

Renewable heating and cooling systems: compliance of product data and quality of installations

National legislations transposing the EPBD require a calculation of the energy performance, using input data to describe the building and its systems. The input data must be compliant, i.e. determined in accordance with the legal rules. The Energy Performance Certificate (EPC) serves as an evidence for meeting energy minimum requirements and as a communication tool for various market actors to inform about the energy performance.

Keywords: EPBD, energy performance, heating, cooling, renewable, product data, quality of installations



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The trend towards Nearly Zero-Energy Buildings (NZEB) implies a better quality of the works, with specific skills of the workforce to reach quality and good performance of the installed systems.

In this context, an international QUALICheck workshop took place in Lyon in January 2017, focusing on renewable heating and cooling systems [5]. This article summarises its outputs.

Renewable technologies gain in importance

In November 2016, the European Commission published the “Clean Energy for All Europeans” legis-

lative proposals, covering also energy efficiency and renewable energy use in buildings. The proposals for a revised Energy Performance of Buildings Directive (EPBD) and a revised Renewable Energy Directive (RED) demonstrate the crucial role of renewable energy systems in buildings for achieving the decarbonisation of the European economy, defined as target to be reached by 2050 [1].

The EPBD aims at transforming the building sector towards improved energy efficiency, with Nearly Zero Energy Building (NZEB) requirements by the end of 2020, making that renewable energy systems come to the fore.

The RED aims at promoting the increased use of energy from renewable sources. The building sector has a potential to use renewable energy and to generate it from building integrated systems.

The proposals for revising the directives include provisions for the use of renewable energy systems in buildings, presented in **Table 1**.

Suggested changes show that more emphasis is put on renewable energy systems in buildings as such, and on actual performance of technical building systems including renewable energy systems.

Labelling and certification schemes: potential to generate compliant input data

Labelling and certification schemes assuring quality on product level can support compliance on building level by providing input data for calculating building energy performance. They are often based on European standards [8].

Labels and certifications can be of a voluntary nature or prescribed as part of legislation.

Mandatory labelling

European regulations for setting energy-related requirements and prescribing labelling for energy-related products according to Ecodesign Directive and Energy Labelling Directive are available or under development or revision for the most important components of building systems [9].

Among others, ecodesign criteria specify energy efficiency parameters and minimum requirements which

can be used either as input data or as default values for the calculation of Energy Performance Certificates, if the national regulation allows or requires it [10].

Voluntary certification of product data

Certification schemes exist at the European level, such as for example the mark “Eurovent Certified Performance” [11] for heating, ventilation and air conditioning products (with 21 certification programmes and more than 115 000 product references certified), the Heat Pump Keymark and the Solar Keymark for solar thermal systems [12].

If allowed by national regulation, certified product data can be used as input data for the EPC calculation.

Product database

Databases of certified products, and databases in which manufacturers publish product characteristics under the control of a third party, provide easy access to product data useful for EPC calculation (if allowed by national regulation. In some cases, a direct link between these databases and the energy performance of building calculation tools facilitates the choice of the input data, while limiting the risk of errors.

QUALICHECK has identified and documented several databases, at national or European level [4,13].

How to reach good quality of installed systems?

QUALICHECK shows that design and installation works need clear specifications on what has to be done, clear procedures on how to decide on non-compliance, and effective control and penalties if non-compliance is detected. Qualification of staff is a key element.

Table 1. Provisions relevant for the use of renewable energy systems in buildings.

Proposal for revised EPBD [2,6,7]	Proposal for revised RED [3]
Definition of technical building systems mentioning the use of renewables, and extended to on-site electricity generation and infrastructure for electro-mobility (Article 2)	Scope extended to self-consumption of renewable electricity (Article 1)
	Minimum levels of renewable energy in new and renovated buildings based on cost-optimal calculations according to EPBD (Article 15)
Requirement that the overall performance of installed, replaced or upgraded systems is assessed, documented and passed on to the building owner (Article 8)	Enabling consumers to self-consume electricity from renewables without undue restrictions (Article 21)

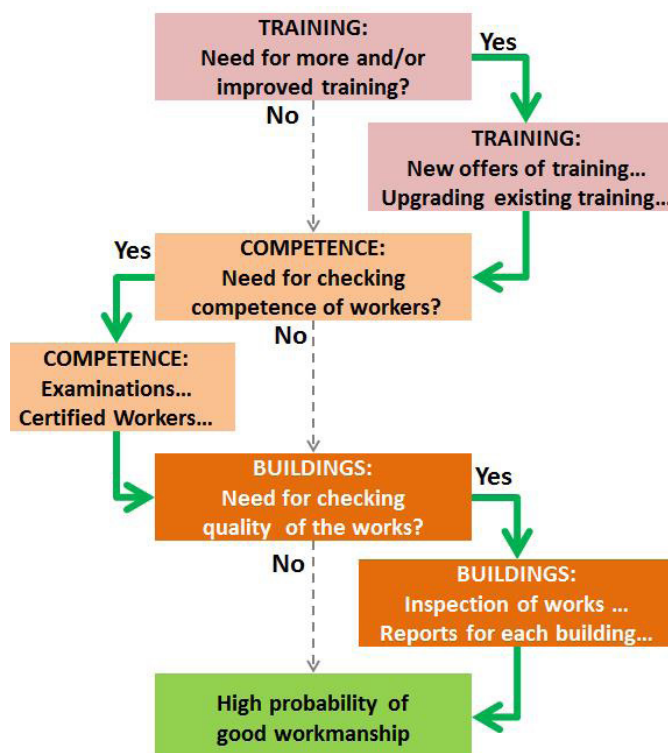


Figure 1. Stepwise approach to analyse the probability of good quality of the works.

Figure 1 shows how training of persons, checking of competence and checks of the quality of the works can be used to have a high probability of good workmanship.

Guidelines, certification of persons or companies and inspection of the works are some of the associated tools [14]. An interesting example of a national initiative to increase the expertise of building professionals is the French programme PACTE [15] in which professional recommendations, technical guides and notebooks for workers (including digital version for smartphones and tablets) are developed to help for design, construction, installation, self-control of quality and commissioning. ■

References

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