# Norms & practices for implementation of the EPBD

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*Buildings Performance Institute Europe*

Burgas, 20 June 2018

On the way to nearly zero-energy buildings: the Norway experience and the challenges in Bulgaria

# 90% OF OUR TIME IS SPENT INDOORS

# 97% OF EU BUILDINGS IS NOT FUTURE PROOF

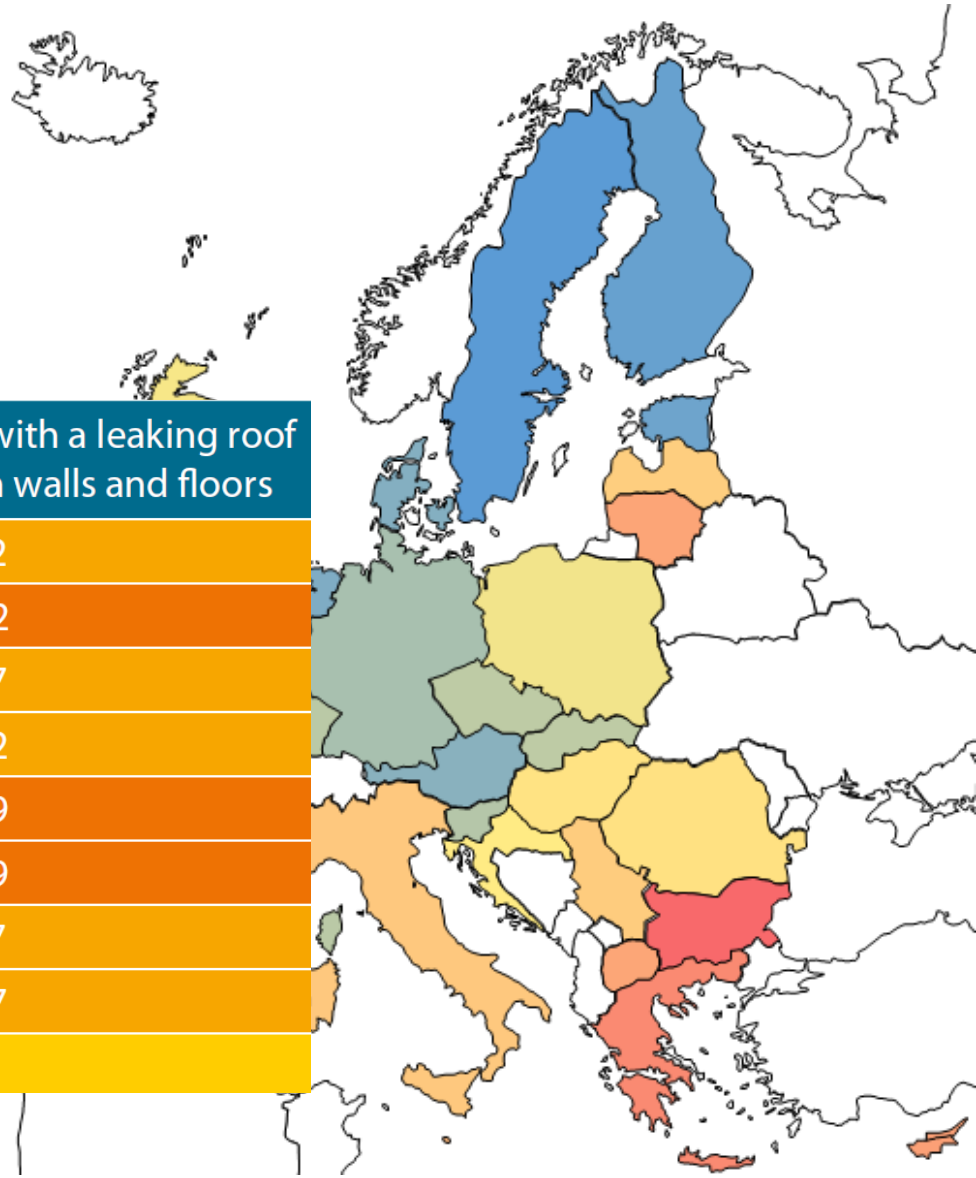
# 4 Bulgarian families out of 10…

are not able to keep their home adequately warm

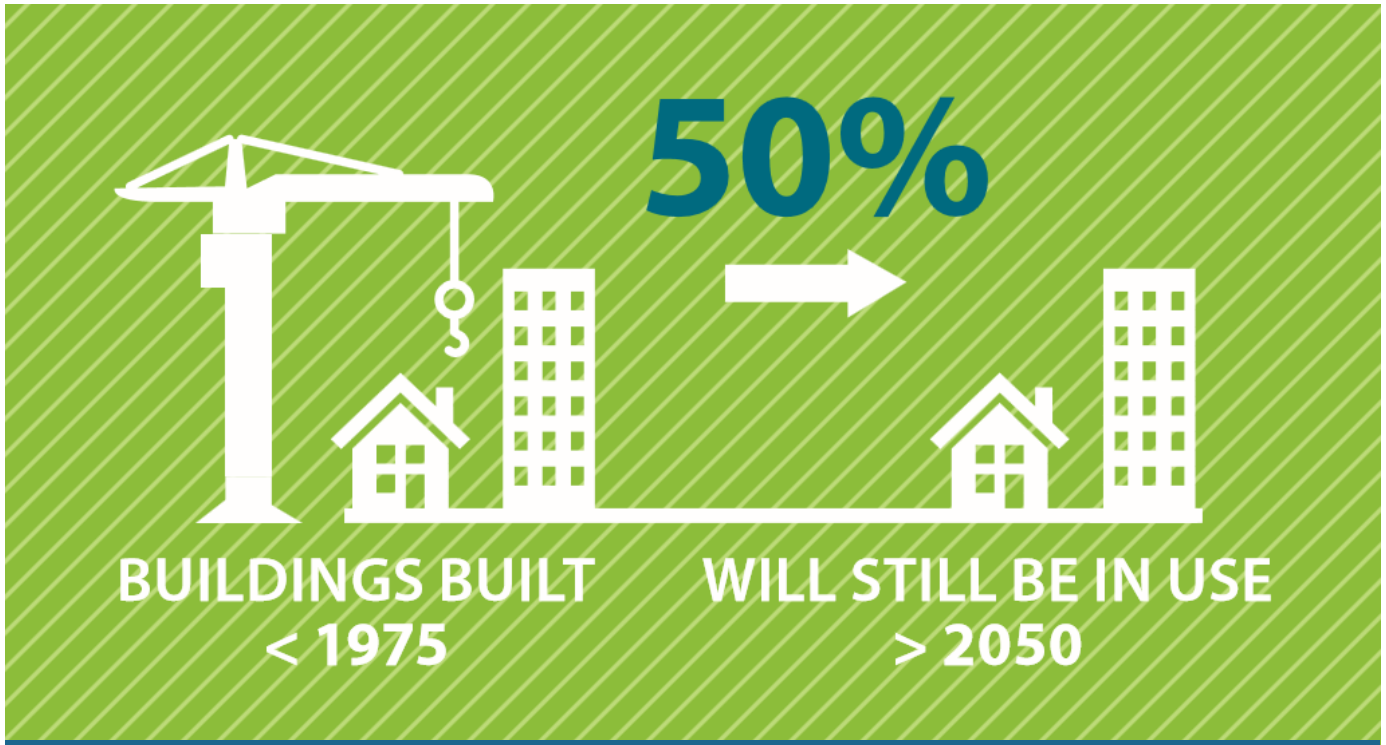
# 1 Bulgarian family in 3…

has arrears on utility bills

| Country | Inability to keep home adequately warm | Arrears on utility bills | Living in a dwelling with a leaking roof and damp or rotten walls and floors |
|---|---|---|---|
| Bulgaria | 40.5 | 32.9 | 13.2 |
| Serbia | 17.1 | 41.4 | 26.2 |
| Greece | 32.9 | 37.3 | 13.7 |
| FYROM | 26.1 | 38.8 | 15.2 |
| Hungary | 11.6 | 22.3 | 26.9 |
| Slovenia | 5.6 | 20.3 | 29.9 |
| Croatia | 9.7 | 29.1 | 11.7 |
| Romania | 12.3 | 21.1 | 12.7 |
| Slovakia | 6.1 | 6.1 | 7.0 |



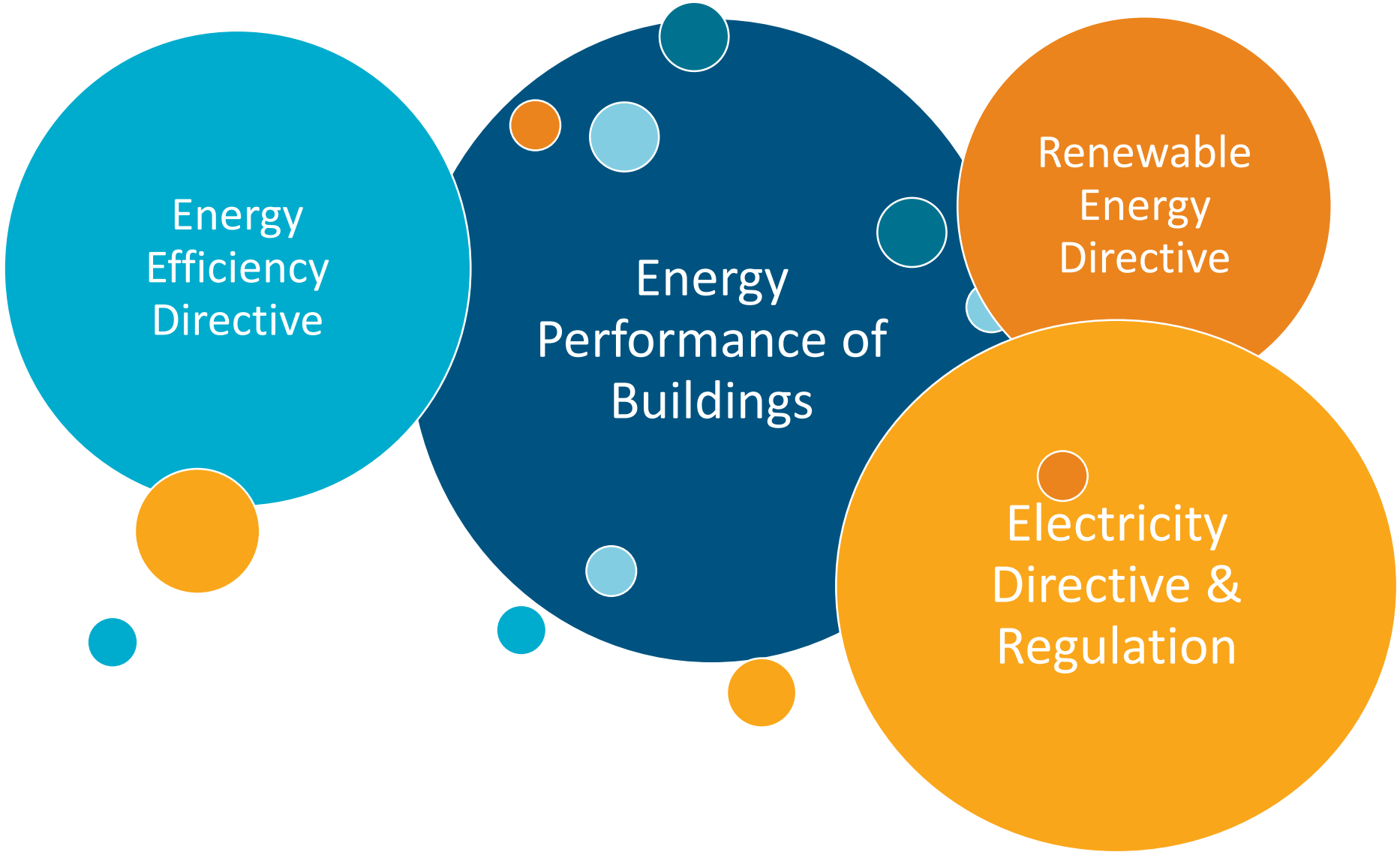
# Highly efficient and decarbonised building stock by 2050



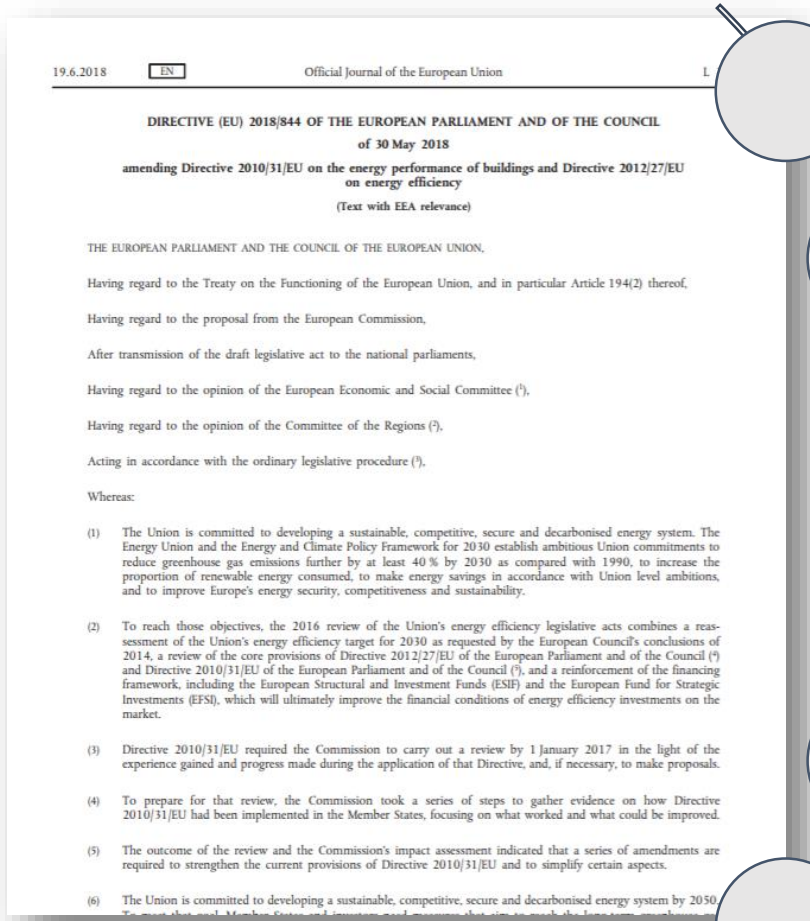

**75-90% of the current building stock will remain in use in 2050**

Renovating the existing building stock is the main challenge

# EU legislation is a complex interaction of initiatives



# New elements and improvements in revised EPBD
*(published 19 June 2018)*



19.6.2018 EN Official Journal of the European Union L

**DIRECTIVE (EU) 2018/844 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**
**of 30 May 2018**
**amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency**
**(Text with EEA relevance)**

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 194(2) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee ([1]),

Having regard to the opinion of the Committee of the Regions ([2]),

Acting in accordance with the ordinary legislative procedure ([3]),

Whereas:

(1) The Union is committed to developing a sustainable, competitive, secure and decarbonised energy system. The Energy Union and the Energy and Climate Policy Framework for 2030 establish ambitious Union commitments to reduce greenhouse gas emissions further by at least 40 % by 2030 as compared with 1990, to increase the proportion of renewable energy consumed, to make energy savings in accordance with Union level ambitions, and to improve Europe's energy security, competitiveness and sustainability.

(2) To reach those objectives, the 2016 review of the Union's energy efficiency legislative acts combines a reassessment of the Union's energy efficiency target for 2030 as requested by the European Council's conclusions of 2014, a review of the core provisions of Directive 2012/27/EU of the European Parliament and of the Council ([4]) and Directive 2010/31/EU of the European Parliament and of the Council ([5]), and a reinforcement of the financing framework, including the European Structural and Investment Funds (ESIF) and the European Fund for Strategic Investments (EFSI), which will ultimately improve the financial conditions of energy efficiency investments on the market.

(3) Directive 2010/31/EU required the Commission to carry out a review by 1 January 2017 in the light of the experience gained and progress made during the application of that Directive, and, if necessary, to make proposals.

(4) To prepare for that review, the Commission took a series of steps to gather evidence on how Directive 2010/31/EU had been implemented in the Member States, focusing on what worked and what could be improved.

(5) The outcome of the review and the Commission's impact assessment indicated that a series of amendments are required to strengthen the current provisions of Directive 2010/31/EU and to simplify certain aspects.

(6) The Union is committed to developing a sustainable, competitive, secure and decarbonised energy system by 2050.

- Strengthened requirements for national renovation strategies, including mobilising financing
- Smartness indicator
- Feasibility study on building renovation passports
- Data from EPCs to be made available
- Advisory tools for building owners and tenants
- Changes to calculation of energy performance

https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1529394717053&uri=CELEX:32018L0844

# Revised article on Long-term Renovations Strategies

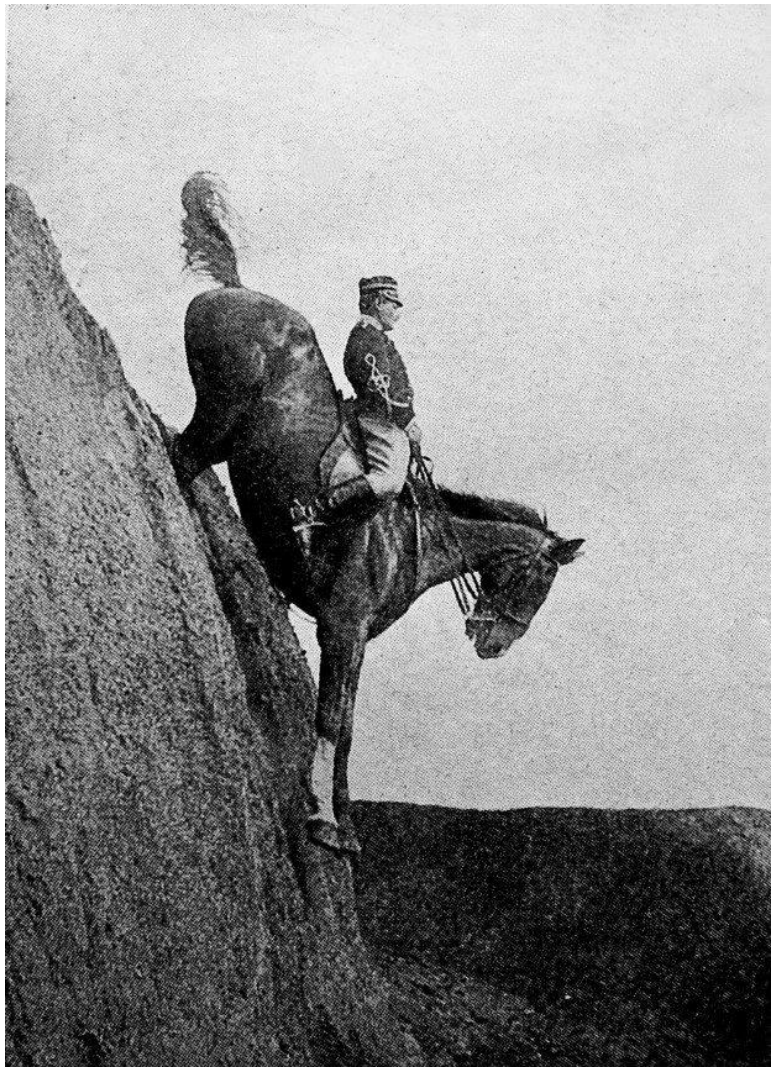
the Revised Energy Performance of Buildings Directive (EPBD) - 2018

Long-term Renovations Strategies – the central tool for Member States to achieve impact

- Transform national building stock to a highly energy efficient and decarbonised building stock by 2050
- Progress indicators & milestones in 2030 and 2040
- Actions to contribute to the alleviation of energy poverty
- Address the multiple benefits of renovation, such as improved health, well-being and air quality

# Taking the challenge…

*"establish a long-term renovation strategy to support the renovation of the national stock of residential and non-residential buildings, both public and private, into a highly energy efficient and decarbonised building stock by 2050, facilitating the cost-effective transformation of existing buildings into nearly zero-energy buildings"*



# Renovation strategies across Europe

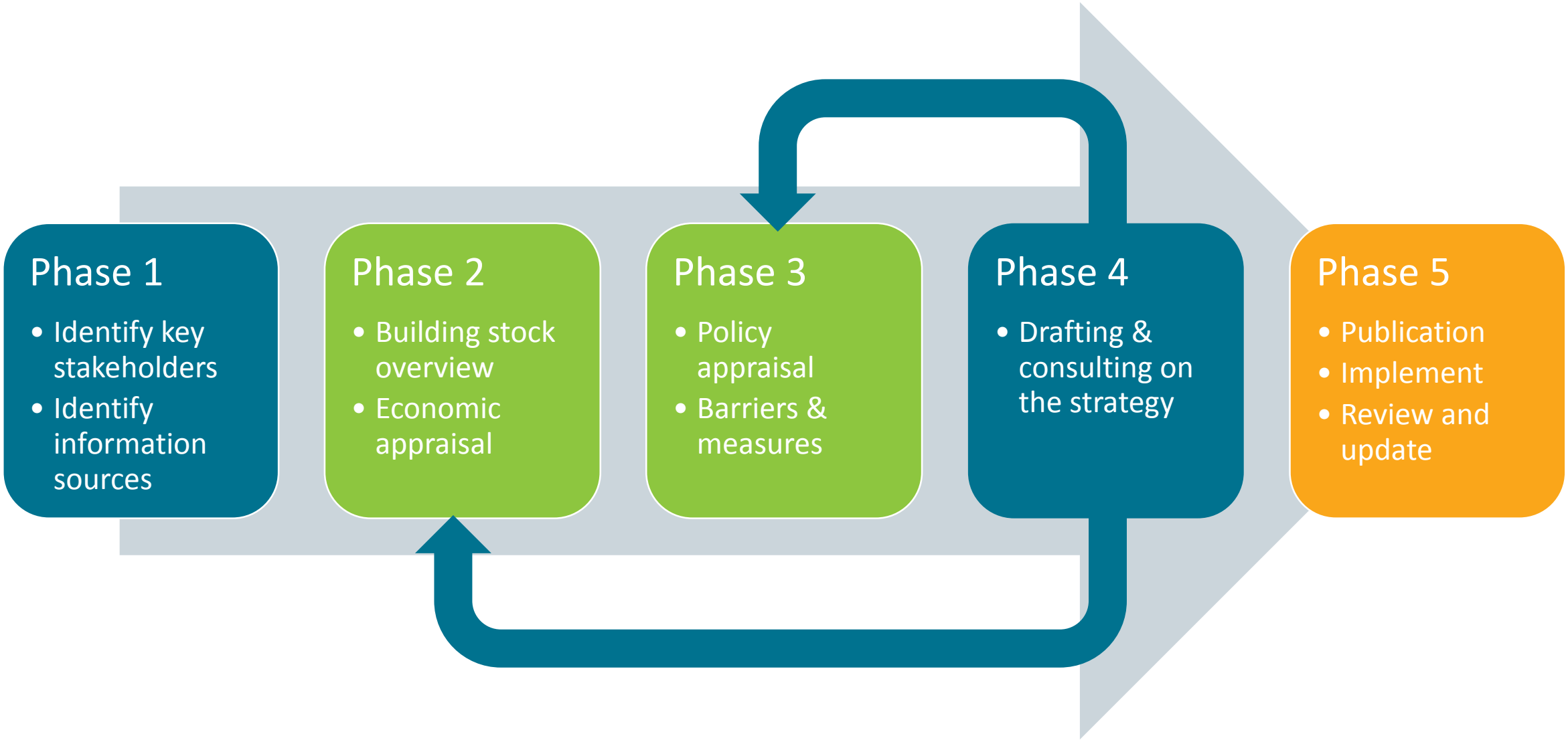
2014

Source: JRC and BPIE

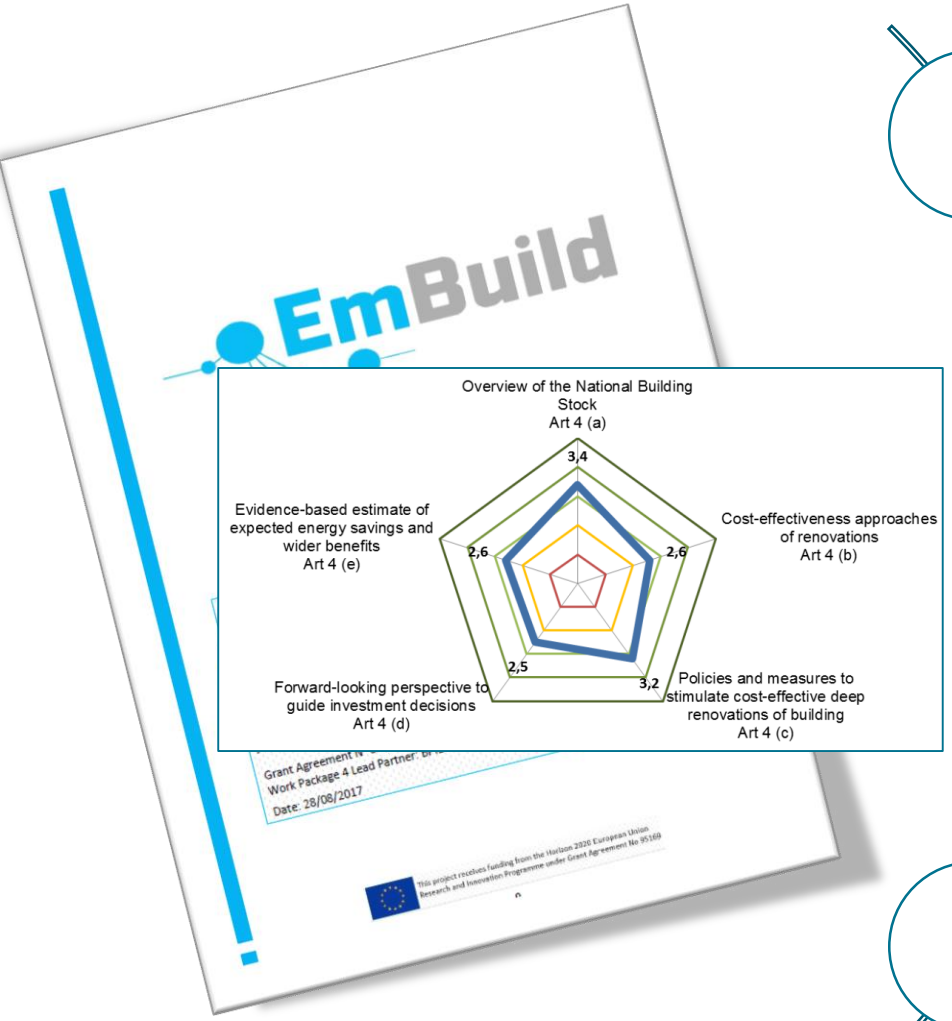
Level of compliance to issue a national renovation strategy which triggers a deep renovation of the building stock

| |
|---|
| 76% - 100% |
| 51% - 75% |
| <50% |

# Method to establish a renovation strategy



# Building up a Renovation Strategy




- Overview of the building stock
- Cost-effective approaches of deep renovations
- Policies & measures to stimulate deep renovations
- Perspective to guide investment decisions
- Expected energy savings and wider benefits

# It’s more than the Energy Savings

## 1 IN 6 EUROPEANS LIVE IN BUILDINGS THAT MAKE THEM SICK

### Offices

- up to ~2% increase in employee productivity from two-fold increase in ventilation rate
- 6%–9% decreased productivity in poor indoor air quality environments
- Additional degree >25°C leads to up to 2% decrease in productivity

### Schools

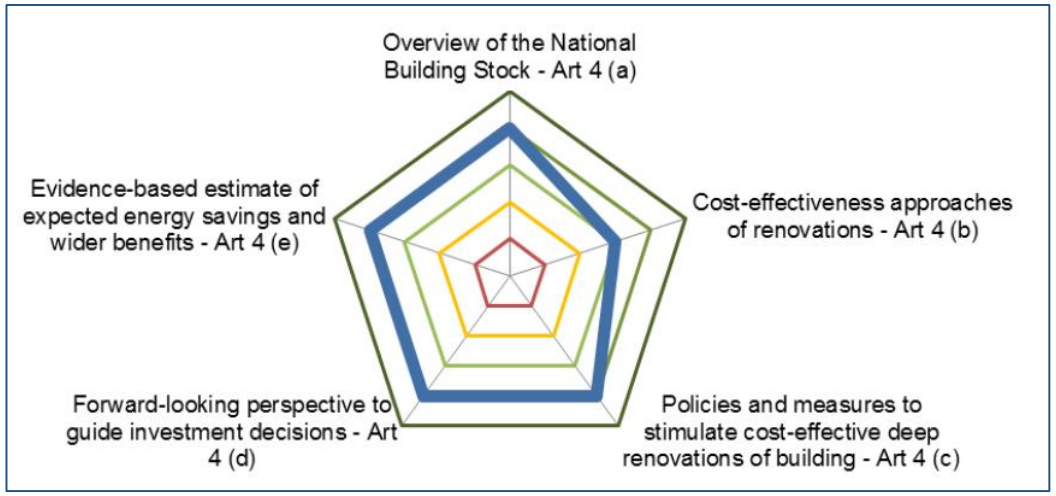
- Learning progress showed 7% to 26% improvement in highly daylight rooms
- 30 % increased reading speed with cold white activating light

### Hospitals

- Hospitalization decreased between 16% and 41% in highly daylight rooms

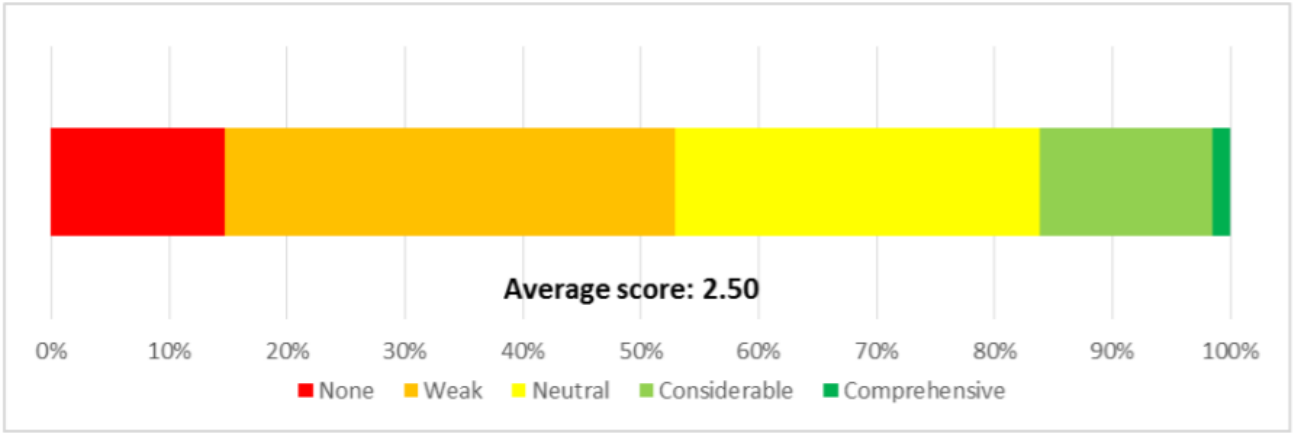
# Reality check at implementation phase

PROMISE



REALITY

**Figure 3 - Has action been taken since 2014 to remove barriers to renovation?**

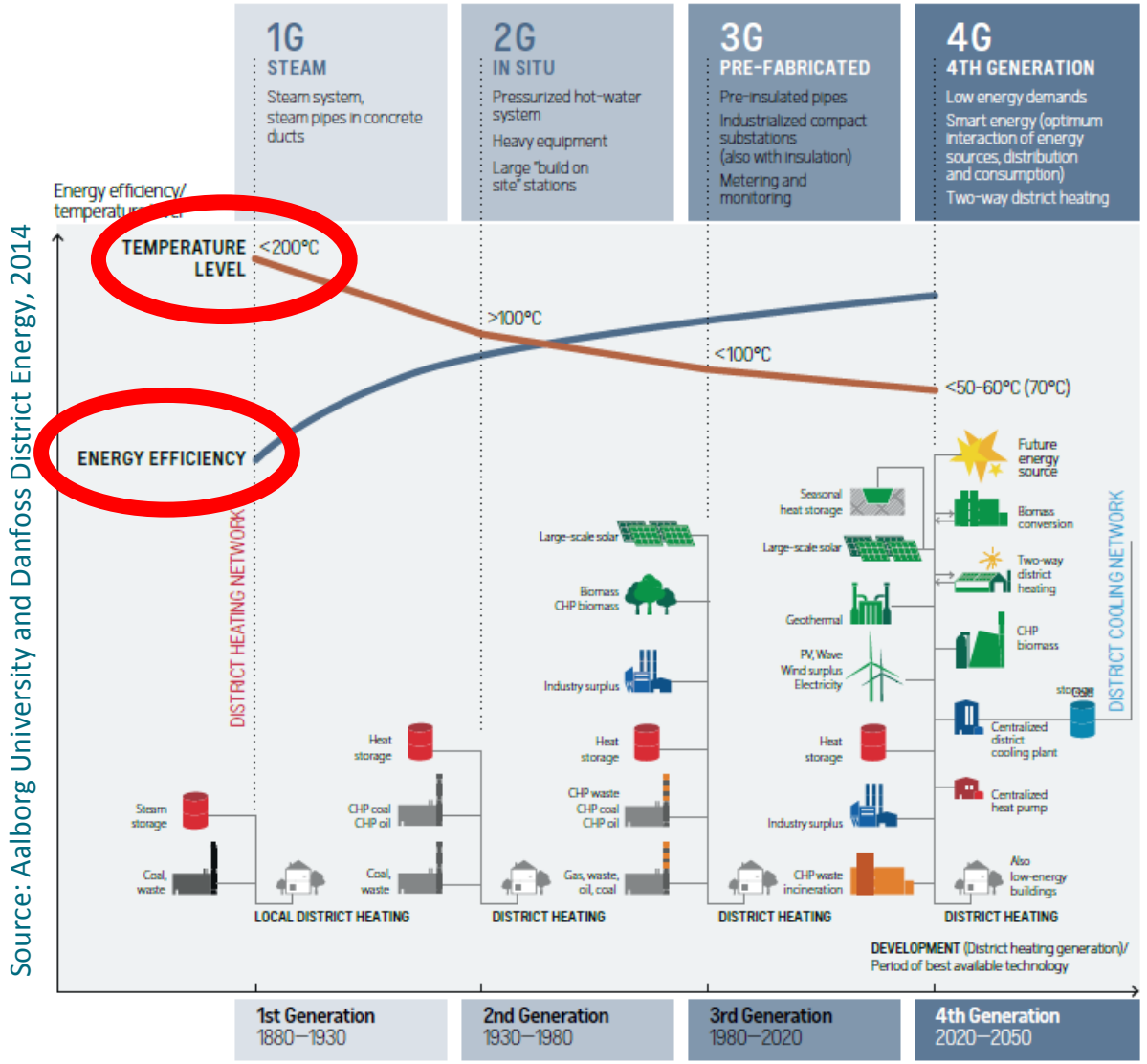


# Belgrade: Aligning district energy and building energy efficiency

- Buildings are the biggest energy consumer
- >300,000 residential buildings connected to the district energy system
- The majority of the Serbian district heating network is supplied by gas, of which 71% is imported

- Objectives
  - ✓Connect 200,000 $m^2$ of buildings per year over the coming years
  - ✓Transition towards a sustainable and modern “4th generation” system
  - ✓Gradually shift from $m^2$ to consumption based billing

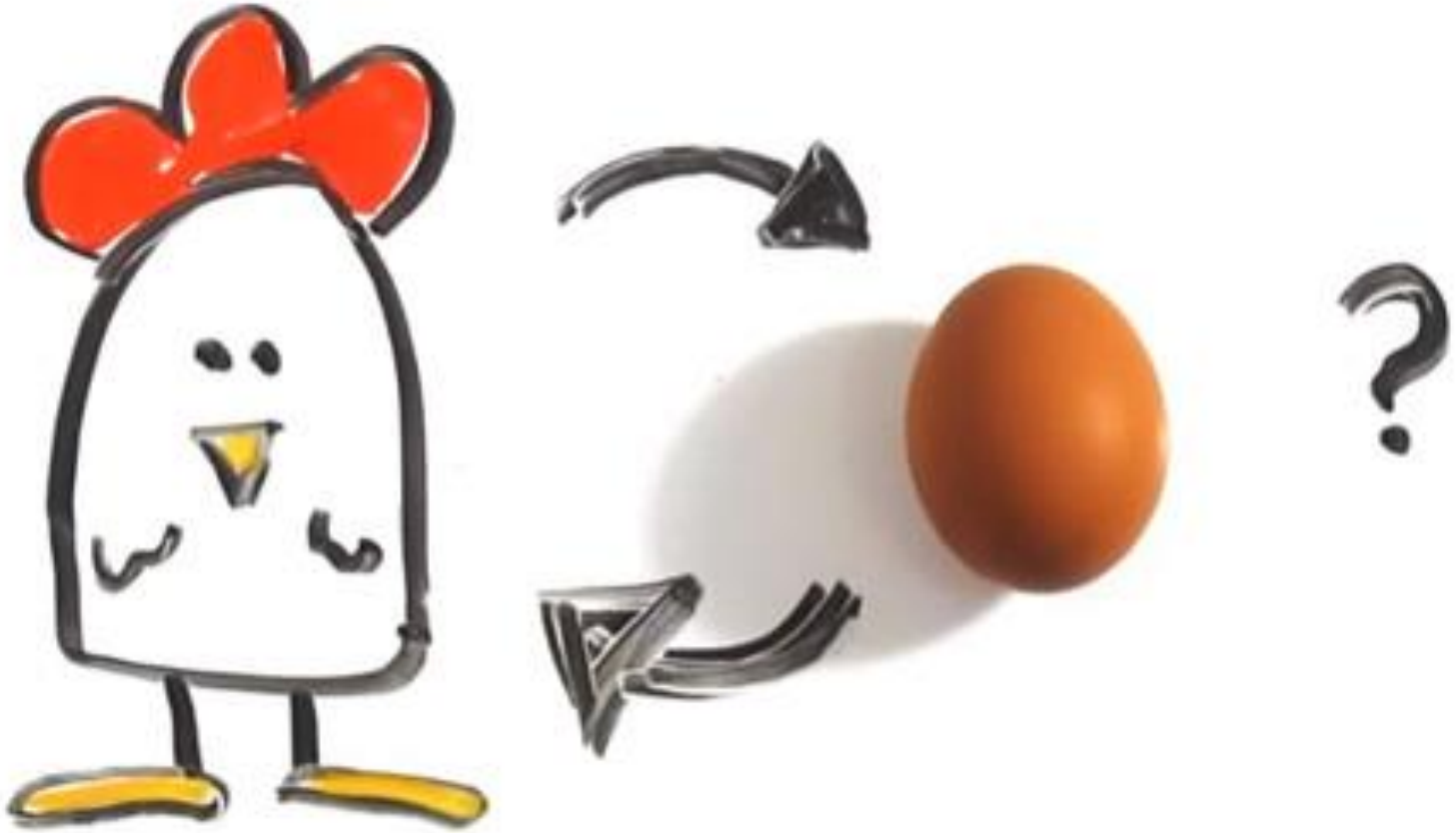
# 4G District Heating as a game changer




Source: Aalborg University and Danfoss District Energy, 2014

- Technology market mature in 2020
- Low heat demand in buildings
- Consumers can become suppliers
- New installation approach

# Efficiency in buildings vs district heating

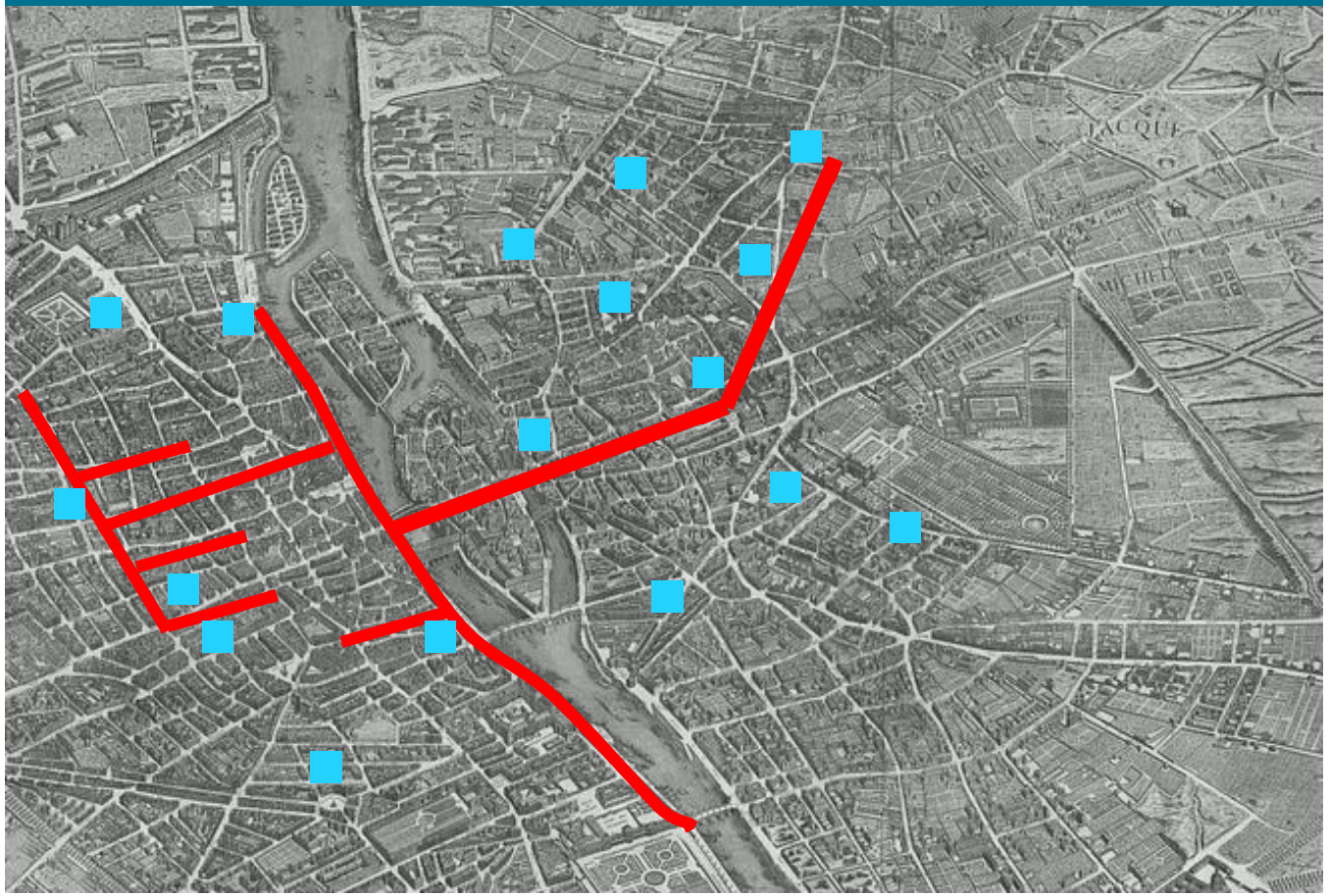


# Aligning energy efficiency in buildings & district energy strategies

| BUILDING STOCK | | DISTRICT ENERGY SYSTEM |
|---|---|---|
| ▪ Overview of building stock<br>▪ Economic appraisal of renovation potential<br>▪ Identify energy and non-energy benefits<br>▪ Quantify investment needs | ASSESSMENT | ▪ Assess existing energy and climate policy objectives, strategies and identify catalysts<br>▪ Map local energy demand and evaluate local energy sources |
| ▪ Identify key stakeholders<br>▪ Identify information sources | LOCAL CONNECTION | ▪ Strengthen or develop the institutional multi-stakeholder coordination framework<br>▪ Integrate district energy into national and/or local energy strategies and planning |
| ▪ Appraisal of barriers<br>▪ Assess a range of potential policy measures<br>▪ Develop a holistic policy package<br>▪ Draft and consultation on the strategy | PROJECT PLAN | ▪ Determine relevant policy design considerations<br>▪ Carry out project pre-feasibility and viability<br>▪ Develop business plan<br>▪ Analyze procurement options<br>▪ Facilitate finance |
| • Establish monitoring and evaluation processes | FOLLOW-UP | • Set measureable, reviewable and verifiable project indicators |

# From fragmented to extended district approach

## Fragmented approach

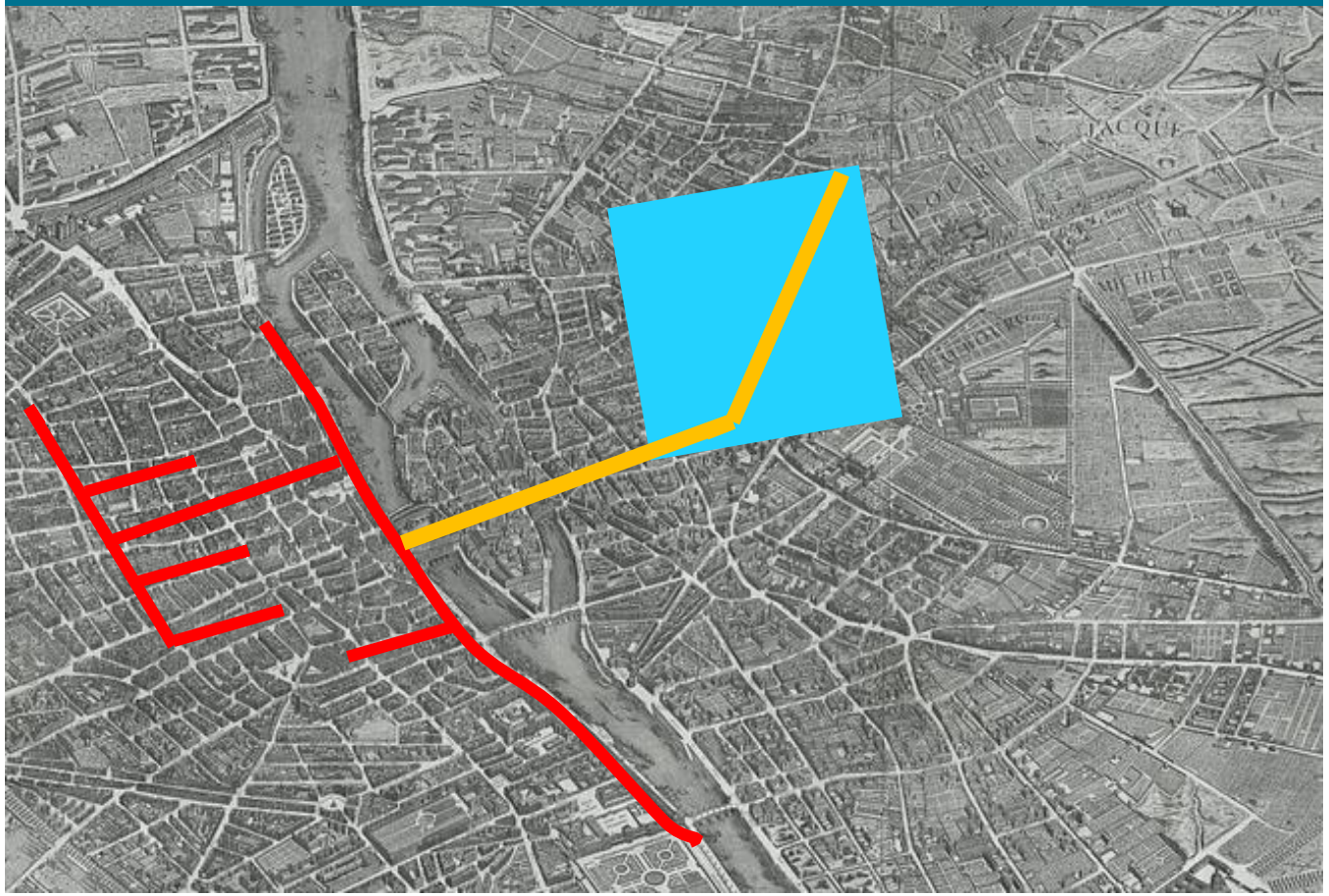


DH Network

Renovation project

# From fragmented to extended district approach

## District approach - initial

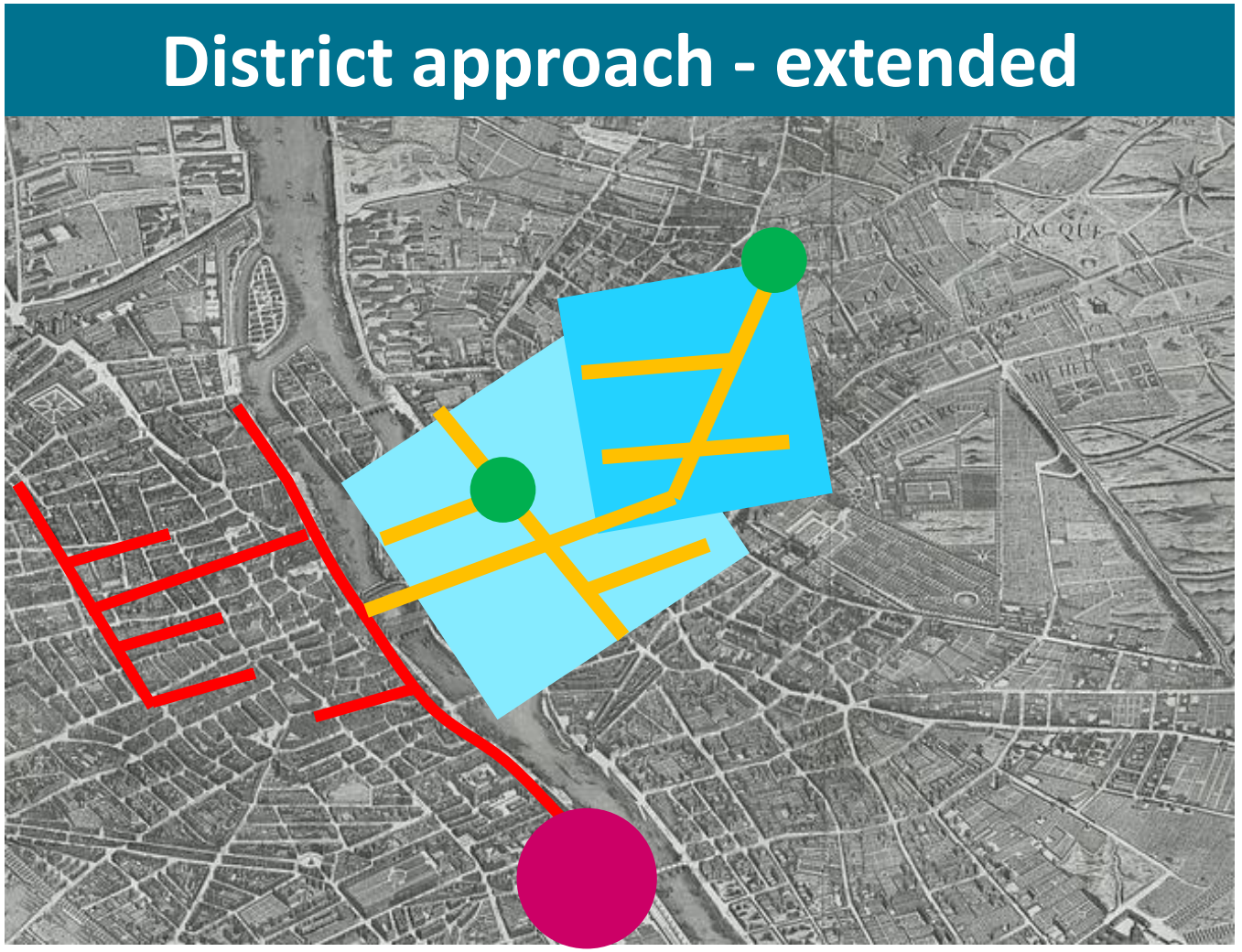


DH Network

DH Network - Upgraded

Renovation project

# From fragmented to extended district approach

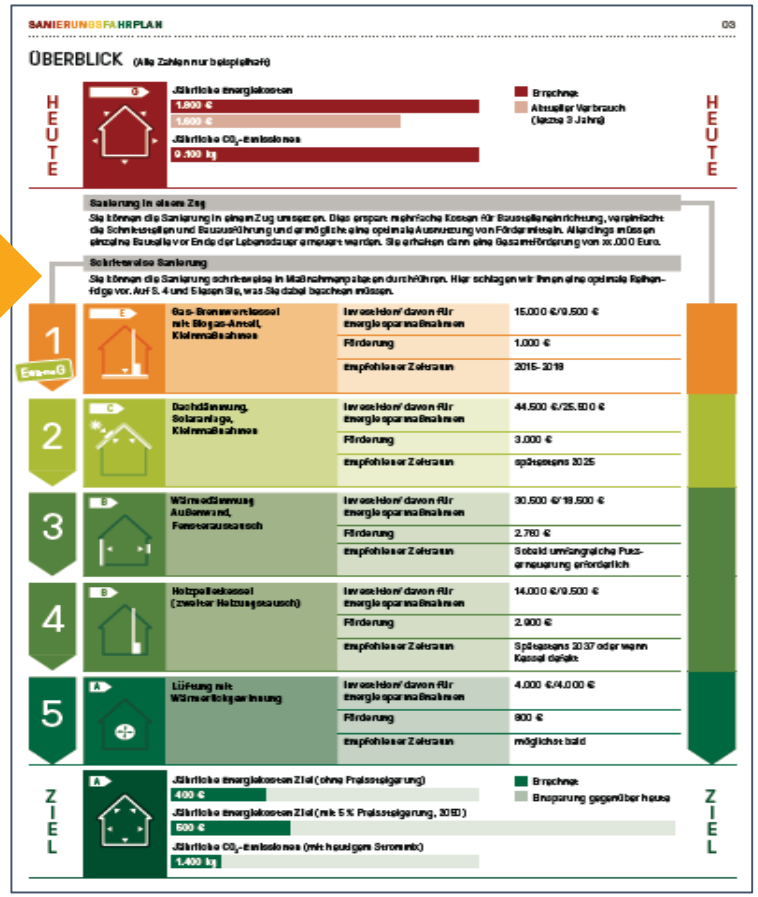


# Achieving deep energy renovation

## Holistic one step deep renovation

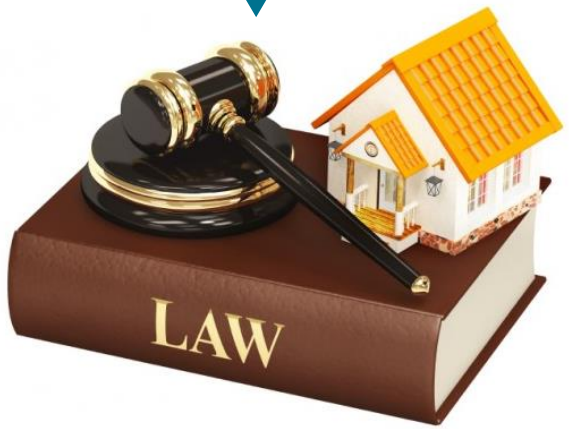
Source: Energiesprung

## Planned staged deep renovation




Source: ifeu

# Policy instruments to foster home renovations

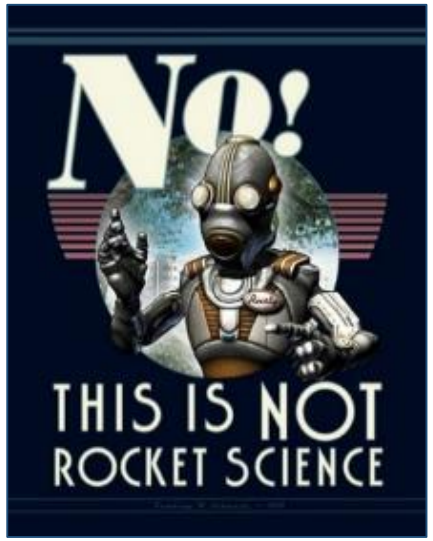


BUILDING RENOVATION PASSPORT

# Need to scale up deep energy renovation

## Unleashing the potential through innovation & industrialisation

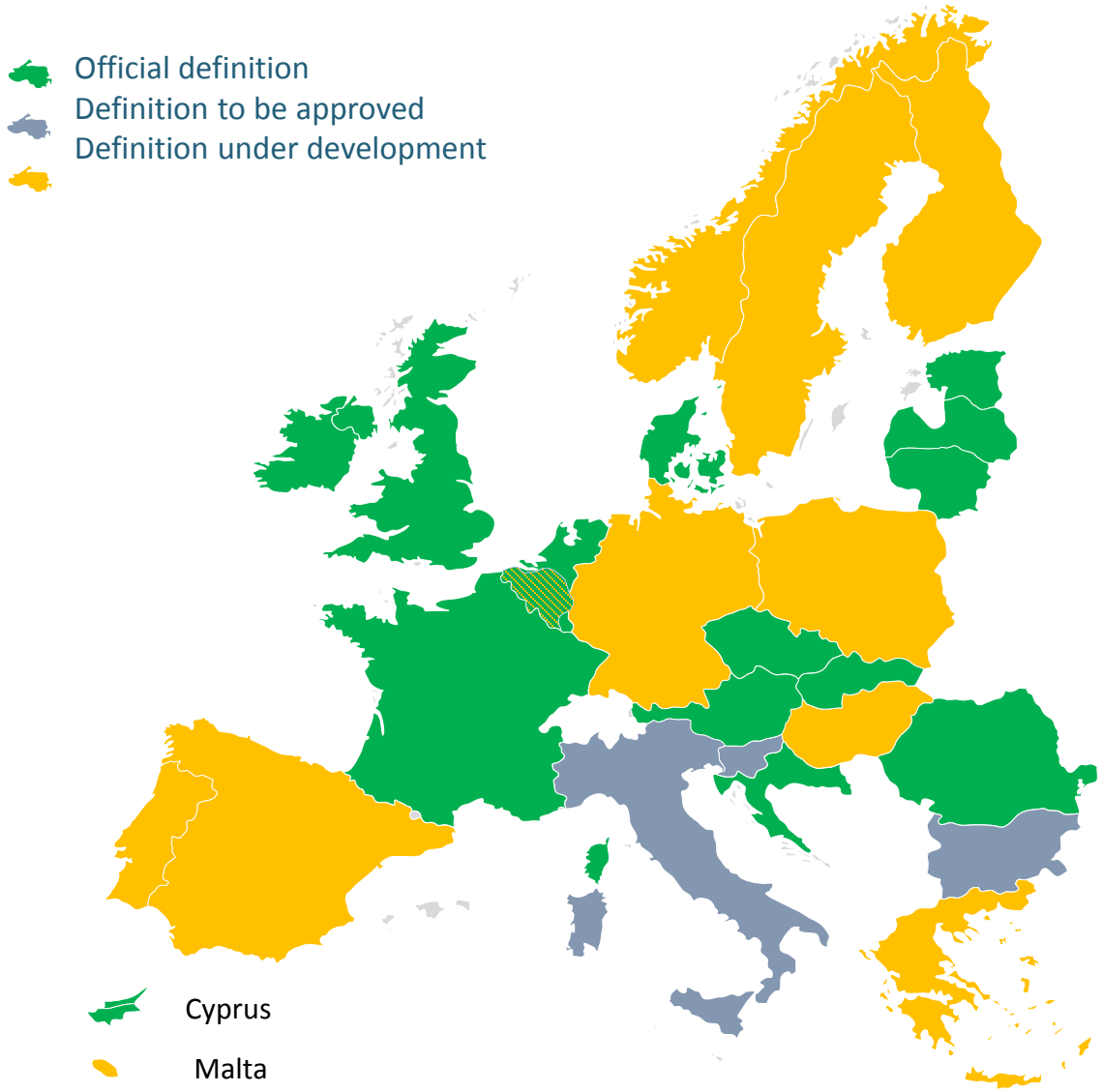
# New buildings: nZEB is no longer rocket science



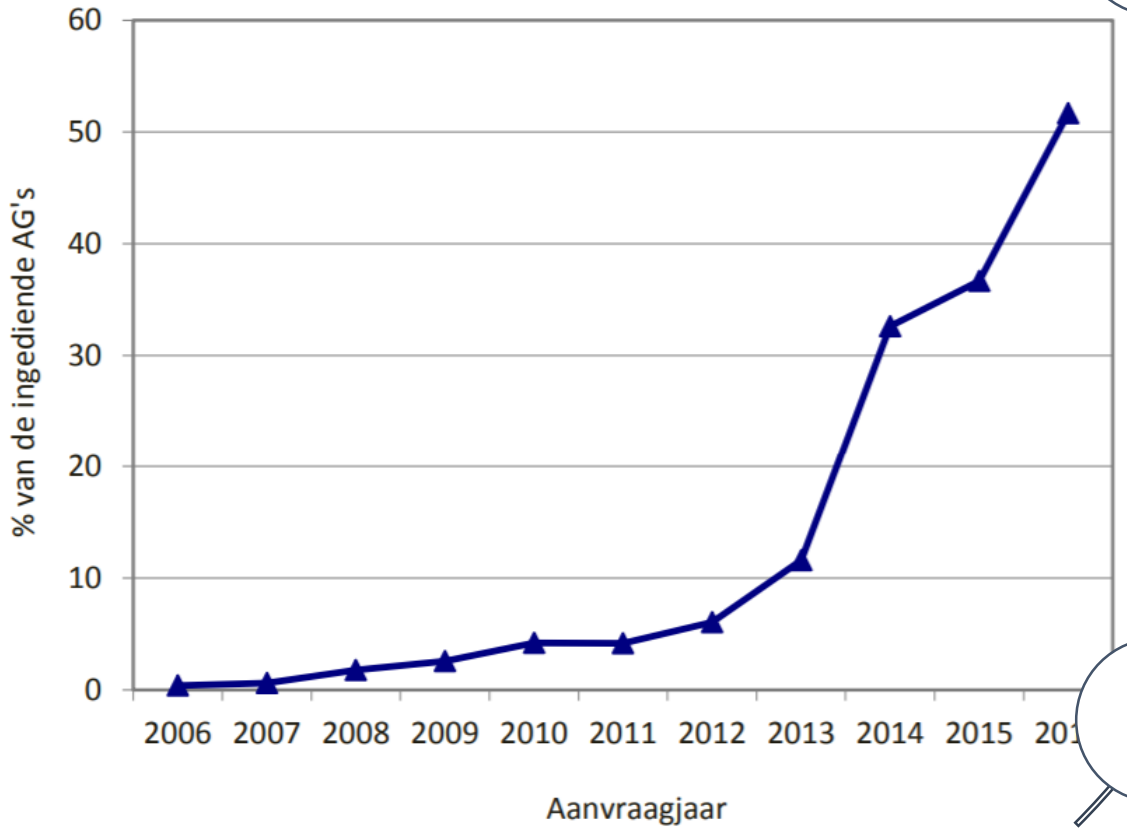
# NZEB implementation in Europe

## Large variations on NZEB definitions

- 16 MS definition for new buildings
- 8 MS definition for existing buildings
- 8 MS share of RES explicitly stated
- Large range maximum primary energy (20-170kwh/m2)
- Some MSs: additional requirements



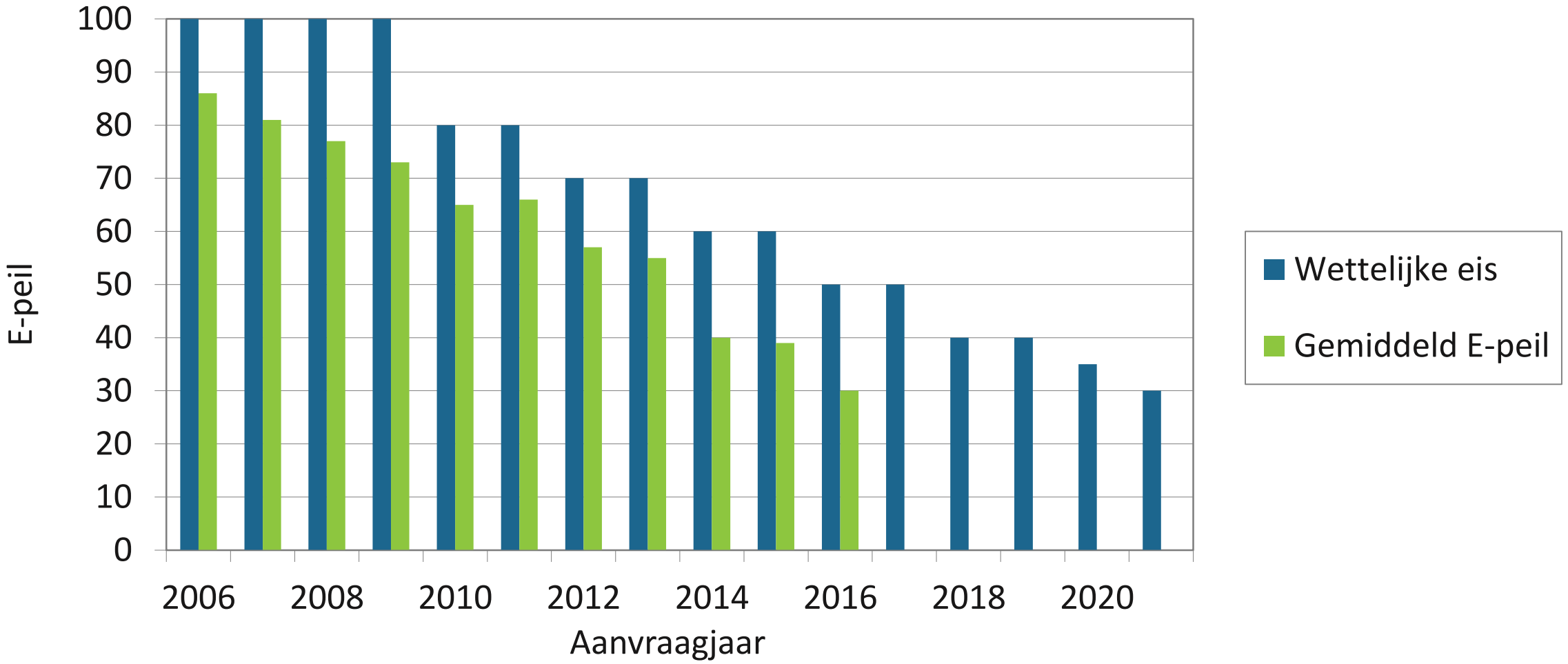
# Example nZEB implementation in Belgium (Flanders)



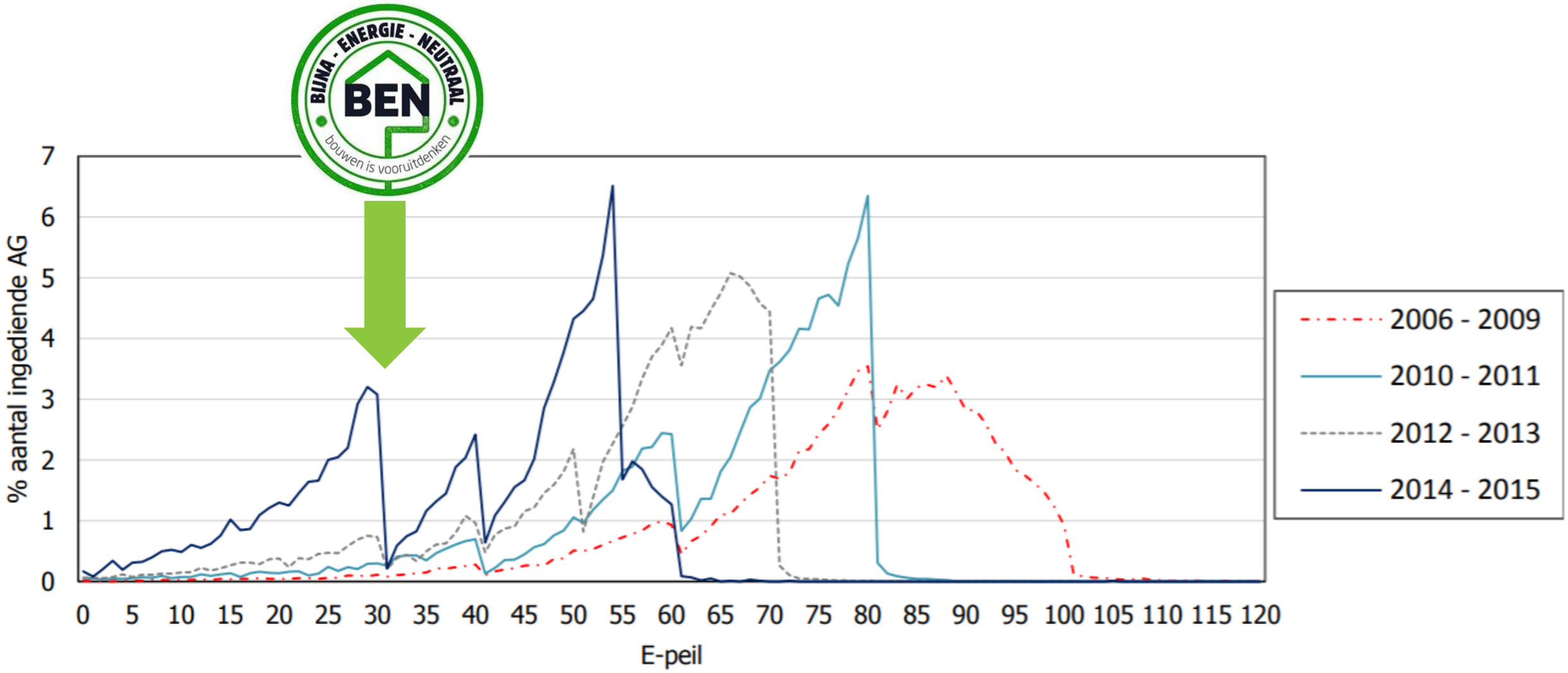

% of SFH achieve nZEB level

- No frontrunner country, but due to dedicated actions succeeds well on NZEB roll-out
- Large stakeholders consultation
- 2013: NZEB definition & gradual tightening building performance requirements towards 2021
- Strict compliance and control mechanism
- Knowledge and frontrunners are available

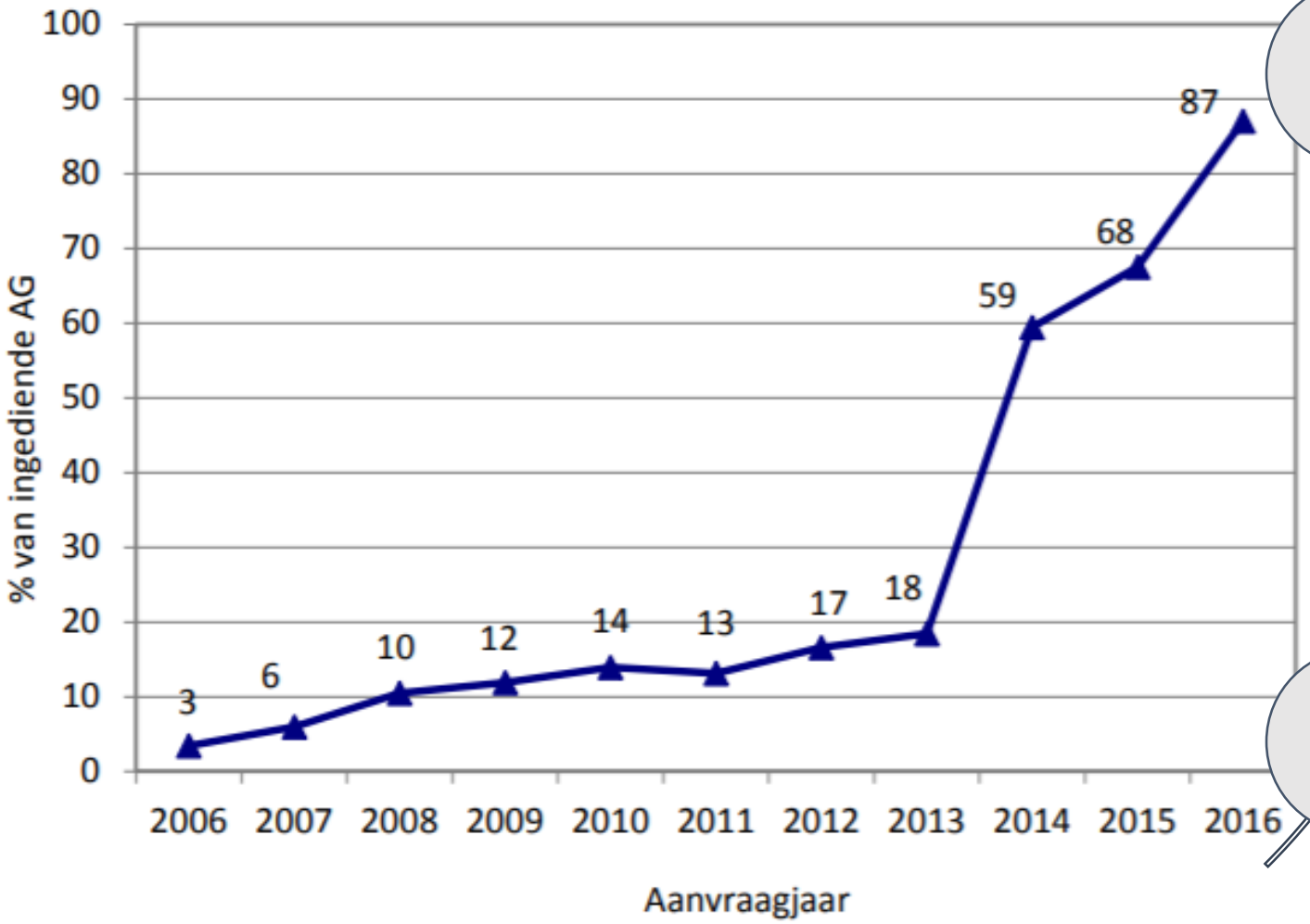
# Belgium: legal requirement vs average energy performance of new buildings



# Belgium: clear impact of support schemes & requirements

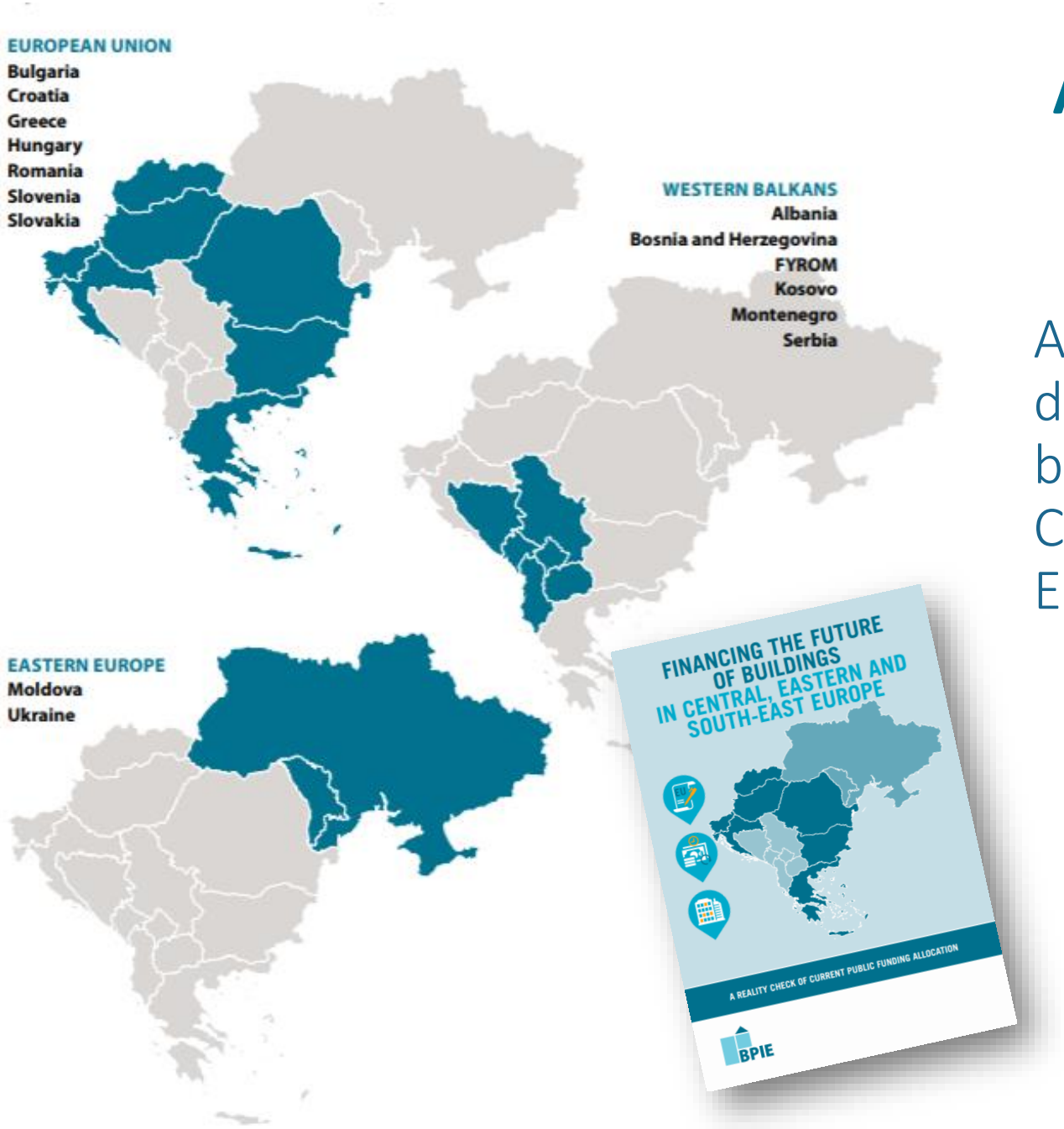


# Belgium: evolution of RES in new buildings




- From 3% in 2006 towards 87% in 2016
- 2014: mandatory minimal share RES
- Mainly PV and heat pumps
- NZEB: >90% PV & 50-80% heat pumps

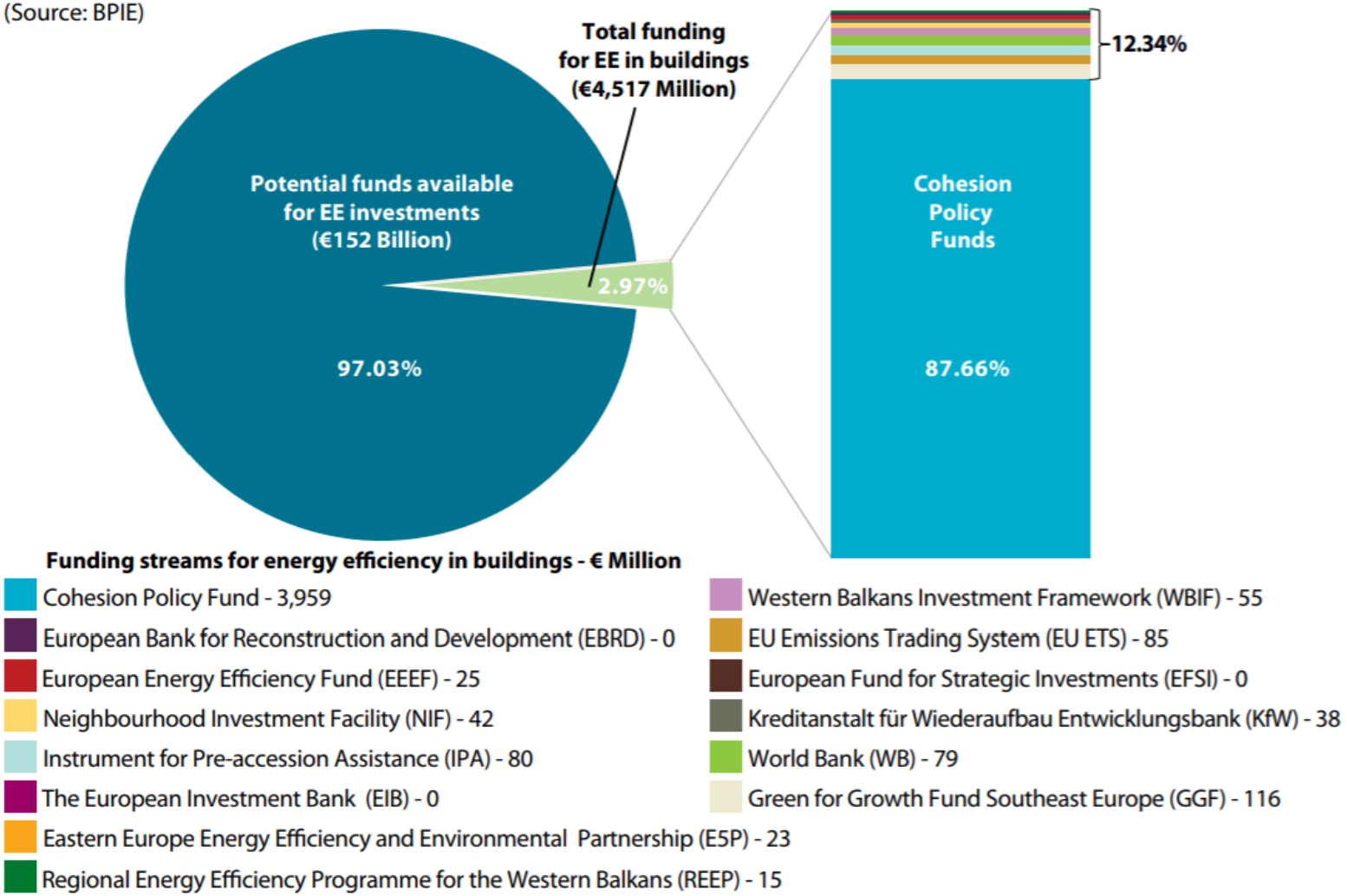
# Analysing funding streams




An analysis of the funding streams directed to energy efficiency in buildings currently available in Central, Eastern and South-East Europe

# Analysing funding streams

**Figure 1 - Overview of the share of funding streams dedicated to energy efficiency (EE) in buildings in the CESEE region**
(Source: BPIE)




**LESS THAN 3%**

of the funds that could be used to support energy-efficiency investments in the region is dedicated to upgrading buildings

# Thank you…

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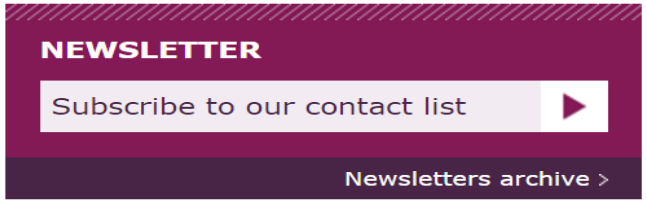


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