

# **Improving the quality of Energy Performance Certificates: lessons from the QUALICHeCK project**

**Peter Wouters – INIVE EEIG**

Coordinator QUALICHeCK (2014-2017)



## 2 objectives of QUALICHeCK project

- *To set up a series of actions which should result in more attention and practical initiatives for **actual compliance with the claimed energy performance for new and renovated buildings***  
*i.e. 'Boundary conditions which force people to do what they declare';*
- *To set up a series of actions, which should result in more attention and practical initiatives for **achieving a better quality of the works**,*  
*i.e. 'Boundary conditions which stimulate **and allow** the building sector to deliver good quality of the works'.*

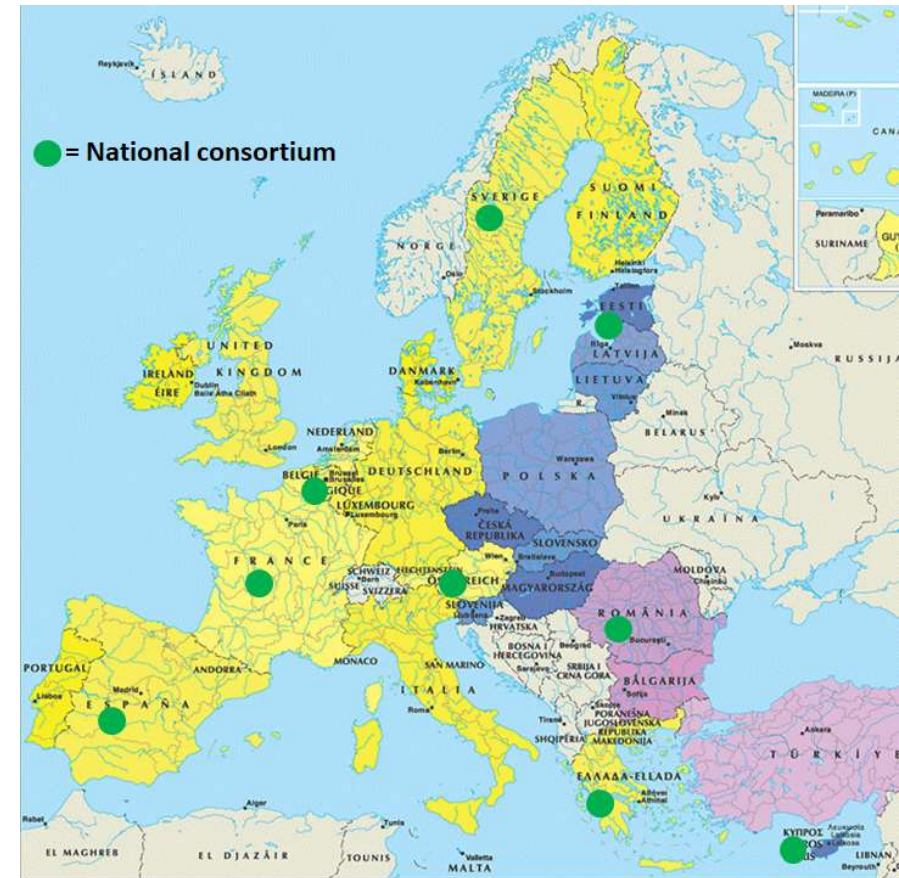
# QUALICHeCK: 4 focus areas and 9 focus countries

Transmission characteristics

Ventilation and airtightness

Sustainable summer comfort techniques

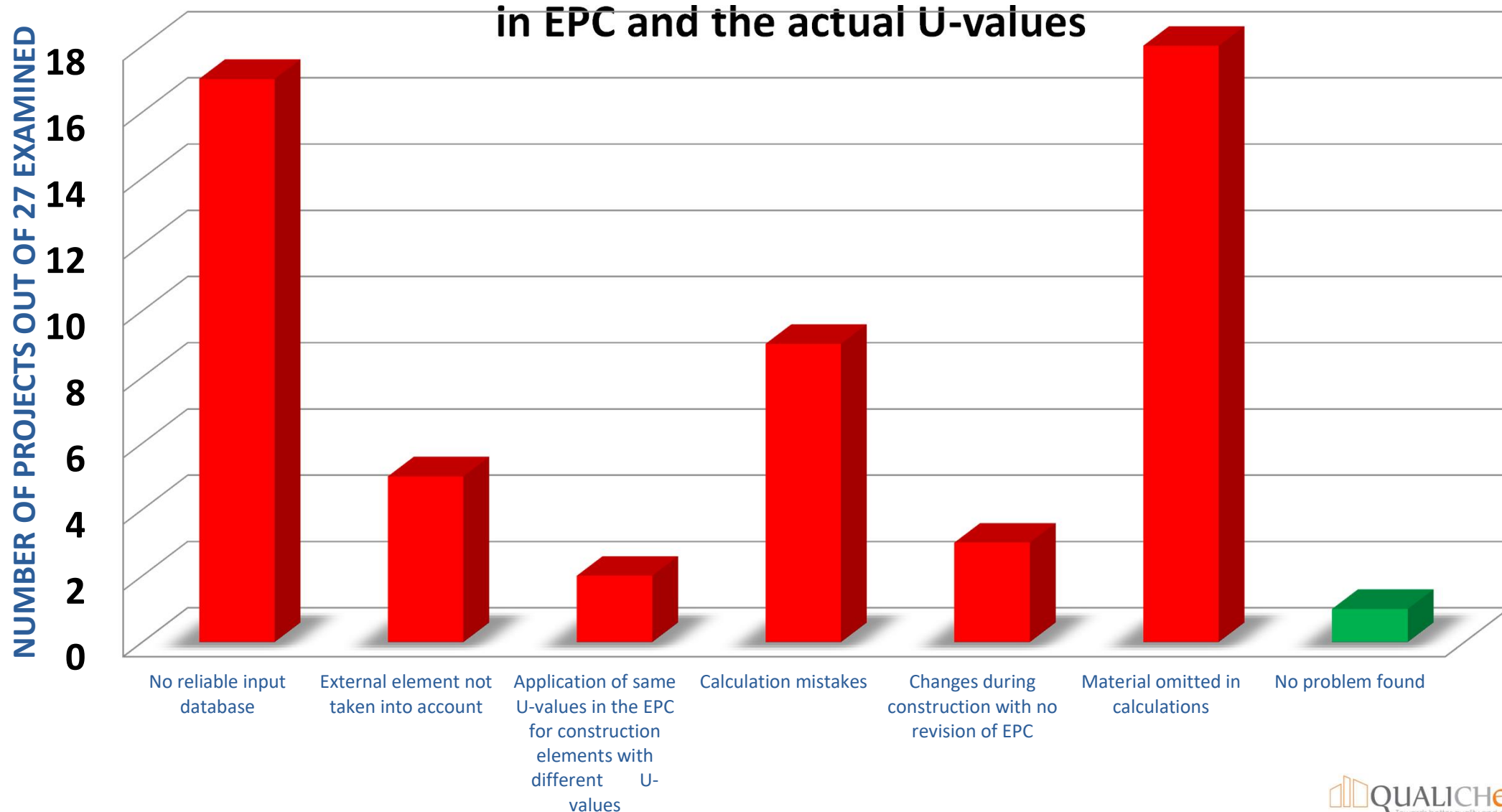
Renewables in multi-energy systems

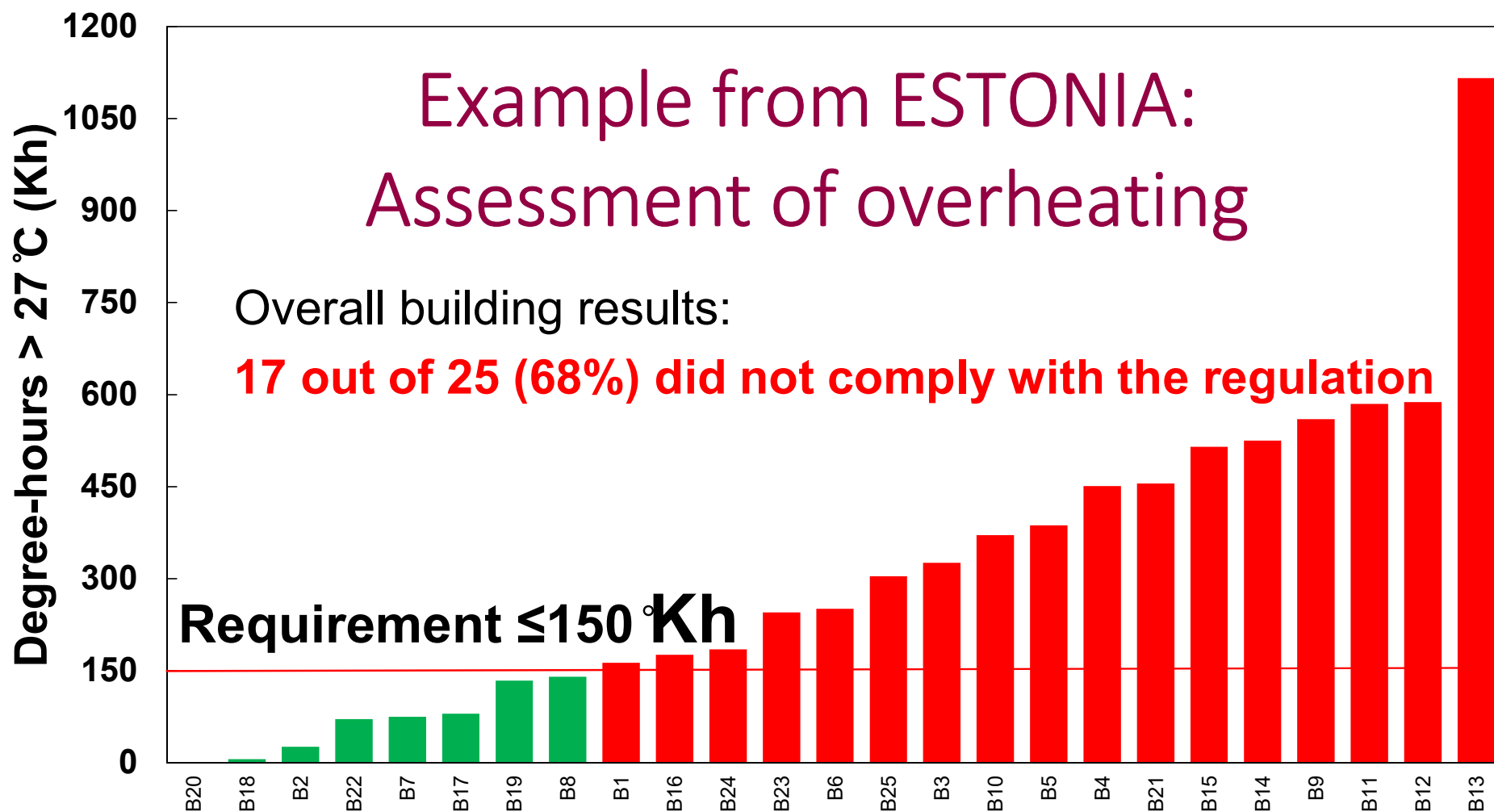


# QUALICHeCK products and outcomes

- 1 About the status on the ground...**
- 2 About interesting approaches...**
- 3 About guidance for improvements**

## Example from CYPRUS: Deviations between U-values in EPC and the actual U-values

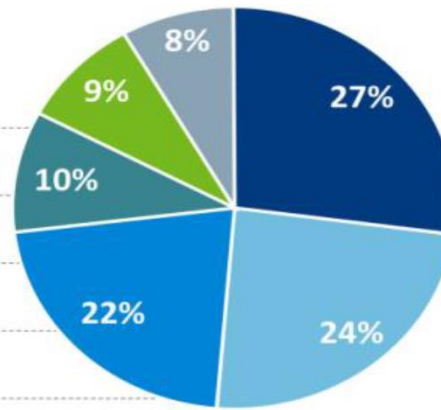
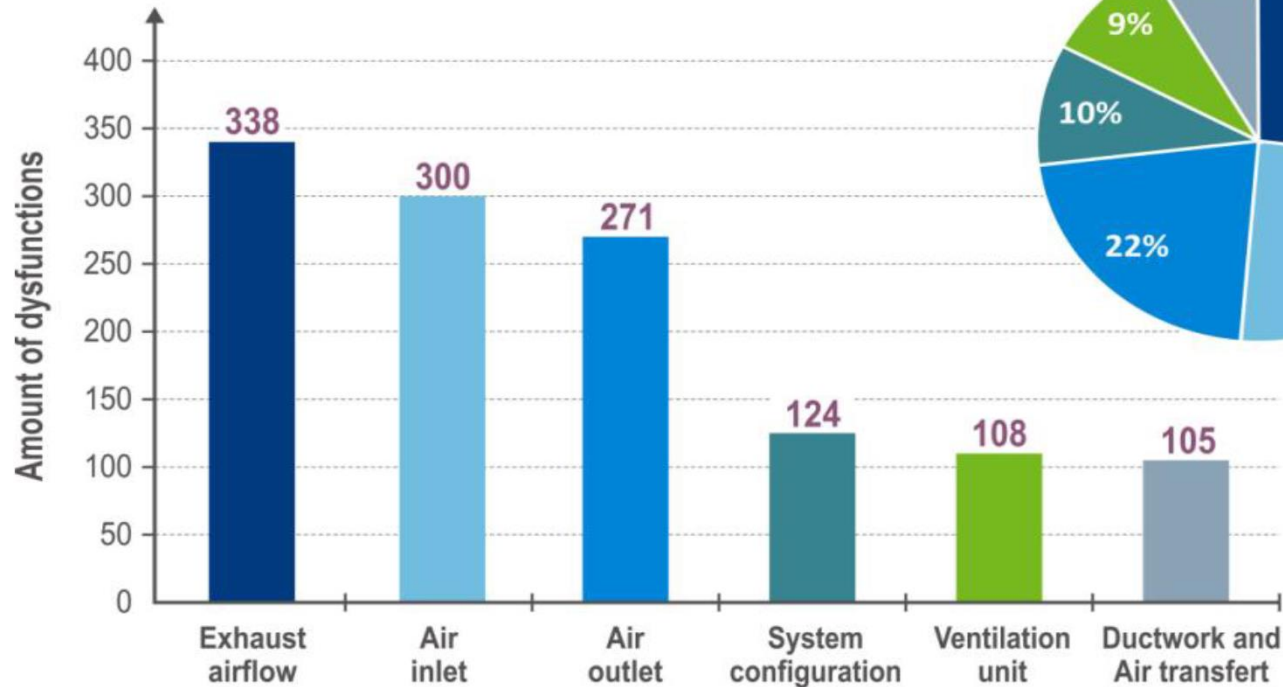




QUALICheck  
Towards better quality and compliance

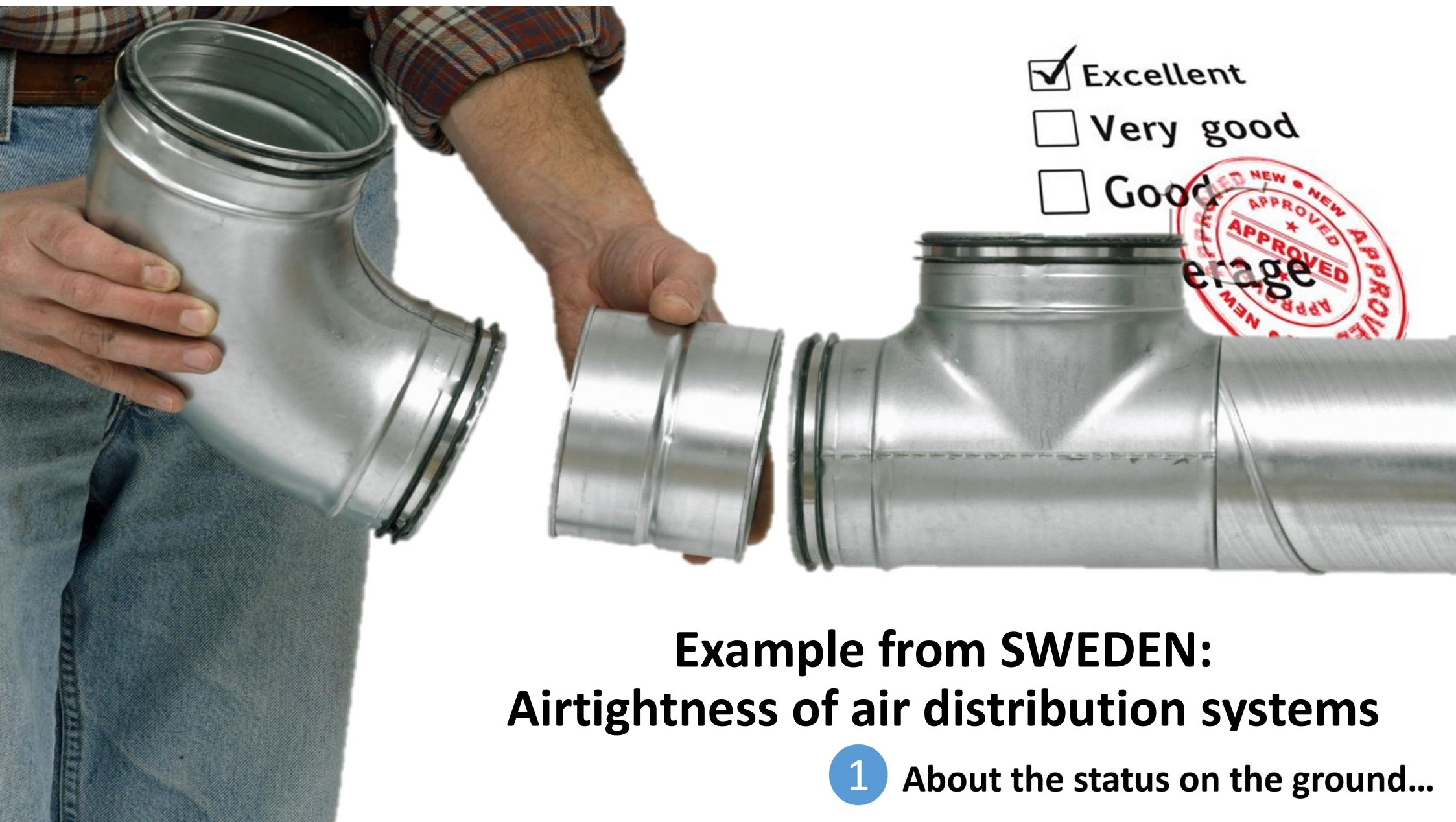
# Example from FRANCE: Quality of ventilation systems in 1.287 new dwellings

Total non-compliance or dysfunctions observed: **1246**



**44 % of multi-family dwellings don't comply**  
**68 % of single-family dwellings don't comply**

**1 About the status on the ground...**



- ☒ Excellent
- ☐ Very good
- ☐ Good



## Example from SWEDEN: Airtightness of air distribution systems

- 1 About the status on the ground...

# QUALICHeCK website



## Quick Access

- Introduction
- Status on the Ground
- Compliant and Easily Accessible EPC Input Data
- Quality of the Works
- Compliance Frameworks

## Find us on

- Introduction
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**1st European conference | BIM and energy performance of buildings, 25 June 2018, Brussels, Belgium**

**[www.qualicheck-platform.eu](http://www.qualicheck-platform.eu)**

## The QUALICHeCK project outcomes in brief

overview of documented examples

**59 factsheets**

3 special issues of the REHVA journal

9 national concertations

final booklet

**4 European conferences**

10 field studies

2 sourcebooks

9 roadshows

4 platform meetings

**16 webinars**

terms and definitions

4 workshops

summary of situation on the ground

material for university courses

# Factsheets

Author  
Christoph Sutter (baubook GmbH, Austria), Susanne Geissler (OEGNB, Austria)

Technology All technologies	Aspect Compliant and easily accessible EPC input data	Country Austria
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## baubook – EASILY ACCESSIBLE PRODUCT INFORMATION FOR EPC CALCULATION PROVIDED BY THE AUSTRIAN DATABASE

*Providing the necessary product data for calculating Energy Performance Certificates (EPCs) is one of the main purposes of the Austrian baubook database. In addition, Life Cycle Assessment (LCA) data and other information about building products are included into the database to facilitate the holistic evaluation of buildings and building components as part of voluntary Sustainable Building Assessment Schemes. This fact sheet presents the baubook database and its functionalities; it provides detailed information about the process to ensure quality of data that can be used as input data for various calculation procedures.*

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

Since 2008, the online product database baubook has offered easily accessible input data needed for the calculation of EPCs (Energy Performance Certificates) according to the Energy Performance of Buildings Directive 2010/31/EU (EPBD) and for the voluntary assessment of the environmental impact of buildings in Austria<sup>1</sup>. The product data are declared by the manufacturer. Prior to publication, all information is checked by qualified persons. In order to ensure highest accessibility, the data are transferred to EPC software programs which are approved for calculating and issuing EPCs in Austria, but also to other software programs and platforms applied for voluntary building assessments.

The data necessary for the calculation of building energy performance are expanded by additional product information about the ecological performance (Life Cycle Assessment (LCA) data, indoor quality data, ...) and technical adjectives. Thus, baubook provides a central product database, containing ecological and energy-related data, and the basic data required to calculate EPC and LCA for buildings. This makes it useful for architects, consultants, developers and construction industry managers looking for tools assisting them in planning and building energy-efficient and ecological buildings.

#### Regulatory background

In Austria, the regulatory background for EPCs is defined by the nine federal provinces because the EPBD is transposed and implemented on the regional level. Thanks to coordination between the federal provinces, the method for calculating EPCs is harmonised to a high degree, though not identical [3, 4]. Declaration of EPC input data for products is based on European Standards, but there are still Austrian standards [5, 6, 7] which have to be considered. Therefore, product information and test certificates developed for other countries cannot be used in all cases in Austria, but have to be issued once again taking into account specific Austrian requirements. This poses an economic challenge especially for small markets such as the Austrian one.

<sup>1</sup> <http://www.baubook.info> and <http://www.baubook.info/?SW=6&lng=2> (new: English version) (retrieved on 16.8.2016)

## What is a factsheet?

Short document on a specific topic

## Fact Sheets by topic

TECHNOLOGIES	Transmission Characteristics	Ventilation and Airtightness	Sustainable Summer Comfort Technologies	Renewables in Multi-Energy Systems
ASPECTS				
Status on the Ground	X	X	X	X
Compliant and Easily Accessible EPC Input Data	X	X	X	X
Quality of the Works	X	X	X	X
Compliance Frameworks	X	X	X	X

*Author*

Christoph Sutter (baubook GmbH, Austria), Susanne Geissler (OEGNB, Austria)

<i>Technology</i>	<i>Aspect</i>	<i>Country</i>
All technologies	Compliant and easily accessible EPC input data	Austria

**baubook – EASILY ACCESSIBLE PRODUCT INFORMATION FOR EPC  
CALCULATION PROVIDED BY THE AUSTRIAN DATABASE**



Technology All technologies	Aspect Compliant and easily accessible EPC input data	Country Greece
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## EASY ACCESS, COMPLIANCE OF EPC INPUT DATA AND QUALITY ASSURANCE OF EPCS

*This factsheet describes the situation in Greece regarding the EPC establishment procedure and the input data of the EPC calculation tool. It investigates issues of attention regarding compliance with the legislative procedures and existing legal framework. Moreover the Quality Assurance scheme of EPCs is provided and recommendations for improvement are proposed in order to enforce quality and compliance.*

Author

Samuel Caillou (BBRI)

Technology	Aspect	Country
Ventilation and airtightness; Transmission characteristics; Sustainable summer comfort	Compliant and easily accessible EPC input data	Belgium

## **VOLUNTARY SCHEME AND DATABASE FOR COMPLIANT AND EASILY ACCESSIBLE EPC PRODUCT INPUT DATA IN BELGIUM**

*The “EPB product database” in Belgium is an effective scheme to improve the compliance and easy access to product characteristics used as input data for the Energy Performance Certificate (EPC) calculation. The acceptance of this scheme by the market has been successful for many years. The present factsheet explains this Belgian scheme and tries to identify the reasons for its success and the prerequisites for the implementation of similar schemes in other countries.*

Authors  
Kalle Kuusk, (TUT) with contributions from:

Susanne Geissler (OEGNB); Arnold Janssens (UGent); Marina Kyprianou Dracou (CYI); Nikolaos Stathopoulos (ENTPE); Theoni Karlessi (NKUA); Horia Petron (URBAN-INCERC); José L. Molina (USE); Pär Johansson (Chalmers)

Technology Summer thermal comfort	Aspect Status on the ground	Country All focus countries
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## SUMMER THERMAL COMFORT REQUIREMENTS AND COMPLIANCE ASSESSMENT FRAMEWORKS

Summer thermal comfort is somehow addressed in most of the building codes. As it is quite a new issue, it is not fully established and more effort is needed for successful implementation.

✓ 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"/>	

### Authors

**Content**  
OIB-RLA 2015 (OIB Guideline 6 on Heat Protection and Energy Saving) and the associated Calculation Guideline have been issued by OIB (Österreichisches Institut für Bautechnik - Austrian Institute of Construction Engineering - [www.oib.at](http://www.oib.at)). This organization is an association (Non Profit Organisation) where all Austrian provinces are members, and it is the objective to harmonize the legislation which is the responsibility of the Austrian provinces, such as the building code. Therefore, all provinces have participated in developing the agreed OIB RL-6 which is the harmonized basis for the building codes at the provinces' level. The building code which is a law at the province level references the agreed OIB RL-6. The OIB-RLA references Austrian Standards, thus becoming part of the legislation. OIB RL-6 has been revised: first version 2007, revised version 2011, and another revised version 2015 [1].

### Summer thermal comfort requirements

OIB-RLA states that in non-residential buildings, cooling energy demand must be below 1 kWh/m<sup>2</sup>.a conditioned area, referring to reference climate (new construction) and 2 kWh/m<sup>2</sup>.a respectively (major renovation).

The proof is a calculation according to Austrian Standard ONORM B 8110-6 (2014-11-15): Thermal insulation in building construction - Part 6: Principles and verification methods - Heating demand and cooling demand - National application, national specifications and national supplements to ONORM EN ISO 13790 [2].

Supplement 1: Single family house - Examples for validation of the heating demand

Supplement 2: Multi-family house - Examples for validation of the heating demand

Supplement 3: Non-residential building - Example for validation of the heating and cooling demand

Supplement 4: Single family house and multi-family house - Examples for validation of the calculation of the heating demand of a lowest-energy building, which can be heated by air (passive house)

For residential buildings there is no specific requirement referring to cooling energy demand.

However, summer thermal comfort is addressed by the requirement of avoiding overheating according to ONORM B 8110-3. The proof is a calculation according to Austrian Standard ONORM B 8110-3 (2012-03-15): Thermal protection in building construction Part 3: Prevention of summer overheating [3]. The

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Technology Summer thermal comfort	Aspect Status on the ground	Country All focus countries
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## SUMMER THERMAL COMFORT REQUIREMENTS AND COMPLIANCE ASSESSMENT FRAMEWORKS

## Author

York Ostermeyer, Paula Wahlgren (Chalmers), Susanne Geissler (OEGNB)

<b>Technology</b> All technologies	<b>Aspect</b> Compliance frameworks	<b>Country</b> Austria, Germany, Sweden, Switzerland,
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## ENERGY EFFICIENCY STANDARDS AS DRIVERS AND BARRIERS FOR INNOVATION IN THE BUILDING SECTOR

*Compliance frameworks are important drivers for energy efficient buildings. However, sometimes they also pre-define solutions to a certain extent and therefore do not only steer but also hinder innovation in the built environment. This fact sheet compares five different energy efficiency standards from four countries and their methods for checking compliance on their implications to systemic solutions and innovation. Three standards are part of the mandatory legislative framework, and two standards are voluntary ones.*

## Authors

François Rémi Carrié (ICEE) and Sandrine Charrier (CEREMA)

Technology	Aspect	Country
Ventilation and airtightness	Quality of the works	France

## **BUILDING REGULATIONS CAN FOSTER QUALITY MANAGEMENT: THE FRENCH EXAMPLE ON BUILDING AIRTIGHTNESS**

*The French regulation includes an alternative route to systematic building airtightness testing to justify for a given airtightness level. This route was developed to push professionals to revisit their methods for implementing building airtightness solutions and to include specific quality requirements. At the end of 2014, 81 such quality management approaches have been approved representing a production of about 15.500 buildings per year.*



**Building Information Modelling**

## Can BIM be a disruptive technology for EPC assessment?



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BIM is in many EU countries high on the agenda. This article is focusing on the potential of BIM in relation to the energy performance of building assessment and also in relation to a better quality of the works.

**Keywords:** EPC, BIM, quality, standardisation, QUALICheck

According to Wikipedia\*, building information modelling (BIM) is a process involving the generation and management of digital representations of physical and functional characteristics of places. Building information models (BIMs) are files (often but not always in proprietary formats and containing proprietary data) which can be extracted, exchanged or networked to support decision-making regarding a building or other built asset. Current BIM software is used by individuals, businesses and government agencies who plan, design, construct, operate and maintain diverse physical infrastructures, such as water, refuse, electricity, gas, communication utilities, roads, bridges, ports, tunnels, etc.

\* [https://en.wikipedia.org/wiki/Building\\_information\\_modeling](https://en.wikipedia.org/wiki/Building_information_modeling)

### BIM developments in Europe

The future market uptake of BIM is difficult to predict with great accuracy, but it clearly is a development with great potential.

In terms of requirements, an increased number of countries impose the use of BIM for certain types of projects, e.g.:

- Since 2007, obligatory in Norway for public buildings, in Finland for any project above 2 M€ and in the USA for any major project
- Since 2012 mandatory in the Netherlands for any major public project
- Since 2014 mandatory in Hong Kong for any public project
- Since 2016 mandatory in South Korea for any project above 50 M\$ and in the UK for public projects



QUALICheck responds to the challenges related to compliance of Energy Performance Certificate (EPC) declarations and the quality of the building works. Find out more at <http://qualicheck-platform.eu>.  
The QUALICheck project is co-funded by the Intelligent Energy Europe Programme of the European Union. The sole responsibility for the content of this article lies with the author(s). It does not necessarily reflect the opinion of the European Union. Neither the EADE nor the European Commission are responsible for any use that may be made of the information contained therein.



## Can BIM technology



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- Since 2014 mandatory in Hong Kong for any public project
- Since 2016 mandatory in South Korea for any project above 50 M\$ and in the UK for public projects

June 25 2018

1<sup>st</sup> European conference

‘BIM and energy performance of buildings’

Brussels –Belgium

# Conclusions

- Various studies indicate that there often are problems with the quality of energy performance certificates
- The QUALICHeCK project has collected a whole range of interesting approaches
- BIM (Building Information Modelling) has the potential to be a game changer for EPC assessment and quality management
- There is a lot of interesting information in the QUALICHeCK outcomes

# Thank you for your attention!



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Programme of the European Union

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