European Commission

European
Construction Sector
Observatory

Policy measure fact sheet

Sweden

Energibyggare/ SWEBUILD

("Energy builder")

Thematic Objective 2

March 2016

Implementing body:	**SWEBUILD (Coordinated by the Energy Agencies of Sweden[1]). An expert group, made up of construction sector stakeholders from academia and the public and private sector, is involved in implementation and monitoring.**
Key features & Objectives:	To provide construction workers & trades people with energy-efficient building techniques, knowledge and skills and an understanding of why energy-efficiency is needed.
Implementation:	2014 – 2017
Targeted beneficiaries:	Construction sector professionals: trainers, workers, trades people, installers.
Targeted sub-sectors:	Industries/companies in the built environment; local, regional and national authorities and facilitators.
Budget (EUR):	IEE Grant under the Build Up Skills (Phase II) initiative (€1.96 million)[2]

In a nutshell

Residential and commercial buildings account for approximately 30% of Sweden's energy usage. Government aims to achieve a 20% reduction in residential energy use by 2020 and 50% by 2050, compared to energy usage in 1995.[3] Energy-efficient home improvements and new technology solutions in the built environment have the potential to significantly reduce costs for households, commercial premises and the public sector.

According to the Energy and Environment Manager at the Swedish Construction Federation, construction companies are facing "increasingly more stringent requirements from their clients for buildings to be more energy efficient".[4] The backdrop to growing client demands over recent years is the introduction of reforms to building regulations in Sweden, which have brought in stricter requirements for energy efficiency in buildings. Energy declarations[5] were introduced in 2008, requiring owners of detached houses, apartment buildings and commercial premises to provide information on the energy use of buildings. Energy declarations are now a factor in property sales and are continuing to evolve as new laws enter into force.[6] Tighter requirements have also been introduced for electrically heated buildings (2009[7]), for new buildings (2012[8]), and for buildings with other heating systems (2013[9]).

Stricter requirements are creating a need for upskilling in energy-efficient building techniques and quality assurance,[10] as construction workers, trades people and installers often lack the right skills and know-how. Limited investment and a lack of availability of energy efficiency training programmes are other obstacles that need to be overcome. If the Government is to achieve its energy reduction objectives, solutions are needed to address these challenges.

Driven by these challenges, the *Energibyggare* initiative ("Energy builder") was launched[11] in 2014 to encourage Sweden's 350,000 construction workers to develop their energy efficient building knowledge and skills. It is a specific initiative under 'Build Up Skills' (Phase II) and it builds on the results of the 'Build UP Skills EU-project' (phase I), which ran until 2013. A web-based education platform and comprehensive training materials have been developed to equip supervisors with the skills they need to provide training for workers, trades people and installers on construction sites across Sweden.

The initiative provides construction companies and workers with an easy to access and flexible learning tool that can be utilised on construction sites and "just-in-time", according to the needs of individual construction projects, so that they can be delivered effectively and on time. The initiative provides a national and coordinated approach to the delivery of training for both trainers and workers.

General description

Energibyggare is designed to provide construction sector professionals with a basic understanding of energy efficiency and

the fundamental skillset they need to deliver the projects they are working on. The training concept and modular programme aim to provide an overall understanding of the importance of energy-efficient construction and renovation, to develop energy efficient building skills and to create a greater understanding of how technologies interact in the construction domain, including from a lifecycle perspective. The initiative not only seeks to address the qualification gap in the construction sector, but also to address the EU's energy and climate goals for 2020 and 2050[12].

Leading players[13] in the Swedish construction industry are driving the *Energibyggare* training initiative, which is being coordinated by the Energy Agencies of Sweden, with the implementation support of an expert group whose members are drawn from academia and the public and private sector. The initiative is also supported by a large number of stakeholders from the built environment in Sweden.

Energibyggare is exploiting the results of the *BUILD UP Skills* EU-project that ran from 2011 to 2013 (Phase I), which identified skills gaps in the construction sector and developed a skills training action plan for the sector. 22 of the 30 participating countries represented in the project, including Sweden, have received funding to continue their work to strengthen energy-efficient construction, renovation and installation. *Energibyggare (also known as SWEBUILD[14])* (2014-2017) has a total budget of €1.96 million. The project is 75% funded (€1.47 million) by the Intelligent Energy Europe Programme and 25% funded (€0.49 million) by the Swedish Energy Agency.[15]

Energibyggare is a coordinated national initiative for skills training in Sweden. A large scale training campaign is coupled with an online training platform that provides 'train the trainer' and 'train the worker' training content and materials. The aim is to educate:

- Trainers (e.g. supervisors, plant managers, skilled workers and special educators) to help them to train, guide and support staff on construction sites;
- Local, regional and national authorities and facilitators;
- Construction workers, trades people and installers to provide them with basic skills and know-how on energy efficient construction and installation technologies.[16]

Roll-out of *Energibyggare* training courses and materials began as the platform went 'live' in March 2016. The platform provides easy, user friendly and free of charge access to all content to anyone that wishes to use it. International benchmarks and participant feedback will be utilised to monitor the quality and effectiveness of the platform.

The training curriculum is being delivered using a blended learning and an interactive web-based education approach. The onsite training modules are presented in Table 1.

Table 1: Overview of training modules

Training modules	Purpose / subject matter
Introduction	The aims, impact and importance of the initiative
The building as a system	Understanding of the building as a system and how all elements interact
Thermal insulation	How to create well-insulated buildings
Viscosity of air	How to make a building airtight and the rationale behind it
Moisture	How to counter and prevent moisture
Installations	'How-to' guide on different types of installations

Each module uses a blend of text, images, videos, interactive exercises and quizzes. Users can login with or without their credentials and access the platform from a computer, tablet or mobile phone. Training can be done individually or in groups under the supervision of a trainer. The intention is to provide a flexible learning tool for use in the work place and "just-in-time", depending on the specific needs of a construction project or process.[17] Trainees that successfully complete the online training courses, under the supervision of an instructor, will receive an *Energibyggare ("Energy Builder")* qualification, which will be input and stored on the national identity card and competence system and database so that employers across the country can verify attainment.

Expected or achieved results

The measure is expected to provide open and free access to energy efficiency training courses and materials to educate construction sector trainers (e.g. supervisors) and workers, including trades people and installers. The initiative identifies a few specific quantifiable objectives regarding short and long-term outputs, and they are outlined in Table 2.

Table 2: Number of people to be trained

	2016	2017	2020
Trainers	500		
Trainees[18]		18,000 (8,500 training hours)	100,000

To be considered successful, the initiative will need to address the existing skills gap by upskilling large numbers of Swedish construction workers. The initiative also expects, more generally, to contribute to CO2 reductions and increased renewable energy use in Sweden. In the longer term, *Energibyggare* estimates that it will achieve energy savings of around 4.7 TWh or 400,000 toe and will increase the installed power of renewable energy to approx. 256 GWh or 22,000 toe. In addition, emissions of GHG are expected to be reduced by around 2,000 tCO2 per year.[19]

The online platform and interactive training content have been developed by AutoTech. Platform testing was completed in November 2015. Four of the six training modules were completed

by December 2015 and were pilot tested at building sites to allow for fine tuning prior to gong 'live'. The other two modules have not been as thoroughly tested but will draw on the lessons learned from the pilot testing phase. The training modules and the start of full training at Swedish construction sites were both launched on 15th March 2016. The training modules can be accessed at: www.energibyggare.se.

Once a trainee has successfully completed a training course under the supervision of a trainer, that qualification will then be input into the national ID06 System. The system was originally set up in 2006 to ensure that every construction worker has an ID06 identity card[20] to enable both businesses and the Tax Office to carry out ID-controls and track on-site attendance to limit undeclared work and corruption. More recently, the ID06 Competence Database[21] has been developed and linked to the ID06 system, enabling training qualifications to be recorded and linked to ID06 identity cards. The purpose is to help companies to manage and verify the validity of qualifications. The ID06 System and the Competence Database can be accessed online, though data input can only be done by organisations that are 'ID06 accredited' by the Swedish Construction Federation. *Energibyggare* will link up with an accredited organisation to ensure qualifications are input into ID06.

Evaluations of supervisor training can be done both digitally and in a paper-based format, whereas evaluations of construction worker and installer training can only be done digitally. Once training is complete, an email with the evaluation link will be sent to the participants, asking them to answer questions on the relevance of the training and the extent to which the learning objectives have been met.

The organisations behind Energibyggare are interested in taking the initiative forward beyond the project end in 2017. They are currently considering how to achieve a continuation and what the most appropriate format would be.

Perspectives and lessons learned

From a **government perspective**, the main lesson learnt from previous policy attempts to enhance the energy-efficiency skillsets of workers, trades people and installers is that too much learning material was often produced, without making it sufficiently user-friendly or easy to access by construction workers. This large-scale initiative has therefore emphasised tailor-made material that is accessible directly at the work place and "just-in-time", according to the needs of construction project or processes; these adaptations are key changes which distinguish the *Energibyggare* initiative from existing training opportunities, such as ByggaBoDialogen and Passive House builders – Energy efficient buildings.[22] Current training opportunities are mostly based on traditional lectures with printed materials that participants can take home. They have made little use of flexible, interactive and web-based training methods and tools. Previous experiences combined with feedback from partner organisations, such as the Swedish Construction Federation, led the *Energibyggare* partners to develop an online education solution, rather than a traditional paper-based solution, because it was felt that it would increase the participation rate.

From a **training provider perspective**, *Energibyggare* partners have developed the training programme and content in close cooperation with stakeholders in the construction domain, and the initiative actively engaged with industry, the public sector and academia during the design phase. Academic literature and public sector and industry publications were also analysed and used as references in the development of training content. Furthermore, the organisations behind the initiative also provide a broad coverage of construction stakeholders, and some have close links to academia.

The piloting of the training modules has so far produced positive results. The pilot phase has led to modifications in the training modules, to better tailor them to the training needs of each target group. During the development phase, it was also decided to limit the total number of modules from 7 to 6. It was felt that the module on Renewable energy was sufficiently covered by other modules, in particular in the Installations and Building as a System module.

Prior to the launch of *Energibyggare*, the partner organisations organised a series of workshops with construction industry companies and with young construction workers, in order to integrate valuable feedback from **industry stakeholders** and to identify current skills gaps and needs in the construction sector.

Following input from construction stakeholders, a number of elements were introduced in the overall design of *Energibyggare.* For example, the initiative listened to industry and decided not to use an exam approach in the training offered, because industry stakeholders felt that this would negatively affect construction worker participation. In line with the preference of industry stakeholders, trainee evaluations involve multiple choice and control questions. In a similar fashion, the importance of making the training content as interesting as possible for construction workers and installers was recognised during the design process. The building sector also insisted on a maximum timeframe of four hours for the training modules, as it was felt that any more would restrict workers from enrolling. Though the timeframe has been reduced, trainers and trainees can follow training courses in a flexible manner, enabling them to adapt their training to their working hours and commitments, and to spread their training out as needed.

Comparison with other analytical sources

This Policy Fact Sheet concurs with the Country Fact Sheet 2016 on Sweden[23]:

- Key issues and barriers in the construction sector – skills shortage, and design and as-built performance;

- National & regional policy & regulatory framework – building regulations;
- Current status & national strategy to meet Construction 2020 objectives – TO 2.

Endnotes

1 http://energikontorensverige.se/in-english/

2 €1.47 million funded by Intelligent Energy Europe (75%) and €0.49 million by the Swedish Energy Agency (25%).

3 http://www.riksrevisionen.se/PageFiles/18571/RiR_19_Klimat%20f%C3%B6r%20pengarna_Bilaga_3_Anpassad.pdf

4 http://energibyggare.se/wp-content/uploads/2015/05/D6.3-Brochure-English.pdf

5 http://du.diva-portal.org/smash/get/diva2:789450/FULLTEXT01.pdf (Section 3: The Swedish Context)

6 E.g.: in response to the Energy Performance of Buildings Directive (2010/31/EU) (EPBD) https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_en_sweden.pdf (Section 4.2.1)

7 http://www.rehva.eu/fileadmin/hvac-dictio/03-2011/A_market_overview_of_erected_low-energy_buildings_in_Sweden.pdf "The requirements specify not only maximum permitted energy use per square meter, but also the permitted installed electric power for heating, and a mean coefficient of thermal transmittance of the building envelope. In addition, the new building code specifies that energy performance must be verified by measurements within 24 months of completion of the building."

8 https://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/uppdelat-efter-omrade/klimat/prognoser-for-Sveriges-utslapp/report-sweden-assessment-projected-progress-2015.pdf (Section 2.2.3.3 National Instruments) http://www.boverket.se/en/start-in-english/publications/2012/building-regulations-bbr/ http://www.boverket.se/globalassets/publikationer/dokument/2012/bbr-engelsk/bfs-2011-26-bbr-eng-9.pdf

9 https://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/uppdelat-efter-omrade/klimat/prognoser-for-Sveriges-utslapp/report-sweden-assessment-projected-progress-2015.pdf (Section 2.2.3.3 National Instruments)

10 http://energibyggare.se/wp-content/uploads/2015/05/D6.3-Brochure-Swedish.pdf

11 http://energibyggare.se/utbildning-2

12 http://energibyggare.se/om-projektet

13 Swedish Construction Federation, Association of Swedish Electrical Contractors, SP Technical Research Institute, Swedish Association of Plumbing and HVAC Contractors, Technological Institute Sweden and Passive House Centre, NCC AB, and WSP Sverige.

14 https://ec.europa.eu/energy/intelligent/projects/en/projects/build-skills-swebuild

15 http://energibyggare.se/om-projektet

16 http://energibyggare.se/wp-content/uploads/2015/05/D4.1-Eligibility-criteria-for-training-providers.pdf

17 http://energibyggare.se/wp-content/uploads/2015/05/D6.3-Brochure-English.pdf

18 Workers, trades people, installers.

19 https://ec.europa.eu/energy/intelligent/projects/en/projects/build-skills-swebuild

20 http://www.id06.se/ http://www.id06.se/UserFiles/Files/Dokument/108354_ID06_eng_2015_LR.pdf

21 http://www.id06.se/id06-kompetensdatabas__56

22 http://energibyggare.se/wp-content/uploads/2015/05/D3.1-Rapport-PR1-Mapping-and-analysis.pdf

23 European Construction Sector Observatory, Country Fact Sheet Sweden, March 2016, http://ec.europa.eu/growth/sectors/construction/observatory/index_en.htm