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European Union – Kazakhstan Sustainable Energy Days 2024

Lectures on Sustainable Energy for Teachers and Students

Karaganda Industrial University, 3 June 2024

EU approach to energy efficiency promotion: lessons learnt and the way forward

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Key expert in energy sector governance, SECCA

Stantec | intec GOPA International Energy Consultants MEMBER OF GOPA CONSULTING GROUP | ACTED | European University Institute | Robert Schuman Centre for Advanced Studies | FSR ENERGY Florence School of Regulation

WHY ENERGY EFFICIENCY FIRST?

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Energy Efficiency first principle (1)

- **Energy Efficiency** is **one of the key pillars** not only **to meet EU's climate objectives** but also to **reduce dependence on fossil fuels** and **increase security of supply** and the **use of renewable energy**

- **Energy Efficiency first (EE1st) principle** is generally understood as a **guiding principle for energy-related policymaking, planning, and investments**

- The principle aims **to treat energy efficiency as a source of energy** in its own right in which the public and the private sector can invest ahead of other more complex or costly energy sources

- This includes **giving priority to demand-side solutions** whenever **they are more cost-effective** than investments in energy infrastructure to meet policy objectives

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Energy efficiency first (EE1st) principle (2)

- The EE1st principle was formally introduced into EU legislation in the Governance Regulation (European Union 2018), which includes a formal definition and **requires Member States to report on the implementation of EE1st** in their **National Energy and Climate Plans (NECPs)**

- In essence, it is meant to **consider and prioritise** investments in both:

  demand-side resources (end-use energy efficiency, demand response, etc.)

  supply-side energy efficiency

  whenever these cost less or deliver more value than default energy infrastructure

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National Energy and Climate Plan

NECP for 2021 – 2030
with the outlook to 2050

Five (5) dimensions:

- **Energy Security**
- **Energy Efficiency** as a primary fuel
- **Decarbonization** and **Renewable Energy** development
- **Market integration**
  - Cross-border connections
  - Harmonized Market rules
  - Addressing **energy poverty** and vulnerable customers
- **Research and Innovation** for new technologies

This approach requires **close coordination across all ministries**

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EE IN BUILDINGS

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Role of Building stock

- Buildings account for approximately **40% of final energy consumption**
- Investing in EE measures in buildings can yield **substantial energy savings**, while **supporting economic growth**, **sustainable development** and **creating jobs**
- Greater use of **energy-efficient appliances** and **technologies**, combined **with renewable energy**, are cost-effective ways of enhancing **the security of energy supply**

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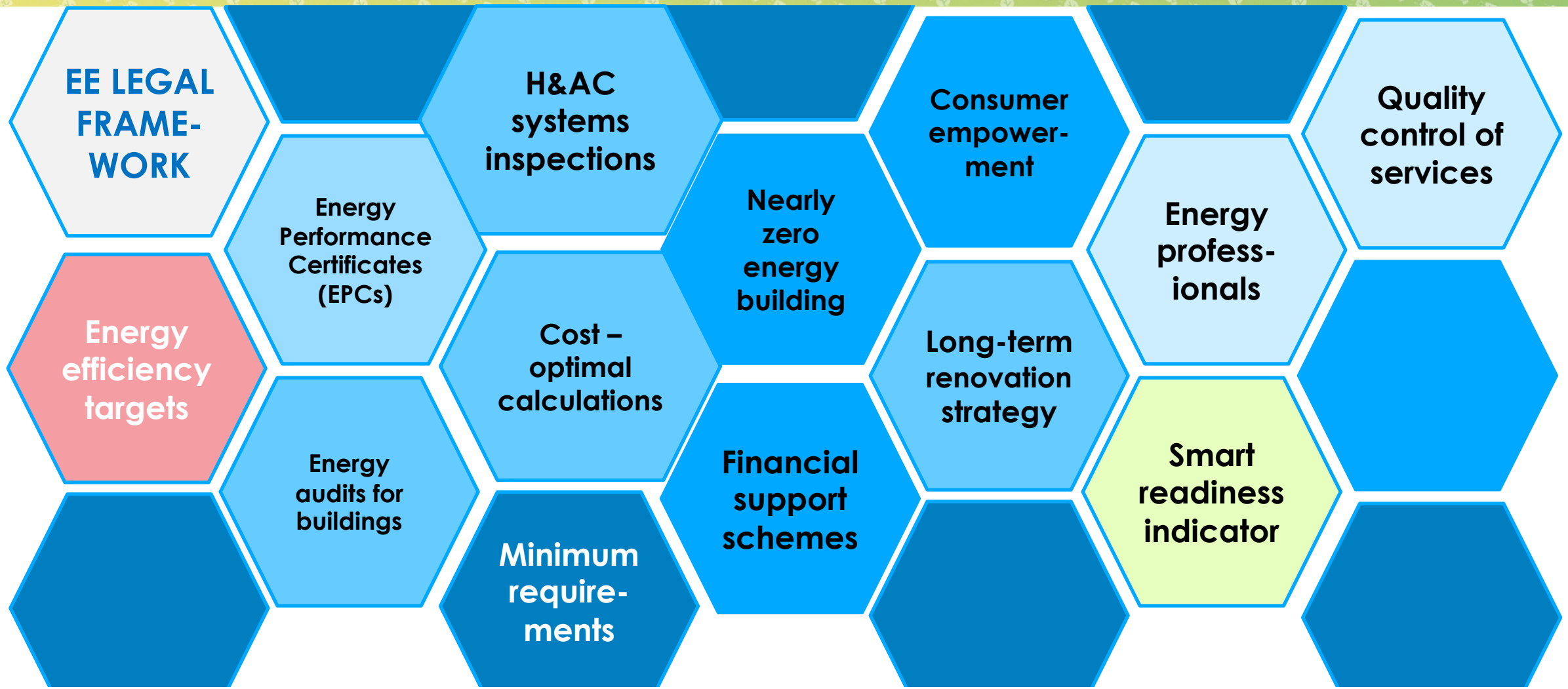
Policy elements and instruments/ tools for EE in Buildings



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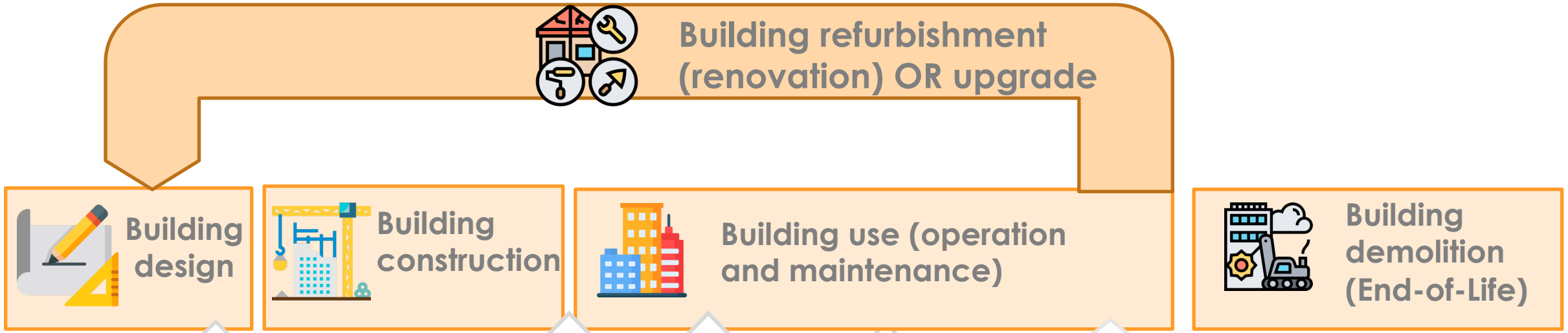
Key tools for promotion of EE improvement in Building life cycle

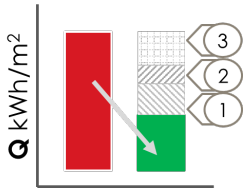


Tools:

① Project EPC

② Energy performance certificate

③ H&C Inspection



④ Energy audit for building

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Building stock

- Public buildings, incl. Central Government Buildings
- Commercial sector buildings (offices, etc.)
- Industrial Buildings
- Residential buildings
  - Multi-apartment buildings
  - Family houses

Each group/ type of buildings has different features - ownership, operation and maintenance models, etc.

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Purpose of Article 5 of EU Energy Efficiency Directive

EU EED 2012, Article 5 sets the renovation requirement for Central Government Buildings:

- it is mandated to renovate annually **3%** of the total area of heated and/or cooled **buildings owned and occupied by the central government**
- these renovations must ensure that buildings meet at **least the minimum energy performance requirements**
- initially, this requirement applies to buildings with a total useful floor area over **500 m²**, which is later reduced to **250 m²**

The rationale behind the Article 5 implementation:

- **Leadership and Exemplary Role**: it positions public sector buildings as energy efficiency leaders, mandating renovations to meet energy performance standards, thus setting an example for the private sector and the public
- **Economic and Environmental Benefits**: boosting energy efficiency in buildings lowers public spending on energy, freeing up the state budget for other priorities while also yielding environmental gains through reduced energy consumption and carbon emissions, supporting the goals for sustainable development and climate change mitigation
- **Stimulating the Market for Energy Services**: the directive demands public building renovations, boosting demand for energy services and fostering innovation, job creation in the green economy, and new business models needed to spread good practices

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A WAY FORWARD – TO ALL PUBLIC BUILDINGS

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Upcoming changes with EED 2023

EED 2018*:

Article 5: Exemplary role of public bodies' buildings

- **Renovation**: 3% of government buildings (>250 m²) renovated yearly for energy standards
- **Priority**: Target poorest performing buildings first
- **Exemptions**: Historic, military (with exceptions), and religious buildings
- **Flexibility**: Excess renovations credited; replacements for demolished buildings qualify

*Not all requirements reflected
** Not yet transposed to EU MS national legislation

EED 2023**:

Article 5: Public sector leading on energy efficiency

- **Annual Reduction**: Public bodies to reduce energy consumption by 1.9% yearly
- **Exemptions**: Municipalities with <50,000 population (till 2026) and <5,000 (till 2029) exempt
- **Lifecycle and Performance Considerations**: encourage consideration of lifecycle carbon emissions and wider benefits
- **Article 6: Exemplary role of public bodies' buildings**
  Renovation: 3% of public bodies' buildings floor area to be renovated to nearly zero-energy/zero-emission standards annually
- **Selection**: Based on cost-effectiveness and technical feasibility
- **Exemptions**: Social housing, historically significant buildings, military buildings, and places of worship
- **Negotiations**: For leased buildings to meet standards
- **Credit for New/Replaced Buildings**: Towards the renovation rate if more energy and CO2 efficient
- **Inventory**: Establish/update biennially an inventory of public buildings over 250 m²

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Evolution of Energy Performance Certification of Buildings concept

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

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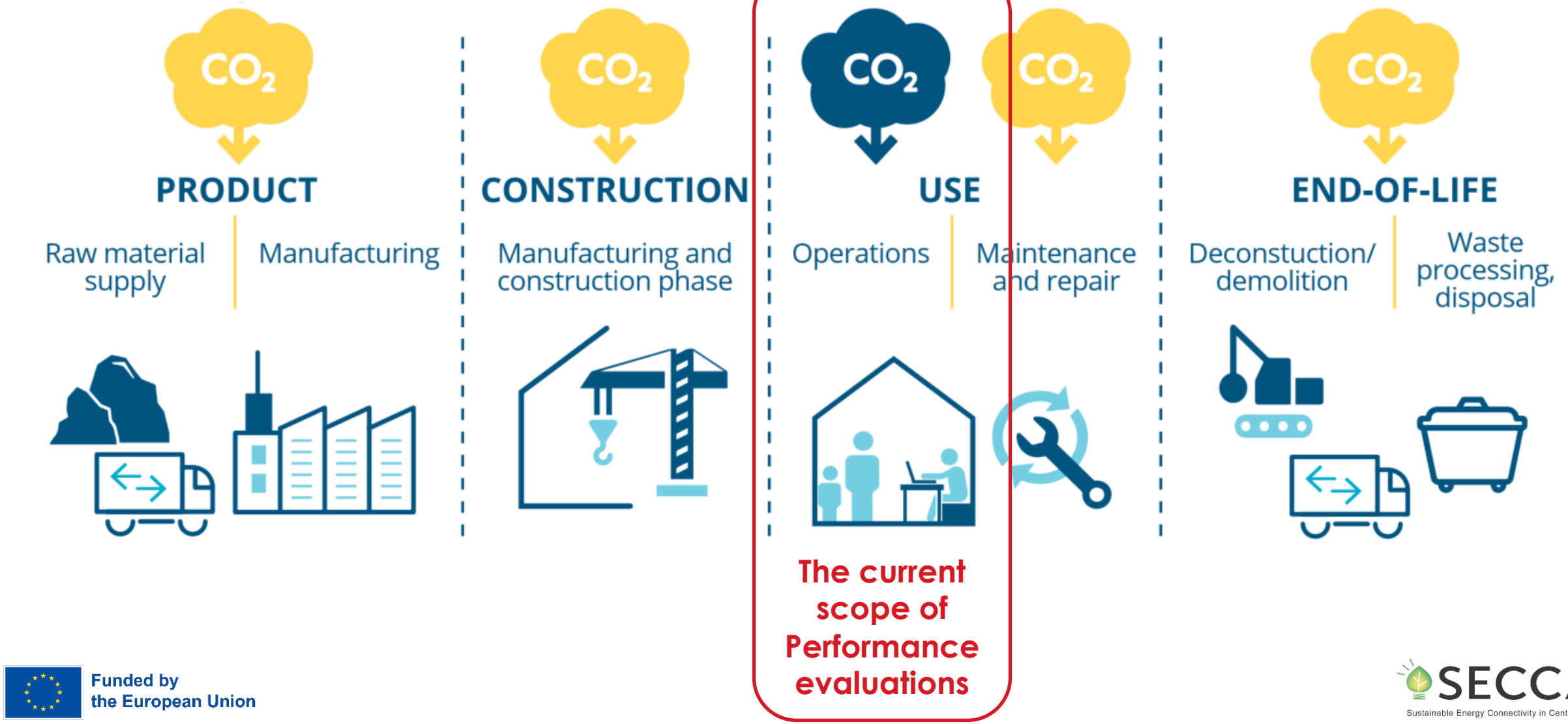
Zero-emission buildings are a new aim for making buildings more climate friendly



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EE IN INDUSTRY

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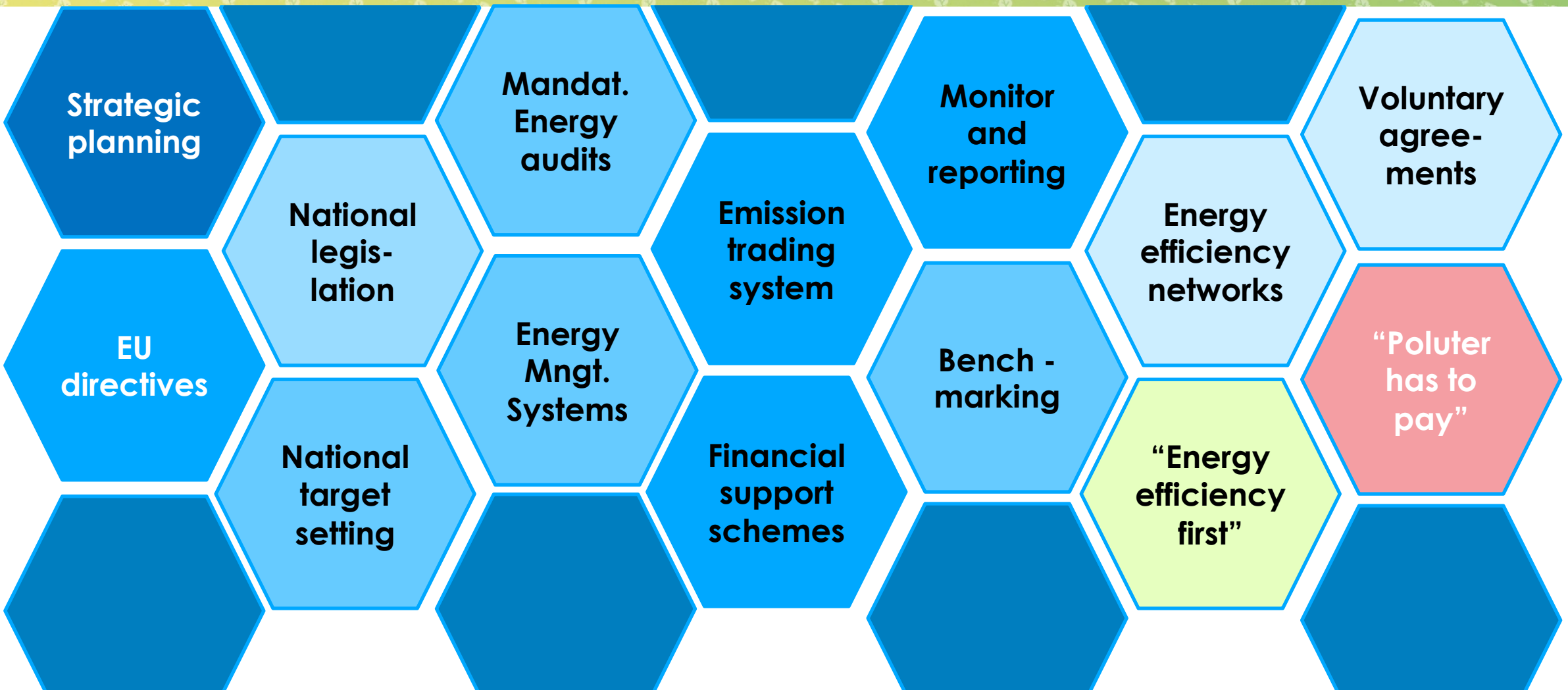
Policy elements and instruments/ tools for EE in Industry



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Role of large enterprises

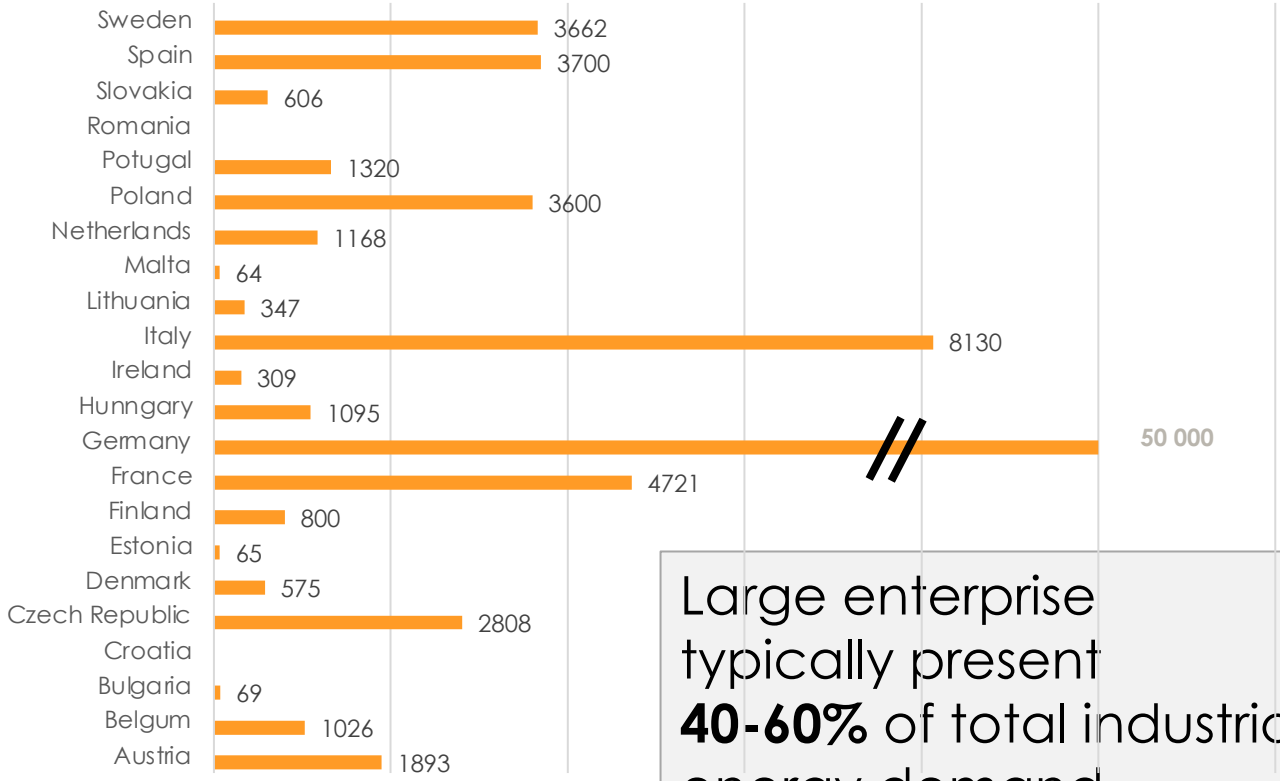
≥250 Number of employees

≥50mln. Annual turnover [euro]

≥43mln. Balance sheet total [euro]

25.10.2012
Directive 2012/27/EU on energy efficiency

Number of Large enterprises in EU MS (2018 data)



Large enterprise typically present **40-60%** of total industrial energy demand

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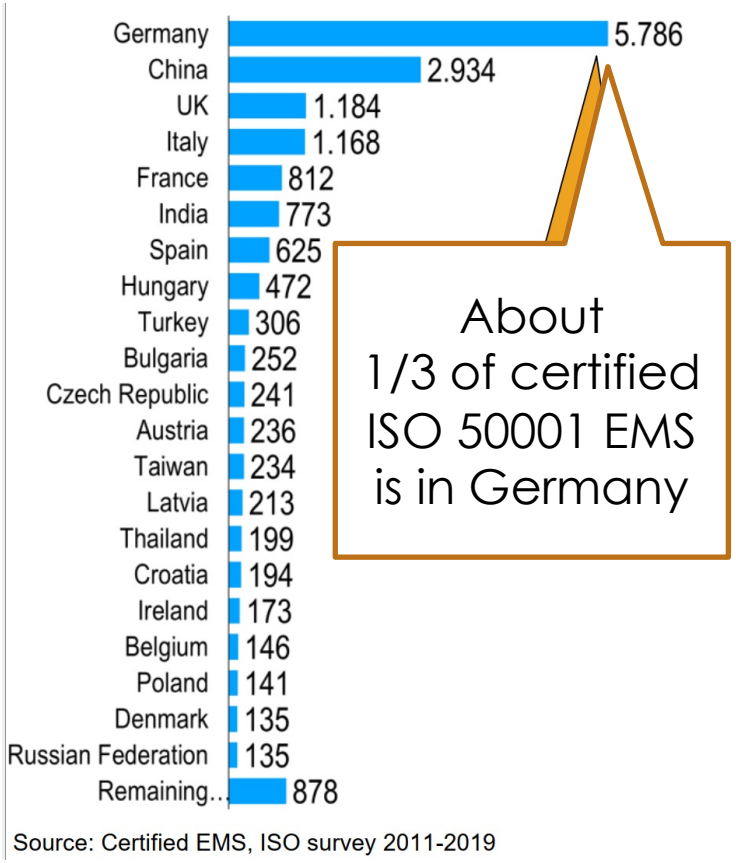
Energy management tools

ENERGY AUDIT (EA) - systematic procedure with the purpose of obtaining adequate knowledge of the energy consumption profile of a facility, identifying and quantifying cost-effective energy saving opportunities, and reporting the findings

ENERGY MANAGEMENT SYSTEM (EMS) - set of interrelated or interacting elements of a plan which sets an energy efficiency objective and a strategy to achieve that objective



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Fit for 55 package: EED recast

Energy Management Systems and **Energy Audits -** subject of application is **shifted from enterprise size** to **energy consumption threshold**

- Enterprises with an average annual (energy) consumption higher than
  - **100 TJ** → implement Energy Management Systems
  - **10 TJ** → subject to Energy Audit

- Results of energy audits including the recommendations **must be transmitted to the management**

- Ensure that **quality checks** are carried out to ensure the validity and accuracy of Energy Audits

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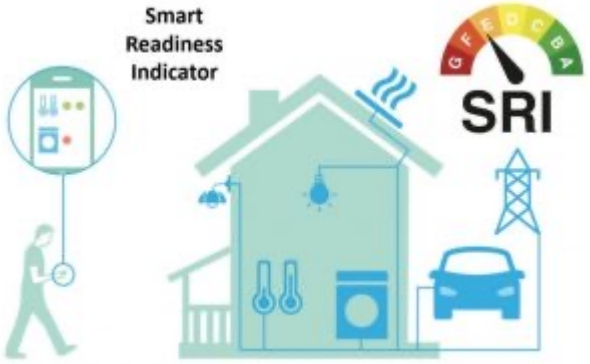
Challenges at the level of practical application

Achieving a more sustainable energy mix requires more smart technologies and solutions

- in promotion of the **use of RE** – smart grids and smart grid technologies (smart metering, demand response, smart appliances, etc.)



- in promotion of **EE in buildings** – smart readiness indicators, emerging technologies and approaches for decarbonization of the building stock, etc.

Open an opportunity for collaboration between EU-CA research institutions

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More information on SECCA website

Latest News and Events

Sustainable Energy Knowledge Hub - EE and RE implementation practices

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Horizon Europe

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