European Commission

JRC TECHNICAL REPORT

Analysis of the annual reports 2020 under the Energy Efficiency Directive

Summary Report

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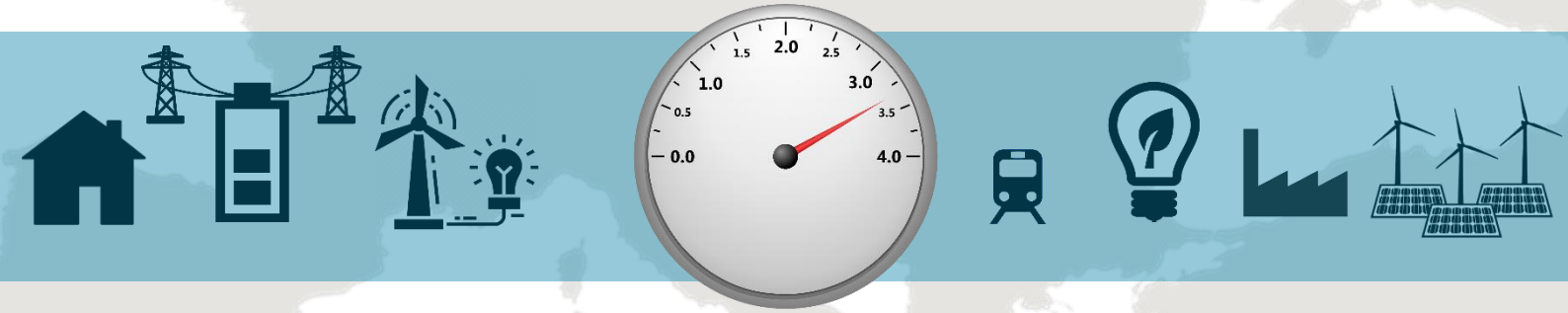
2020



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Contents

Abstract

This report discusses the progress towards the 2020 Energy Efficiency targets and the implementation of the provisions of the Energy Efficiency Directive 2012/27/EU (EED), providing an overview of the main energy trends in the European Union with special focus on the period 2005-2018. It is based on the latest available EUROSTAT data and on the information provided by Member States in their Annual Reports 2020 submitted under the EED. Our analysis has shown that 2015 was a turning point for the progress towards the energy efficiency targets due to a reversal in the preceding 5-year declining consumption trend of 2010-2014. Final energy consumption increased mildly in 2015 and continued to rise in 2016, 2017 and 2018; the latest increase in 2018 point to a gap of 3.5% with respect to the EU final energy consumption target of 2020. Primary energy consumption decreased slightly in 2018 leading to a gap of 4.6% with respect to EU 2020 target. At end-use level, rising energy consumption in transport and industry were the main causes of this progress slowdown. The assessment of the 2020Annual Reports generally confirmed good progress with regards to implementation of various provisions the Energy Efficiency Directive including those stipulated in Article 7 on energy efficiency obligations. While a few Member States reported new measures which can be viewed positively in light of the need to narrow the gap towards the targets, more intensified policy efforts are needed. Beyond the various information gaps identified by this report, our analysis suggests that achieving central government requirements on energy efficiency may be challenging and accelerated efforts across all sectors are crucial in ensuring that sufficient progress is made in the coming years.

Executive summary

Policy context

The context of this report is the Energy Efficiency Directive (2012/27/EU), adopted in 2012. This law aims to contribute to the achievement of the EU 2020 primary and final energy consumption targets by reducing energy consumption in all primary and end-use sectors. We dedicate a specific focus to the following three Articles of the Directive:
- Article 3: which includes indicative energy efficiency targets of Member States, for primary, final consumption or energy intensity;
- Article 5: which imposes to the Member States the obligation to renovate, every year, at least the 3% of the total floor area of heated and/or cooled buildings owned and occupied by their central government which does not meet minimum energy requirements or to apply measures that will generate equivalent or greater savings than those which would be achieved through the application of the renovation requirement previously described in the same building stock.
- Article 7: which requires Member States to implement Energy Efficiency Obligation Schemes or alternative measures to generate savings in order to achieve their cumulative savings requirement in the period 2014-2020.

The information contained in this Report constitutes one key source for the 2020 Report from the Commission to the European Parliament and Council on the assessment of the progress made by Member States towards the implementation of the Energy Efficiency Directive (COM(2020) 954 final)

Data and Methodology

The report reviews and assess 2020 Member States' Annual Reports (required under Article 24(1) of the Energy Efficiency Directive) as a basis for the monitoring of the progress towards national 2020 targets. Other data sources used in the analysis are Eurostat, Odyssee and DG MOVE Statistical Pocketbook.

Key conclusions

In the period from 2005 to 2018, the European Union has achieved a reduction in both primary and final energy consumption by 9.8% in primary energy and 5.9% in final energy, however it still exceed the theoretical linear target path 2005-2020 in 2018. This is the result of the observed energy consumption increases in various sectors in many Member States in the last studied years. Based on Member States reporting, among the basic factors that have led to this increase, are the economic growth, the increase of value added, the increase of transport of passengers and of goods, the increase of population and the number of households and the increase of disposable income.

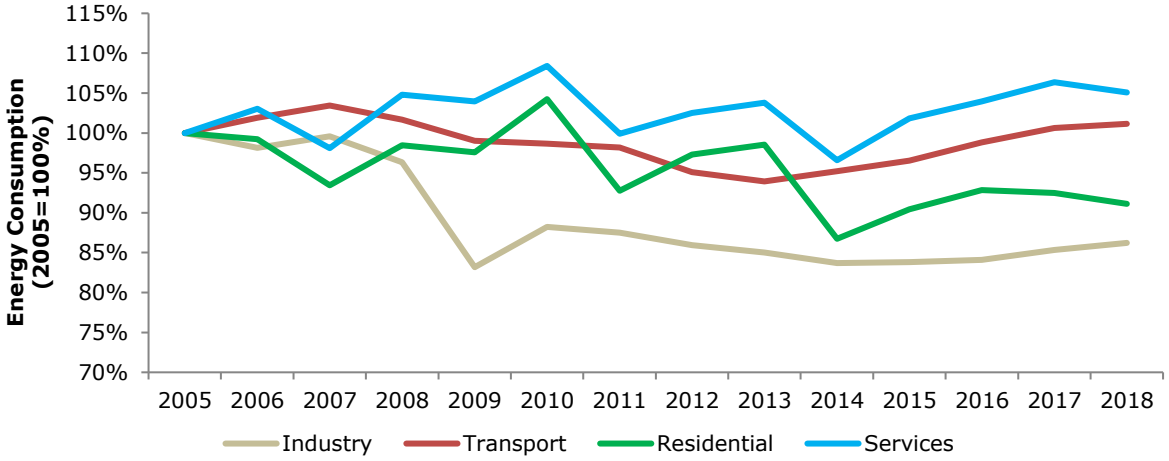
In an attempt to achieve their established 2020 targets, the Member States continue every year to update their legislation and policies. In this context, they reported 336 policy updates in 2019. Most of them were under the category 'Funds, financial & fiscal', were claimed under non-specified legal basis or under Article 7, and they concerned amendments, implementation or design changes and extension of on-going measures.

The analysis of the Annual Reports 2020 shows a good progress in the implementation of Article 7 and of Article 5. In both Article there are Member States that have achieved or even overachieved their annual and cumulative targets. On the contrary, there also Member States that it's required to implement significant additional efforts and continued commitment to ensure that they will achieve their targets by the end of 2020. At this point, it's important to highlight that the use of a common template in reporting can contribute significantly to the assessment of the progress. Among the policy measures implemented under Article 7, the policy types that have achieved the highest amounts of savings are energy efficiency obligation scheme and the taxation measures. To note also, that some Member States have included new measures under Article 5 and 7 in their 2020 Annual Reports trying to achieve their 2020 targets

Main findings

In the period from 2005 to 2018, the EU energy consumption and energy intensity followed a decreasing downward trend. This could mean an increase in energy efficiency and in competitiveness. Primary energy consumption was 1552 Mtoe in 2018,, corresponding to a gap of 4.6% with the EU 2020 target. Final energy consumption was 1124 Mtoe in 2017 or 3.5% above the EU 2020 target. Energy consumption presented different trends in every end-use sector. The sector in which it increased mostly in 2018 was industry, followed by transport sector. On the contrary, services and residential sectors have registered decreases in 2018.Regarding the period 2005-2018, industry and residential sectors followed decreasing trends while energy consumption in services and transport sector increased. Member States reported various reason for increase in energy consumption in 2018. Economic growth, increase of value added, and increase of production were the most commonly reported reasons for industry sector, while for transport were increase of transport of goods and passengers. According to

Member States reporting, the factors lead to increased consumption in 2018 in residential sector were increase of population and number of households, increase of disposable income and economic growth, while for services sector increase of value added, economic growth and increase of employment.



Regarding the implementation of Articles 5 and 7 of the Directive, overall the Member States have shown good progress even if the reporting is more completed for Article 7. More analytically, more than the half of the Member States (18) have achieved or exceeded their annual target in 2018 while 16 Member States have achieved their expected cumulative target for the period 2014-2018 on the basis of linear delivery. For Article 5, from the Member States with available data, 7 achieved their annual obligation in 2019 or 2018[1] for energy savings or renovated floor area while almost the half Member States (13) achieved total annual obligations in the period 2014-2019 or 2014-2018.

[1] Some Member States have reported their annual savings for the year 2018 instead of 2019 and their total savings for the period 2014-2018 instead of 2014-2019

	Article 7		Article 5	
	Savings achieved from new actions implemented in 2018 against expected annual average savings on the basis of linear delivery [%]	Cumulative savings achieved over the period 2014-2018 against expected average savings on the basis of linear delivery [%]	Annual obligation achieved in 2019 in terms of energy savings or renovated floor area[%]	Annual obligation achieved in 2014-2019 in terms of energy savings or renovated floor area[%]
EU28				
BE				
BG				
CZ				
DK				
DE				
EE				
IE				
EL				
ES				
FR				
HR				
IT				
CY				
LV				
LT				
LU				
HU				
MT				
NL				
AT				
PL				
PT				
RO				
SI				
SK				
FI				
SE				
UK				

	fully reached or exceeded their obligation
	50-99% of the obligation reached
	0-50% of the obligation reached
	not available data

Related and future JRC work

This Report is part of a series of JRC studies in supporting the European Commission in the implementation and monitoring of the Energy Efficiency Directive.

In the context of a continuous support to DG Energy, future JRC work will consists of analysing forthcoming MSs Reports on the 2020 targets. A specific publication with a focus on the impact of Covid-19 on energy consumption trends, out of the scope of the current study, is envisaged.

Quick guide

This report analyses the progress towards the 2020 Energy Efficiency targets in the context of the implementation of Energy Efficiency Directive. It assesses the implementation of the main Articles of the Directive while it also studies the evolution of the trends of energy consumption per sector and overall as well as the trends of some other important indicators. This analysis is needed in order to evaluate whether and how the efforts made by Member States to reduce energy consumption and increase energy efficiency are successful. The study covers the period from 2005 to 2018. The assessment has been implemented based on the latest Annual Reports provided by the Member States summarising their progress towards their targets by reporting their measures and savings as well as their trends in the established indicators.

1 Introduction

The Energy Efficiency Directive 2012/27/EU (the EED or the Directive), adopted in 2012, forms a key part of the EU's overall climate and energy legislative package, laying down the foundation for actions to be taken in order to help realise the energy efficiency potential of the European economy. All EU Member States are required to implement policy measures that improve energy efficiency at all stages of the energy chain from production to final consumption. This effort is aimed at achieving the EU energy efficiency target in 2020. In particular, the EU target corresponds to a 20% reduction in the EU primary energy consumption by 2020 compared to 2007 primary energy consumption projections in 2020 (based on the model PRIMES 2007). In terms of primary energy, this target results in a reduction of 370 Mtoe and consumption levels of 1483 Mtoe in 2020 (to be compared with 2007 projections of 1853 Mtoe in 2020).

In accordance with Article 3, Member States have set indicative energy efficiency targets – based on either primary or final energy savings, primary or final energy consumption or energy intensity – in view of the overall target of 20% reduction in EU primary energy consumption by 2020. To comply with Article 24, Member States are also requested to report on the progress achieved towards their national energy efficiency targets by 30 April each year as of 2013 in the form of the so-called Annual Reports (ARs). In particular, Member States are required to specifically report on their recent consumption trends as well as policy updates and progress towards implementing Articles 5 and 7 of the Directive.

As per the Directive's requirements, the European Commission's responsibilities include the assessment of the annual progress made by Member States towards achieving the national indicative energy efficiency targets and implementing the various provisions of the Directive. The Joint Research Centre has undertaken the task of evaluating the submitted annual reports and the results of the analysis of the Annual Reports of 2020 (AR2020) are presented in this Report[2]. This report represents the fourth of the summary report series published by the JRC to monitor the progress at the EU and MS levels in relation to the key elements of the EED. The assessment of the latest Annual Reports of 2020 covers the progress towards the targets (covering the year 2018 for which the latest available data exist) and progress in relation to various energy efficiency policies.

The structure of the report is as follows. Section 2 sets the background, with information of the main elements covered by and submission details of the national Annual Reports of 2020. Section 3 discusses the progress towards the 2020 targets, focusing at the whole economy and each end-use sector individually (industry, residential, services and transport). Section 4 zooms into the evolution of short-term trends of key energy efficiency-related indicators in the latest two-year period (2017-2018) and discusses the underlying reasons behind the trends in part through the application of decomposition analysis. The progress towards the implementation of EED provisions is discussed in Section 5, with a detailed summary of a country-by-country progress achieved towards EED Articles 5 and 7. New AR2020 measures identified under Articles 7 and 5 are also highlighted in Section 5, with a view to discuss how Member States have recently accelerated their efforts to reach the 2020 targets. Conclusions are drawn in Section 6 and complementary information is presented in Annexes 1-3.

[2] The latest Annual Reports submitted by MSs are publicly available at the following link: https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/national-energy-efficiency-action-plans_en#national-plans-for-the-eu-2030-target

2 Background

The annual reports referred to in Article 24(1) of the EED provide a basis for the monitoring of the progress towards national 2020 targets.

For the Annual Reports 2020, the following minimum information had to be provided by each Member State:

(a) an estimate of various energy-related indicators (listed in Table 1) for the year 2018, including a discussion of the reasons if stable and growing energy consumptions were observed;

(b) updates on major legislative and non-legislative measures implemented in 2019 which contribute towards the overall national energy efficiency targets for 2020;

(c) the total building floor area of the buildings with a total useful floor area over 500 m^2 and as of 9 July 2015 over 250 m^2 owned and occupied by the Member States' central government that, on 1 January 2020, did not meet the energy performance requirements referred to in Article 5(1);

(d) the total building floor area of heated and/or cooled buildings owned and occupied by the Member States' central government that was renovated in 2019 referred to in Article 5(1) or the amount of energy savings in eligible buildings owned and occupied by their central government as referred to in Article 5(6);

(e) energy savings achieved in 2018 through the national energy efficiency obligation schemes referred to in Article 7(1) or the alternative measures adopted in application of Article 7(9).

Table 1. Indicators to be included in the Annual Reports, as required by Annex XIV of EED.

(i) primary energy consumption (PEC)
(ii) total final energy consumption (FEC)
(iii) final energy consumption (FEC) of industry sector
(iii) final energy consumption (FEC) of transport sector
(iii) final energy consumption (FEC) of households sector
(iii) final energy consumption (FEC) of services sector
(iv) gross value added (GVA) of industry sector
(iv) gross value added (GVA) of services sector
(v) disposable income for households (DIH)
(vi) gross domestic product (GDP)
(vii) electricity generation from thermal power generation (thPG)
(viii) electricity generation from combined heat and power plants (CHPP)
(ix) heat generation from thermal power generation (thPG)
(x) heat generation from combined heat and power plants (CHPP), including industrial waste heat
(xi) fuel input for thermal power generation (thPG)
(xii) passenger kilometres (pkm)
(xiii) tonnes kilometres (tkm)
(xiv) combined transport kilometres (pkm + tkm), in case (xii) and (xiii) are not available
(xv) population

In the framework of the Administrative Agreement TSSEED[3] between DG Energy and JRC, in 2015 the European Commission has developed a reporting template in order to facilitate a harmonised reporting approach and thereby enhance data analysis and comparability. In 2020, as in the previous year, 14 Member States - one more Member State compared to the previous year -filled out the suggested template .These are (Austria, Belgium, Cyprus, Denmark, Estonia, Latvia, Greece, Spain, Hungary, Ireland, Italy, Portugal, Slovenia, and the Netherlands) (see Table 2). Three countries (AT, IT, and NL) submitted both a standard report and the template to summarise the information and data provided.

The effectiveness of this reporting tool in terms of improved clarity and understanding was confirmed by the analysis of the Annual Reports 2018, 2019 and 2020.

Table 2. Reporting overview of Annual Reports 2020 (T: Template, R: Report).

	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
T	✓	✓		✓			✓	✓	✓	✓				✓	✓	✓			✓		✓		✓			✓		
R	✓		✓		✓	✓					✓	✓	✓			✓	✓	✓		✓	✓	✓		✓	✓		✓	✓

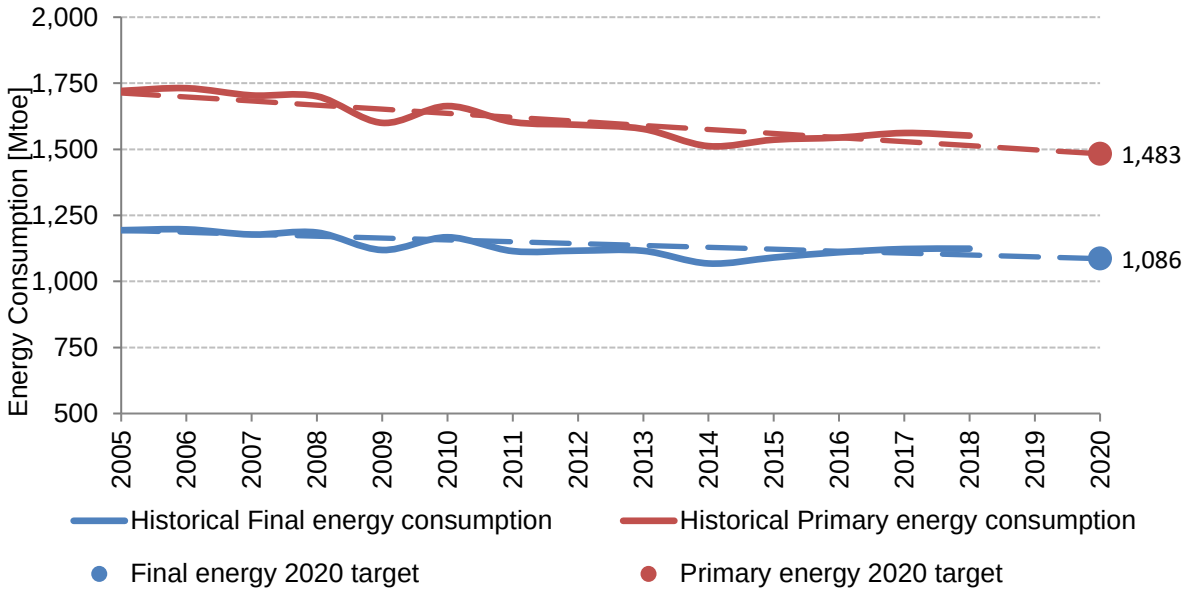
Source: JRC elaboration on ARs 2020

[3] Technical and Scientific Support to the implementation of the EED and the EPBD, as well as contribution to the development of concepts for the strengthening of the overall EU legislative framework for energy saving.

3 Progress towards the 2020 Energy Efficiency targets[4]

In the period from 2005 to 2018, the EU energy consumption has followed a general downward trend, as depicted in Figure 1. The decrease in energy consumption was accompanied with an overall drop in energy intensity and energy consumption per capita, reflecting a possible increase in competitiveness in the same period. In 2014, the EU had already met the target values set in the EED for 2020 in terms of final energy consumption (1068 Mtoe in 2014 vs 1086 Mtoe of the target) and it was on track to reach the target value for primary energy consumption (1512 Mtoe in 2014 vs 1483 Mtoe of the target; corresponding to a gap of 2.0%). However, from 2015 to 2018 final energy consumption increased continuously. In 2018, it registered the value of 1124 Mtoe, corresponding to a gap of 3.5% above the target. Primary energy consumption followed a similar trend until 2017, with a gradual increase as of 2014. However, the increasing trend was reversed in 2018: the EU primary energy consumption amounted to 1552 Mtoe, leading to a gap of 4.6% with the EU 2020 target.

Figure 1. Final and Primary Energy Consumption trends of the EU28 (the dotted line represent a linear trajectory between the 2005 actual consumption and the 2020 target consumption).



Source: Eurostat, JRC, 2020.

In terms of individual end-use sectors, only transport and services have increased their final energy consumption over the 2005-2018 period (by 1% and 5% respectively); whilst in the others (i.e. residential and industry sectors) the final energy consumption has declined.

[4] Unless otherwise stated, the source of the data presented in this chapter is EUROSTAT. The indicators used are listed in Annex 1.

Table 3. Indicative national energy efficiency targets for 2020.

MS	PEC Target [Mtoe]		FEC Target [Mtoe]	
	Up to 2016	Latest value (from NEEAP 2017 or latest value)	Up to 2016	Latest value (from NEEAP 2017 or latest value)
BE	43.70	43.70	32.50	32.50
BG	16.87	16.87	8.64	8.64
CZ	39.60	44.31	25.32	25.32
DK	17.40	17.52	14.43	15.17
DE	276.60	276.60	194.30	194.30
EE	6.50	6.50	2.80	2.80
IE	13.90	13.90	11.70	11.70
EL	24.70	24.70	18.40	18.40
ES	119.80	122.6	80.10	87.24
FR[5]	219.90	219.90	131.40	131.40
HR	11.15	10.71	7.00	6.96
IT	158.00	158.00	124.00	124.00
CY	2.20	2.23	1.85	1.92
LV	5.37	5.37	4.47	4.47
LT	6.49	6.49	4.28	4.28
LU	4.48	4.48	4.20	4.24
HU	24.10	26.6	14.40	18.2
MT	0.70	0.82	0.50	0.63
NL	60.70	60.70	52.20	52.20
AT	31.50	31.53	25.07	25.08
PL	96.40	96.40	71.60	71.60
PT	22.50	22.50	17.40	17.40
RO	43.00	43.00	30.30	30.32
SI	7.30	7.13	5.10	5.12
SK	16.38	16.38	9.24	10.38
FI	35.86	35.86	26.66	26.66
SE	43.40	43.40	30.30	30.30
UK	177.60	177.60	129.20	129.20
Sum of indicative targets EU28	**1526.09**	**1536.80**	**1077.36**	**1090.43**
EU28 target 2020	**1483**		**1086**	

Source: AR 2020, DG ENERGY 2020.

[5] FR excludes international aviation in the target reported in AR2020.

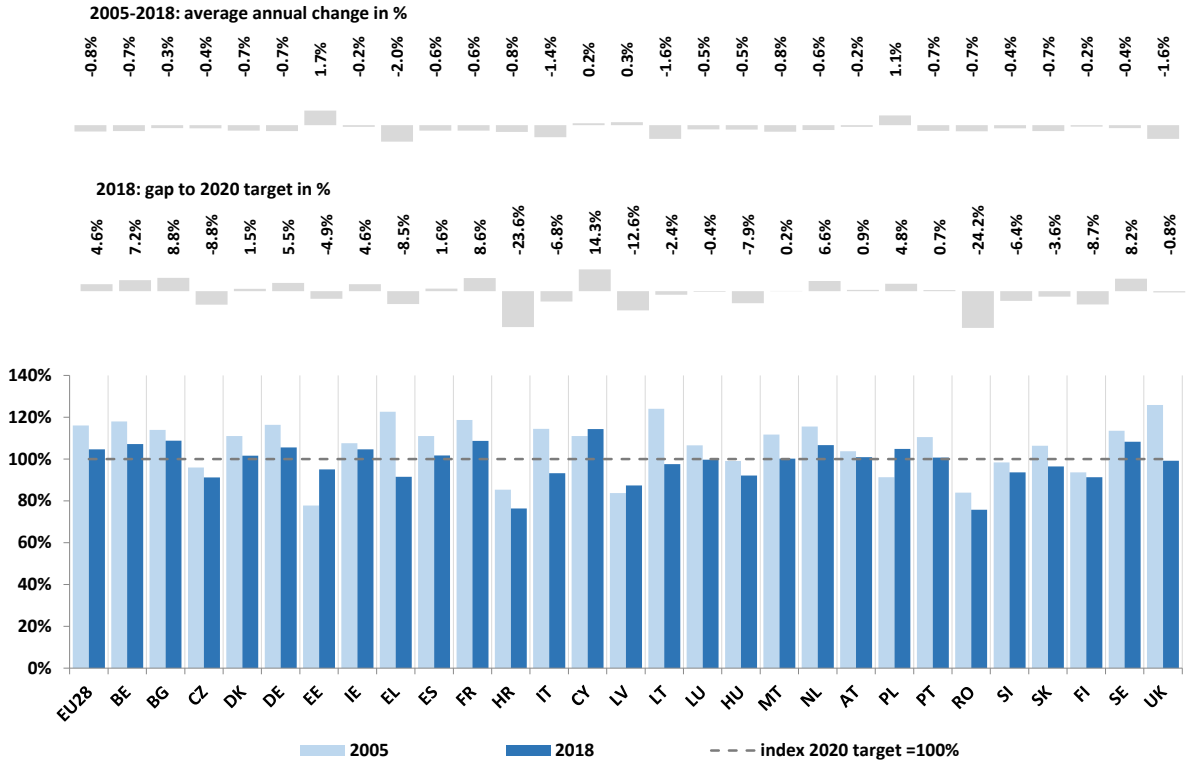
It has to be noted that, after the last updates by some Member States, the sum of national 2020 absolute consumption targets is 1536.8 Mtoe in terms of primary energy and 1090.4 Mtoe in terms of final energy (

Table **3**). The latter value is slightly above the EU target (0.4% higher compared to 1086 Mtoe),. There is also a negative mismatch regarding the primary energy objective: the sum of the indicative national targets is 3.6% above the EU target (1483 Mtoe) and therefore corresponds to 17.1% savings (instead of 20%) compared to the PRIMES baseline projections.

At national level, the absolute primary energy consumption of all Member States, except Estonia, Cyprus, Latvia and Poland, has declined since 2005 (Figure 2). Estonia experienced the largest primary energy consumption increase, which was equivalent to an average annual 1.7% rise in the period 2005-2018. The average annual reduction during 2005-2018 was more pronounced compared to EU28 in 4 Member States (Greece, Italy, Lithuania and the United Kingdom). Twelve countries (Belgium, Bulgaria, Denmark, Germany, Ireland, Spain, France, Cyprus, Austria, the Netherlands, Poland, and Sweden) registered primary energy consumption values above their 2020 national indicative targets in 2018. This means that efforts to further reduce the energy consumption in these countries are necessary in the remaining period up to 2020.

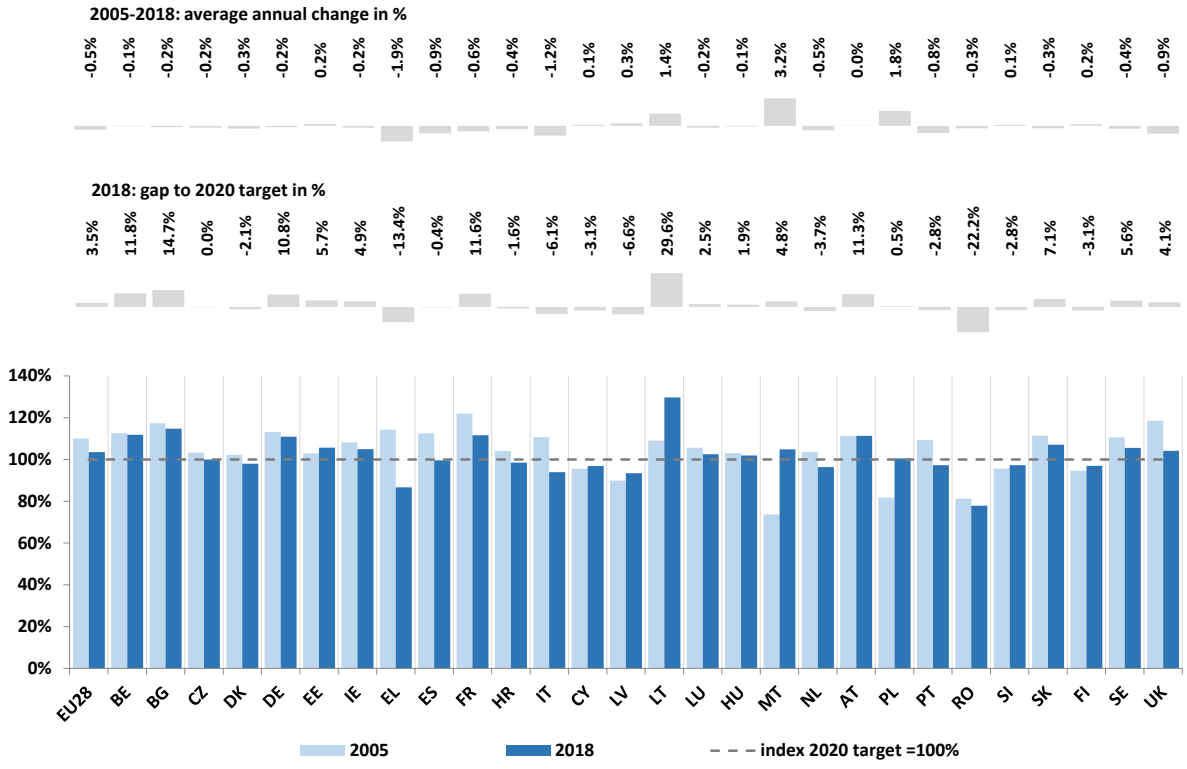
The absolute final energy consumption of all Member States has declined since 2005 except in Estonia, Cyprus, Latvia, Lithuania, Malta, Austria, Finland, Slovakia and Poland (Figure 3). 13 Member States achieved already in 2018 a final energy consumption which is below or equal to the indicative final energy target for 2020 (Czech Republic, Denmark, Greece, Spain, Croatia, Italy, Cyprus, Latvia, the Netherlands, Portugal, Romania, Slovenia and Finland).

Figure 2. Primary energy consumption trends (2005-2018), average annual change in 2005-2018 and comparison of current efforts with EU 2020 target.



Source: Eurostat, JRC, 2020.

Figure 3. Final energy consumption trends (2005-2018), average annual change in 2005-2018 and comparison of current efforts with EU 2020 target.



Source: Eurostat, JRC, 2020.

An overview of main energy trends is shown in Table 4 and Table 5, where the green colour is used to indicate a decrease in energy consumption.

Table 4. Overview of variations of main energy indicators (part 1).[6]

MS	Trend to reach the 2020 target		Short-term trend		Energy Intensity whole economy	Industry	Residential	
	PEC 2005-2018 trend compared to PEC 2005-2020 trend to reach the 2020 target	FEC 2005-2018 trend compared to FEC 2005-2020 trend to reach the 2020 target	Change of PEC 2018 compared to PEC 2017 [%]	Change of FEC 2018 compared to FEC 2017 [%]	2005-2018 average annual change of PEC energy intensity [%]	2005-2018 average change of FEC energy intensity in industry [%]	2005-2018 average annual change of FEC in residential per capita with climatic corrections [%]	2005-2018 average annual change of FEC in residential per m2 with climatic corrections [%]
EU28	-	-	-0.6%	0.1%	-2.0%	-1.8%	-0.3%	-1.6%
BE	-	-	-4.6%	0.6%	-2.2%	-0.3%	-1.7%	-1.7%
BG	-	-	0.1%	0.2%	-2.8%	-4.1%	2.3%	-0.9%
CZ	+	+	0.1%	-0.7%	-3.1%	-4.6%	1.5%	-0.2%
DK	-	+	0.4%	0.6%	-2.0%	-2.0%	0.3%	-1.2%
DE	-	-	-2.1%	-1.5%	-2.2%	-1.4%	0.1%	-0.6%
EE	+	-	9.6%	3.4%	-1.0%	-5.5%	1.4%	0.5%
IE	-	-	1.1%	4.7%	-4.1%	-4.1%	-2.0%	-3.1%
EL	+	+	-2.8%	-2.9%	-0.6%	0.4%	-0.7%	-0.3%
ES	-	+	-0.5%	2.4%	-1.6%	-1.6%	0.7%	-1.2%
FR	-	-	-0.1%	-1.3%	-1.7%	-1.2%	0.0%	-1.0%
HR	+	+	-1.8%	-1.1%	-1.7%	-1.3%	0.6%	-1.8%
IT	+	+	-1.1%	1.1%	-1.3%	-2.3%	0.9%	0.3%
CY	-	+	0.5%	-0.3%	-1.4%	-0.7%	5.2%	-1.3%
LV	+	+	5.1%	4.1%	-1.8%	2.2%	0.5%	-1.9%
LT	+	-	2.8%	3.8%	-4.7%	-1.9%	2.2%	-1.5%
LU	+	-	4.0%	4.0%	-3.0%	-1.9%	-1.1%	-2.8%
HU	+	-	-0.1%	0.1%	-1.8%	2.2%	0.5%	-0.5%
MT	+	-	1.8%	6.1%	-4.9%	-0.4%	11.8%	1.6%
NL	-	+	-0.6%	-0.1%	-2.1%	-1.8%	-0.7%	-2.1%
AT	-	-	-3.1%	-2.5%	-1.3%	-0.8%	0.8%	-0.1%
PL	-	-	1.9%	1.4%	-2.7%	-3.7%	1.0%	-0.2%
PT	+	+	-0.7%	2.1%	-1.0%	-1.2%	0.6%	-2.4%
RO	+	+	0.4%	1.1%	-4.3%	-4.6%	1.9%	-3.0%
SI	+	+	-0.8%	0.6%	-2.0%	-2.7%	0.7%	-0.6%
SK	+	-	-2.2%	-0.1%	-4.0%	-4.0%	-0.1%	-1.2%
FI	+	+	2.0%	2.3%	-1.7%	-0.1%	0.5%	-0.9%
SE	-	-	1.3%	-0.6%	-2.5%	-1.1%	-1.0%	-1.1%
UK	+	-	-0.3%	0.7%	-3.0%	-2.8%	-1.9%	-2.3%
Source and extraction data	Eurostat 06/2020	Eurostat 06/2020	Eurostat 06/2020	Eurostat 06/2020	Eurostat 06/2020	Eurostat 06/2020	Eurostat 06/2020	Odyssee 07/2020

Source: Eurostat, Odyssee, JRC, 2020.

[6] EU28, UK: Eurostat data of April 2020 have been used.

Table 5. Overview of variations of main energy indicators (part 2).

MS	Services	Transport			Generation	
	2005-2018 average change of FEC energy intensity in the service sector [%]	2005-2018 average change of FEC in the transport sector [%]	2017 vs. 2005 change of share of trains, motor coaches, buses and trolley buses for passenger transport [%]	2017 vs. 2005 change of share of railway and inland waterways for freight transport [%]	2005-2018 average annual change of heat generation from CHP [%]	2005-2018 average annual change of ratio Transformation output/Fuel input of thermal power generation [%]
EU28	-1.0%	0.1%	-0.4%	-0.5%	-0.8%	1.7%
BE	-0.4%	0.2%	-2.2%	7.0%	4.1%	2.5%
BG	-0.3%	1.8%	-14.2%	-8.2%	-2.3%	0.9%
CZ	-2.2%	1.2%	1.6%	0.8%	-1.0%	0.6%
DK	-1.4%	0.0%	-2.5%	NA	-1.0%	2.9%
DE	-2.2%	0.1%	0.1%	0.8%	0.0%	2.4%
EE	0.1%	1.2%	-3.5%	NA	3.3%	0.1%
IE	-4.0%	-0.2%	-0.5%	NA	NA	3.8%
EL	2.0%	-1.5%	-4.2%	NA	1.3%	2.3%
ES	0.6%	-0.9%	-3.3%	NA	NA	2.0%
FR	-0.5%	0.2%	1.6%	0.6%	-3.5%	0.8%
HR	-0.2%	1.2%	-0.5%	-1.4%	1.1%	4.4%
IT	1.8%	-1.2%	-0.9%	5.4%	1.0%	2.6%
CY	2.2%	0.1%	NA	NA	67.4%	1.6%
LV	-1.8%	1.0%	-7.9%	NA	1.7%	-0.7%
LT	-1.8%	3.5%	-1.4%	-9.9%	-3.9%	9.2%
LU	-0.5%	-0.7%	2.6%	NA	2.2%	7.7%
HU	-5.3%	1.5%	-5.8%	-2.0%	-6.6%	0.4%
MT	-0.1%	2.8%	NA	NA	NA	4.8%
NL	-1.6%	-0.3%	2.4%	8.2%	-2.5%	0.5%
AT	-2.5%	0.4%	1.7%	9.8%	2.0%	3.0%
PL	-2.1%	4.9%	-8.9%	-13.5%	-0.9%	0.7%
PT	-0.2%	-0.7%	0.7%	NA	3.8%	5.2%
RO	-1.4%	3.4%	-4.2%	0.3%	-4.9%	0.5%
SI	-2.1%	2.6%	-0.8%	NA	0.8%	1.9%
SK	-4.4%	1.6%	-3.6%	-7.8%	-0.6%	0.3%
FI	0.3%	0.1%	0.7%	NA	-0.7%	1.3%
SE	-2.2%	-0.3%	2.2%	NA	2.2%	0.7%
UK	-1.0%	-0.2%	2.1%	-1.6%	NA	3.7%
Source and extraction data	Eurostat 06/2020	Eurostat 06/2020	DG MOVE Pocketbook 2019	DG MOVE Pocketbook 2019	Eurostat 06/2020	Eurostat 06/2020

Source: Eurostat, DG MOVE, JRC, 2020.

[7] Symbol "+" indicates that Member States decreased their primary and final energy consumption between 2005 to 2018 at a rate which is higher than the rate of decrease which would be needed in the period 2005 to 2020 to meet the 2020 primary and final energy consumption targets. Symbol "–" was used for the other cases.

3.1 Primary energy consumption

Primary energy consumption (PEC) [8] in the EU-28 in 2018 was 1552 Mtoe, i.e. almost 0.6% lower than in 2017. During the period 1990-2005 it increased by 9.8% and it decreased by 9.8% over the period 2005-2018. There was however consumption increase in 2010, when primary energy consumption increased by nearly 4% in one year. That was followed by another relevant and constant decrease in the period 2011-2014. After several years of decline, PEC started to increase again in 2015 and continued increasing in 2016 and 2017. In 2018, the increasing trend was reversed.

In 2018, only 4 Member States (Belgium, Estonia, Luxembourg, Finland and Sweden) were associated with primary energy consumption of over 4 toe per capita. In Croatia, Malta and Romania consumptions was under 2 toe per capita, while the EU average stood at 3.0 toe per capita.

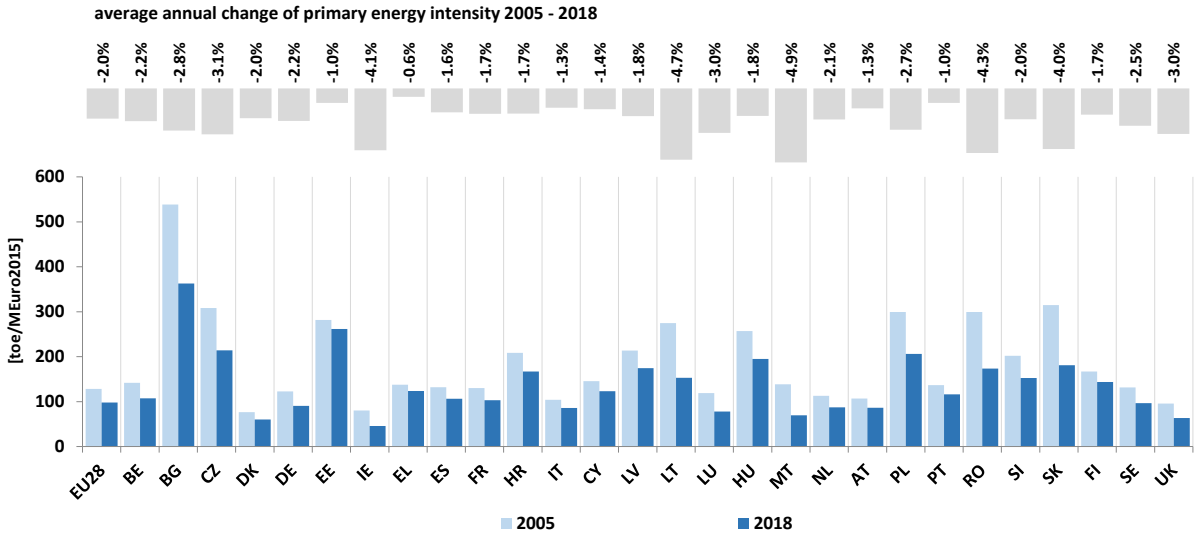
The biggest increase in primary energy consumption per capita between 2005 and 2018 was observed Estonia (around +26%), followed by Latvia (+21%), while the biggest decrease (under -20%) was observed in the United Kingdom, Luxembourg, Malta, Greece and Italy.

In many countries, primary energy consumption per capita increased between 1990 and 2005 and then decreased between 2005 and 2018. The biggest difference was seen in Ireland, Greece, Italy, Cyprus and Spain, where the consumption per capita increased over 25% between 1990 and 2005, then decreased by more than 10% in the period up until 2018. In other countries (Estonia, Latvia, Poland), the picture was reversed: there was indeed a decrease in consumption per capita from 1990 to 2005, however this was followed by a further increase in the period up to 2018. The biggest difference in absolute terms was seen in Estonia, where the consumption per capita decreased by 38% between 1990 and 2005 and then rose by 26% in the period up to 2018.

[8] PEC 2020-2030 indicator of Eurostat

As shown in Figure 4, the EU primary energy intensity (PEC divided by GDP) has dropped by an average rate of 2.0% per year in the period 2005-2018. On average, all Member States significantly reduced their primary energy intensity in this period. Czech Republic, Ireland, Lithuania, Malta, Romania, Slovakia and the United Kingdom reduced their intensity on average by more than 3% per year. The largest annual average decrease of primary energy intensity over this period has been recorded in Lithuania, Malta, Romania and Ireland (between -4.1 and -4.9%/ year). In 2018 the largest drops compared to the previous year were observed in Ireland (-6.9%) and Belgium and Slovakia (-6.0% each of them).

Figure 4. Primary energy intensity trends and average annual change in 2005-2018



Source: Eurostat, JRC, 2020.

3.2 Final Energy consumption

Final energy consumption (FEC)[9] in EU-28 was 1124 Mtoe in 2018, almost in the same levels as in 2017 (+0.1%). Final energy consumption has increased slowly since 1994, reaching its highest value, 1197 Mtoe, in 2006. After that, the level remained relatively steady, until the first strong decrease, by 5.6% (with respect to the previous year), in 2009. The sharpest drop among the main energy sources used in final energy in 2009 was in the use of solid fuels, by 10.6%, followed by natural gas (6.4%), electricity and oil and petroleum products (5% for both of them). Overall, there was an increase in 2010, when the final energy consumption increased by 4.3%, though in 2011, there was a decrease of 4.5%, whilst final energy consumption remained almost at the same level in the period 2012-2013. In 2014, final energy consumption decreased by 4.3% compared to the previous year. In the period 2015-2018, final energy consumption registered positive annual growth rates under 2.5%. The final energy consumption in 2018 resulted slightly above the 2011 level.

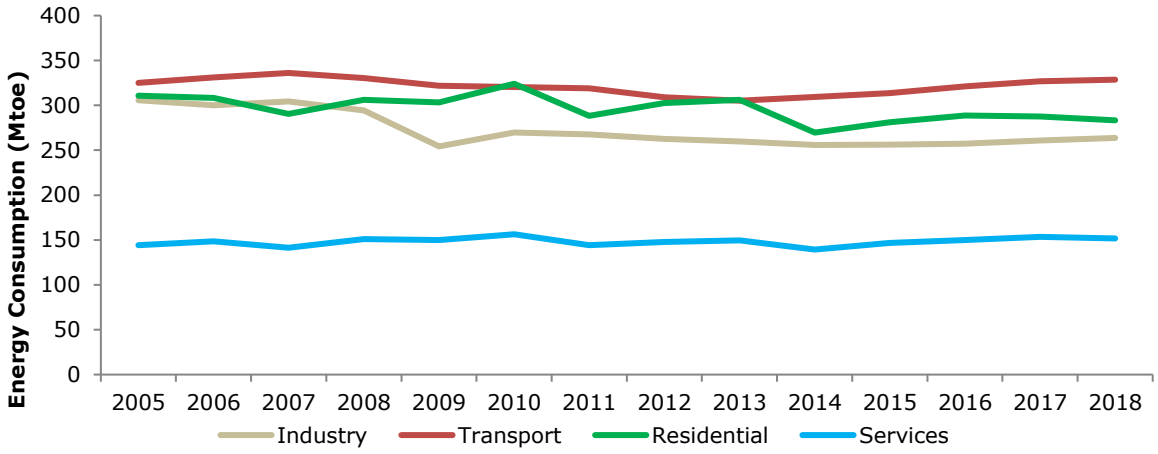
Figure **5** shows final energy consumption values per sector[10] from 2005 to 2018. It can be observed how final energy consumption values in industry and residential sector have oscillated more markedly throughout the different years, while energy consumption of the transport and services sector has changed more gradually.

The breakdown of final energy consumption in 2018 by sector shows that transport accounted for the largest share (31%), followed by residential and industry (26.7% and 24.8% respectively). The service sector accounted for 14.3% whilst the other sectors were responsible for the remaining 3.2%.

Figure 5. Final energy consumption dynamics through main sectors in the EU-28, 2005-2018.

[9] FEC 2020-2030 indicator of Eurostat

[10] The new methodology of Eurostat for energy balances have been used in sectoral consumption analysis.



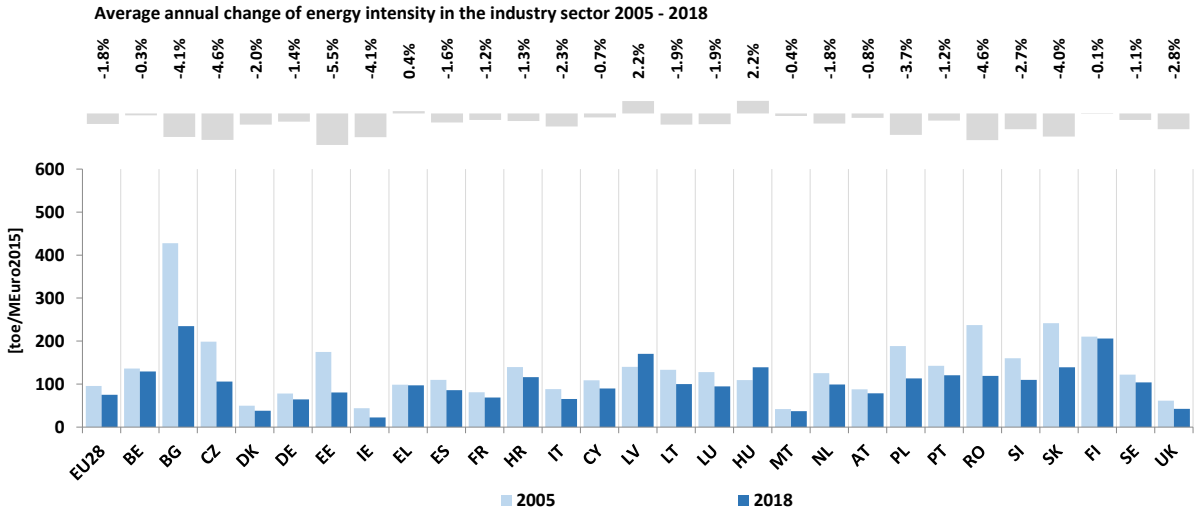
Source: Eurostat, JRC, 2020.

3.2.1 Industry

The previously mentioned final energy consumption decrease of 2009 was sharpest in industry (-13.7%), which was partially compensated in 2010 (+6.1%). After the decrease in the period 2011-2015 (-1.0% on average), the final energy consumption slightly increased in 2016, 2017 and 2018 (+0.4 +1.5% and +1.1% respectively compared to the previous years).

In terms of industry final energy intensity of industry sector (FEC divided by GVA[11]) (Figure 6), in 2018 there is still a significant difference between the most energy intensive Member State, Bulgaria (234.8 toe/M€), and the least energy intensive one: Ireland (22.5 toe/M€). Most Member States however decreased energy intensity in industry in 2018 compared to 2005, the exceptions being Hungary, and Latvia.

Figure 6. Final energy intensity trends in industry and average annual change in 2005-2018.



Source: Eurostat, JRC, 2020.

3.2.2 Residential

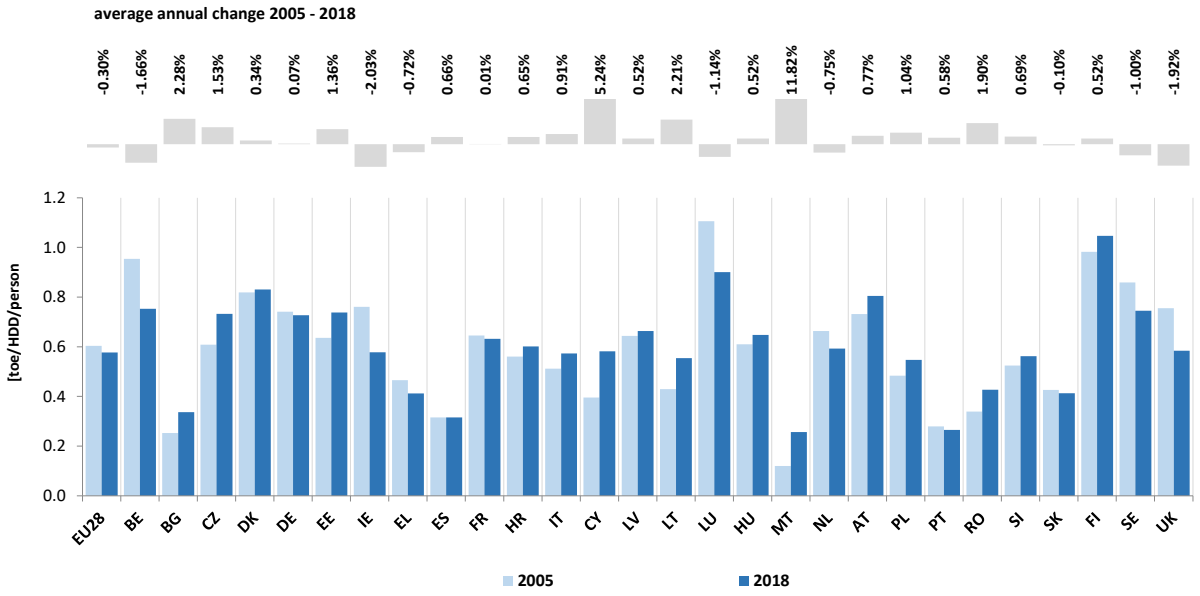
The final energy consumption of the EU28 residential sector decreased slightly in 2009, increased by nearly 7% in 2010, and decreased substantially in 2011 (-11%). In the period 2011-2013 a small recovery was registered (around +6%), while in 2014 another significant decrease was recorded (-12%). 2015 data show an increase of 4.3%, the data for 2016 show an increase of 2.7% compared to the previous year, the last data for 2017 show a slight reduction by 0.4% while the data for 2018 show a reduction by 1.5%. Residential final energy consumption remains abundantly below the figure of 2005 (283.2 Mtoe vs 310.9 Mtoe, representing a decrease of -8.9%). This might reflect the efficiency improvements occurred in the last decade, but also the influence of the annual climatic variations on this indicator. The reduction in the HDD normalised final energy consumption[12] over the period 2005-2018 is -1.0%.

Taking also population into account, it can be seen that EU28 decreased its final energy consumption per capita on annual average by 0.3% (see Figure 7). The biggest improvements (under -1.5%) are in Ireland, United Kingdom and Belgium.

[11] Gross Value Added

[12] For this calculation the average heating degree days of the reference period 2005-2018 are taken into account.

Figure 7. Climate-normalised residential final energy consumption per capita and average annual change in 2005-2018.



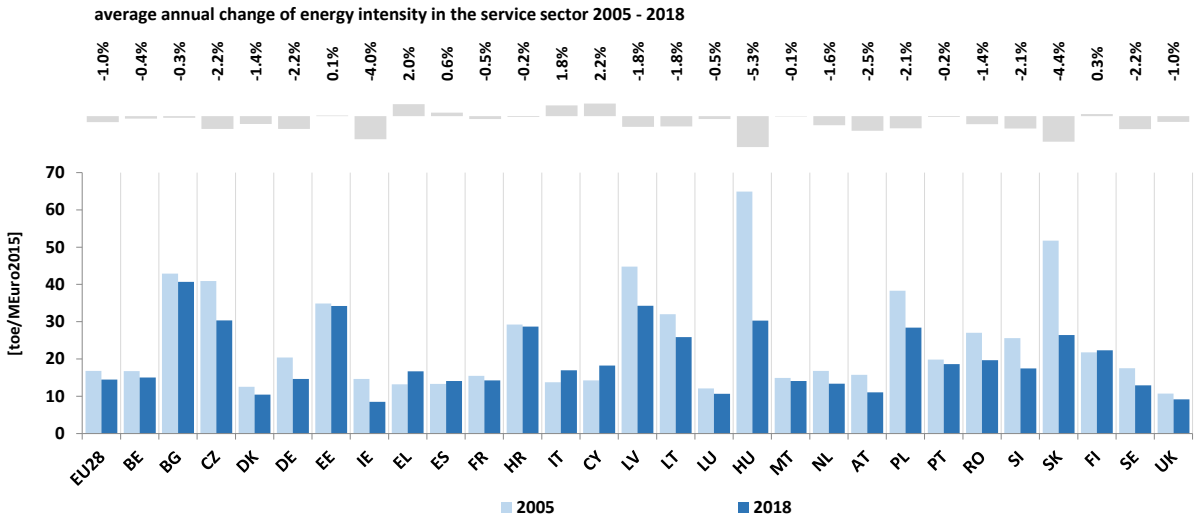
Source: Eurostat, JRC, 2020.

3.2.3 Services

Similarly to residential, the FEC of the EU28 service sector decreased in 2009, increased by 4.3% in 2010, and then decreased again by 7.9%. In the period 2011-2013 a small increase was registered (almost +3.9%), while in 2014 another decrease was recorded (-7%). Data of 2015, 2016 and 2017 show increases of 5.4%, 2.1% and 2.3% respectively, while last data for 2018 show a decrease by –1.2%.

As shown in Figure 8, EU28 has improved the energy intensity of its service sector (FEC divided by GVA[13]) annually on average by 1.0 % over the period 2005-2018. The highest improvements (between -5.3% and – 4.0%) happened in Ireland, Hungary, and Slovakia, in this period.

Figure 8. Final energy intensity in the services sector and average annual change in 2005-2018.



Source: Eurostat, JRC, 2020.

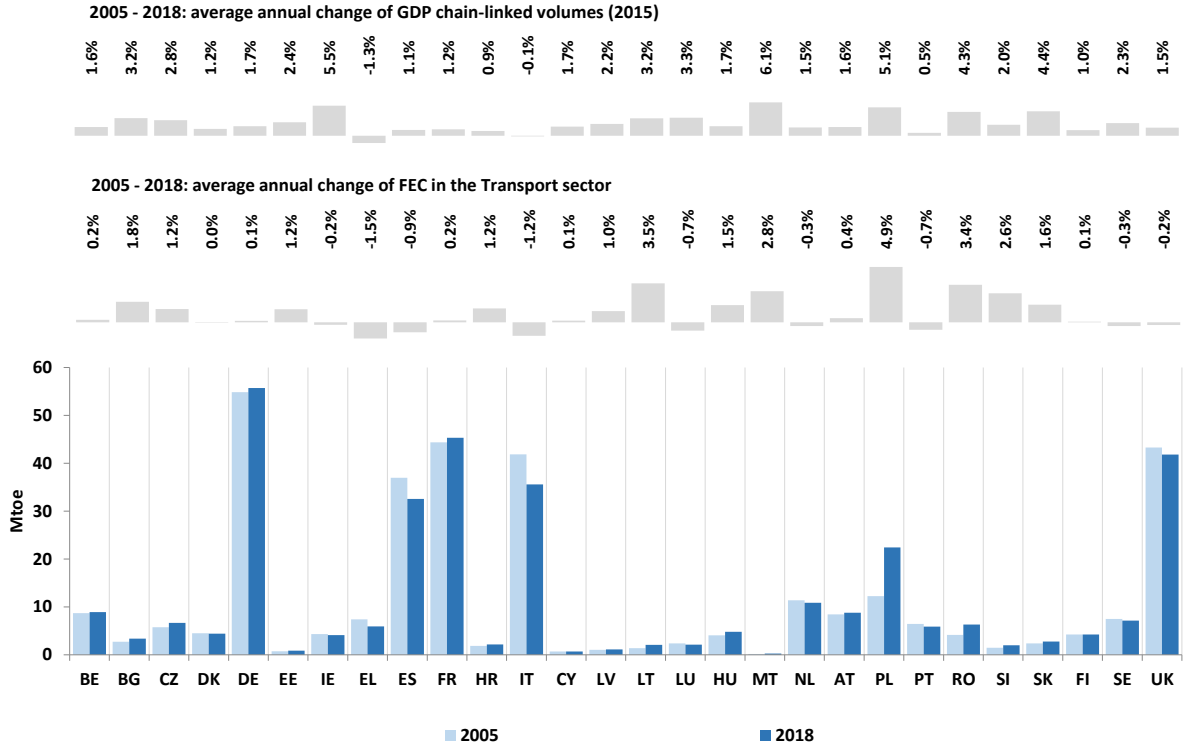
[13] Gross Value Added

3.2.4 Transport

In the last year a slight increase in the FEC of the transport sector has been registered (+0.5%). Transport FEC increased from 325 Mtoe in 2005 to 329 Mtoe in 2018 (on average the annual increase was 0.1% in the period 2005-2018).

Comparison between Member States should be undertaken with caution because final energy consumption is based on the fuels sold rather than on the fuel used on the territory of a country. Therefore, factors other than energy efficiency come into play (e.g. the degree to which a given Member State is a 'transit country' for road transport or a hub for aviation). As shown in Figure 9, 18 Member States increased their consumption in this sector on average in 2005-2018. The rest of the countries managed to slightly decrease their consumption. With a parallel increase in GDP a decrease in energy consumption could be a sign of increased energy efficiency. This is the case of 7 countries (Ireland, Spain, Luxembourg, the Netherlands Portugal, Sweden and the United Kingdom).

Figure 9. Final energy consumption in the transport sector and average annual change in 2005-2018.



Source: Eurostat, JRC, 2020.

4 Evolution in the short-term

Despite the positive trend over the period 2005-2018, in 2018 a general increase of energy consumption compared to the previous year was observed. Table 6 shows the short-term trend of the energy consumption in 2018 with respect to 2017. A colour-code system was used to define these trends: red for an increase of at least 1% with respect to 2017, green for a decrease of at least 1% and light pink for stable trend (a change within the range of ±1%). For comparability reasons, the data used to assess these trends are derived from EUROSTAT. It can be noted that this year only 5 Member States (Germany, Greece, France, Croatia, and Austria) have experienced a reduction in total final energy consumption and all countries except Germany have observed at least one increasing trend in one of the economic sectors reported in Table 6. 12 Member States have experienced increases in total final energy consumption while 11 Member States maintain their final energy consumption stable. The largest increases were observed in Malta (+6%), Ireland (+5%) and Latvia (+4%).

Only 7 Member States recorded instead a reduction in primary energy consumption (Belgium, Germany, Greece, Croatia, Italy, Austria, and Slovakia). The largest increases are in Estonia (+10%), Latvia (+5%) and Luxembourg (+4%).

Table 6. Trends in consumption in key sectors at national level in the period 2017-2018.

MS	Primary Energy	Final Energy				
		Total	Industry	Transport	Households	Services
BE	↘	→	↗	→	→	→
BG	→	→	→	↗	↘	↗
CZ	→	→	→	→	↘	↘
DK	→	→	→	↗	→	→
DE	↘	↘	→	↘	↘	↘
EE	↗	↗	↗	↗	→	↗
IE	↗	↗	↗	↗	↗	↗
EL	↘	↘	→	↗	↘	↘
ES	→	↗	↗	↗	↗	→
FR	→	↘	↗	↘	↘	↘
HR	↘	↘	↗	↘	↘	↗
IT	↘	↗	↘	↗	↘	↗
CY	→	→	↘	→	↘	↗
LV	↗	↗	↗	↗	↗	↘
LT	↗	↗	↗	↗	↗	↗
LU	↗	↗	↗	↗	↘	↗
HU	→	→	↗	↗	↘	↘
MT	↗	↗	↘	↗	↗	↘
NL	→	→	↘	↗	→	→
AT	↘	↘	↗	→	↘	↘
PL	↗	↗	↗	↗	↘	↘
PT	→	↗	↗	↗	↗	↗
RO	→	↗	↗	↗	→	↗
SI	→	→	↗	↗	↘	↘
SK	↘	→	↗	↘	↘	↘
FI	↗	↗	↗	↗	↘	↗
SE	↗	→	→	↘	↘	↗
UK	→	→	→	→	↗	↗
EU	→	→	↗	→	↘	↘

Source: Eurostat, JRC, 2020.

The sector with the most significant final energy consumption growing trend is noted as the industry sector with a 1.1% increase at the EU level. Only Italy, Cyprus, Malta and the Netherlands reported a drop in the final energy consumption of the industry sector. A 13% increase was noted in Latvia, followed by 7% in Estonia and Slovenia.

Energy consumption in the transport sector experienced the second largest growth after the industry sector, with the EU average increase of 0.5% in 2018 compared to 2017. All countries experienced a growth or maintain stable levels of energy consumption except Germany, France, Croatia, Slovakia and Sweden that registered a drop. The most significant growth rates are observed in Malta (+11%), Luxembourg (+7%), followed by Hungary and Lithuania (+6%).

Services and residential sectors have registered decreases in their energy consumption levels (by -1.2% and -1.5% respectively at EU level) with 16 countries reporting a decrease of the final consumption of residential sector while 11 countries reporting a decrease of final consumption of services sector. The highest growths were observed in Ireland (+7%), and Portugal and Latvia (+3%) for households while Cyprus (+17%), Ireland (+7%) and Italy and Romania (6%) for services.

When residential and service energy consumptions are corrected for climate variations, a worsening is observed for all the Member States except Ireland, Romania, Spain and the United Kingdom. This means that the variation over the 2017-2018 periods goes from negative (without climatic correction) to positive or stable or that the decrease rate becomes lower or that the growth rate become higher.

As requested by Annex XIV of EED, Member States must analyse sectors where energy consumption remains stable or is growing year by year, and provide possible explanations for that. This has been done by almost all countries, but often without the support of in-depth analyses. The reasons manly indicated for growing or stable consumptions are summarised in Table 7. Annex 2 shows all the detailed explanations provided by Member States in the Annual Reports 2020.

Table 7. Main reasons provided by Member States (sorted from high to low recurrences) to justify growing or stable final energy consumptions over the period 2017-2018.

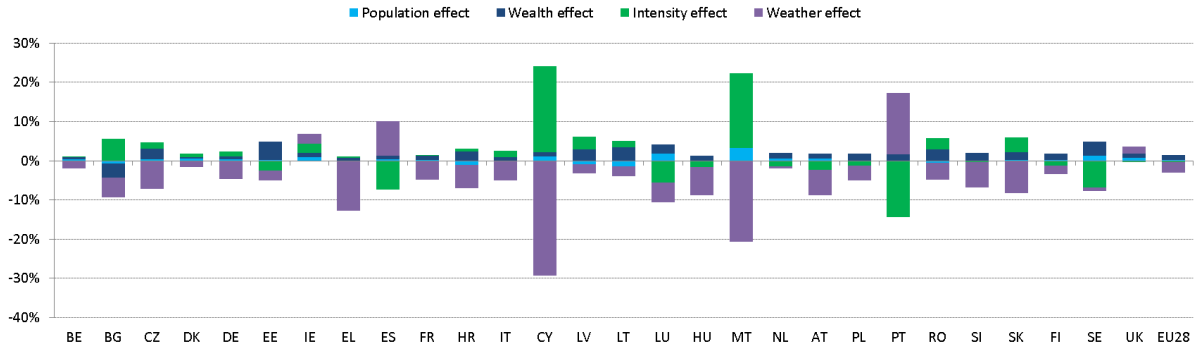
Sector	Reasons
Industry	Economic growth. Increase of value added. Increase of production.
Transport	Increase of transport of passengers. Increase of transport of goods. Economic growth.
Residential	Increase of the population or the number of households. Increase of the disposable income of households. Economic growth.
Services	Increase of value added. Economic growth. Increase of employment.

Source: AR2020, JRC, 2020.

Most of the reported reasons, in all sectors, refer, directly or indirectly, to GDP growth. Some of them are possibly correlated to economic growth (e.g. increase of production and value added for industry; increase of transport of passengers and goods for transport; increase of disposable income in residential sector or employment for the service sector). Within the scope of this Report, and based on the information provided by MSs (Annex 2), it is not possible to analyse them more in details.

Nevertheless, in order to contextualise the explanations provided by Member States, the JRC carried out index decomposition analysis, with the aim to identify and quantify possible driving factors of and their contributions to the latest energy consumption trends in the EU (Economidou, 2017, Economidou and Roman-Collado, 2019, Economidou, 2020).

Figure 10. Contribution of different effects on the variation of the residential FEC, in the countries where increased or stable consumption was observed over the period 2017-2018.



Source: JRC, 2020.

Error! Reference source not found. provides a breakdown of the additive decomposition results in the residential sector in all Member States in the period 2017-2018, expressed as share of 2017 consumption levels. At the EU level, the mild drop of energy consumption in 2018 was mainly caused by warmer winter conditions (-2.8%) and energy efficiency gains (-0.3%) with respect to 2017. The combined impact of these effects offset both the overall positive population (0.2%) and wealth effects (1.2%) at EU level. While trends vary from country to country, the MS results also suggest that warmer weather was an important factor restricting energy consumption growth in most countries. In particular, warmer winter conditions in 2018 with respect to 2017 exerted a limiting force on consumption in all Member States except Ireland, Spain, Portugal and the UK. Energy efficiency improvements drove down consumption in 11 Member States (Estonia, Spain, Luxembourg, Hungary, the Netherlands, Austria, Poland, Portugal, Slovenia, Finland and Sweden). Increase in population effect had a very mild impact driving up consumption in all but 9 countries (Bulgaria, Greece, Croatia, Italy, Latvia, Lithuania, Hungary, Portugal and Romania). The wealth effects linked to growth of floor area and increase in disposable income of households exerted an upward force in all countries except Bulgaria and Malta.

The policy measures that MSs adopted (2019 updates) and reported in their ARs are shown in next section 5. We cannot exclude that additional measures, implementing actions, or corrections will be put in place in some MSs in view of reaching their 2020 targets, however it is not possible to provide more details on the basis of the reported information.

5 Progress towards implementation of EED provisions

5.1 Overview of policy updates in year 2019

In compliance with the general framework for annual reports Annex XIV Part 1, Member States were required to report updates on major legislative and non-legislative measures implemented in the previous year which contribute towards the overall national energy efficiency targets for 2020.

In 2020, all the Member States except Austria, Czechia, Germany[14] and Sweden communicated their updates in the Annual Reports.

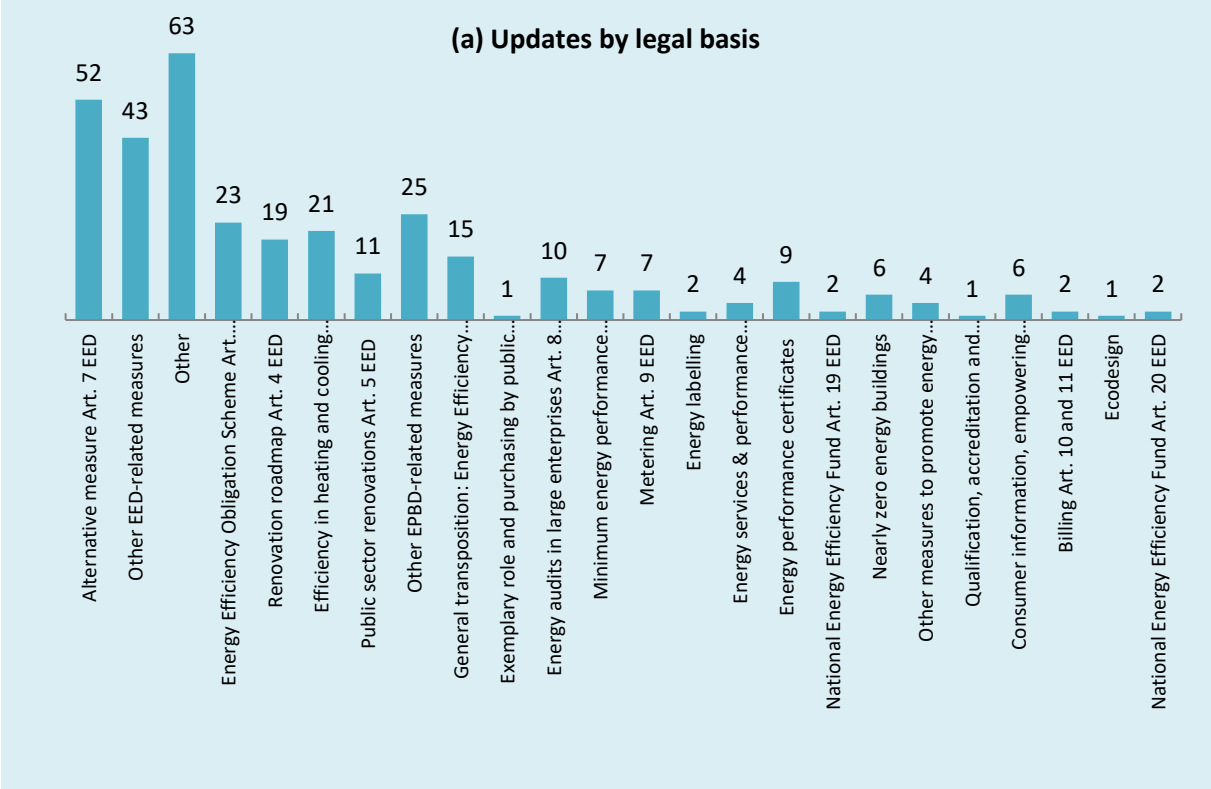
In total 336 updates were reported, i.e. 56 more than 2019 (280 updates in 2019 Annual Reports[15]). As shown in Figure 11, the majority of the AR2020 updates concerned measures claimed under not-specified legal basis, alternative measures under Article 7 and other EED-related measures.

In terms of policy types, the vast majority of policies were "Funds, financial & fiscal" (38.4%) and "Regulations, supporting legal & other legislative measures" (38.1%). These were followed by updates in "Plans & Strategies" (8.9%), "Information, knowledge & advice" (5.1%), "Competition, pilot & demonstration projects" (4.5%), "Market-based instruments (e.g. EEOS)" (3.0), and "Other" and "Voluntary Agreements" (1.5% and 0.6% respectively).

Figure **12** provides more details.

As shown in Figure 13, the major part of the measure updates (around 34.7%) concerned amendments, implementation or design changes and extension of on-going measures. adoption of new measures, conclusion of agreements, publication of legislations, and commencement or enforcement of measures and programmes represented around one quarter of all updates (around 27.3%).

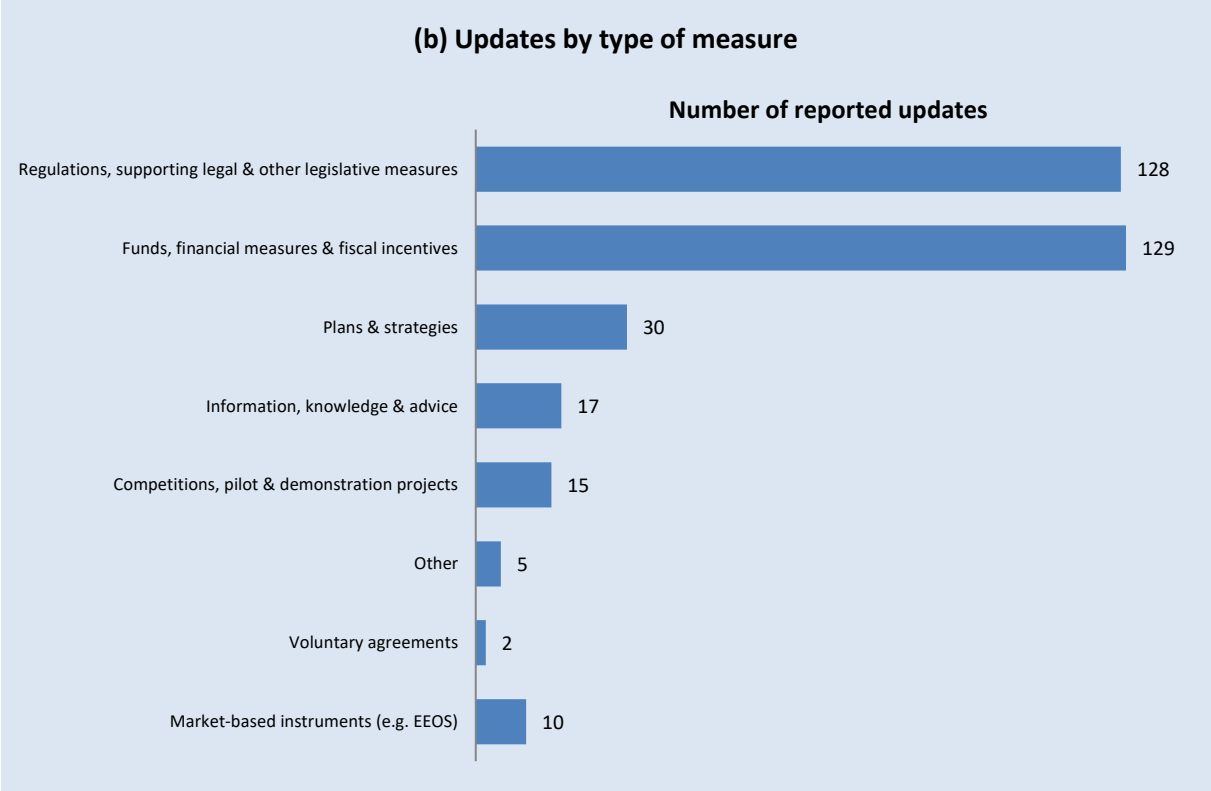
Figure 11. Summary of policy updates reported in Annual Reports 2020 by type of legal basis.



Source: AR2020, JRC, 2020.

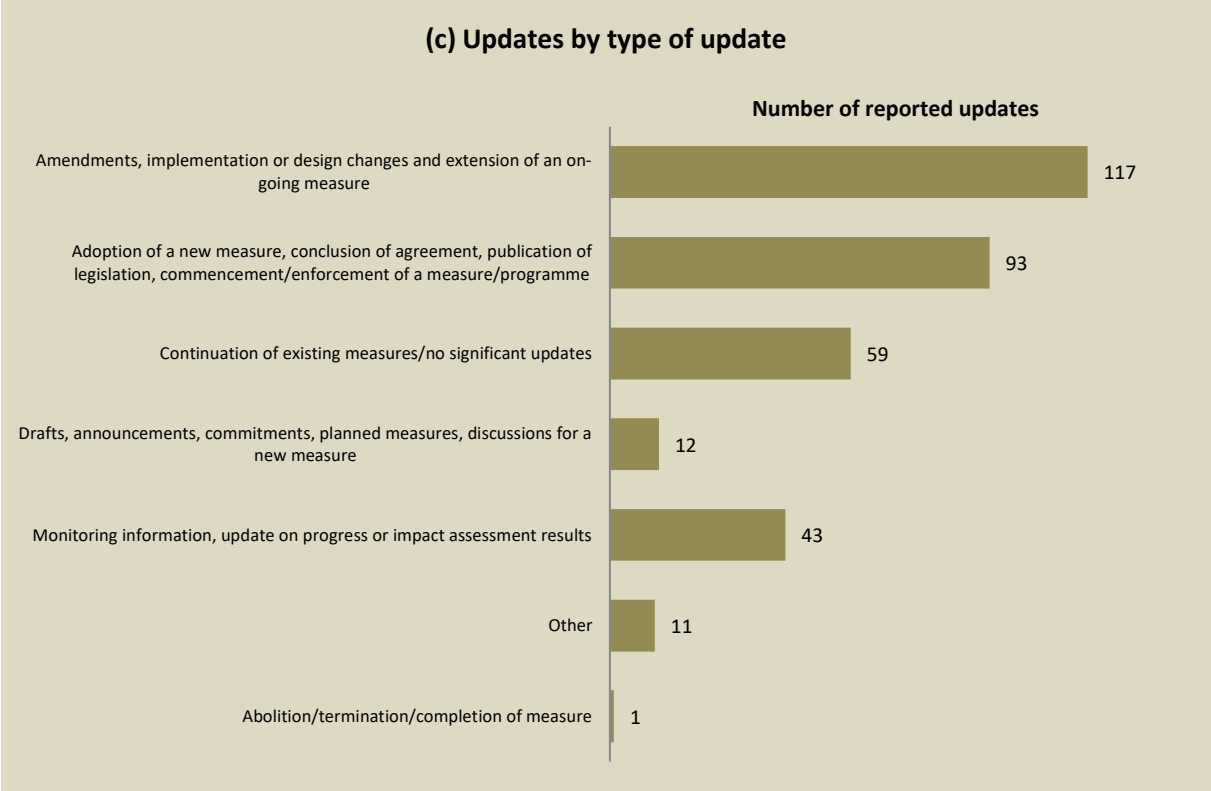
[14] Germany provided an external link to the Germany Energy Efficiency Strategy 2050 in original language.
[15] In 2019 the updates of only 2 Member States were missing.

Figure 12. Summary of policy updates reported in Annual Reports 2020 by type of measure.



Source: AR2020, JRC, 2020.

Figure 13. Summary of policy updates reported in Annual Reports 2020 by type of update.



Source: AR2020, JRC, 2020.

5.2 Progress towards Article 5 in 2019

In accordance with Article 5(1) of Directive 2012/27/EU, Member States were required to ensure that, as from 1 January 2014, 3% of the total floor area of heated and/or cooled buildings owned and occupied by their central government which does not meet minimum energy requirements is renovated each year, to meet at least the minimum energy performance requirements (MEPS) that has been set in application of Article 4 of Directive 2010/31/EU. Alternatively, Member States may opt for an alternative approach (Article 5(6)), and achieve by 2020, energy savings which are equivalent or greater than those which would be achieved through the application of the provisions of Article 5(1) in the same building stock.

A summary of the latest progress made by Member States in connection with Article 5 are presented in Table 8 (default approach) and Table 9 (alternative approach). This is based on the latest data[16] reported by Member States on the central government building stock and the obligations calculated by Member States to comply with the Article 5 provisions in terms of annual floor area to be renovated or annual energy savings to be reached. The actual progress made in 2019 (in terms of renovated floor area or energy savings) is currently under review. Moreover, the fifth column displays the actual obligation achievement for the year 2019 (if available), which is expressed as the:

- ratio of renovated floor area in 2019 to the respective annual renovation obligation for countries opting for the default approach (Article 5(1));
- ratio of achieved annual energy savings in 2019 compared to the annual energy saving obligation for countries opting for the alternative approach (Article 5(6)).

The last column reports (when provided data allow to calculate this values):

- ratio of the total renovated floor area over the period 2014-2019 and the total renovation requirements over the same period for Member States opting for the default approach (Article 5(1));
- ratio of total savings generated in 2014-2019 and the total savings requirement over the same period for Member States opting for the alternative approach (Article 5(6)).

The following colour-code system was used to depict the level of obligation achievement: green circles indicate countries which fully reached or exceeded their obligation in 2019, while the yellow and red circles show countries which fell short of their 2019 obligation by up to 0-50% and 50-99%, respectively. The ratios were calculated based only on information declared by Member States in their Annual Reports 2020. Table cells coloured in yellow refer to data that Member States have provided to the European Commission in documents other than the Annual Reports. Table cells coloured in green include instead values that have been calculated by the JRC based on these additional data.

[16] Where an updated target figure was not made available by Member States, we considered the value provided in previous annual reports.

Table 8. Implementation status of Article 5 of Member States which chosen the default approach (Art. 5(1)), based on the reports of the Member States [17] [18] (data currently under review)

MS	Central government buildings with floor area > 250 m2 in 1/1/2020		Article 5. annual requirement	Article 5 progress in 2019				
	All [m2]	Non-compliant with MEPS [m2]	Floor area renovation obligation [m2]	Renovated floor area [m2]	Annual obligation achieved in 2019 in terms of floor area [%]	Sum of savings in 2014-2019	Total renovated floor area over the period 2014-2019	Total obligation achieved in 2014-2019 in terms of floor area [%]
BG	2,548,365	1,830,110	55,472	121,531	219.1%	n.a.	n.a.	n.a.
EE	1,391,826	886,679	27,604	22,549	81.7%	n.a.	n.a.	n.a.
EL	212725	200725	n.a.	0	0.0%	0.15	n.a.	n.a.
ES	11,232,118	9,331,465	279,902	173,608	62.0%	n.a.	1589361	91.5%
HU	n.a.	400,386	n.a.	8,630	n.a.	n.a.	42070	n.a.
IT	16824851	13467418	414,193	339,001	82%	n.a.	3018432	111.2%
LT	n.a.	2,089,897	64,624	64,336	100%	n.a.	411251	108.0%
LU	126,253	61,050	1,955	4,128	211%	0.17	23013	168.9%
LV	1,862,320	1,862,320	55,953	40,357	72%	287%	n.a.	n.a.
RO	n.a.	n.a.	n.a.	n.a.	n.a.	5.52 (2014-2018)	n.a.	n.a.
SI	890,899	828,058	21,387	17,733	83%	0.34	n.a.	n.a.

Source: AR2016, AR2017, NEEAP2017, AR2018, AR2019, AR2020 JRC, 2020.

[17] 44614 m2 updated 19722 withdrawn, BG: The information received from the owners of the buildings shows differences (including in the number and surface areas of the buildings) with the information submitted in the previous year by the same institutions. The AUER has accepted for the purposes of this report the information received as of March 2020. in 2019, compared to 2018, information was submitted on 9 buildings which were not yet in place on the list, where the data for the two years also arose. ES: From the report: "The total building floor area [m2] of buildings renovated in 2019 as referred to in Article 5(6) is 173.608 m2, therefore the fulfilment is 62% over 279.902 m2, which is the 3% of 9.330.073 m2 (total building floor area [m2] of the buildings which did not meet the energy performance requirements referred to in Article 5(1) on 1 January of 2019). Taking into account the 1.589.361 m2 of building floor area renovated in the period 2014-2019, the fulfilment is 94% over the target of 1.736.977 m2. The difference of 110.763 m2 can be balanced with an excess over the next year."

[18] Unless otherwise stated annual renovation obligation is calculated by multiplying the reported non-compliant with MEPS floor area of last year per 3%.

Table 9. Implementation status of Article 5 of Member States which chosen the alternative approach (Art. 5(6)), based on the reports of the Member States[19] [20] [21] [22] [23] [24] (data currently under review)

MS	Central government buildings with floor area > 250 m2 in 1/1/2020		Article 5. annual requirement	Article 5 progress in 2019				
	All [m2]	Non-compliant with MEPS [m2]	Annual energy savings obligation [ktoe]	Savings achieved [ktoe]	Annual obligation achieved in 2019 in terms of energy savings [%]	Sum of savings in 2014-2019	Total renovated floor area over the period 2014-2019	Annual obligation achieved in 2014-2019 in terms of energy savings [%]
AT	n.a.	n.a.	0.15	0.89	608.9%	4.01	n.a.	457.4%
BE	n.a.	n.a.	0.11	n.a.	0	3.99 (2014-2018)	n.a.	742.9%
CY	585,502	582,282	0.29	0.25	89.3%	1.61	n.a.	94.1%
CZ	2,405,273	1600494 (2019)	0.49	0.29	58.5%	1.67	n.a.	56.4%
DE	n.a.	2,900,000	0.61	0.23	38%	3.52	n.a.	89.2%
DK	1,826,510	1,078,297	n.a	2.4(2018)	n.a	3.3(2014-2018	n.a.	n.a.
FI	884,000.00	n.a.	0.10	0.08	79.3%	1.22	n.a.	233.7%
FR	n.a.	22200000	35.55	99.74 (2018)	281%	588.13 (2014-2018)	5583574 (2014-2018)	331%
HR	n.a.	n.a.	0.12	0.11	95.1%	4.07	n.a.	580.4%
IE	n.a.	335,175.00	0.11	0.01	7.2%	1.09	n.a.	163.2%
MT	167,166.00	49,715.00	n.a.	0.02	n.a.	n.a.	n.a.	n.a.
NL	5973000 (2019)	n.a.	4.18	2.4 (2018)	57%	33.3 (2014-2018)	n.a.	159%
PL	n.a.	1,087,964.10	0.37	0.40	106%	2.63	n.a.	117.1%
PT	7329150 (2019)	82284 (2019)	n.a.	54.80	n.a.	55.02	n.a.	n.a.
SE	3807000 (2014)	n.a.	0.24	5.28	n.a.	n.a.	n.a.	n.a.
SK	n.a.	n.a.	4.49	7.89	176%	34.72	n.a.	129.0%
UK	n.a.	n.a.	3.52	2.86	81%	40.88	n.a.	193.7%

Source: AR2016, AR2017, NEEAP2017, AR2018, AR2019, AR2020 JRC, 2020.

[19] Unless otherwise stated in the annual reports and in other documents possibly provided by Member States, it has been assumed that the annual saving target is identical for all the years

[20] BE: Data for 2020 for floor are are not available because of the switch to a new data platform. Total building floor area was equal to 1728729 m2 on 1st January of 2019 for Federal State, Brussels and Vlaams Gewest, while the inventory of 2018 was equal to 776527 m2 for FWB, DG and Waloonia. Non-compliant with MEPS floor area was equal to 473982 m2 for Vlaams Gewest on 1st January 2019, 94463 m2 for Brussels on 1st January 2020 and 74082 m2 for FWB, DG and Waloonia in 2018.

[21] SE: Not clear if savings reported in AR2019 are new or total

[22] DE: Energy savings and annual target for each year have been provided by the Member State. Required savings are calculated by JRC based on data related to energy savings and annual targets expressed in primary energy as provided by Germany.

[23] FI: Reported current savings in force probably correspond to the total annual savings. Difference of the current savings in force in 2018 minus the current savings in force in 2017 possibly corresponds to the new savings achieved in 2018.

[24] BE, DK, DE, CY, HU, PL: primary energy savings
EL, SK, SI, SE, PT, UK: not clear if savings are primary or final
CZ, LV, FR, HR, LU, MT, NL, AT, FI, IE: final energy savings

Compared to 2019, there was a similar level of compliance with reporting obligations. Five Member States did not provide the requested update on Article 5 progress in 2019: Belgium, Romania, Denmark, France and the Netherlands (the last three notified their achievements for 2018 but not for 2019).

As shown in Table 8, from the Member States with available reports that have chosen the default approach, there are 3 Member States that achieved their annual targets in terms of renovated floor area. These are Bulgaria, Lithuania and Luxemburg. In addition, based on the provided data, other 3 countries have fulfilled their total targets for the period 2014-2019. These are, Italy, Luxemburg and Lithuania.

As displayed in Table 9, from the Member States that have implemented the alternative approach 3 Member States achieved their annual energy saving targets in 2019. These are the Austria, Poland and Slovakia while France has achieved their targets for 2018. At the same time, 7 countries have provided data allowing establishing that they have fulfilled their total targets for the period 2014-2019. These are Austria, Croatia, Finland, Ireland, Slovakia, Poland and UK. France, Belgium and Netherlands have fulfilled their total targets for the period 2014-2018.

In addition, it should be noted that 18 Member States provided data within the AR2020 related to the floor area which is non-compliant with the minimal energy performance standards. These are Bulgaria, Denmark, Germany, Estonia, Ireland, Greece, Poland, Spain, France, Italy, Cyprus, Lithuania, Latvia, Luxembourg, Hungary, Malta, Portugal and Romania. Czechia provided figures for the floor area which is non-compliant with the minimal energy performance standards for 2019. Two Countries notified a slightly larger non-compliant total floor area with respect to the previous year: Slovenia (+16.2%) and Spain (+0.01%).

5.3 Progress towards Article 7 in 2018

With regards to EED Article 7, a number of Member States notified updates on their Energy Efficiency Obligations Schemes (EEOSs) (Article 7(1)) and alternative policy measures (Article 7(9)) in their Annual Reports. It is important to note that the following analysis is based on unverified information reported by Member States. The Commission services are in the process of verifying the information submitted by the Member States and the presented figures may be subject to corrections if it is found that they are not in line with the methodology set by the EED.

Table 10 provides a summary of the latest Article 7 implementation status. It provides an overview on the approach used by each Member State (i.e. obligation scheme and/or alternative measures) and the total amount of cumulative savings required by the end of 2020 per each Member State. The actual progress made is presented in terms of:

A. savings achieved from new actions implemented in 2018;

B. savings achieved in 2018, from new actions implemented in 2018 and from actions implemented in 2014, 2015, 2016 and 2017 that continue delivering savings in 2018;

C. cumulative savings achieved over the period 2014-2018.

Where applicable the progress is also expressed as a ratio of savings achieved from new actions implemented in 2018 (A) and of the cumulative savings achieved over the period 2014-2018 (C) against the expected annual savings on the basis of a linear delivery. In addition the last column provides the share of cumulative savings (C) against the national cumulative savings requirement due by the end of 2020. As represented in Figure 14, the linear delivery (taken as reference) assumes that the new actions implemented every year (from 2014) achieve 1/28 of the total savings requirements to be achieved by the end of 2020.

The same colour-code system as above was used to highlight the level of the achievement in 2018: green indicates countries which fully reached or exceeded their expected savings for 2018, yellow denotes countries which fell short of their 2018 expected savings by up to 50% and red indicate countries which fell short by more than half.

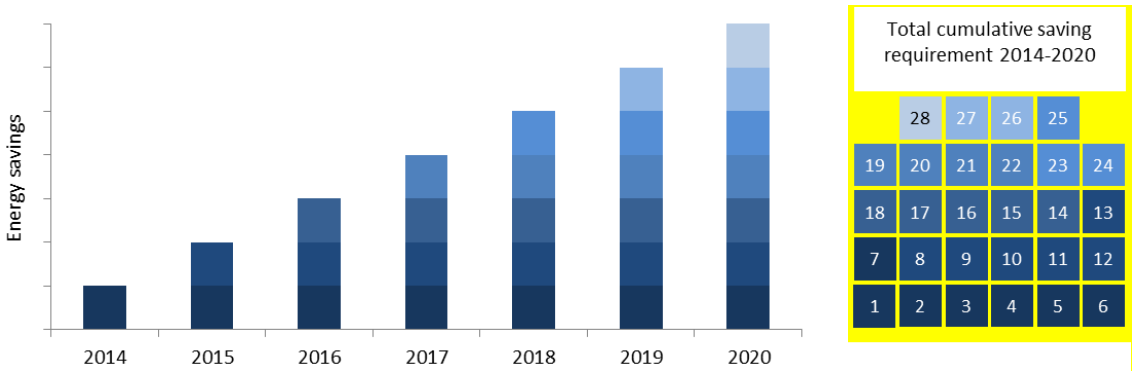
Table 10. Article 7 implementation status based on latest information available (final energy). [25] [26] [27] [28]

MS	Implementation approach		Total cumulative savings requirement in 2014-2020 under Article 7 [ktoe]	Progress made in 2018					
	Obligation schemes	Alternative measures		Savings achieved from new actions implemented in 2018 [ktoe]	Savings achieved from new actions implemented in 2018 against expected annual average savings on the basis of linear delivery [%]	Savings achieved [ktoe] in 2018 (amount of savings from new actions implemented from 2014 to 2018 that delivered savings in 2018)	Cumulative savings achieved over the period 2014-2018 [ktoe]	Cumulative savings achieved over the period 2014-2018 against expected average savings on the basis of linear delivery [%]	Share of savings achieved until 2018 against total cumulative savings requirement in 2014-2020 [%]
EU28			230486	11233	136%	39366	127670	103%	55%
BE		✓	6911	234	95%	1176	3878	105%	56%
BG	✓	✓	1942	32	46%	175	496	48%	26%
CZ		✓	4882	176	101%	613	1728	66%	35%
DK	✓		3841	173	126%	1045	3188	155%	83%
DE		✓	41989	2950	197%	6277	21553	144%	51%
EE		✓	610	88	404%	91	341	104%	56%
IE	✓	✓	2164	87	112%	466	1408	121%	65%
EL	✓	✓	3333	211	178%	478	1355	76%	41%
ES	✓	✓	15979	539	95%	2349	7113	83%	45%
FR	✓		31384	1413	126%	5698	17429	104%	56%
HR	✓	✓	1296	24	52%	189	642	92%	50%
IT	✓	✓	25502	706	78%	3998	12729	93%	50%
CY		✓	242	77	892%	83	162	125%	67%
LV	✓	✓	851	120	394%	168	472	104%	56%
LT		✓	1004	79	220%	171	540	150%	54%
LU	✓		515	9	50%	44	113	41%	22%
HU		✓	3680	131	100%	622	1731	88%	47%
MT	✓	✓	67	5	220%	15	47	132%	71%
NL		✓	11512	611	149%	2274	7777	126%	68%
AT	✓	✓	5200	372	200%	1334	4130	148%	79%
PL	✓		14818	331	62%	2977	8891	112%	60%
PT		✓	2532	37	40%	193	528	39%	21%
RO		✓	5817	n.a.	n.a.	332	1261	40%	22%
SI	✓	✓	945	38	112%	161	447	88%	47%
SK		✓	2284	107	233%	477	1447	134%	63%
FI		✓	4213	543	361%	1469	5258	233%	125%
SE		✓	9114	1436	441%	1436	n.a.	n.a.	n.a.
UK	✓	✓	27859	705	71%	5056	18469	124%	66%

Source: AR2016, AR2017, AR2018, AR2019, AR2020 JRC, 2020.

[25] It is important to note that the table is subject to correction following the verification by the Commission services.
[26] UK: Total savings for 2014, 2015, 2016, 2017 and 2018 include savings generated by early actions. RO: Not clear if savings included in the ARs are total or from new actions.
[27] LU, SK: Calculations are based in the assumption that savings don't decay.
[28] EE, ES, AT, LV: The energy savings reported in ARs of taxation measures have been adjusted to have a lifetime of 1 year.

Figure 14. Example of linear delivery of the total cumulative savings requirement under Article 7.



Source: Own elaboration

At EU level 15 of the Member states have achieved their cumulated target over the period 2014-2018 (C)[29]. Good partial results achieved by Finland, Denmark and Lithuania are to be emphasised. On the other side, 5 Member States (Croatia, Luxembourg, Bulgaria, Portugal and Romania) seem to be far away from their savings requirements.

A variety of policy measures were used by Member States to generate the energy savings claimed under Article 7 in 2018 The breakdown of the savings achieved from new actions in 2014, 2015, 2016, 2017 and 2018 per type of policy measure is shown in

[29] Considering as reference an average annual saving rate equal to the total cumulative saving requirement divided by 28.

Figure 15. Here the measures have been grouped into the following 6 categories:

- energy efficiency obligation schemes (EEOS);
- regulations;
- taxation;
- funds, fiscal and financial incentives;
- information, training and education;
- other measures.

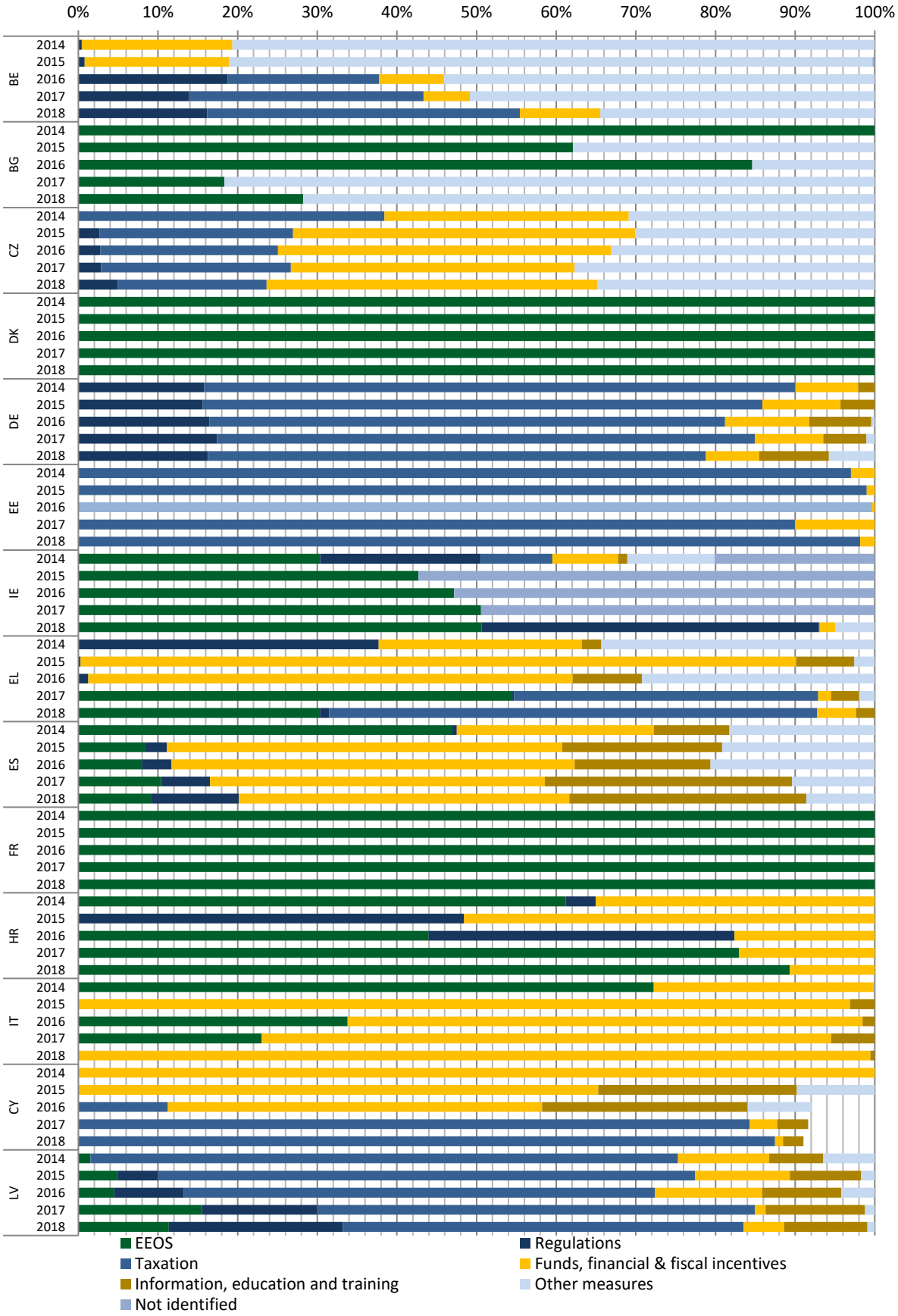
The figure about the savings achieved from new actions implemented in 2018 (A) is not available for 1 Member States (Romania) [30] and it is not possible to identify the policies' contributions to Slovakia targets in the related AR2020. Of the remaining 24ones[31] with available annual reports, 14 Member States either partially or fully generated their 2018 savings through the implementation of EEOS (EED Article 7(1)): Bulgaria, Denmark, Croatia, Ireland, Greece, Spain, France, Luxemburg, Latvia, Malta, Austria, Poland, Slovenia and UK. In absolute terms, the savings generated by the EEOSs represent the 21.5% of the Article 7 savings at the EU level.

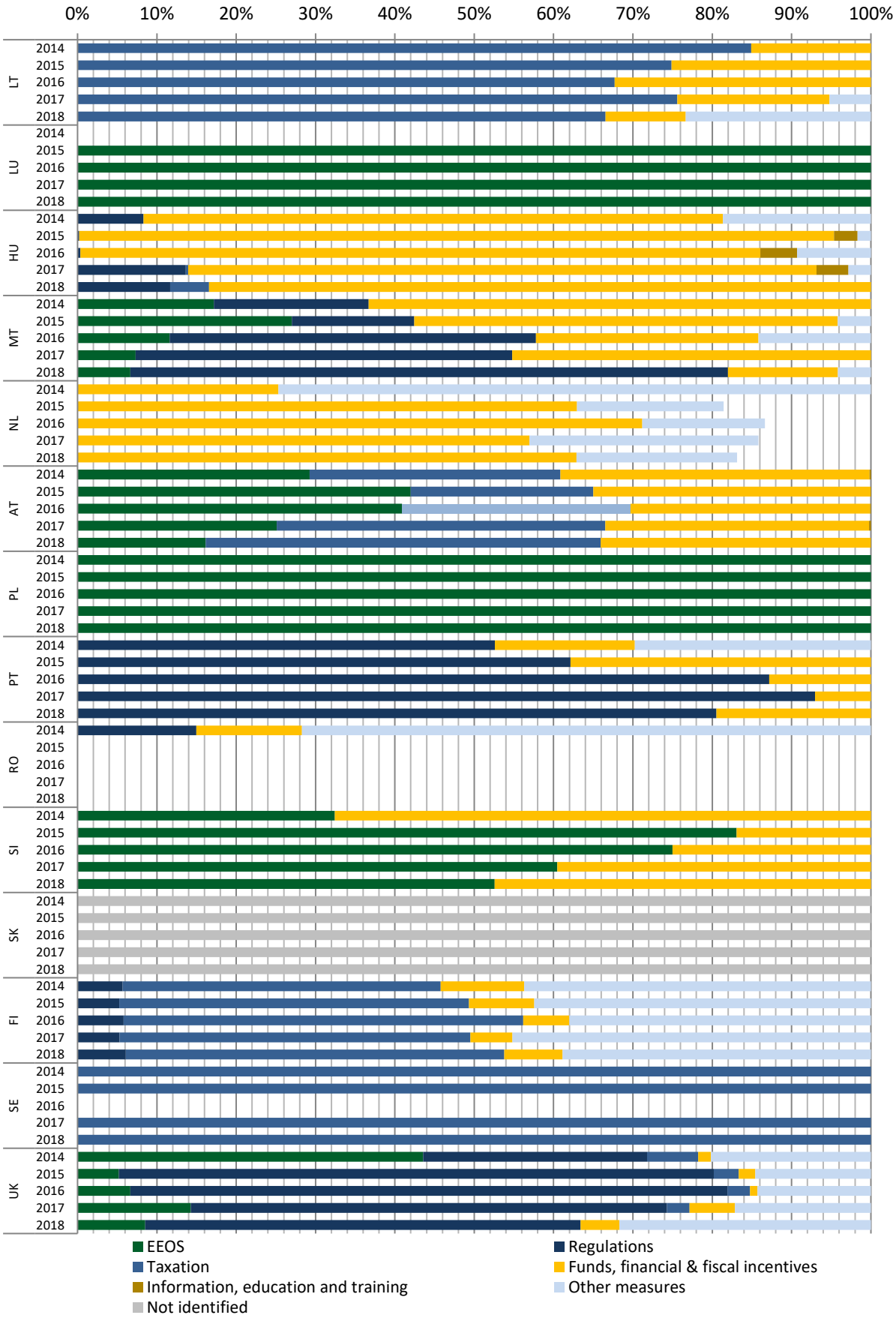
Looking at the current (not exhaustive) picture, savings through alternative measures (EED Article 7(9)) play a relevant role for generating the new energy savings under Article 7 in 2018. The measures falling under the category "Taxation" covered a substantial share (39.7%) of the total achieved savings in 2018 while "Funds, fiscal and financial incentives" measures provided the 15.1% of the savings. New regulatory measures were adopted by 12 Member States (Belgium, Czechia, Germany, Ireland, Greece, Spain, Malta, Hungary, Latvia, Portugal, Finland and UK) generating 10.6% of the total savings reported for 2018. "Information, education and training" measures used by Germany, Greece, Spain, Latvia, Italy and Austria generated 4.2% of the total saving achieved by new actions that were implemented in 2018. Instead, 8.0% was achieved through other measures, as voluntary agreements, public transport development programmes, etc. The remaining 1.0% could not be associated with any specific measure type.

[30] Not clear if reported savings are new or total.

[31] Netherlands and Cyprus were excluded from the calculations detailed in this paragraph as the distribution of the totally generated energy savings over the different measures considered under Article 7 is provided in the related 2019AR without excluding energy savings double counting among different measures.

Figure 15. Share of energy savings achieved in 2014, 2015, 2016, 2017 and 2018from new actions that were implemented in these years, by type of policy measure





Source: AR2016, AR2017, AR2018, AR2019, AR2020 DG ENERGY, JRC, 2020.

5.4 New measures under Articles 7 and 5

In an attempt to step up efforts towards the achievement of the 2020 targets, some EU Member States have included new policies and measures under Articles 5 and 7 in their AR2020. "New" measures in this context refer to measures which have not been reported in the previous year's Annual Report (i.e. AR2019). These new measures may include newly-implemented measures, but can also be on-going measures which have not contributed to the Article 5 or 7 targets before. In the Annual Reports of 2020, these correspond to new Article 7 measures implemented in 2018 and new Article 5 measures implemented in 2019.

As shown in Table 11, more Member States implemented new measures under Article 7 compared to Article 5: only 3 Member States (Czechia, Denmark, the Netherlands) listed new Measures under Article 5, while 11 Member States listed new measures under Article 7. The latter include Belgium, Bulgaria, Croatia, Czechia, Estonia, Greece, Spain, Lithuania, Latvia, the Netherlands, and Romania.

There are in total 41 new measures under Article 7 in 2020 Annual Reports. Of these, 10 (or 24.4%) were implemented by Romania and other 10 by Spain[32], 4 (9.8%) by Belgium and other 4 by Croatia, followed by Czechia (3 measures or 7.3%). There are in total 8 new measures under Article 5 in 2020 Annual Reports. Of these, 6 were implemented by Romania while the remaining 2 measures were implemented by Czechia and the Netherlands.

The savings generated by these measures varied from country to country[33]. In case of Croatia, 61.8% of total 2018 savings have been generated by new policies and measures listed in Annual Reports of 2020. The measure that has generated the largest share of these savings is Energy Efficiency Obligation Scheme[34] In case of Lithuania, 10.2% of total 2018 savings and 2.9% of the total cumulative savings expected by 2020 have been generated by new policies and measures listed in Annual Reports of 2020. The measure that has generated the largest share of these savings is the "Agreements for the education and consultation of energy consumers". In case of Romania, 5.6% of the total savings[35] generated in 2018 are associated with new measures. Among the new Romanian measures, "Thermal Rehabilitation of public buildings" generated the largest share of these savings. In case of Spain, 3.9% of the total savings generated in 2018 and 3.3% of the total cumulative savings expected by 2020 are generated by new measures. Among the new Spanish measures, "Plan Director de Ahorro y Energía ADIF" generated the largest share of these savings. For Latvia, the 3.6% of the total savings in 2918 has been generated by the new listed measure 'Operational Programme Growth and Employment'. For the remaining countries with available savings (Belgium, Czechia, Estonia, Greece), the share of savings of new measures against the total savings of 2018 are less significant (under 1%).

In summary, almost the half of the new measures under Article 7, fell under the category "Funds, financial & fiscal incentives" (48.8%), followed by "Other measures" (transport sector measures, voluntary agreements etc.) (26.8%), "Regulations" (14.6%), "Information, education and training" (4.9%), EEOS "Taxation" (2.4% both of them).

For Article 5, the new measures reported by Denmark generated savings equal to 0.09 ktoe in 2019 while for Czechia, a total of construction measures including the new measure "Insulation of roof coatings" resulted in savings equal to 0.29 ktoe in 2019[36].

More information regarding the new policies and measures under Articles 5 and 7 can be found in Annex 3.

[32] Some measures are not mentioned in previous ARs but it seems that they have delivered savings also in past years.
[33] Some countries did not provide the savings for new measures.
[34] According to HR Annual Report 2020, the energy efficiency obligation scheme has been operational since 2019.
[35] Expected savings by 2020 not provided
[36] No savings provided for new measure of the Netherlands

Table 11. Overview of *new* measures in 2019 and 2018 under Articles 5 and 7, respectively ("new" measures are defined as measures which have not been reported in the previous year) [37]

	Article 5		Article 7		Information on new measures under Article 7
	No new measures in 2019	New measures in 2019	No new measures in 2018	New measures in 2018	
BE	X			X	BATEX: 0.04% of total savings in 2018. Flanders has also notified the additional measures that will generate savings until 2020: Financial support for scrapping and reconstruction, Immovable property reduction for energy efficient new houses and apartment, REG-public service obligations electricity distribution system operators - additional actions
BG	X			X	Energy efficiency in large enterprises, Renewable energy, energy efficiency, energy security
CZ		X		X	Clean Energy Prague programme: 0.2% of total savings in 2018, National Environment Programme and Declaration on strategic cooperation by ČEZ are also new measures
DK		X	X		
DE	X		X		
EE	X			X	Renovation of kindergarten: 0.1% of total savings in 2018, Supporting biomethan production and use in transport is also a new measure
IE	X		X		
EL	X			X	Energy efficient street lighting: 0.1% of total savings in 2018
ES	X			X	MOVALT, information campaigns, e-learning course, PAREER II, state programmes, ADIF, energy efficiency regulations, ICO IDEA line, Sustainable urban development: 3.9% of total savings in 2018
FR	X		X		
HR	X			X	EEOS, loans for public lighting, energy efficient street lighting programme: 61.8% of total savings in 2018
IT	X		X		
CY	X		X		
LV	X			X	National Operational Programme 'Growth and Employment': 3.6% of total savings in 2018
LT	X			X	Energy efficiency improvement measures, agreements for the education and consultation of energy consumers: 10.2% of total savings in 2018
LU	X		X		
HU	X		X		
MT	X		X		
NL		X		X	Climate agreements, accelerated climate investments for industry: these measures will produce additional savings until 2020
AT	X		X		
PL	X		X		
PT	X		X		
RO	X			X	Smart metering, Acquisition of better performing equipment, Energy audit and energy management related to the Construction domain, Thermal Rehabilitation of Public Buildings, Rehabilitation of public lighting, Thermal rehabilitation of buildings (offices, business premises), Modernisation of shipping transport: 5.6%of total savings in 2018. Procurement of electrical equipment with higher performance, Renewal of car fleet, Modernising urban public transport are also new measures
SI	X		X		
SK	X		X		
FI	X		X		
SE	X		X		
UK	X		X		

Source: AR2020, JRC, 2020.

[37] For some Member States there are new measures not included in previous Annual Reports; however it seems that they have delivered savings also in the past years.

6 Conclusions

In light of the latest 2018 energy consumption data, the EU energy consumption trends can now be viewed alongside the overall targets. In 2018, both primary and final energy consumption levels exceeded the theoretical linear target path 2005-2020. As explained by the Member States in their latest Annual Reports, several contextual factors justify this 2018 increasing trend: the economic growth and the increase of value added, the increase of the population and number of households, the increase of passengers and goods transport, the increase of the disposable income of households, are some of the reported reasons for observed energy consumption increases. Increase of adjusted disposable income and increase of population and households primarily affected the residential sector, while economic growth and increase of value added had an impact on industry and services. The increase in transport of passengers and goods influenced instead the transport sector consumption negatively.

While the aforementioned factors are generally expected to drive up energy demand, continued commitment can ensure that the EU could reach the 2020 targets. The impact of COVID-19 pandemic is out of the scope of this analysis, but its role on energy consumption trends, not captured with the data and the information used in this report, will be assessed in future research.

In this context, the EED energy savings obligation related to Article 5 ("Exemplary role of public bodies' buildings") and Article 7 ("Energy efficiency obligation schemes") of the Energy Efficiency Directive are crucial. The first one has an important symbolic value, since it demonstrates public commitment on government properties and therefore lead-by-example approach. The second one is associated with a significant energy saving potential and represents one of the most important articles of the Directive in terms of measurable/verifiable energy savings.

The assessment of the Annual Reports submitted by Member States in 2020 has confirmed good progress with regards to the implementation of Article 7 and of Article 5. However, a lack of information provided in the Annual Reports is observed which does not enable to have a complete picture at EU level. Beyond the various information gaps, our analysis suggests that achieving the Article 5 requirements may be challenging and accelerated efforts are crucial in ensuring that sufficient progress is made in the coming years. At this point, it's important to highlight that some Member States have included new measures in their 2020 Annual Reports (not included in 2018 Annual Reports) in an attempt to accelerate the efforts to achieve the 2020 targets.

On the update process, it is important to emphasize the importance of using a common reporting format. The template introduced in 2015 and fine-tuned in 2016/2017 allowed Member States to harmonise the collection of main information and well-defined indicators, avoiding serious misinterpretations and subsequent need of requests for clarification. This aspect should be taken into account in the future reporting framework related to the requirements of the new Energy Union Governance.

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List of abbreviations and definitions

AR	Annual Report
CHPP	Combined Heat and Power Plants
EE	Energy Efficiency
EED	Energy Efficiency Directive
EPBD	Energy Performance of Buildings Directive
FEC	Final Energy Consumption
GDP	Gross Domestic Product
GVA	Gross Value Added
HDD	Heating Degree Days
MS	Member State
NEEAP	National Energy Efficiency Action Plan
PEC	Primary Energy Consumption
thPG	Thermal Power Generation
TSSEED	Technical and Scientific Support to the implementation of the EED and the EPBD, as well as contribution to the development of concepts for the strengthening of the overall EU legislative framework for energy saving

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Annex 1: EUROSTAT indicators

The table below lists the EUROSTAT indicators (and related information) associated to the indicators required by Annex XIV of the EED.

Annual Report Indicator	EUROSTAT Indicator(s)	EUROSTAT database table	EUROSTAT Code	Field/ product(s)	Unit(s)	Period (EU28)
(i) primary energy consumption	Primary energy consumption (Europe 2020-2030)	Simplified energy balances - annual data [nrg_bal_s]	PEC2020-2030	All products	ktoe	2005-2018
(ii) total final energy consumption	Final energy consumption (Europe 2020-2030)	Simplified energy balances - annual data [nrg_bal_s]	FEC2020-2030	All products	ktoe	2005-2018
(iii) final energy consumption - industry	Final consumption - industry sector - energy use	Simplified energy balances - annual data [nrg_bal_s]	FC_IND_E	All products	ktoe	2005-2018
(iii) final energy consumption - transport	Final consumption – transport sector - energy use	Simplified energy balances - annual data [nrg_bal_s]	FC_TRA_E	All products	ktoe	2005-2018
final energy consumption in pipeline transport	Final consumption – transport sector - pipeline transport - energy use	Simplified energy balances - annual data [nrg_bal_s]	FC_TRA_PIPE_E	All products	ktoe	2005-2018
(iii) final energy consumption - households	Final consumption - other sectors - households - energy use	Simplified energy balances - annual data [nrg_bal_s]	FC_OTH_HH_E	All products	ktoe	2005-2018
(iii) final energy consumption - services	Final consumption - other sectors - commercial and public services - energy use	Simplified energy balances - annual data [nrg_bal_s]	FC_OTH_CP_E	All products	ktoe	2005-2018
final energy consumption - agriculture	Final consumption - other sectors - agriculture and forestry - energy use	Simplified energy balances - annual data [nrg_bal_s]	FC_OTH_AF_E	All products	ktoe	2005-2018
final energy consumption – other sectors	Final consumption – other sectors - not elsewhere specified - energy use	Simplified energy balances - annual data [nrg_bal_s]	FC_OTH_NSP_E	All products	ktoe	2005-2018
(iv) gross value added - industry	- Industry (except construction) - Construction	Gross value added and income by A*10 industry breakdowns [nama_10_a10]	- B-E - F	Value added, gross	Million euro, chain-linked volumes, reference year 2015 (at 2015 exchange rates)	2005-2019
(iv) gross value added - services	- Wholesale and retail trade, transport, accommodation and food service activities - Information and communication - Financial and insurance activities - Real estate activities - Professional, scientific and technical activities; administrative and support service activities - Public administration, defence, education, human health and social work activities - Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies	Gross value added and income by A*10 industry breakdowns [nama_10_a10]	- G-I - J - K - L - M_N - O-Q - R-U	Value added, gross	Million euro, chain-linked volumes, reference year 2015 (at 2015 exchange rates)	2005-2019
(v) disposable income for households	Gross disposable income	Non-financial transactions [nasa_nf_tr]	- S14 (if available) or S14_S15	Households (if available) or Households; non-profit institutions serving households	Million euro (current prices)	2005 - 2018
(vi) gross domestic product (GDP)	Gross domestic product at market prices	GDP and main components - volumes [nama_10_gdp]	B1GQ - Gross domestic product at market prices	-	Million euro, chain-linked volumes, reference year 2015(at 2015 exchange rates)	2005 - 2018

Annual Report Indicator	EUROSTAT Indicator(s)	EUROSTAT database table	EUROSTAT Code	Field/ product(s)	Unit(s)	Period (EU28)
(vii) electricity generation from thPG	- Gross electricity generation Main activity electricity only - Nuclear - Gross electricity generation Main activity CHP plants - Nuclear - Gross electricity generation Autoproducer electricity only - Nuclear - Gross electricity generation Autoproducer CHP plants - Nuclear - Gross electricity generation Main activity electricity only - Geothermal - Gross electricity generation Main activity electricity only - Combustible Fuels - Gross electricity generation Main activity electricity only - Other Sources - Gross electricity generation Main activity CHP plants - Geothermal - Gross electricity generation Main activity CHP plants - Combustible Fuels - Gross electricity generation Main activity CHP plants - Other Sources - Gross electricity generation Main activity electricity only - Solar Thermal - Gross electricity generation Autoproducer electricity only - Geothermal - Gross electricity generation Autoproducer electricity only - Combustible Fuels - Gross electricity generation Autoproducer electricity only - Heat from Chemical Sources - Gross electricity generation Autoproducer electricity only - Other Sources - Gross electricity generation Autoproducer CHP plants - Geothermal - Gross electricity generation Autoproducer CHP plants - Combustible Fuels - Gross electricity generation Autoproducer CHP plants - Heat from Chemical Sources - Gross electricity generation Autoproducer CHP plants - Other Sources - Gross electricity generation Autoproducer electricity only - Solar Thermal	Gross and net production of electricity and derived heat by type of plant and operator [nrg_ind_peh]	-GEP	- PRR_MAIN - ELC - N9000 - PRR_MAIN - CHP - N9000 - PRR_AUTO - ELC - N9000 - PRR_AUTO - CHP - N9000 - PRR_MAIN - ELC - RA200 - PRR_MAIN - ELC - CF - PRR_MAIN - ELC - X9900 - PRR_MAIN - CHP - RA200 - PRR_MAIN - CHP - CF - PRR_MAIN - CHP - X9900 - PRR_MAIN - ELC - RA400 - PRR_AUTO - ELC - RA200 - PRR_AUTO - ELC - CF - PRR_AUTO - ELC - X9900H - PRR_AUTO - ELC - X9900 - PRR_AUTO - CHP - RA200 - PRR_AUTO - CHP - CF - PRR_AUTO - CHP - X9900H - PRR_AUTO - CHP - X9900 - PRR_AUTO - ELC - RA400	GWH	2005 - 2018
(viii) electricity generation from CHPP	- Gross electricity generation Main activity CHP plants - Nuclear - Gross electricity generation Autoproducer CHP plants - Nuclear - Gross electricity generation Main activity CHP plants - Geothermal - Gross electricity generation Main activity CHP plants - Combustible Fuels - Gross electricity generation Main activity CHP plants - Other Sources - Gross electricity generation Autoproducer CHP plants - Geothermal - Gross electricity generation Autoproducer CHP plants - Combustible Fuels - Gross electricity generation Autoproducer CHP plants - Heat from Chemical Sources - Gross electricity generation Autoproducer CHP plants - Other Sources	Gross and net production of electricity and derived heat by type of plant and operator [nrg_ind_peh]	-GEP	- PRR_MAIN - CHP - N9000 - PRR_AUTO - CHP - N9000 - PRR_MAIN - CHP - RA200 - PRR_MAIN - CHP - CF - PRR_MAIN - CHP - X9900 - PRR_AUTO - CHP - RA200 - PRR_AUTO - CHP - CF - PRR_AUTO - CHP - X9900H - PRR_AUTO - CHP - X9900	GWH	2005 - 2018

Annual Report Indicator	EUROSTAT Indicator(s)	EUROSTAT database table	EUROSTAT Code	Field/ product(s)	Unit(s)	Period (EU28)
(ix) heat generation from thPG[38]	- Gross heat production Main activity CHP plants - Nuclear - Gross heat production Main activity heat only plants - Nuclear - Gross heat production Autoproducer CHP plants - Nuclear - Gross heat production Autoproducer heat only plants - Nuclear - Gross heat production Main activity CHP plants - Geothermal - Gross heat production Main activity CHP plants - Combustible Fuels - Gross heat production Main activity CHP plants - Heat Pumps* - Gross heat production Main activity CHP plants - Electric Boilers* - Gross heat production Main activity CHP plants - Other Sources - Gross heat production Main activity CHP plants - Solar - Gross heat production Autoproducer CHP plants - Geothermal - Gross heat production Autoproducer CHP plants - Combustible Fuels - Gross heat production Autoproducer CHP plants - Heat Pumps* - Gross heat production Autoproducer CHP plants - Electric Boilers* - Gross heat production Autoproducer CHP plants - Heat from Chemical Sources - Gross heat production Autoproducer CHP plants - Other Sources - Gross heat production Autoproducer CHP plants - Solar - Gross heat production Main activity heat only plants - Geothermal - Gross heat production Main activity heat only plants - Solar - Gross heat production Main activity heat only plants - Combustible Fuels - Gross heat production Main activity heat only plants - Heat Pumps* - Gross heat production Main activity heat only plants - Electric Boilers* - Gross heat production Main activity heat only plants - Other Sources - Gross heat production Autoproducer heat only plants - Geothermal - Gross heat production Autoproducer heat only plants - Solar - Gross heat production Autoproducer heat only plants - Combustible Fuels - Gross heat production Autoproducer heat only plants - Heat Pumps* - Gross heat production Autoproducer heat only plants - Electric Boilers* - Gross heat production Autoproducer heat only plants - Heat from Chemical Sources - Gross heat production Autoproducer heat only plants - Other Sources - Gross heat production Autoproducer heat only plants - Heat from Chemical Sources - Gross heat production Autoproducer heat only plants - Other Sources	Gross and net production of electricity and derived heat by type of plant and operator [nrg_ind_peh]	- GHP	' - PRR_MAIN - CHP - N9000 - PRR_MAIN - HEAT - N9000 - PRR_AUTO - CHP - N9000 - PRR_AUTO - HEAT - N9000 - PRR_MAIN - CHP - RA200 - PRR_MAIN - CHP - CF - PRR_MAIN - CHP - X9900 - PRR_MAIN - CHP - RA400 - PRR_AUTO - CHP - RA200 - PRR_AUTO - CHP - CF - PRR_AUTO - CHP - X990H - PRR_AUTO - CHP - X990 - PRR_AUTO - CHP - RA400 - PRR_MAIN - HEAT - RA200 - PRR_MAIN - HEAT - RA400 - PRR_MAIN - HEAT - CF - PRR_MAIN - HEAT - X990 - PRR_AUTO - HEAT - RA200 - PRR_AUTO - HEAT - RA400 - PRR_AUTO - HEAT - CF - PRR_AUTO - HEAT - X990H - PRR_AUTO - HEAT - X990	TJ	2005 - 2018
(x) heat generation from CHPP[39]	- Gross heat production Main activity CHP plants - Nuclear - Gross heat production Autoproducer CHP plants - Nuclear - Gross heat production Main activity CHP plants - Geothermal - Gross heat production Main activity CHP plants - Combustible Fuels - Gross heat production Main activity CHP plants - Heat Pumps - Gross heat production Main activity CHP plants - Electric Boilers - Gross heat production Main activity CHP plants - Other Sources - Gross heat production Main activity CHP plants - Solar - Gross heat production Autoproducer CHP plants - Geothermal - Gross heat production Autoproducer CHP plants - Combustible Fuels - Gross heat production Autoproducer CHP plants - Heat Pumps - Gross heat production Autoproducer CHP plants - Electric Boilers - Gross heat production Autoproducer CHP plants - Heat from Chemical Sources - Gross heat production Autoproducer CHP plants - Other Sources - Gross heat production Autoproducer CHP plants - Solar	Gross and net production of electricity and derived heat by type of plant and operator [nrg_ind_peh]	- GHP	'- PRR_MAIN - CHP - N9000 - PRR_AUTO - CHP - N9000 - PRR_MAIN - CHP - RA200 - PRR_MAIN - CHP - CF - PRR_MAIN - CHP - X9900 - PRR_MAIN - CHP - RA400 - PRR_AUTO - CHP - RA200 - PRR_AUTO - CHP - CF - PRR_AUTO - CHP - X990H - PRR_AUTO - CHP - X990 - PRR_AUTO - CHP - RA400	TJ	2005 - 2018
(xi) fuel input for thPG	- Transformation input - electricity and heat generation - main activity producer electricity only - energy use - Transformation input - electricity and heat generation - main activity producer combined heat and power - energy use - Transformation input - electricity and heat generation - main activity producer heat only - energy use - Transformation input - electricity and heat generation - autoproducer electricity only - energy use - Transformation input - electricity and heat generation - autoproducer combined heat and power - energy use - Transformation input - electricity and heat generation - autoproducer heat only - energy use	Complete energy balances [nrg_bal_c]	- TI_EHG_MAPE_E - TI_EHG_MAPCHP_E - TI_EHG_MAPH_E - TI_EHG_APE_E - TI_EHG_APCHP_E - TI_EHG_APH_E	- All products except Renewables an biofuels (RA000) - All products - All products except Renewables an biofuels (RA000) - All products except Renewables an biofuels (RA000) - All products - All products except Renewables an biofuels (RA000)	ktoe	2005 - 2018
(xii) passenger kilometres (pkm)	Railway TRA_COV: Total transport	Railway transport - Total annual passenger transport (1 000 pass., million pkm) [rail_pa_total]	- TOTAL	-	Millions of passenger-kilometres	2005 - 2018

[38] Not available data for gross heat production from electric boilers and heat pumps
[39] Not available data for gross heat production from electric boilers and heat pumps

Annual Report Indicator	EUROSTAT Indicator(s)	EUROSTAT database table	EUROSTAT Code	Field/ product(s)	Unit(s)	Period (EU28)
	Road VEHICLE: Total	Passenger road transport on national territory, by type of vehicles registered in the reporting country [road_pa_mov]	- TOTAL	-	Millions of passenger-kilometres	2005 – 2018
(xiii) tonnes kilometres (tkm)	Railway TRA_COV: Total transport	Railway transport - Goods transported, by type of transport (1 000 t, million tkm) [rail_go_total]	- TOTAL	-	Millions of Tonne-kilometre	2005 - 2018
	Road TRA_OPER: Total - Total transport	Summary of annual road freight transport by type of operation and type of transport (1 000 t, Mio Tkm, Mio Veh-km) [road_go_ta_tot]	- TOTAL	Total	Millions of Tonne-kilometre	2005-2018
	Waterway TRA_COV: Total transport	Transport by type of good (from 2007 onwards with NST2007) [iww_go_atygo]	- TOTAL	Total	Millions of Tonne-kilometre	2007-2017
(xv) population	Population on 1 January - total	Demographic balance and crude rates [demo_gind]	JAN	-	Persons	2005-2019

Annex 2: Explanations provided by Member States

The table below collects all of the reasons provided by Member States in their Annual Reports 2020 to explain growth or stable final energy consumption in 2018. The indicator shown in the "Trend" column refers to EUROSTAT data. Eventual disagreements between this indication and the reason provided are due to the fact that some Member States refer to national statistics which can be different respect the EUROSTAT ones.

MS	Sector	Trend	Reasons
AT	Industry	↗	**Economic growth - Increase of value added**
	Transport	→	**Increase of transport of goods - Increase of transport of passengers**
	Households	↘	
	Services	↘	
	Agriculture	↘	
BE	Industry	↗	**Economic growth**
	Transport	→	**Economic growth**
	Households	→	
	Services	→	**Economic growth - Increase of value added**
	Agriculture	→	
BG	Industry	→	
	Transport	↗	**Increase of transport of passengers** (increased use of passenger cars)- **Other** (Reduced load on trucks and passenger cars)
	Households	↘	
	Services	↗	**Increase of value added - Increase of employment - Other** (increase of energy comfort in public buildings)
	Agriculture	↗	
HR	Industry	↗	**No clear explanation**
	Transport	↘	Energy consumption decreases in this sector.
	Households	↘	Energy consumption decreases in this sector.
	Services	↗	**No clear explanation**
	Agriculture	↗	**No clear explanation**
CY	Industry	↘	
	Transport	→	**Economic growth**
	Households	↘	
	Services	↗	**Increase of value added - Economic growth - Increase of employment**
	Agriculture	↘	
CZ	Industry	→	Energy consumption decreases in this sector.
	Transport	→	**Increase of transport of passengers**
	Households	↘	
	Services	↘	
	Agriculture	↘	
DK	Industry	→	**Economic growth - Increase of value added**
	Transport	↗	**Increase of transport of goods - Increase of transport of passengers**
	Households	→	**Increase of population and/or households - Economic growth**
	Services	→	**Economic growth**
	Agriculture	↘	**Increase of value added**
EE	Industry	↗	**Economic growth - Increase of value added - Increase of employment**
	Transport	↗	**Economic growth - Increase of transport of goods - Increase of transport of passengers**
	Households	→	**Economic growth - Increase of disposable income of households**
	Services	↗	**Economic growth - Increase of value added - Increase of disposable income of households**
	Agriculture	↘	**Economic growth**
FI	Industry	↗	**Increase of value added - Other** (increase of production)
	Transport	↗	**Increase of transport of goods - Increase of transport of passengers**
	Households	↘	
	Services	↗	**Increase of value added - Other** (structural change towards more energy-consuming services) **- Worsening of summer climatic conditions - Other** (increase of the area of buildings)
	Agriculture	↘	
FR	Industry	↗	**Other** (increase of production)
	Transport	↘	
	Households	↘	
	Services	↘	
	Agriculture	→	
DE	Industry	→	**Energy consumption decreases in this sector.**
	Transport	↘	
	Households	↘	
	Services	↘	
	Agriculture	↗	n.a.
EL	Industry	→	
	Transport	↗	**Economic growth - Increase of transport of passengers - Increase of transport of goods**
	Households	↘	
	Services	↘	
	Agriculture	↘	

MS	Sector	Trend	Reasons
HU	Industry	↗	**Economic growth - Increase of value added - Increase of employment**
	Transport	↗	**Increase of transport goods - Economic growth - Increase of transport of passengers**
	Households	↘	Energy consumption decreases in this sector.
	Services	↘	Energy consumption decreases in this sector.
	Agriculture	↗	**Increase of value added - Economic growth - Increase of transport of goods - Other** (Increase of agricultural income)
IE	Industry	↗	**Economic growth**
	Transport	↗	**Economic growth - Increase of transport of goods - Increase of transport of passengers**
	Households	↗	**Worsening of winter climatic conditions**
	Services	↗	**Economic growth**
	Agriculture	↗	n.a.
IT	Industry	↘	
	Transport	↗	**Increase of transport of goods - Increase of transport of passengers**
	Households	↘	
	Services	↗	**Increase of employment - Increase of value added**
	Agriculture	↗	n.a.
LV	Industry	↗	**Economic growth - Increase of value added**
	Transport	↗	**Economic growth - Increase of transport of passengers - Increase of transport of goods**
	Households	↗	**Increase of disposable income of households**
	Services	↘	
	Agriculture	↘	
LT	Industry	↗	**Other** (increase of production) **- Other** (increase of technology deployment) **- Other** (increase of labour productivity) **- Other** (increase of exports)
	Transport	↗	**Increase of transport of goods - Increase of transport of passengers - Increase of value added - Other** (implementation of an effective policy of public authorities to combat the entry of smuggled fuels (diesel) into the national territory from third countries)
	Households	↗	**Decline of fuel prices - Increase of disposable income of households - Other** (increase of new costumers) **- Other** (Increase of electrical and electronic equipment)
	Services	↗	**Increase of value added - Other** (Development of the sector)
	Agriculture	↘	
LU	Industry	↗	n.a.
	Transport	↗	**Other** (Increase of transit traffic)
	Households	↘	
	Services	↗	n.a.
	Agriculture	↘	
MT	Industry	↘	**Increase of value added**
	Transport	↗	**Economic growth - Increase of transport of passengers - Other** (Increase of goods-carrying vehicles) **- Other** (Increase of tourism) **- Other** (Increase of motorcycles) **- Increase of passenger cars**
	Households	↗	**Other** (Increase in total household expenditure) **- Increase of population and/or households**
	Services	↘	**Increase of value added - Other** (Increase in the number of tourist arrivals)
	Agriculture	↗	n.a.
NL	Industry	↘	
	Transport	↗	**Economic growth - Increase of transport of passengers**
	Households	→	**Increase of population and/or households**
	Services	→	
	Agriculture	→	
PL	Industry	↗	Energy consumption decreases in this sector.
	Transport	↗	**Economic growth - Other** (increase of foreign trade**)**
	Households	↘	
	Services	↘	
	Agriculture	→	n.a.
PT	Industry	↗	**Economic growth**
	Transport	↗	**Increase of transport of passengers - Increase of transport of goods**
	Households	↗	n.a.
	Services	↗	**Economic growth**
	Agriculture	↗	n.a.
RO	Industry	↗	**Economic growth**
	Transport	↗	**Economic growth**
	Households	→	**Economic growth**
	Services	↗	**Economic growth**
	Agriculture	↗	**Economic growth**
SK	Industry	↗	**Other** (Limited implementation of measures with greater energy savings potential due to limited resources)
	Transport	↘	**Increase of transport of passengers - Increase of transport of goods - Other** (Increase of registered vehicles) **- Other** (Increase of number of SUVs)
	Households	↘	
	Services	↘	
	Agriculture	↘	
SI	Industry	↗	**Change in the methodology of measurement or calculation of energy consumptions - Increase of value added**
	Transport	↗	**Increase of transport of passengers - Increase of transport of goods**
	Households	↘	

MS	Sector	Trend	Reasons
	Services	↘	
	Agriculture	→	
ES	Industry	↗	**Economic growth - Increase of value added - Increase of disposable income of households**
	Transport	↗	**Increase of transport of passengers - Increase of transport of goods - Increase of disposable income of households**
	Households	↗	**Increase of population and/or households - Increase of disposable income of households - Worsening of winter climatic conditions**
	Services	→	Other - Energy consumption has been stabilised in the services sector.
	Agriculture	→	**Increase of value added.**
SE	Industry	→	Energy consumption decreases in this sector.
	Transport	↘	Energy consumption decreases in this sector.
	Households	↘	Energy consumption decreases in this sector.
	Services	↗	Energy consumption decreases in this sector.
	Agriculture	↘	
UK	Industry	→	**Increase of value added**
	Transport	→	Energy consumption decreases in this sector.
	Households	↗	n.a.
	Services	↗	**Increase of value added**
	Agriculture	↘	

Annex 3: New measures under Articles 7 and 5

The tables below provide all the policies and measures under Article 5 and 7 reported by Member States in the AR 2020 which were not included in the AR2019.

New measures under Article 7

	Name of measure	Category	Total savings achieved in 2018 (ktoe)	Share with respect to total savings in 2018 (%)	Savings achieved in 2018 from new actions (ktoe)	Share with respect to new savings in 2018 (%)	Total cumulative expected savings [ktoe] by 2020 expressed in	Share with respect to total cumulative savings expected by 2020(%)
BE-BRU	BATEX	Funds, financial & fiscal incentives	0.5	0.04%	No savings		3.48	
BE-FLA	Financial support for scrapping and reconstruction	Funds, financial & fiscal incentives					3.59	
BE-FLA	Immovable property reduction for energy efficient new houses and appartment	Taxation					60.35	
BE-FLA	REG-public service obligations electricity distribution system operators - addittional actions	Regulations					47.18	
BG	Energy efficiency in large enterprises (period of action 2019-2020)	Funds, financial & fiscal incentives						
BG	'Renewable energy, energy efficiency, energy security'	Funds, financial & fiscal incentives						
CZ	Clean Energy Prague programme	Funds, financial & fiscal incentives	1.11	0.18%	0.13	0.02%	5.75	0.94%
CZ	National Environment Programme	Funds, financial & fiscal inc	0.00	0.00%	0.05	0.03%	0.15	0.02%
CZ	Declaration on strategic cooperation by ČEZ	Other measures	4.20		0.96		19.69	
EE	Renovation of kindergarten	Funds, financial & fiscal inc	0.05	0.05%	0.05	0.05%	n.a.	
EE	Supporting biomethan production and use in transport	Other measures	n.a.		n.a.		n.a.	
EL	Energy efficient street lighting	Funds, financial & fiscal inc	0.59	0.12%	0.59	0.28%	n.a.	
ES	Campañas de comunicación "controlas tu energía"	Information, education and	13.05	0.56%	0.00	0.00%	91.34	0.78%
ES	Curso e-learning de IDAE	Information, education and training	0.71	0.03%	0.07	0.01%	3.95	0.03%
ES	Plan Director de Ahorro y Energía ADIF	Other measures	26.56	1.13%	5.79	1.07%	129.01	1.10%
ES	Medidas de eficiencia energética AENA	Regulations	4.94	0.21%	1.05	0.19%	28.83	0.25%
ES	Medidas de eficiencia energética Ministerio de Defensa	Regulations	0.19	0.01%	0.04	0.01%	0.94	0.01%
ES	Programa eficiencia energética en edificios (PAREER II)	Funds, financial & fiscal inc	17.83	0.76%	17.83	3.31%	53.50	0.46%
ES	Línea ICO IDAE de eficiencia energética 2017-2018	Funds, financial & fiscal inc	0.60	0.03%	0.60	0.11%	1.80	0.02%
ES	TRAMO PLURIRREGIONAL (IDAE): Desarrollo Urbano Sostenible	Funds, financial & fiscal inc	15.33	0.65%	15.33	2.84%	46.00	0.39%
ES	MOVALT	Funds, financial & fiscal inc	1.13	0.05%	1.13	0.21%	3.38	0.03%
ES	Programa Estatal de fomento de la rehabilitación	Other measures	10.35	0.44%	10.35	1.92%	31.04	0.26%
HR	Deployment of efficient electric motor drives and other	Other measures	0	0.00%	0.00	0.00%	n.a.	
HR	Energy Efficiency Obligation Scheme	EEOS	115.03	60.77%	21.57	89.35%	n.a.	
HR	Energy-efficient street lighting programme 2014-2020(	Funds, financial & fiscal inc	1.97	1.04%	0.00	0.00%	n.a.	
HR	ESIF loans for public lighting (HBOR)	Funds, financial & fiscal inc						
LV	National Operational Programme "Growth and Employment"	Funds, financial & fiscal inc	6.10	3.64%	6.10	5.10%	26.56	4.61%
LT	Municipal public buildings projects, implementing energy efficiency improvement measures	Other measures	0.11	0.06%	0.08	0.11%	0.34	0.05%
LT	Agreements for the education and consultation of energy consumers	Other measures	17.29	10.14%	17.29	21.91%	20.89	2.81%
NL	Climate agreement	Other measures	n.a.		n.a.		n.a.	
NL	Accelerated climate investments for industry	Funds, financial & fiscal incentives	n.a.		n.a.		n.a.	
RO	Smart metering	Regulations	0.61	0.18%	0.61		n.a.	
RO	Acquisition of better performing equipment	Funds, financial & fiscal inc	1.18	0.35%	1.18		n.a.	
RO	Energy audit and energy management related to the Construction domain	Regulations	0.95	0.29%	n.a.		n.a.	
RO	Procurement of electrical equipment with higher performance	Regulations	n.a.		n.a.		n.a.	
RO	Thermal Rehabilitation of Public Buildings	Funds, financial & fiscal inc	12.43	3.74%	n.a.		n.a.	
RO	Rehabilitation of public lighting	Funds, financial & fiscal inc	2.98	0.90%	n.a.		n.a.	
RO	Thermal rehabilitation of buildings (offices, business premises)	Funds, financial & fiscal inc	0.02	0.00%	0.02		n.a.	
RO	Renewal of car fleet	Other measures	n.a.		n.a.		n.a.	
RO	Modernising urban public transport	Other measures	n.a.		n.a.		n.a.	
RO	Modernisation of shipping transport	Other measures	0.28	0.08%	n.a.		n.a.	

New measures under Article 5

	Name of measure	Savings achieved in 2018 [ktoe]	Notes
CZ	Insulation of roof coatings	n.a.	A total of construction measures including the insulation of roof coatings resulted in savings equal to 12.11 TJ (0.29 ktoe) in 2019
DK	Purchasing more efficient light sources and appliances, such as LED bulb	0.092	Savings achieved in 2018
DK	Improvement of buildings' climate screen, eg post insulation or new win		
DK	New installations, eg renovation of heating system, ventilation with hea		
DK	Streamlining of energy supply, eg replacing oil furnace with heat pumps		
DK	Water savings through replacing toilets and fittings, etc.		
DK	Other actions such as relocation, energy screenings and behavioral camp		
NL	Sectoral Roadmap for Central Government Real Estate	n.a.	

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