

# **Modelling of cost effective energy systems – a regional approach to sustainable energy planning**

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The logo for NEPAS, featuring the letters 'NEPAS' in a bold, sans-serif font. The letter 'E' is stylized with a yellow dot above it.

# Introduction

## Objective

- Local energy planning implies analysing the energy system in a municipality to reveal the potential for reducing energy consumption and GHG emissions
- Can a regional approach to sustainable energy planning give an added value to the process? How should such a regional collaboration be organised?
- Testing of the simulation tool REAM in a regional context

## Presentation

- The regional planning process
- REAM scenario calculations
- Experiences from the regional collaboration

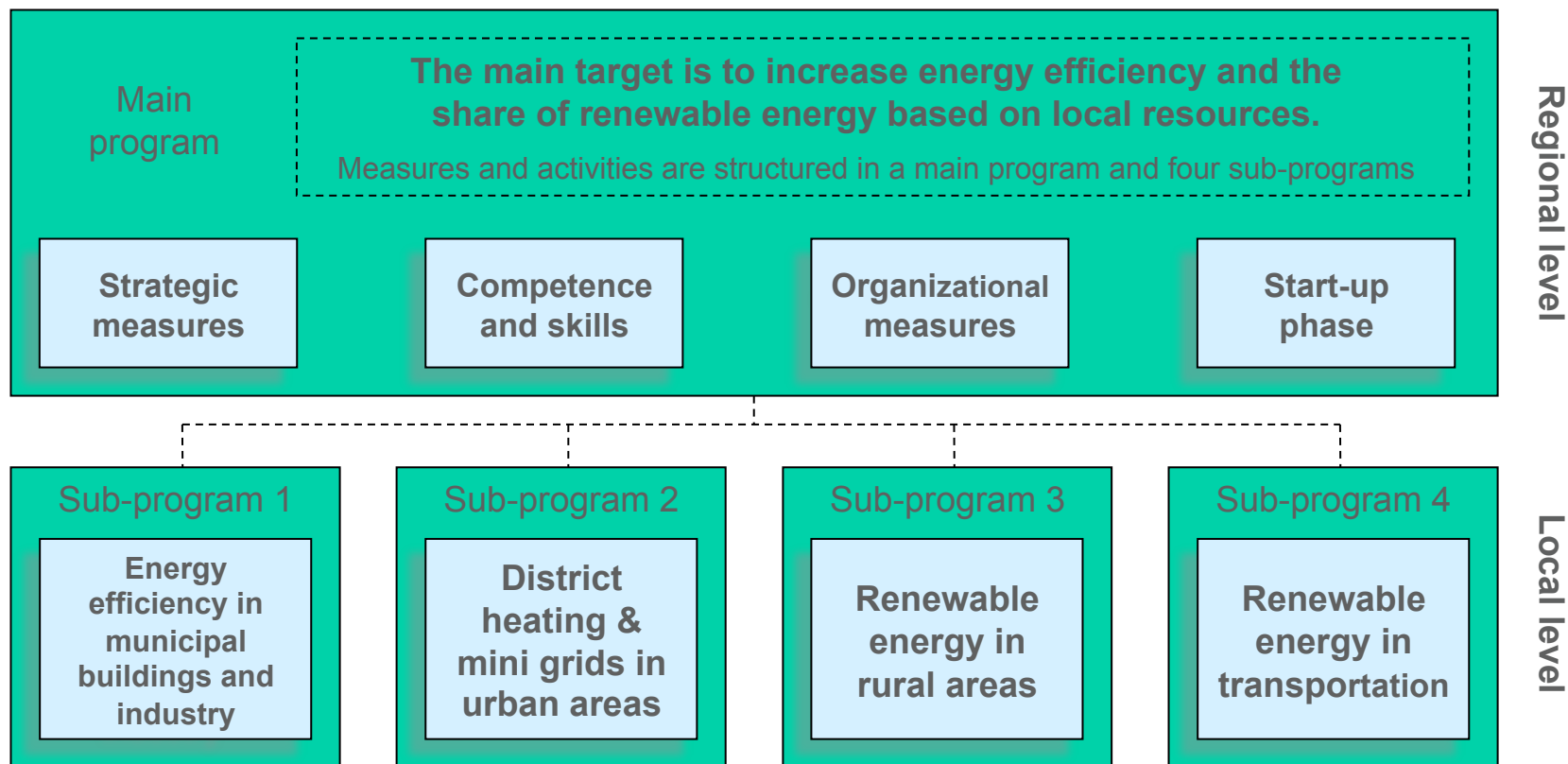
# Case study: The region of Sør-Østerdal



- Five municipalities
- 35.000 inhabitants, 10.000 km<sup>2</sup>
- Forestry and farming are important industries
- One of the most densely timbered areas in Norway
- The climate is dry and stable, with (still) nival winters

# Program structure

Initiated by the Regional Council in 2007, still ongoing



# Some key measures and activities

## The main program

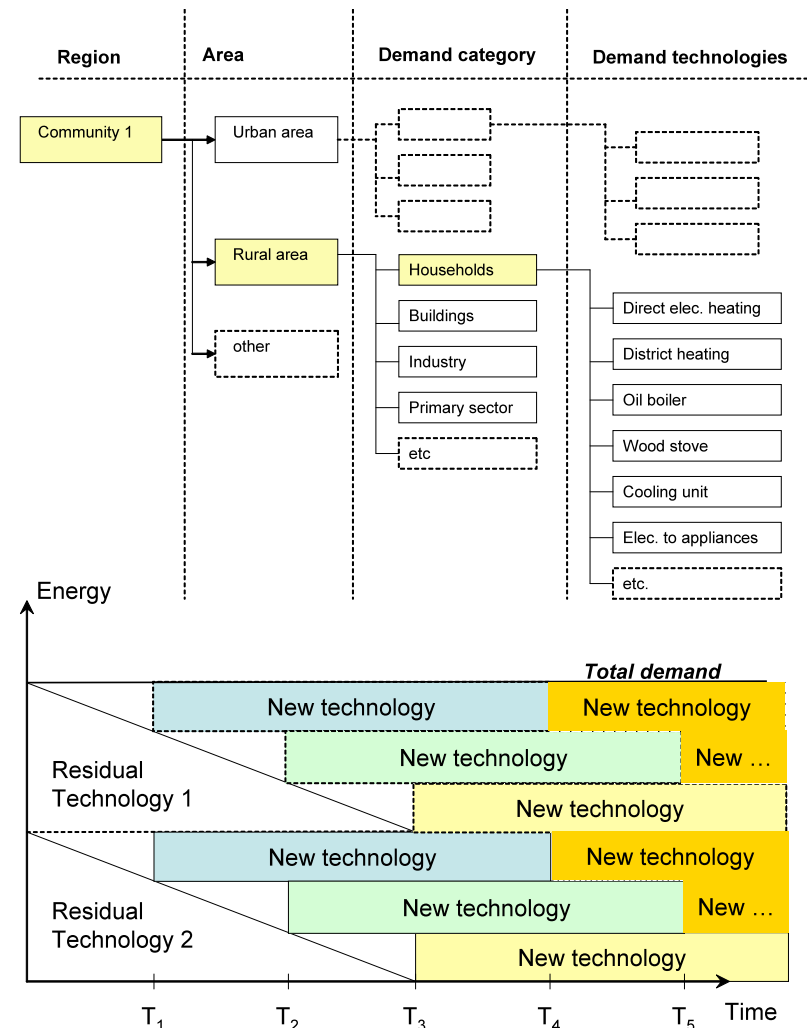
- “Green economic zone”, a pre-feasibility study suggesting improved framework conditions for local biomass energy
- Competence and skills upgrading, i.e. through collaboration with the local University College (HiHm)
- Implement the Common Assessment Framework (CAF)

## Energy efficiency

- Energy audits in all municipal buildings. Preliminary estimates reveal a potential for energy savings of 14-18 %
- Audits in lumber industry. Energy savings potential estimated to 25 %, based on national benchmarks
- Disseminate existing support schemes (Enova) for households, private services etc.

# REAM – Regional Energy Analysing Model

- Simulation model for local/regional energy planning
- Analyses the development of the stationary energy system on a least cost basis
- Handles production, distribution and final consumption of energy, including efficiency measures
- Analyses an entire municipality/region, or selected sectors/areas
- Developed by Profu (SWE) and IFE (NO) under the framework of the IEE-project *3-nity* ([www.ieeprojects.net/treenity.html](http://www.ieeprojects.net/treenity.html))
- The region of Sør-Østerdal was used as a test case

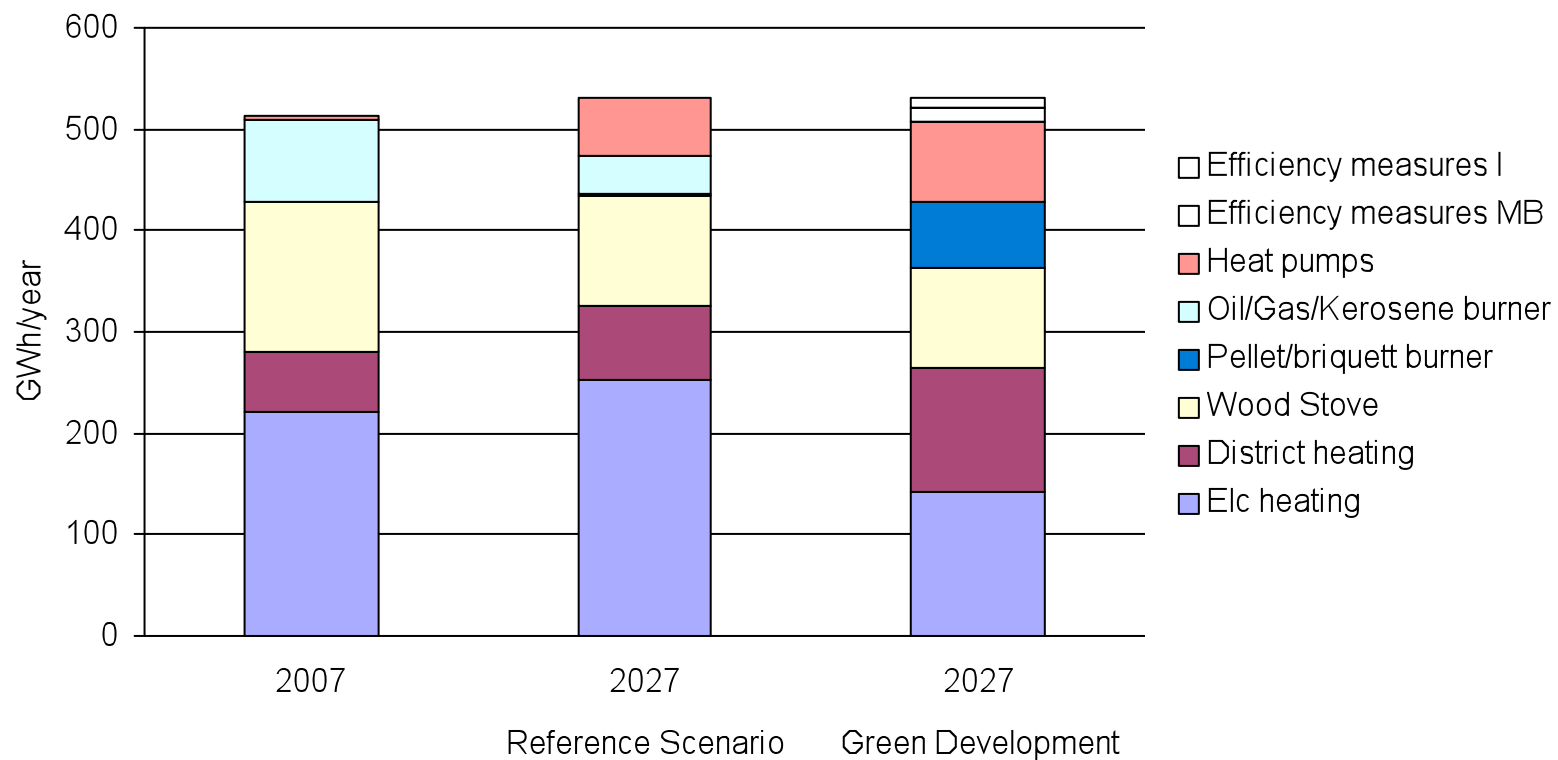


# REAM – Scenario assumptions

The Reference Scenario	The Green Development Scenario
No specific energy efficiency measures	EEM are introduced in municipal buildings and certain industrial units
Increased supply of district heating only due to expansions in existing grids.	Realisation of existing plans for new DH centrals/ grids cause additional increase in supply of DH
General fuel price increase of 2 % p.a.	The price development of refined biomass and DH is limited to 1 % p.a.
Investment costs in accordance with today's prices.	The investment costs for refined biomass burners reduced by 10 %
The past trend for use of fossil fuel technologies is assumed to continue.	The future development of fossil fuel technologies solely a result of cost effectiveness.
The past trend for use of heat pumps is assumed to continue.	Information about potentials for energy savings is assumed to affect the public behaviour

# REAM – Scenario results

Heat demand in Sør-Østerdal in 2007 and 2027, according to the two REAM scenarios





# Experiences from the regional collaboration

## Positive outcome

- A steering committee and a project coordinator appointed
- Measures such as the “Green economic zone”-study requires regional collaboration
- The common initiative to carry out audits to identify energy saving potentials in all municipal buildings
- All municipalities agreed to be pilot studies in the IEE-project SEC-BENCH ([www.sec-bench.eu](http://www.sec-bench.eu))

## Potential improvements?

- Gathering of data (top-down) may be difficult; What about bottom-up approaches in selected buildings?
- The planning process can also be described as “top-down”; 1) regional plan; 2) local plans. Can a “bottom-up” process give added value?
- Could a more active management have accelerated the process (but risking jeopardizing local ownership)?
- Concerning potential political conflicts: What about regions of fifty or hundred municipalities?

# Thank you for your attention

## Questions?

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