

EnerKey

Module 3:

Buildings and Settlements

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Objectives of the module

- **Schools and Administrative Public Buildings**
- **Energy Concept Adviser for Urban Districts**
- **Roadmap to Improve Building Stock of a quarter**

Objectives of the module

- **Schools and Administrative Public Buildings**
 - demonstrates best-practice examples for retrofits in school and administrative public buildings
 - focus is on technologies that are low-cost measures
 - two schools and two administrative public buildings are supported in design and analysis of an energy efficient retrofit concept
 - realization itself is done by the South African Partners
 - best- practice examples are described and published as a guideline for energy efficient retrofit in educational and public buildings.

Objectives of the module

- **EnerKey Advisor**


- a building and supply systems related decision guidance for the application of energy efficient technologies in existing and new urban districts.
- It aims at decision makers in local governments and technical committees of towns to trigger thinking on energy efficiency.
- The energy demand of urban areas depends on many influences (buildings themselves, allocation of (typical) buildings, supply systems and the distribution of the required energy in an aggregation of buildings in the urban area)

Objectives of the module

- **EnerKey Advisor**



- It shows up the potential of energy efficient planning and retrofits, which cannot be obtained easily without tools.
- The EnerKey Advisor gives also an overview on possible technical measures for energy efficiency and a description of best-practise examples.
- A benchmarking tool for a comparison of energy consumption will be also included.

Objectives of the module

 EnerKey Adviser Energy Concept Adviser for Urban Areas	
Energy Concept Adviser for Urban Areas	
Compare the energy consumption of your district with national averages	Performance Rating
Learn from X realised energy efficient districts from both existing/retrofitted and new built districts	Case Studies of energy efficient Districts
Which energy efficient strategies and technologies are applicable?	Energy efficient Strategies + Technologies
Assess different energy concepts (demand and supply) for districts (Calculation of final energy, primary energy and energy characteristics)	Energy Assessment of Districts
Download of reports from the research project EnerKey	Basics
Information on different detailed planning tools	Detailed Planning
Contact the participating organisations of EnerKey	Contact

Modullar structure at demand side and supply side

Demand side: building types will be represented by symbols and by default values

e.g.:	residential buildings:	single-family houses	
		multi-family houses	
	non-residential buildings:	public administration	
		other office buildings	
		industry buildings (mix)	
		commercial buildings	
		schools/universities	
		buildings for traffic	
		agricultural buildings	

Demand side: default values: example: single-family house:

- number of accomodation units or total floor area of the building type
- energy characteristics
 - in steps: existing buildings: 140%, 200%, 100% EnEV
 - new buildings: 100% EnEV, 60% EnEV
- HVAC systems (mix or e.g. district heating only, etc.)

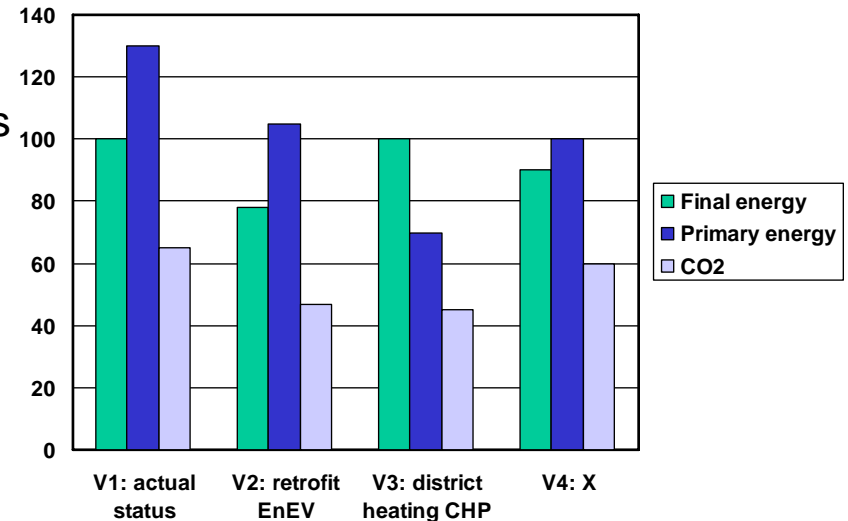
-> default values can be overwritten by the user
 also possible: building type defined by the user

supply structures: also by using types with default values and symbols

- e.g.:
- district heating (CHP/fossil/renewable + specific mix defined by user)
 - heating oil
 - gas
 - electricity
 - wood/wood pellets
 - solar
 - mix (with fractions)
 - cooling



- results of the assessments: variants
 - primary energy characteristics
 - costs?



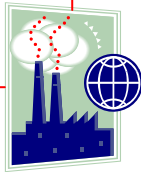


EnerKey Adviser

Energy Concept Adviser for Urban Areas

District to be assessed

Supply:



Choice



etc.

Objectives of the module

- **Roadmap to Improve the Real Estate of a quarter**
 - The EnerKey Advisor will be applied in a selected quarter in the region of Gauteng.
 - With the results of the EnerKey Adviser, an Energy Plan for the quarter and a roadmap to Energy Efficiency will be worked out.
 - The Energy Plan will define target for energy efficiency and the roadmap will be assistance for achieving this goals.

Main tasks

- Schools Project (contribution to module 7)
- Public Administration buildings project (contribution to module 7)
- EnerKey Adviser (Energy Concept Adviser for Urban Districts)
- Feasibility study (contribution to module 7)
- Roadmap to improve building stock of a quarter
- Education and training (contribution to module 7)

Results from pre-phase

- **Energy Concept Adviser for Educational Buildings**
- **Implemented pilot projects**
 - **Uhland-School** in Stuttgart
 - **Emmarentia Primary School**
 - **Laerskool Garsfontein**

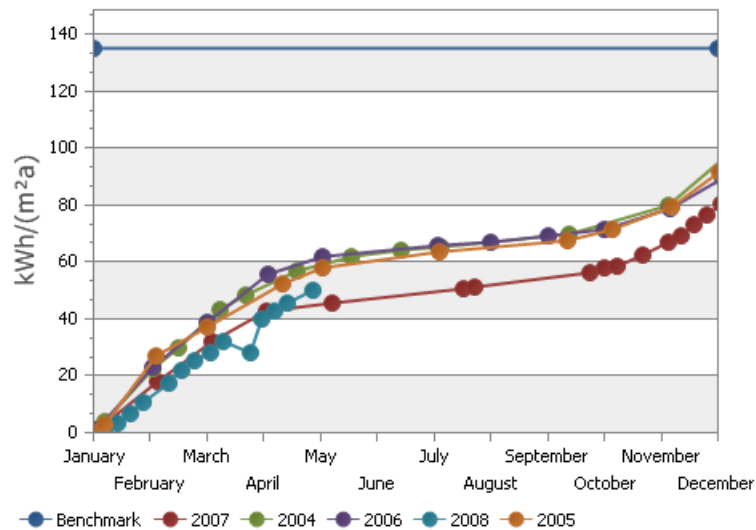
Results from pre-phase

Heating

Meter reading: 861192,00 m³

Related consumption: 49,89 kWh/m²a

Last reading: 28.04.2008

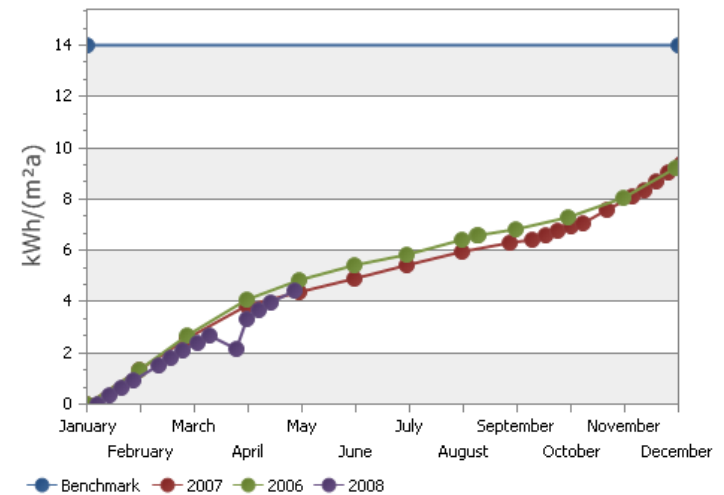


Electricity

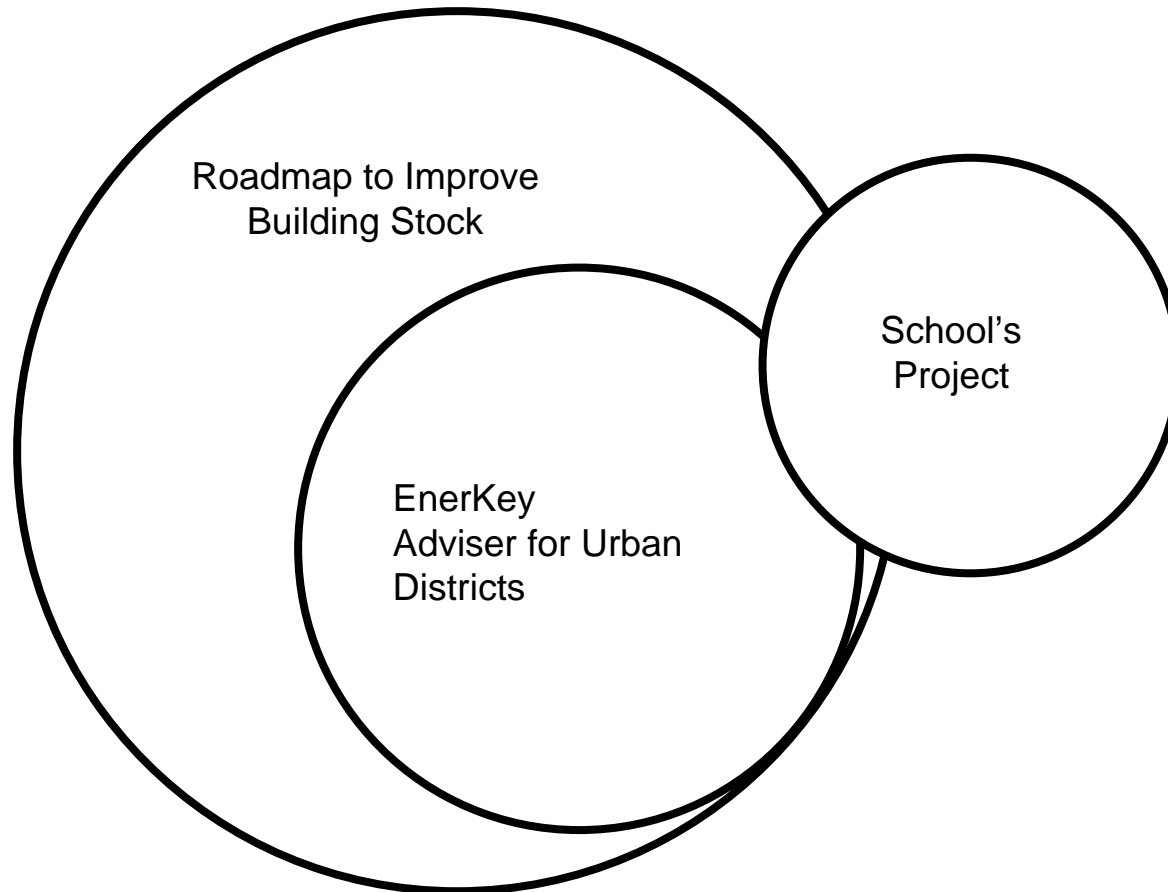
Meter reading:
HT: 2514,04 kWh
NT: 763,14 kWh

Related consumption: 4,45 kWh/m²a

Last reading: 28.04.2008



Interlocking of Module 3



Needed Input

Months 1 -18

- WP1
 - Administrative Building for evaluation
- WP2
 - Exemplary districts or quarters for setting up building register
 - values for energy consumption in typical buildings (heating, cooling, lighting)
 - characteristic values for energy consumption in typical urban areas (heating, cooling, lighting)
 - structure of supply side systems

WP 1 Schools and administrative public buildings

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With a contribution to module 7: Implementation and Pilot Actions

Objectives:

Evaluation of two new schools and two administrative public buildings; Implementation of Best Practise-Example into the Energy Concept Adviser

Description of work packages:

The two already started school projects and five more Best Practise examples will be implemented in the ECA. Two new schools and two administrative public buildings will be evaluated (current state and development of retrofit concept).

Expected Results:

Fundamentals for work package 4.

WP2: EnerKey Adviser - Fundamentals and data collection

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Objectives:

Analysis of buildings, supply side systems and urban districts

Description of work packages:

- Setting up building register for chosen districts or quarters
- Identification and description of typical buildings out of building register
- Identification of characteristic values for energy consumption in typical buildings (heating, cooling, lighting)
- Distribution of typical buildings in districts and identification of typical forms of urban areas
- Identification of characteristic values for energy consumption in typical urban areas (heating, cooling, lighting)
- Analysis of supply side systems
- Total analysis, system of characteristic values for energy consumption, Energy Certificate for quarters or districts

Expected Results:

Fundamentals for work package 3 and 4.

WP3: EnerKey Adviser - Collection and development of measures

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Objectives:

Development of measures for new and existing buildings, supply side systems and urban districts.

Description of work packages:

- Measures for new buildings (typical buildings)
- Retrofit measures for existing buildings (typical buildings)
- Measures for new urban districts and supply side
- Retrofit measures for existing urban districts and supply side
- Analysis of influences and selection of qualified combinations
- Identification of characteristic cost values for measures and energy sources

Expected Results:

Fundamentals for work package 4.

WP4: EnerKey Adviser - Model and tool development

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Objectives:

Development of the EnerKey Adviser

Description of work packages:

- Development of tool for benchmarking and performance rating
- Development of description format to describe typical buildings and settlements for use in ECA and Times
- Adaption of existing tools to South African Conditions (DIN V 18599)
- Development of main frame program 'EnerKey Adviser'
- Numerical calculation of energy demand for typical buildings and settlements
- Implementation of measures as extensible Plug-In
- Validation and Calibration of ECA based on consumption data

Expected Results:

EnerKey Adviser

WP5: EnerKey Adviser - Feasibility study

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Contribution to module 7: Implementation and Pilot Actions

Objectives:

Test the recommendations given by the EnerKey Adviser.

Description of work packages:

- Test of recommendations on the basis of a test settlement/quarter
- Description of experiences / tips for users

Expected Results:

Experience using the EnerKey Adviser

WP6: Roadmap to improve building stock (for a quarter/district)

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Objectives:

Identify feasible targets for an energy plan and assemble it with recommendations to a Roadmap to Improve Building stock for a quarter/ district.

Description of work packages:

- Identification of feasible targets for an energy plan
- Development of an energy plan
- Political control and implementation methods
- Roadmap To Improve Building Stock

Expected Results:

Roadmap to Improve Building Stock of a quarter

WP7: Education and training

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Contribution to module 7: Implementation and Pilot Actions

Objectives:

In this work package three conferences are carried out:

- Energy Efficiency in Buildings
- Retrofit measures for existing buildings and settlements
- Settlement energy planning

Additional a training session on the EnerKey Adviser will be held.

This is a contribution to module 7: Implementation and Pilot Actions

Description of work packages:

Participation and carrying out 3 Conferences and Workshops

Training EnerkeyAdviser

Expected Results: