



Net-Zero Carbon Buildings and Neighbourhoods

EU policy context and project examples

14/09/2022 | Oliver Rapf,
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2nd International
Conference and Exhibition
Augmenting Nature by Green
Affordable New-Habitat –
ANGAN, New Delhi





BUILDINGS PERFORMANCE INSTITUTE EUROPE

What we do



EUROPEAN
NON-PROFIT
THINK-TANK



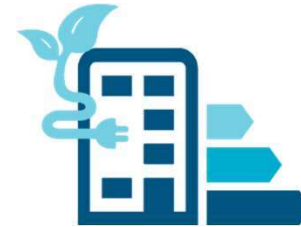
POLICY ADVICE
ON BUILDING
REGULATION,
FROM DESIGN TO
IMPLEMENTATION



BRUSSELS
AND
BERLIN



INDEPENDENT
RESEARCH



IMPROVING THE
ENERGY
PERFORMANCE
OF BUILDINGS
ACROSS EUROPE



IN OPERATION
SINCE 2010





CONTENTS



European Union Net- Zero emissions goal



What does net-zero carbon mean for the EU?



Energy Performance of Buildings Directive



Examples (buildings and neighbourhoods)



EU Climate neutral cities mission





Goal: Net-Zero emissions by 2050

The European Union committed to cut its net greenhouse gas emissions by at least **55% by 2030** (compared to 1990 levels) and to become **climate neutral by 2050**.

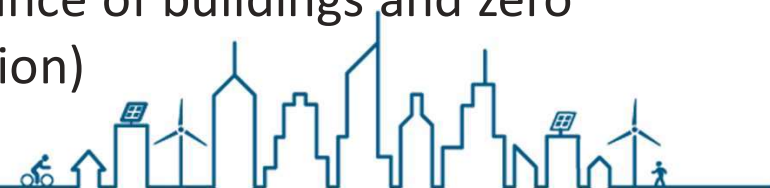
EU must have climate-neutral (zero-emission) building stock by 2050. Buildings must achieve net zero carbon throughout their lifecycle, including development, renovation and operation.

[EUROPEAN CLIMATE LAW]¹ - Key regulation to deliver on 2030 & 2050 decarbonisation objectives

[ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE]² - EU's main legislative instrument on energy performance of buildings and zero emission objectives (currently under revision)

¹REGULATION (EU) 2021/1119

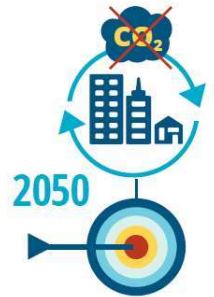
²Proposal for EPBD (recast) 2021/0426 (COD)





NET-ZERO CARBON BUILDINGS

What does it mean?



By 2050, all new constructions must be net zero carbon over the whole life-cycle and all existing buildings must be net zero operational carbon.

- **'Net-zero operational carbon'** means net-zero emissions related to the ongoing operation and actual use of the building
- **'Net-zero whole-life carbon'** means net-zero emissions over the whole lifecycle of the building

NET ZERO OPERATIONAL CARBON



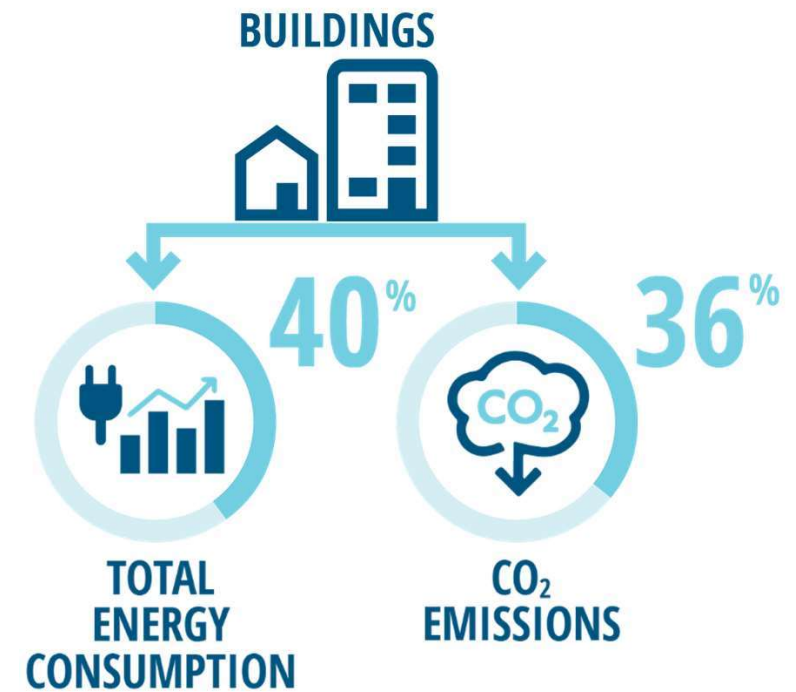
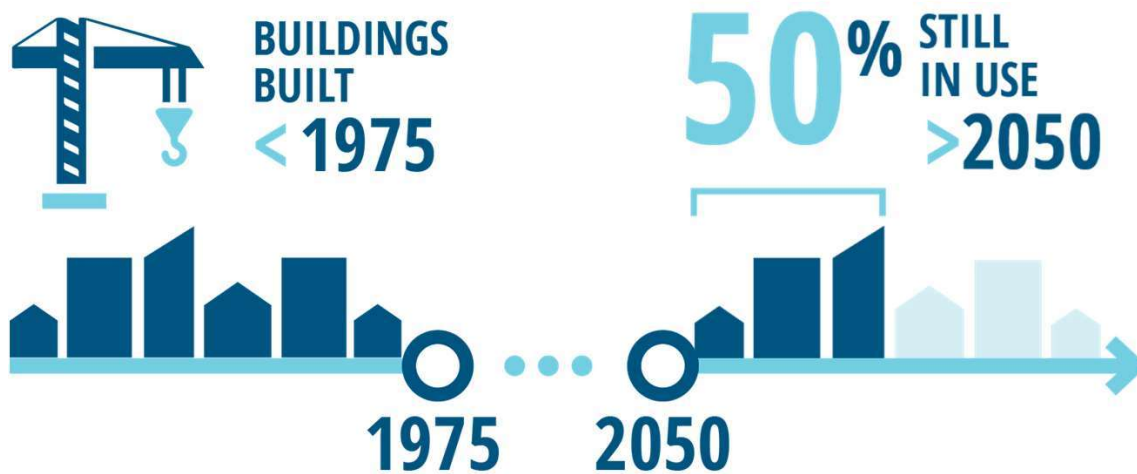
NET ZERO WHOLE-LIFE CARBON



BPIE (2022) How to embed whole-life carbon in EPBD



EUROPE'S BUILDINGS





NET-ZERO CARBON BUILDINGS

EPBD recast proposal (2021)



Introduces a new EU definition of a 'zero emissions building'

Applies definition to all new buildings from 2027 and to all renovated buildings from 2030

Zero-emissions buildings would need to factor in their life-cycle global warming potential

Promotes the uptake of renewable energy in buildings as well as high energy efficiency performance



Policy instruments for Whole Life Carbon considerations in renovation

ENERGY PERFORMANCE CERTIFICATE



- Disclose the energy and carbon performance of the property
- Prove compliance with minimum performance standards or green building requirements

BUILDING RENOVATION PASSPORT



- Voluntary deep renovation advice
- Data to develop individual climate-proofing roadmaps

MANDATORY MINIMUM PERFORMANCE STANDARD



- Mandatory renovation obligation of the worst performing buildings

NATIONAL BUILDING RENOVATION PLAN



- Establish building stock data
- Monitor progress
- Evaluate impact of policies and financial programmes

DIGITAL BUILDING LOGBOOK

- Repository of all building related data
- Contains information to enable low-carbon measures and an increased circularity





EU policy actions promoting net-zero emissions

Building level → Neighbourhood level

▪ **LEVEL(s)**: A sustainable building framework

▪ **New European Bauhaus**
(Building and district level renovation)

▪ **EPBD** proposal 2021

▪ **EU Mission**: Climate-Neutral and Smart Cities





NET-ZERO BUILDINGS

Projects funded by EU Horizon 2020



EXCESS

(2019-2024)

Demo case (zero-energy district)

- Granada, Spain
- 4 storey apartment complex
- 30 apartment units
- Positive energy buildings



cultural 

(2019-2024)

Demo case (zero-energy district)

- Leers, France
- 4 storey building
- 19 dwelling units
- Positive energy buildings





NET-ZERO NEIGHBOURHOODS

Projects funded by EU Horizon 2020



Sustainable
plus energy
neighborhoods



Verksbyen urban development project, Norway
2 Demo buildings
56 units in apartment buildings

Net delivered final energy	-13 kWh/(m ² yr) surplus
GHG emissions from energy use	-1,7 kg CO ₂ -eq/(m ² yr) negative
Renewable energy generation	51 kWh/(m ² yr)
Share of renewables	100%





EU Mission: Climate-Neutral and Smart Cities

Cities play a pivotal role in achieving climate neutrality by 2050

Aim of the EU Mission:

- Deliver **100 climate-neutral and smart cities** by 2030
- Ensure that these cities act as **experimentation and innovation hubs** to enable all European cities to follow by 2050



Cities from every
Member State



Capital cities



Small, medium,
large cities



Frontrunners and
less prepared cities





Thank you for your interest!

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