

Technological possibilities for wood construction + research and innovation initiatives in Sweden

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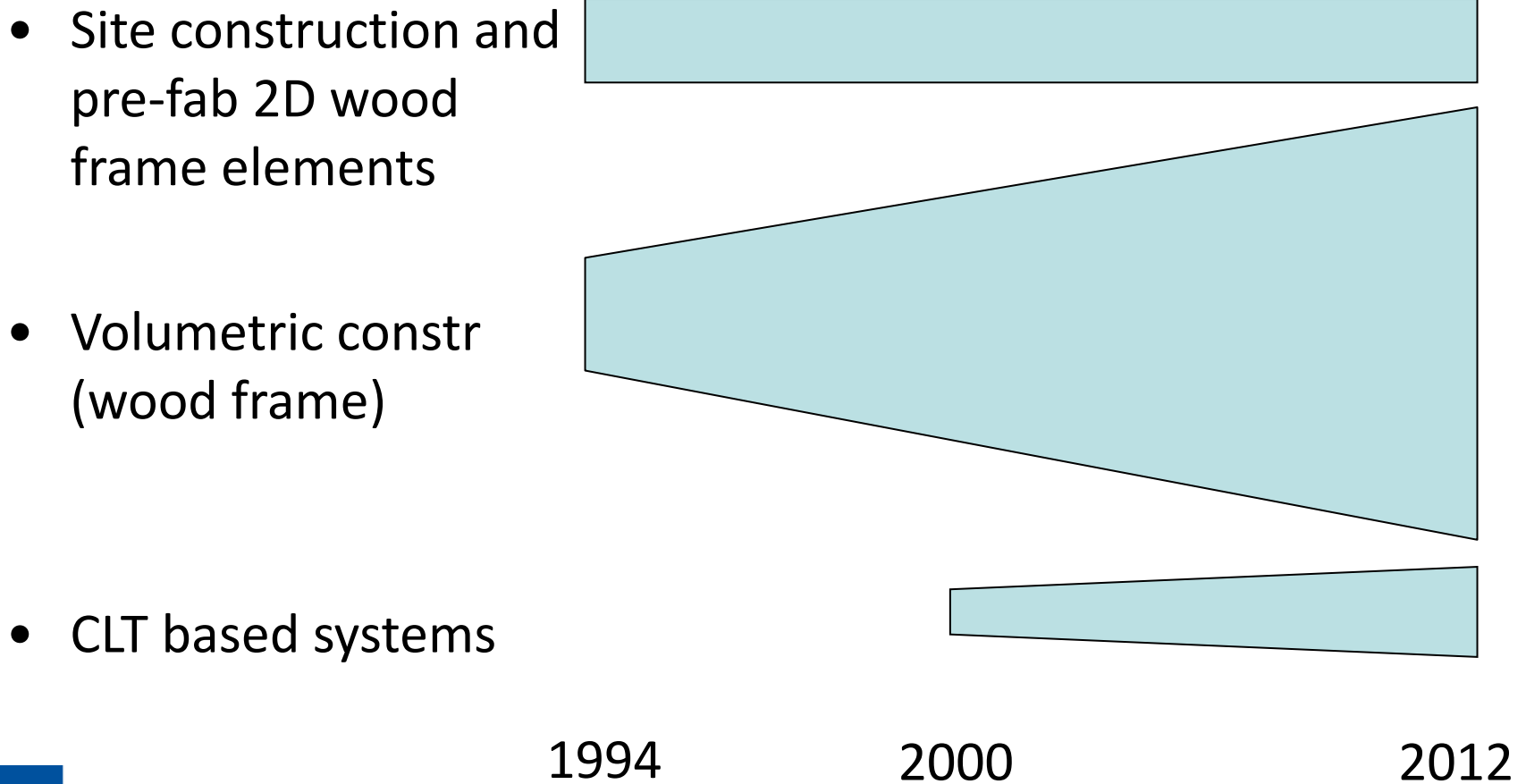


SP Sveriges Tekniska Forskningsinstitut

Development of modern multi-storey wood buildings in Sweden

- | | |
|-----------|---|
| Ca 1900 | Sweden (almost) bans wooden cities. |
| (1930- | House manufacturing industry develops and dominates single family market ever since.) |
| 1994 | The building regulations are changed in Sweden => Multi-storey wood construction allowed. First 4 storey. |
| 1995 | First 5 storey building. |
| 1994-2000 | Nordic technical R&D program makes the Nordic countries leaders in the technology. Market development weak. |
| 2000-04 | Student housing in volumetric construction develops well. |
| 2004- | National strategy for wood construction => (A few) More actors. Market expands to ordinary apartments. |
| 2007 | First 8 storey building. |
| 2013 | Approximately 10 % market share. |

Three basic building systems

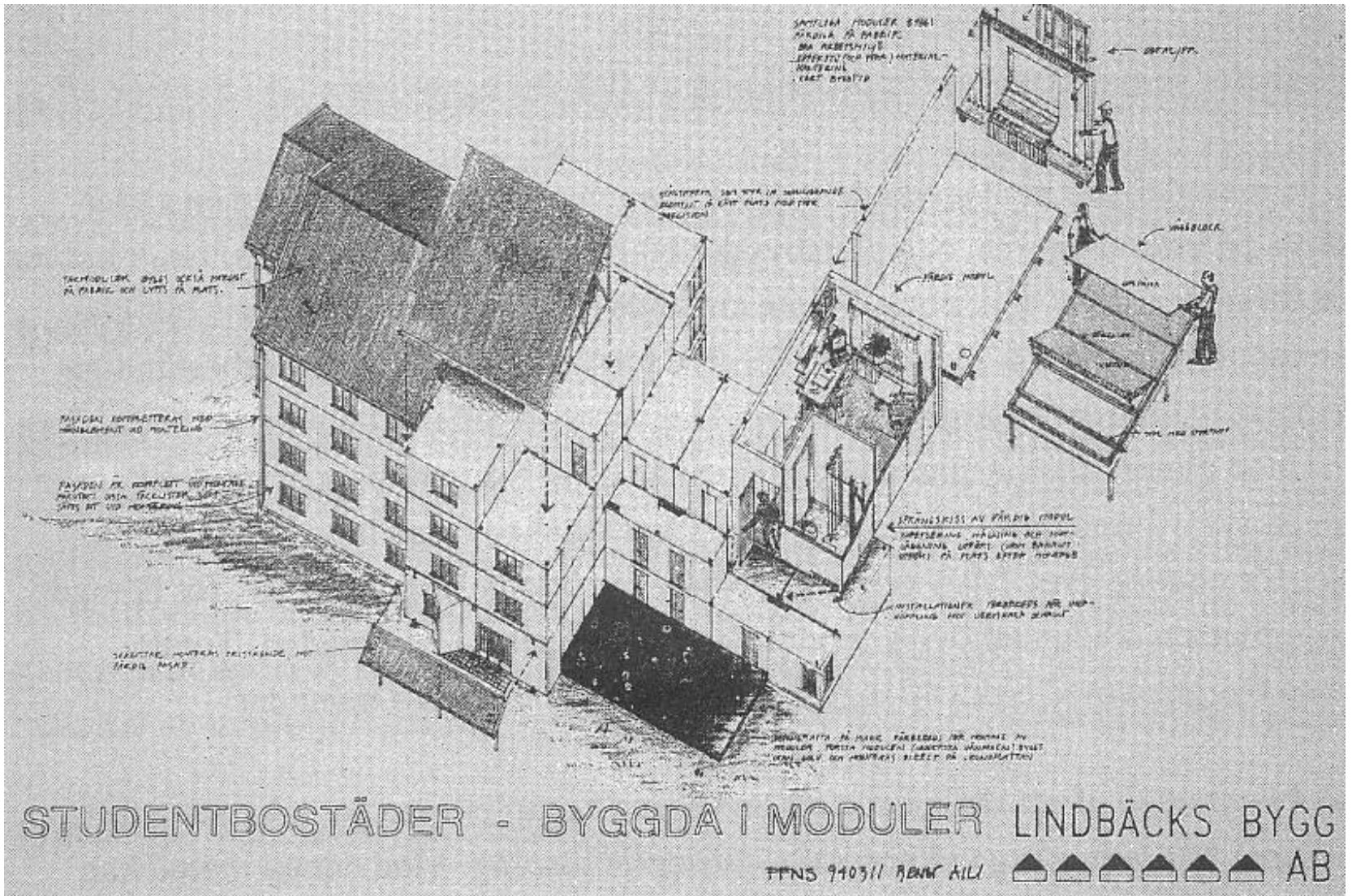


Early projects: USA-based systems combined with Nordic single family housing systems



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....or a different vision



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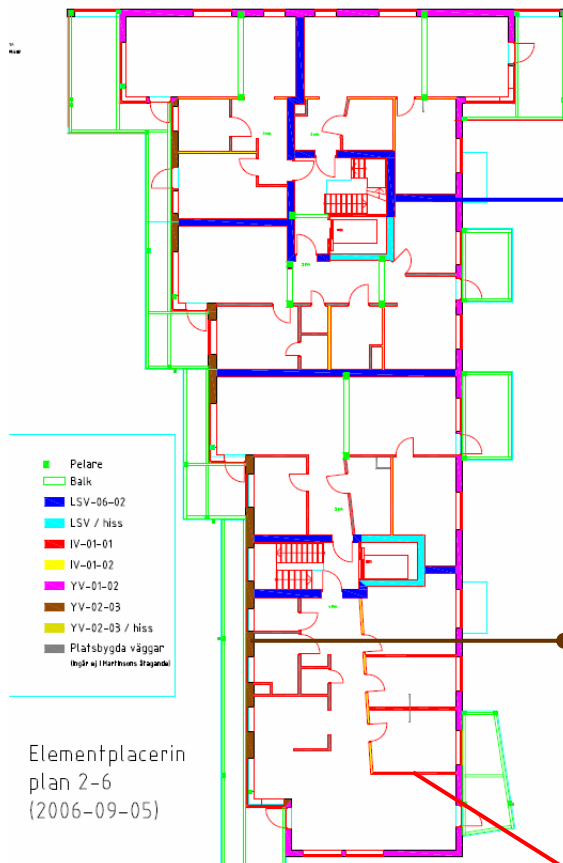


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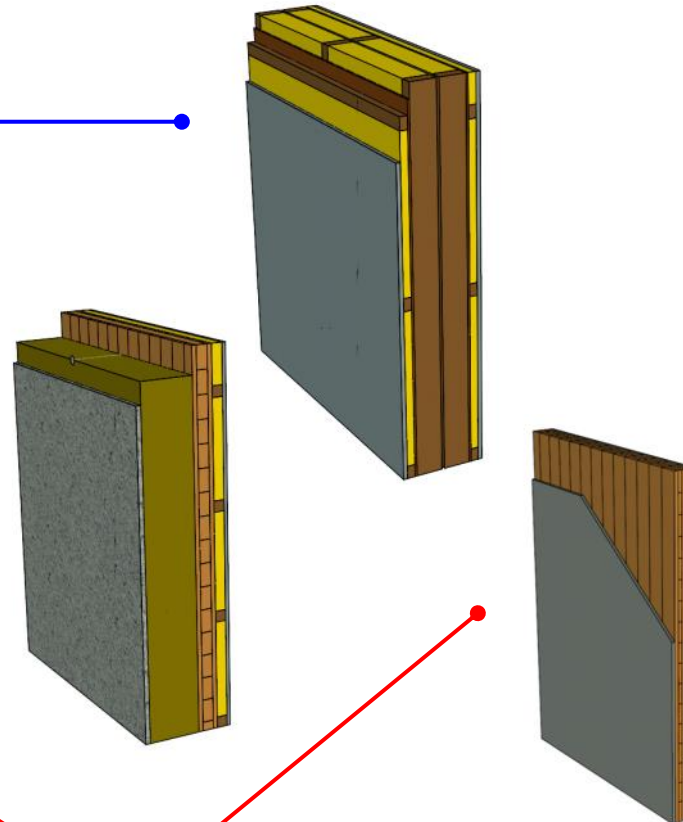


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Limnologen, Växjö (Martinsons) 2007 – 8 storeys



Elementplacering
plan 2-6
(2006-09-05)





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Pure CLT systems (rare in Sweden)



Fire safety

~~Non-combustibility~~

Performance requirements
(R, E, I)

e.g. REI 60, EI 30 etc



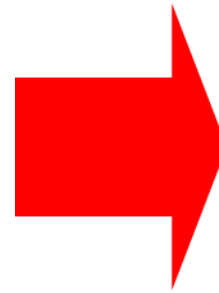
Load bearing
R



Integrity
E



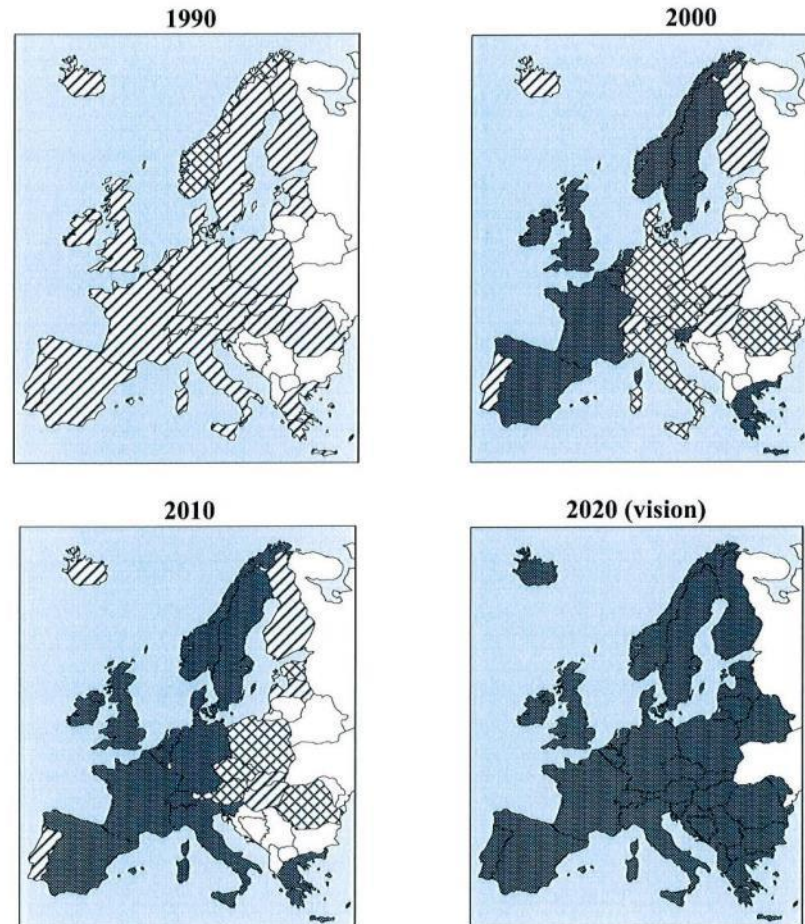
Insulation
I



Possibilities for multi-storey timber buildings in Europe 1990-2020

Load-bearing structure without sprinklers

Maximum number of storeys in timber



- ≥ 5 storeys
- ▣ 3-4 storeys
- ▤ ≤ 2 storeys (incl. 0)
- No information

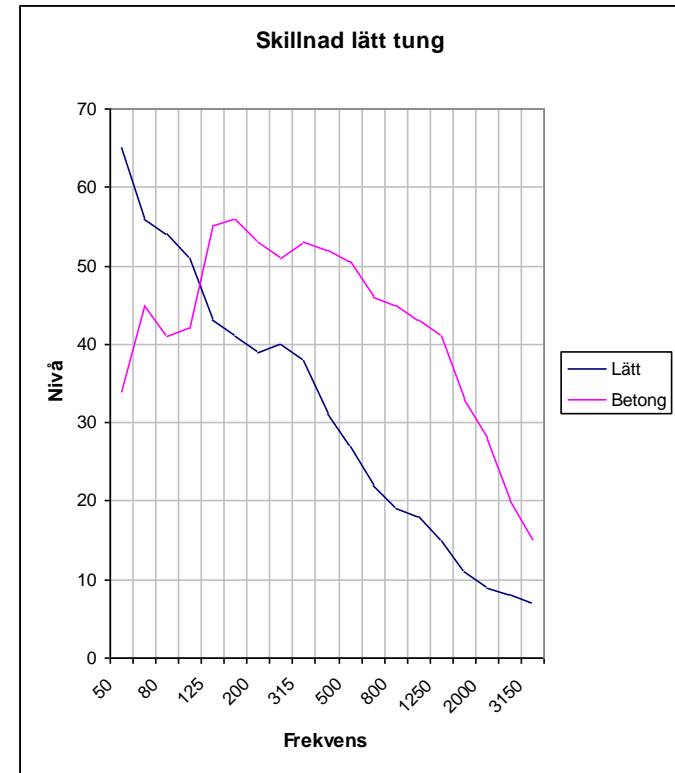
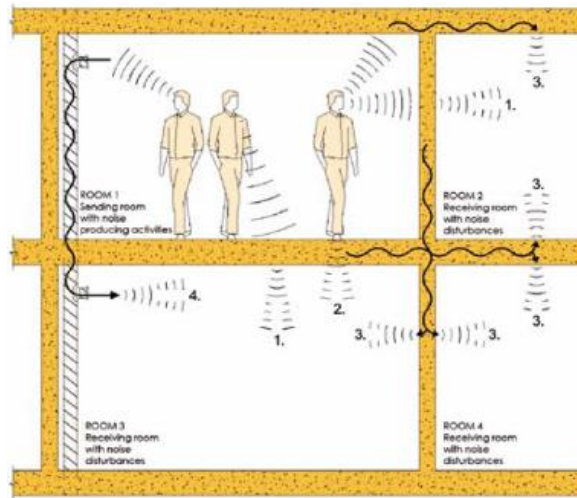
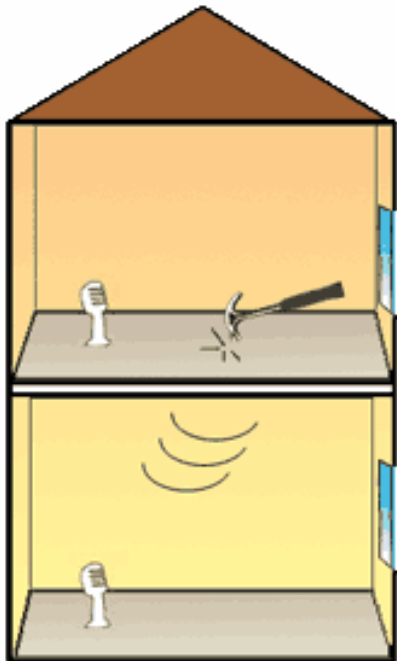
”The devil is in the details”

- Functional requirements met
- No injuries
- But complete damage due to:
 - Ventilation duct detail in attic
 - No attic compartments
 - Poor fire-stop function
- Property protection/insurance issue

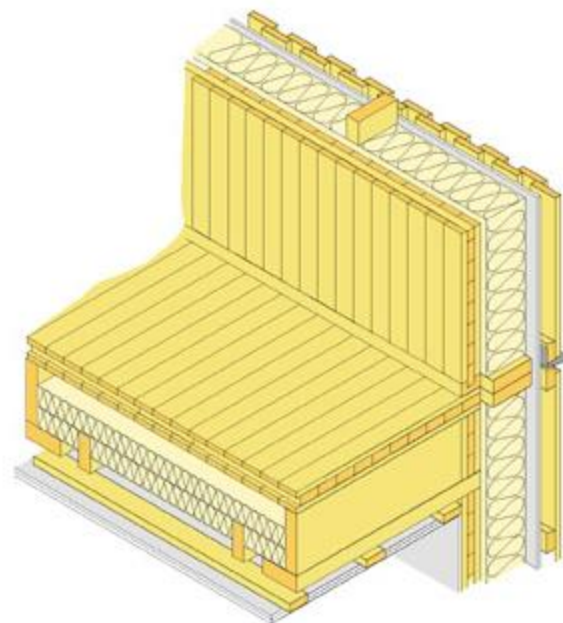
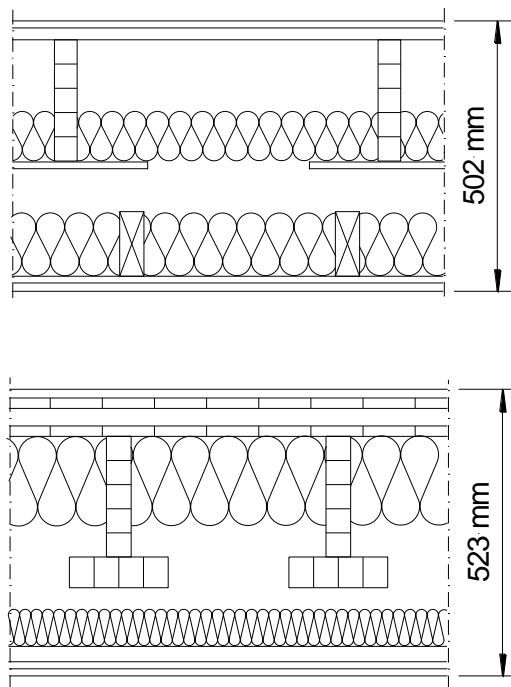


Acoustics

- AkuLite – Acuwood projects



Separating floors



Weather protection



Integrated weather protection and site logistics



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SMART HOUSING

S M Å L A N D




A Vinnväxt environment supported by Vinnova.

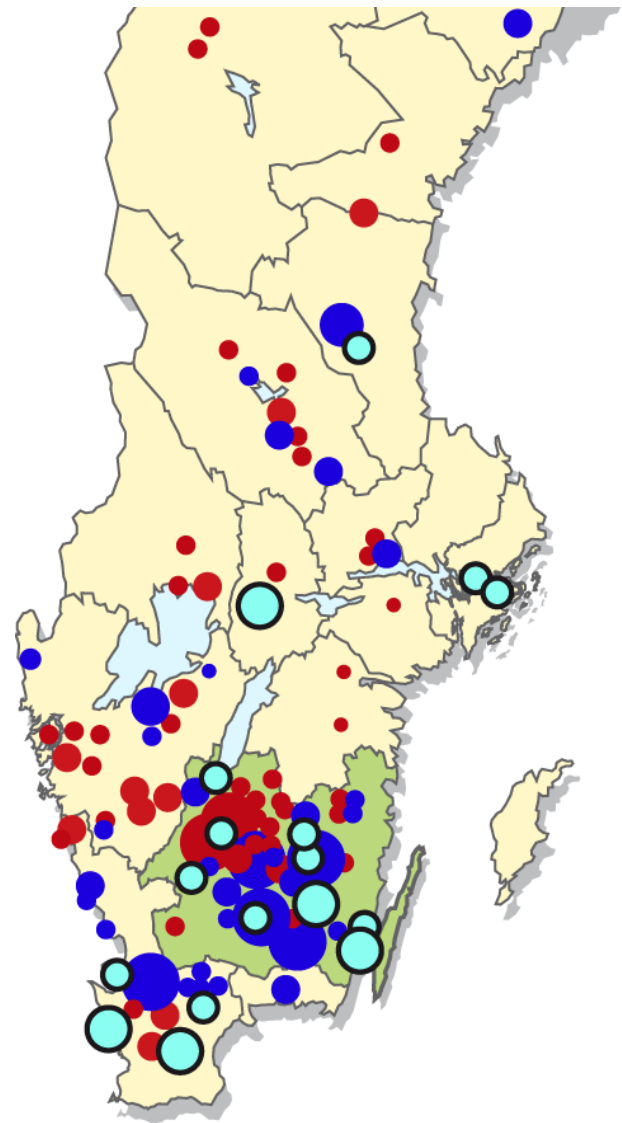


Our vision

Smart Housing Småland is an internationally leading innovation environment that, with a focus on the user, creates smart housing and sustainable built environment based on glass and wood.

Centre for wood and glass

-  Flat glass
-  Prefabricated housing in wood
-  Doors / Windows / Floors



10 year comittment by:

- 3 regional councils (Kalmar, South Småland, Jönköping)
 - Industry
 - 2 universities
 - 2 research institutes
 - Vinnova (Sweden's Innovation Agency)
- + University education and PhD program for industry
- + National innovation program – BioInnovation



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