

QUALICHeCK – kvaliteedi ja tõendamise EL projekt

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QUALICHeCK-i teemad

Probleemid:

- Energiatõhususe reaalne saavutamine
- Energiamärgiste usaldusväärsus
- Usaldusväärsed lähteandmed

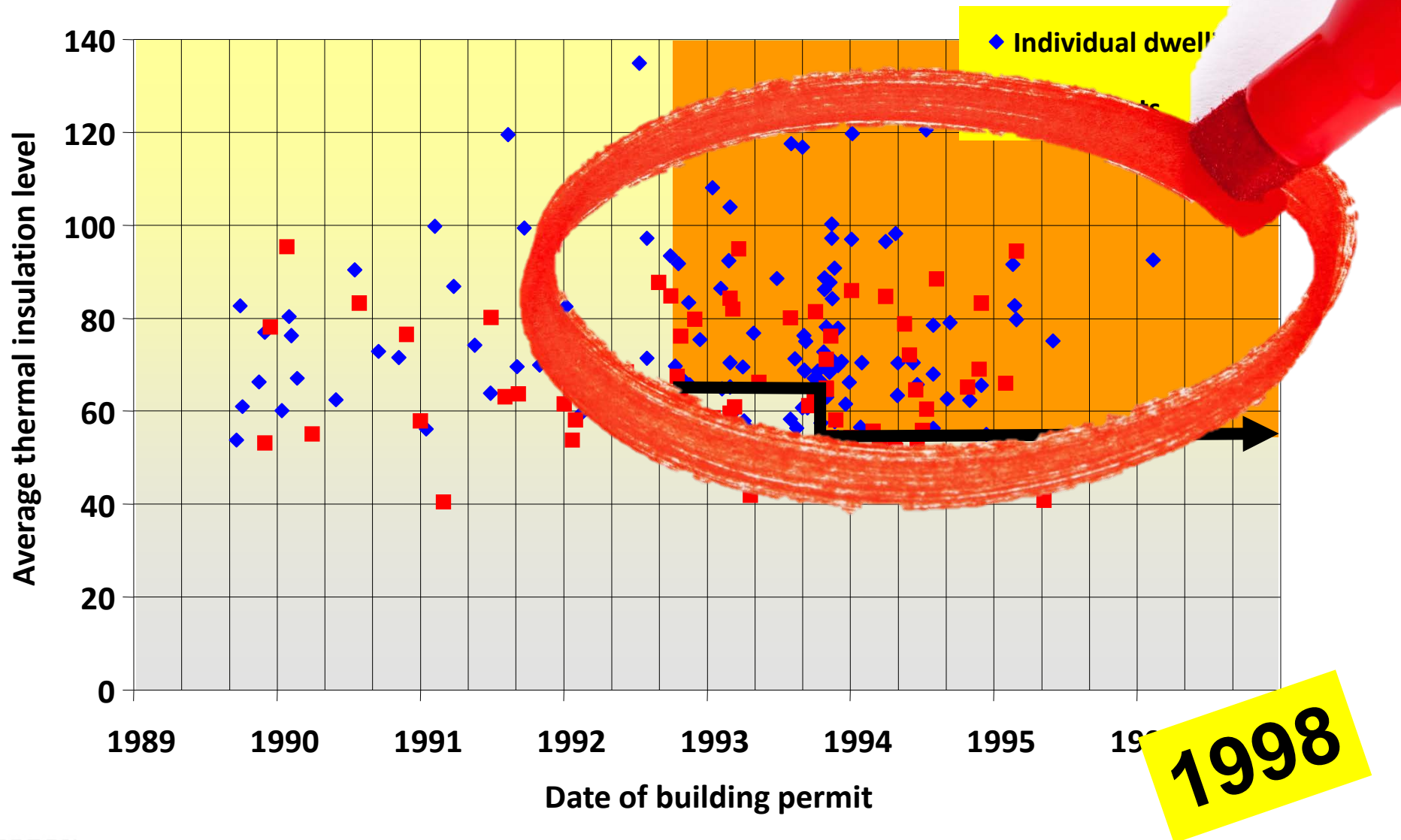
QUALICHeCK-i tegevused:

- Miinimumnõuete tõendamine ja läheandmete (arvutuste) dokumenteerimine
- Tööde kvaliteedi tagamine
- Projekteerimise ja ehitamise aegsed kontrollmehanismismid
- Sanktsioonid ja karistused

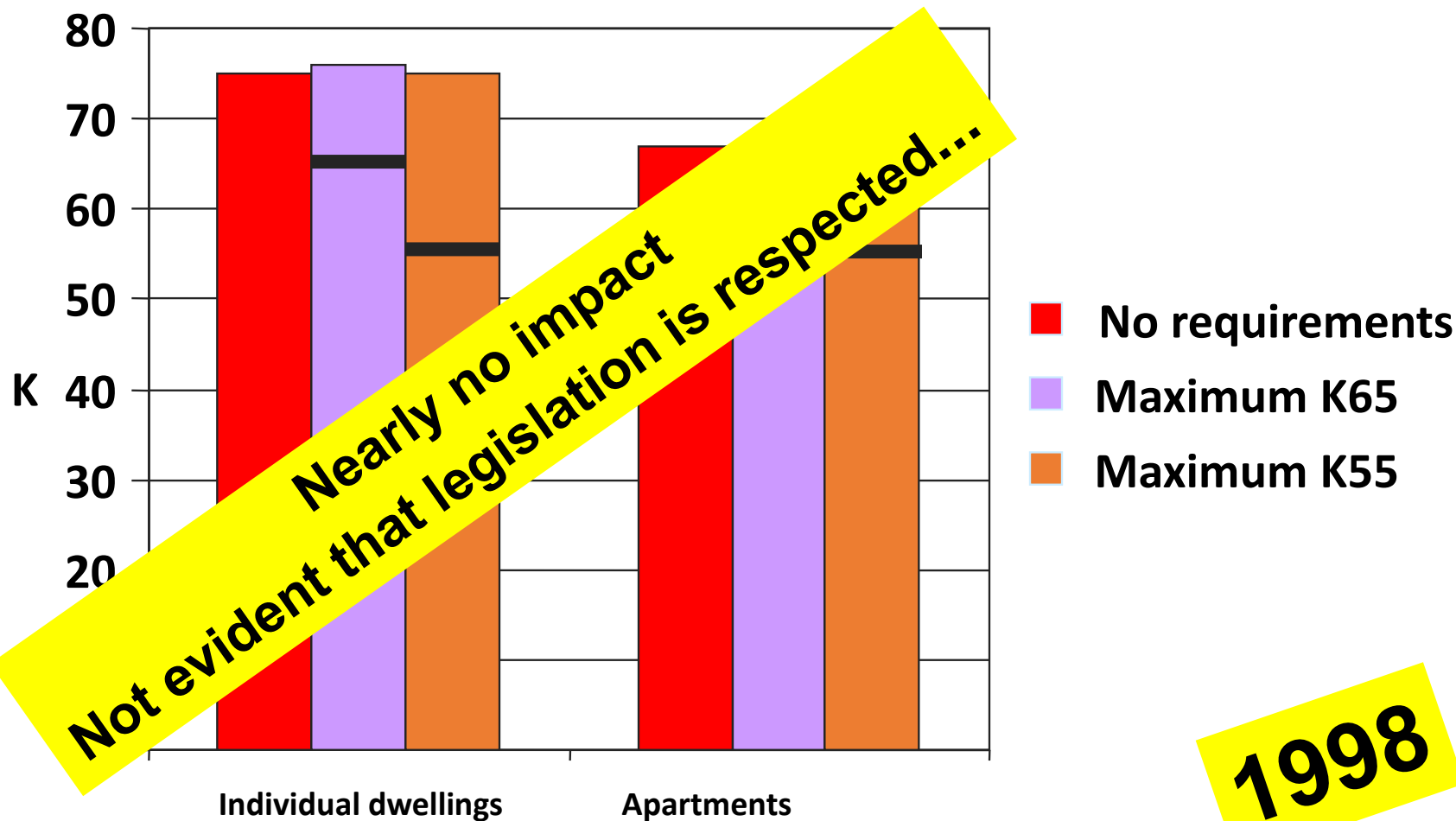
Karmistuvad nõuded vs. ehitusturg

- Oluline, et uued nõuded rakenduvad ehituses ...
- ... et projektides, märgistes ja aktides raporteeritud sooritusvõime (ETA, õhuleke, külmasillad, tooteomadused jne.) on usaldusväärsed
- Palju näiteid, et nõuded ei rakendu kavandatud viisil ilma vajalike protseduuride väljatöötamise ja juurutamiseta (tüüplahendused, pilootprojektid, järelevalve, mõõtmised, tõendamised, juhendid, koolitus)

Impact of legislation? Results of Belgian SENVIV-study



Results for different periods...



QUALICHeCK approach

Status on the ground

- Existing data analyses report based on 31 previous studies:
 - Measured performance
 - Reliability of input data
 - Quality of the works
 - Compliance frameworks
- 10 new data collection studies from 9 focus countries
 - 10 reports + summary



Mikk Maivel, Kalle Kuusk, Raimo Simson, Jarek Kurnitski, Targo Kalamees (Tallinn University of Technology, Estonia)

Field data confirms concerns for compliance and quality of the works

- “Status on the ground” report based on outcomes of 31 studies addresses specific concerns on performance data from the field, the compliance of the input data, the quality of the works, and the compliance frameworks
- Technology areas covered:
 - Transmission characteristics and air tightness
 - Ventilation systems
 - Summer thermal comfort solutions
 - Renewable systems (heat pumps, thermal solar, PV)



New data collection studies on

- EP compliance and EPC input data quality (5 studies)
 - Site visits
 - Check of design documentation
 - New EPC calculation
- Summer thermal comfort compliance (1 study)
 - Measurements, design documentation, temperature simulations
- Reliability of EPC issued with different methods (1 study)
- Transmission characteristics related studies (3 studies)
 - Cavity insulation: quality framework for cavity wall insulation
 - Windows: input data on window thermal performance
 - U-values compliance

→ Reports available in June 2016

Some findings: **Compliance frameworks**

- Compliance frameworks may stop to scheme design/building permit; final design, construction and actual energy performance of buildings is not under control, i.e. the **compliance is controlled until issuing the building permit**
- Many of countries have no control mechanism for:
 - Final design/production information
 - Design changes during construction
 - Commissioning

Typical examples of approval procedures in design and construction phases

Submission of preliminary design to apply building permit	Building permit is issued by local authority based on (preliminary) scheme design documentation and EPC.
Final design / production information	Usually there is no official control mechanism for final design stage, energy calculations are not required to be repeated (exemption e.g. province Salzburg where a design EPC and a completion EPC is required).
Design changes	The building owner, or the site supervisor representing the building owner, is responsible to fulfil legal obligations such as the energy performance minimum requirements and in the case of significant design or component changes, energy calculations have to be revised, but as there is no control mechanism, this is not followed in practice.
Commissioning	Commissioning includes several measurements, but is only required for the housing subsidy scheme and for voluntary building certification (e.g. TQB, klima:aktiv, Passivhaus)
Completion announcement, handover and permit of use	The building authority issues the permit of use based on the completion announcement and connected with a site visit, but in fact there is no inspection. With the permit of use the building may be occupied.
Operation phase	New energy certificate after 10 years is mandatory.

4 out of 9 countries have compliance frameworks extended to final design and construction and commissioning phases

Assessment type ^a →	Calculated (asset)		Measured (operational)	
Sub-type ^a →	Design		As-built	Actual
Typical time frame →	Building permit		After completion of the works	<2 years after completion
Used for EPC →	Yes	No	Yes	Yes
Country ↓				
AT	•			
BE			•	
CY	•			
EE	•			
ES		•	•	
FR		• ^b	•	
GR				
RO		• ^b	•	
SE		• ^b		•

^a Defined in FDIS ISO 52000-1:2016 (Energy performance of buildings — Overarching EPB assessment — Part 1: General framework and procedures)

^b Not based on EPC method

Control of performances!



**Accredited
organisation(s)**

Government



**Certified
building
contractor**

**Random
checks**



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Towards better quality and compliance



Building airtightness

French approach in framework of new regulations introduced in 2012



OPTION 1: Certified tester

Control of the end result!



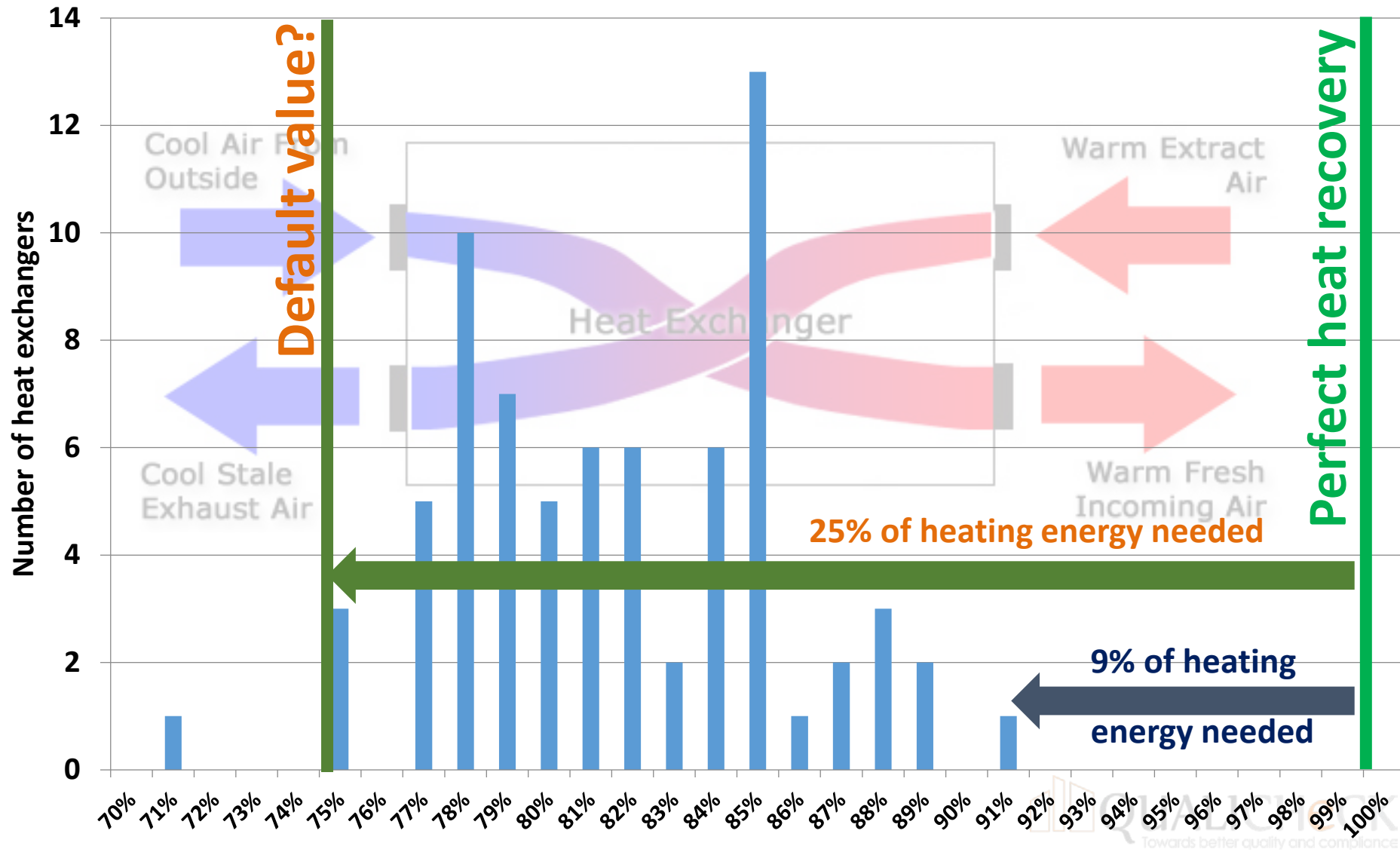
OPTION 2: Building firm with integral quality approach

Control of competence/organisation AND end result!

Some findings: **Reliable input data**

- Because of EPC procedure of EPBD this area is somewhat under control:
 - National procedures do exist
 - Building permit is not issued without EPC calculation
 - EPC databases are based on building permit, not “as built” data
- Developed schemes to improve input data quality:
 - Approaches of certified products and products databases – to be sure that correct product data is used
 - Approaches focusing on documentation – to be sure that the values actually used are documented
- Random checks of EPC calculations (EPBD requires)

Default values may stop the progress



Some findings: **Measured performance**

- Poor ventilation could be seen as a major European problem: ventilation rates and noise typically did not comply
- Ductwork air tightness is an issue in Central Europe, but was solved 30 years ago in North Europe
- Building leakage showed both good and bad examples
- Limited data on transmission characteristics (mostly inconclusive, additional studies needed)
- Heat pumps, solar thermal and other renewables showed good performance if certified installers etc. schemes applied
- Limited data on summer thermal comfort (not well addressed in building codes)

Most of ventilation studies report poor performance

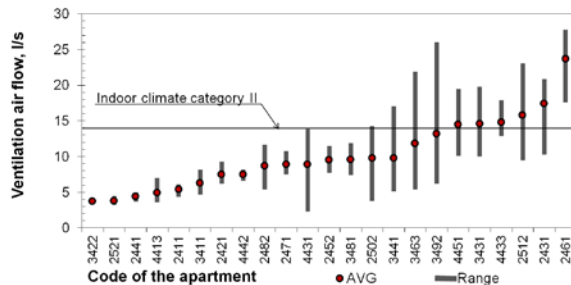
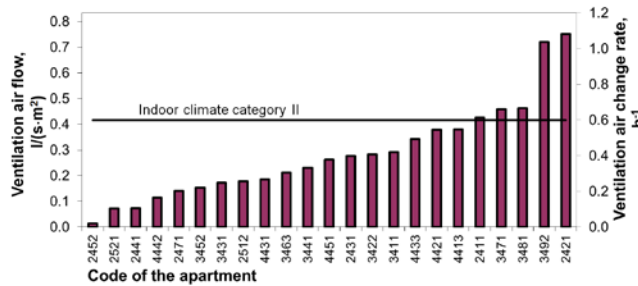
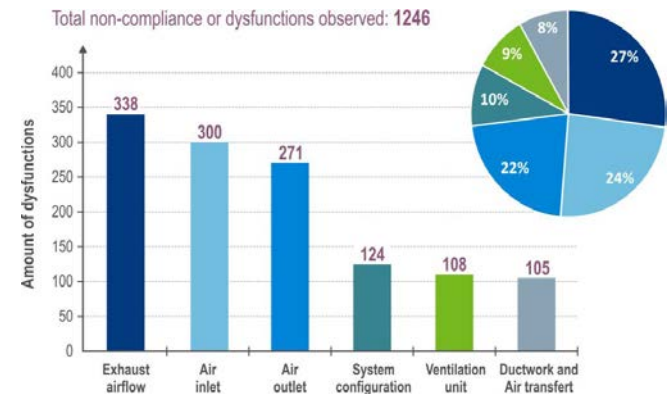


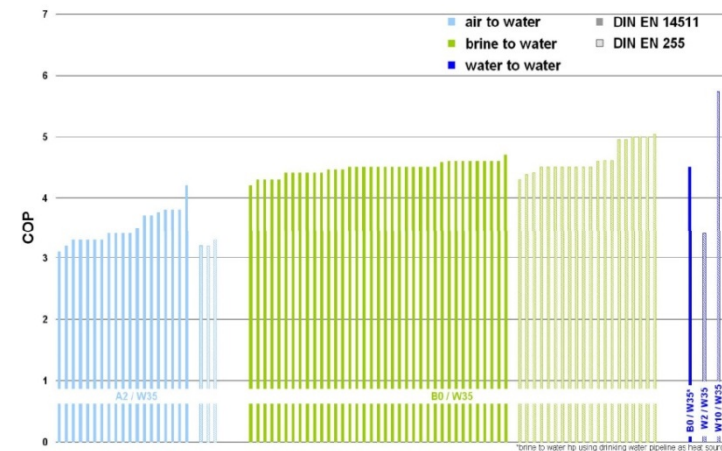
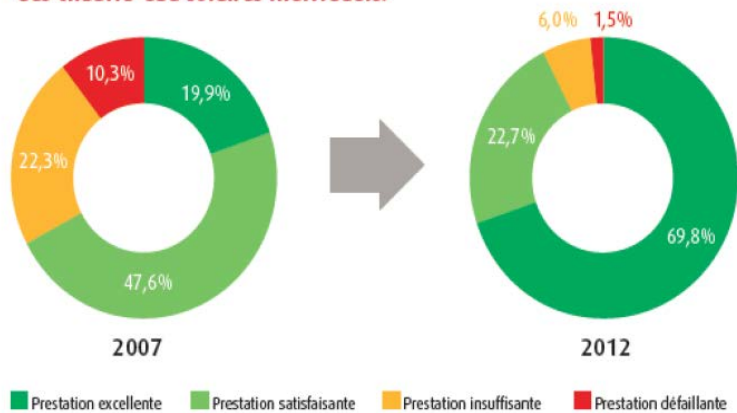
Table 1 Ventilation system failure modes in a study of 40 dwellings

Value	Description
33 (82.5%)	Ductwork incorrectly fitted (kinked / bent / poor joints / excessive length)
10 (25%)	Undersized fans to meet the minimum ventilation requirement
6 (15%)	Insufficient fans or terminal outlets for dwelling type
3	No boost function
3	Incorrect installation data
2	Missing ductwork
1	Blocked ductwork

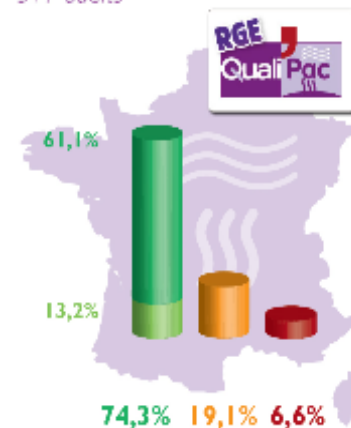


Mostly positive studies about renewable systems

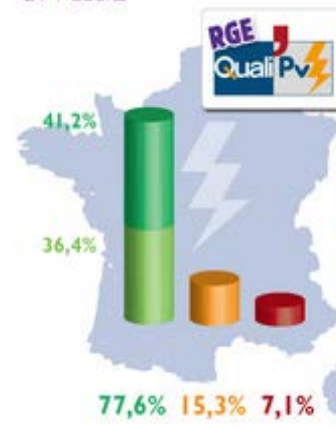
Exemple d'amélioration de la qualité avec les résultats des audits des chauffe-eau solaires individuels.



Pompe à chaleur
319 audits



Photovoltaïque
294 audits



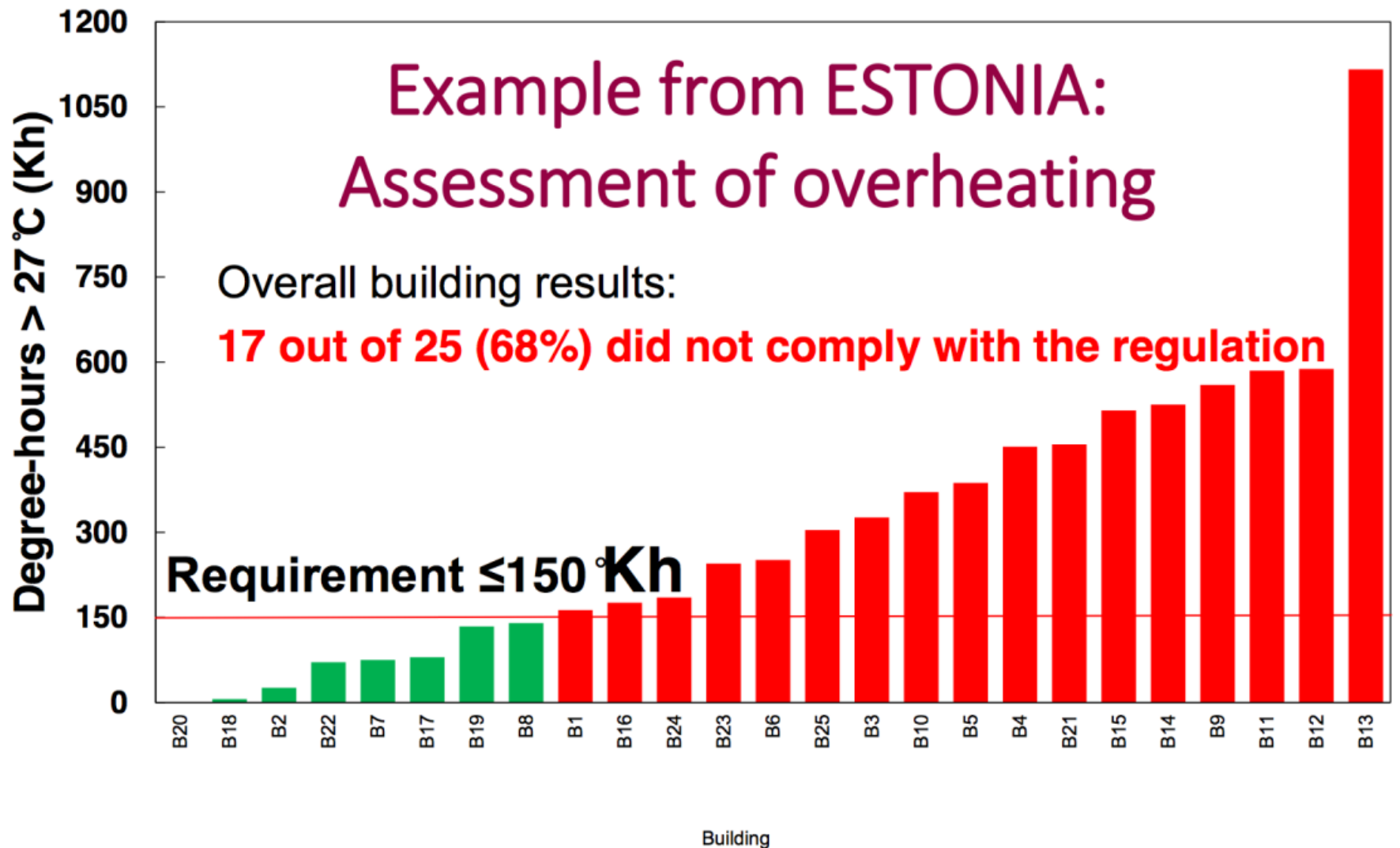
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Example from ESTONIA: Assessment of overheating

Overall building results:

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



Järeldused – Eesti valupunktid

- Energiatõhususe tõendamine lõppeb ehitusloaga
 - Arvutuslik märgis antakse eelprojekti alusel, kus ei ole nõutud tehnosüsteemide jooniseid (magistraalid ja tehnilised ruumid)
 - Põhiprojekti ja tööprojekti muudatused ei kajastu tavaliselt arvutuslikus energiamärgises
 - Uue kontrollmehhanismi vajadus – energiamärgis oleks õigem väljastada kasutusloa staadiumis (uus energiaarvutus)
- Õhupidavuse tõendamine õhulekketestiga parandaks oluliselt kvaliteeti – mõõtmise kohustuslikuks
- Suvised ülekuumenemise metoodika juurdub aeglaselt ja vajab tähelepanu, samuti energiamärgiste kvaliteet