Introduction to selected tools and models for sustainable energy planning at local level:
REAM and SEC-BENCH

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Anyksciai, 3 May 2010

"Transfer of Norwegian experience in promotion of the use of the renewable energy sources to Lithuanian Municipalities"
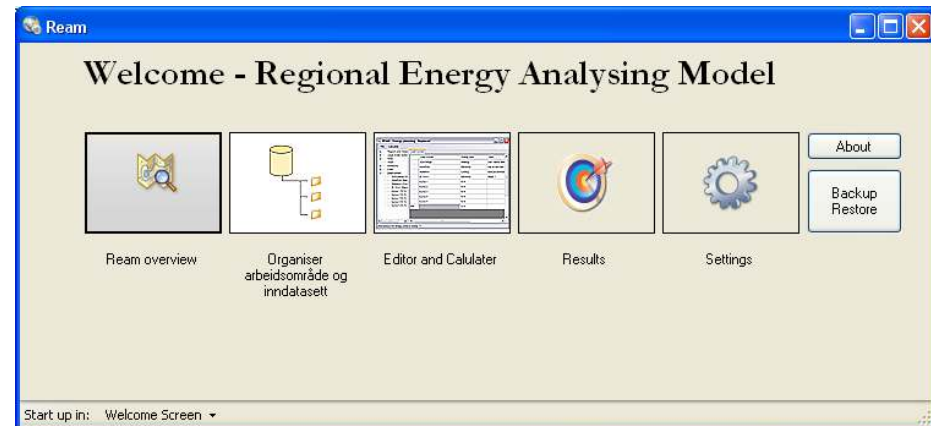
Presentation

1. REAM – Regional Energy Analysing Model
   A multi-scenario tool for local and regional energy planning

2. SEC-BENCH web based benchmarking tool
   Benchmarking of energy and climate indicators on the web

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REAM
Regional Energy Analysing Model

- REAM is developed through the EU-project 3-Nity, Developed by Profu (SWE) and IFE/NEPAS (NOR)

- Designed to analyse local and regional stationary energy systems

- Simple navigation with an Explorer-look-alike interface

- REAM is based on Microsoft.NET, can be installed on computers with Windows XP, Windows 7

- Licences for REAM is available for municipalities/regional authorities, private companies and educational establishments.
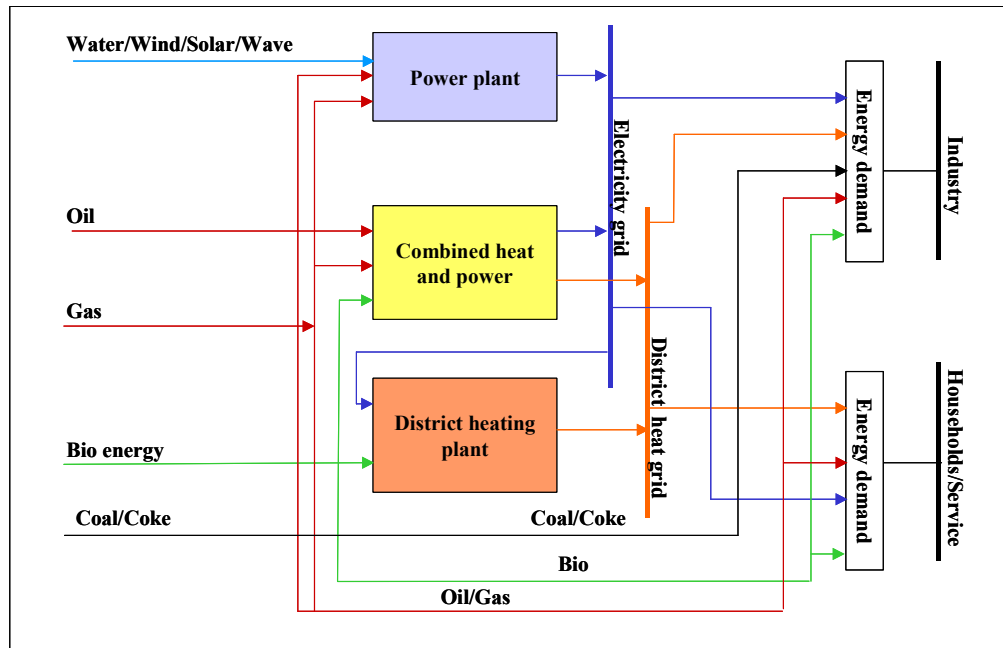
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General description

- REAM includes:
  - Local energy production, small and large scale facilities
  - Infrastructure for transmission of electricity, heating and cooling
  - End use of energy
  - Energy efficiency measures
- Analyses the development on a least cost basis
- REAM is easy to handle; the user chooses level of detail
- REAM can analyse the energy system in an entire municipality/region, or selected sectors or geographic areas
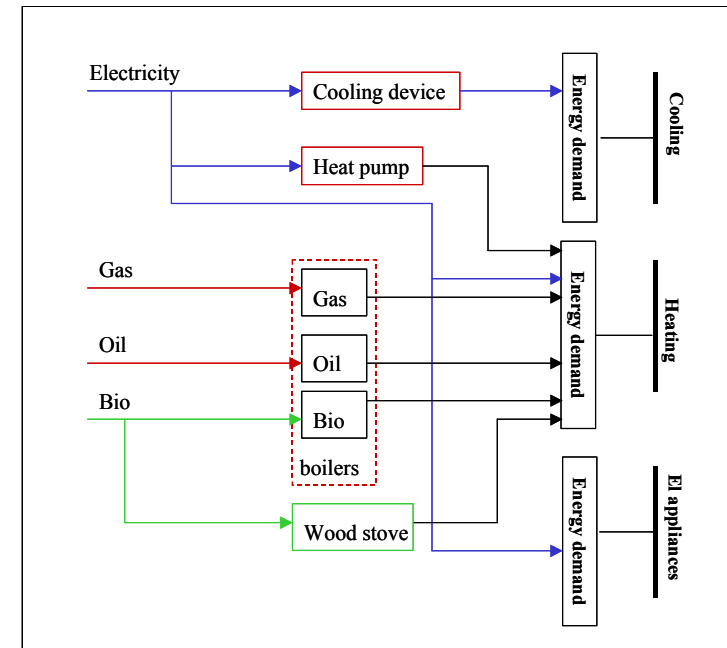- Language flexibility, partly unit flexibility

⇒ **REAM is a tool for local and regional energy planning**
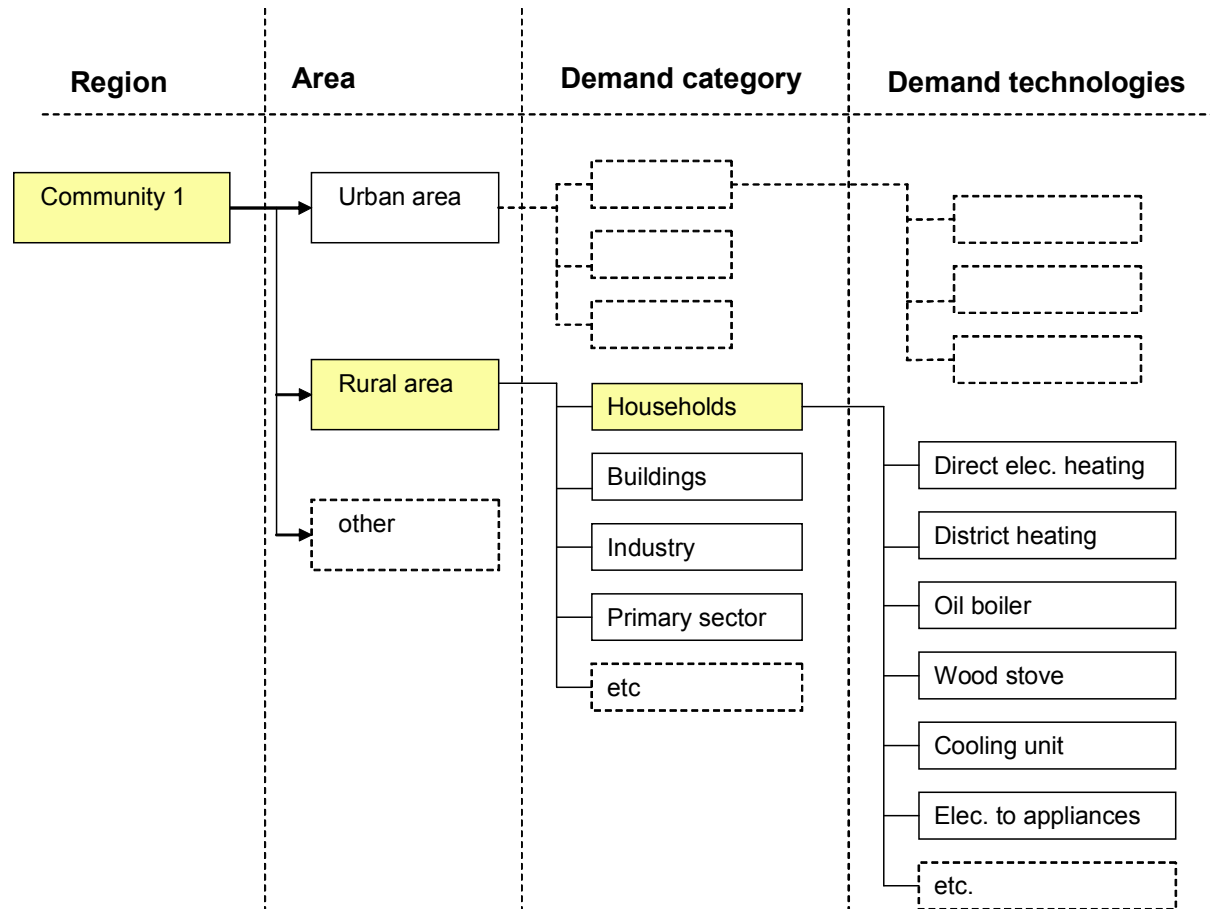
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Principal RES

Overview level

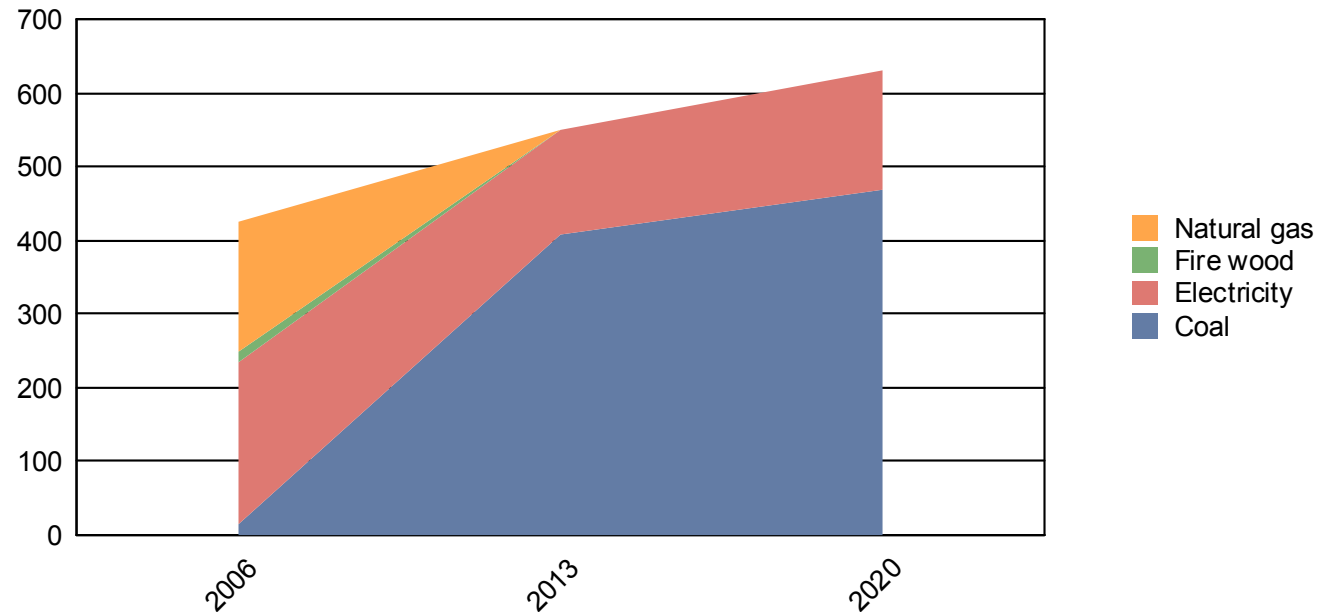## Demand category level

John Johnsson, Profu

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Model Structure

Example: Scenario calculations

- Municipality of Dobrich, Bulgaria used as an example
- Three scenarios will be presented
    - Basic scenario
    - Business As Usual Scenario
    - Low Emission Scenario
- Data for energy consumption in Dobrich for 2006 (residential, industry, services, municipal buildings)
- Today's energy prices and cost estimates for Bulgaria
- **Take notice**: A number of general assumptions have been made. The value of this example is not the results of the calculations, only how to show how REAM may be used to simulate different scenarios.

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Energy supply
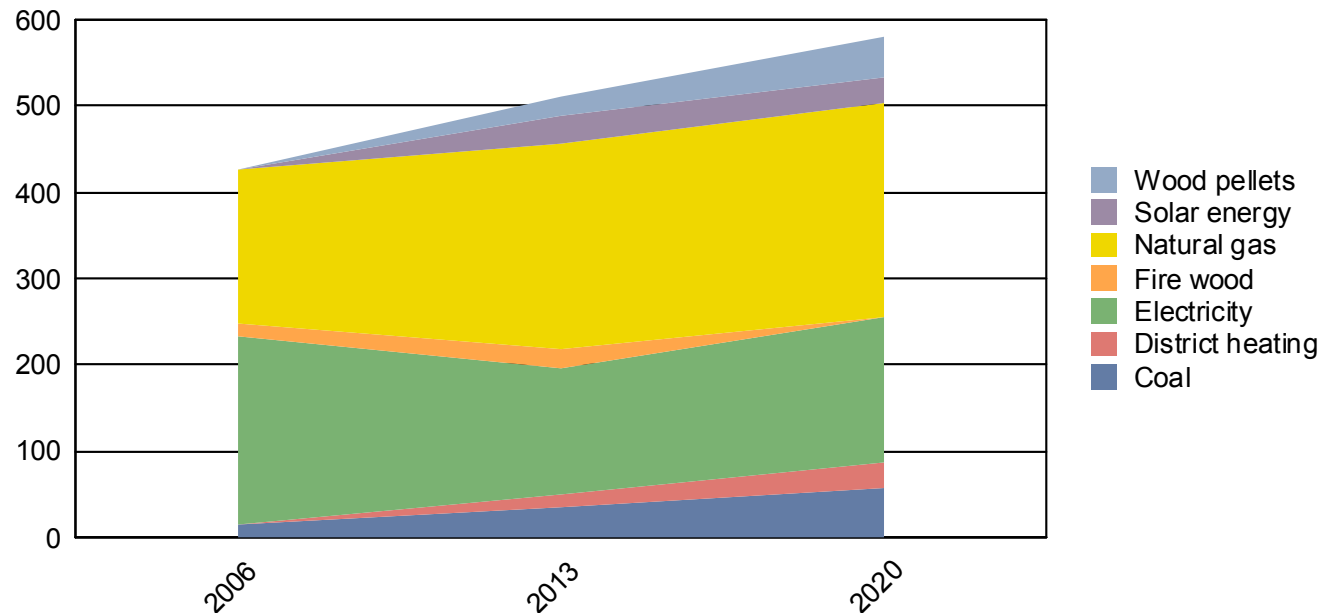### For Dobrich - Basic Scenario

"Basic" Scenario

- The development is solely based on least cost calculation

- No additional assumptions or restrictions introduced
  (such as resources limitation or other barriers)

- No cost adjustments, general price increase on all fuels

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Energy supply

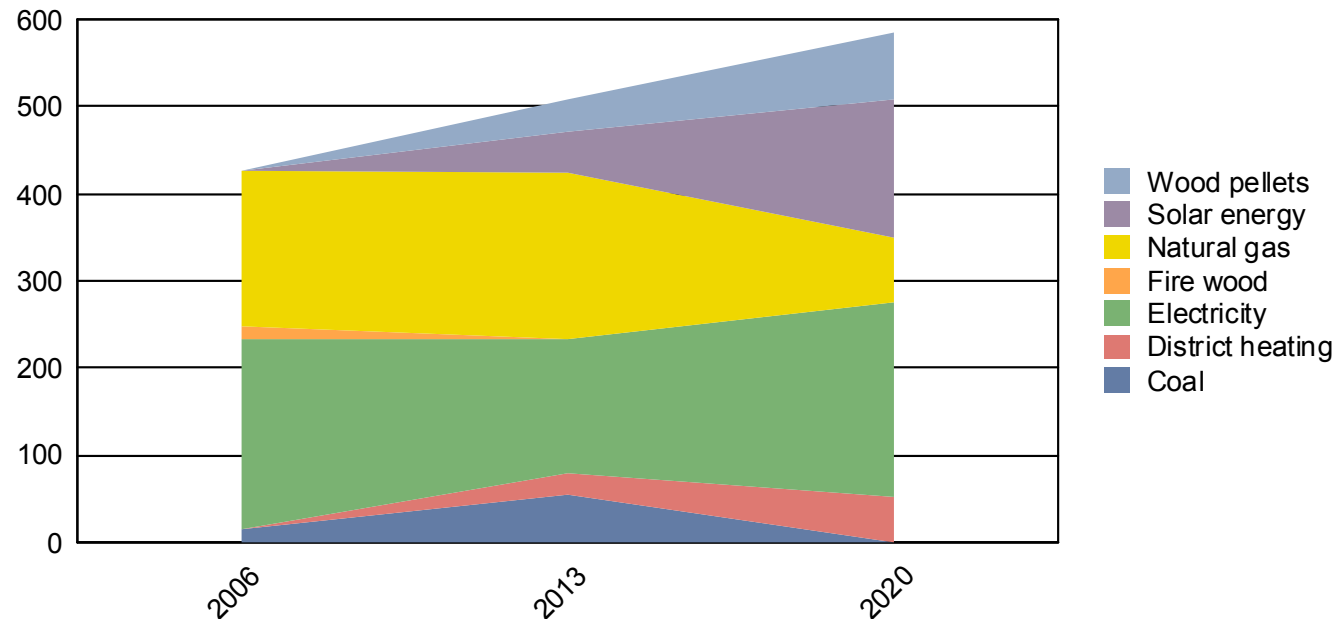For Dobrich - Business As Usual Scenario

"Business As Usual" Scenario

- Restrictions introduced due to technical barriers, resource limitations and human behaviour (based on assumptions)
- Still no cost adjustments

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Energy supply

For Dobrich - Low Emission Scenario

Legend:
- Wood pellets
- Solar energy
- Natural gas
- Fire wood
- Electricity
- District heating
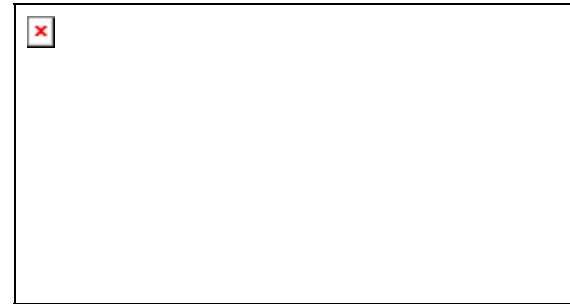- Coal

"Low emission" Scenario

- Restrictions introduced due to technical limitations and human behaviour (based on assumptions)

- Increased taxes on fossil fuels

- Reduced investment cost on solar collectors (e.g. due to subsidies)

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SEC-BENCH benchmarking tool

- A web based tool for monitoring and benchmarking of energy and climate indicators on local level

- Developed under the framework of the project SEC-BENCH: "Sustainable Energy Communities – Benchmarking on the web", supported by IEE

- By comparing energy and climate performances best practice examples will stand out, and continuing improvements illustrated

- A tool for stimulating groups of municipalities to move together towards more sustainable energy systems at local level
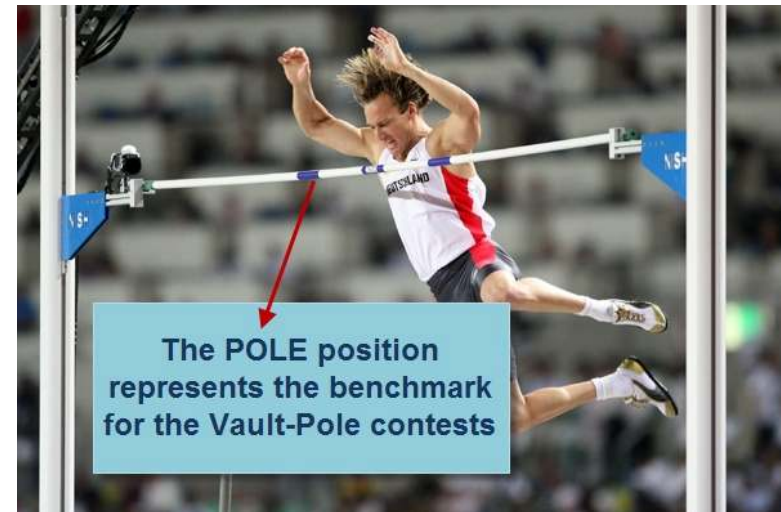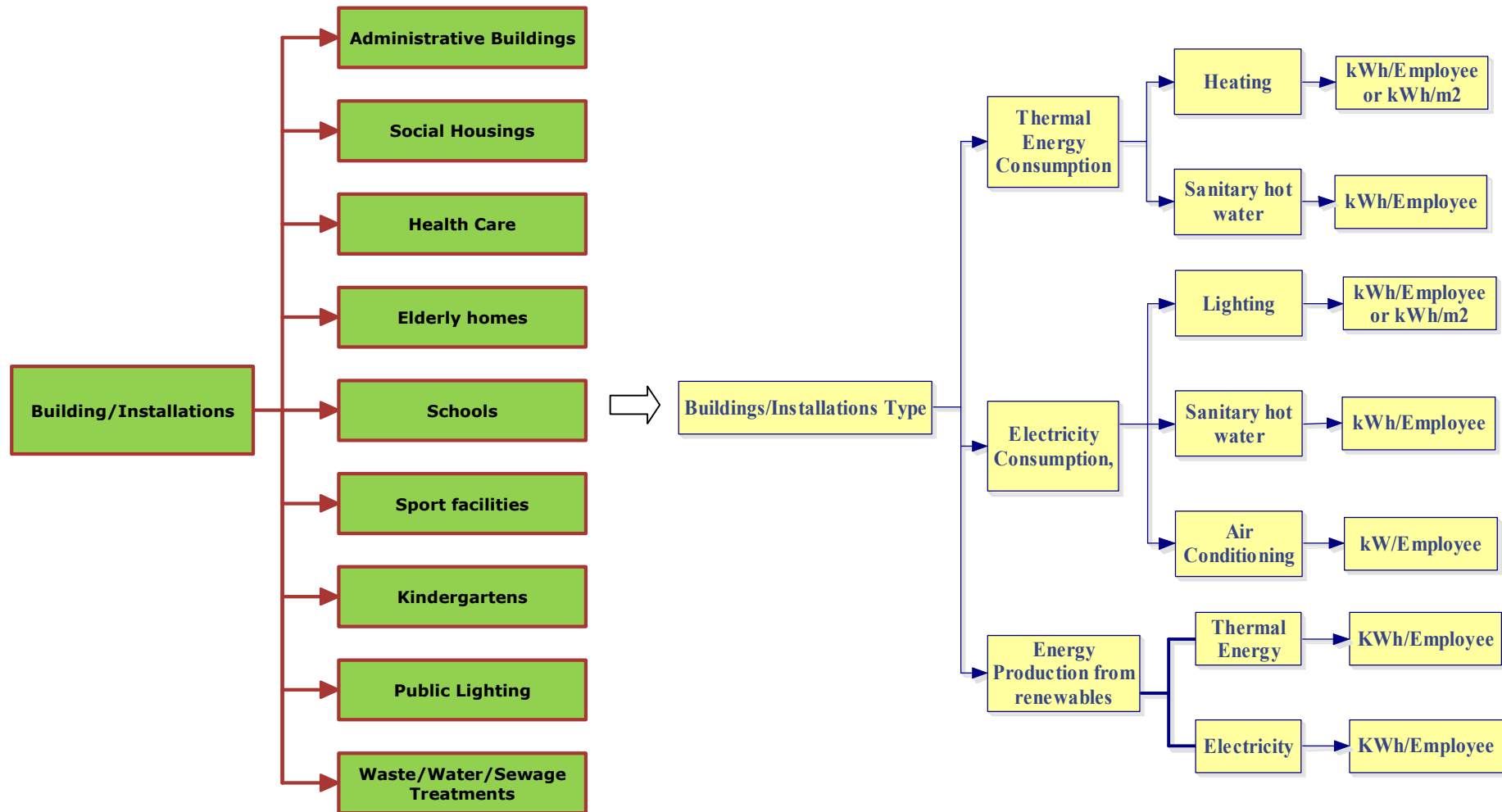
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The SEC-BENCH indicators

A bench-mark is a criterion by which to measure something; a standard; a reference point

The SEC-BENCH application calculates benchmarks for:

- The buildings specific energy consumption (kWh/m2) per energy source and if possible per final use

- The energy consumption per employee (when meaningful)

- The renewable energy production (kWh/year and kWh/employee)

- The cost of the used energy (EURO/kWh)

The POLE position represents the benchmark for the Vault-Pole contests

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The SEC-BENCH indicators

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Benchmarking
web based energy registration

Registration of data

Results/Indicators
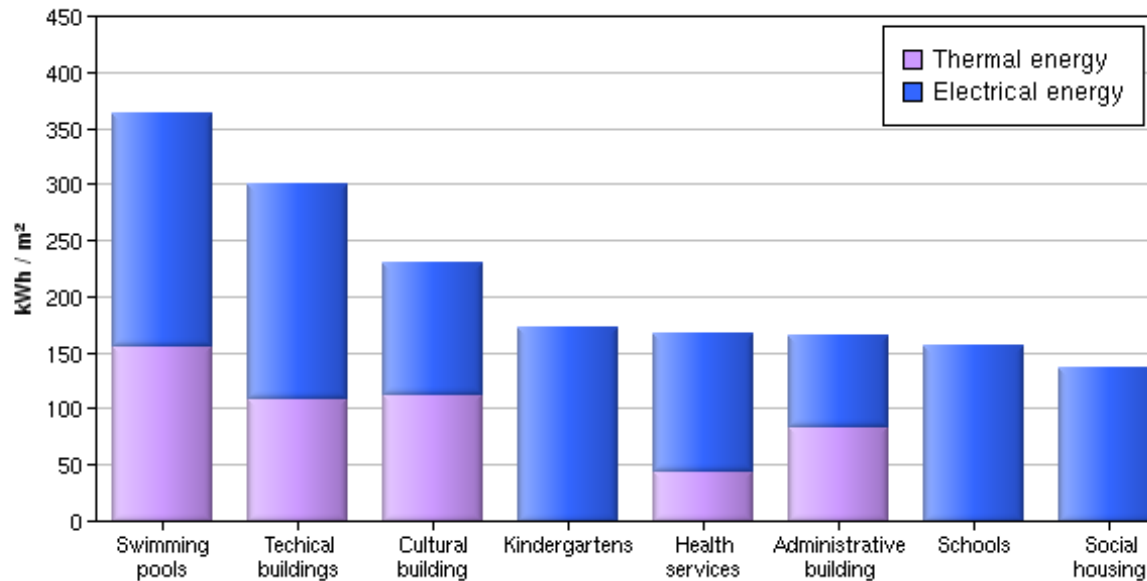
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Building data - 32 - Kulturhus

3 - Annual Energy Consumption ▼   **Next step**
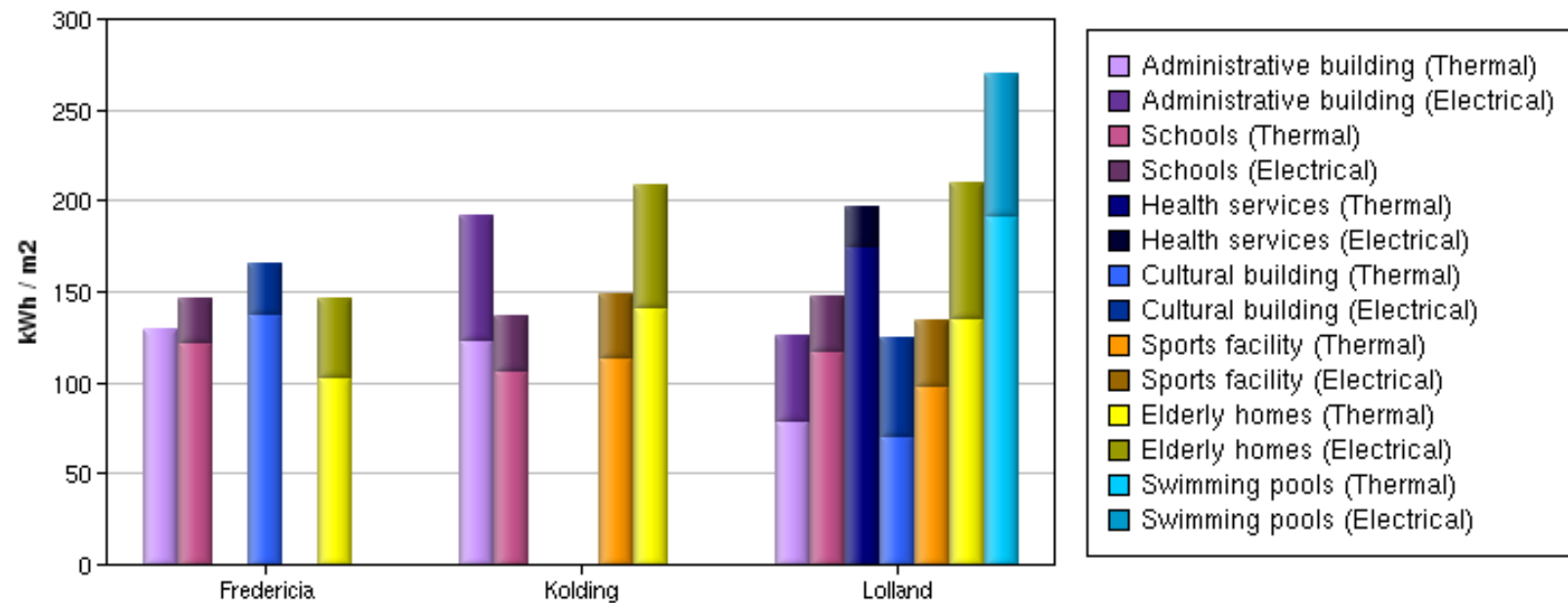
Data has been submitted and can not be changed.

Annual Energy Consumption

	2007		2008		2009	
Total heating area	10438 m²		10438 m²		10438 m²	
Total cooling area	1 m²		2 m²		3 m²	
Electricity	1330316 kWh		7000 kWh		8000 kWh	
Heating	0 %	0	99 %	6930	100 %	8000
Cooling	0 %	0	1 %	70	0 %	0
Hot Water	0 %	0	0 %	0	0 %	0
Lighting	50 %	665158	0 %	0	0 %	0
Electrical appliances	50 %	665158	0 %	0	0 %	0
District Heating	1415050 kWh		0 kWh		0 kWh	
Heating	70 %	990535	0 %	0	0 %	0
Cooling	20 %	283010	0 %	0	0 %	0
Hot Water	10 %	141505	0 %	0	0 %	0
PV electricity production (kWh)	0		0		0	
Heat sold (kWh)	0		0		0	
Electricity sold (kWh)	0		0		0	

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Specific energy consumption in building groups (kWh/m²)

Specific energy consumption on national level (kWh/m²)

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Specific energy consumption in building groups (kWh/m²), broken down to end use purpose (thermal and electrical)

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Thank you for your attention

Questions?

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