Tallinn
27 April 2017

QUALICHeCK
Towards better quality and compliance

The QUALICHeCK project:
Context – Status on the ground – How to progress…

Peter Wouters
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

INIVE

Structure of the presentation

- Context of QUALICHeCK activities
- The QUALICHeCK project
- QUALICHeCK outcomes
- Quality of the works - control might be necessary
- Can BIM be a game changer?
- Conclusions

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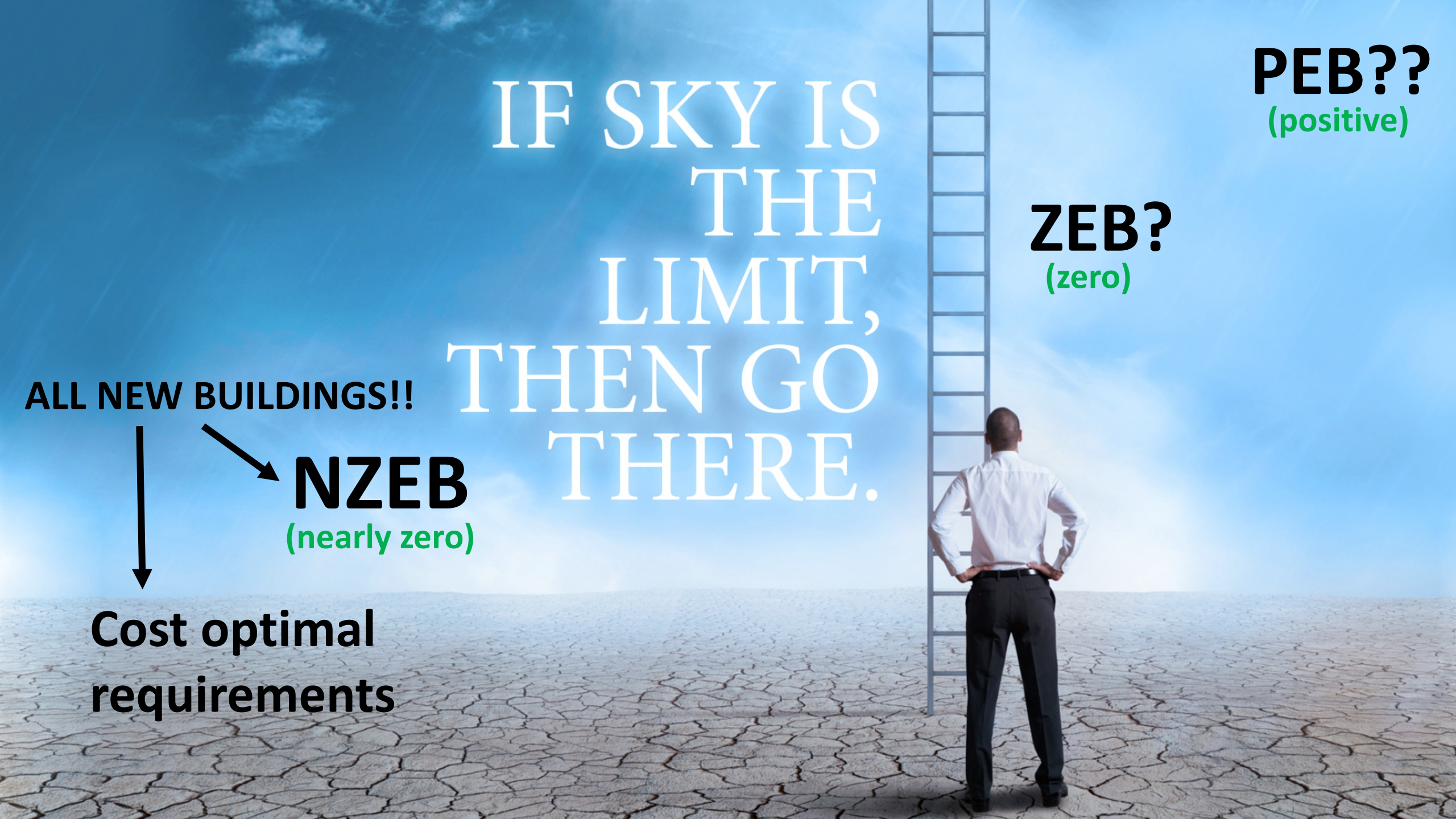
IF SKY IS THE LIMIT, THEN GO THERE.
PEB??
(positive)
ZEB?
(zero)
ALL NEW BUILDINGS!!
NZEB
(nearly zero)
Cost optimal requirements

You expect a reliable label

… and you expect a good quality

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79 g/km
Yaris Hybrid

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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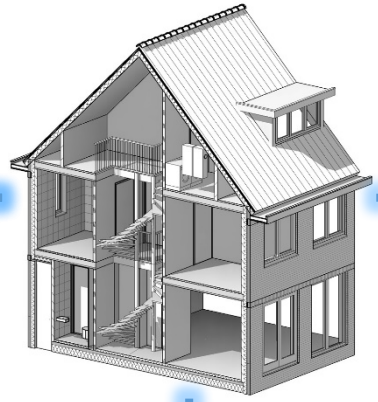
EPBD Article 27 - Penalties

- Member States shall lay down the rules on penalties applicable to infringements of the national provisions adopted pursuant to this Directive and shall take all measures necessary to ensure that they are implemented.
- **The penalties provided for must be effective, proportionate and dissuasive.**
- Member States shall communicate those provisions to the Commission by 9 January 2013 at the latest and shall notify it without delay of any subsequent amendment affecting them.

2 societal expectations…

- *There should be (more) attention for* ***<u>EPC compliance of new and renovated buildings</u>***

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



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 syster
- **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'.

4 focus areas in QUALICHeCK

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

= National consortium
ÍSLAND
Reykjavik
SVERIGE
SUOMI
FINLAND
NORGE
Oslo
Stockholm
Helsinki
Helsingfors
Tallinn
EESTI
Riga
LATVIJA
LIETUVA
Vilnius
Minsk
BELARUS
Moskva
RUSSIJA
UNITED KINGDOM
IRELAND
ÉIRE
Dublin
Baile Átha Cliath
London
DANMARK
København
NEDERLAND
Amsterdam
Berlin
BELGIE
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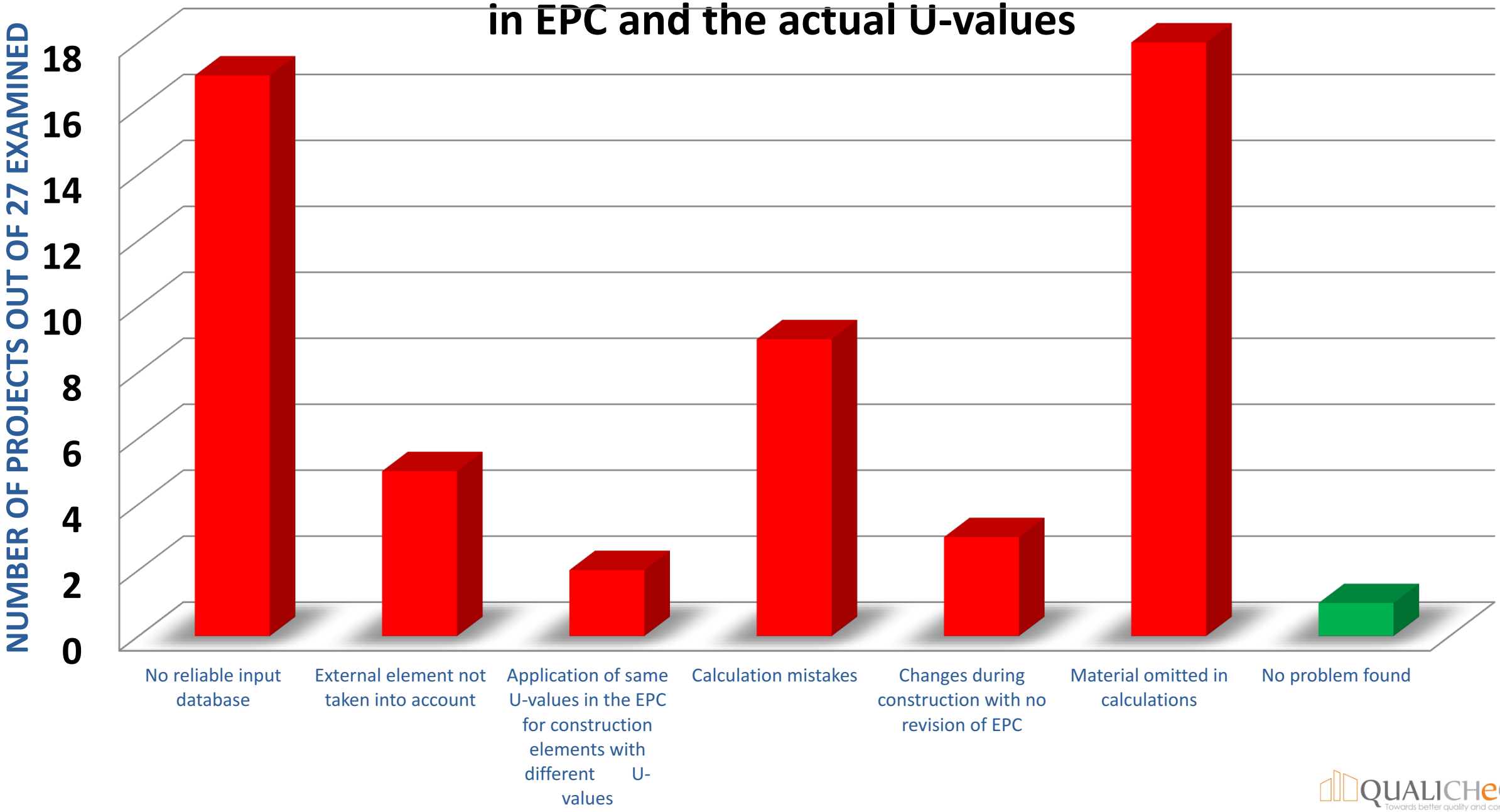
Athinai
Alger
Rabat
Tunis
EL MAGHREB
EL DJAZĀIR
TOUNIS
Valletta
MALTA
ΚΥΠΡΟΣ
Λευκωσία
Lefkosia
Lefkoşa
LIBNAN
Beyrouth
MADEIRA (P)
Paramaribo
SURINAME

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



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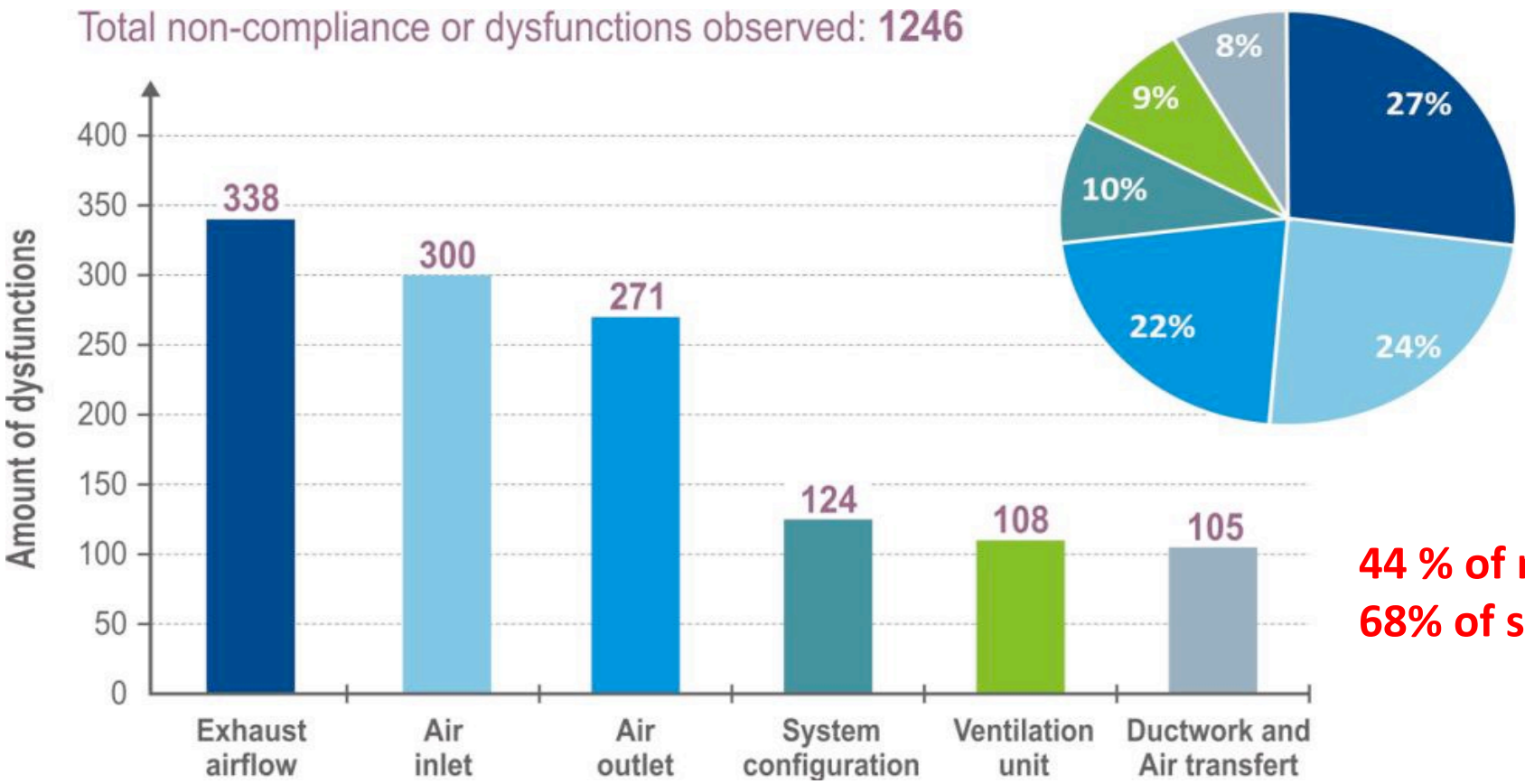
Example from FRANCE:
Quality of ventilation systems in 1.287 new dwellings



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

2: 50% of new residential ventilation systems don’t work well

rganisations signed in 2012 a declaration that in 2015 all systems rectly

nts

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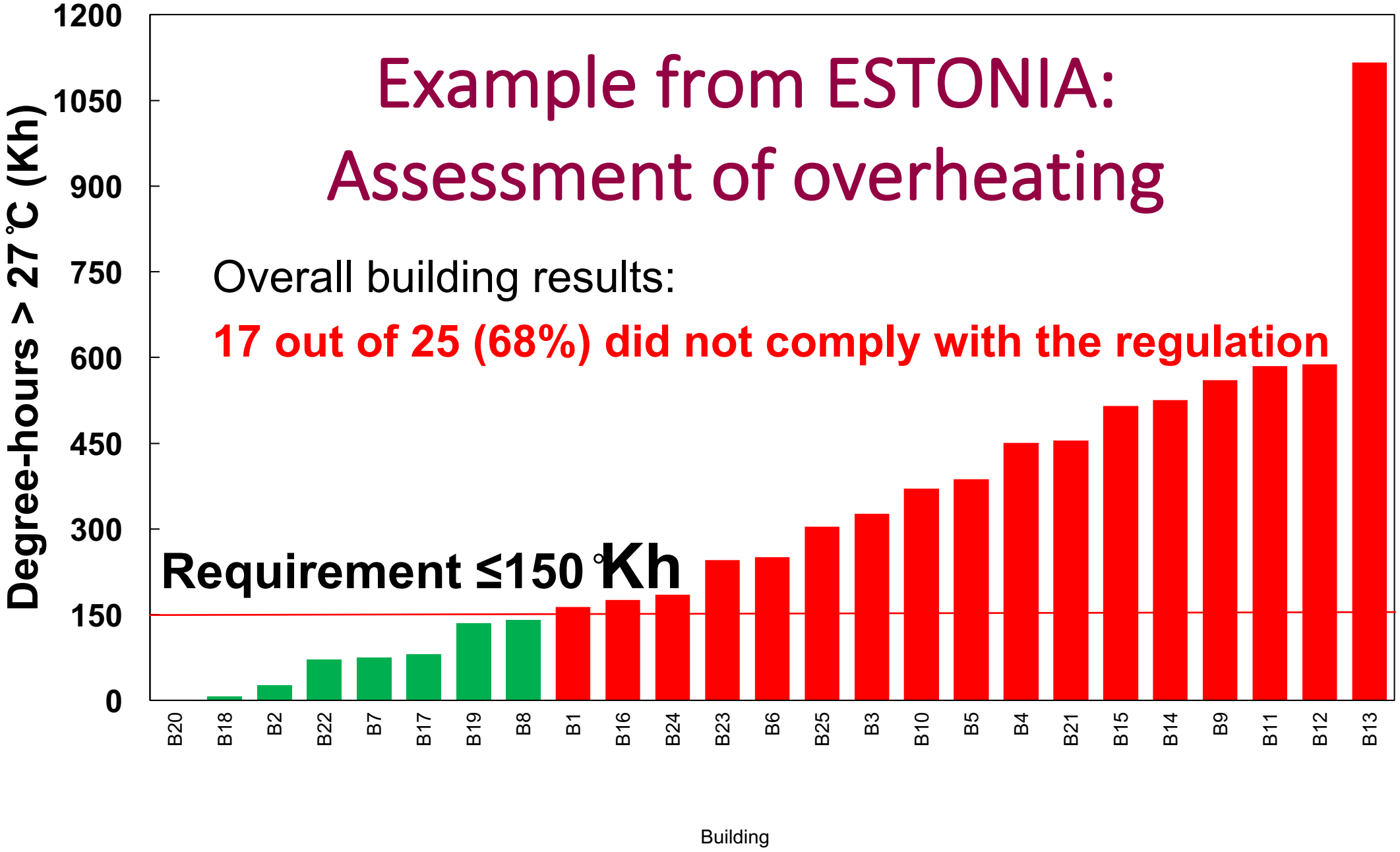
Example from ESTONIA: Assessment of overheating

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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QUALICHeCK products and outcomes

- 2 booklets
- 3 global reports
- 2 source books
- 9 country reports
- 54 fact sheets
- 6 newsletters
- 16 webinars
- 4 conferences
- 4 focused technology workshops
- 9 national roadshows
- 3 special issues of REHVA Journal
- …

QUALICHeCK website

www.qualicheck-platform.eu

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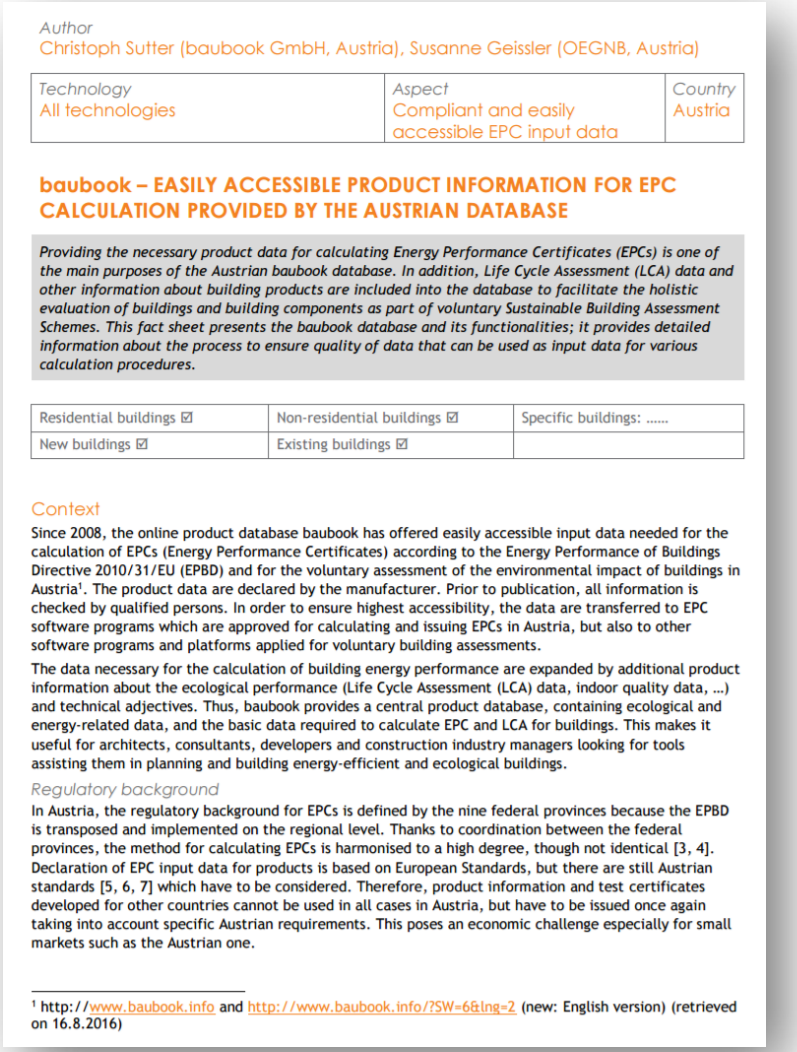
Factsheets



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

Technology	Aspect	Country
All technologies	Compliant and easily accessible EPC input data	Austria

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

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[1]. 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.

[1] 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

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Fact Sheets by topic

TECHNOLOGIES / ASPECTS	Transmission Characteristics	Ventilation and Airtightness	Sustainable Summer Comfort Technologies	Renewables in Multi-Energy Systems
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

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FACT SHEET #52 | QualiShell: Romanian qualification schemes for installers of opaque building elements and/or window systems

Posted on 2017/02/17 by Alexander Deliyannis

The Romanian project 'BUILD UP Skills QualiShell' has as its main objectives to substantiate, develop and promote two national qualification schemes for the most releva
efficie
Contin

FACT SHEET #51 | Increasing the expertise of building professionals for a better quality of construction: the French programme PACTE

Posted on 2017/02/17 by Alexander Deliyannis

The quality of construction in France can still be improved, especially for high energy efficiency buildings. National programmes have been implemented. The national progra
series
Contin

FACT SHEET #47 | Quality control frameworks for cavity wall insulation

Posted on 2017/02/17 by Alexander Deliyannis

Several countries have installed a quality control system to provide confidence in the quality of the works of cavity wall insulation in existing walls. Based on the experiences in Belgium and the
Continue reading →

FACT SHEET #44 | The quality assurance system of the German reconstruction loan corporation (KfW) in the field of energy-efficient construction and retrofitting (residential buildings)

Posted on 2017/01/26 by Alexander Deliyannis

In the scope of the KfW funding programmes "Energy-Efficient Construction and Refurbishment", loans and subsidies from federal funds are granted. Under this scheme, eligibility for funding implies stricter energy requirements on new constructions and on buildings subject to refurbishment than …
Continue reading →

FACT SHEET #30 | Critical situations on the construction site and ideas for quality assurance procedures: The German perspective

Posted on 2016/12/30 by Maria Dimitropoulou

The outcomes of the EU IEE project QUALICHeCK with a focus on improved quality on the construction site were mirrored in a dedicated workshop with 15 research experts in the field of energy efficient new buildings, renovations and energy efficient ...

FACT SHEET #29 | WE-Qualify project: Improving the Cypriot workforce skills

Posted on 2016/12/30 by Maria Dimitropoulou

The Cypriot project 'We Qualify' has as its main objective to help the construction sector of Cyprus to overcome the barrier of lack of skills in its workforce and especially the lack of qualified personnel for the construction of energy ...

FACT SHEET #28 | Voluntary Green Building assessment paves the way for better as-built quality

Posted on 2016/12/30 by Maria Dimitropoulou

The work on the Austrian voluntary green building assessment scheme called TQB (Total Quality Building) started at the end of the 1990ies, responding to a serious

FACT SHEET #09 | AMA – General material and workmanship specifications

Posted on 2016/03/23 by Maria Dimitropoulou

AMA (General material and workmanship specifications) has been used in Sweden for more than sixty years. The different parts of AMA are used as reference documents in technical specifications. Between 90 and 95% of all building projects in Sweden refer ...

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Focused technology workshops

- **Focus area ventilation and airtightness**:
  - March 16-17 2015 in Lund
  - With support from TightVent, venticool, AIVC and REHVA
- **Focus area sustainable summer comfort**:
  - March 9 – 10 2016 in Athens
  - With support from the European Cool Roof Council, ES-SO, venticool and AIVC
- **Focus area transmission losses**:
  - December 15 2016 in Brussels
  - With support from EURIMA
- **Focus area renewables in multi-energy systems**:
  - January 17-18 2017 in Lyon

→ All presentations are available on the website

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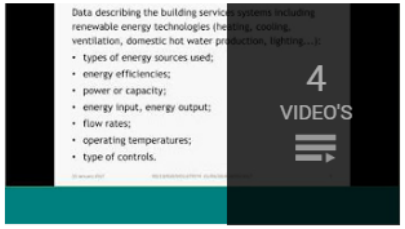
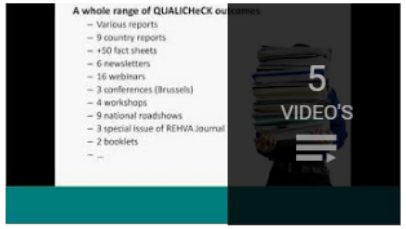
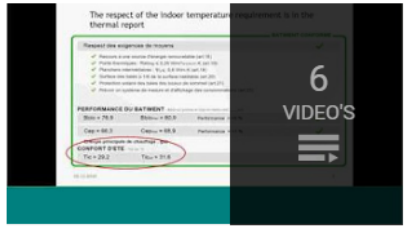


QUALICHeCK Webinar #14 2017 01 25 Renewable energy systems

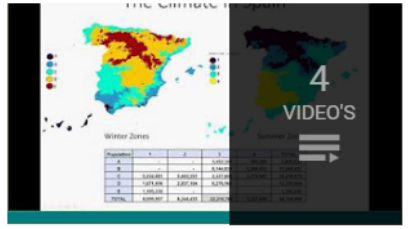


QUALICHeCK Webinar #13 2017 01 24 Envelope performance

QUALICHeCK Webinar #12 2016 12 13 A guide for policy makers

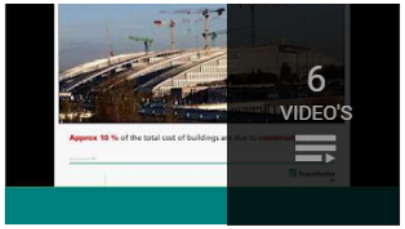


QUALICHeCK Webinar #11 2016 12 02 Prevention of summer…

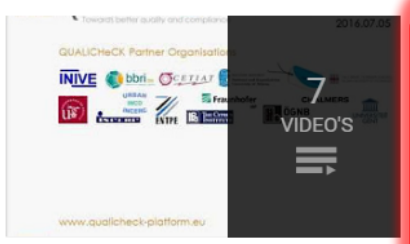


QUALICHeCK Webinar #10 2016 12 01 Ventilative cooling…

QUALICHeCK Webinar #09 2016 09 28 Cool Roofs

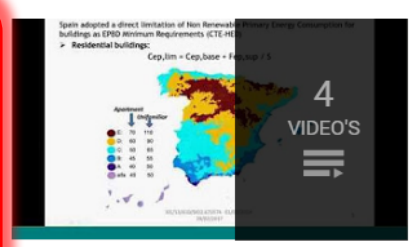


QUALICHeCK Webinar #08 2016 09 16 Certification Schemes



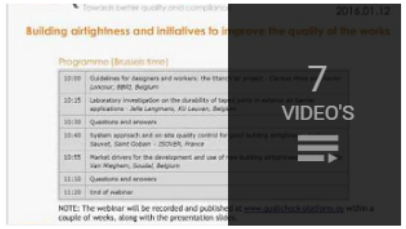
QUALICHeCK Webinar #07 2016 07 05 EPCs Databases

QUALICHeCK Webinar #06 2016 06 28 Product Databases

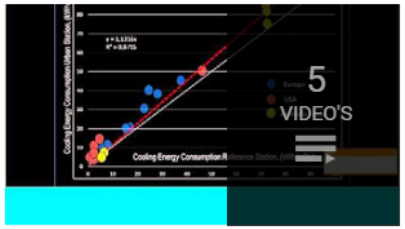


QUALICHeCK Webinar #05 2016-06-23 Solar Control

QUALICHeCK Webinar #04 2016 06 15 Transmission Losses



QUALICHeCK Webinar #03 2016 01 12 Building airtightness



QUALICHeCK Webinar #02 2015 12 17 Ventilative cooling BE, EE…

QUALICHeCK Webinar #01 2015 04 27 Compliant Energy…

QUALICHeCK Webinar 2016 06 28 Product Databases

QUALICHeCK Platform • 6 video's • 9 weergaven • Laatst geüpdatet op 14 aug. 2016

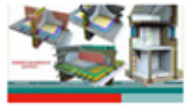
Product databases and compliance of input data for the Energy Performance Certificates (EPCs) of buildings

Tuesday 28 June 2016, 11.00 – 12.20 Brussels time (CET)

1
QUALICHeCK Webinar 06 2016 06 28 Product Databases 1 Francois Durier
door QUALICHeCK Platform

2
QUALICHeCK Webinar 06 2016 06 28 Product Databases 2 Xavier Loncour
door QUALICHeCK Platform

3
QUALICHeCK Webinar 06 2016 06 28 Product Databases 3 Q&A #1
door QUALICHeCK Platform

4 
QUALICHeCK Webinar 06 2016 06 28 Product Databases 4 Bart Ingelaere
door QUALICHeCK Platform

5
QUALICHeCK Webinar 06 2016 06 28 Product Databases 5 Susanne Geissler
door QUALICHeCK Platform

6
QUALICHeCK Webinar 06 2016 06 28 Product Databases 6 Q&A #2
door QUALICHeCK Platform

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Source book on quality of the works

Aim:

To give guidance towards better frameworks for quality of the works

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QUALICHeCK platform

- **Objective:**

  To continue collaboration around this topic beyond the duration of the project

- **Members and associated members**

eurima
European Insulation Manufacturers Association

EUROPEAN WOODSHADING ORGANISATION
energy savings & comfort

venticool
the international platform for ventilative cooling

TightVent Europe
BUILDING AND DUCTWORK AIRTIGHTNESS PLATFORM

BPIE

3E

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- Context of QUALICHeCK activities
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Quality frameworks

- **Without third party control**
  - By owner, architect, …
  - Very direct, but not always the required competence, sometimes conflict of interest, …

- **By third parties**
  - Control of competence of designers, of executers, …
  - Control of execution of the works
  - Control of achieved performances

Combining capacity building with enforcement schemes

EPBD related administrations

Cost-optimal and nZEB requirements

TRAINING:
Need for more and/or improved training?

EPBD related administrations

Cost-optimal and nZEB requirements

TRAINING:
Need for more and/or improved training?

Yes

TRAINING:
New offers of training
Upgrading existing training
…

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EPBD related administrations

Cost-optimal and nZEB requirements

TRAINING:
Need for more and/or improved training?

Yes

TRAINING:
New offers of training
Upgrading existing training
…

No

COMPETENCE:
Need for checking competence of workers?

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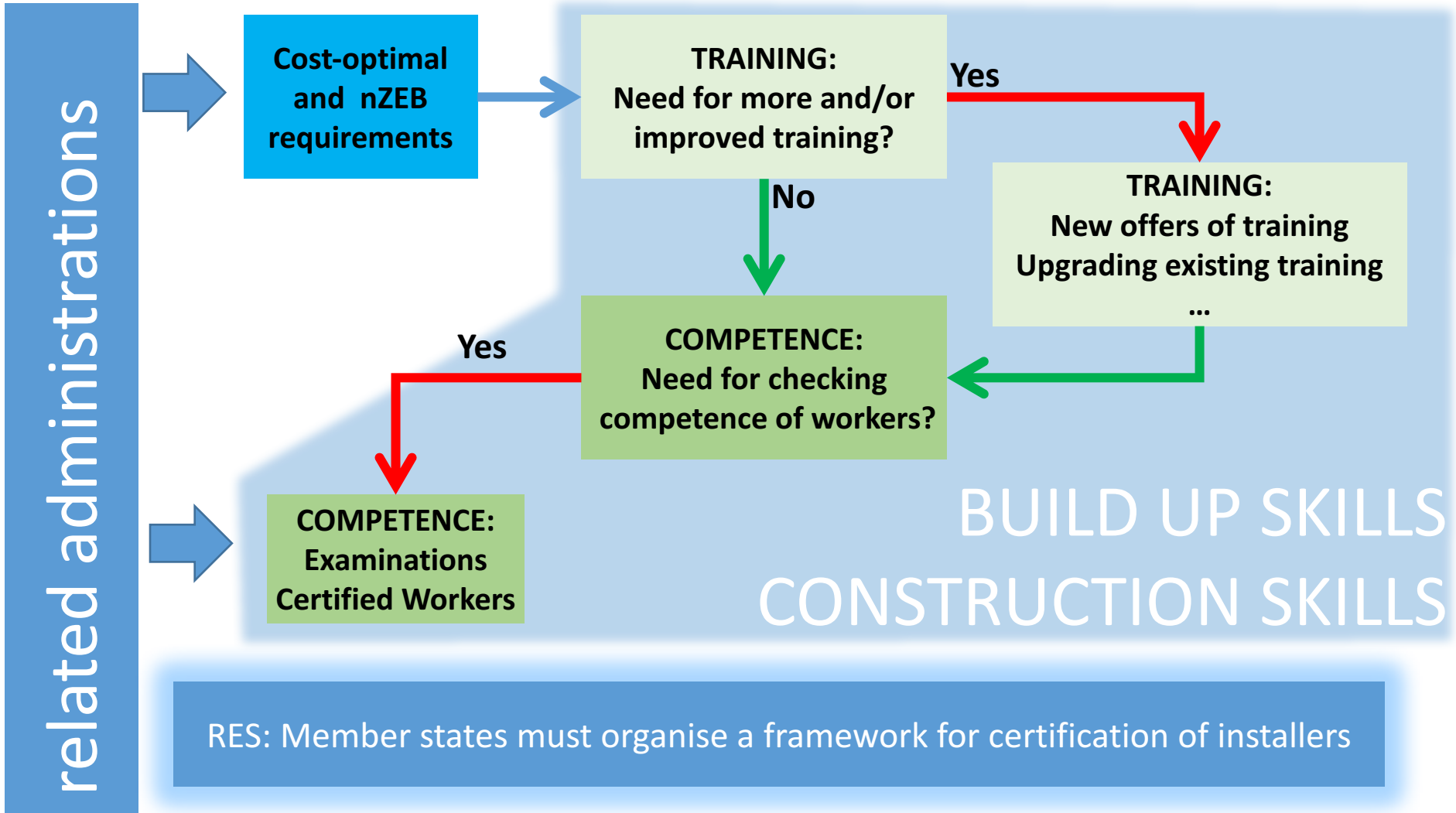
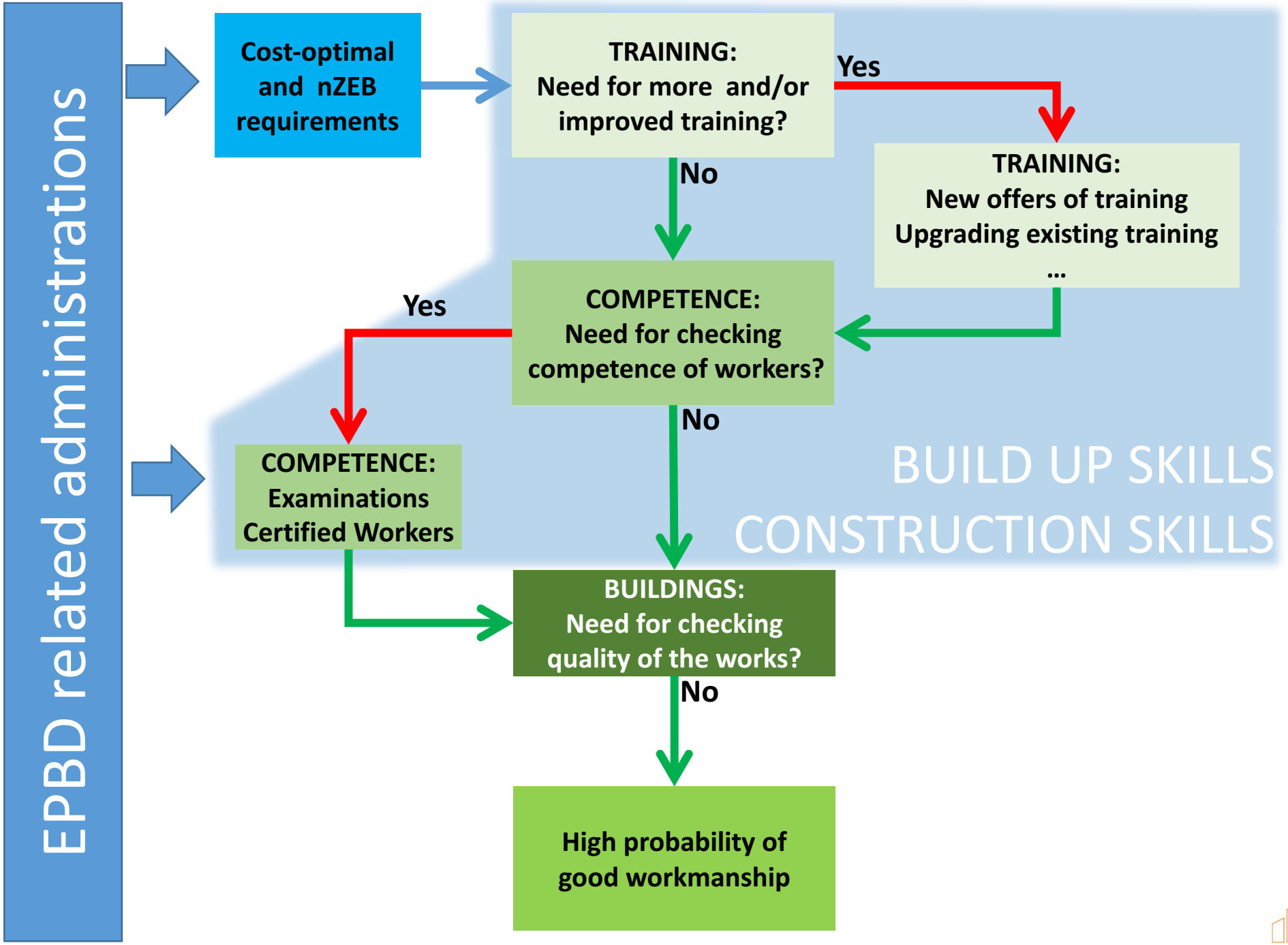


RES: Member states must organise a framework for certification of installers



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The impact of training activities on quality of the works?

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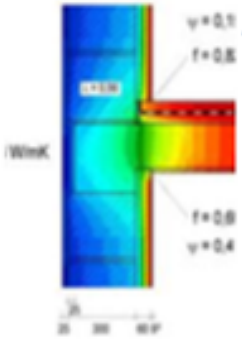

Thermal bridges

Belgium
France
Germany
Netherlands
…
Interesting EPBD related approaches…

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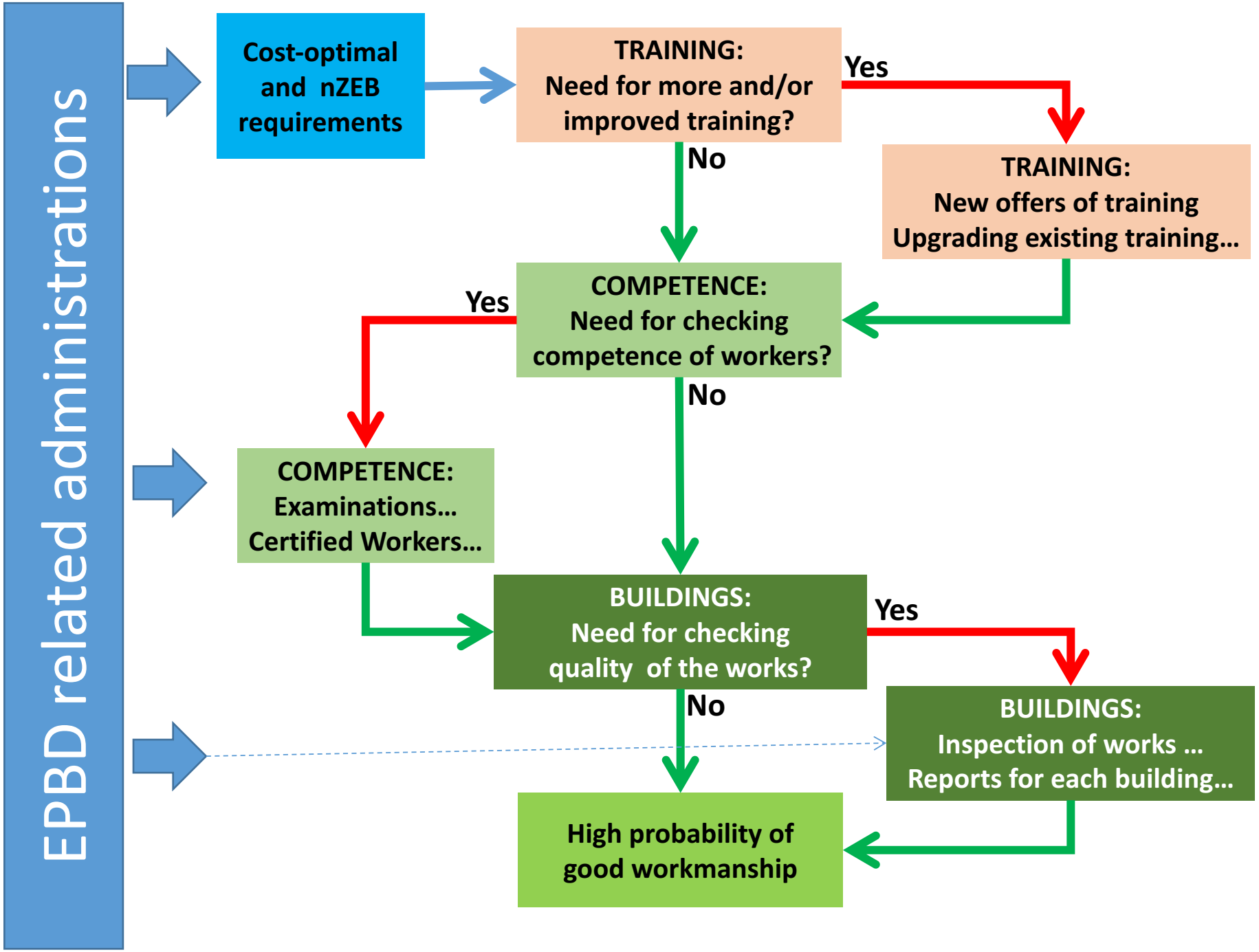

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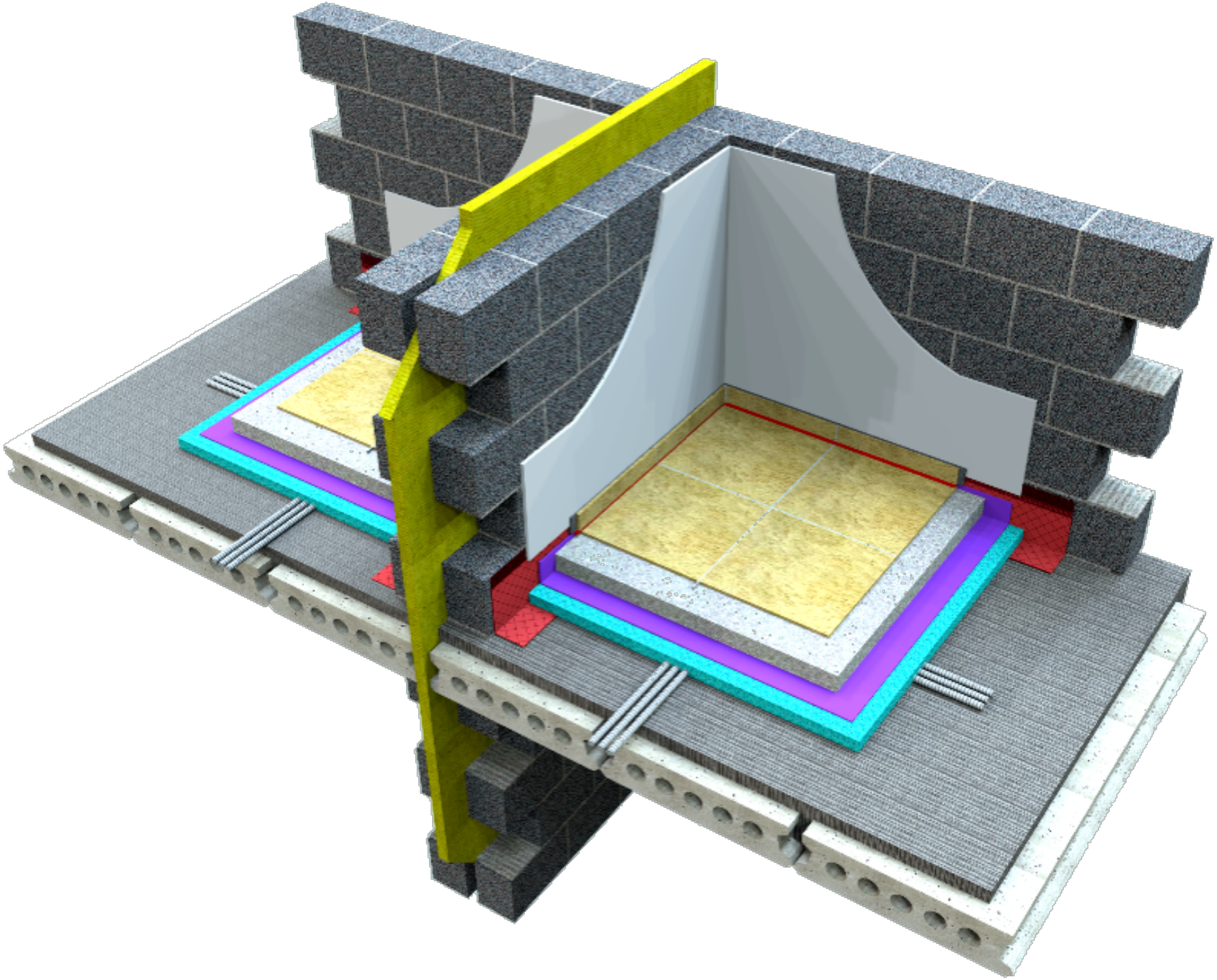

3D building nodes

Acoustics
Fire protection
…

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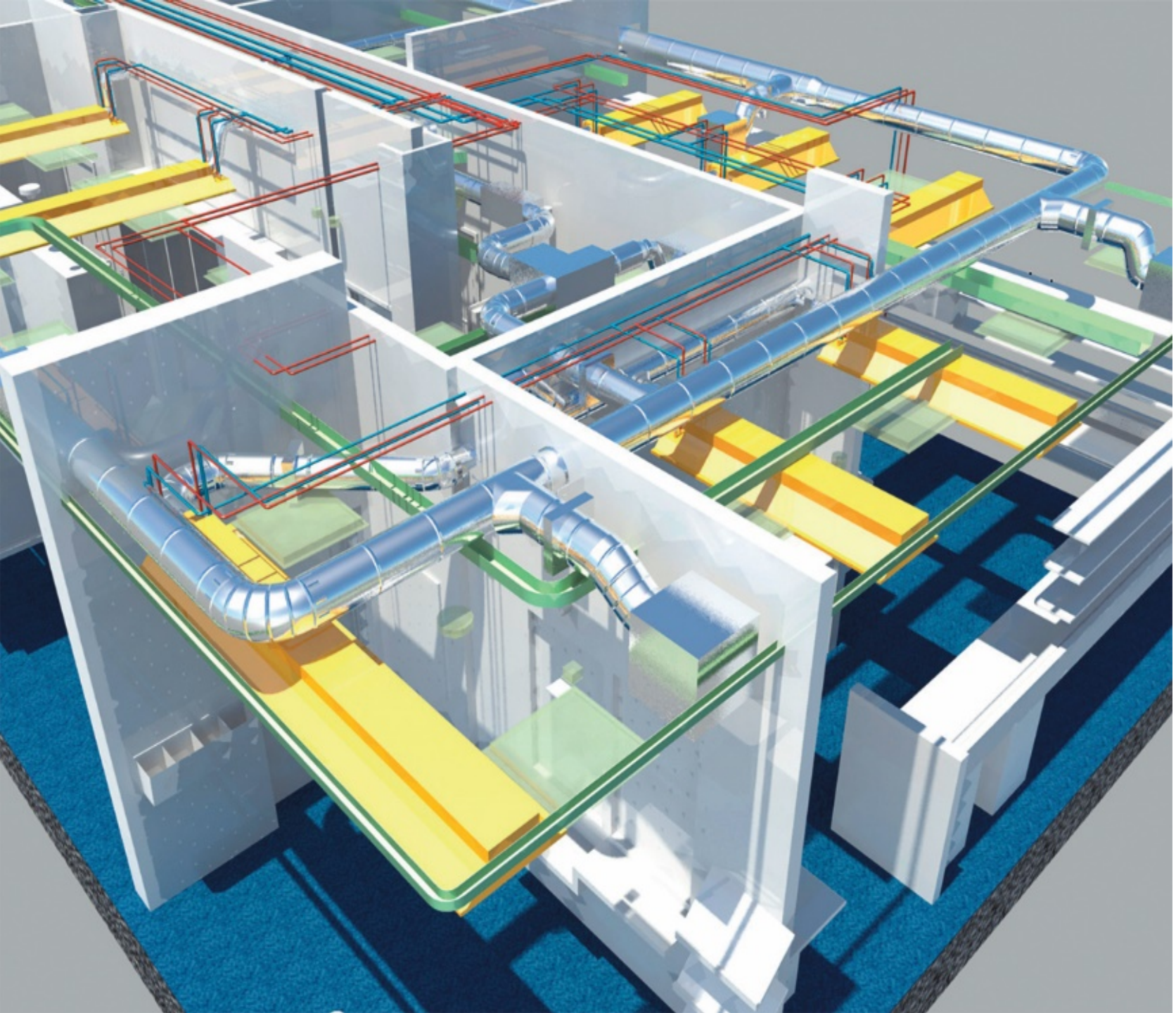

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Towards better quality and compliance

What if BIM would be widely used?

- All building elements have associated performances
  - E.g. fan, concrete, lighting luminaire, ductwork, …
- It would be possible to have complex calculations with limited efforts
  - E.g. thermal bridge calculations → whole building is a 3-dimensional object
- It could be possible to optimise the dimensioning of a system
  - E.g. heat pump, solar collector, floor heating, ventilation
- It could be possible to assess the correctness of building details
  - Not only in energy terms, also acoustics, stability, fire, …

EPC Compliance and enforcement:
BIM creates a new context…

- If BIM covers all kind of aspects, there probably will be a large pressure from various partners in the project to have a dossier as built

- In such context, there is a much smaller need for a specific pressure for checks on compliant energy performance input data

- New challenges/opportunities for (CEN-ISO) standards

Quality of the works:
BIM creates for many areas a new context…

- Correct dimensioning of installations: more or less automatic check possible and even optimised dimensioning
  - Poor quality of the works is often linked to poor specifications/dimensioning
    - E.g. ventilation, solar collectors, heat pumps, PV installations, …

- Of course not possible to check the quality of execution by the workers, but if the specifications are very clear, less probability of poor execution
- …

Structure of the presentation

- Context of QUALICHeCK activities
- The QUALICHeCK project
- QUALICHeCK outcomes
- Quality of the works - control might be necessary
- Can BIM be a game changer?
- **Conclusions**

Conclusions

- Not evident to assume that EPC information is compliant
- Important that EPC reflects well the performance of systems
- Important to pay attention to frameworks for better quality of the works
- BIM can be a game changer

Thank you for your attention!

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