

Author

Paula Wahlgren, Chalmers University of Technology

<i>Technology</i> All Technologies	<i>Aspect</i> Compliant and easily accessible EPC input data	<i>Country</i> Sweden
---------------------------------------	---	--------------------------

CERTIFICATION OF EXPERTS FOR THE ISSUANCE OF EPCS IN SWEDEN

Certification of energy experts who issue the building energy performance certificates (EPCs) is a way to ensure a high quality of EPCs. In the following, a description of the role and certification of energy experts in Sweden is provided.

Residential buildings <input checked="" type="checkbox"/>	Non-residential buildings <input checked="" type="checkbox"/>	Specific buildings:
New buildings <input checked="" type="checkbox"/>	Existing buildings <input checked="" type="checkbox"/>	

Context

Energy performance certificates (EPCs) in Sweden are based on on-site measurements on occupied buildings (either new, or existing for many years), and in rare cases on calculations, and are valid for ten years. Certified energy expert issues EPCs. They can also check the compliance with the requirements on energy use and insulation if a municipality asks for it because a lacking in competence of a builder is suspected. The certification is personal and is issued by a certification body. The certification bodies are accredited by Swedac (Swedish national accreditation body). Boverket (National Board of Housing, Building and Planning) formulated the regulations for certification of energy experts and collects the EPCs into a database filled in by the energy experts.

Objectives and problems addressed

A Swedish EPC must contain the following information:

- ✓ energy performance of the building (usually measured/operational specific energy use, rated class A to G),
- ✓ floor area,
- ✓ description of the heating system,
- ✓ description of the ventilation system,
- ✓ information if radon and OVK (mandatory ventilation control) measurements have been made (and results of radon measurements if existing),
- ✓ and specific energy use for a reference building (for comparison).

In addition, recommended measures to decrease the energy use of the building must be included.

Issuing a complete EPC involves many steps and requires extensive knowledge. Therefore the EPC can only be issued by an energy expert who is educated and certified.

Until 2014, it was enough that one person (in a leading position) within an accredited company was an energy expert in order for other personnel within the same company to be able to issue EPCs, but this was considered as an insufficient requirement. A certification applying to energy experts as persons was defined and implemented.

Approach to overcome identified problems

In order to become an energy expert, several requirements need to be fulfilled and there are two levels of competence: Normal (for simpler buildings, i.e. residential buildings with low complexity) and Qualified (for complex buildings) [1]. The independence of the energy expert is required.

The energy expert needs to have a proper educational background with a general technical knowledge. Professional degree or higher education on relevant topics is required, such as building technology,

building energy systems or building services engineering. There is also a requirement concerning practical experience described as at least five years' work within the building or real estate sector and whereof two years should be close to the field of energy use and indoor environment (for the appropriate building type, complex or simple).

There are also several requirements on the actual competence of the person, such as:

- ✓ knowledge about indoor factors affecting health and comfort,
- ✓ knowledge about building components and building materials,
- ✓ knowledge about systems (from different time periods) for heating, ventilation, domestic hot water, heat producing units (i.e. heat pumps, solar panels), electricity,
- ✓ knowledge about energy balance of a building including the influence of user behaviour,
- ✓ knowledge about energy efficiency measures (taking into account indoor air quality and prevention of moisture damage),
- ✓ knowledge about calculation of energy use and energy savings, with the ability to use at least one energy calculation program for buildings and ability to use the EPC registration tool,
- ✓ insight on that architectural and cultural values of buildings are affected by energy efficiency measures,
- ✓ and an understanding for the environmental impact of different energy sources.

In addition, there are requirements on the knowledge about regulations and advice, in particular the Swedish planning and building regulations (PBL, BBR) but also about European standards and directives.

The competences that are needed to become a Qualified energy expert (i.e. for complex buildings) are even higher and in more details, both for calculation skills and understanding of for systems, methods and regulations.

The certification includes training (optional but usually a prerequisite) and an exam. The training duration ranges from one day to a few days and is followed by the exam. The exam includes performing a test EPC. The results from the exam are submitted to the certification body to which the person that wants to be certified sends an application. There are currently four accredited certification bodies for energy experts in Sweden and Boverket is the regulatory body.

If the person fulfils the requirements, the certification is granted and is valid for five years. It can be renewed after performing a simplified exam (unless there are special reasons). When the energy expert is certified, his/her name appears at the web site of Boverket and he/she is granted access to the EPC database managed by Boverket, being then able to register EPCs in the database. In addition, the energy expert reports every year on his/her activity (which EPC he/she has performed and what further training he/she has taken).

The certification can be recalled by the certification body if the expert provided incorrect information or if the energy expert has proven to be inappropriate for the task (for example incompetent).

Market acceptance of the approach

Compared to the previous accreditation scheme (before 2014), the current system requires that the person performing the EPC is certified. Earlier, it was the company that had to be accredited. This led to some problems [2, 3], for example, a lack in independence between energy expert and property developers.

In the year of 2010, there were 952 experts at companies that were authorized to perform EPCs in Sweden and in January 2017 there were a total of 830 certified energy experts (persons) [4].

Pros and cons of possible options

There are different pros and cons for the options of having a personal certification and a company accreditation.

Since Sweden is a large European country with respect to area and not densely populated, there can be some difficulty to find an expert in a given area. With the previous accreditation scheme, finding a person that can perform an EPC as a member of an accredited company was probably easier, with only one expert required in the company and not certified staff being able to perform the EPC. With the current scheme of certification of persons, the travel cost can become high for someone who needs an EPC if the expert has to travel far.

It is also possible that the cost for an EPC can be higher for the system using certification of persons, since assistants can no longer participate in the execution of the EPC.

For the accreditation body Swedac, it was easier to monitor and control companies than individuals.

Option	Pros	Cons
<ul style="list-style-type: none"> ✓ Certified energy experts as persons instead of accredited companies 	<ul style="list-style-type: none"> ✓ Higher quality of EPCs. ✓ Each person performing an EPC has a high level of competence. ✓ For small companies performing EPCs the cost can be less. ✓ Increased competition can decrease the cost for EPCs. 	<ul style="list-style-type: none"> ✓ It can be difficult to find a person for a remote area. ✓ Higher cost for education of staff at companies performing EPC (more people have to be thoroughly educated). ✓ Systems for quality assurance and follow-up are more difficult to maintain and improve for individual experts than the accreditation of the whole company. ✓ Easier to monitor and control for the accreditation body. ✓ Risk for higher cost for EPCs since assistants cannot participate in the work.

Table 1: Pros and cons for certified energy experts (persons) versus accredited companies.

Compliance concerns related to EP certificates and to the QM approach

No reporting <input type="checkbox"/>	Wrong reporting <input checked="" type="checkbox"/>	Not meeting the performance requirements <input checked="" type="checkbox"/>
---------------------------------------	---	--

Compliance concerns related to EP certificates (see QUALICHeCK terms and definitions)

Since performing a complete EPC involves many steps and requires extensive knowledge, the level of competence of the person in charge is important. Two different approaches have been tried in Sweden: accredited companies (which required one leading energy expert at the company), and certification of persons (energy experts). Both approaches aims at maintaining a high competence. However, it has been judged that a personalized certification assures a higher level of competence and thus more compliant EPCs [5].

Financial aspects

In preparation for the change from accredited companies to certification of persons, the cost for the two different options were calculated (in 2010).

Cost for the accreditation of a company: yearly cost for the accreditation (to Swedac and documentation) 26 000-80 000 SEK (2600-8000 €) + yearly fee app. 30 000 SEK (3000 €) + initial cost in order to conform to ISO 17020. The latter amount depends largely on the starting point of the company, i.e. how developed the company is in terms of, for example, quality assurance work.

Cost for the certification of an energy expert: training (usually three days) app. 15 000 SEK (1500 €) + time and cost for exam, 2000 SEK (200 €) + yearly fee almost 1000 SEK (100 €). The certification is renewed every fifth year.

Overall evaluation

Certification of energy experts is important. In Sweden, two approaches have been used over the time: accredited companies (which required one leading energy expert at the company) until 2014, and personalized certification of energy experts since then. The overall evaluation is that the current certification of persons is well functioning.

Pros	Cons
✓ Higher quality of EPCs (due to higher requirements about the competence of the energy expert).	✓ Systems for quality assurance and follow-up are easier to maintain and improve in companies.
✓ Facilitates for smaller companies if persons are certified since personal certification means a smaller initial cost for the company.	<ul style="list-style-type: none"> ✓ Easier to monitor and control companies for the accreditation body. ✓ There might be a risk for lack of capacity (energy experts) at times when many EPCs expire. In Sweden, this will occur during 2018-2019.)

Table 2: Overall pros and cons of the approach with certification of individual persons.

Level of complexity (dark orange = simplest)	
Potential for replication (dark orange = best)	

Prerequisites

Prerequisites are: an accreditation body, certification bodies (to certify the energy experts), regulations and a regulatory authority for control. A database for EPCs is valuable but not mandatory.

Hints	Pitfalls
<ul style="list-style-type: none"> ✓ The independence of the certified energy expert need to be ensured. ✓ Requirements on education are important to provide the prerequisites for a good quality. ✓ A certain flexibility in the requirements on education and experience would add value to the system. ✓ Simplified recertification should be possible if the energy expert has shown good results during the certification period of five year. 	<ul style="list-style-type: none"> ✓ The EPCs can be costly if only very qualified persons can operate the work. ✓ Less control of how the experts work when the certification is personal compared to when the company is certified. ✓ Might be a risk for lack of capacity (energy experts) at times when many EPCs expire.

Table 3: Overall hints and pitfalls to avoid when developing a system for certification of energy experts.

References

- [1] Boverkets föreskrifter och allmänna råd för certifiering av energiexpert, CEX, BFS 2007:5 med ändringar till och med BFS 2016:15, Boverket, 2016.
- [2] Regeringens proposition 2012/13:171, Kompetens och oberoende vid upprättandet av energideklarationer, government proposition 2012/13:171, 2013, (<http://www.regeringen.se/49bbbd/contentassets/7d8128a3eef34150a0e77a6b6e114c85/kompetens-och-oberoende-vid-upprattandet-av-energideklarationer-prop.-201213171>)
- [3] Konsekvensutredning med anledning av ändringar i Boverkets föreskrifter och allmänna råd (2007:5) för certifiering av energiexpert, Dnr: 1191-4101/2013, Boverket, 2013
- [4] Finding certified energy experts : <http://www.boverket.se/sv/om-boverket/tjanster/hitta-certifierade/>
- [5] Regeringens proposition 2011/12:120, Vägen till mer effektiva energideklarationer, government proposition 2011/12:120, 2012, (<https://data.riksdagen.se/fil/269EE8AE-794C-4461-8ED1-69D116958705>)

All references are in Swedish.

The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EASME nor the European Commission are responsible for any use that may be made of the information contained therein.



Co-funded by the Intelligent Energy Europe Programme of the European Union