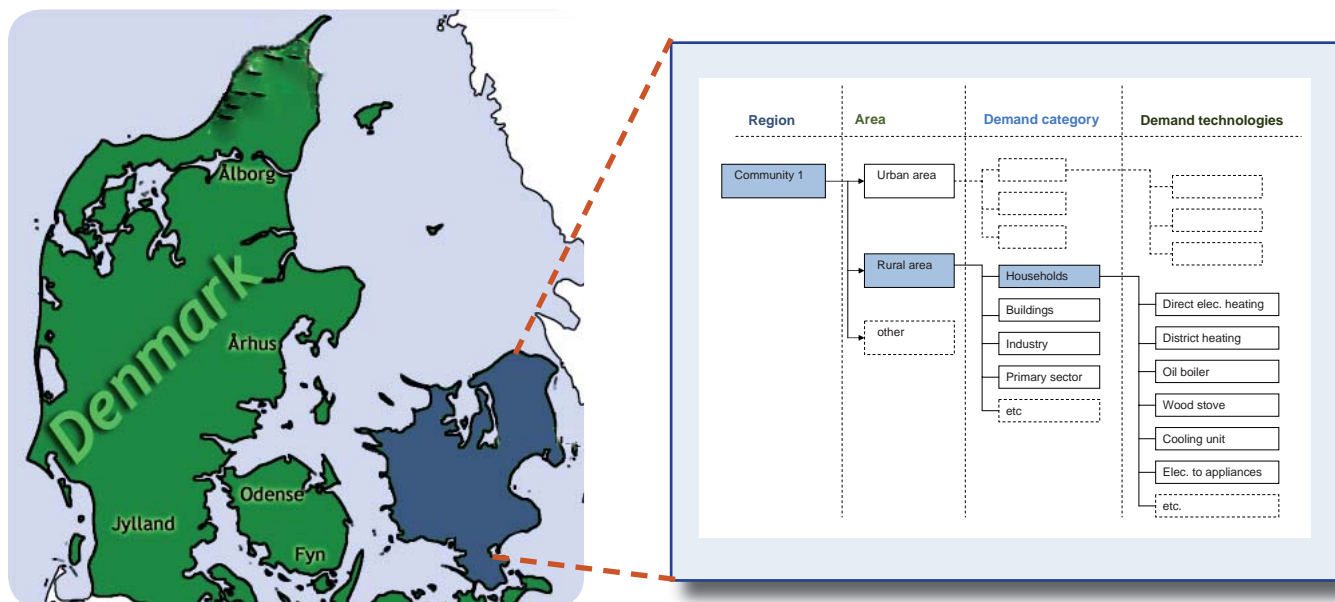


## Regional Energy Analysing Model



# REAM

- an analysing tool for local energy systems

- ▶ Designed to analyze the stationary energy system today and in the future
- ▶ Local and regional communities and regions in Europe
- ▶ Local energy production, infrastructure for heat, electricity and cooling as well as end-use sectors and energy efficiency



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# REAM

## - Regional Energy Analysing Model



### GENERAL DESCRIPTION OF THE REAM MODEL

The Ream model is designed to analyze the stationary energy system and the future development of local communities and regions in Europe. The model includes local energy production, infrastructure for heating, electricity and cooling as well as end-use of energy divided in different end-use sectors and energy efficiency measures. Ream is a simulation model that supports the user to identify a cost effective development of the energy system in a community or a region. The user can choose the level of detail in the description of the energy system in the whole or parts of the community/region. The result is a detailed basis for local energy planning in specific areas, in a community or in a region.

” The user can choose the level of detail in the description of the energy system in the whole or parts of the community/region”

*The Ream model has been developed by Profu (Sweden) and IFE (Norway) as part of the 3-nity project supported by Intelligent Energy Europe (IEE). The 3-nity project aims at supporting local communities in their effort to become “Sustainable Energy Communities”.*

## LOCAL ENERGY PLANNING

Local energy planning implies a broad perspective on energy policy by focusing on all forms of energy carriers and on energy consumption in all end-use sectors. However, attention is often limited to stationary energy use, and this is the case with the Ream model as well.

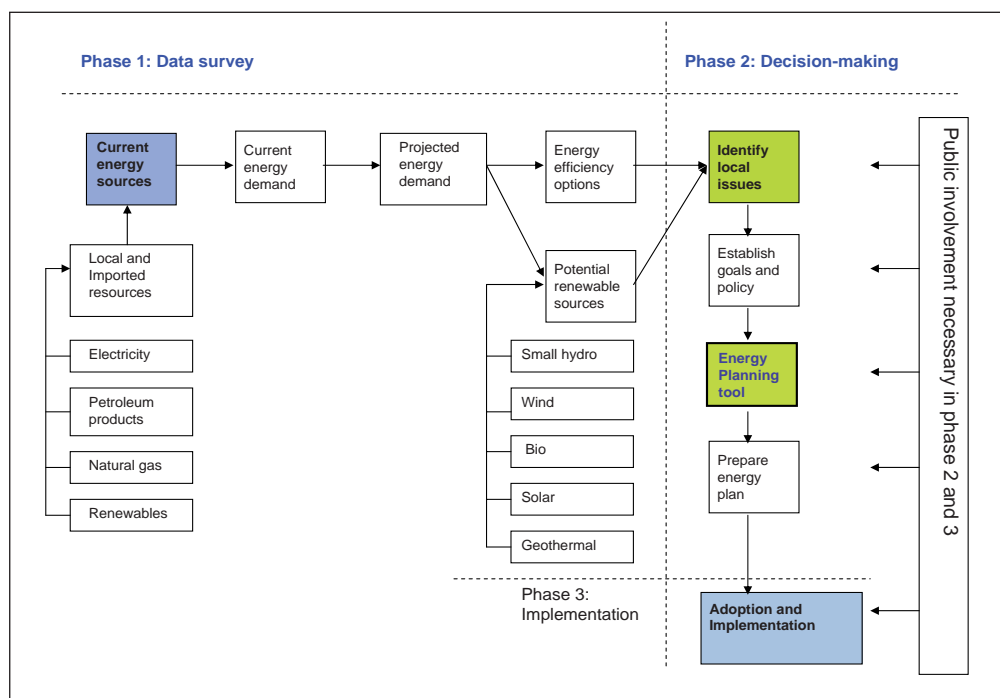
Energy planning and efficient use of energy should be a priority in communities for several reasons: it conserves valuable resources, reduces energy related costs, reduces the impact on the environment and contributes to security of energy supply. Moreover, local governments need to take decisions on investing in energy infrastructure. Detailed energy planning reduces the uncertainties of future energy needs.

Energy planning consist of preparation of surveys, modelling of the energy system, dialogue between key

actors such as local government, industry, building associations, energy suppliers and deciding on an action plan to be implemented in the community. Important surveys to start the energy planning work are:

- Energy resources – costs and potentials
  - renewable and non renewable energy sources?
  - the diversity in the mix of energy supplies?
- Energy demand – divided in areas, sectors and sub-sectors
- Technologies for heating, cooling and electricity
  - current usage and future
- Assessing energy efficiency potentials and costs
- Taxes and other policy instruments

The different tasks in the energy planning work can be illustrated by the figure below.



In the first phase of the process, it is necessary to gather information, thus it is useful to establish a dialog with relevant companies and organizations; such as energy suppliers, building associations, large industrial companies, energy efficiency consultants. The second and third phases of the project need public contribution and involvement in order to achieve a general acceptance of the energy plan in the community.

Energy planning is a process, which in many cases tries to overview and analyse a complex energy system,

and the process includes a large number of participants with different scopes and goals for the energy system. The Ream model can be a effective support tool in the sustainable energy planning process. The model is a modern planning and investment decision tool for local energy planning, prepared for active involvement by several levels in the local community i.e. politicians, planners, energy market actors as well as the citizen.

## SOME MORE DETAILS ABOUT THE MODEL

The user of the model can in detail describe parts of or the whole energy system in a community. Moreover, a number of communities or areas can be analyzed together in regional analyses. The Ream model includes four levels of the energy system:

- all regions
- region
- area
- demand category

An area can be the west or east, a central city or rural areas, or different municipalities in one region. The model handles an unlimited number of areas. The model also handles an unlimited number of demand sectors. Examples of main categories are households, service and industry. However, these main end use sectors can then be divided in sub sectors such as single-family houses, apartments, school buildings, hospitals, hotels, office buildings, food industry and metal industry. Demand sectors can also be specified in different geographic areas, such as urban areas (where district heating is optional) and rural areas (where district heating is not an option), as shown in the figure.

The time perspective in the model is flexible, which means that the user can define variable time periods for the future energy system, such as 2008, 2011, 2014, 2020, 2030, 2050.

The starting-point in the calculation is the changes of the technologies used in the demand categories. The changes will either take place on a cost-effective basis or be defined by the user or as a combination of these two. The cost-effective calculations include e.g. energy prices, taxes and fees, investment costs and variable costs.

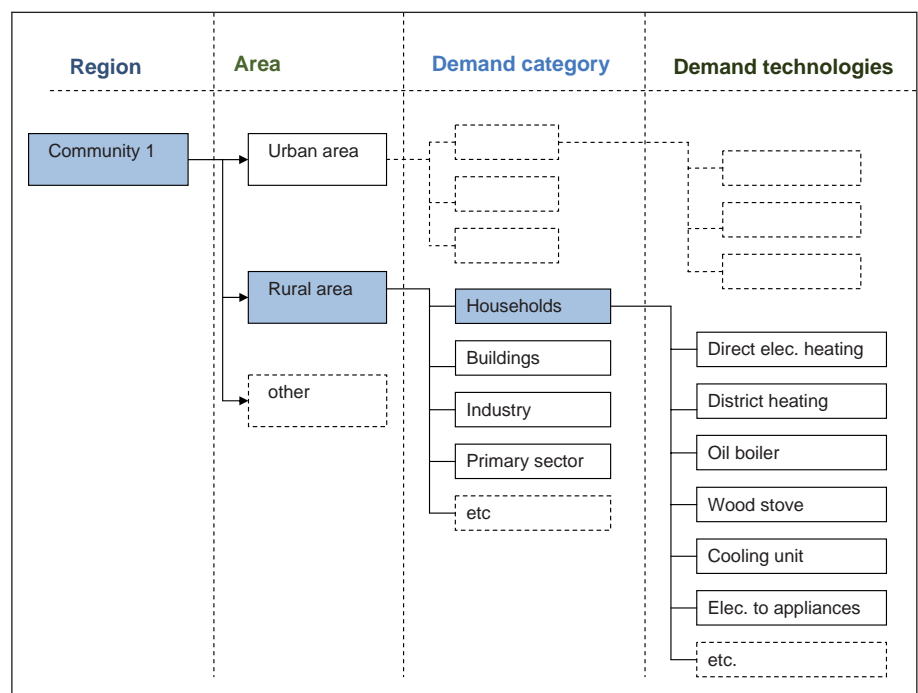
In general, the more areas and demand categories, the more detailed information and statistical data are needed. However, the more detailed input data, the more detailed results will be available from the analyses. It is possible to model with different detailing level in the different areas or demand categories. If, for instance, the energy plan focuses on one specific area of the community, it is important to model this part in more detail than the other areas in the community.

Both individual technologies (e.g. oil boilers and bio pellets stoves) and common technologies such as district heating or local electricity production can be analysed in the model.



The model is flexible for energy units and monetary units. The user specifies the monetary unit (for example €, £, NOK) and the energy unit (J or Wh).

The Ream model is available in several languages, such as English, French, German, Norwegian, Polish, Swedish, Greek, Slovenian and Ukrainian.



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