

Växjö, contemporary timber city



Tallinn 2007.12.05
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Professor/arcitect





This is Växjö

Municipal profile

- Population 80 000
- Land area 1700 km²
- Forests and lakes
- 7,000 companies
- Centre of trade and education



Tree issues

- Climate and environment
- Timber constructions
- Low energy houses



Fossil Fuel Free Växjö



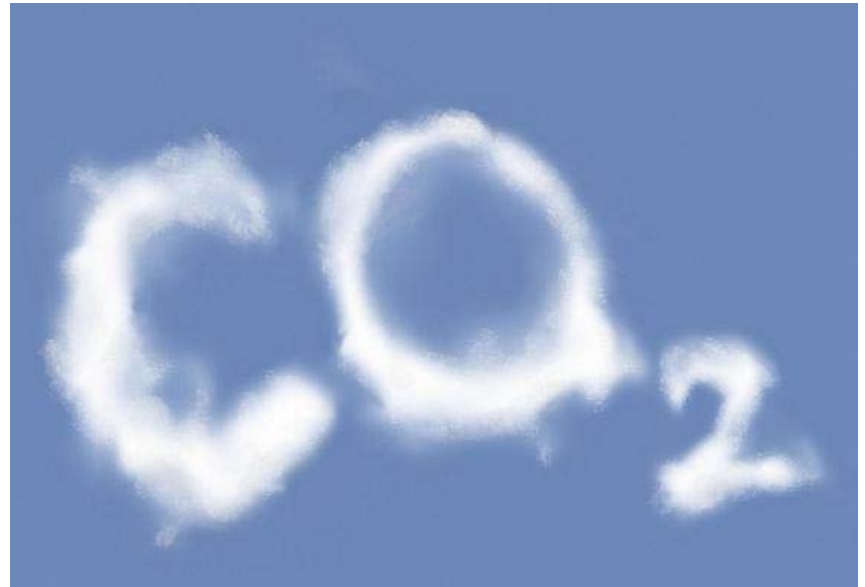
Vision



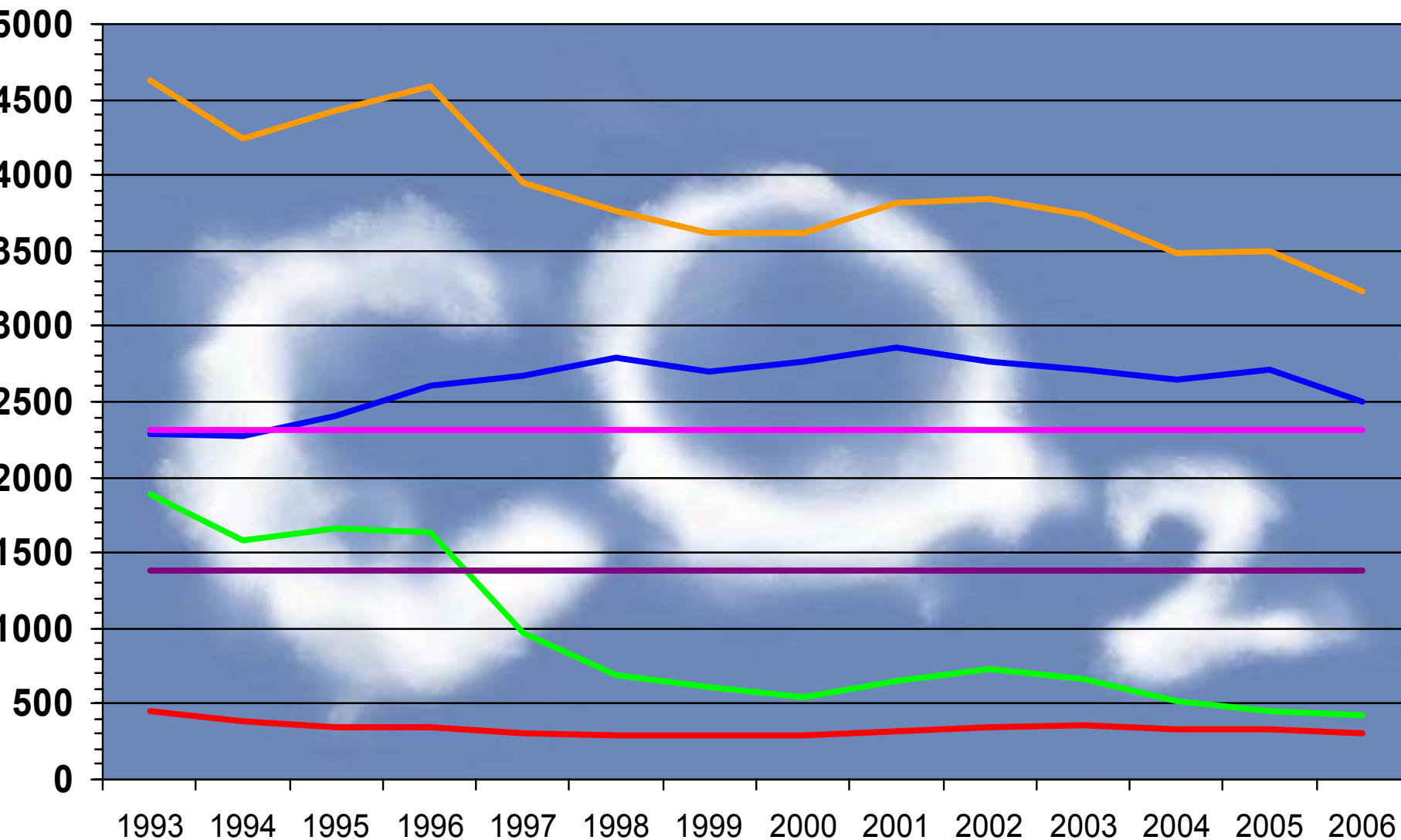
A fossil fuel free Växjö, where our energy consumption does not lead to any climate change.

1996, political consensus

- The City of Växjö shall be a fossil fuel free city.
- The emissions of fossil **CO₂** shall decrease by 50 % per capita between 1993 and 2010



Emissions of fossil CO₂(kg/inh)

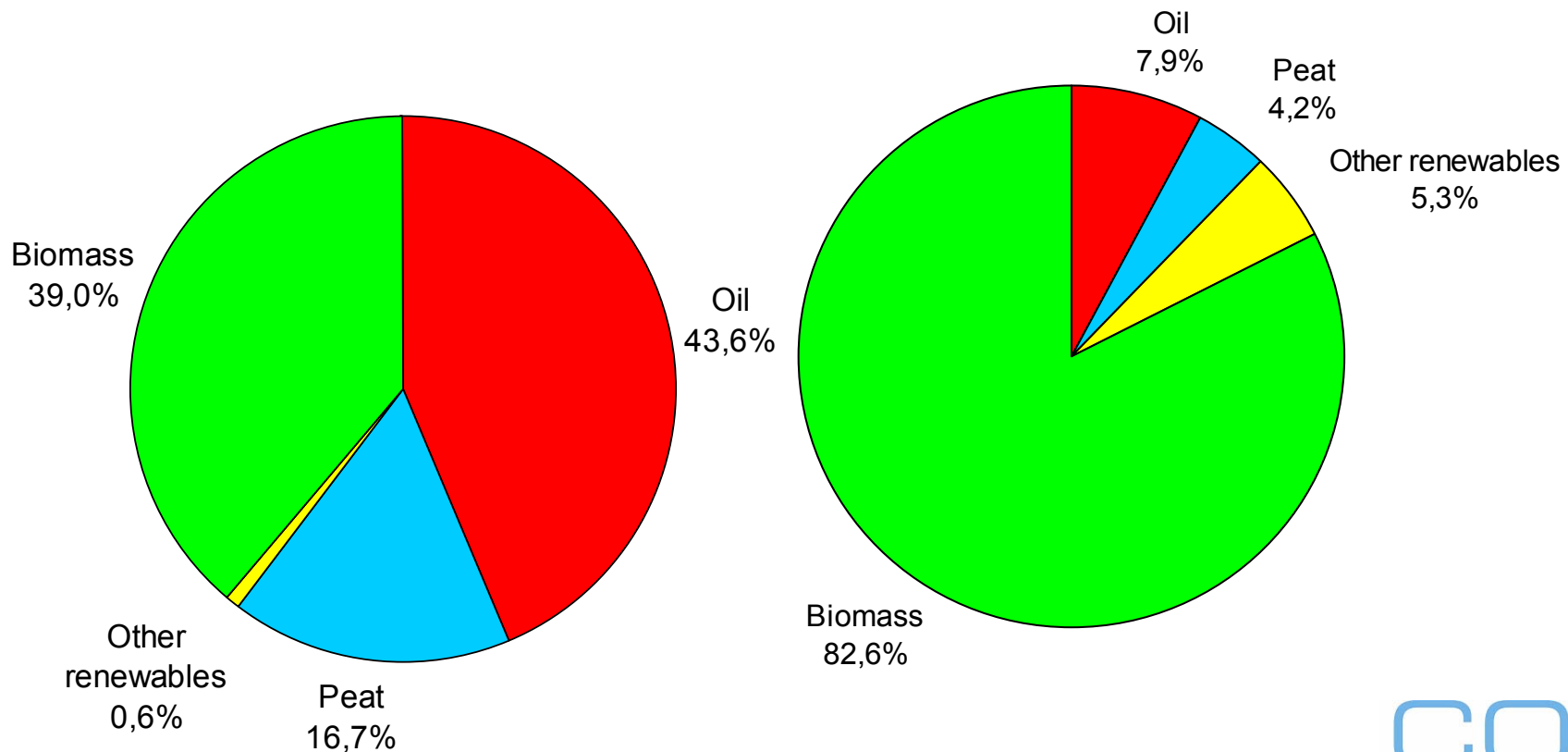


— Total — Transport — Heating — Power — Goal 2010 — Goal 2025

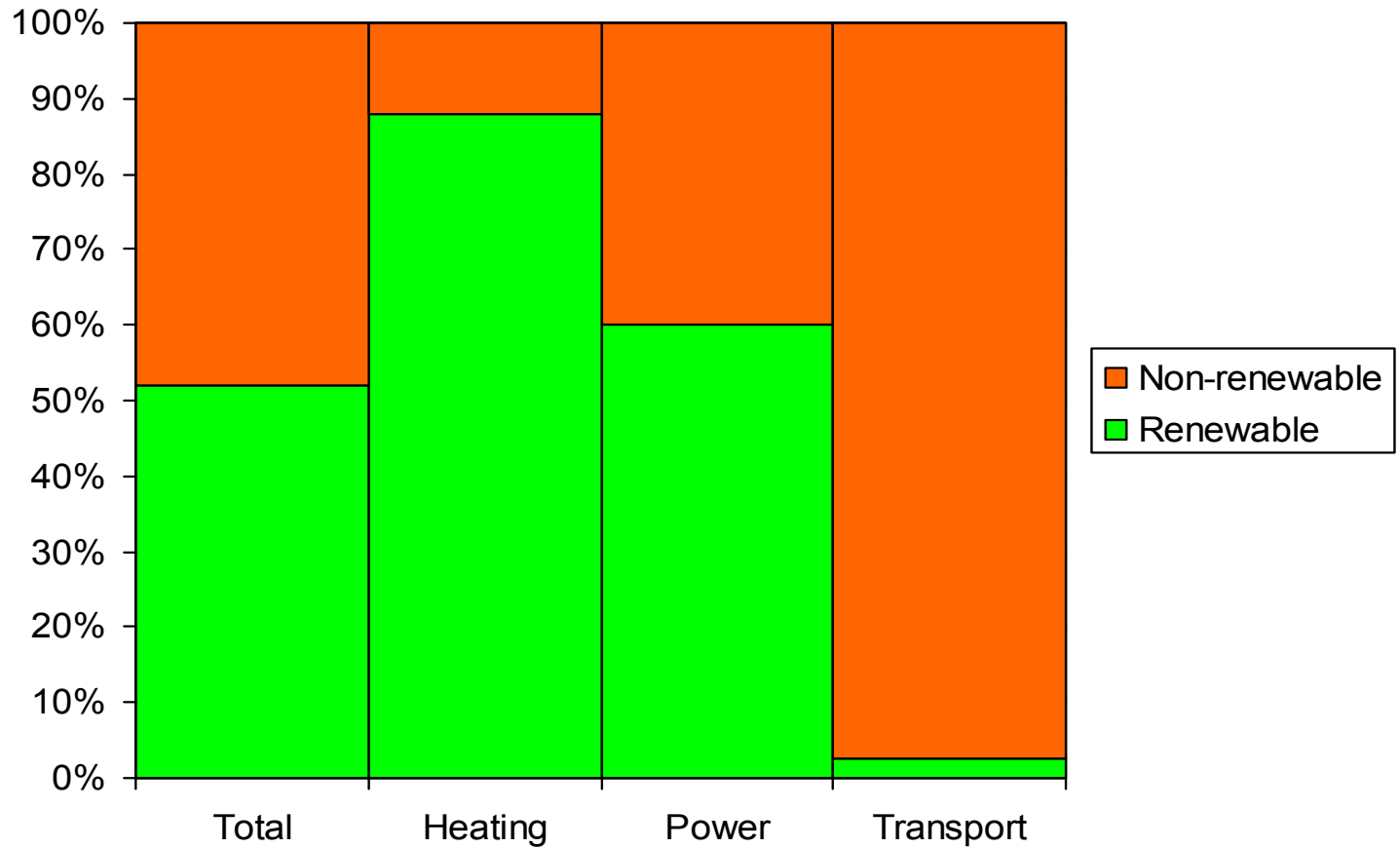
Energy for heating 1993 and 2006

(electric heating not included)

1993 (736 GWh) 2006 (877 GWh)



Share of renewable energy 2006



Roads to success



- Political consensus – decisions
- Broad collaboration - Agenda 21 and networks
- Resources - financial support
- Win a few awards



City of Växjö - Award Winner

2000 Local Initiatives
Awards Winner for
Excellence in
Atmospheric Protection



2007 City of Växjö received Sustainable Energy Europe Award 2007 in the category Sustainable Community. Fossil Fuel Free programme is an overall program to reduce human impact on global climate change.

Timber constructions



Timber i high buildings has been
banned for over 100 years



A loss of :

- Know how
- Education: architects, engineers,...
- Market
- Timber buildings managers
- Equipment
- Standards
- ...



Välludden, Växjö 1994.

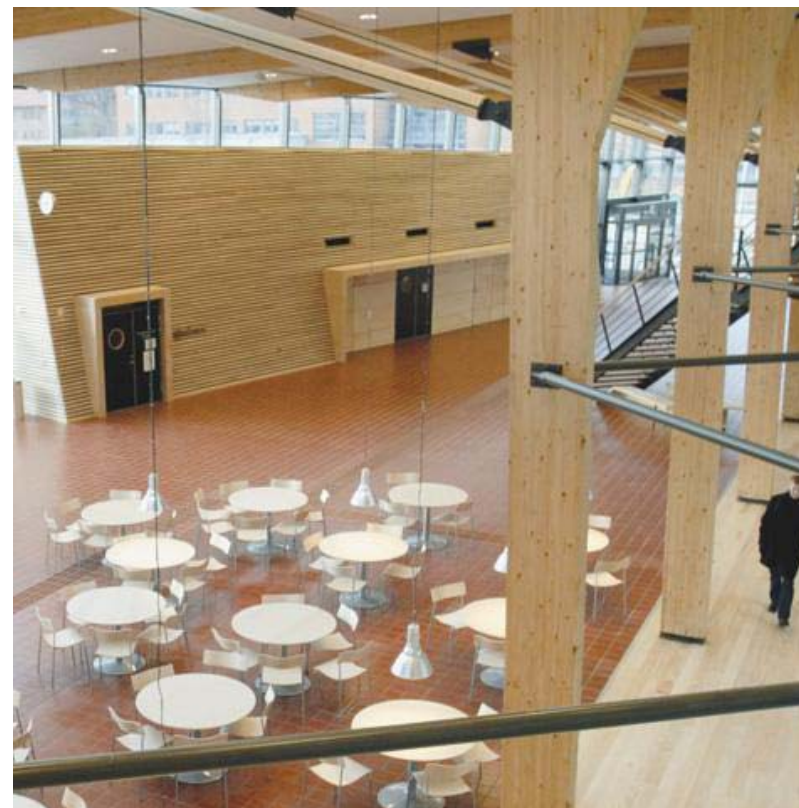


Videum, architect Ola Malm

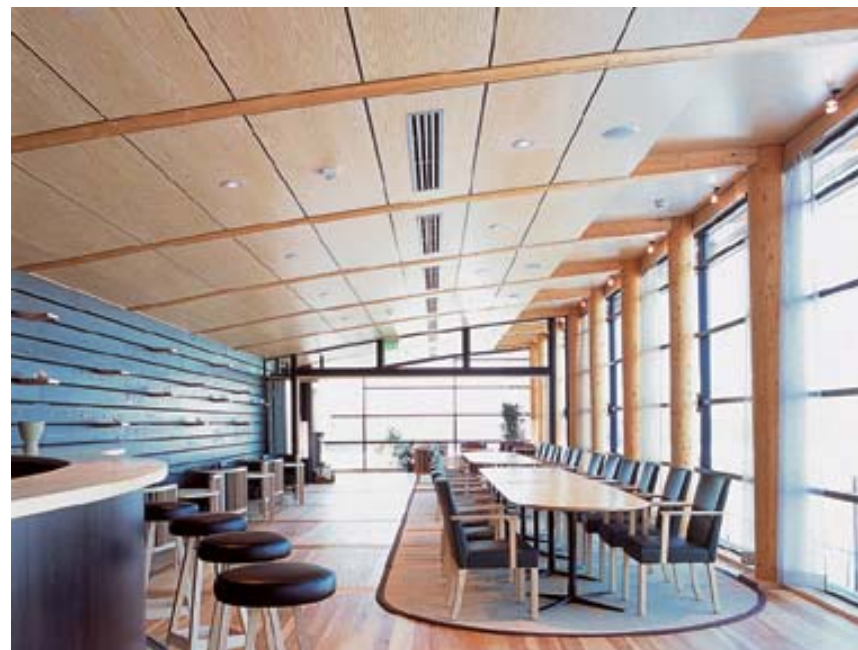




Växjö university, arcitect Mats White



Interiors, Arkitektbolaget



We need wood constructions but still the answer is concrete!

To change you must have a strategy



BYGG STORT och spännande i trä

Välkommen till en unik möjlighet att följa
modernt träbyggande i praktiken.



Introduktion till Nationella
Träbyggnadsstrategins
FORTBILDNINGSPROGRAM.

Sveriges
Träbyggnadskansli

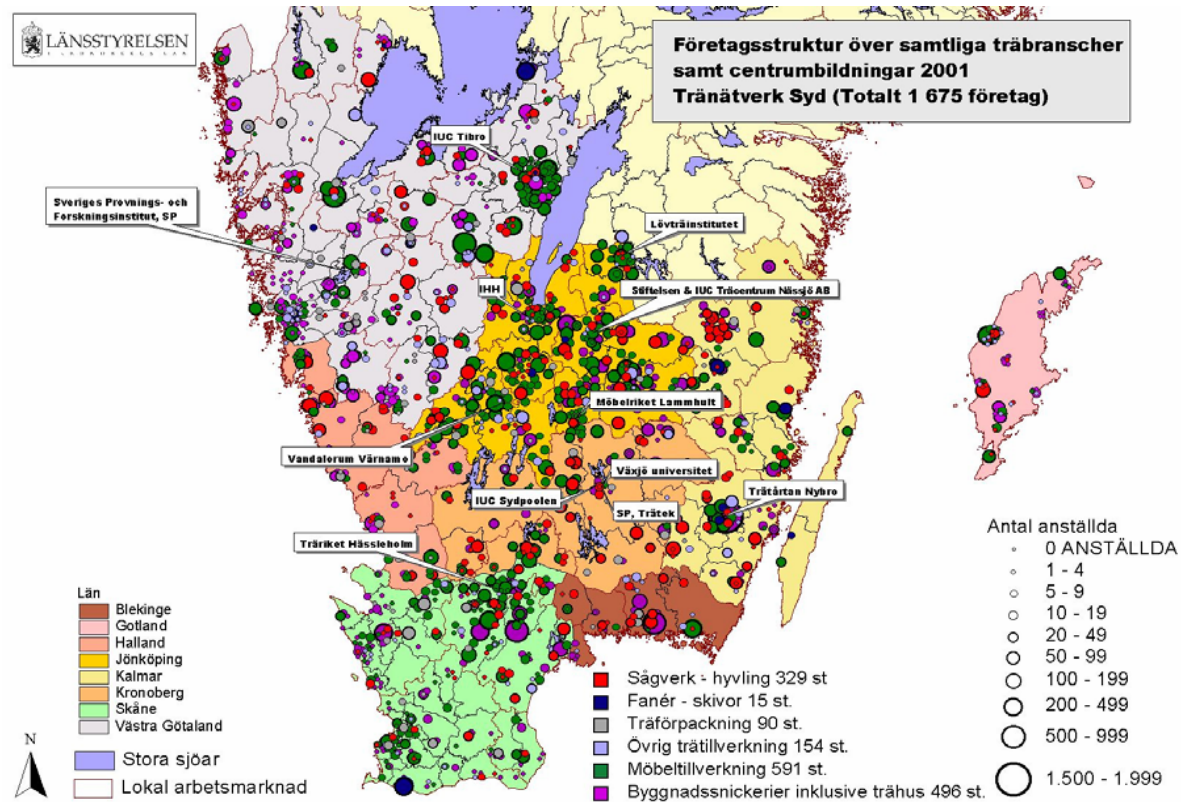


A lokal strategy

- Motives
- Tools
- Political decisions

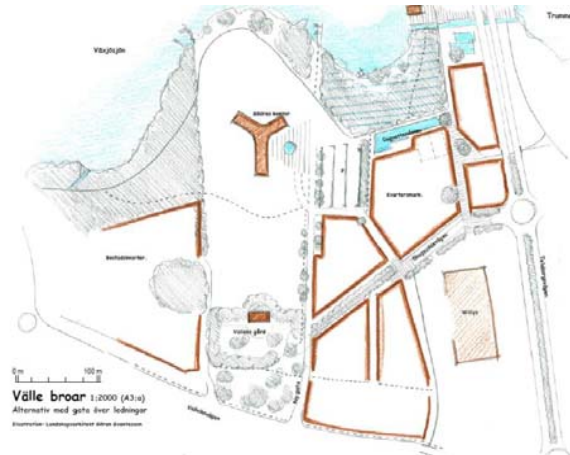
Motives

- Economy
- Employment
- Enviroment



Two ways

- The use of timber constructions must be discussed in every project
- Välle Broar: the contemporary timber town, we must use timber constructions

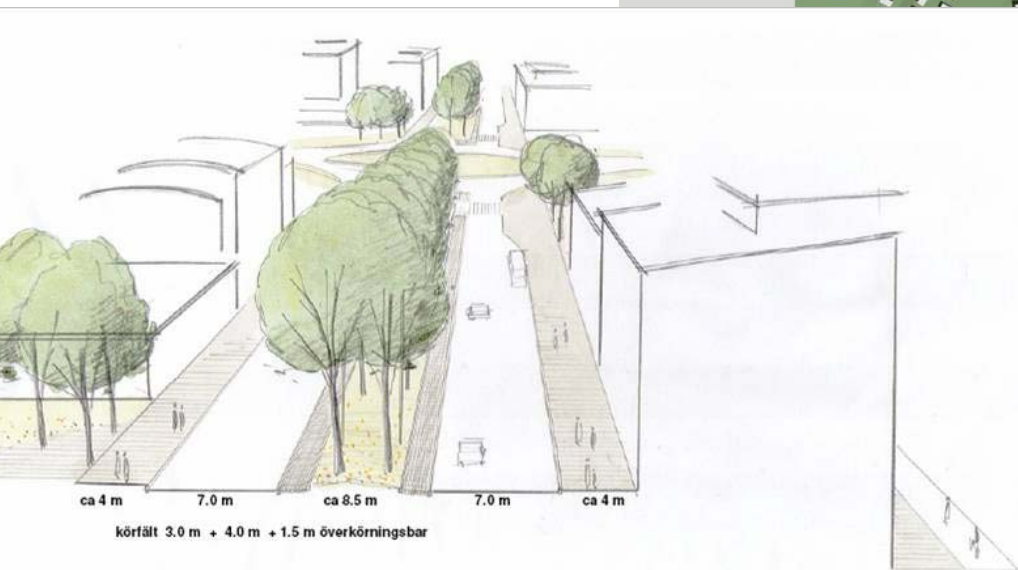


Välle Broar, plan

Conecting the
university and city
centre

20 blocks

1000 apartments



A continuous building exhibition

- 10 – 15 years
- Best practice
- Timber must be used
- Open for research



Why or why not timber constructions?

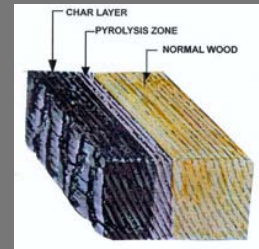
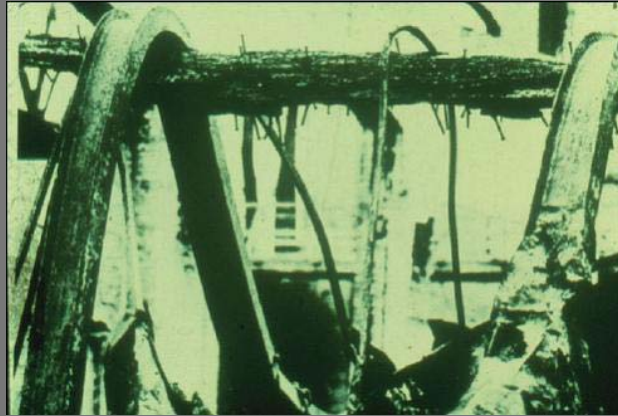
- Problems/challenges

Fire

Sound

Damp/rain

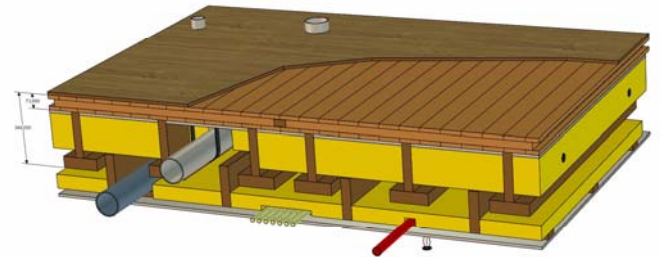
Stability



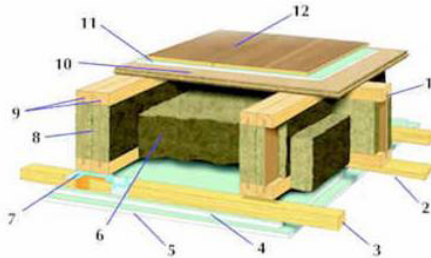
Different systems

- Volume elements or separate components
- Solid wood or light constructions
- Complete systems or a choice between components
- Industrialised processes or traditional methods ("2x4 system")





A1 Konstruktionsexempel
Ljudbjälklag typ A1
Stegljudsklass: A och B

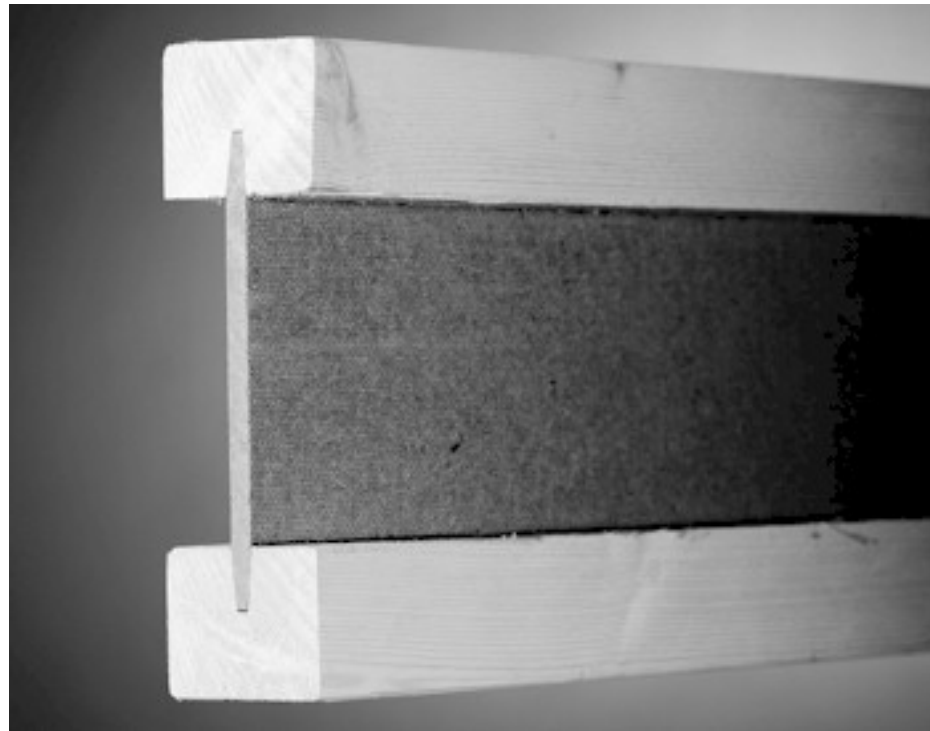


Bjälklagets totalhöjd: 502 mm

$L_{n,w} = 48 \text{ dB}$ $+ C_{1,00-2000} = 50 \text{ dB}$

Vikt = 92 kg/m² Spännvidd ≤ 6m

- | | | |
|------------------|---------------------|------------------------|
| 1) Kortlingsbalk | 5) 15 mm protect F | 9) 2x Swelite balk (H) |
| 2) 28x70 mm s400 | 6) 190 mm isolering | 10) 38 mm Compactfloor |
| 3) 45x45 mm s400 | 7) Ljudprofil | 11) 13 mm golvgips |
| 4) 13mm gipskiva | 8) Livisolering | 12) Övergol |



Derome

Use standard products

Has the know how



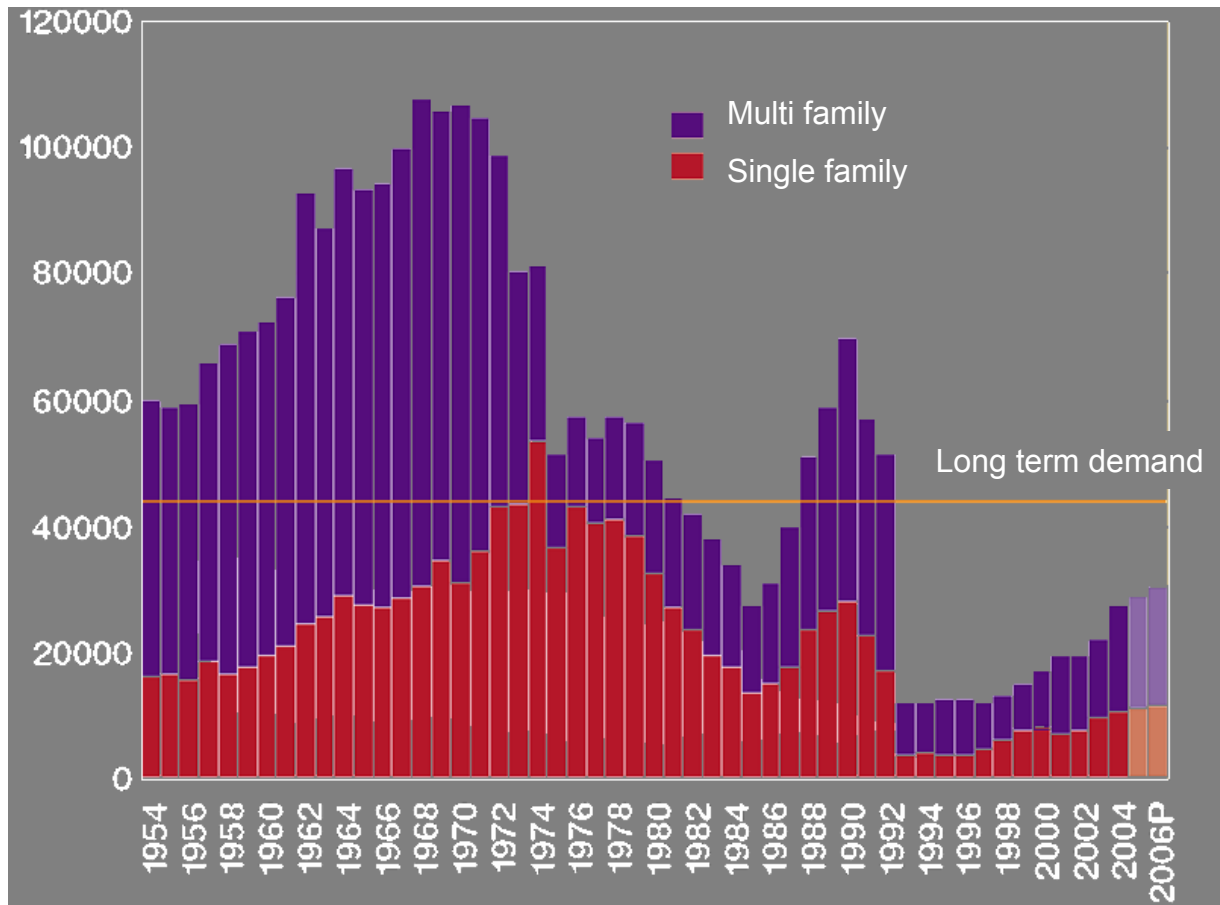
CBBT

centre for living and building with wood

**Supporting applied research
and development**

www.cbbt.se

Residential housing in Sweden



Wooden housing

- Multi-storey residential and commercial timber buildings. Possibilities for:
 - Increased market shares
 - Value-added production
 - Industrialised process
 - Demonstrators for export

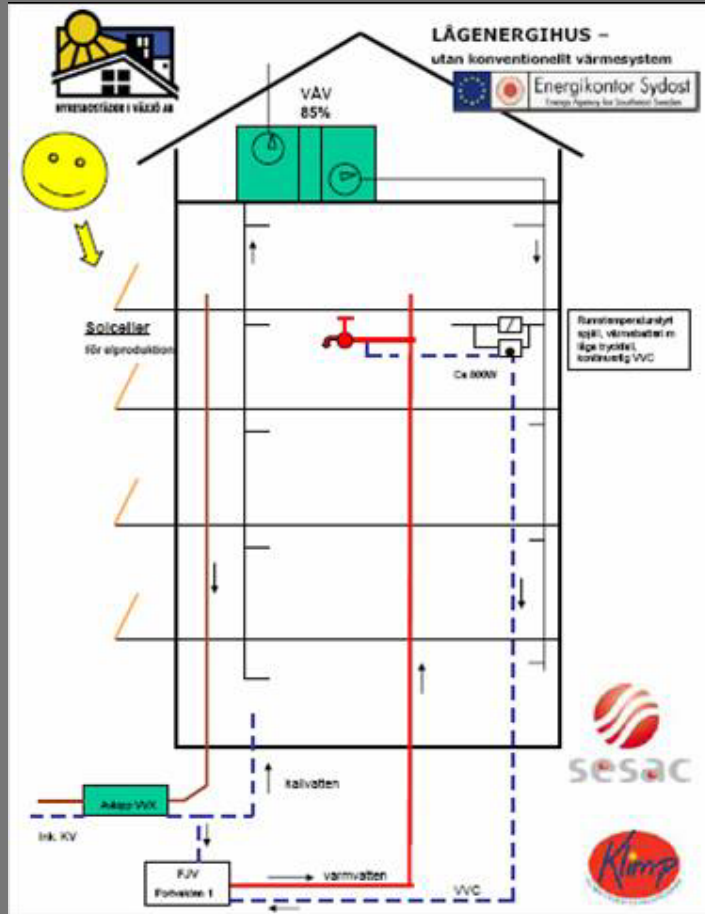
CBBT – What is it?

- Non-profit organisation (foundation)
- Members are
 - Växjö University, SP Träteknik, The City of Växjö, Södra, JGA, Möckeln, Derome, Vida, Rörvik, Trivselhus
- Funding for applied research and development
- Focus on
 - ***Building with wood***

CBBT – Work Areas

- Timber-based building systems
- Wood in combinations with other materials
- Multi-storey buildings
- On-going project
 - Technology (material, mechanics, durability), processes, economy, energy and climate-change perspectives
- Upcoming?
 - Design and architecture

Low energy building





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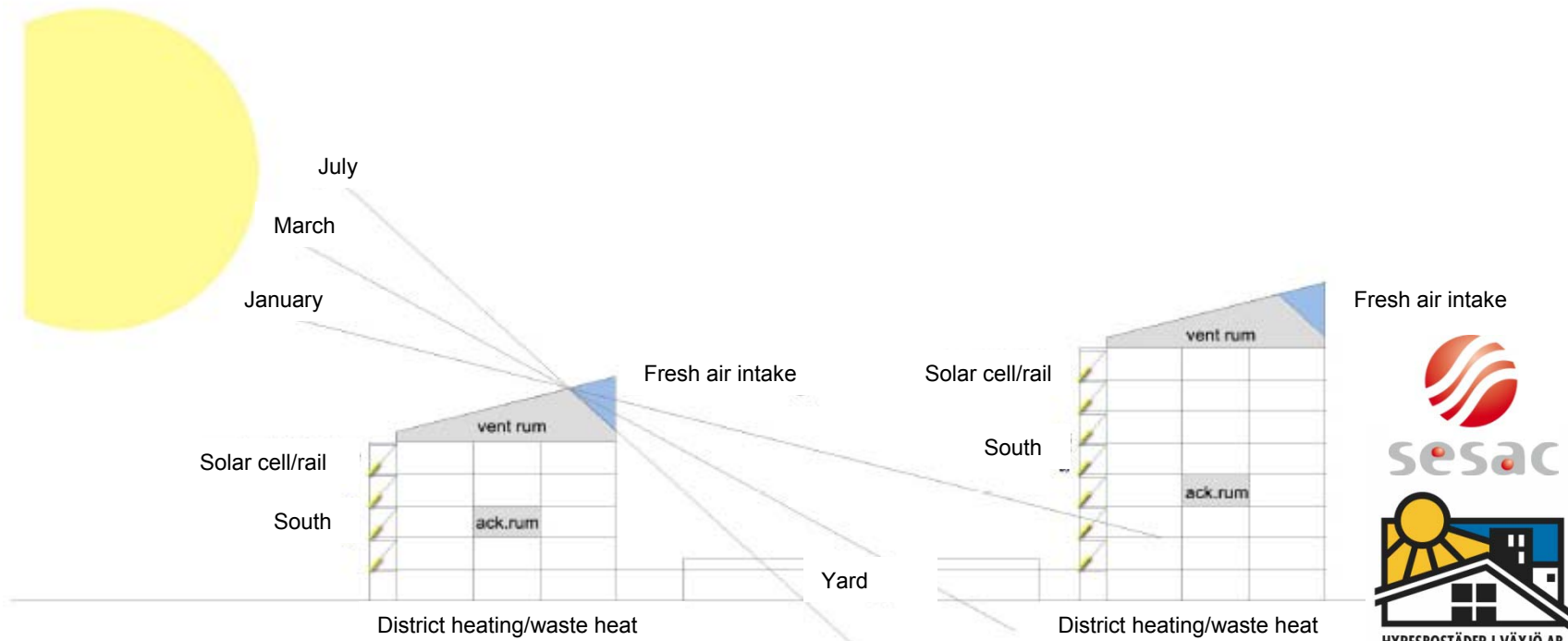


**S
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Facade/section / 1:500



Section/Diagram / 1:500

Energy-efficient house - House without a heating system - Passive house

Strategy:

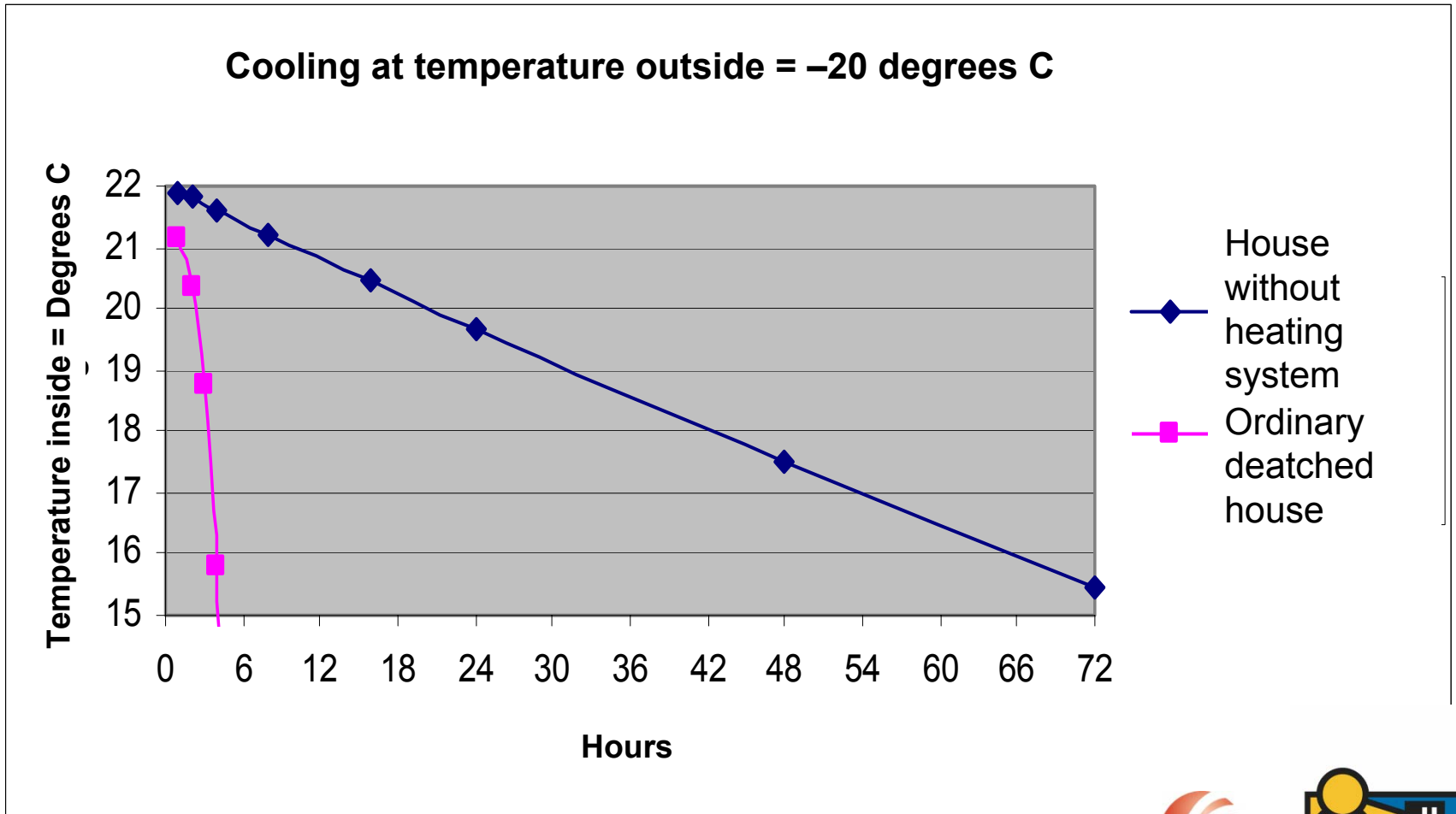
- To minimise energy losses = good energy housekeeping

Solutions:

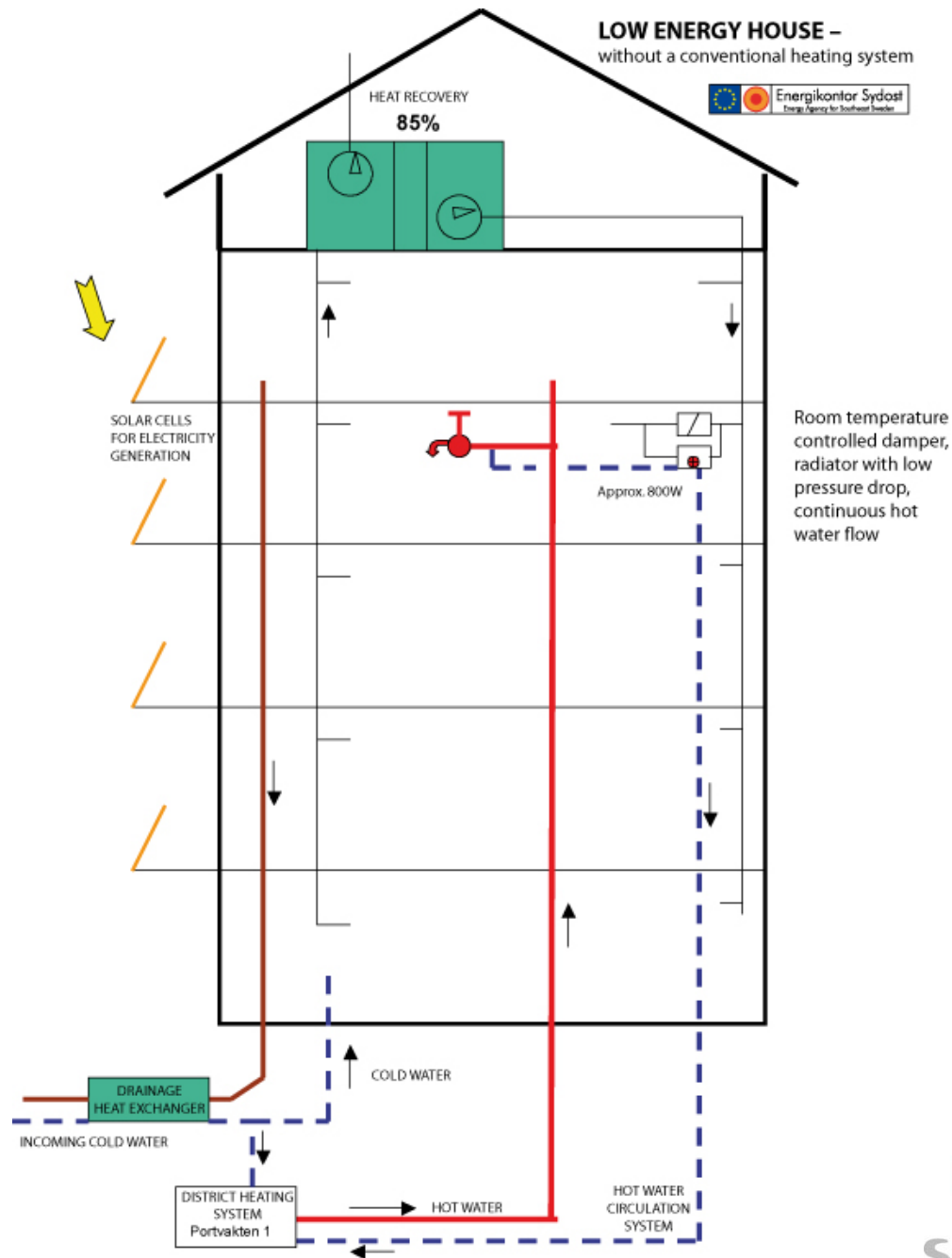
- Very well-insulated, climate proof shell, no cold "bridges"
- Minimal air leakage
- Mechanical ventilation with very high level of heat recovery, FTX
- Solar energy, for electricity generation
- Energy sparing lift
- Energy sparing lighting
- Energy sparing mixers (water) and household appliances
- Individual metering; water, hot water and electricity
- Recovery of waste water



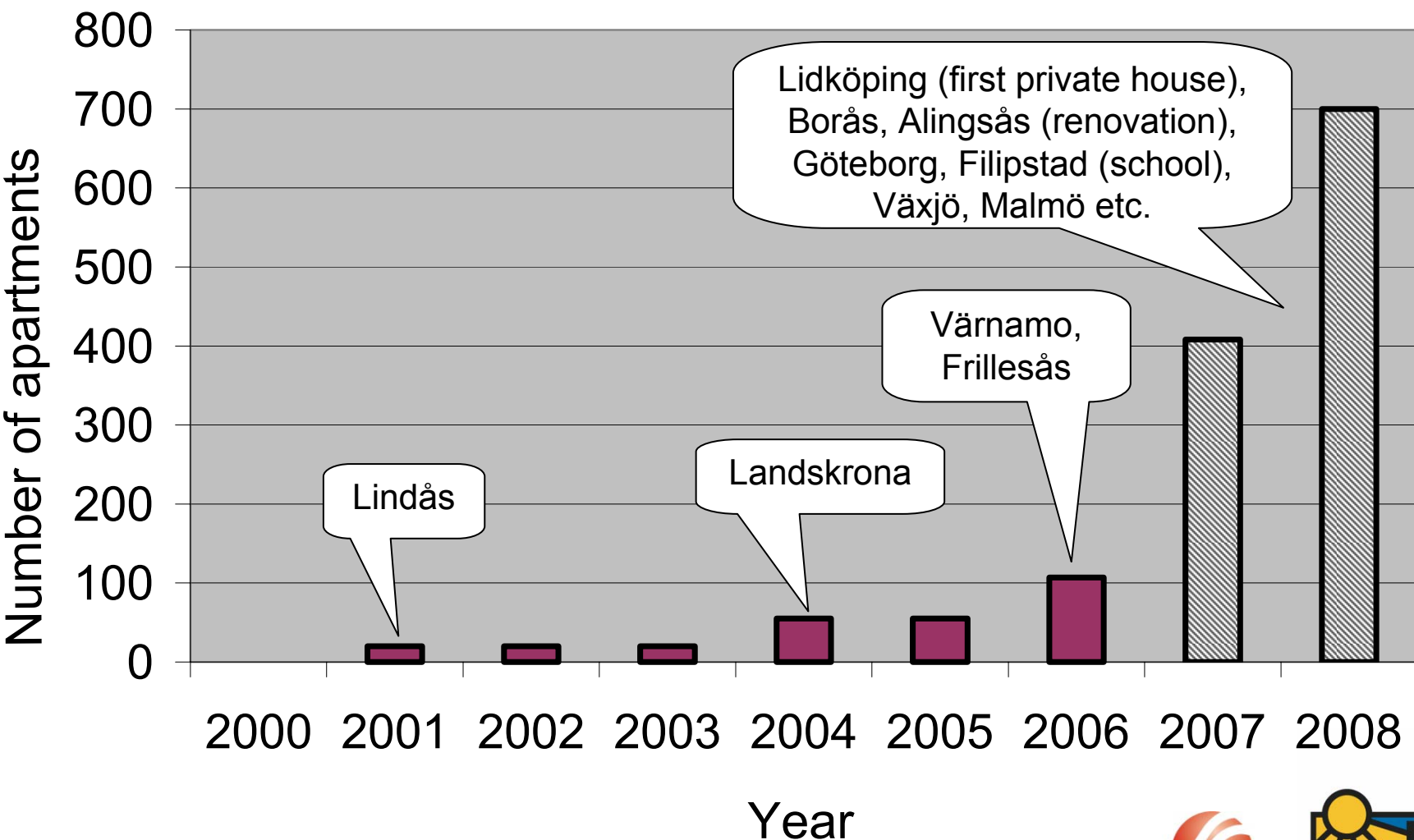
PASSIVE HOUSE – That's why it works.....



LOW ENERGY HOUSE – without a conventional heating system



This is what it looks like here at home:



Thank you for listening!



For more information

www.vaxjo.se/english

www.vallebroar.se

www.cbbt.se