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Towards better quality and compliance

EPBD legislation in practice: Challenges regarding compliance and quality of the works

Peter Wouters

Manager INIVE EEIG – Coordinator QUALICHeCK

IEE/13/610/SIO2.675574

01/03/2014-28/02/2017

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

Structure of the presentation

- About good compliance and good quality of the works
- What kind of activities in QUALICHeCK?
- Outcomes of QUALICHeCK
- Some considerations about future challenges
- Conclusions

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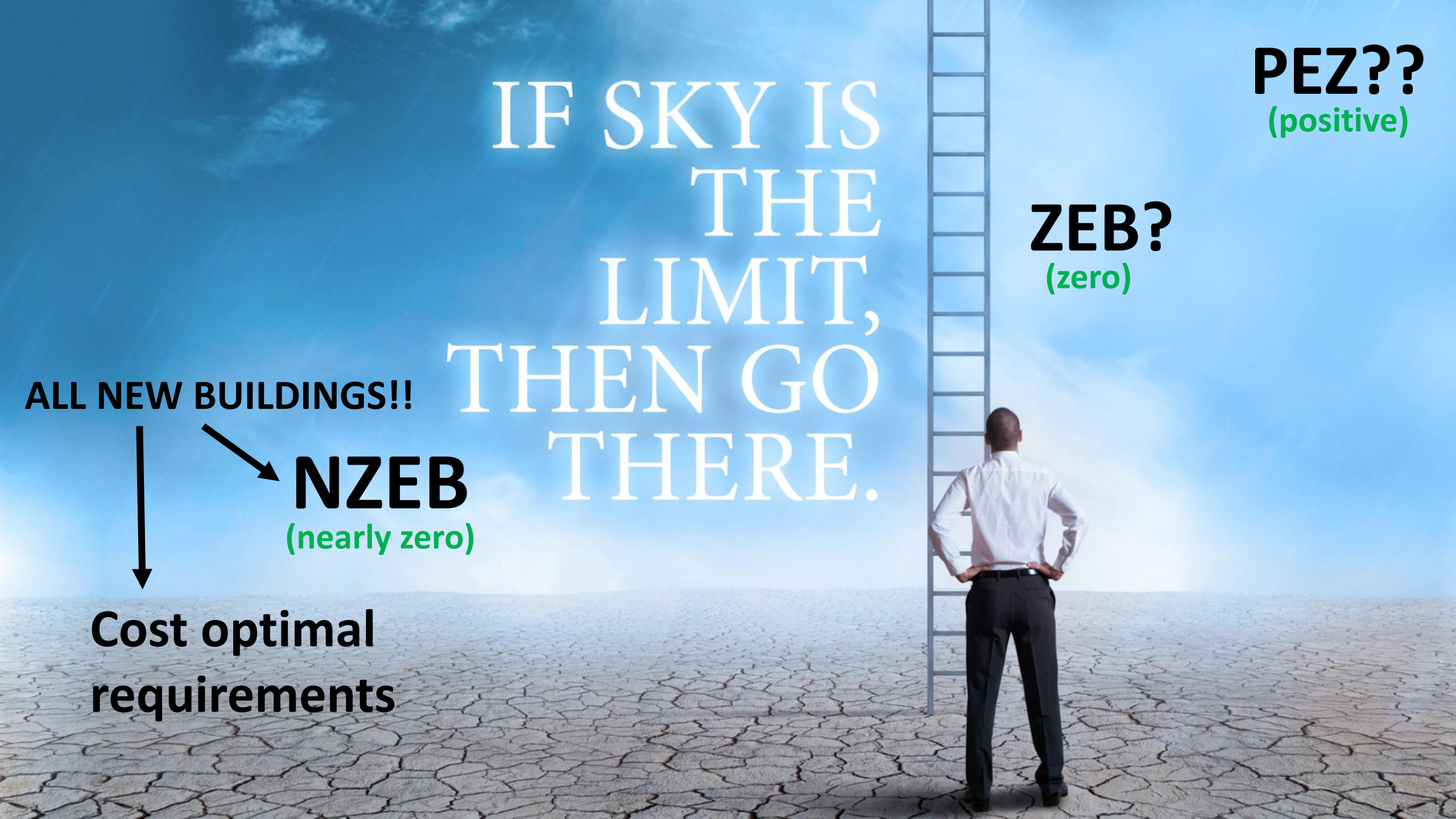
IF SKY IS THE LIMIT, THEN GO THERE.
PEZ??
(positive)
ZEB?
(zero)
ALL NEW BUILDINGS!!
NZEB
(nearly zero)
Cost optimal requirements

You expect a reliable label

… and you expect a good quality

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You expect a reliable label

… and you expect a good quality

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… **and you expect a good quality**

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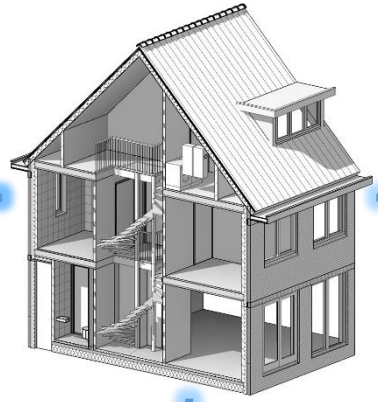
2 societal expectations…

- *There should be (more) attention for **compliance with the EPC for new and renovated buildings***

- *There should be (more) attention for **achieving a good quality of the works***



Are the works correctly executed?

Components/systems as assumed in calculations?

Physical modelling OK?

Real occupancy

?=

≈?

EPC

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Energy certificates with respect to ventilation …

EPC calculation

- Efficiency of heat exchanger
- Fan characteristics
- Ductwork airtightness
- Demand controlled ventilation
- …
- …

Observation:

In many countries no or nearly no control regarding compliance of EPC

Execution of the works

- Air flow rates
- Acoustics
- …
- …

Observation:

In many countries no or nearly no control regarding real performances

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Which problems are often observed?

- **Air flow rates** (→ IAQ)
- **Acoustics**: from system or from outside
- **Draught problems**
- **Maintenance**
- …
- Problems are found for a syste
- **Good execution exists and also not extremely difficult**

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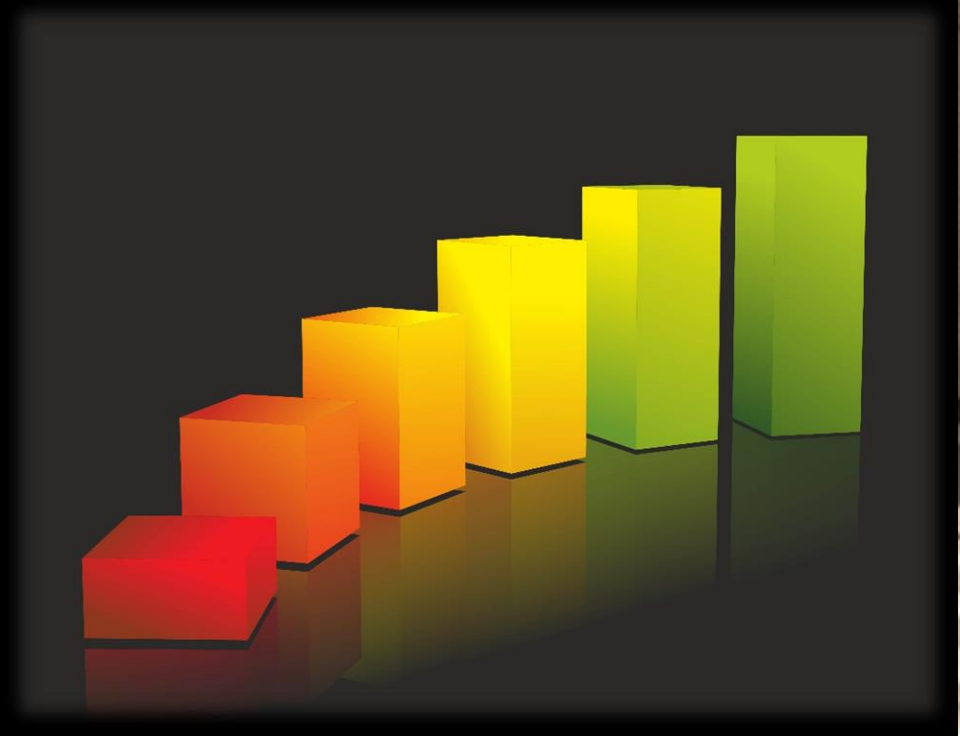

2 objectives of QUALICHeCK project

- *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'.

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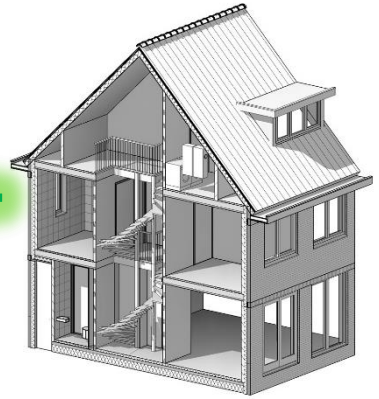

Create boundary conditions for a correct execution

Create boundary conditions for good compliance

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Towards better quality and compliance

Structure of the presentation

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QUALICHeCK project (2014-2017)

Status of compliance and quality on the ground

Solutions

- Easy access of **compliant** EPC input **data**
- Towards more **quality** of the works
- Towards better **compliance** and effective penalties

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Towards better quality and compliance

4 focus areas in QUALICHeCK

- Transmission characteristics
- Ventilation and airtightness
- Sustainable summer comfort techniques
- Renewables in multi-energy systems

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= National consortium
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ÍSLAND
SVERIGE
SUOMI
FINLAND
NORGE
Oslo
Helsinki
Helsingfors
Stockholm
Tallinn
EESTI
Riga
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LIETUVA
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Minsk
BELARUS
Moskva
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Athinai
Alger
Rabat
Tunis
EL MAGHREB
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Valletta
MALTA
ΚΥΠΡΟΣ
Lefkosia
Beyrouth
LIBNAN
MADEIRA (P)
Paramaribo
SURINAME

Structure of the presentation

- About good compliance and good quality of the works
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- **Outcomes of QUALICHeCK**
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HOME ABOUT EVENTS RESULTS TEAM CONTACT

Search Site

Quick Access

- Introduction
- Situation on the Ground
- Compliant and Easily Accessible EPC Input Data
- Quality of the Works
- Compliance and Effective Penalties

Newsletter

REPORT — Quality of the Works

Posted on 2015/02/28 by Alexander Deliyannis

The trend towards Nearly Zero-Energy Buildings (NZEB) implies the correct execution of classical building works on the one hand, and the proper use of specific workforce skills for implementing advanced technologies on the other. Therefore, to reach NZEB targets in …

Continue reading →

Posted in Highlights, Reports, Results

REPORT — Compliant and Easily Accessible EPC Input Data

Posted on 2015/02/28 by Alexander Deliyannis

The Energy Performance Certificate (EPC) of a building will only be able to serve its purpose if it is considered trustworthy while minimising the risk of non-compliance of the actual building with the minimum energy performance requirements of the regulations. In doing so, two are the key …

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QUALICHeCK NEWS

Towards better quality and compliance issue #1 : 2014/10

Welcome

Environmental concerns, in particular, have over the last decade led to a series of new initiatives in the European Union related to energy efficiency in buildings, with several directives comprising the main driver for action at the level of the Member States. In about 6 years from now, all new buildings should meet the nearly zero-energy (NZEB) targets and, at the same time, building renovation represents a major challenge. Further steps have to be taken on the longer term and in particular for the existing building stock to ensure radical progress.

All Member States are currently transposing the various directives (in particular the Energy Performance of Buildings Directive, the Renewable Energy Sources Directive and the Energy Efficiency Directive) into national legislation. Though imposing stimulating requirements is important, the claimed energy performance can be different from the reality. Moreover, it is important that works related to energy efficiency and renewables are of good quality, in order to ensure that the expected energy performances are achieved and that the works will be sustainable over a long lifetime. In the opposite case, societal and political support might be lost.

These 2 concerns are in the centre of the QUALICHeCK project, which started in March 2014 and which will run until February 2017. The key objectives are the following:

> To set up a series of actions which should result in more attention and real action for reliable information in the Energy Performance Certificates of new and existing 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 real action 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".

Dissemination of information is a key activity in QUALICHeCK. This newsletter is one of such activities, as is the website. In this issue, you find information on various QUALICHeCK related events and outcomes.

I wish you a pleasant reading.

Peter Wouters

QUALICHeCK Coordinator

Contents

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

1st QUALICHeCK Conference

The 1st international QUALICHeCK Conference "Towards improved compliance and quality of the works for better performing buildings" was organised on 30 September 2014 at the KBC auditorium in Brussels. The event represented a major physical opportunity to expand dialogue on compliance and quality issues for energy efficiency in buildings, with the initial QUALICHeCK project findings used as one of the starting points for discussion. The Conference covered among others:

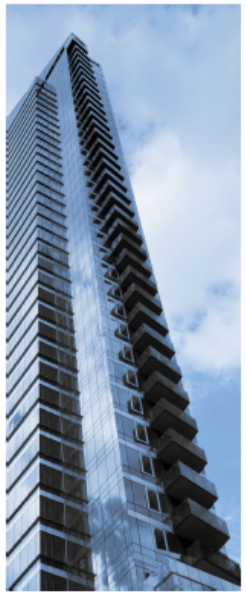
- The overall scene regarding compliance and quality of works for energy efficient buildings.
- Lessons learned from major EU initiatives regarding reliability of Energy Performance Certificate input data and quality of works.
- Experience from industry representatives regarding reliable energy performance data and challenges in respect to quality of works.
- The QUALICHeCK action and networking perspectives.

More specifically, the following topics were presented and discussed:

Setting the framework: • *Financing energy efficiency - The challenges* (Erik Van Acker, KBC) • *EU energy policy - Status and challenges* (Linn Johnsen, DG ENERGY) • *EU Directives and challenges for the Member*

QUALICHeCK NEWS

Towards better quality and compliance issue #2 : 2015/02



Welcome

Welcome to this 2nd newsletter of the QUALICHeCK project, which is now at the and of its first year.

A major QUALICHeCK event is the upcoming 1st workshop in Lund, on 16 and 17 March 2015, focusing on issues related to ventilation and airtightness. The 2nd workshop is scheduled for March 2016 in Athens with as focus sustainable summer comfort technologies. Also good to know that the 2nd QUALICHeCK conference in Brussels will be on 4 September 2015.

In this newsletter, you find a link to the first 2 reports produced by the consortium members on compliance of EPC input data and quality of the works. The present reports already contain information about existing studies in EU countries. A major outcome in 2015 will be the findings of the new data collection studies being carried out at this moment by the QUALICHeCK team in 9 focus countries. You can already have a sneak preview at the first results of the Estonian study on compliance with summer thermal comfort requirements in apartment buildings.

In order to achieve more compliance in EPC input data and/or quality of the works, action is required at country level. Further on, you find information about the national stakeholders concertation in Austria. In 2016, a series of similar events is foreseen in other participating countries.

Last but not least, QUALICHeCK will produce a series of factsheets and organise a series of webinars. The first factsheet presented in this newsletter is about a French quality management approach to improve building airtightness. The first webinar is scheduled on 27 April 2015. More factsheets and webinars are planned for 2015.

If you would like to be kept informed, please visit *www.qualicheck-platform.eu*.

Enjoy you reading!

Peter Wouters

QUALICHeCK Coordinator

Contents

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BauZ! QUALICHeCK workshop as part of the BauZ! Conference 2015

by Susanne Geissler, ÖGNB

The Bauz! Conference (www.bauz.at) is an annual event addressing the Austrian construction industry, authorities and administration, representatives of the real estate sector, as well as architects and engineers involved in building design.

It was the objective of the workshop to introduce the QUALICHeCK project, to present a first batch of good examples from other European countries, to present first results from the Austrian new data collection study carried out by FH Technikum (Lukas Maul, Marc Wohlschak and a group of students, *www.technikum-wien.at/fh/institute/erneuerbare_energie*), and to explain the view of the real estate sector (Martina Hoffmann, FH Wien der WKW *www.fh-wien.ac.at/immobilienwirtschaft/master-studium*).

The presentations prepared the ground for discussions with about 30 participants, resulting in the following conclusions:

(1) It is necessary to have a two stages procedure, meaning that the design Energy Peformance Certificate (EPC) needed for the building permit must be updated after completion of the building, because design changes and revision of decisions occur which need to be documented.

(2) Default values are important, because the use of default values results in EPCs allowing for comparison of buildings. However, some default values are unrealistic and need revision.

(3) In Austria, it is difficult to assess the impact of the EPC on the real estate market: The residential real estate market is divided into the market of buildings and building units being rented and the ones being sold. The residential renting market is regulated in detail, making it extremely difficult to assess the impact of energy efficiency on prices. The observation of the selling market shows that real estate agents present the

Status of compliance and quality on the ground

Easy access of compliant EPC input data

Towards more quality of the works

Towards better compliance and effective penalties

Solutions

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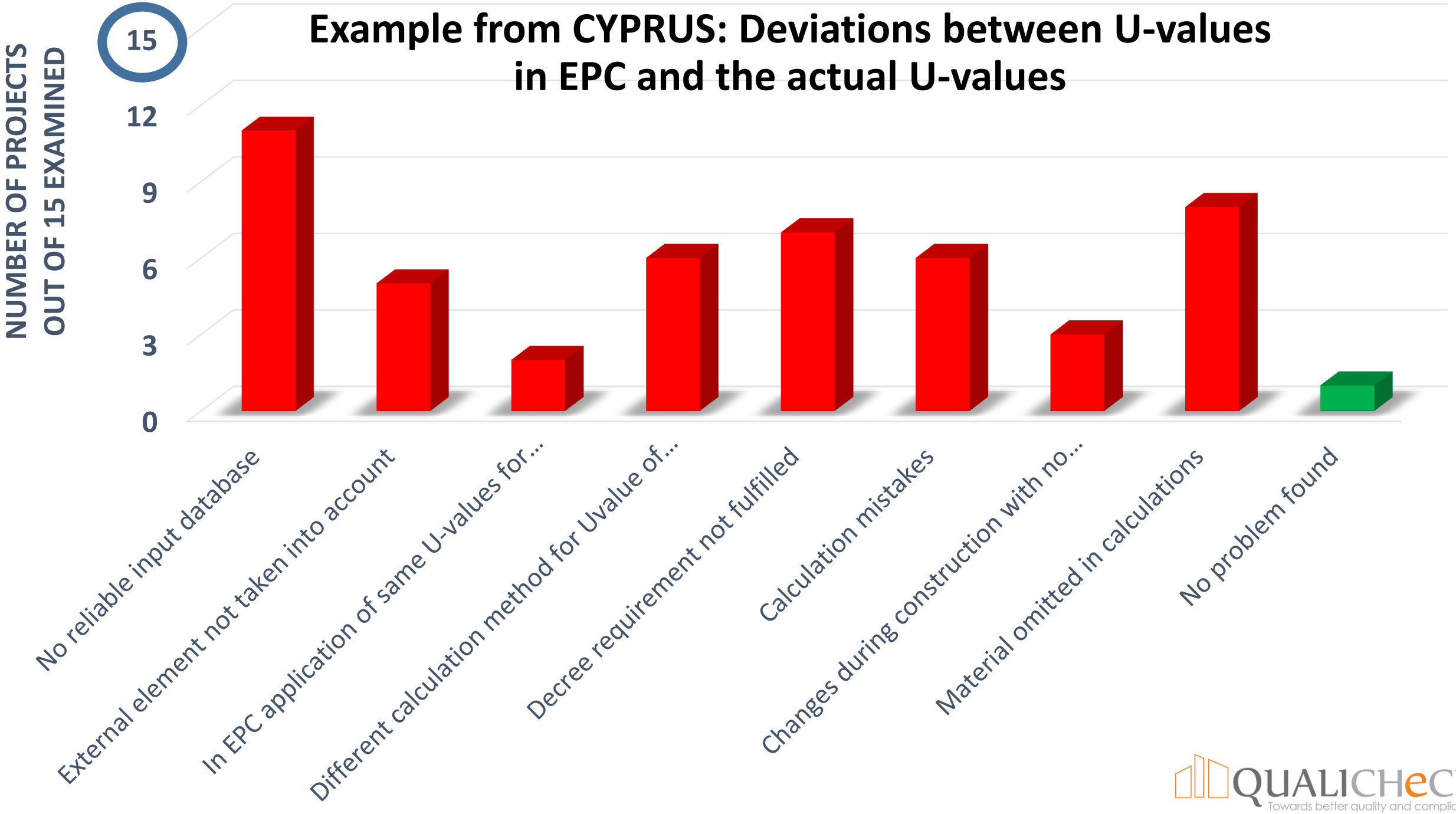
Example from CYPRUS: Deviations between U-values in EPC and the actual U-values



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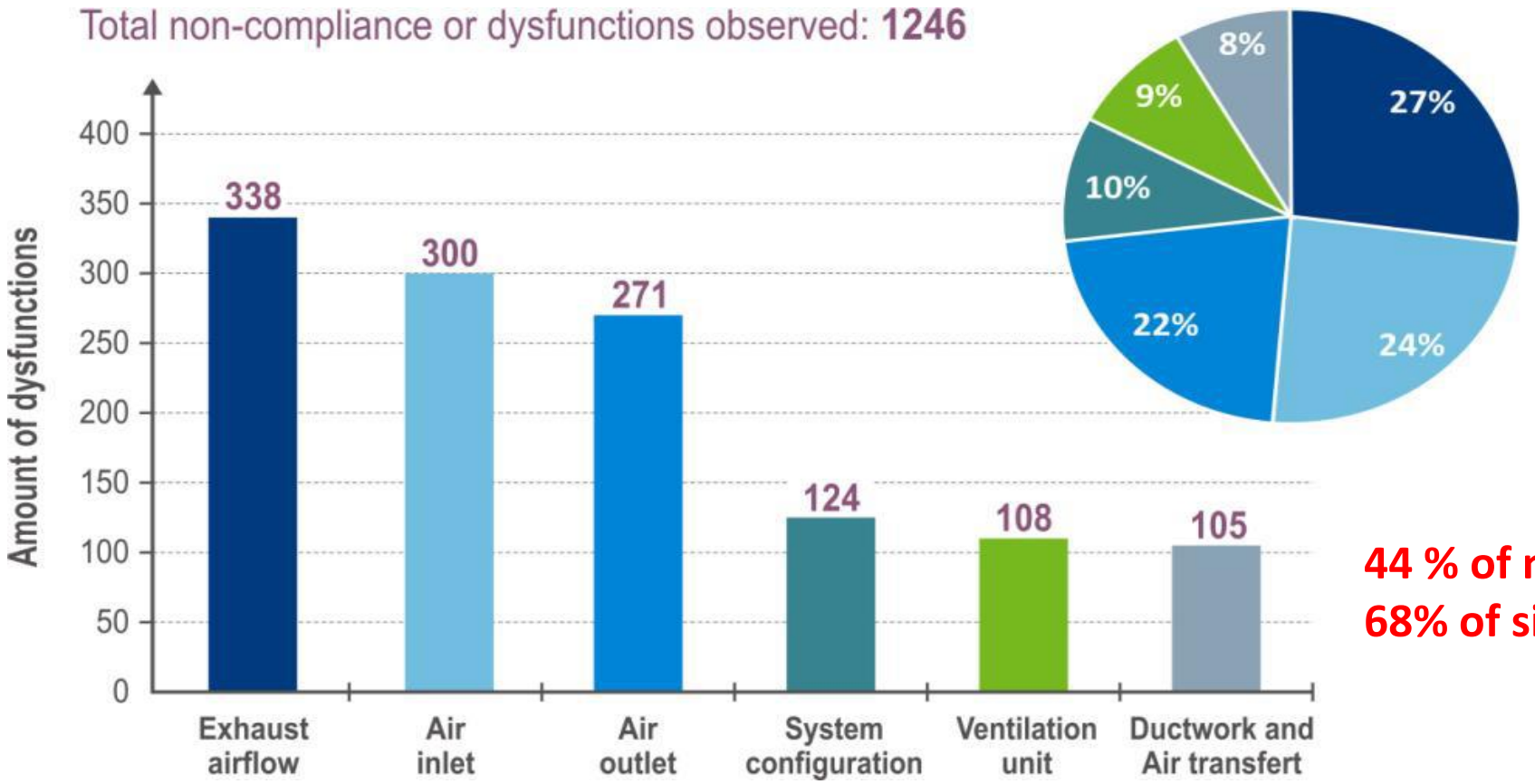
Example from FRANCE:
Quality of ventilation systems in 1.287 new dwellings



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

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Example from the Netherlands

r 2014:

tion Improvement plan has failed”

statement by Dutch minister

012: 50% of new residential ventilation systems don’t work well

’ organisations signed in 2012 a declaration that in 2015 all systems should

ients

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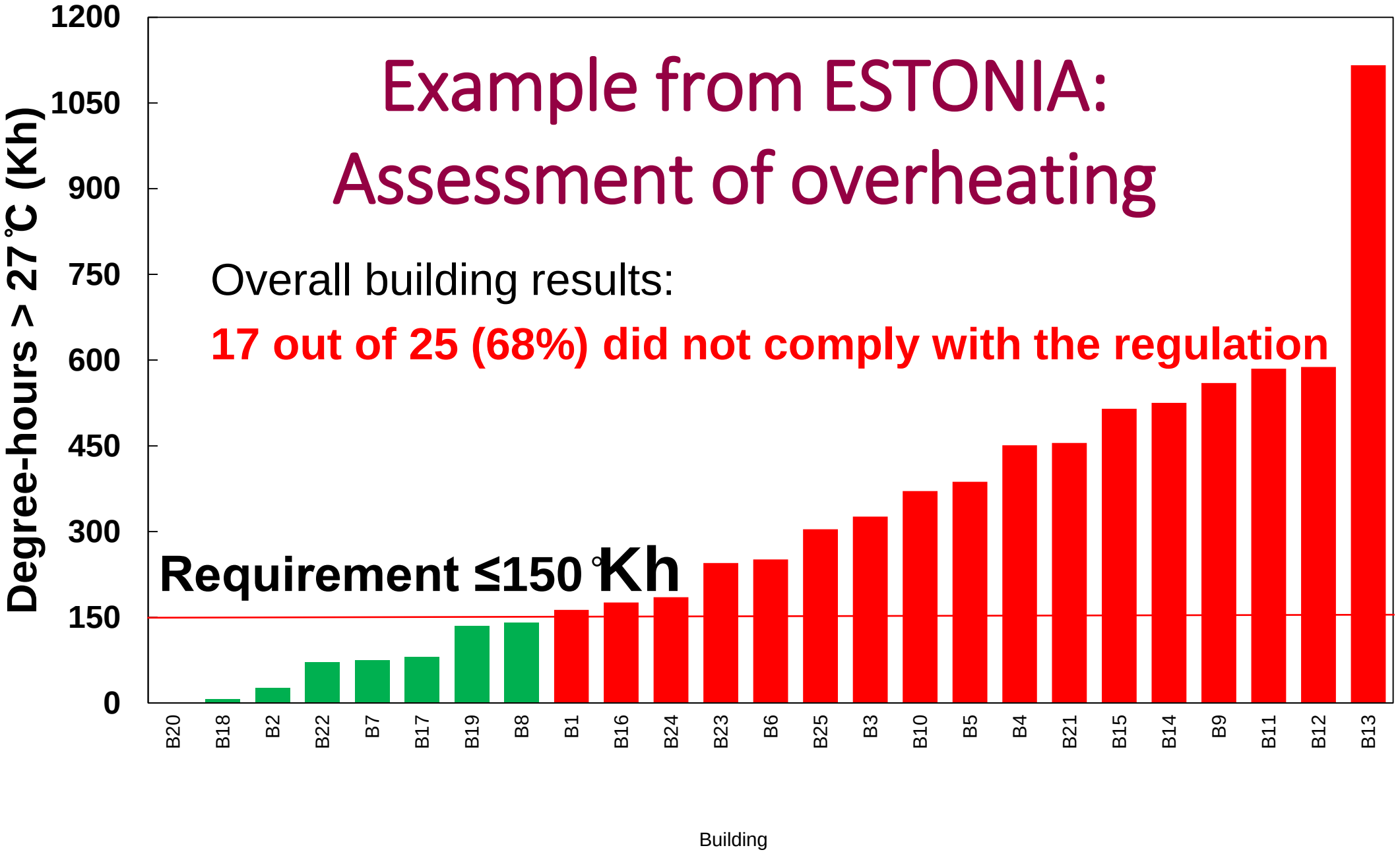
Example from ESTONIA: Assessment of overheating

Overall building results:

17 out of 25 (68%) did not comply with the regulation



Example from SWEDEN:
Airtightness of air distribution systems

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Status of compliance
and quality on the ground

Easy access of compliant EPC input data

Towards more quality of the works

Towards better compliance and
effective penalties

Solutions

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"Towards compliant and easily accessible EPC input data"

How to get compliant and accessible data for the energy rating calculation of a building?

Overview of some existing approaches

Compliant and accessible data

Draft report for discussion with stakeholders, 30 October 2014
(A final report, including information from other experiences and feedback from stakeholders, is planned to be published in September 2015)

François Durier (CETIAT, France)

With contributions and/or reviews from: Samuel Caillou (BBRI, Belgium), François Rémi Carrié (ICEE/INIVE), Jan-Olof Dalenbäck (Chalmers, Sweden), Hans Erhorn (Fraunhofer IBP, Germany), Susanne Geissler (OEGNB, Austria), Arnold Janssens (University of Gent, Belgium), Pär Johansson (Chalmers, Sweden), Theoni Karlessi (University of Athens, Greece), Jarek Kurnitski (Tallinn University of Technology, Estonia), Jelle Laverge (University of Gent, Belgium), Marianna Papaglastra (SYMPRAXIS Team), Mikk Maivel (Tallinn University of Technology, Estonia), Clarisse Mees (BBRI, Belgium), José L. Molina (University of Seville, Spain), Horia Petran (URBAN-INCERC, Romania), Paula Wahlgren (Chalmers, Sweden), Peter Wouters (BBRI, Belgium), Bruce Young (BRE, UK)

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"Towards improved quality of the works"

Documented examples of existing situations regarding quality of works

Quality of the works

Draft report for discussion with stakeholders, 30 October 2014 (A final report, including information from other experiences and feedback from stakeholders, is planned to be published in September 2015)

Heike Erhorn-Kluttig, Hans Erhorn, Sarah Doster
(Fraunhofer Institute for Building Physics, Germany)

With contributions and/or reviews from: Samuel Caillou (BBRI, Belgium), François Rémi Carrié (ICEE/INIVE), Jan-Olof Dalenbäck (Chalmers, Sweden), Eric Dupont (BBRI, Belgium), François Durier (CETIAT, France), Chrysanthi Efthymiou (NKUA, Greece), Susanne Geissler (OEGNB, Austria), Pär Johansson (Chalmers, Sweden), Theoni Karlessi (NKUA, Greece), Marina Kyprianou Dracou (Cyl, Cyprus), Mikk Maivel (TUT, Estonia), Marianna Papaglastra (Sympraxis Team, Greece), Horia Petran (URBAN-INCERC, Romania), Paula Wahlgren (Chalmers, Sweden), Peter Wouters (BBRI, Belgium)

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QUALICHeCK fact sheet #01

Towards better quality and compliance

2015.1

QUALICHeCK fact sheet #01
Towards better quality and compliance
2015.1

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.

Residential buildings ☑	Non-residential buildings ☑	Specific buildings: .....
New buildings ☑	Existing buildings ☐	

Context

There exists a significant body of literature showing the negative impacts of air leaks in building envelopes as well as the benefits of good building airtightness with appropriate provisions for ventilation, whether natural or mechanical. This explains why the French regulation has taken into account building airtightness since over 30 years, unfortunately with little success until about 2006. That year, a new regulation (RT 2005) came into force, with a benefit of about 7% on the calculated energy use for better airtightness on single-family houses. This regulation also introduced a new scheme (Annex VII of the regulation) to justify for the target airtightness level based on quality management (QM) principles.

Objectives and problems addressed

The QM scheme was initially developed considering the difficulties building professionals had to achieve good airtightness and the hope that cost abatements due to allowance for non-systematic testing could encourage building professionals to engage in a QM approach for building airtightness. The major problems addressed with this approach include:

- ✓ Poor training of designers and workers
- ✓ Recurrent poor treatment of envelope leakage sites
- ✓ Absence of self-checks on site
- ✓ Cost for systematic airtightness testing

This scheme is applicable to all new buildings. Because of its limited market potential for non-residential buildings, it will be restricted to residential buildings as of July 2015 (Annex VII, 2014).

Approach to overcome identified problems

Regulatory background

The 2012 French regulation introduced a minimum requirement for the building airtightness of all residential buildings, including mandatory justification of the airtightness levels mentioned in Table 1. For non-residential buildings, default values apply depending on the building types; if a value better than the default value is used in the calculation, mandatory justification applies as well.

In all cases where justification is necessary, the building airtightness level must be justified either:

- ✓ with an airtightness test by a certified tester of each building; or
- ✓ with a certified quality management approach that allows non-systematic testing.

The reference text for this QM approach is in the Ministry order of the energy performance regulation itself (RT 2005 and RT 2012). It allows the applicant not to perform an airtightness test systematically, but requires the organisation to set up a quality management approach for the whole building process that has to be approved by a specific national committee. In its 2012 version (Annex VII of RT 2012), successful applicants can use air permeability at 4 Pa in multiples of 0,1 $m^3/h/m^2$:

- ✓ in the range of 0,3-0,6 $m^3/h/m2$ (depending on the results they submitted in their application) for single-family buildings (this range corresponds to about 1,6-3,2 $m^3/h/m2$ at 50 Pa);
- ✓ in the range of 0,3-1,0 $m^3/h/m^2$ (depending on the results they submitted in their application) for multiple-family buildings;
- ✓ greater than 0,3 $m^3/h/m^2$ and smaller than the default value for other types of buildings (no longer applicable as of July 2015).

	Minimum requirement	Possible values in case of QM approach (multiples of 0,1 $m^3/h/m^2$	Default value
Single-family buildings	0,6 (3,2)	0,3-0,6 (1,6-3,2)	
Multi-family buildings	1,0 (5,4)	0,3-1,0 (1,6-5,4)	
Non-residential buildings (no longer applicable as of July 2015)		0,3-1,7 (1,6-9,2) or 0,3-3,0 (1,6-16,2) depending on building type	1,7 (9,2) or 3,0 (16,2) depending on building type

Table 1: Airtightness levels in the 2012 French regulation in m^3/h per m^2 of cold surface area at 4 Pa. Approximate corresponding values at 50 Pa are shown in parenthesis.

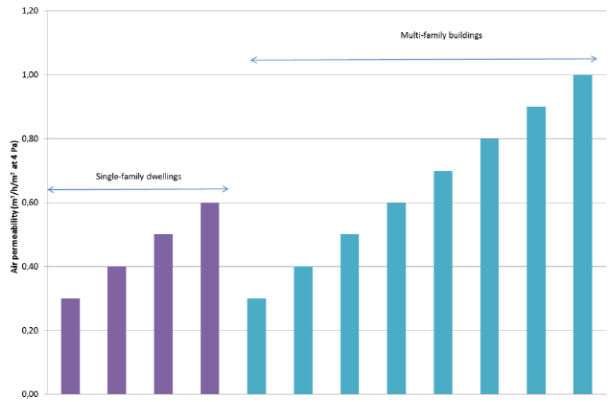

Figure 1: Possible values of maximum air permeability guaranteed by the applicant in single-family dwellings and multi-family buildings.

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Special issues by QUALICHeCK for REHVA Journal

3 special issues are planned:

- 1st issue August 2015
- 2nd issue around June 2016
- 3rd issue around February 2017

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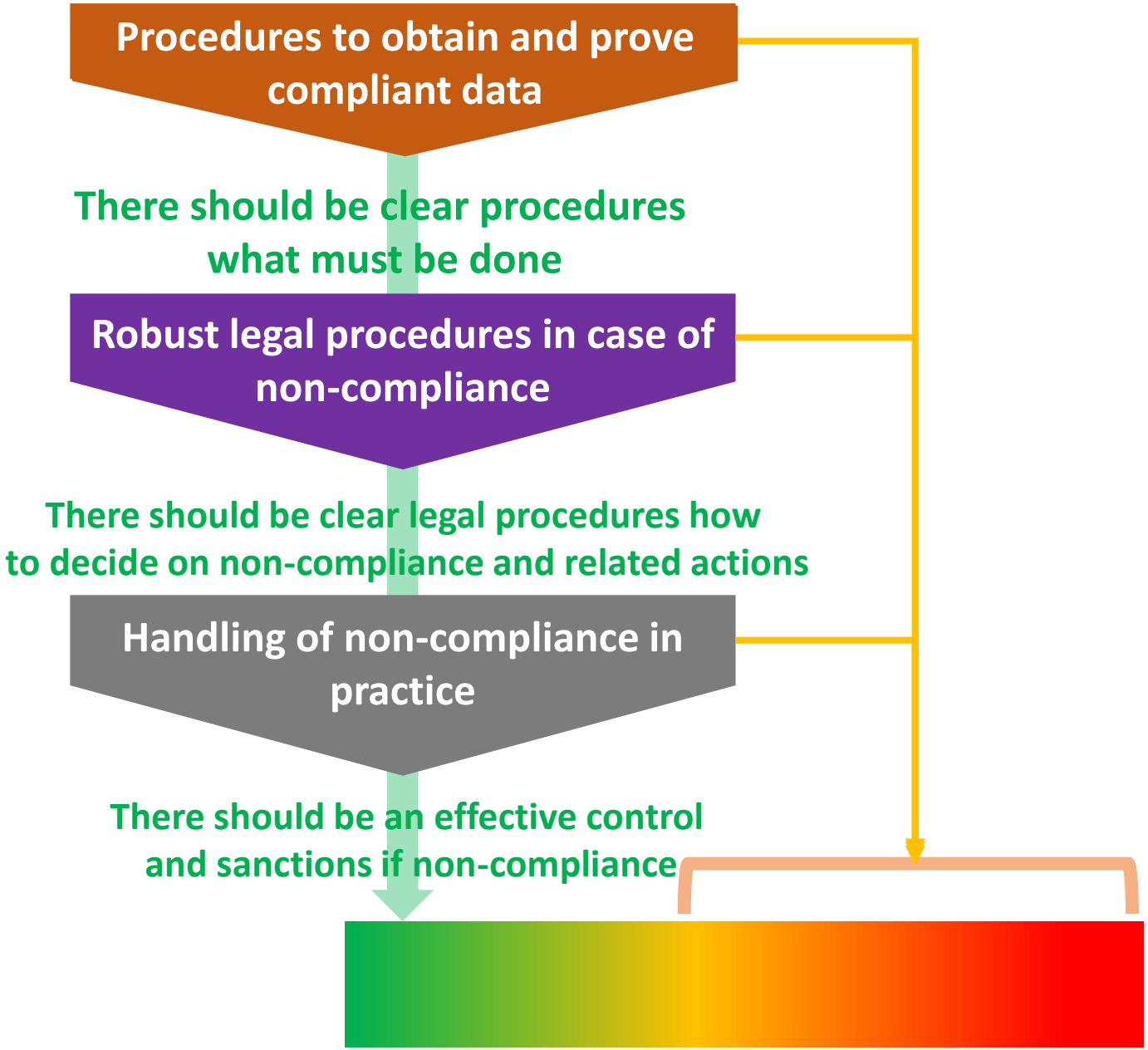
Source book “Compliance in relation to EPC”

! Societal support !



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STEP 1: Procedures to obtain and prove compliant data

! Societal support !

There should be clear pr
what must be done

Robust legal procedures in case of non-compliance

There should be clear legal procedures how to decide on non-compliance and related actions

Handling of non-compliance in practice

There should be an effective control and sanctions if non-compliance

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Towards better quality and compliance

STEP 2: Robust legal procedures in case of non-compliance

! Societal support !

There should be clear procedures what must be done

Robust legal procedures in case of non-compliance

There should be clear legal procedures how to decide on non-compliance and related actions

Handling of non-compliance in practice

There should be an effective control and sanctions if non-compliance

Loss of License

STEP 3: Handling of non-compliance in practice

! Societal support !

There should be clear procedures what must be done

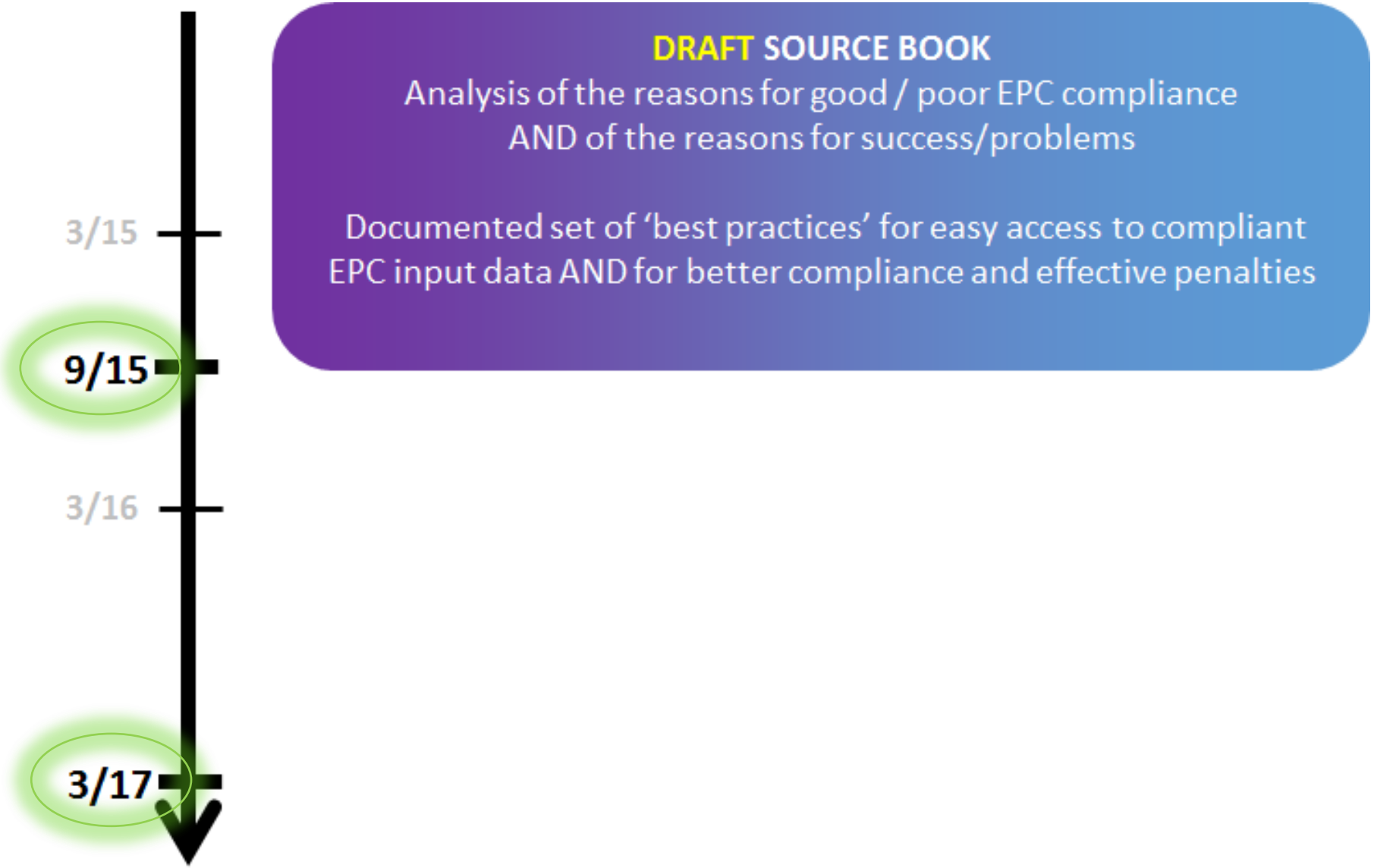
Robust legal procedures in case of non-compliance

There should be clear legal procedures how to decide on non-compliance and related actions

Handling of non-compliance in practice

There should be an effective control and sanctions if non-compliance

Timeline for both QUALICHeCK sourcebooks…



DRAFT SOURCE BOOK

Analysis of the reasons for good / poor EPC compliance
AND of the reasons for success/problems

Documented set of 'best practices' for easy access to compliant EPC input data AND for better compliance and effective penalties

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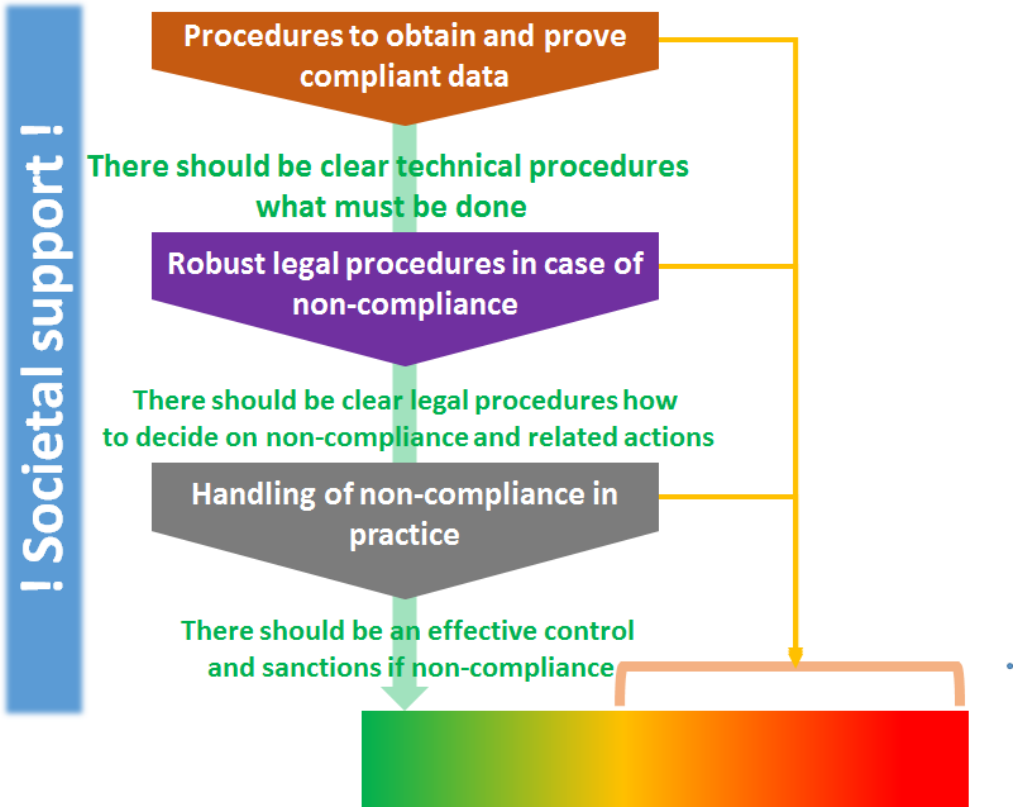
2nd QUALICHeCK conference Brussels

September 4 2015

Focus on

- "**better compliance/quality of the works**"
- " Review of **EPBD recast**?"



September 2015						
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

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Towards better quality and compliance

International QUALICHeCK workshops

(Supported by REHVA)

- Transmission characteristics — **TALLINN – October 2016**
- Ventilation and airtightness — **LUND - 16-17 March 2015**
- Sustainable summer comfort techniques — **ATHENS – 9-10 March 2016**
- Renewables in multi-energy systems — **LYON – ~January 2017**

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2nd QUALICHeCK workshop 'Sustainable summer comfort'

March 9-10 2016 Athens (Greece)

2-days workshop

Technologies to be covered:

- Solar control
- Thermal mass
- Ventilative cooling
- Cool roofs
- Daylighting

Structure of the presentation

- About good compliance and good quality of the works
- What kind of activities in QUALICHeCK?
- Outcomes of QUALICHeCK
- **Some considerations about future challenges**
- Conclusions

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Some considerations about future challenges

- Should there be more attention by the Member States for compliance and quality of the works?

- Should these issues receive attention in the framework of a revision of the EPBD?

Structure of the presentation

- About good compliance and good quality of the works
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Conclusions

- We have to be ambitious in terms of the requirements imposed for the energy performances of new and renovated buildings

- But it is also very important to create boundary conditions that:
  - Result in good compliance (a ‘reliable’ EPC)
  - Result in good quality of the works

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