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COST-EFFECTIVE LOW-ENERGY SOLUTIONS

- A DEMONSTRATION PROJECT IN DENMARK**
- RESULTS FROM THE CLASS 1 EU CONCERTO PROJECT**

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A CONCERTO project?

A CONCERTO project combines:

- Energy savings and renewable energy
- Research, development and demonstration
- Education and dissemination

- Participation from various countries



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The CLASS 1 project:

- Demonstration of:
 - 400 new dwellings at low energy standard class 1 + kindergarten and centre for elderly people
 - Renewable energy supply: Solar heating and Biomass- CHP
- Research and development of:
 - 6 core technologies
 - Legislation (pro et contra)
 - EU Flower labelling
- Training and dissemination
 - knowledge transfer from experiences and lessons learned to 4 associated countries (Estonia, France, Italy and Romania)
 - General dissemination (website, journals, conferences, etc.)

Location / History = A fairy tale



First phase requirements (as easements in the sales docs):

- No PVC allowed
- No pressure impregnated wood allowed
- Rainwater has to be utilised
- The energy demand for space heating should not exceed 30-34 kWh/m²/year (row houses/ single family houses).

In spite of these requirements all the land area was quickly sold out.



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Work Packages

Demonstration	WP1
R&D: Legislation analyses	WP2
R&D: Development of technologies	WP3
R&D: Indoor air climate, measuring and evaluation	WP4
R&D: Environmental labelling	WP5
Training activities	WP6
Dissemination (for Class 1 separately and common for Concerto)	WP7
Project management and EU contact	WP8



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WP1 - Demonstration

Aim: Implementation of the demonstration project in Stenløse Syd – Building projects and energy supply. Consist of:

- List of requirements
- Identification of the builder
- Assistance in the design of low energy building
- Optimisation and design of an energy supply system
- Quality control throughout the development of the building projects
- Socio-economic analyses of the builders' motivations and criteria.



Lead: Egedal Municipality

City Town Hall



Train station

Elderly activity house

Kindergarden
1000 m²

Ultra low energy houses
69 apartments

Demonstration area of the Class 1 project

OFFENTLIG FÆLLED



Storparcel = Dense low-rise dwellings
Husparcel = Single family houses

Biomass CHP-Plant



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The centre for elderly people under construction





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Prefab low-energy buildings < lowenergy 1”





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- now completed





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Also ~ 100 single family houses to be build:



User preferences in Stenløse Syd

House owners' preferences in the context of efficient dwellings:

- The project is a Danish low energy building
- The project has promoted low energy buildings
- The project is a Danish low energy building
- Legislative measures gives them a sense of "pulling along with others" !
- The newcomers to Stenløse Syd are perfectly ordinary people and the project thus proves that it is possible to work with low energy building projects on market terms



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WP2 - Various legislative initiatives

Aim: Analyses of
energy building

Consist of:

- Method de
- Implemen
- Developm
- order to fu

Conclusion:

Legislative initiatives/requirements need
to be followed by

- assistance and
- checking!

support low

initiatives in

Report is been completed these days: D8. Lead: DTU



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WP3 –Development of technologies

Aim: To further the development of 6 chosen technologies. Activities:

- Applied technical development of each technology:
 - windows
 - foundation and insulation towards the ground
 - biomass CHP,
 - ventilation with heat recovery and heat pump
 - heat distribution for local district heating
 - CTS (intelligent control and monitoring) – towards low energy class 1 building.
 - A report and a product brochure covering each technology.
-

Lead: Cenergia.



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PRO TEC

The window manufacturer PRO TEC has developed a special low energy window towards a more competitive and flexible product PRO TEC 7 .The Class 1 engagement has contributed to reducing production costs by 30 % by process changes and machinery investments. Compared to several other passive house windows the product is now vastly more cost-effective.

- PRO TEC 7 is still about 10 % more expensive than traditional aluminium clad timber windows.
- During the development process it is now possible to supply inward opening doors and tilt/turn windows and more is coming in the near future



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Genvex

- GENVEX has advanced a mechanical ventilation system with heat recovery and integrated heat pump for house heating
- The new product series will be developed in 3 sizes in order to be able to cover dwellings from 50 m² to 300 m²
- The products are designed for use in highly insulated dense dwellings in Europe and they must be able to observe the regulations of the different countries, among others be approved according to regulations and requirements of Minergie P+, Passive House and Low Energy Class 1



WP4 – Indoor climate quality, measuring and evaluation

Aim: Assistance in the projecting phase, quality-check in the target phase and subsequent measuring and evaluation as regards indoor air climate, air quality and energy efficiency.

- Development of design guidelines for Stenloese Syd
- Evaluation of existing guidelines in each country and their use in relation to the European Building Performance Directive (EBPD)
- Guidelines for measuring of total energy supply (m. KV) and CTS – integration
- Co-ordinating with CONCERTO PLUS recommendations concerning measurements
- Dissemination of measuring data to CONCERTO PLUS
- Analyses of measuring data
- Reporting

3 reports: D21-D23 – D21 & D22 has been produced. Lead: ENEA



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Specific Design Guidelines for Stenlose Syd

- The thermal envelope - guidelines concerning low energy buildings
- Guidelines concerning airtightness
- Guidelines concerning The heating systems
- Guidelines concerning Indoor environmental quality
- Guideline for Thermal comfort in residential houses
- Guidelines for Daylighting and Visual Comfort in residential houses
- User influence
- Dynamic simulation on house type Lind og RISØR

Available as report/deliverable D21 on the project website.



National Guidelines for Residential Buildings

Presented as Grid of applicability in the participating countries

- Existing guidelines: the enquiry
- National Guidelines summaries and applicability evaluation
- Evaluation of Results of Applicability Assessment
- There seems to be a lack of up-to-date design guidelines for dwellings of different categories
- A new initiative to develop common European, still country specific, design guidelines with a special emphasis on check-lists for each phase in the design and construction process is recommended

Report D22 available on the project website



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WP5 – Environmental labelling (The European eco-label. – The Flower)



Aim: Development of the Flower to be used for labelling of building projects.
Development of an instruction manual for municipalities and the building industry in the use of the Flower and also to further the interest of using the Flower.

Activities:

- Development of product lists (apply to the manufacturers etc.)
- Development of information material in the use of the Flower.

3 reports incl. information material. Lead: Cenergia.



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EU Ecolabel

FIRST CONCLUSIONS

- The project has shown that it is very important to identify the decision makers as early as possible (before they take decisions on product use)
- A main barrier in integrating the EU Ecolabel is the lack of certified products available.
- Ecolabel ignorance is also a main barrier and initiatives to overcome this must be prioritised so that the benefits of using Ecolabel products are made clear
- One of the important issues that has emerged in this project is the necessity for “Ecolabel competence - training workshops” for the participants. It is important that municipality key personnel (purchasers, planners and other staff involved) are well informed and aware of the possibilities and benefits regarding the Ecolabel and Green product procurement
- Future work will focus on “dense low rise dwellings” as this is a very promising area for introducing Ecolabel products.



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WP6 – Training

Aim: To train and inform of low energy building aiming at 3 target groups:

- technical personnel in the administration of a municipality
- builders and
- users.

Activities:

- Comprehensive planning (in relation to very limited resources)
- Preparation of material for the 3 target groups
- For each of the associated municipalities a carry out the training courses covering the two first target groups
- For the Class1 community: 1 training course

3 reports: D27 – D29. Leader: ICIE



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**THANK YOU
FOR
YOUR ATTENTION!**



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Overview

- The project runs for 5 years
- Start: November 2007
- Total budget: Euro 3.600.000 (2/3 for demonstration)
- 19 participants in the contract with EU, of this
 - 10 Danish and 9 foreign (France, Italy, Estonia & Romania)
- Information: www.class1.dk



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Participants

- Danish:
 - Egedal, Cenergia, SBi, DTU and 6 manufacturers: Protec Vinduer, Maxit, Biosynergi Process, Genvex, Logstor and T.A.C.
- Foreign:
 - 8 act together in pairs (advisor + municipality) for 4 cities: Valga (Estonia), Begles (France), Bologna (Italy) and Focsani (Rumania).
 - 1 - ENEA (Italy) is the leader of the WP4 covering indoor air climate, measuring and evaluation