



European Construction Sector Observatory

Policy measure fact sheet

Sweden

Wood City (Trästad) 2012

Thematic Objective 3

February 2018



In a nutshell

Implementing body:	The County Administrative Board of Västerbotten
Key features & objectives:	Knowledge exchange for a climate-smart and rational community building. The aim of the project is to conceptualise and develop technical solutions and architecture for wood construction.
Implementation date:	1 January 2010 – 31 December 2012
Targeted beneficiaries:	Local builders, architects, planners, consultants, entrepreneurs and politicians
Targeted sub-sectors:	Residential, non-residential, wood construction and engineering
Budget (EUR):	7.8 million (77 million SEK)

In 2005, the Swedish government introduced the National Wood Building Strategy aimed to support the development of industrial wood construction. Although that initiative came to an end in 2008, it led to the launch of other initiatives. In 2010, the County Administrative Board of Västerbotten received a government assignment, in collaboration with interested municipalities, with four objectives: (1) to foster a cost-effective and sustainable wood construction; (2) to increase knowledge on the benefits of using wood as a key building material; (3) to involve more municipalities to use wood in construction; and (4) to contribute to achieving the national climate goals. Those objectives were achieved by the Wood City 2012 project (Trästad 2012 in Swedish).

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In 1874, the construction of multi-family houses with wooden frames was prohibited by the National Building Code due to the risk of city fires (following major incidents in city of Sundsvall, Umeå). The restrictive legislation was first removed when Sweden became an EU-member state in 1995. The ban on using wood for construction was replaced by a set of functional and safety requirements mandatory for all types of constructions. However, during the more than 100 years it was forbidden to build with wood, much expert knowledge on the matter disappeared or stopped being further developed. Therefore, primarily other materials such as concrete had a dominant position within the industry.

In the decades that followed, there had been an increasing recognition of the major technical and environmental benefits of wood. In order to revive and strengthen knowledge on wood construction and to reduce the impact of the sector on climate change, first public efforts started to emerge. They were, however, not cost-efficient enough to change from concrete to wood systems entirely.

The final outcomes of the project were positive. Wood City 2012 helped to increase the knowledge on sustainable construction, foster sustainable construction across Sweden, and raise awareness on the adverse impacts that some building materials can have on the environment. Today, almost 10% of all buildings in the country are made of wood and the number is expected to increase to 20-30% in the following years. Equally positive was the feedback received from the targeted beneficiaries and involved institutions and organisations. From their perspective, Sweden is well-positioned to produce raw materials for wood construction given the country's leadership in the forest industry.

1

General description

In 2008, the emissions of greenhouse gases (carbon monoxide and dioxide, methane, nitrous oxides and particulate matter) from activities in the construction and real estate subsectors amounted to 2,078,084 tonnes and 303,073 tonnes, respectively¹. In the construction sector, different elements impact on the level of emissions, including the selection of construction materials. In fact, an apartment building made of wood has an environmental impact half that of an equivalent concrete building.

Against this background and in light of Sweden's wider objectives to achieve a more sustainable future by 2050, a nationwide initiative called Wood City (Trästad) 2012 was launched in 2010. **Its main objective was to foster construction of wooden buildings in Sweden, given wood's ability to act as a carbon dioxide reducer**². A wooden building³ generally consists of a large proportion of wood which is the load bearing structure that makes up a large part of the material used. The main benefits of wooden buildings include:

- Lower carbon dioxide emissions and primary energy use than steel and concrete buildings;
- Lower energy consumption and carbon dioxide emissions in the production phase than traditionally-built buildings;
- Equivalent energy needs (when in use) as those that are constructed using traditional building materials;
- Advantageous over traditional building materials in the demolition phase;
- Adherence to strict requirements on sound and safety; and
- Repairs cause less noise disturbance^{4,5}.

Wood City 2012 acted as a source of inspiration for local builders, architects, planners, consultants, entrepreneurs and politicians by fostering exchanges of knowledge and experiences on wood construction. More specifically, it aimed to:

- Shorten the construction process by 70%;
- Cut labour requirements by 50%;
- Build industrially and replace the construction site with an assembly site;
- Use industrial precision and build in a dry, quality-assured factory environment – the purpose is to industrialise the wood construction process by manufacturing wood construction components off-site under high quality factory conditions; and
- Reduce CO₂ emissions in the construction processes by 90%.

17 out of 290 Swedish municipalities and four out of 21 Swedish regions participated in the project.

The four main participating regions included Västra Götaland, Kronoberg, Dalarna and Västerbotten. Västerbotten was appointed as the National Coordinator of the project and oversaw the overall implementation of the project. The project was also supported by Luleå University of Technology, Växjö University, Högskolan Dalarna College and SP Trätek and was carried out in close collaboration with major wood construction projects in Skellefteå, Falun and Växjö. The purpose of this collaboration was to:

- Monitor and record wood construction projects;
- Make presentations and draw conclusions at seminars held in connection to the project and at specialist workshops;
- Ensure the availability of records and information;
- Provide a natural tie-in with education and research at universities and institutions; and
- Create the basis for the development of strong supplier groups in the wood construction sector.

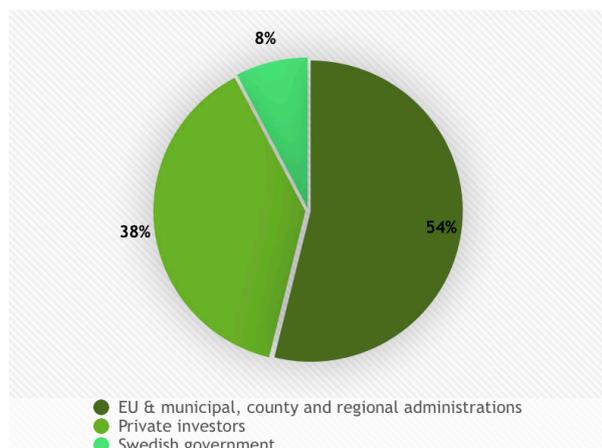
The map in Figure 1 shows the Swedish regions and municipalities that participated in the project.

Figure 1: Map of Sweden illustrating regions and municipalities participating in the project



Source: Niclas Svensson, The Timber Market (2011)⁶

Figure 2: Budget allocation expressed in %



Source: The Forest Sector in the Green Economy, United Nations (2010)⁷

Wood City 2012 had a total budget of EUR 7.8 million, which included both public and private funding.

Figure 2 shows the contribution made by each funding source, as a percentage of the total budget. Public sector funding contributed approximately two thirds of the total amount. Private investors contributed the other third. The key public investors include municipal, county and regional administrations and the European Union. The Swedish Government allocated around EUR 600,000 to the 3-year project.

2

Achieved or expected results

Wood City (Trästad) 2012 made a substantial contribution to an increasing interest in wood construction. It positively influenced and transformed a traditional industry and brought about a noticeable development in as little as three years. During the period of the project, wood construction in Sweden has gained great momentum.

A number of construction projects have been significant on a national level as they have made great progress in terms of development. A total of 15 major wood construction projects, 3 initiative projects and 12 joint action projects were documented⁸. Primarily, these projects involved the construction of residential buildings: 3 to 8 storey buildings throughout Sweden, from low cost to exclusive projects. Some non-residential buildings were also constructed, including the Acusticum concert hall in Piteå and the Q-med industrial plant in Uppsala⁹.

Figure 3 illustrates Stockholm's first eight-storey building made entirely of wood, which is located in Sundbybergs Strandpark. The construction of the building commenced in 2012 and was completed in 2015. The project was designed to ensure zero carbon dioxide emissions during construction, low energy consumption, and the selection and use of resource efficient building materials, and installation and production methods, to avoid waste.

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Moreover, some member municipalities adopted policies to support wood construction, for example, by designating planned areas for wood-framed buildings and stipulating that wood-framed alternatives should always be investigated for new buildings. For instance, the town of Trollhättan adopted the Declaration of Aalborg, and as a result, the town has taken a holistic approach to work on sustainable construction development¹¹. In addition, the municipalities of Falun (2011), Mora (2011) and Rättvik (2012), Leksand (2012) and Orsa (2012) have each created a politically endorsed timber construction

Figure 3: Stockholm's first eight-storey building made entirely of wood in Sundbybergs Strandpark



Source: Devis Bionaz, Sundbybergs Strandpark¹⁰

strategy. Other municipalities that have not yet adopted a timber construction strategy, such as Skellefteå, have produced a set of guidelines for sustainable choices with an emphasis on social, ecological and financial sustainability.

The Wood City 2012 project also published an official publication / book entitled 'A new way Trästad 2012'¹² in October 2012. It presents the project's main outcomes and successes and reflects on the general developments in the field of wood construction.

In 2016, the Trästad Association¹³ was formed as a continuation of the project. The Association is active and its primary role is similar to its role in Wood City 2012 – to promote the growth of wooden building constructions in Sweden through a continuous dialogue with relevant stakeholders.

To achieve its aim, the Association regularly organises seminars, conferences and roundtable discussions on different thematic topics, often with the participation of a government representative. The Association is currently headed by the Governor of Västerbotten and a board with a chancellor¹⁴.

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3

Perspectives and lessons learned

From a **local government perspective**, the municipalities involved view Wood City 2020 as having substantially contributed to an increased interest in wood construction and the structural solutions applied.

In their view, the main strengths of the project lay in the active involvement and participation of stakeholders from various backgrounds (municipalities, regions, organisations, institutions, companies and academia). This broad engagement by stakeholders has greatly benefitted the exchange of knowledge and experiences between all parties involved. At the beginning of the project, the involved participants had already started developing and facilitating wood construction. As a result, they were able to effectively and meaningfully contribute towards the development of new concepts from the very outset. Nevertheless, the Regional Developer of the Västra Götaland region¹⁵ underlines the need for thorough studies and verified figures that would precisely indicate the benefits of wood construction to the environment. Such evidence is needed, in particular, to support decision-making and maintain the ambition to promote the wider use of wood in the construction sector.

From a **communications perspective**, the Communications and Public Affairs Officer at the Swedish Wood Construction Chancellery (Sveriges Träbyggnads Kansli), and a member of the Trästad Association¹⁶, says that there is a growing trend towards more environmentally-friendly construction methods that utilise alternative building materials.

The Wood City 2012 project and the Association that has been borne as a result have and are contributing to that growing trend.

The focus on wood construction as an alternative has also been strengthened following the Paris Climate Change Conference (COP 21) in 2015. Greater use of wood construction increases Sweden's chances of meeting national environmental targets. According to the Government's vision, Sweden has to achieve climate neutrality by 2050, and according to parliamentary environmental targets, energy consumption in Swedish homes has to be reduced by 20% by 2020, and by 50% by 2050.¹⁷ To achieve these climate and energy targets, energy must be used much more efficiently than it is at present.

The Communications and Public Affairs Officer at the Swedish Wood Construction Chancellery points to a potential weakness that may hinder the effectiveness of the Trästad Association. Its small size may limit its ability to stay apace with the growth of the wood construction sector in Sweden, as interest, knowledge and commitment increases.

From an **industry perspective**, the main challenge faced during the initial phase of the project was to:

1. Explain and exemplify the climate issue within the construction industry; and
2. Highlight the need for the development of an industrial building approach to wood construction.

The largest Swedish building contractors¹⁸ have shown little interest in wood as a structural material, which is mainly due to a lack of experience in wood construction. However, in cases where they have been involved in wood construction projects, the general response has been positive in most cases.

Endnotes

- 1 European Commission, European Construction Sector Observatory, Country Profile Sweden, March 2017:
<https://ec.europa.eu/docsroom/documents/23752/attachments/1/translations/en/renditions/native>
- 2 Skellefteå municipality, Skellefteå City of Wood:
http://www.skelleftea.se/Samhallsbyggnad/Sidor/Bifogat/Trastad_Magasin_ENG_low.pdf
- 3 Skellefteå municipality, Wood construction strategy, Adopted by the municipal council of Skellefteå 2014:
http://www.skelleftea.se/Samhallsbyggnad/Sidor/Bifogat/Wood%20construction%20strategy_2017_eng.pdf
- 4 Ibid
- 5 Swedish Wood, Climate-Smart Building: https://www.swedishwood.com/use_wood/construction/why_wood/climate-smart_building/
- 6 Niclas Svensson, The Timber Market, 2011:
<https://www.svensktra.se/siteassets/6-om-oss/events/2015/november/tramarknaden-i-karlstad-niclas-svensson.pdf>
- 7 The Forest Sector in the Green Economy, United Nations, 2010:
<https://sustainabledevelopment.un.org/content/documents/807DP-54.pdf>
- 8 L. Westerlund, A new way Trästad 2012, December 2012, Davidsons Tryckeri, Växjö
http://www.neesonline.org/original/wp-content/uploads/2013/04/Tr%C3%A4stad_boken_web_rev-GB.pdf
- 9 C. Bengtsson, Challenges in timber construction, SP Träteknik and Växjö University:
http://www.forum-holzbau.com/pdf/ihf09_Bengtsson.pdf
- 10 Devis Bionaz, Sundrybergs Strandpark: <http://fotografdevis.se/Arkitektur>
- 11 L. Westerlund, A new way Trästad 2012, December 2012, Davidsons Tryckeri, Växjö
http://www.neesonline.org/original/wp-content/uploads/2013/04/Tr%C3%A4stad_boken_web_rev-GB.pdf
- 12 Ibid
- 13 Trästad: <http://www.trastad.se/>
- 14 Sveriges Träbyggnads Kansli, Trästad på Grand:
<http://trabyggnadskansliet.se/haendelser/2018/traestad-paa-grand/>
- 15 Interview conducted with Ms Marianne Gustafsson, Regional Developer at Västra Götaland Region
- 16 Interview conducted with Mr Carl Wangel, Communications & Public Affairs, Sveriges Träbyggnads Kansli
- 17 L. Westerlund, A new way Trästad 2012, December 2012, Davidsons Tryckeri, Växjö
http://www.neesonline.org/original/wp-content/uploads/2013/04/Tr%C3%A4stad_boken_web_rev-GB.pdf
- 18 Interview conducted with Ms Marianne Gustafsson, Regional Developer at Västra Götaland Region