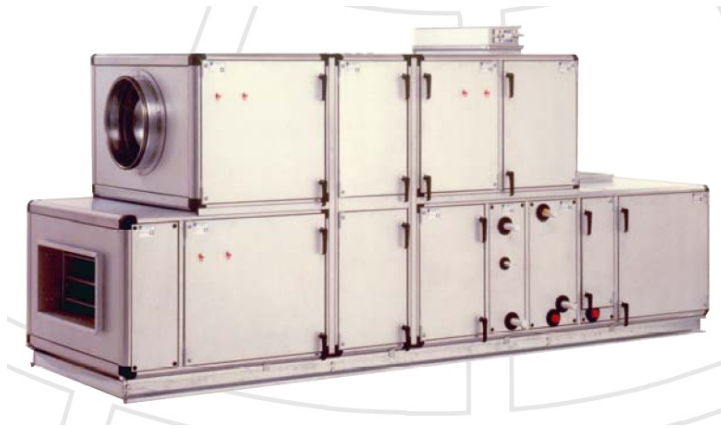


Most buildings have the ability to become energy flexible



Commercial buildings

ventilation systems



PAC 128 HF-A

cooling systems

supermarkets

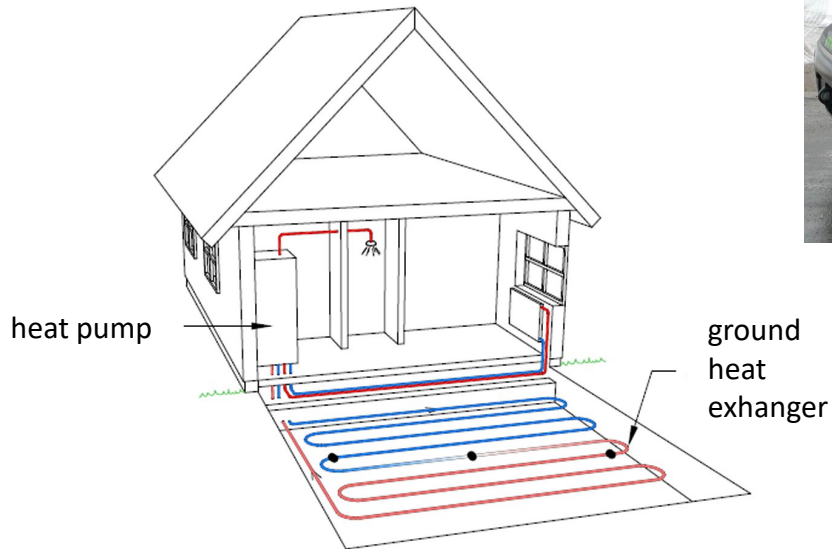


pumps



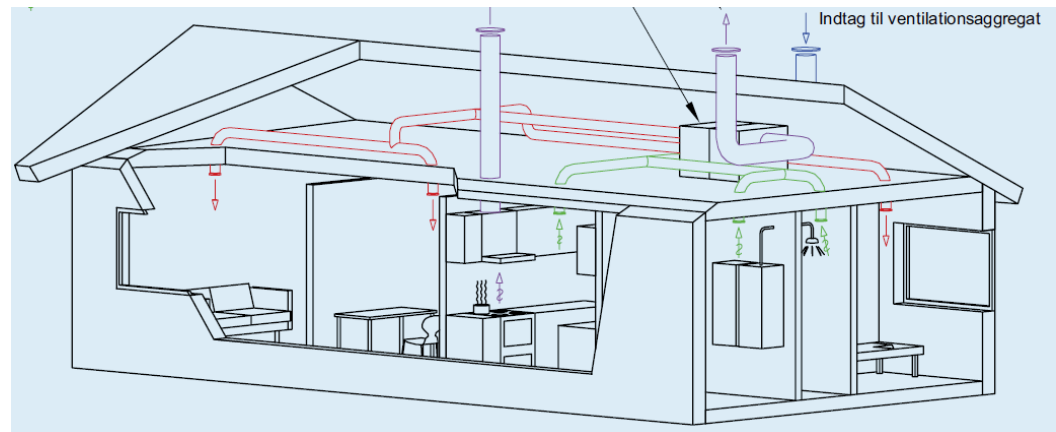
Electricity demand in households

heat pumps (aircondition)



EVs

ventilation systems



white goods

Prosumers



Definition of Energy Flexibility in buildings

The Energy Flexibility of a building is the ability to manage its demand and generation according to local climate conditions, user needs and grid requirements. Energy Flexibility of buildings will thus allow for demand side management/load control and thereby demand response based on the requirements of the surrounding grids.

European Union

Smartness Indicator in EBPD (Energy Performance in Buildings Directive)

- The introduction of a smartness indicator rating the readiness of the building to adapt its operation to the needs of the occupant and the grid, and to improve its performance
- The smartness indicator should be used to measure buildings' capacity to use ICT and electronic systems to optimise operation and interact with the grid

Challenge concerning Energy Flexibility of buildings

Currently there is, however, **still** no **real** overview or insight into how much Energy Flexibility different building types and their usage may be able to offer to future energy systems.

There is thus a need for increasing knowledge on and demonstration of the services Energy Flexible Buildings can provide for the energy grids as well to identify critical aspects and possible solutions to manage this Energy Flexibility.

IEA EBC Annex 67

Energy Flexible Buildings

June 2014 – June 2015: Preparation phase: done

June 2015 – June 2018: Working phase: ongoing

June 2018 – June 2019: Reporting phase

Eight and final working meeting:

Aalborg, Denmark, April 3-5, 2019

Annex 67 work plan

Subtask A: Definitions and Context

- Common terminology and definition of Energy Flexibility in buildings
- Methodology for characterization of Energy Flexibility in buildings
- User needs, motivation and barriers for application of EF in building
- Market analysis

Subtask B: Analysis, Development and Testing

- Simulation of Energy Flexibility in single buildings and clusters of buildings
- Control strategies and algorithms
- Laboratory tests of components, systems and control strategies
- Example cases and design examples

Subtask C: Demonstration and User Perspectives

- Measurements in existing buildings
- Demonstration of Energy Flexibility in real buildings and clusters
- User motivation and acceptance

Participating countries

- Austria
- Belgium
- Canada
- China
- Denmark
- Finland
- France
- Germany
- Ireland
- Italy
- Norway
- Portugal
- Spain
- Switzerland
- The Netherlands
- UK

Output from Annex 67

- **Principles of Energy Flexible Buildings** summarizes the main findings of Annex 67 and targets all interested in what Energy Flexibility in buildings is, how it can be controlled, and which services it may provide.
- **Characterization of Energy Flexibility in Buildings** presents the terminology around Energy Flexibility, the existing indicators used to evaluate the flexibility potential and how to characterize and label Energy Flexibility.
- **Stakeholder perspectives on Energy Flexible buildings** displays the view point of different types of stakeholders towards Energy Flexible Buildings.
- **Control strategies and algorithms for obtaining Energy Flexibility in buildings** reviews and evaluates control strategies for Energy Flexibility in buildings.
- **Experimental facilities and methods for assessing Energy Flexibility in buildings** describes several test facilities including experiments related to Energy Flexibility and draws recommendations for future testing activities.
- **Examples of Energy Flexibility in buildings** summarizes different examples on how to obtain Energy Flexible Buildings.
- **Project Summary Report** brief summary of the outcome of Annex 67.

Website

annex67.org

The screenshot shows a web browser window with the address bar displaying "annex67.org". The website header features the EBC logo and the text "ANNEX 67" with the subtitle "Energy in Buildings and Communities Programme". A search bar and links for "Newsletter sign up" and "Login" are present. A navigation menu includes: Home, About Annex 67, Subtasks, Publications, Newsletters, Next meeting, Participants, Contact, and Member login.

Currently there is no overview or insight into how much Energy Flexibility different building types and their usage may be able to offer to future energy systems. The aim of the Annex is thus to increase knowledge on and demonstrate the Energy Flexibility buildings can provide for the energy grids, and to identify critical aspects and possible solutions to manage this Energy Flexibility.

In-depth knowledge of the Energy Flexibility that buildings may provide is important for the design of future Smart Energy systems and buildings. The knowledge is, however, not only important for the utilities it is also necessary for companies when developing business cases for products and services supporting the roll out of Smart Energy networks. Furthermore, it is important information for policy makers and government entities involved in the shaping of future energy systems.

Read more about Annex 67, [click here](#)

A diagram illustrating the layers of energy infrastructure, shown as a series of overlapping trapezoidal blocks. From top to bottom, the layers are: "Smart Grid & other energy infrastructures" (with a plug icon), "Built environment" (with a house icon), "Building" (with a building icon), "Floor" (with a floor plan icon), "Room" (with a room icon), "Workplace" (with a person at a desk icon), and "User" (with a person icon).

Objectives

Two photographs showing people in a meeting. The left photo shows a group of people sitting around a table, looking at a laptop. The right photo shows a person sitting at a table, looking at a laptop.

Project beneficiaries

The Windows taskbar at the bottom of the screen shows various application icons, including the Start button, Internet Explorer, Google Chrome, and several office applications. The system clock in the bottom right corner displays the time as 10:08 and the date as 13/03/2017.

Thank you for your attention