

Introduction: EU legislation



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SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA



Topics

- Global problems
- European problems
- Directives
 - RED
 - EED
 - EPBD

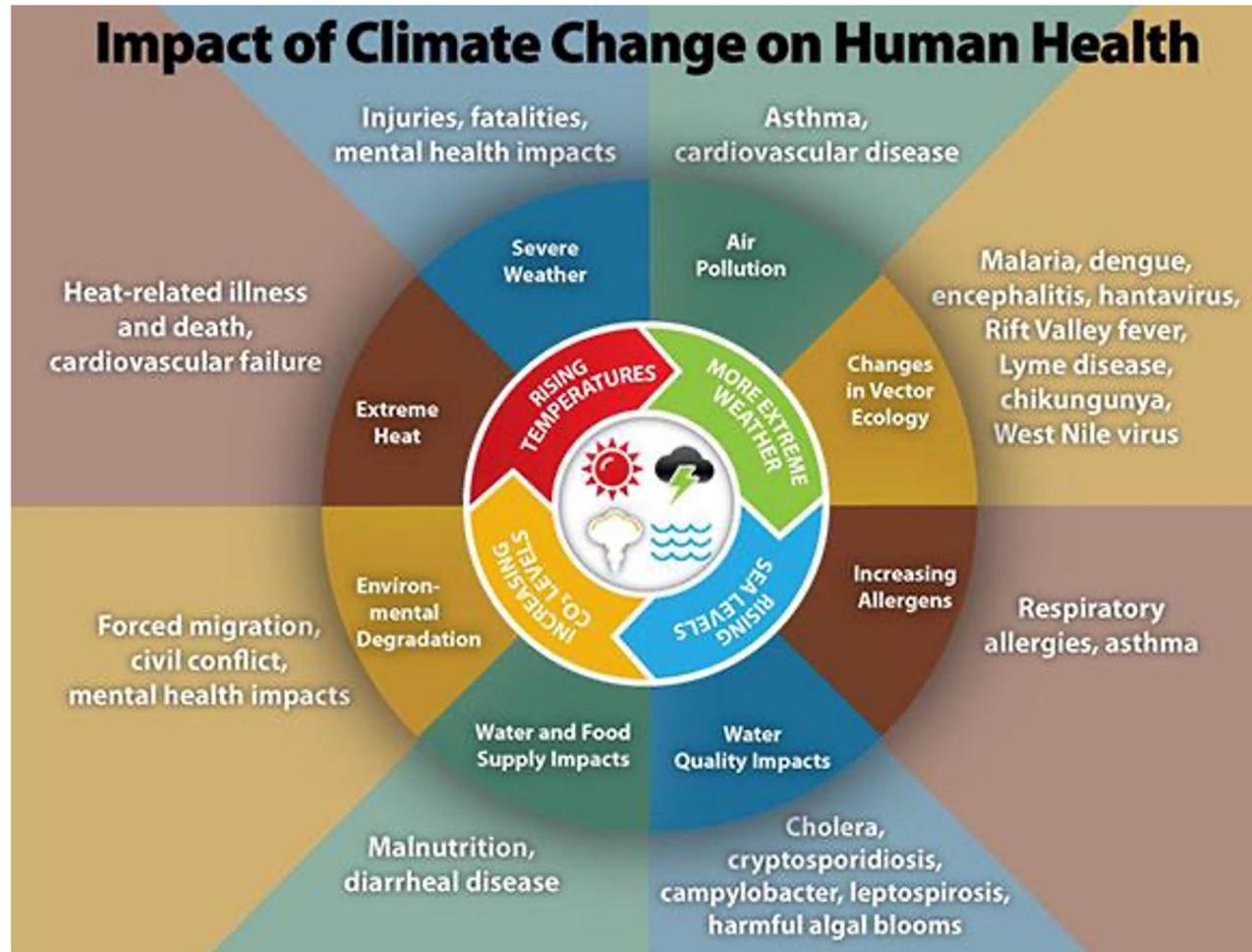
European and global challenges

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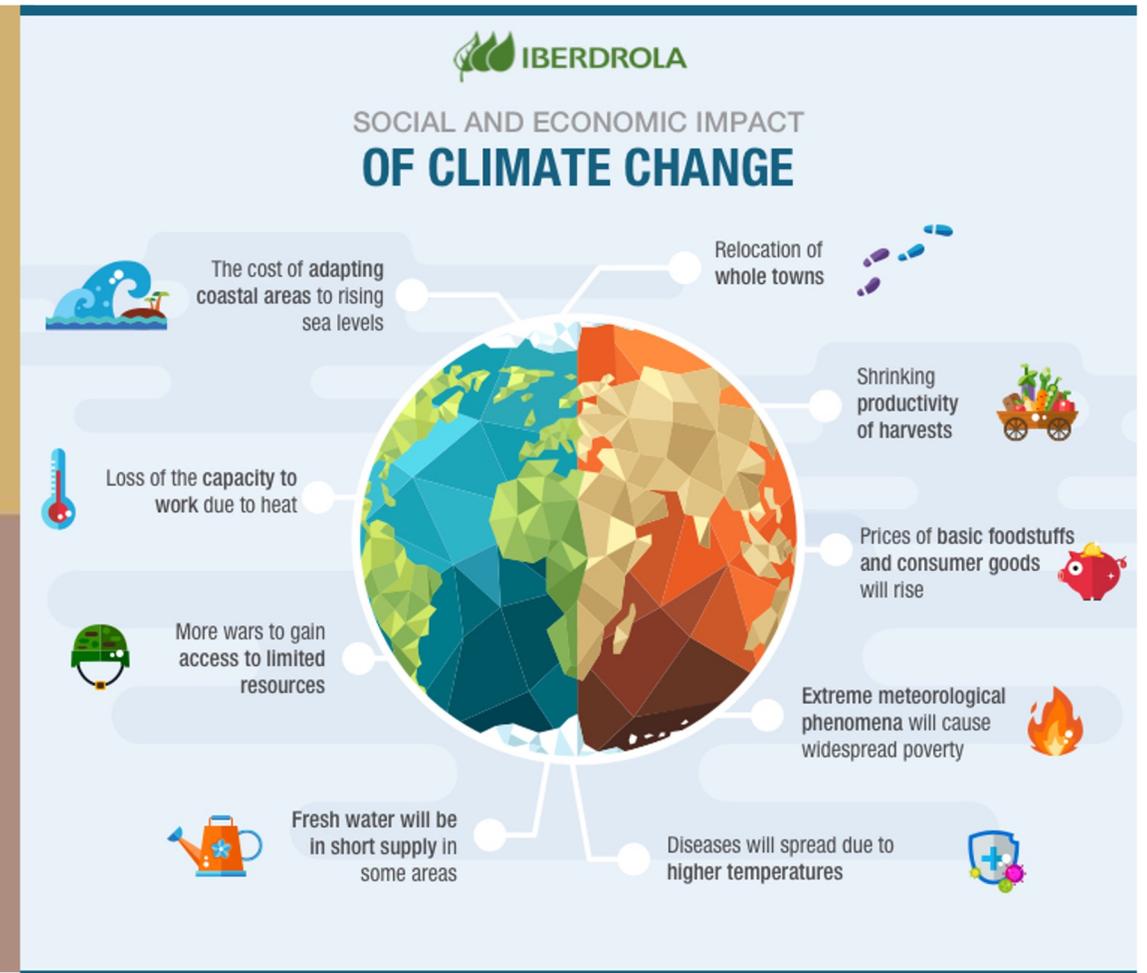
- Climate change (i.e. extreme weather conditions)
- Dependency from fossil fuels in general
- Dependency from fossil fuels import (EU imports 53%)
- Health problems (i.e. air pollution)
- Unsustainable structures (i.e. depleted fossil fuel sources)
- Growing energy demand (i.e. growing economy needs more energy)
- Inefficient buildings

Let's see some data!

Climate change is real and causes health, social and economical problems!



Source: <https://www.cdc.gov/climateandhealth/effects/default.htm>



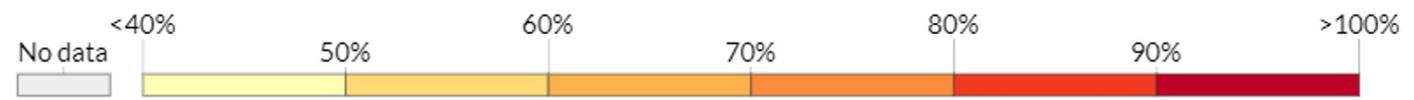
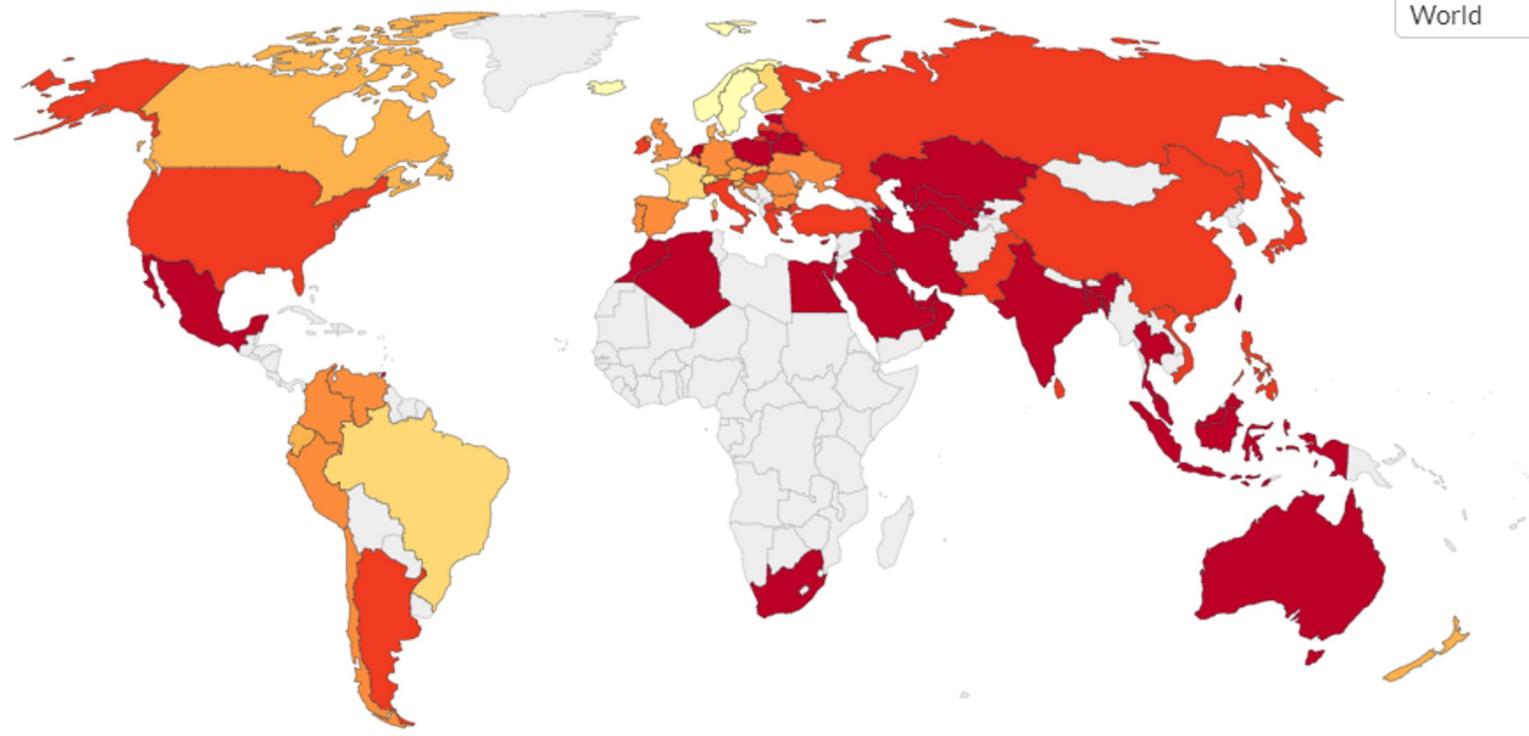
<https://www.iberdrola.com/environment/impacts-of-climate-change>

Dependency from fossil fuels in general

Share of primary energy from fossil fuels, 2019

Our World
in Data

World



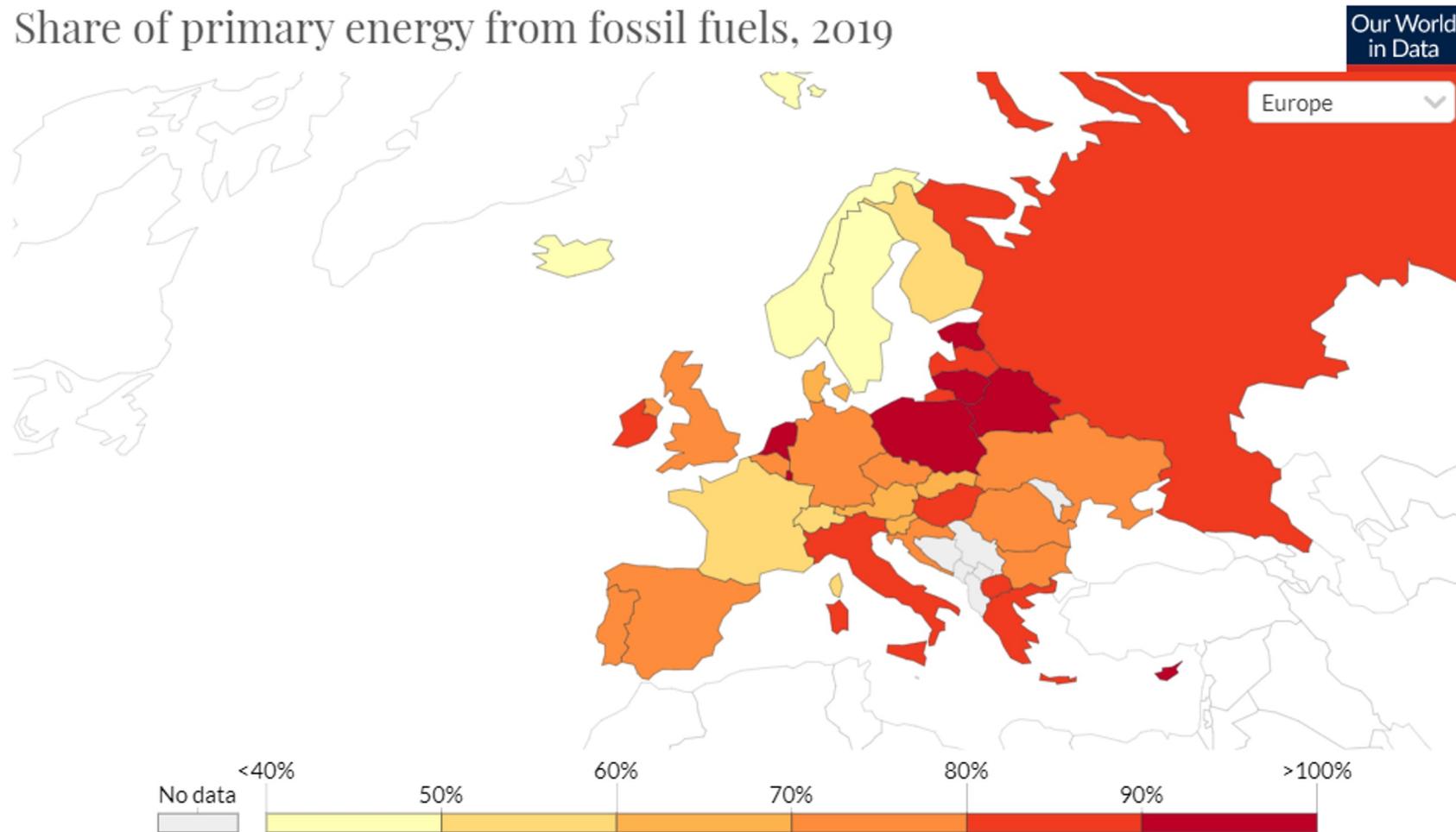
Source: Our World in Data based on BP Statistical Review of World Energy (2020)
Note: Primary energy is calculated using the 'substitution method' which takes account of the inefficiencies energy production from fossil fuels.

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Source: <https://ourworldindata.org/fossil-fuels#what-share-of-primary-energy-comes-from-fossil-fuels>

Dependency from fossil fuels in Europe

Share of primary energy from fossil fuels, 2019



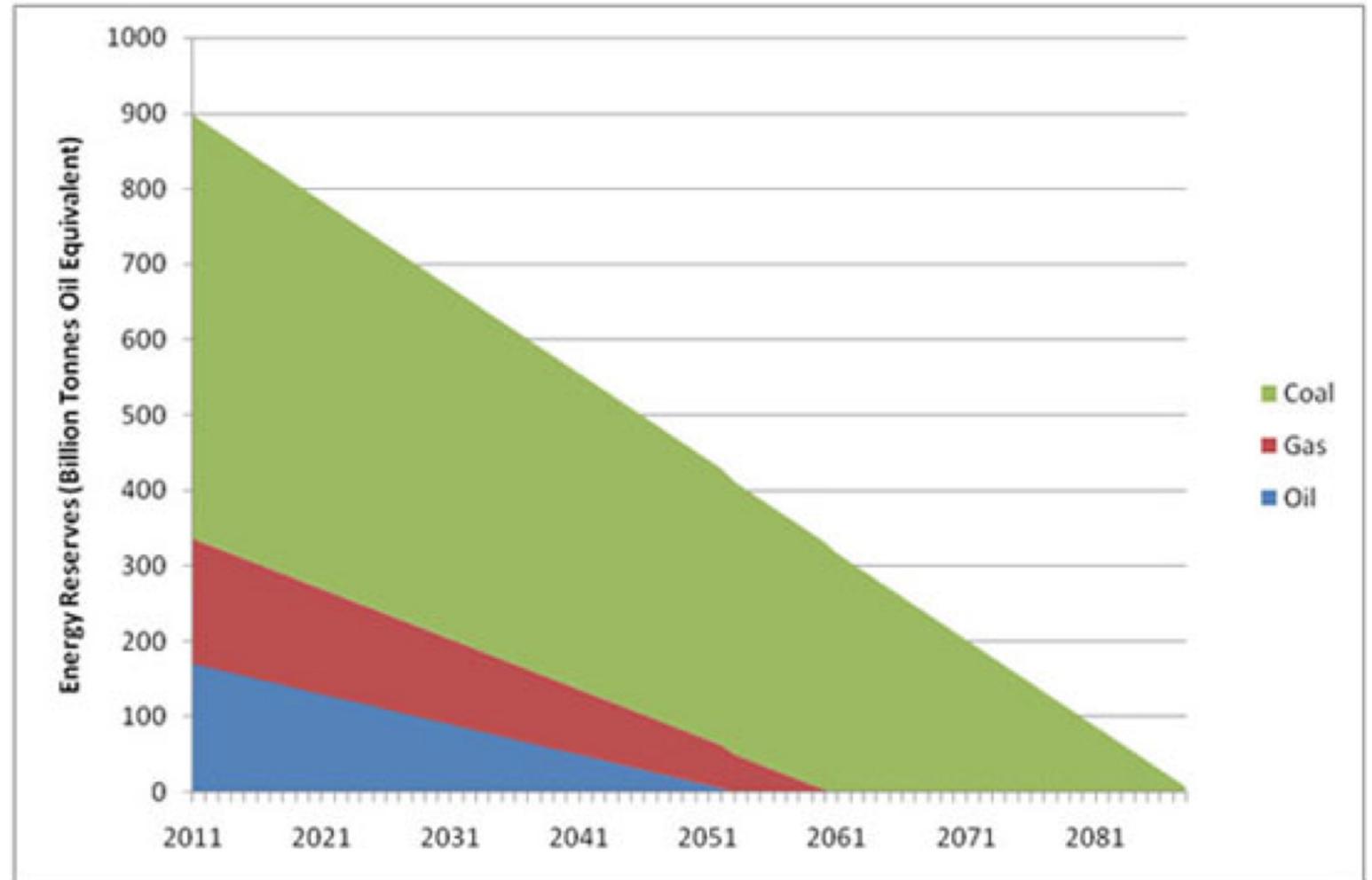
Source: Our World in Data based on BP Statistical Review of World Energy (2020)

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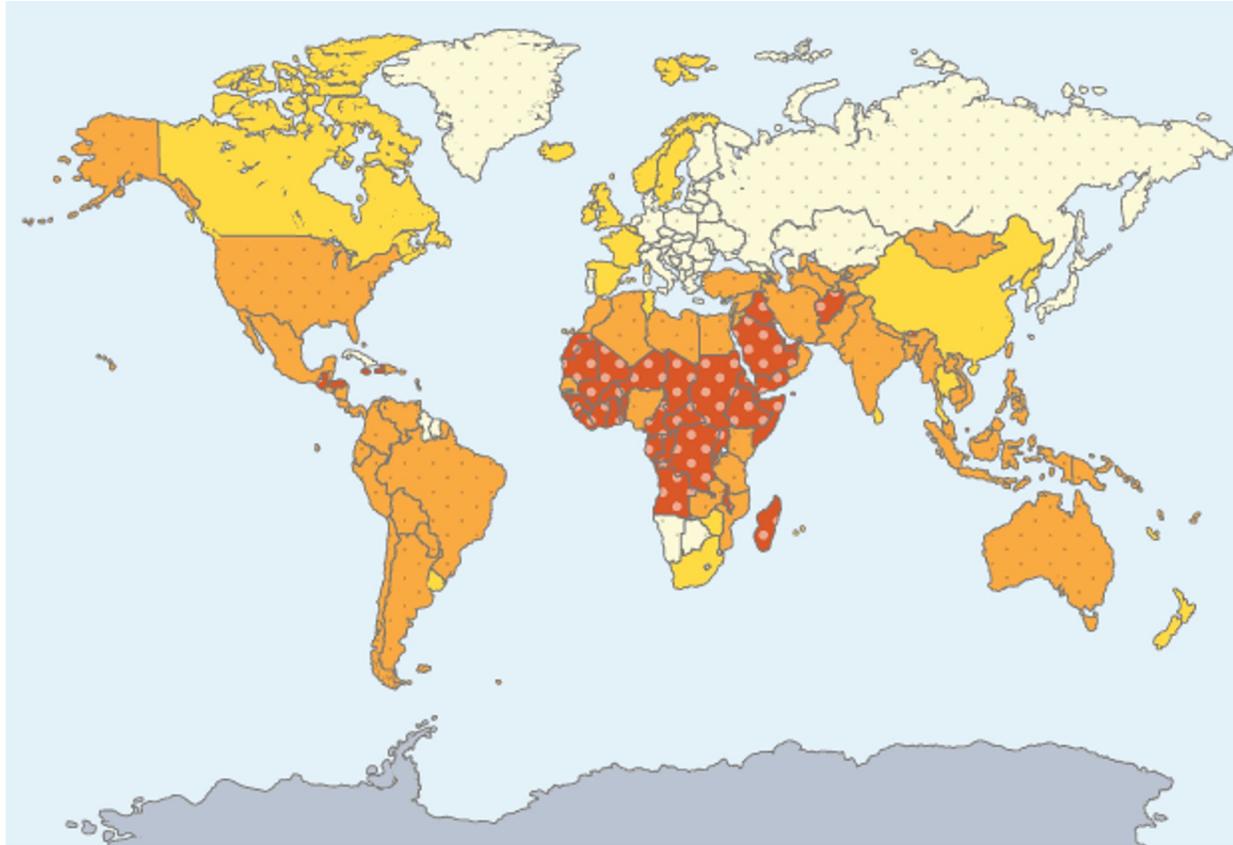
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Unsustainable structures (i.e. depleted fossil fuel sources)

For example, according to BP, Earth has 53 years of oil reserves left at current rate of consumption .



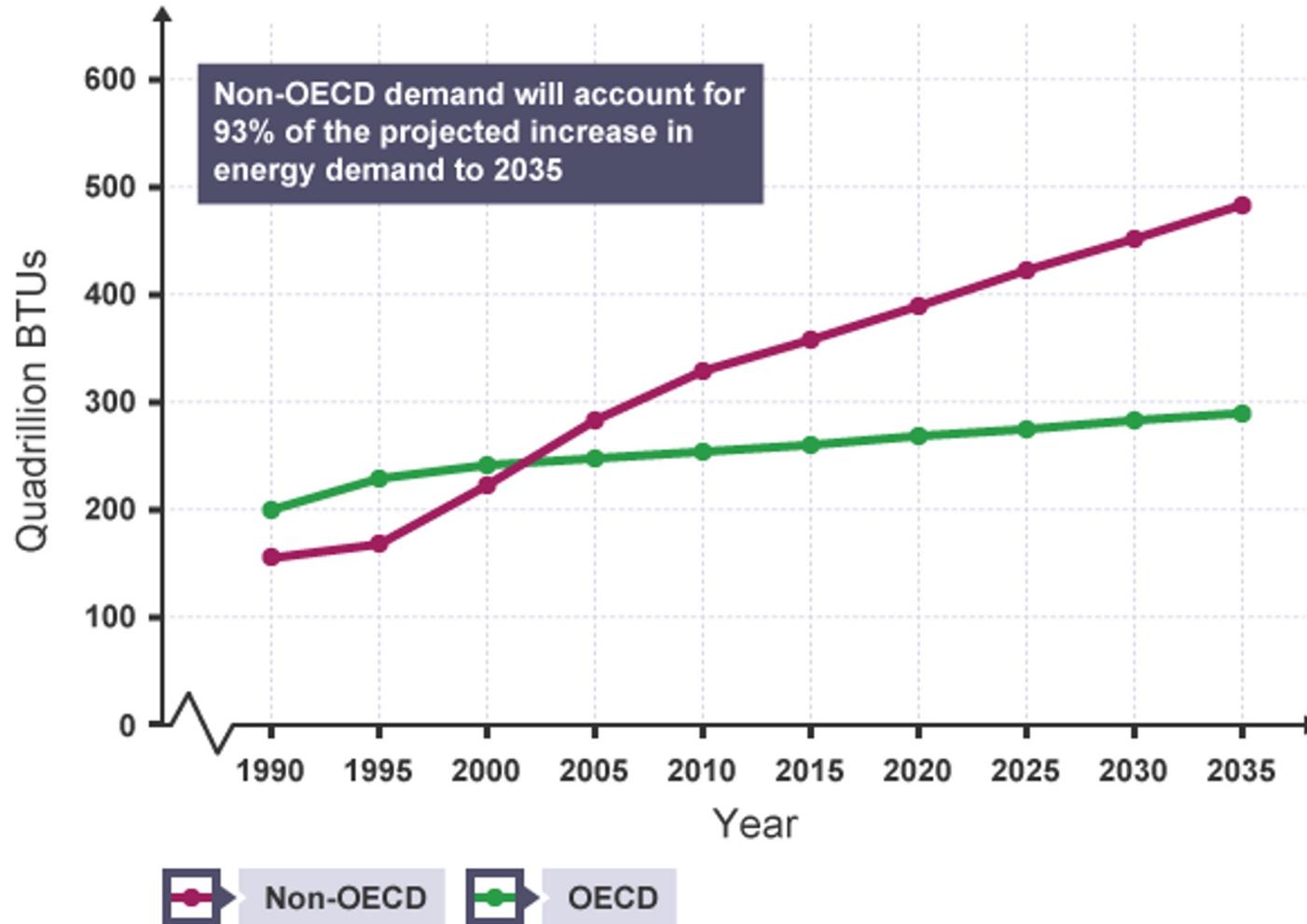
Growing energy demand because of global population growth



Percentage population change, 2005 - 2050

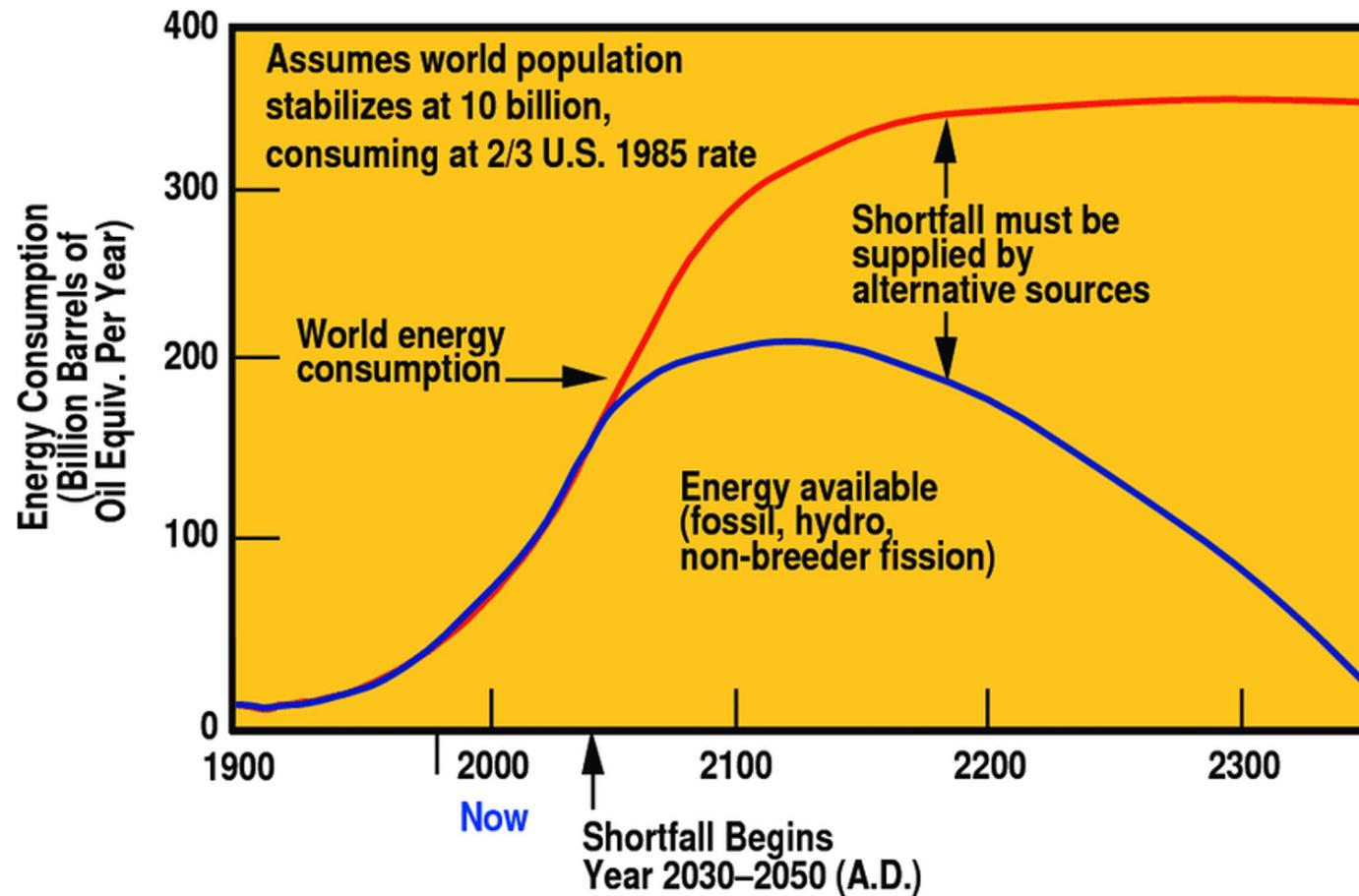


Growing energy demand because of projected economic growth



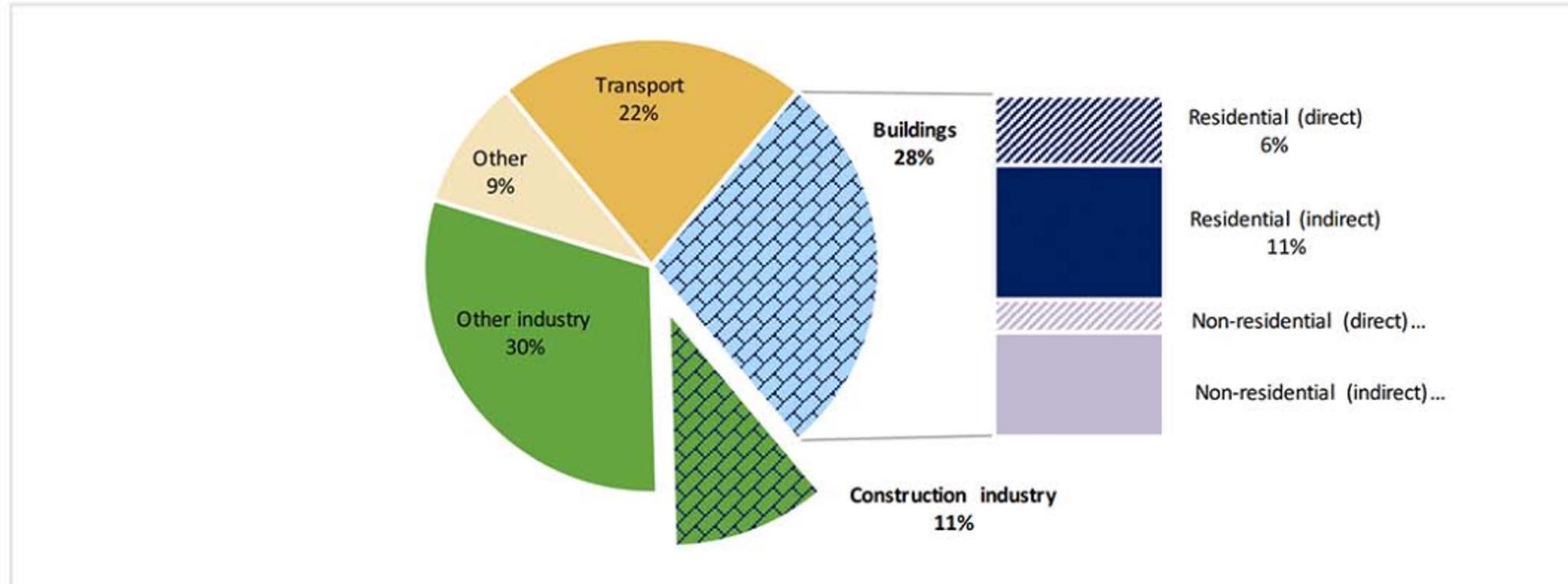
BTU - British Thermal Unit

Projected shortfall of energy in the future if we don't do anything



Globally: building sector is one of the biggest „consumer” and CO₂ emitter

FIGURE 7 Share of global energy-related CO₂ emissions by sector, 2015



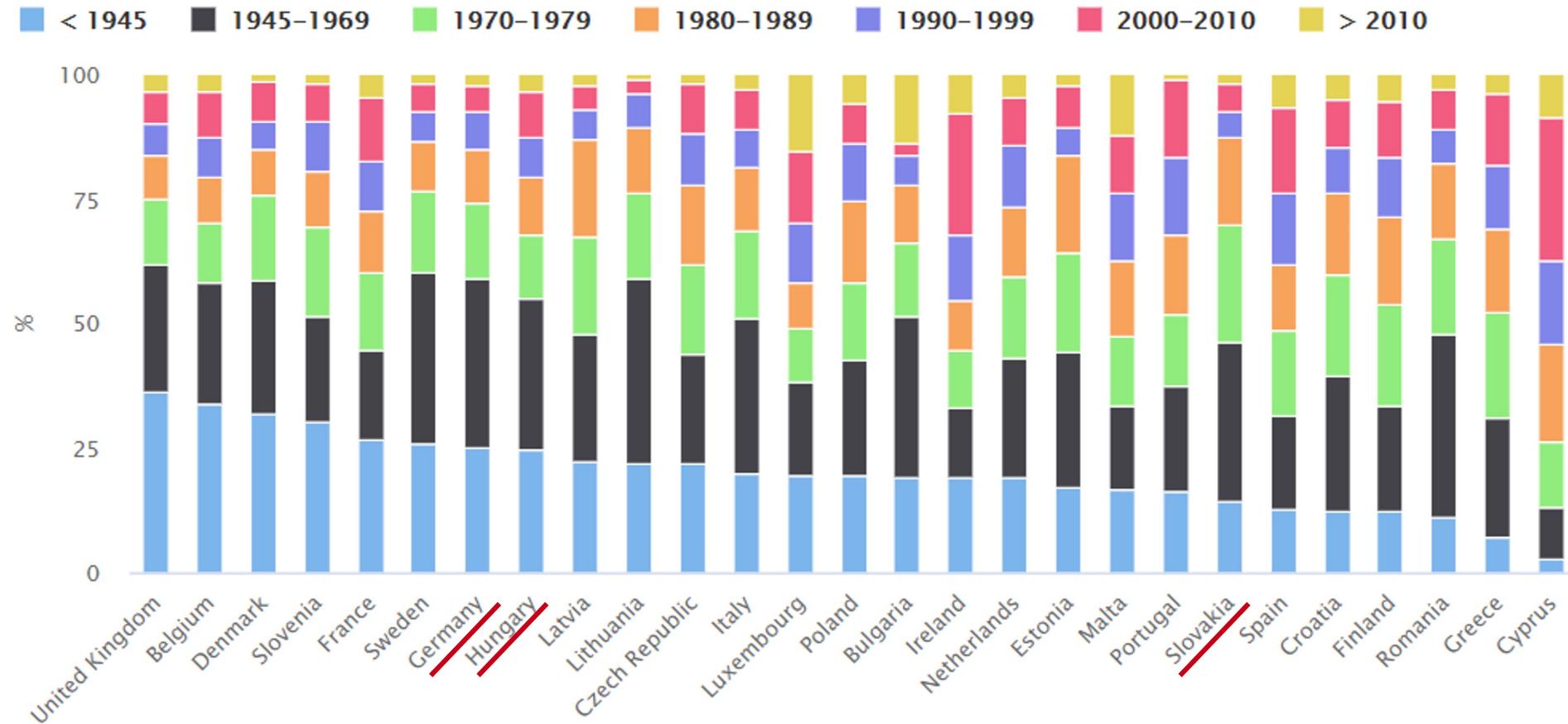
Note: The "construction industry" is an estimate of the portion of the overall industry sector that applies to the manufacturing of materials for building construction, such as steel, cement and glass.

Source: derived with IEA (2017), World Energy Statistics and Balances, IEA/OECD, Paris, www.iea.org/statistics

How we can change this?

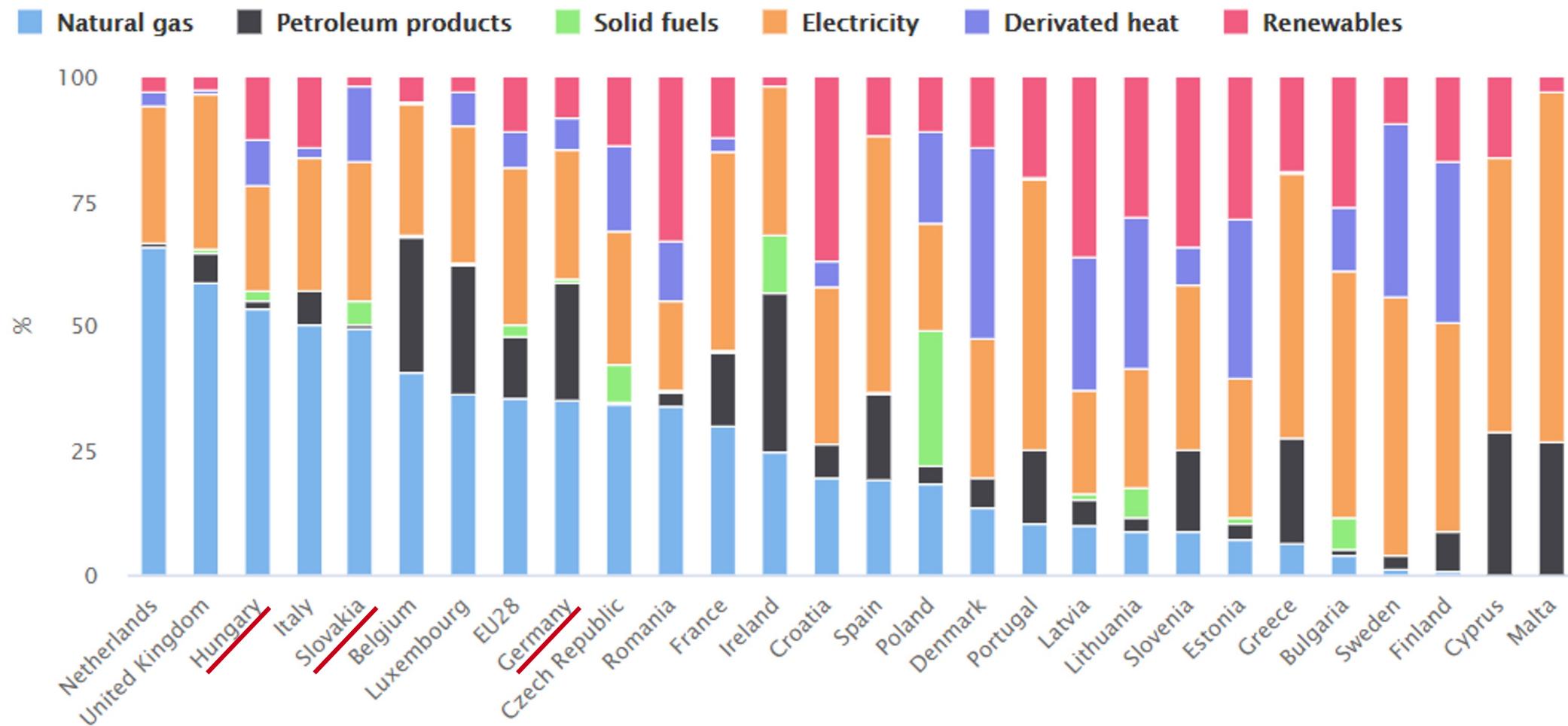
Particular challenges in the European building sector

The European building stock is old and inefficient



Source: https://ec.europa.eu/energy/eu-buildings-factsheets_en

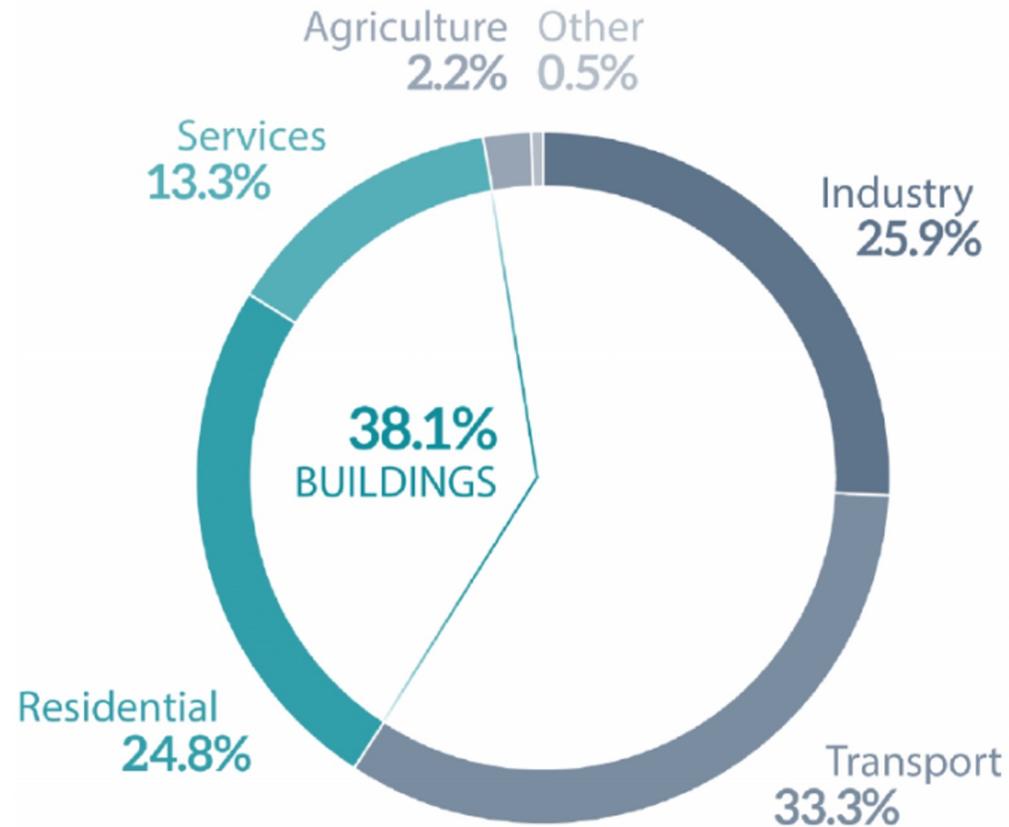
Share of energy in consumption for buildings (2013)



Source: https://ec.europa.eu/energy/eu-buildings-factsheets_en

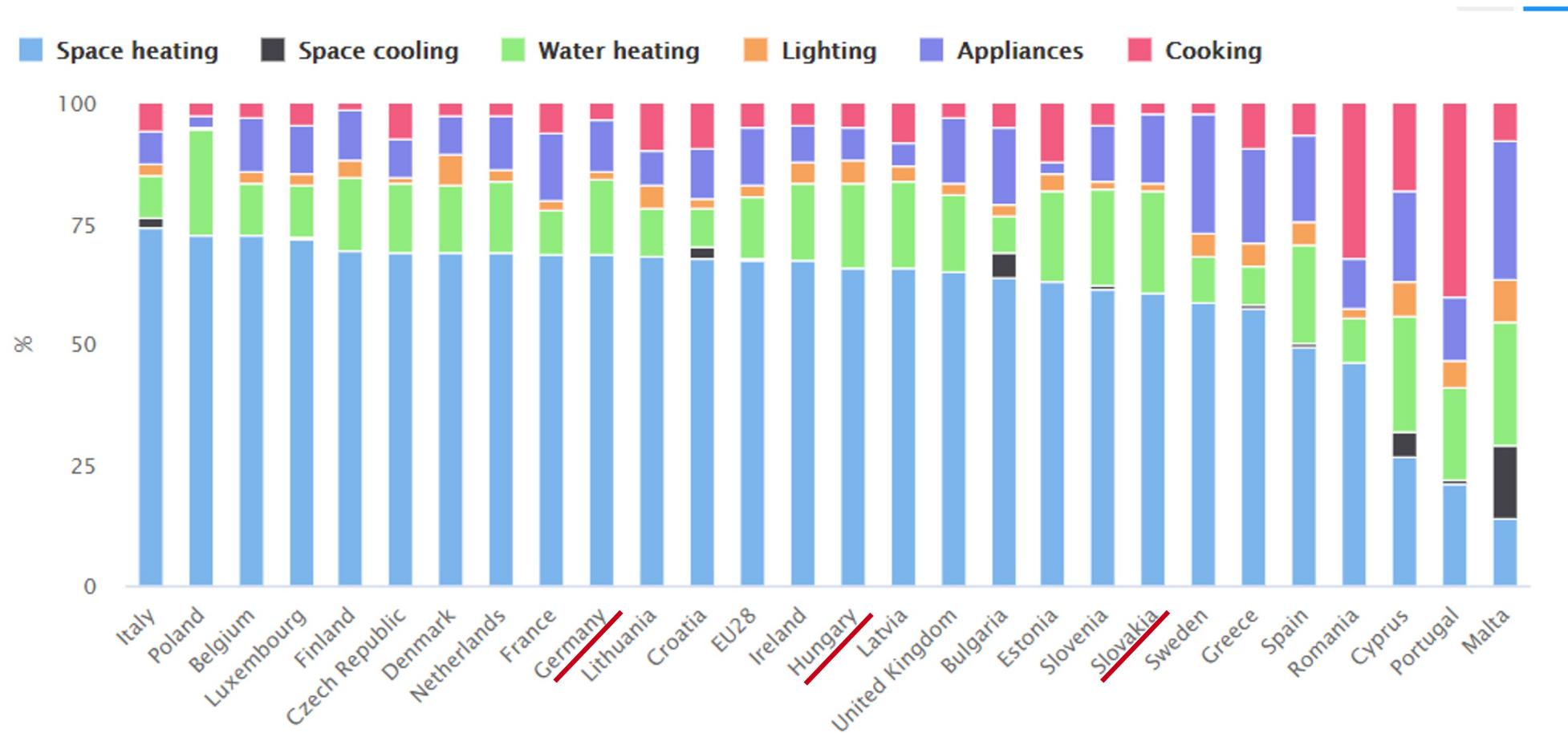
In Europe, around 40% of primary energy is consumed by buildings

Figure 1 – 2014 energy consumption by sector in the EU-28



Data source: [Eurostat](#), 2014.

Energy consumption by end-use in residential buildings (2013)



Particular challenges

The European building stock is old and inefficient

In Europe, around 40% of primary energy is consumed by buildings (and 60% of it is gas import used for heating and cooling)

More than 2/3 of the buildings will remain in use by 2050 and beyond

Energy efficiency of buildings is need to be improved!

Goals of the EU policies

Fight against **climate change**

Decrease **air pollution**

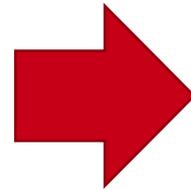
Higher **energy efficiency**

Stronger **energy independence** on EU level

More **energy security**

Boost **the economy**

Higher **sustainability**

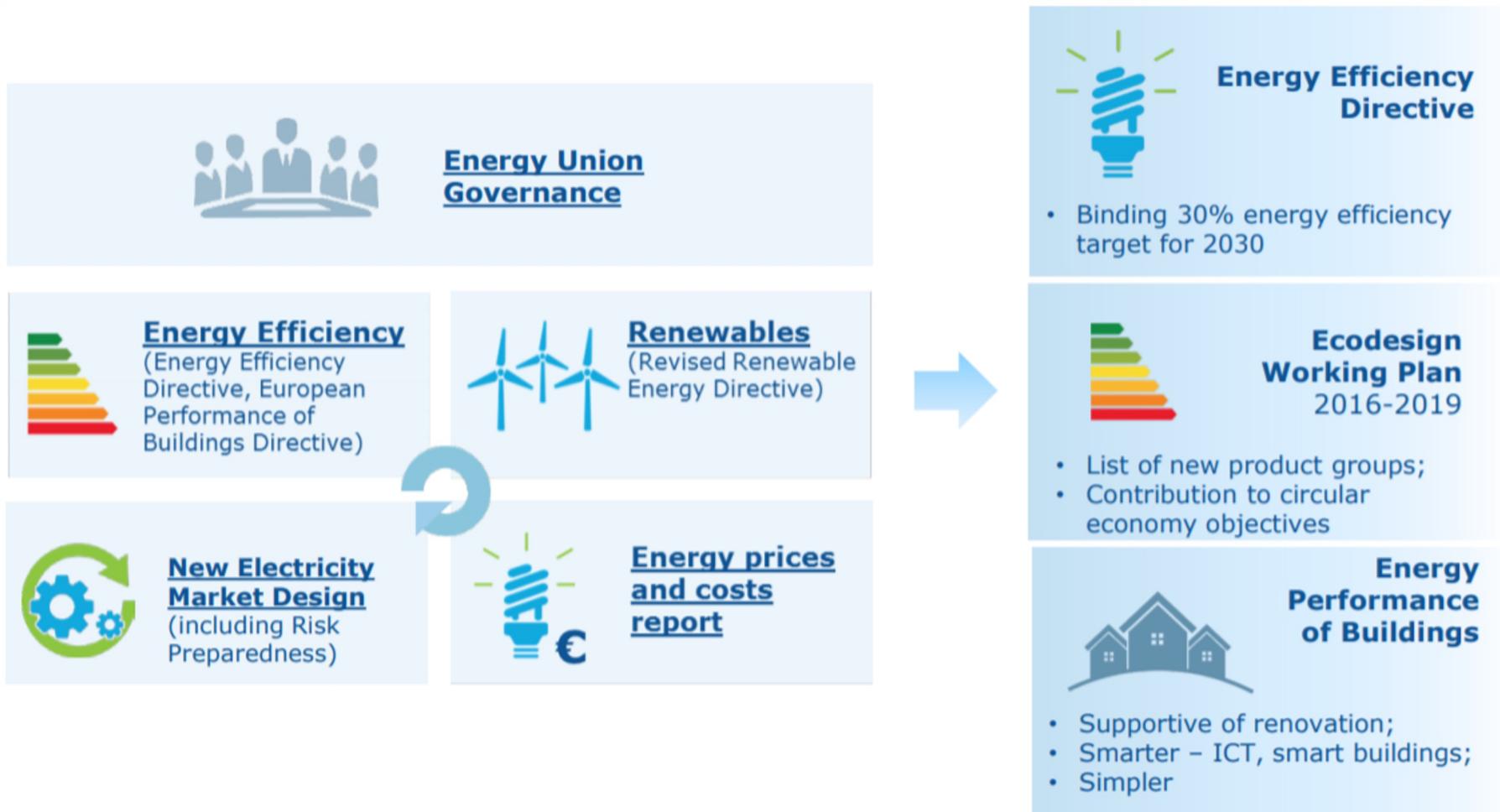


Until 2030

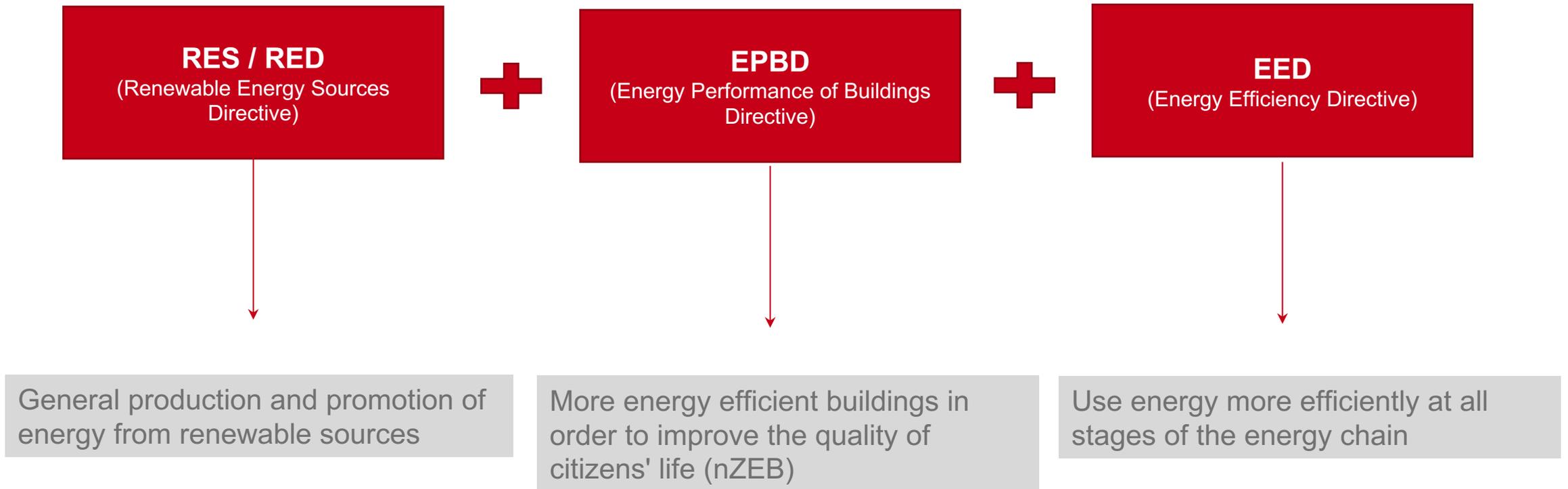
- At least 40% cuts in greenhouse emissions
- At least 32% renewables in energy consumption
- At least 32.5% energy efficiency

Clean Energy for All Europeans Package

THE RIGHT REGULATORY FRAMEWORK FOR POST – 2020



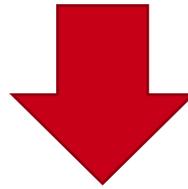
Ambitious goals laid in directives by the EU part of the Clean energy for all Europeans package



Renewable Energy Sources Directive

The importance of renewable energy

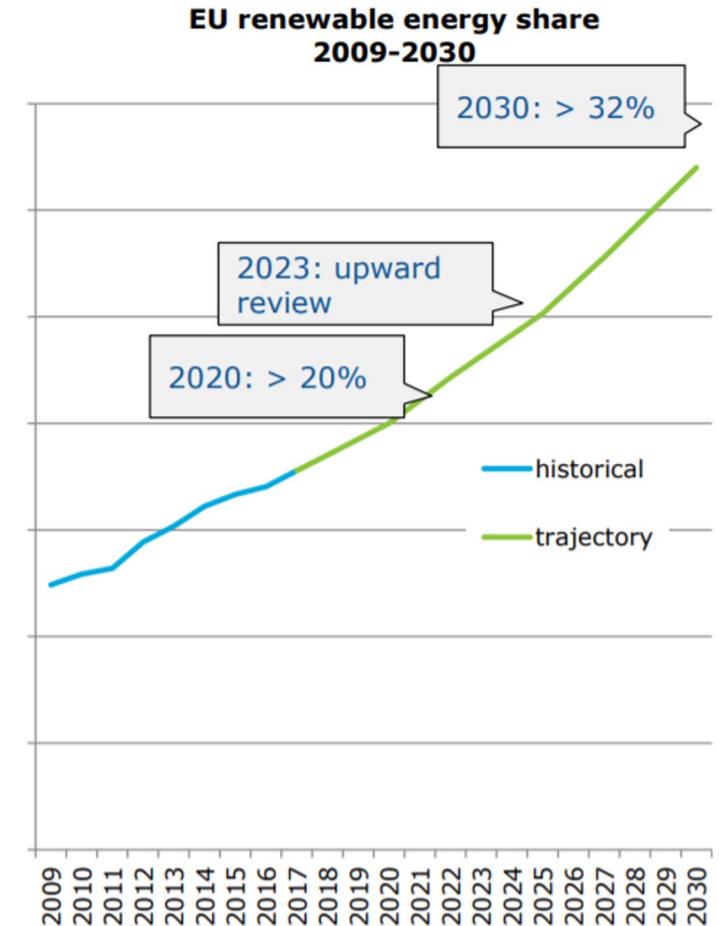
- The energy sector is responsible for more than **75% of the EU's greenhouse gas emissions.**



- **Increasing the share of renewable energy** across the different sectors of the economy is therefore a key building block to achieving an integrated energy system that delivers on **Europe's ambition of climate neutrality.**

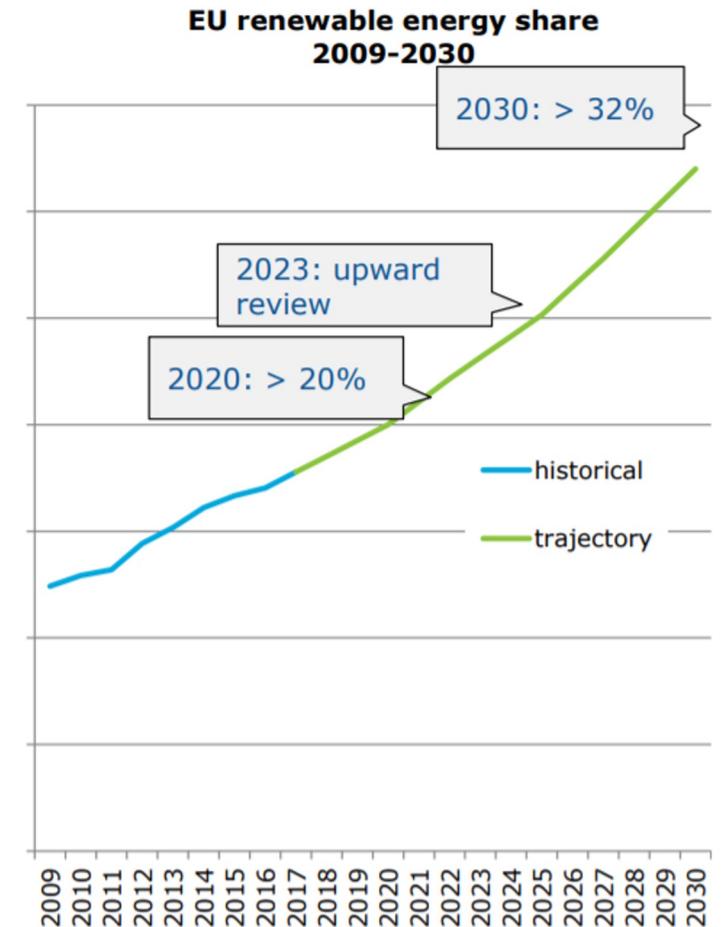
Main goal of RES = Increase the share of renewables

- It set a goal for the EU to fulfil at least 20% of its total energy needs with renewables by 2020 and became less dependent on “foreign” fossil fuels.
- The directive was amended and set a new goal: for 2030 of at least **32% energy should come from renewables**, with a clause for a possible upwards revision by 2023.



National binding targets

- The directive specifies **national binding renewable energy targets** for 2020 for each country, taking into account its starting point and overall potential for renewables.
- These targets range from a low of 10% in Malta to a high of 49% in Sweden.
 - Hungary: 13% / Germany: 18% / Slovakia: 14%



Policy goals of RES

- Energy savings, reduction of GHG emissions
- Promoting the security of energy supply
- Promoting technological development and innovation
- Promoting RES in the building sector
- Providing opportunities for employment and regional development
- Ensuring grid access and operability on liberated way
- Defining sustainability criteria for biofuels/-liquids

Some key measures of RES

Measures: general promotion of energy from renewable non-fossil sources

- Wind (on-shore and off-shore)
- Solar (solar thermal and photovoltaic)
- Geothermal energy
- Ambient energy
- Tidal, wave energy
- Hydropower
- Biomass
- Landfill gas, sewage treatment plant gas and biogas

Measures: mandatory national targets

Translating the EU's 32% goal into individual targets for each member state, reflecting different starting points and potential.

Calculation:

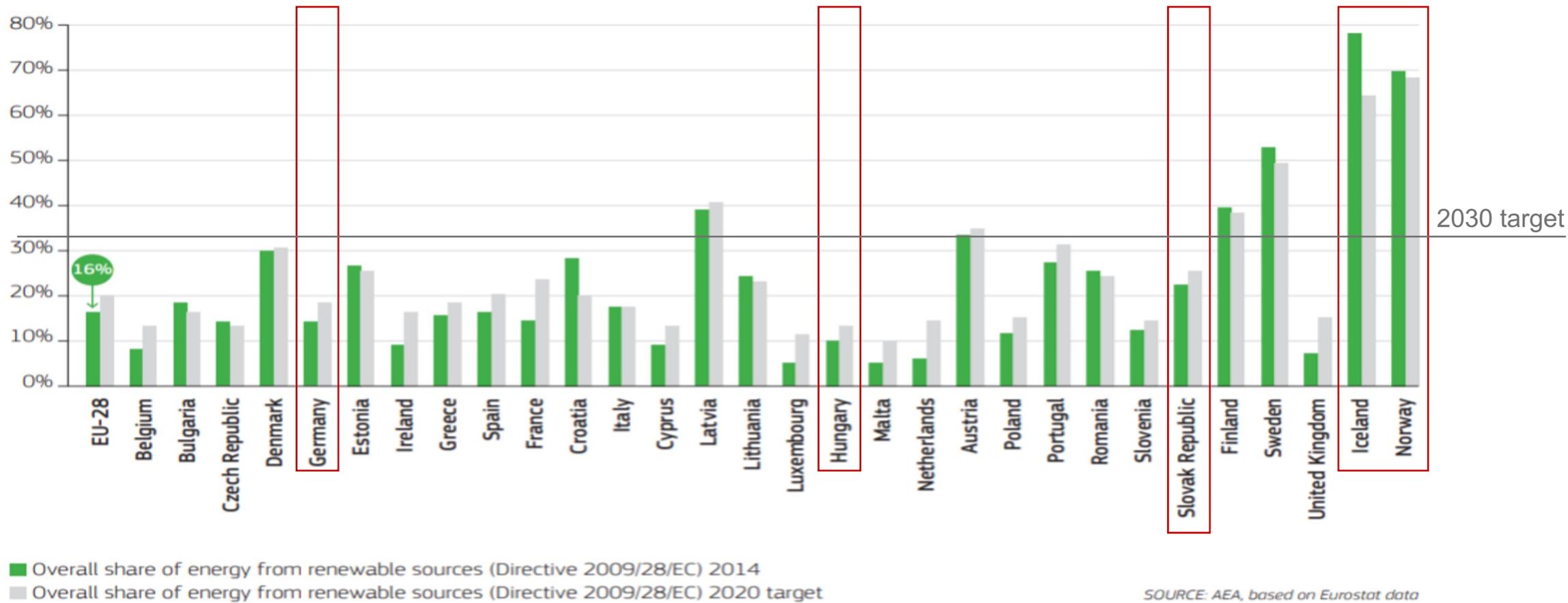
- equal increase in each Member State's 2005 share weighted by their GDP
- Taking into account past efforts

The following may be applied to reach the target:

- Promotion of energy efficiency and savings
- Support schemes
- Cooperation measures (i.e.: energy cooperations)

2020 goal and the share of renewables

FIGURE 1 Overall Share of RES in Gross Final Energy Consumption in EU Member States, Iceland and Norway



National Renewable Energy Action Plans

All EU countries have adopted national renewable energy action plans showing what actions they intend to take to meet their renewables targets.

These plans include sectorial targets for

- electricity,
- heating and cooling,
- transport;
- planned policy measures;
- different mix of renewables technologies they expect to employ;
- planned use of cooperation mechanisms.

New targets for renewable energy in 2030

- Renewables will continue to play a key role in helping the EU meet its energy needs beyond 2020.
- EU countries have already agreed on a new renewable energy target of at least 27% of final energy consumption in the EU by 2030.

An example: the German National Renewable Energy Action Plan

- **Reduction of GHG emissions** by 40 % by 2020, 55 % by 2030, 70 % by 2040 and by 80 to 95 % by 2050, compared to reference year 1990;
- **Reduction of primary energy consumption** by 20 % by 2020 and by 50 % by 2050;
- **Increase of energy productivity** of 2.1 % per year compared to final energy consumption;
- **Reduction of electricity consumption** by 10 % by 2020 and by 25 % by 2050, compared to 2008;
- **Reduction of heat demand in buildings** by 20 % by 2020, while primary energy demand is to fall by 80 % by 2050 (compared to 2008);
- **Renewable energy** shall achieve an 18 % **share of gross final energy consumption** by 2020, 30 % by 2030, 45 % by 2040 and 60 % by 2050;
- By 2020 **renewable energy** shall achieve a share of at least 35 % **in gross electricity consumption**, 50 % by 2030, 65 % by 2040 and 80 % by 2050.

Measures: Mandatory national overall targets for renewable energy in transport

Member States must require fuel suppliers to supply a **minimum of 14% of the energy consumed in road and rail transport by 2030 as renewable energy.**

- Within the 14% transport sub-target, there is a dedicated target for **advanced biofuels**
- A share of final consumption of bio fuel energy in the transport sector shall be at least 0,2 % in 2022, at least 1 % in 2025 and at least 3,5 % in 2030.



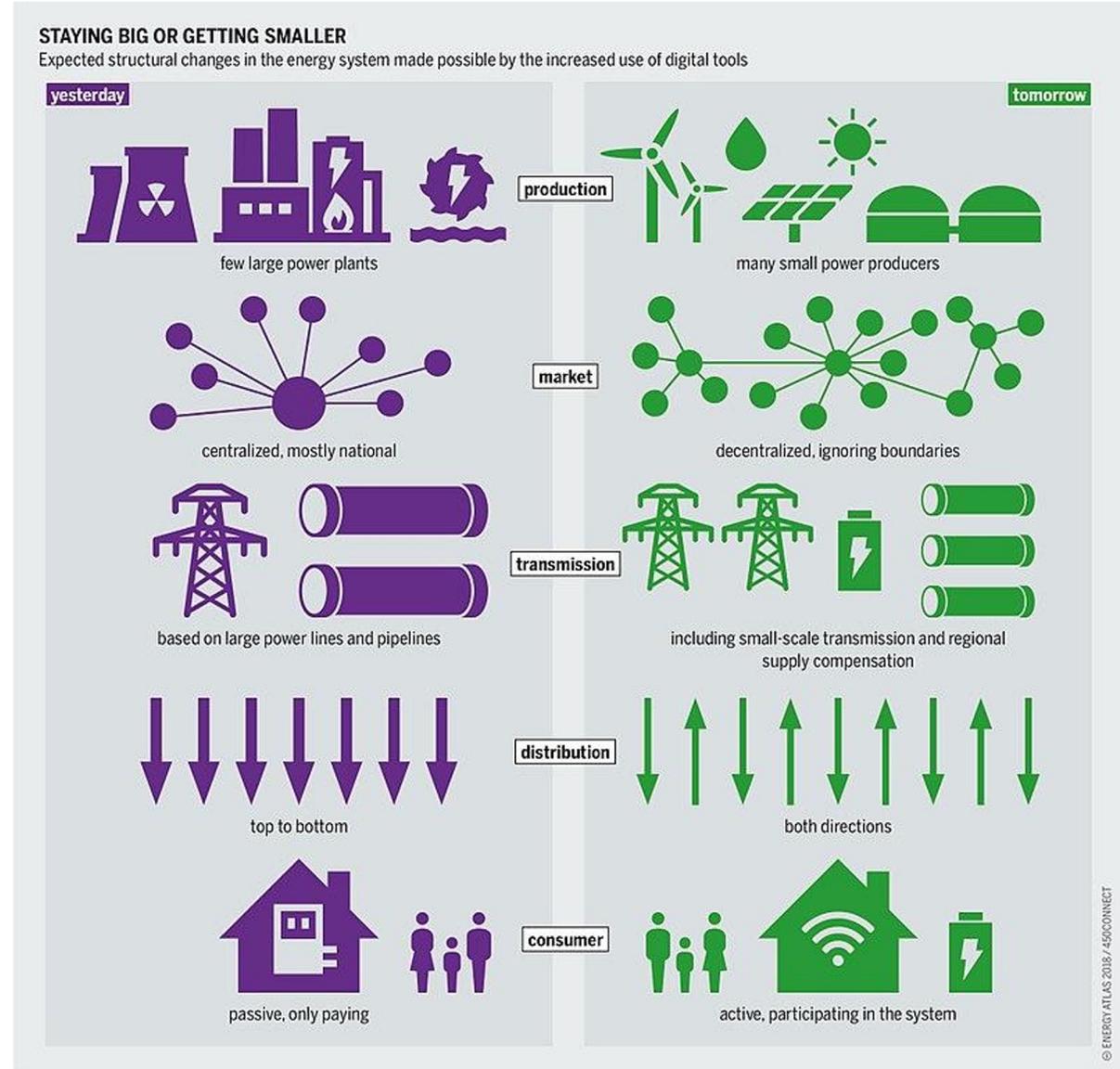
Measures: Guarantees of origin of electricity, heating and cooling produced from RES

- Member states should implement measures in order to **guarantee the origin of energy** to prove to final customers the share of renewables.
- In the recast, guarantees of origin (GOs) is modified and extended to renewable gas. It will become mandatory to issue GOs for heating and cooling upon request by the producer.
- The scheme **provided an increased level of transparency to customers**, allowing them to choose to purchase renewable or non-renewable.

Measures: Grid access and operation

Member states

- Should develop grid infrastructure, intelligent networks, storage facilities and the electricity system
- Should make easier the authorization procedures, ensuring the transmission and distribution of electricity from renewables
- Should provide priority or guaranteed access for electricity from renewables to the grid



Measure: Promote cooperation mechanisms

The Directive promotes cooperation amongst EU countries (and with countries outside the EU) to help them meet their renewable energy targets. This cooperation can take the form of:

- **Statistical transfers of renewable energy** (an amount of renewable energy is deducted from one country's progress towards its target and added to another's)
- **Joint renewable energy Projects** (co-fund a renewable energy project in electricity or heating and cooling, and share the resulting renewable energy for the purpose of meeting their targets)
- **Joint renewable energy support schemes** (a common feed-in tariff, a common feed-in premium, or a common quota and certificate trading regime)

Measure: More renewables in the district heating/cooling

From 2020, **district heating and cooling**, each Member State should increase the share of energy **from renewable sources** and from waste heat and cold by at least 1% annually.

This will dynamize the district heating and cooling sector with

- the right to disconnect from inefficient heating and cooling networks,
- the right to be informed about the fuels used
- the obligation to offer third party suppliers access to district heating systems, in case they are producing energy from renewable energy sources or excess heat and cold.

Measures: promoting RES in the building sector

- Member states should set the minimum levels of renewable energy where it is technically, functionally and economically feasible.
- Member States shall introduce appropriate measures in their building regulations and codes in order to increase the share of all kinds of energy from renewable sources in the building sector.

EED – Energy Efficiency Directive

EED – Energy Efficiency Directive

Goals: all EU countries are required to use energy more efficiently at all stages of the energy chain, including energy generation, transmission, distribution and end-use consumption

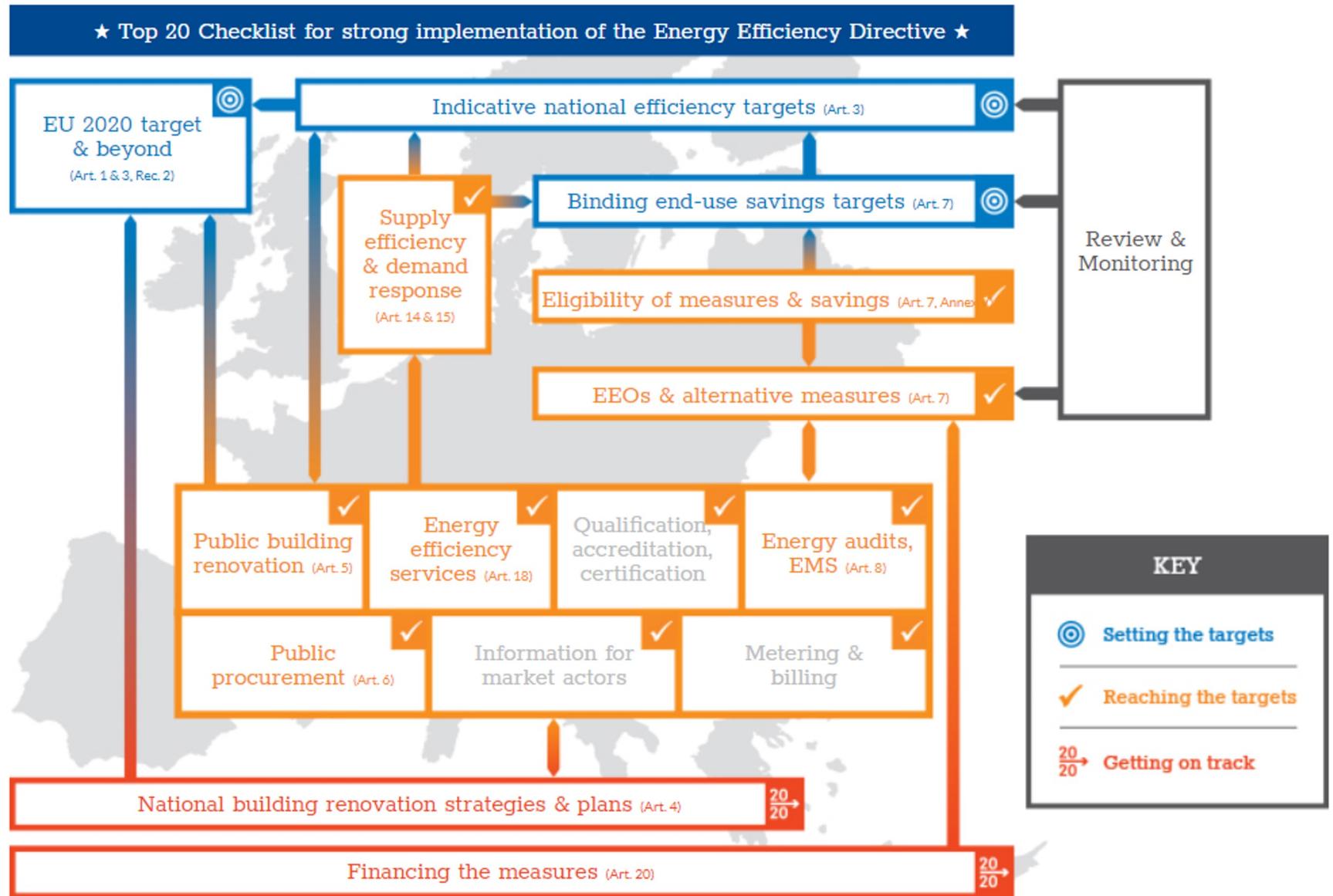
- **Energy efficiency targets** and energy labels **encourage industry** to innovate and invest
- **More energy efficient buildings** will save energy, reduce bills, address health issues, lower air pollution and improve people's quality of life
- Lower consumption will making Europe **less reliant on energy imports**

Energy efficiency target for 2030 of at least 32.5%



Paris Agreement climate goals

The structure of EED

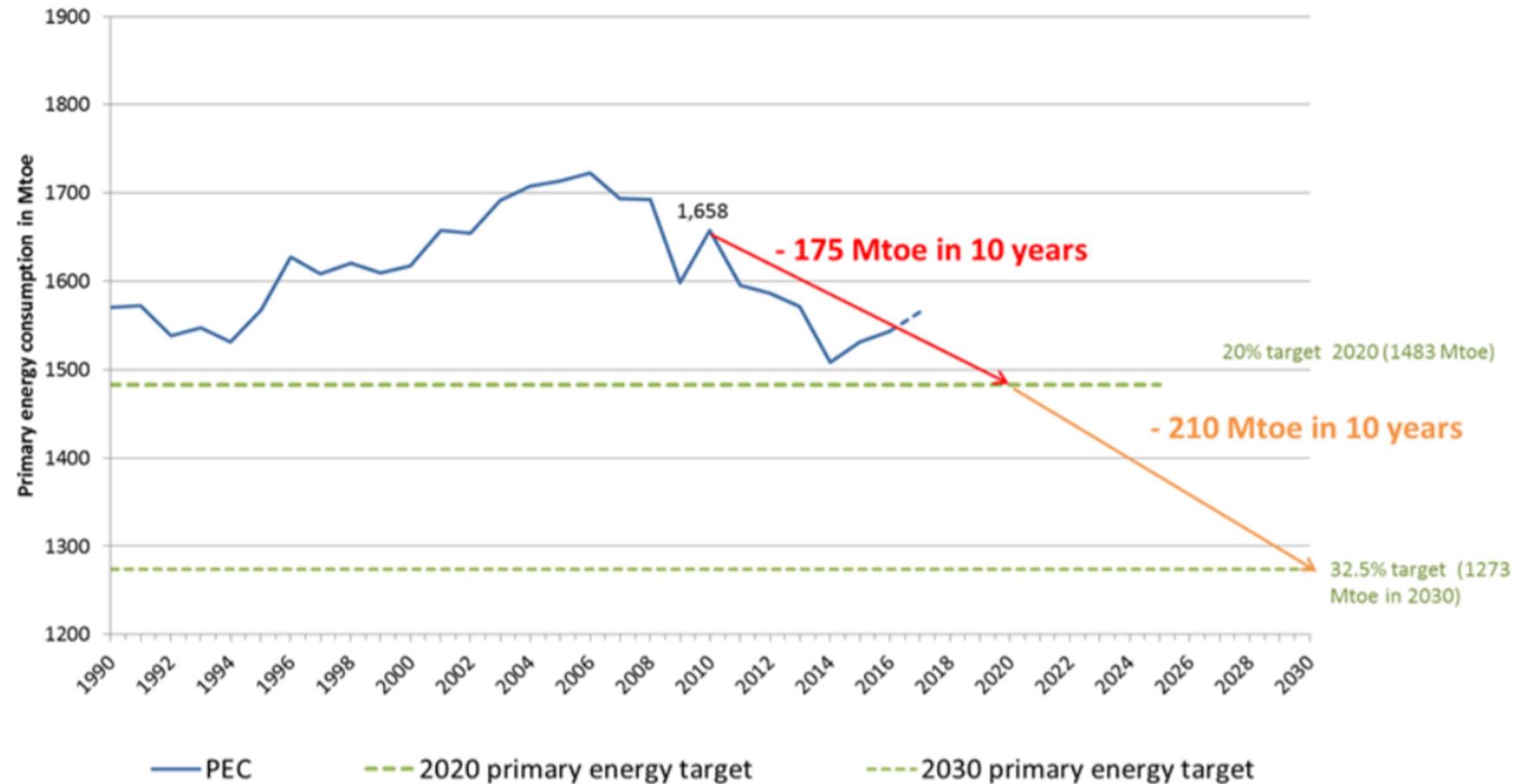


Decreasing energy sales

The EED's three main cross sectoral targets are:

- Originally, the 20% EU energy savings target: The EED's overarching objective is “to ensure the achievement of the Union's 2020 20% headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date”. The 20% target is defined as a maximum of 1483 Mtoe primary energy or 1086 Mtoe final energy consumption in 2020.
- The key element of the **amended** in 2018 directive is a headline energy efficiency **target for 2030 of at least 32.5%**. In absolute terms, this means that EU energy consumption should be no more than 1273 Mtoe of primary energy and/or no more than 956 Mtoe of final energy.
- The **indicative national efficiency targets**: in terms of making this operational, the EED stipulates that MSs must set their own overall indicative national energy efficiency targets, which the Commission will assess as sufficient or not to reach the EU target and thereafter consider proposing a binding target
- The national **binding target for end-use savings** for energy companies until 2020: a general binding target to deliver **1.5% cumulative annual energy end-use savings**
- From 2021 to 2030 of **0.8 % of annual final energy consumption should decrease.**

The 2030 target in primary energy consumption



Indicative national targets for 2020

- %s, Mtoe, GWh and other measures are also working

| EU Member State | Indicative national energy efficiency targets for 2020 | Absolute 2020 level of energy use [Mtoe] | |
|-----------------------|--|--|-------|
| | | Primary | Final |
| Austria | Final energy consumption of 1100 PJ | 31.5 | 26.3 |
| Belgium | 18% reduction in primary energy consumption by 2020 relative to the Primes 2007 baseline (53.3 Mtoe) | 43.7 | 32.5 |
| Bulgaria | Increase of energy efficiency by 25% until 2020 (5 Mtoe primary energy savings in 2020) and 50% energy intensity reduction by 2020 compared to 2005 levels | 15.8 | 9.16 |
| Croatia | Energy efficiency 20% (9 192 toe) | - | - |
| Cyprus | 0.463 Mtoe energy savings in 2020 (14.4% reduction in 2020 compared to a reference scenario) | 2.8 | 2.2 |
| Czech Republic | 47,84 PJ (13,29 TWh) savings of final energy consumption* | 39.6* | 24.4* |
| Germany | Annual improvement of energy intensity (energy productivity) by 2.1% pa on average until 2020 | 276.6 | 194.3 |
| Denmark | Primary energy consumption of 744.4 PJ (17.781 Mtoe) in 2020 | 17.8 | 14.8 |
| Estonia | Stabilisation of final energy consumption in 2020 at the level of 2010 | 6.5 | 2.8 |
| Greece | Final energy consumption level of 20.5 Mtoe | 27.1 | 20.5 |
| Spain | 20% energy savings to be achieved by 2020 | 121.6 | 82.9 |
| Finland | 310 TWh of final energy consumption in 2020 | 35.9 | 26.7 |
| France | 17.4% reduction of final energy consumption in 2020 compared to a baseline | 236.3 | 131.4 |
| Hungary | 1113 PJ primary energy consumption in 2020 (236 PJ savings compared to business-as-usual), resulting in 760 PJ final energy consumption | 26.6 | 18.2 |
| Ireland | 20% energy savings in 2020 along with a public sector energy saving target of 33% | 13.9 | 11.7 |
| Italy | 20 Mtoe primary energy reduction by 2020, 15 Mtoe final energy reduction by 2020 | 158.0 | 126.0 |
| Lithuania | 17% reduction in final energy use compared to 2009 level (reduction of 740 ktoe) | 6.485 | 4.278 |
| Luxembourg | Preliminary target value for 2020 of 49,292 GWh or 4,239.2 ktoe final energy | 4.482 | 4.239 |
| Latvia | Primary energy savings in 2020 of 0.670 Mtoe (28 PJ) | 5.37 | 4.47 |
| Malta | 22% energy or 237.019 toe savings target by 2020 | 0.825 | 0.493 |
| Netherlands | 1.5% energy savings per year (partial) | 60.7 | 52.2 |
| Poland | 13.6 Mtoe primary energy savings in 2020 | 96.4 | 70.4 |
| Portugal | Reduction of primary energy use in 2020 by 25% compared to projections | 22.5 | 17.4 |
| Romania | Reduction of 10 Mtoe (19%) in the primary energy consumption | 42.99 | 30.32 |
| Sweden | Energy use shall be 20% more efficient by 2020 compared with 2008 and a 20% reduction in energy intensity between 2008 and 2020 | 45.9 | 30.3 |
| Slovenia | 10.809 GWh energy savings by 2020 | - | - |
| Slovakia | 3.12 Mtoe of final energy savings for the period 2014-2020 | 16.2 | 10.4 |
| United Kingdom | Final energy consumption in 2020 of 129.2 Mtoe on a net calorific value basis | 177.6 | 157.8 |

Alternative policy measures to reach the decreased target of final energy consumption

To reach the **yearly decrease of final energy consumption**, **energy companies** need to carry out measures which help final consumers improve energy efficiency. This may include improving the heating system in consumers' homes, installing double glazed windows, or better insulating roofs to reduce energy consumption.

EU countries may also implement alternative policy measures which reduce final energy consumption. These measures could include:

- Energy or CO2 taxes
- Financial incentives that lead to an increased use of energy efficient technology
- Regulations or voluntary agreements that lead to the increased use of energy efficient technology
- Energy labelling schemes beyond those that are already mandatory under EU law
- Training and education, including energy advisory programmes

National strategies for renovation

Member States shall establish a long-term strategy for mobilizing investment in the renovation of the national stock of residential and commercial buildings, both public and private. This strategy shall encompass:

- an overview of the national building stock based, as appropriate, on statistical sampling;
- identification of cost-effective approaches to renovations relevant to the building type and climatic zone;
- policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations;
- a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions;
- an evidence-based estimate of expected energy savings and wider benefits.

Consumer information and empowering programme

Member States shall take appropriate measures to **promote and facilitate an efficient use of energy by small energy customers**, including domestic customers. These measures may be part of a national strategy:

A range of instruments and policies to **promote behavioral change** which may include:

- fiscal incentives; access to finance, grants or subsidies;
- information provision;
- exemplary projects;
- workplace activities;
- cost-effective and easy-to-achieve changes in energy use;
- information on energy efficiency measures.



Exemplary role of public bodies' buildings

- Every year 3% of buildings owned or rented by the government should be renovated in order to be more energy efficient.
- Goal is to create examples for the general public.



Renovated community center in Szentende (Hungary): changed windows doors and new insulation for the whole building

„Green” Public procurement

- Central governments also should set an example through the purchase of products, services and buildings with high energy-efficiency performance insofar that it is consistent
 - with cost-effectiveness,
 - economical feasibility,
 - wider sustainability,
 - technical suitability
 - and sufficient competition
- The EED also encourages MSs to apply these public purchase requirements to other public bodies, including at the regional and local levels to follow the exemplary role
- Encourage public bodies, when tendering service contracts with significant energy content to assess the possibility of concluding long-term energy performance contracts (EPC) that provide long term energy savings

Energy Audits are compulsory for large companies

- The EED requires high-quality energy audits in the EU and ensure that **large enterprises** are subject to regular energy audits at least every four years. (see the Chapter about Energy Audits)



Promoting smart meters and protecting consumer rights

- The EED planned to rollout of close to 200 million smart meters for electricity and 45 million for gas by 2020
- The general goal is to reach **the consumption-based billing** for every user.
- Various studies and practical experience have shown that this leads to **more careful use of energy, reducing home energy consumption** by at least 20 per cent.
- **Transparency:** EED is also protecting the rights of consumers by receiving easy and free access to data on real-time and historical energy consumption (e.g. transparent and easily understandable billing)



Promotion of efficiency in district heating and cooling

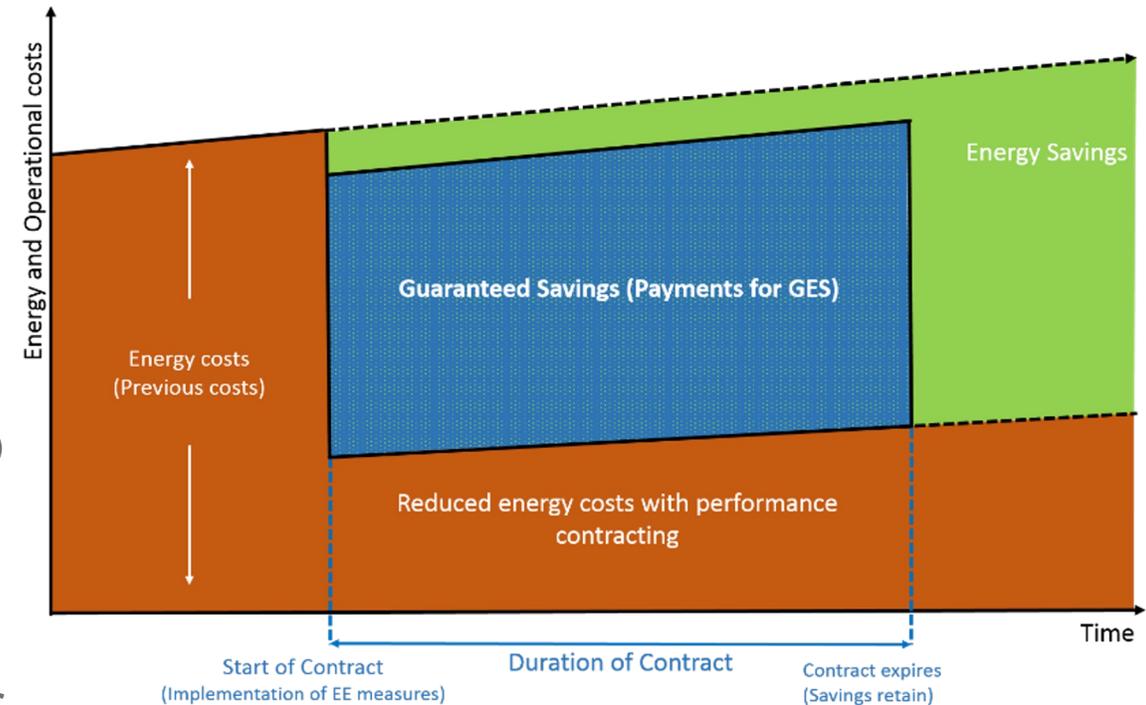
- Member states should carry out a comprehensive **assessment of the potential for the application** of high-efficiency cogeneration and efficient district heating and cooling.
- Take adequate **measures for the development of efficient district heating and cooling** infrastructure and to use renewable sources and waste.



Óbuda district heating plant: Highest building in Budapest

Promoting the Energy Performance Contracting

- Energy performance contracting (EPC) is a mechanism for organizing the energy efficiency financing.
- The EPC involves an Energy Service Company (ESCO) which provides various services, such as finances and guaranteed energy savings.
- The remuneration of the ESCO depends on the achievement of the guaranteed savings. The ESCO stays involved in the measurement and verification process for the energy savings in the repayment period. ESCO and energy performance contracting are mostly found in the public sector and to a lesser extent in the industrial and commercial building sectors



EPBD - Energy Performance of Buildings Directive

Needs of general regulation for the energy performance of the buildings

75% of the EU building stock is energy inefficient → energy = waste.

Needs to improve existing buildings and using smart solutions, energy efficient materials when building new houses.

- reduce EU's total energy consumption
- lower carbon dioxide emissions

On average, less than 1% of the national building stock is renovated each year.

In order to meet our climate and energy objectives, the **current rates of renovations should at least double.**

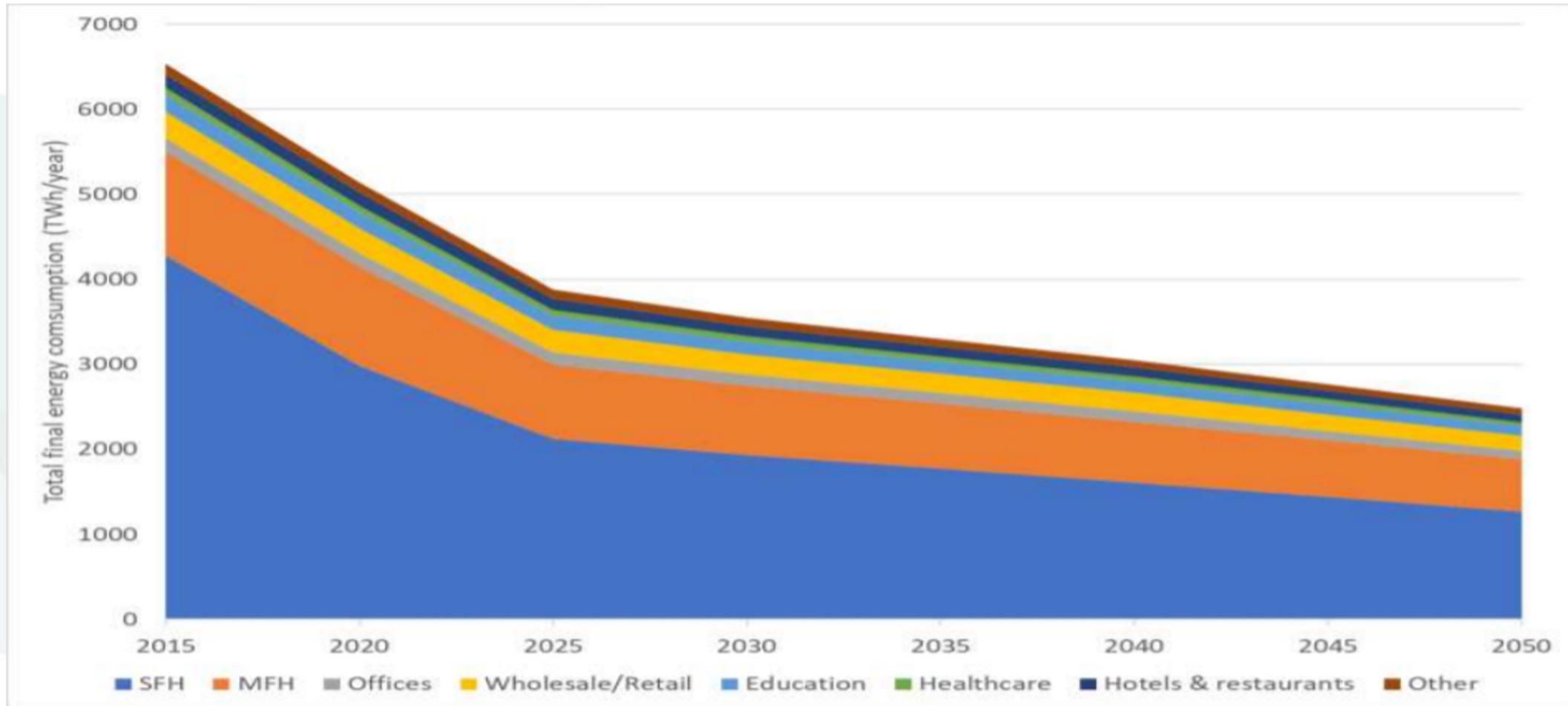
EPBD - Energy Performance of Buildings Directive

EPBD is the main legal instrument in the European Union for improving energy performance in buildings and was accepted in 2010 and was amended in 2018.

Goals: create better and more **energy efficient buildings** - as they account for almost 40% of the consumption of energy - in order to **improve the quality of citizens' life** while bringing additional benefits to the economy and the society

- 1) achieve a highly **energy efficient and decarbonized building stock** by 2050 with thermal insulation, space and hot water heating, cooling, ventilation and lighting.
- 2) create a **stable environment for investment decisions**
- 3) enable **consumers and businesses to make more informed choices** to save energy and money

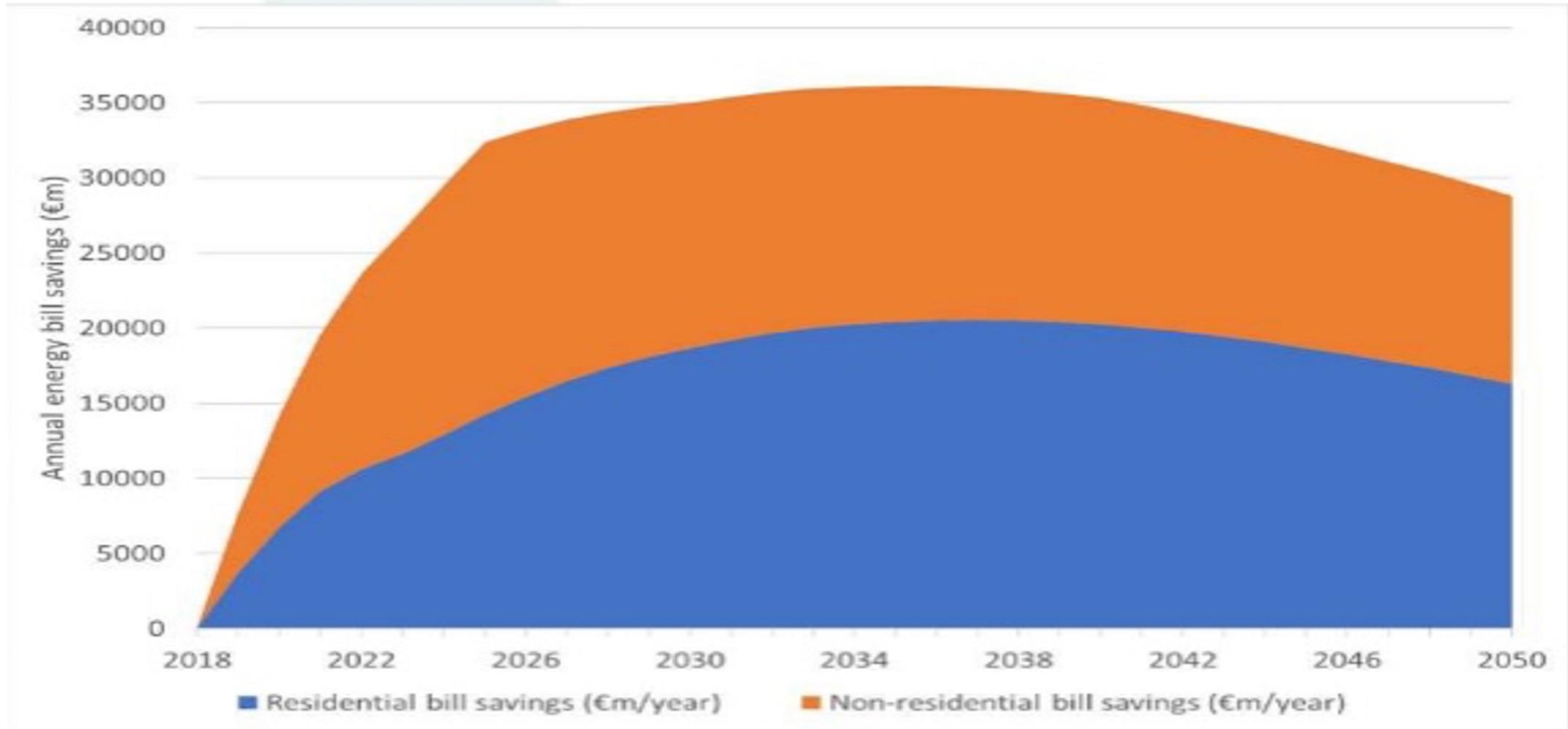
Total final energy consumption by building type under the EPBD compliant scenario



SFH = single family housing

MFH = multi family housing

Avoided energy bills due to the EPBD measures



Tools and measures of EPBD

Decarbonization of building stocks

- Decarbonise the national building stocks by 2050, with indicative milestones for 2030, 2040 and 2050 facilitating the cost-effective **transformation of existing buildings into nearly-zero energy buildings** (residential and non-residential as well)
- Member States should ensure that
 - by 31 December 2020, all new buildings are NZEBs and
 - after 31 December 2018, new buildings occupied and owned by public authorities are NZEBs.
- The **targets should be implemented into the national energy and climate plans**: by 10 March 2020, Member States must provide their new renovation strategy to the European Commission. This should also include details on progress with implementation of the current strategy, which should have been provided to the European Commission in 2017.

nZEB building regulations must be implemented

Nearly zero energy building means a building that has a very high energy performance, and the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.
(See the chapter about nZEB buildings)

Cost-optimal minimum of energy performance requirements

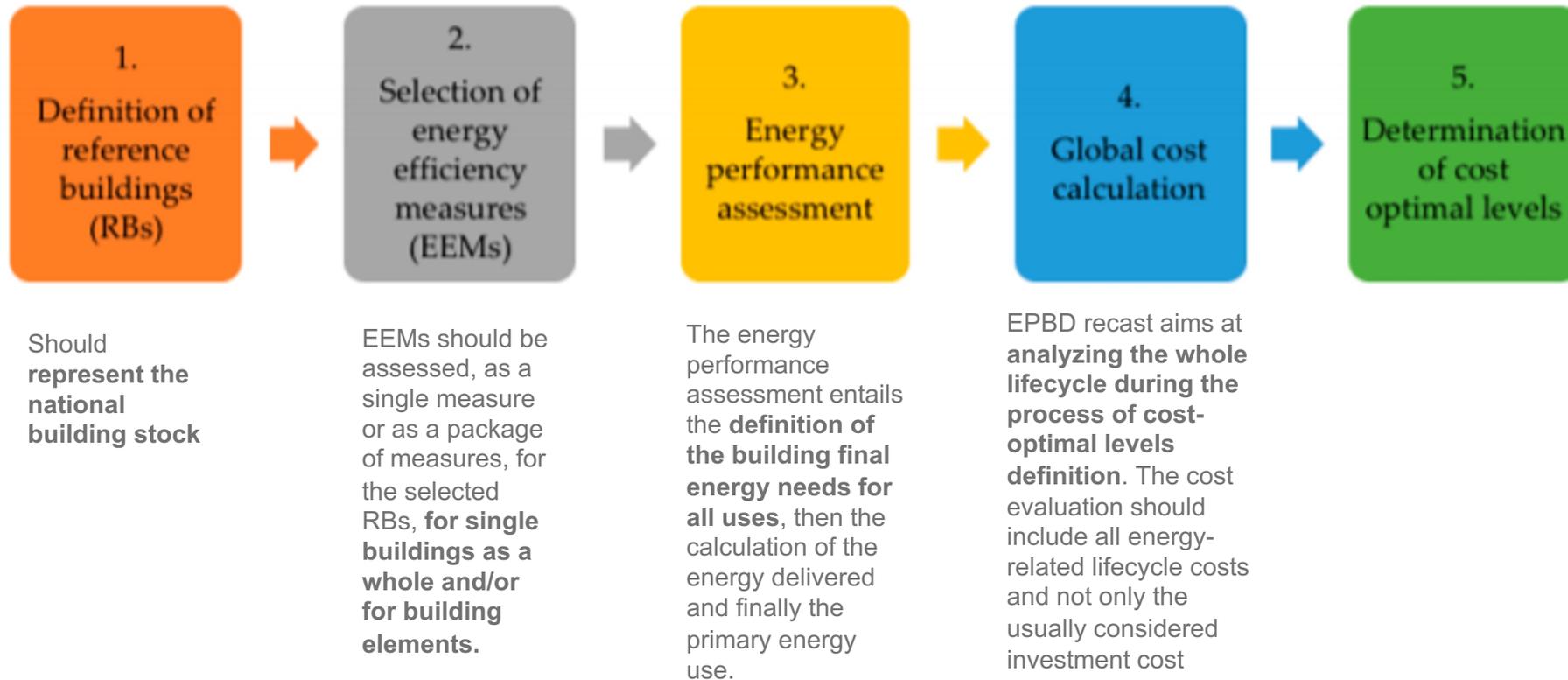
EPBD: „Assure that minimum energy performance requirements for buildings or building units are set with a view to achieving **cost optimal levels**”

What does it mean?

„The energy performance level which leads to the lowest cost during the estimated economic lifecycle.” (financial and macro-economic)

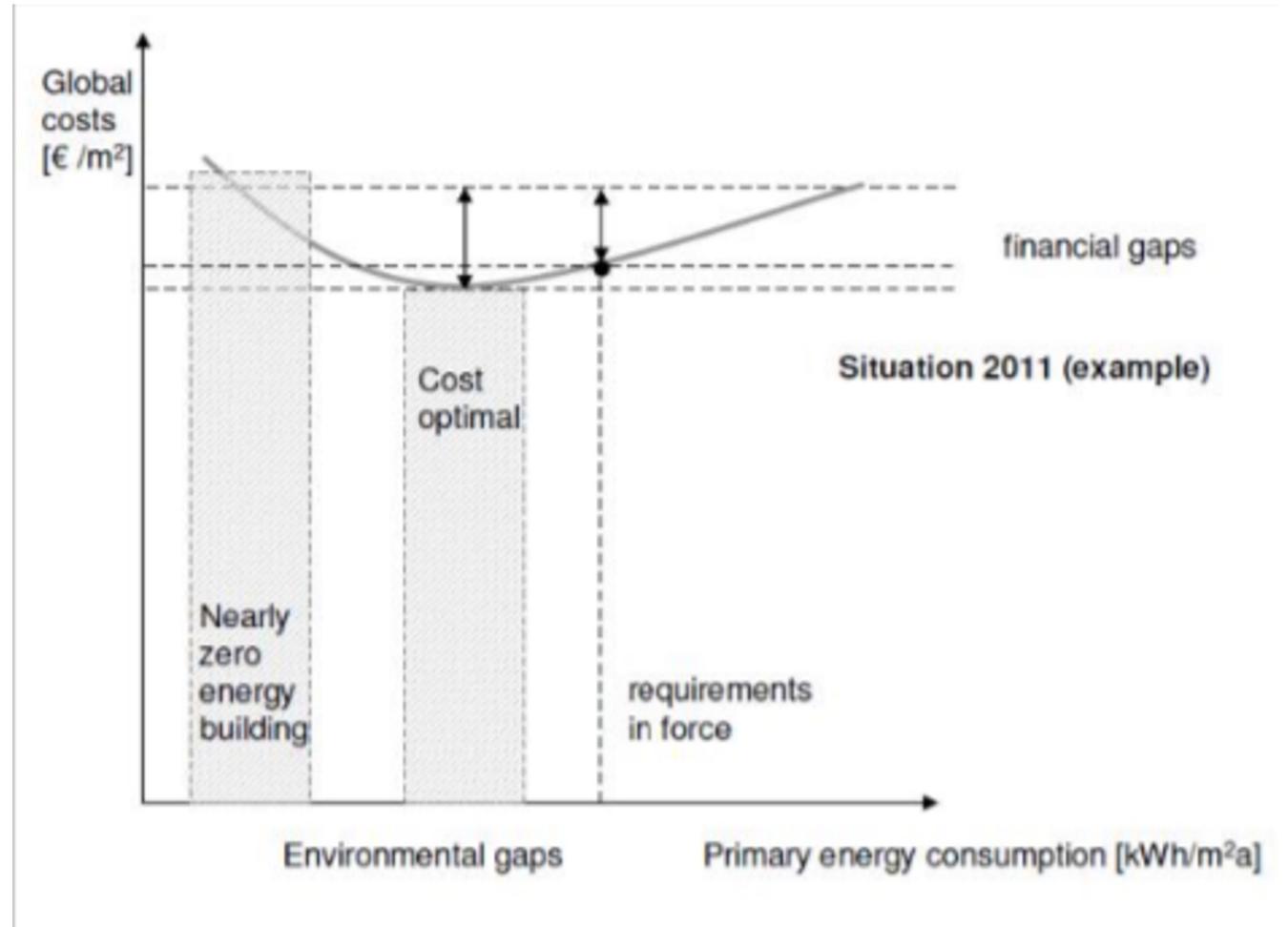
- Member States should use this at national or regional level for the calculation of the energy performance of buildings (see nZEB chapter)
- Heating, cooling or roof systems must have energy performance requirements, which is defined in kWh/m²*annual primary energy use

General methodology of the cost-optimal calculation



Idea of the cost-optimal calculation and nZEB levels

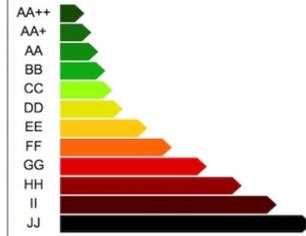
A minimum of 10 variants per reference building must be calculated in order to identify the cost -optimal level



Introduced the system of Energy Performance Certificates

Energy performance certificates must be issued **when a building is sold or rented**, and inspection schemes for heating and air conditioning systems must be established.

(See the chapter about EPCs)

| HITELES ENERGETIKAI TANÚSÍTVÁNY | |
|---|--|
| ÖSSZESÍTŐ LAP HET-007153 | |
| Épület (önálló rendeltetési egység) Rendeltetés: Lakó- és szállásjellegű Cím: 7531 Nagyváros Széles út 3. HRSZ: 1234 Az épület védettsége: Nem védett | Megrendelő Név: Példá Szende Cím: Magyarország (HU) 1357 Kiseváros Energiatekarékos utca 7.  |
| Energetikai minőség szerinti besorolás: EE  |  |
| Átlagosnál jobb | |
| Energetikai adatok Fűtött alapterület: 152,49 m ² Összesített energetikai jellemző: -mértékelt érték: 193,19 kWh/m ² a -követelményérték: 100 kWh/m ² a -a követelményérték százalékában: 193,19% Fajlagos hővesztésegényező: -mértékelt érték: 0,43 W/m ² K -a követelményérték százalékában: 173,39% Megjülő energia részarány (a méretezett összesített energetikai jellemző százalékában): 61,1% | Korszerűsítési javaslat A korszerűsítési javaslat leírása a számítási rész végén található. A javaslattal elérhető besorolás: CC Megjegyzés Tanúsítás módszere: Teljes épület, számítással A tanúsítvány kiállításának oka: ingatlan adásvétel |
| Tanúsító szakember adatai Név: BÁRÁNY LAJOS Cím: 2795 Napfényes Tanúsító utca 1. Telefon: 06 30 824 3306 Email: info@energraph.hu  | |
| Jogosultsági szám: TÉ 13-64671 (MMK) Alátámasztó munkarész: -kelte: 2018. január 18. -készítő szoftver megnevezése: WinWatt 7.63 (2017. 12. 16.) -azonosítója a tanúsítónál: 6-2018 | |
| Hiteles kiállítás dátuma: 2018. január 18. | ----- Alíráás (Pecsdét helye) |

ORSZÁGOS ÉPÍTÉSÜGYI NYILVÁNTARTÁS, E-TANÚSÍTÁS - ET adatlap verzió 2.3.16

https://entan.e-epites.hu

More emphasis on electro-mobility

Electro-mobility is supported by introducing minimum requirements for **car parks** over a certain size and other minimum infrastructure for smaller buildings

Requirements:

- Minimum number of charging points
- Simplification of the deployment of recharging points
- Deployment of ducting infrastructure
- 1 charging point per building
- Targeted exemptions



Introduces the Smart Readiness Indicator - SRI

This indicator will allow for rating the smart readiness of buildings

- gives a common general framework for rating the smart readiness of buildings
- aims at making the added value of building smartness more tangible for building users, owners, tenants and smart service providers.
- it provides information on the technological readiness of buildings to interact with their occupants and the energy grid, and also demonstrates the building's capabilities for more efficient operation and better performance through ICT technologies.
- the SRI assessment starts with determining which smart ready services are present in a building, so with a **checklist** these impacts and functionalities are then aggregated into an overall score displaying the smart readiness of a building.



Readiness to

adapt in response
to the needs of the
occupant



Readiness to

facilitate main-
tenance and
efficient operation



Readiness to

adapt in response
to the situation of
the energy grid

Inspection of heating, cooling and ventilation systems

- EPBD requires Member States to **set up inspections of equipment** for combined space heating/air conditioning and ventilation purposes of over 70 kW.
- Regular maintenance and inspection is needed to ensure maintained optimal performance of heating and air-conditioning systems.

GOAL

Energy-efficiency, because missing inspection and maintenance leads to significant system deterioration and unnecessary energy use.

General promotion of smart technologies and well-being of the occupants

- Smart technologies are promoted by EPBD, which requires MS to regulate the installation of building automation and control systems, and on devices that **regulate temperature at room level**
- In existing buildings, the installation of such self-regulating devices shall be required when heat generators are replaced, where technically and economically feasible.
- (See Module 5)

GOAL

Health and well-being of building users is addressed, for instance through the consideration of air quality and ventilation

Thank you for your attention!

Co-funded by the
Erasmus+ Programme
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