



Ministry of Energy and Water Resources
of Republic of Tajikistan



Green Diplomacy Week – a global just energy transition

EU-Central Asia Sustainable Energy Days

International Conference

Energy Efficiency in Tajikistan: prospects and challenges

Dushanbe Serena Hotel, 25-26 October 2023

EU approach to the promotion of energy efficiency in buildings - lessons learned and a way forward

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THE OUTLINE OF PRESENTATION



- Why building sector is important?
- How were the concepts designed aiming to improve energy efficiency in buildings?
- What tools are used to improve energy efficiency in the building sector?
- What are the important aspects of the energy efficiency improvement in buildings?
- What are the future directions of the development?

THE BUILDING SECTOR MAKES IMPACT TO ENERGY CONSUMPTION, CLIMATE CHANGE AND HUMAN HEALTH



The average person spends 90% of their lifetime indoors.

– to create comfortable conditions, the energy is consumed: to heat, cool, ventilate, ensure proper light and other services

Energy is consumed to extract materials, manufacture, transport construction products and assemble them into buildings.

That converts to carbon dioxide emissions:

38%
of global GHG emissions comes from building sector

=

27% of
emissions comes from energy use for buildings (heating, cooling, electricity consumption)

+

11% of
emissions is due to building constructions (embodied)

GHG – green house gas(or „CO2 equivalent“)

STARTING FROM ENERGY CRISIS IN 70's ENERGY AUDITS AND ENERGY PERFORMANCE CERTIFICATION HAS DEVELOPED



1970

1973

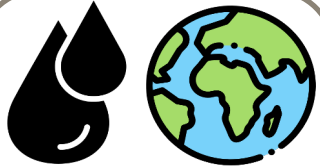
1979

1980

1982 - 1987

1990s

2002-2006



Oil crises spark energy conservation interest globally



Denmark introduces its first energy labeling scheme

UK, GE, FR establish the programs which enable energy audits



US launched a number of programs to promote energy efficiency, including a program to **provide energy audits to homeowners**



Several European countries (Sweden, UK, Netherlands) experiment with energy labeling and rating schemes



International energy agency ran a project to improve the maturity of the Energy audit process.



EU adopts the Energy Performance of Buildings Directive (EPBD)."
EU adopted the Energy Service Directive, later replaced with Energy Efficiency Directive (EED)

THE ENERGY PERFORMANCE CERTIFICATION CONCEPT IS EVOLVING WITH EACH EPBD VERSION



2002

2010

2018

2023

Directive 2002/91/EC - EPBD 2002

- Introduced EPCs for buildings when constructed, sold, or rented.
- Emphasized improving energy performance of buildings.
- Mandated regular inspection of boilers and air-conditioning systems.

Directive 2010/31/EU - EPBD Recast

- Introduced "nearly zero-energy buildings" (NZEB) concept.
- All new buildings to be NZEB by end of 2020.
- Enhanced user-friendliness of EPCs and promoted wider dissemination.

Directive (EU) 2018/844 - EPBD Revision

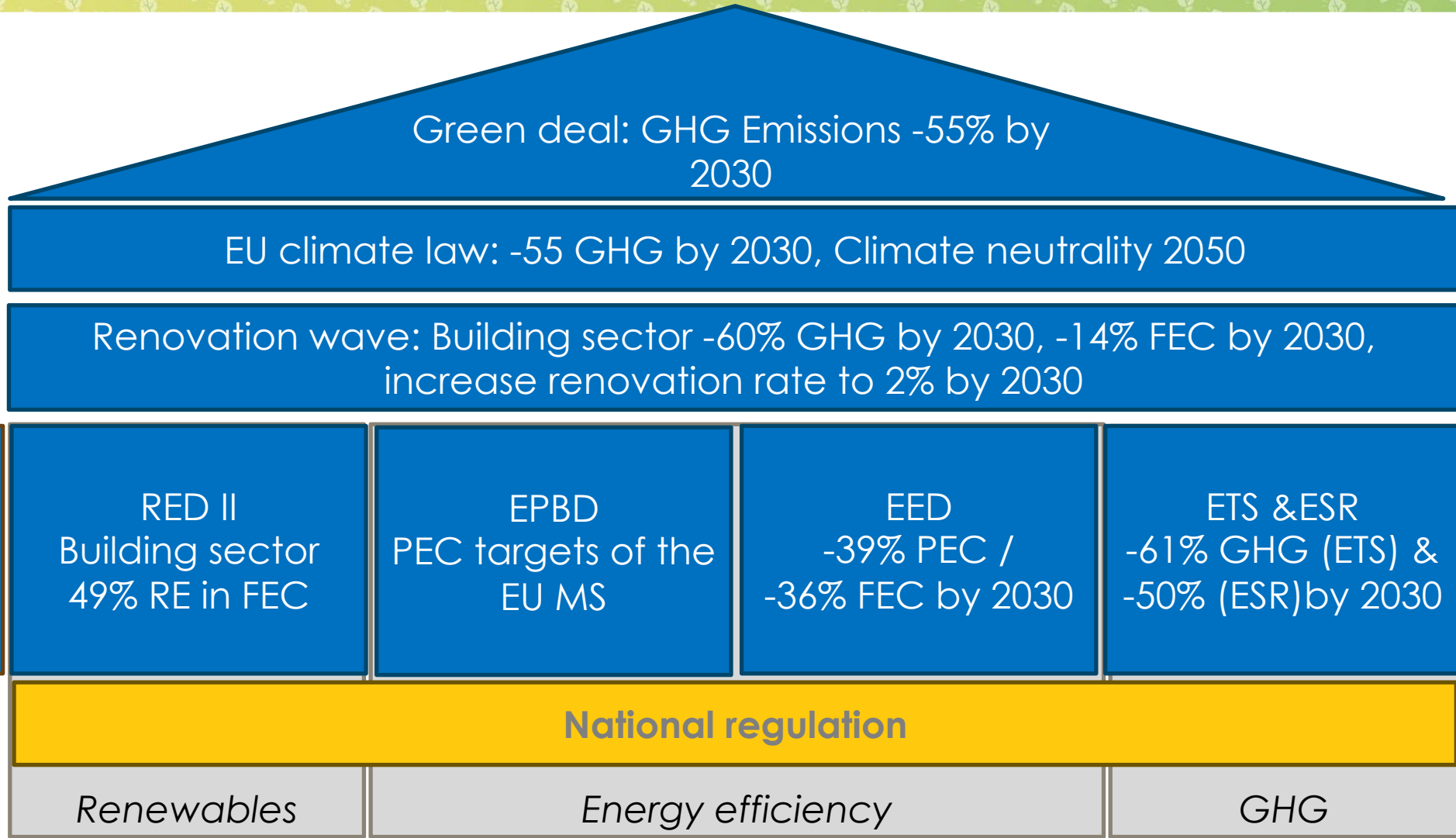
- Aims to decarbonize building stock by 2050.
- Promotes smart technologies and e-mobility.
- Encourages use of financial tools for energy efficiency improvements
- Stresses the use of EPC for Long-term renovation strategy

The evolution of EU directives reflects a growing commitment to energy efficiency and environmental sustainability

IN 2023 EU POLICY FRAMEWORK IS COMPLEX AND CLIMATE CHANGE PREVENTION ALIGNED SET OF REGULATIONS



Taxonomy

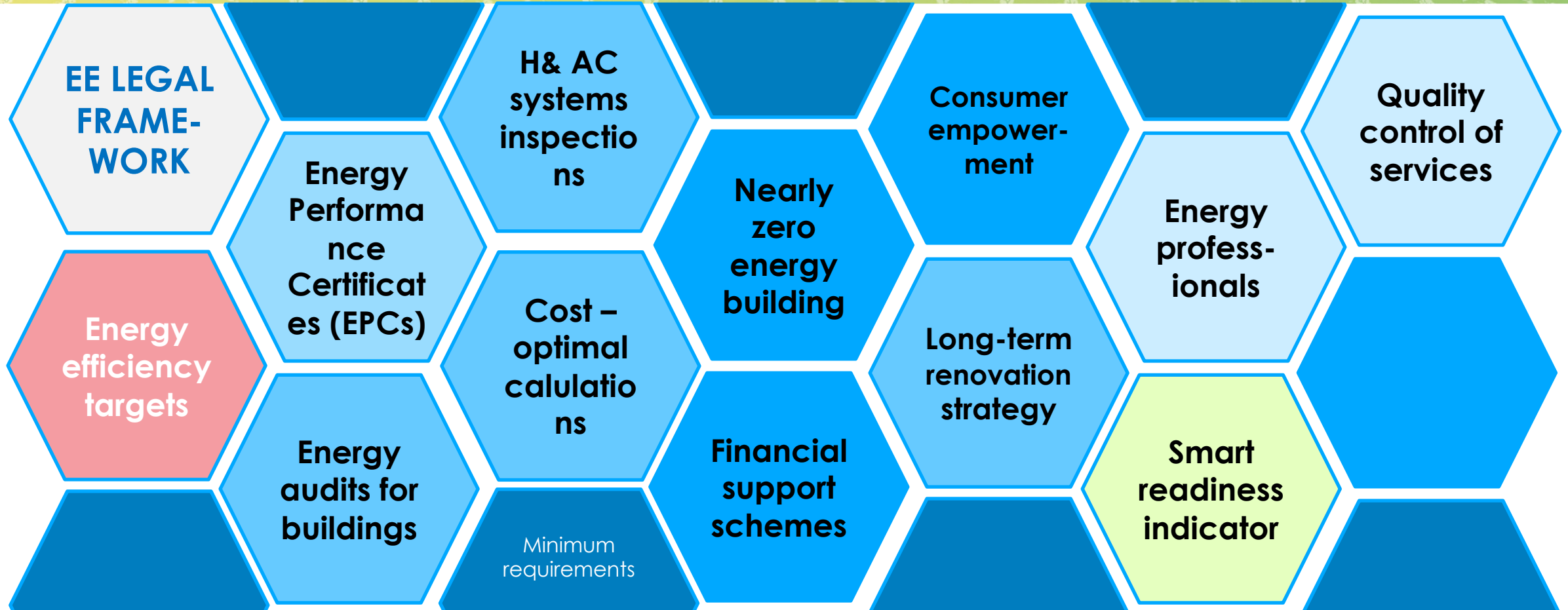


Governance
Regulation EU

NECP

LTRS

ENERGY EFFICIENCY IN BUILDING SECTOR IS ENABLED BY THE SET OF MULTIPLE TOOLS



To facilitate the change European commission and EU member states employ multiple tools and methods to improve energy efficiency

THE PRINCIPLES FROM DIRECTIVES ARE TRANSPOSED TO NATIONAL LEGISLATION AND IMPLEMENTED BY DESIGNATED BODIES



- **Energy Performance of Buildings (EPBD) Energy Efficiency Directive (EED)** recommends the structure and key principles



- **Member states** transpose EPBD & EED recommendations to national legislation and foresee implementation mechanisms (responsible institutions, penalties, financial support mechanisms)



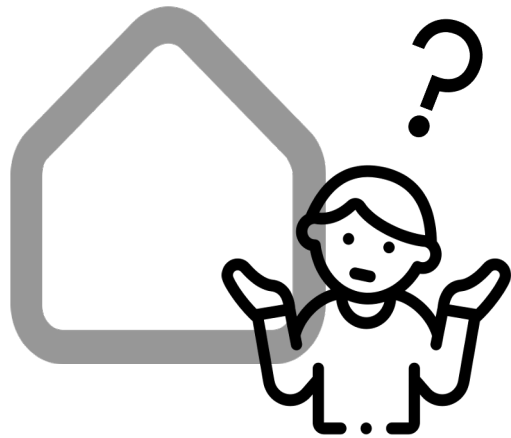
National implementation bodies (Agencies or others) implement the policy:



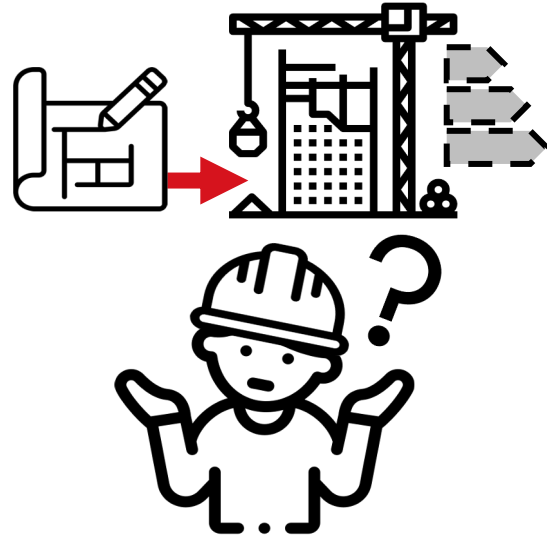
- Perform actions needed to run the systems, helping to improve energy efficiency
- Monitors the implementation data
- Aggregates and analyses the collected information
- Reports the status and achieved energy savings

The key elements enabling policy actions are directives, their transposition to national legislation and national implementation bodies

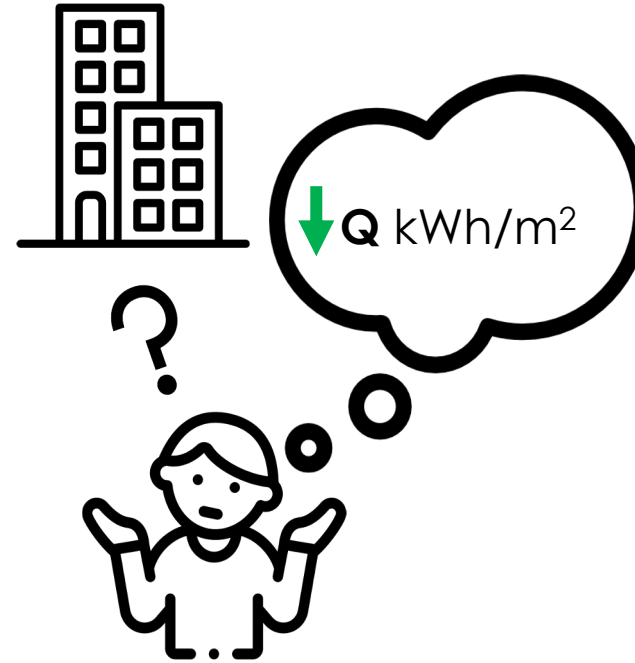
KEY QUESTIONS THAT WE ARE LOOKING TO ANSWER WHEN DEALING WITH BUILDINGS



HOW ARE OUR BUILDINGS PERFORMING?



HOW TO BUILD AN ENERGY-PERFORMING BUILDING?

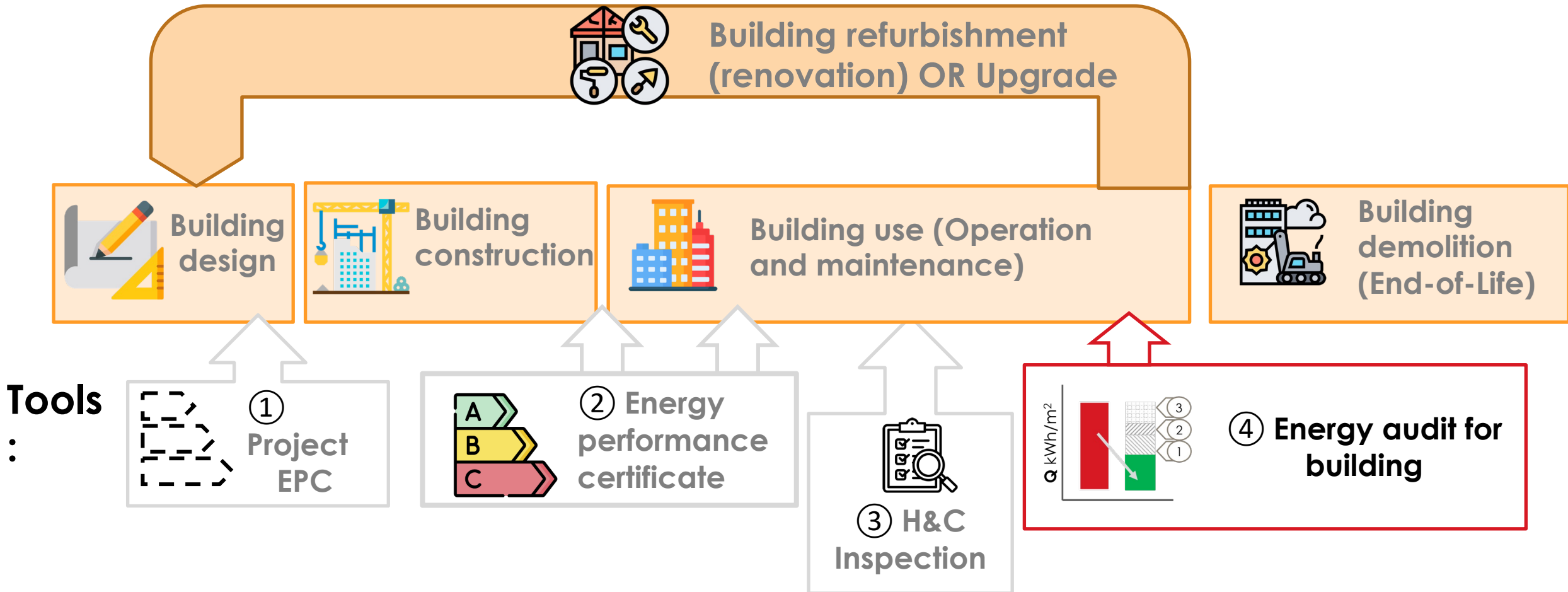


WHERE TO INVEST TO REDUCE ENERGY CONSUMPTION?



HOW TO ENSURE THAT HEATING AND COOLING OPERATES IN EFFICIENT WAY?

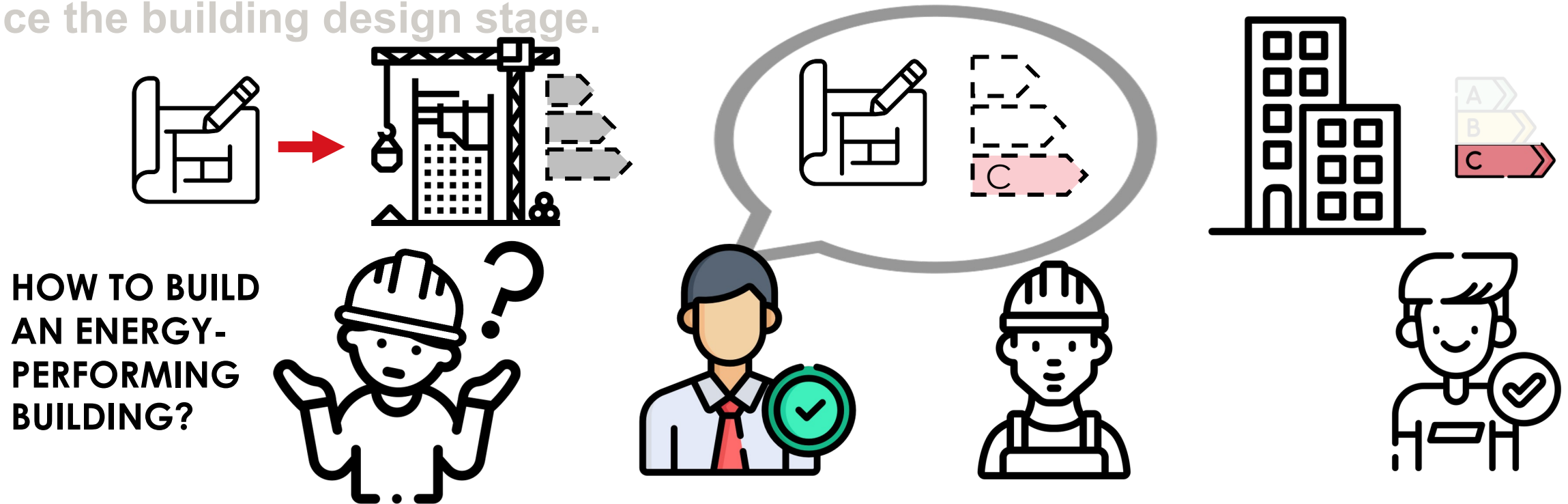
EACH EFFICIENCY IMPROVEMENT TOOL HAS IMPORTANT ROLE IN BUILDING LIFE CYCLE



① ENERGY PERFORMANCE DESIGN DESCRIBES HOW THE BUILDING SHOULD BE BUILT TO MEET ENERGY PERFORMANCE REQUIREMENTS



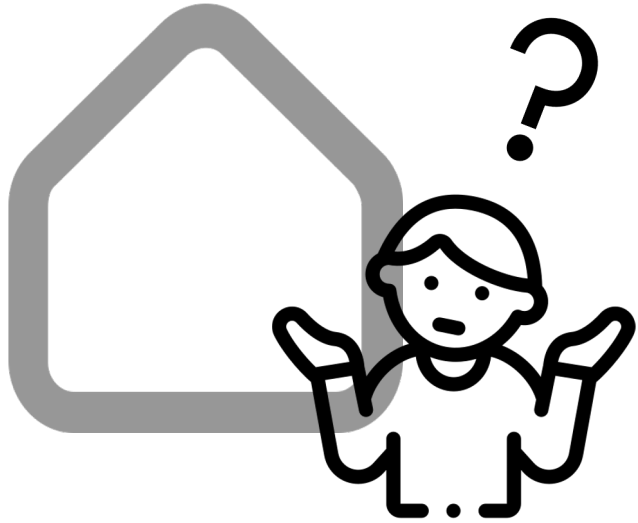
Energy Performance Design (project EPC) sets the requirement how building should be built if specific energy performance class should be reached. It ensures that energy performance goals are set and detailed since the building design stage.



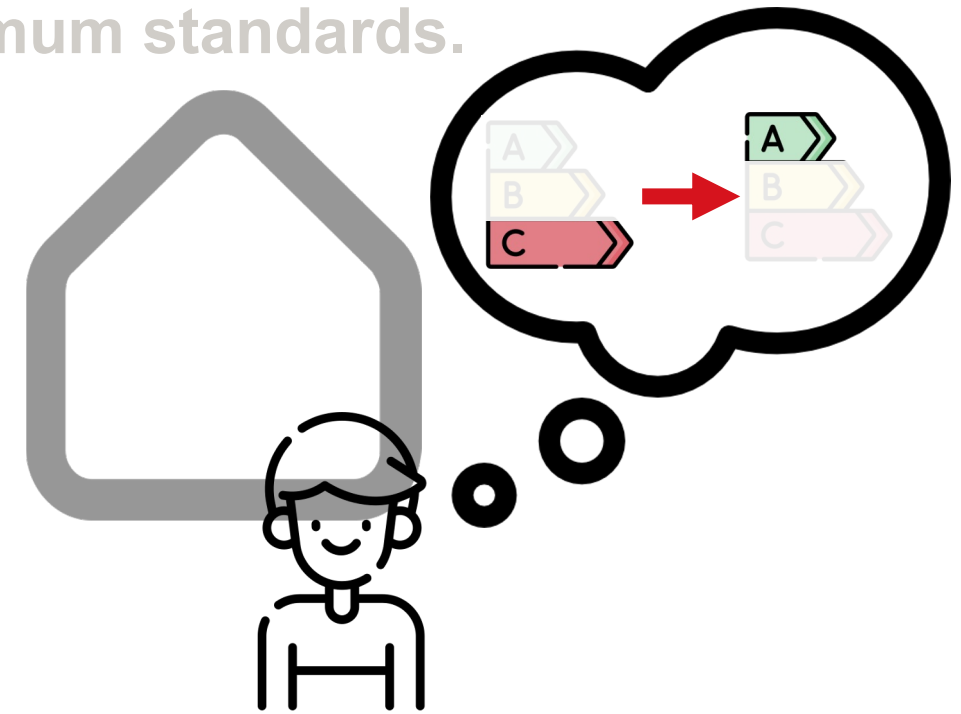
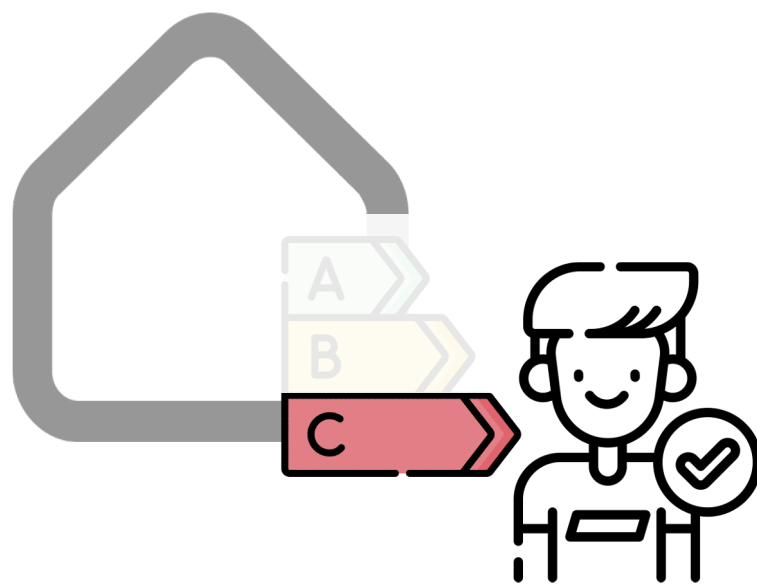
② ENERGY PERFORMANCE CERTIFICATES MAKE BUYERS AND OWNERS LIVES EASIER BY INFORMING THEM ABOUT THE STATE OF THE BUILDING



Energy Performance Certificates (EPCs) make it easier to understand how good in terms of energy consumption the building is. They help customers know more and aim for better than just the minimum standards.



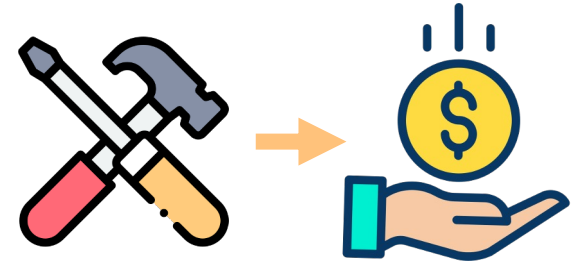
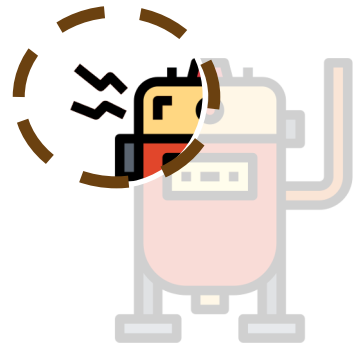
HOW IS OUR BUILDING PERFORMING?



③ INSPECTION HELPS TO MONITOR AND MAINTAIN THE PERFORMANCE OF HEATING AND AIR CONDITIONING SYSTEMS



Inspection aims to identify the performance of the systems, identify issues and propose operational improvements to reduce energy consumption and increase efficiency



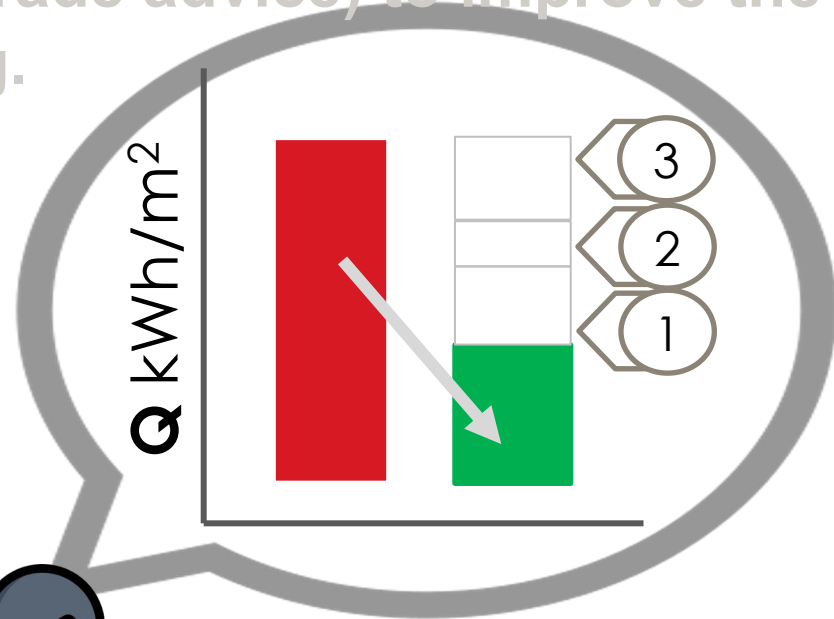
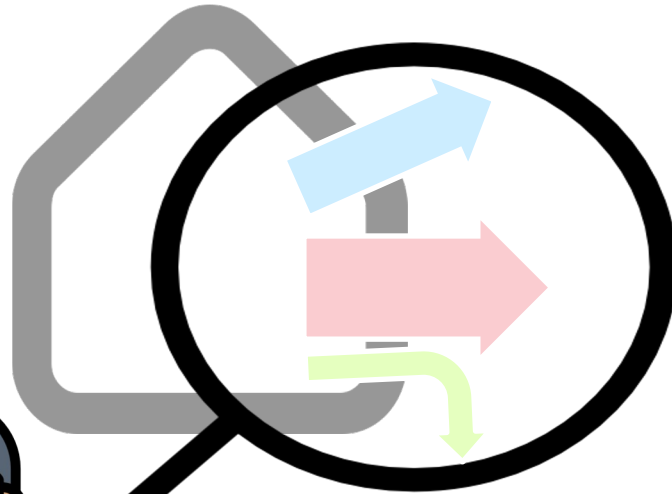
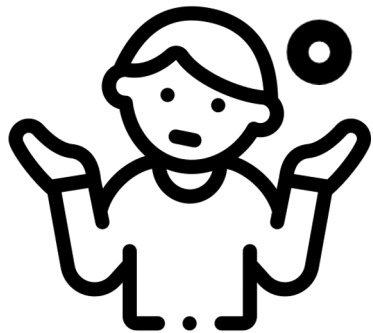
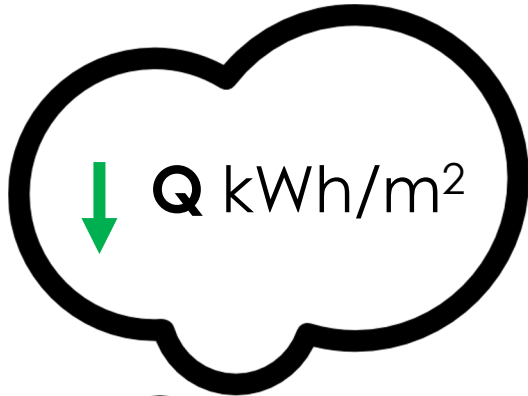
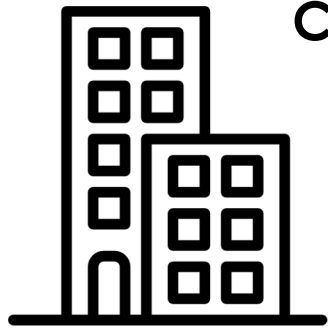
HOW TO ENSURE THAT HEATING AND COOLING OPERATES IN EFFICIENT WAY?

④ ENERGY AUDIT HELPS TO DIAGNOSE THE ISSUES AND PROPOSES THE MEASURES TO IMPROVE ENERGY EFFICIENCY OF BUILDING



WHERE TO INVEST TO REDUCE ENERGY CONSUMPTION?

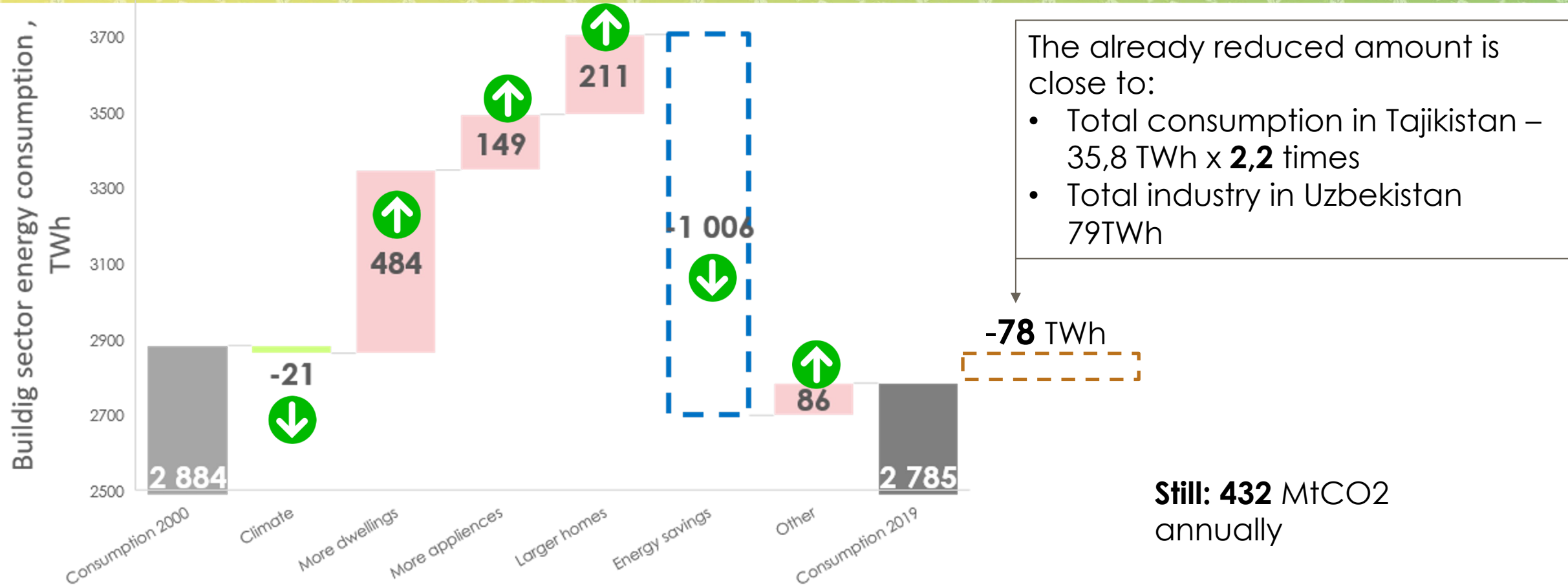
An energy audit helps to understand energy flows and their impact on consumption, identifies the losses and proposes the prioritized list of measures (investment grade advice) to improve the efficiency of the building.





IMPORTANT ASPECTS OF IMPLEMENTATION

ACHIEVEMENTS OF ENERGY EFFICIENCY IMPROVEMENT IN BUILDINGS REMAIN LESS VISIBLE DUE TO THE GROWING BUILDING STOCK



Source: <https://www.indicators.odyssee-mure.eu/decomposition.html>

Despite creating the savings that would reduce energy consumption in the sector by 1/3, the actual consumption reduction is much smaller due to the increasing number of heated area, number of dwellings and more appliances

ENERGY POVERTY HAS TO BE MEASURED AND ADDRESSED TO IMPROVE THE EFFICIENCY FURTHER



11% of the EU's population cannot adequately heat their homes at an affordable cost.

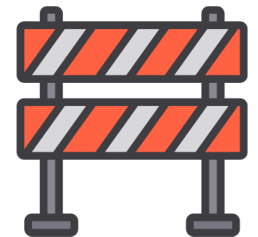
50 million households in the European Union are affected

The scale of the problem is due to **rising energy prices**, **low household incomes**, **a lack of access to finance**, and **inefficient buildings and appliances**.

As renovation may be a solution for this part of the population,



but it is also inaccessible for them regularly due to low income.



Source: <https://energy-poverty.ec.europa.eu/>



FUTURE DIRECTION

THE UPCOMING BUILDING ENERGY PERFORMANCE DIRECTIVE WILL INTRODUCE VARIOUS CHANGES



2020

All new buildings in EU must be **Near Zero Energy Buildings (NZEB)**

2025

Energy performance certificates (EPCs) must be based on a **harmonised energy performance scale** by 2025.

2030

All buildings must have a **smart readiness indicator (SRI)** by 2026, to assess their ability to integrate smart technologies

All new buildings in the EU must be **zero-emission buildings (ZEBs)** from 2030

2050

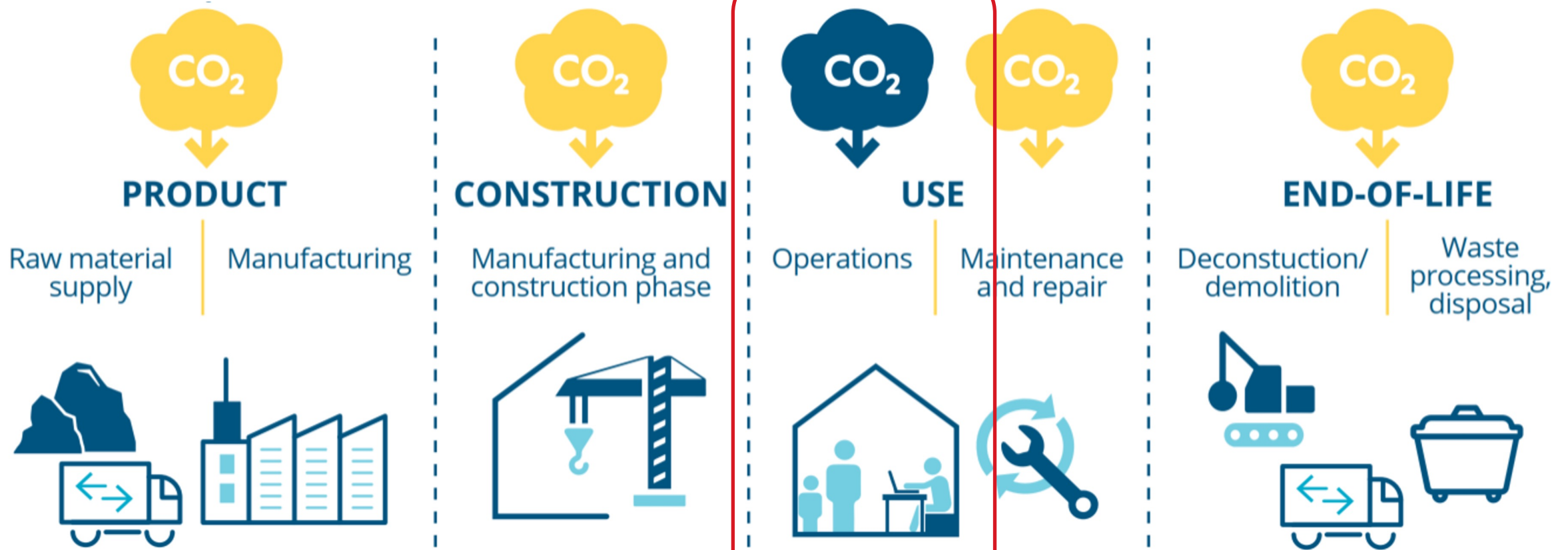
Existing **PUBLIC** buildings must be **renovated to a high energy performance level**, with minimum energy performance standards set at EU level

Building **life cycle carbon emissions calculation** will be introduced

all new **PUBLIC** buildings must be **zero-emission buildings (ZEBs)** from 2027.

DECARBONIZED BUILDING STOCK IN 2050

ZERO-EMISSION BUILDINGS ARE A NEW AIM FOR MAKING BUILDINGS MORE CLIMATE AND OCCUPANT-FRIENDLY



The current scope of Performance evaluations

A background of vertical stripes in various shades of blue, transitioning from dark blue on the left to light blue in the center, and then to orange and red on the right.

Climate stripes by Prof. Ed Hawkins.

A banner with a green-to-yellow gradient background, featuring a repeating pattern of small, stylized leaf or tree icons.

CONCLUSIONS

SUMMARY: KEY TAKE AWAYS



- THE BUILDING SECTOR MAKES SUBSTANTIAL IMPACT TO ENERGY CONSUMPTION, CLIMATE CHANGE AND HUMAN HEALTH
- STARTING FROM ENERGY CRISIS IN 70's ENERGY AUDITS AND ENERGY PERFORMANCE CERTIFICATION HAS DEVELOPED
- IN 2023 EU POLICY FRAMEWORK IS COMPLEX, AND CLIMATE CHANGE PREVENTION ALIGNED SET OF REGULATIONS
- ENERGY EFFICIENCY IN BUILDING SECTOR IS ENABLED BY THE SET OF MULTIPLE TOOLS
- ACHIEVEMENTS OF ENERGY EFFICIENCY IMPROVEMENT IN BUILDINGS REMAIN LESS VISIBLE DUE TO THE GROWING BUILDING STOCK
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- ZERO-EMISSION BUILDINGS ARE A NEW AIM FOR MAKING BUILDINGS MORE CLIMATE AND OCCUPANT-FRIENDLY

EU APPROACH TO THE PROMOTION OF ENERGY EFFICIENCY IN BUILDINGS - LESSONS LEARNED AND A WAY FORWARD



***THANK YOU FOR
YOUR ATTENTION
!***



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„Helping to Unlock the Value of Energy Efficiency and Sustainability for a More Resilient Future “



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