ETC CM Report 2023/06

Overview of reported integrated national climate and energy policies and measures in Europe in 2023

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Executive summary

Key messages

The number of reported single national policies and measures to reduce greenhouse gas emissions increased since the last reporting cycle. In addition, Member States reported for the first time on national policies and measures for all five dimensions of the Energy Union. A total of 3 039 policies and measures were reported.

This increase is also consistent with the continuing implementation of the National Energy and Climate Plans to achieve the EU's 2030 climate and energy targets. However, the number of reported national policies and measures by a country is not necessarily related to its level of ambition.

The completeness of reported quantitative information on national policies and measures has not improved. This relates to both the achieved (*ex-post*), expected (*ex-ante*) effects on greenhouse gas emissions and their costs and benefits. This remains insufficient for any meaningful analysis. Information on renewable energy production and energy savings, which has to be reported for the first time, is only anecdotally reported.

The majority of the reported policies and measures affect the dimension decarbonization: greenhouse gas emissions and removals, followed by energy efficiency and decarbonization: renewable energy.

Most Member States provided information on article 5 (21) and article 7 (25) of the Energy Efficiency Directive and on financing (23), although for the latter information might not yet be complete for all countries.

In 1992, under the United Nations Framework Convention on Climate Change (UNFCCC), developed countries committed to adopting national policies and taking corresponding measures on the mitigation of climate change. Under the Paris Agreement, all countries committed to pursue domestic mitigation measures to achieve the objectives of their nationally determined contributions. In 2021, EU Member States reported on 2 052 national policies and measures to reduce greenhouse gas emissions and achieve climate targets. From 2023 onwards, EU Member States must report on greenhouse gas policies and measures and also all other national policies and measures of the five dimensions of the energy union, as part of the National Energy and Climate Progress reports[(1)].

This report presents an overview of the information on national policies and measures reported by EU Member States on:

- integrated national PaMs attributes and progress;
- new PaMs from the Energy Efficiency Directive (EED);
- PaMs related to Article 7 of the EED;
- PaMs related to Article 5 of the EED;
- information on the financing of PaMs; and
- PaMs effects on air quality.

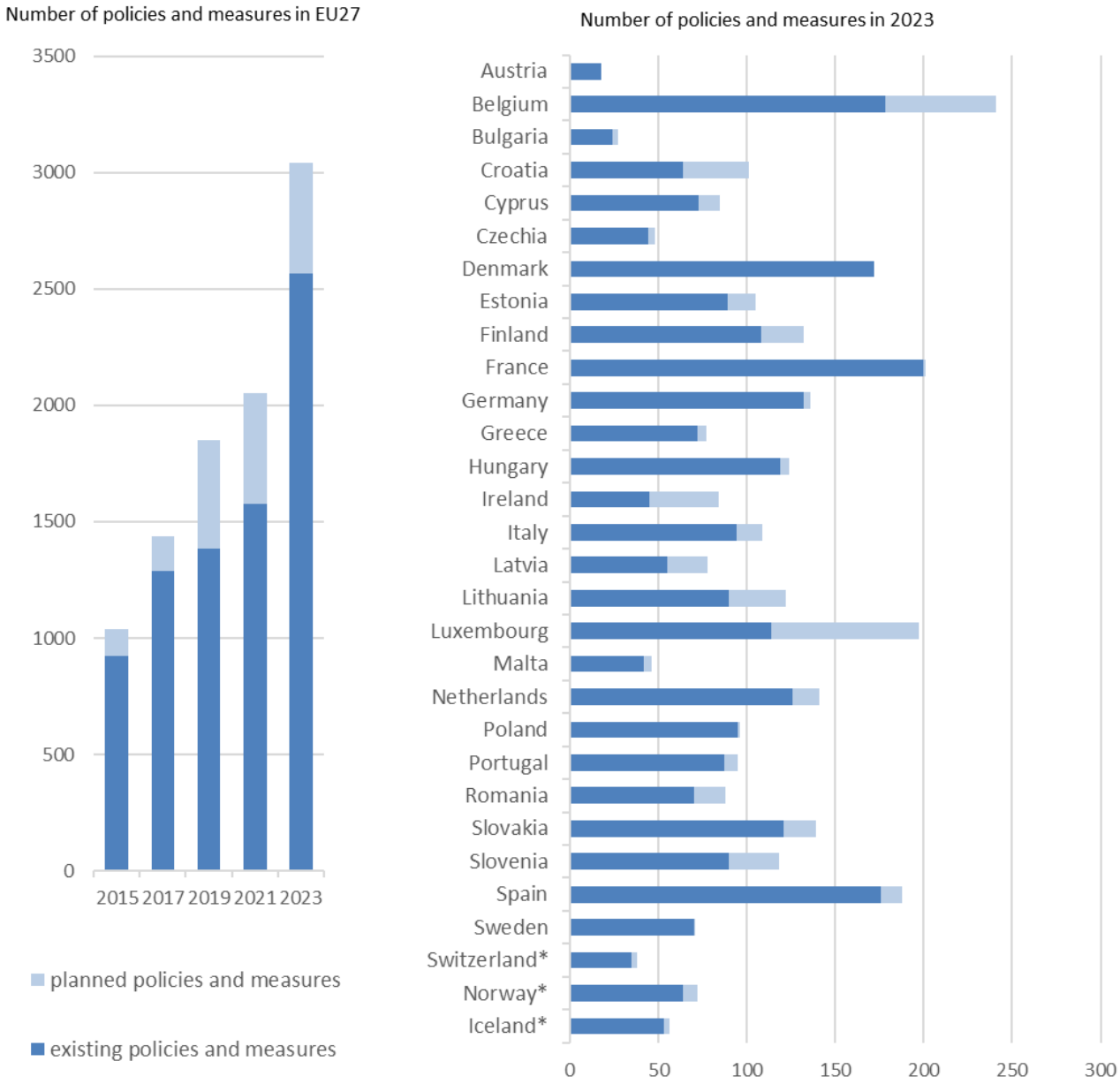
(1) Article 17 of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.

This information was reported to the European Environment Agency (EEA). Detailed information on policies and measures introduced by European countries on greenhouse gas emission reductions, renewable energy sources, energy efficiency, energy security, internal energy market and research, innovation and competitiveness is also available online.

In 2023, EU Member States reported on 3 039 single policies and measures. This is a substantial increase compared to the previous reporting, reflecting the increased scope of reporting.

In 2023, Member States reported a similar number of planned policies and measures than in previous reporting, although the share of planned policies and measures compared to the total number of policies and measures is now smaller (Figure ES-1). The increase in the number of reported policies and measures reflects the increase in scope of reporting, making comparison with previous reporting complicated.

Figure ES-1 Number of single existing and planned PaMs reported by Member States in different reporting years.



Source: ETC CM, 2023

An important share of the reported Member States policies and measures started 2021 or later. 2021 was the most often stated start year of single policies and measures in reporting year 2023. This was also the case in reporting year 2021, but the number of policies and measures starting after 2021 increased substantially: the second and third most frequently start years were respectively 2023 and 2022. This could reflect the implementation of the national energy and climate plans by the Member States. For 5% of the policies and measures the start year was not known, illustrating that there is still a large amount of uncertainty linked to a substantial part of the reported national policies and measures.

2023 was the first climate and energy integrated reporting on national policies and measures according to the Governance Regulation. The first reporting shows the potential this reporting has as a repository for policies and measures across all dimensions of the Energy Union, although there is still room for improvement on the completeness, consistency and transparency of this information.

Of the 3 039 integrated policies or measures reported by Member States in 2023:

- Most primarily target energy-related greenhouse gas emissions, which represent 80% of all greenhouse gases emitted in the EU. The sectors energy consumption (30%), energy supply (29%) and transport (25%) have the most single policies and measures.
- Most correspond to economic policy instruments (e.g. subsidies or feed-in tariffs, 44%) or regulatory instruments (e.g. energy efficiency standards, 39%).
- Many (13%) were implemented in the five years following the adoption of the 2009 climate and energy package (between 2010 and 2014), although in the current reporting the period 2021-2023 represents by far the most important years of implementation (34% of policies started in this period).

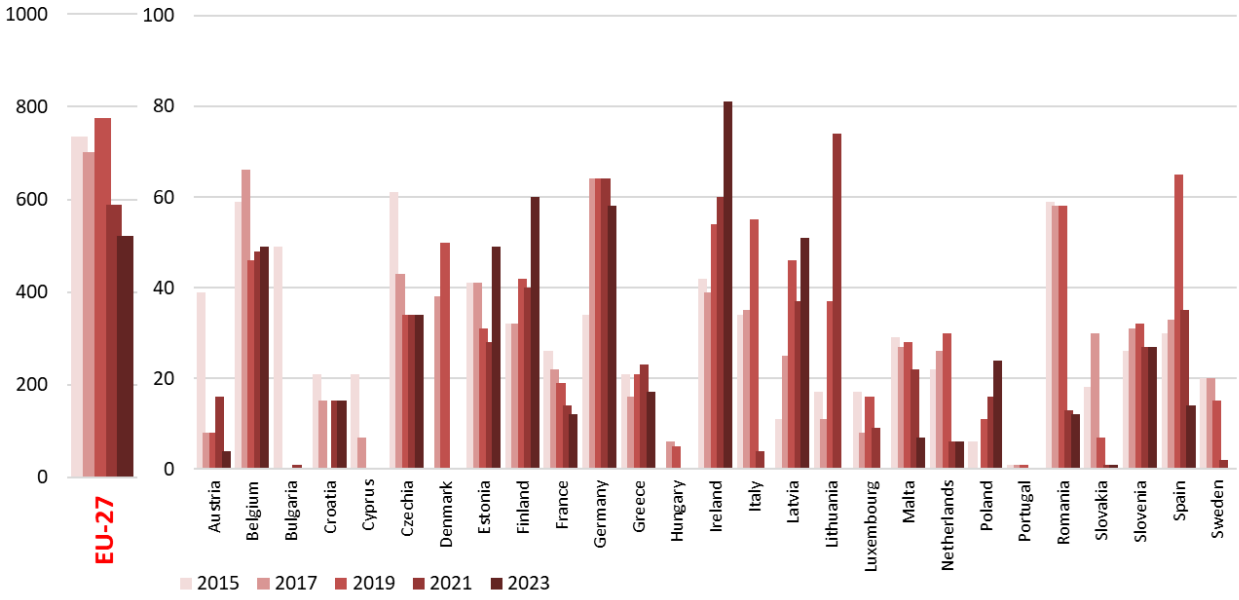
The Governance Regulation also introduced several new reporting requirements. Reporting is not always complete, transparent, or consistent regarding these new requirements. The most important elements are related to the reporting on the dimensions of the Energy Union, including the relevant objective target or contribution the policy or measure is contributing to. The dimension "decarbonization: greenhouse gas emissions and removals" however remains by far the most important dimension (77%), followed by "energy efficiency" and "decarbonization: renewable energy". In addition, Member States had to report on the relevant provisions relating to Union renewable energy and energy efficiency policies; update since last submission; and additional qualitative and quantitative information on the progress against policy objectives and indicators.

While qualitative information on policies and measures helps to understand better the nature of climate actions at national level, additional information on the effects of these actions is needed to help identify successes and failures, and to provide a key knowledge base to inform policy decisions. This is why Member States must also report, where available, quantitative information on the greenhouse gas emission savings, renewable energy production or energy savings achieved by, or expected from, the reported policies and measures either individually or for groups of policies and measures. However, the information remains very incomplete and there does not seem to be any improvements compared to previous reporting years. New reporting requirements on renewable energy production and energy savings are almost entirely incomplete.

The number of Member States reporting expected, *ex-ante*, effects of policies decreased in 2023 compared with 2021 (Figure ES-2) and remains very insufficient. Only 18 Member States reported some information on expected *ex-ante* emission savings. The number of policies with reported effects differs significantly and ranges from a very high level of completeness (e.g., for Ireland) to one single policy and measure.

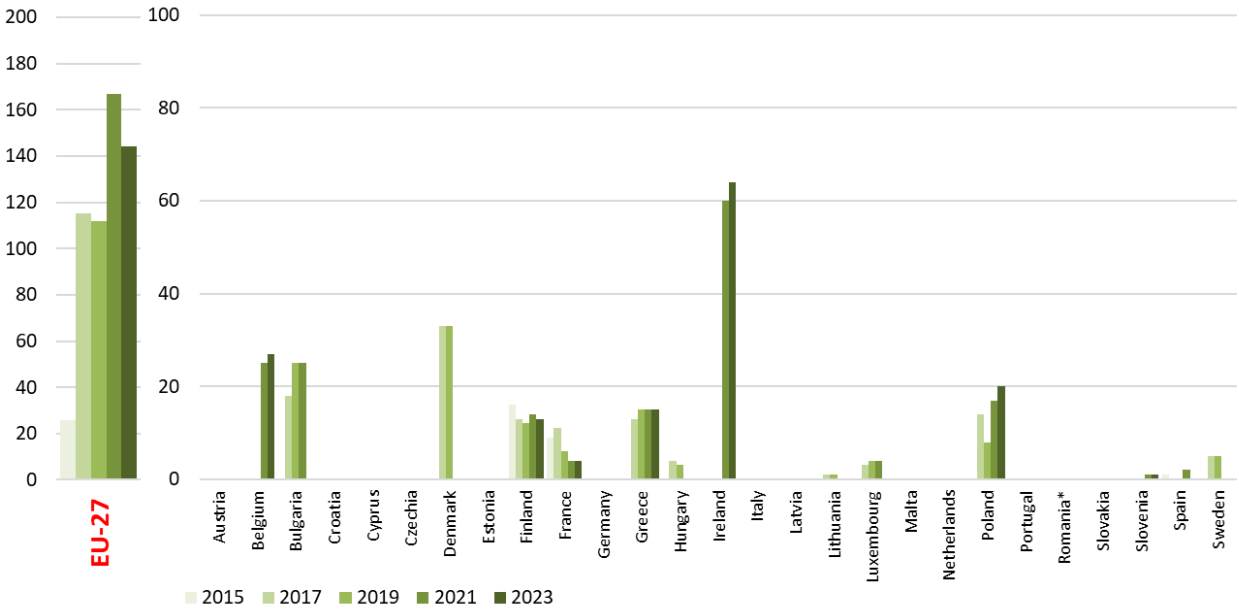
In 2023, only seven Member States (Belgium, Finland, France, Greece, Ireland, Poland, and Slovenia) reported information on the *ex-post* emission reductions achieved for 5% of total national policies and measures (144 single or grouped policies and measures). This is less than in 2021.

Figure ES-2 Total number of policies and measures with *ex-ante* greenhouse gas emission savings reported in the EU-27 (left) and by country (right).



Source: ETC CM, 2023

Figure ES-3 Total number of policies and measures with *ex-post* greenhouse gas emission savings reported in the EU-27 (left) and by country (right).



Source: ETC CM, 2023

This does not allow for a comprehensive analysis of the impacts of existing national climate policies across the EU and makes comparing and summing up *ex-post* emission savings a highly uncertain exercise. Some Member States, such as Ireland, do report extensively on the impact of a part of their national policies and measures. It illustrates again the further need for Member States to increase their efforts to assess the effects of implemented policies more systematically and to report on this transparently. The new EU Regulation on the Governance of the Energy Union and Climate Action was expected to facilitate the streamlining and integration of the reporting of climate and energy policies and measures and of their effects. However, at the first reporting round of the National Energy and Climate Progress reports, this expectation was not met.

> **The completeness of quantitative information on the achieved or expected impact of policies and measures remains an important issue. This information is nevertheless important to properly assess and track the progress Member States are making in implementing their Nation Energy and Climate Plans.**

In 2023 there were still important issues with timelines, incompleteness, consistency, accuracy and transparency.

Member States could also update the information on their national system for reporting policies and measures and greenhouse gas projections. This includes for example information on legal, administrative, procedural and institutional arrangements, as well as a description of data collection, quality assurance and quality control processes and how models and assumptions are selected. All Member States provided this information in 2021. Although changes were sometimes limited, 21 Member States updated this information in 2023. Reporting is not mandatory, so it is important that Member States keep this information as up to date as possible.

1 Introduction

This report presents a synthesis of the information on national integrated climate and energy policies and measures (PaMs) and national systems for PaMs and projections reported by EU Member States under the EU Governance Regulation and its Implementing Regulations. In the Governance Regulation PaMs are defined as "all instruments which contribute to meeting the objectives of the integrated national energy and climate plans and/or to implement commitments […] of the UNFCCC, which may include those that do not have the limitation and reduction of greenhouse gas emissions or change in the energy system as a primary objective".

Reporting on PaMs was already mandatory under the Monitoring Mechanism Regulation, the predecessor of the Governance Regulation, from 2015. Member States reported in 2015, 2017, and 2019, with mandatory, if applicable (where substantial updates exist), reporting in intermediate years by a selection of Member States.

In 2021, Member States had to report for the first time information on their greenhouse gas policies and measures under the Governance Regulation (Article 18). The reporting requirements are elaborated in Article 37 and Annex XXIV of Implementing Regulation No 2020/1208 on the structure, format, submission processes and review of information reported by Member States.

In 2023, Member States had to report for the second time information on their greenhouse gas policies and measures and for the first time information on policies and measures of the other dimensions of the Energy Union under the Governance Regulation (Article 17). The reporting requirements are elaborated in Article 7 to 11 and Annex IX to XIV of Implementing Regulation No 2022/2299 on the structure, format, submission processes and review of information reported by Member States. Because the reporting requirements are very similar, the Article 17 and Article 18 reporting were integrated into one reporting template.

Member States also had to update information on their national system for PaMs and projections if there are substantial changes in 2023. This information was submitted for the first time in 2021 following article 39 of the Governance Regulation and further described in article 36 and Annex XXIII of the Implementing Regulation No 2020/1208. Those systems include the relevant institutional, legal and procedural arrangements established within a Member State for evaluating PaMs and making projections of anthropogenic greenhouse gas emissions. The national system should describe the use and application of data, methods and models, and the implementation of quality assurance and quality control activities and sensitivity analysis. In addition, the national system should ensure the timeliness, transparency, accuracy, consistency, comparability and completeness of the information reported. Reporting was mandatory only in 2021, while in subsequent years only modifications of the national system need to be reported.

To facilitate reporting by Member States, the EEA developed an online reporting webform starting from the 2015 reporting cycle that followed the template of the implementing act. This webform, available via Reportnet 3 has been updated to reflect the changes in reporting under the Governance Regulation and has been integrated into the new e-reporting on environmental and climate data. The information that is reported by the EU Member States is also available for consultation and for downloading (https://reportnet.europa.eu/public/dataflow/900).

The data presented in this report are also aggregated by the EEA and can be accessed by the general public via the online EEA database on climate change mitigation policies and measures in Europe (http://pam.apps.eea.europa.eu/) and the online PaM data viewer. The search engine gives access to

detailed information for each of the PaMs (or groups of PaMs) as it was reported by the Member States. The interface allows easy access, filtering and downloading of the information.

1.1 Scope of the analysis

The analysis was based on information reported by Member States as part of their submissions under the Governance Regulation until 4th September. Regarding PaMs, information requested for each measure that falls under Article 17 and 18 of the Governance Regulation and its implementing acts includes the following:

- Annex - PaMs attributes and progress (hereinafter referred to as Annex IX):
  - name, objective (quantified if available) and description of each single or group of PaMs;
  - type of instrument used;
  - geographical coverage;
  - gases and sectors targeted;
  - sectoral objectives;
  - dimension and related information;
  - EU policy responsible for implementation of the policies or measure;
  - current status and period of implementation (start and end year);
  - entities responsible for implementing the policy;
  - indicators used to monitor and evaluate progress;
  - contribution of the policy or measure to the achievement of the Union's climate-neutrality objective and to the achievement of the long-term strategy;
  - realized and projected (for years 2025, 2030, 2035, and 2040) GHG emissions savings, divided between ETS, ESR and LULUCF, when available;
  - realized and projected (for years 2025, 2030, 2035, and 2040) energy savings, when available;
  - realized and projected (for years 2025, 2030, 2035, and 2040) renewable energy production, when available;
  - projected and realised costs and benefits of the reported PaMs.

- Annex X - New PaMs of the Energy Efficiency Directive (EED):
  - Energy efficiency Obligation Schemes (EEOS)[2]
  - Alternative policy measures[3]
  - Information on taxation measures
  - Information about the lifetime of the individual actions eligible to the policies and measures reported for Article 7 of the EED

- Annex XI - EED Article 7
  - Energy savings achieved through Article 7 of the EED

- Annex XII - EED Article 5
  - Total renovated building floor area of heated and/or cooled buildings owned and occupied by the Member States' central government[4]
  - The amount of energy savings in eligible buildings owned and occupied by their central government[5]

(2) referred to in Article 7a of Directive 2012/27/EU

(3) referred to in Article 7b and Article 20(6) of Directive 2012/27/EU) (except taxation measures)

(4) referred to in Article 5(1) of the Directive 2012/27/EU

(5) referred to in Article 5(6) of Directive 2012/27/EU

- Annex XIII - Progress towards financing:
  - Initial investment assumptions
  - Actual investments up to and including year 2021
  - Actual investments still to be implemented

- Annex XIV - Impacts on air quality and emissions to air:
  - Quantitative impact or qualitative information, if quantitative data is not available, on the impact of PaMs on emissions of NH3, NMVOC, NO_x, PM2.5, SO_2, and others.

An analysis is provided of the overall trends in the PaMs data, but focuses on key trends in new developments in PaMs.

1.2 Outline of the report

Chapter 2 gives an overview of important changes in PaMs compared to the 2021 reporting.

Chapter 3 looks more closely to the new reporting on the PaMs attributes and progress. Specific attention is given to the five dimensions of the Energy Union.

Chapter 4 presents a description of PaMs reported by Member State and estimates on the reported expected emissions savings resulting from the reported PaMs. Further, it addresses reported costs and benefits and presents information on reported indicators to monitor the reported policies.

Chapter 5 gives an overview of the reporting on the other reporting tables under Annexes X to XIV.

Chapter 6 looks into the reporting by Member States on the national system for reporting on PaMs and GHG emission projections.

The final chapter, chapter 7, provides conclusions and recommendations to further improve the reporting on PaMs.

2 Recent developments in climate and energy policies and measures in Member States

2.1 Union policies that affect national climate PaMs

The period between the previous (2021) and the current (2023) reporting cycle was a period with further important climate and energy policy developments at EU and international level.

In 2021, the **EU Climate Law** was published. The European Climate Law enforces the European Green Deal's goal for the EU to become climate-neutral by 2050. In the Climate Law the EU also commits to reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. It aims to ensure that all EU policies contribute to this objective and that all sectors of the economy participate. Key elements include legally binding targets for 2050 and 2030, measures to monitor progress and adjust actions, and a process for setting a 2040 climate target. It also emphasizes fairness, solidarity among Member States, and the need for negative emissions after 2050, while promoting independent scientific advice and adaptation to climate change.

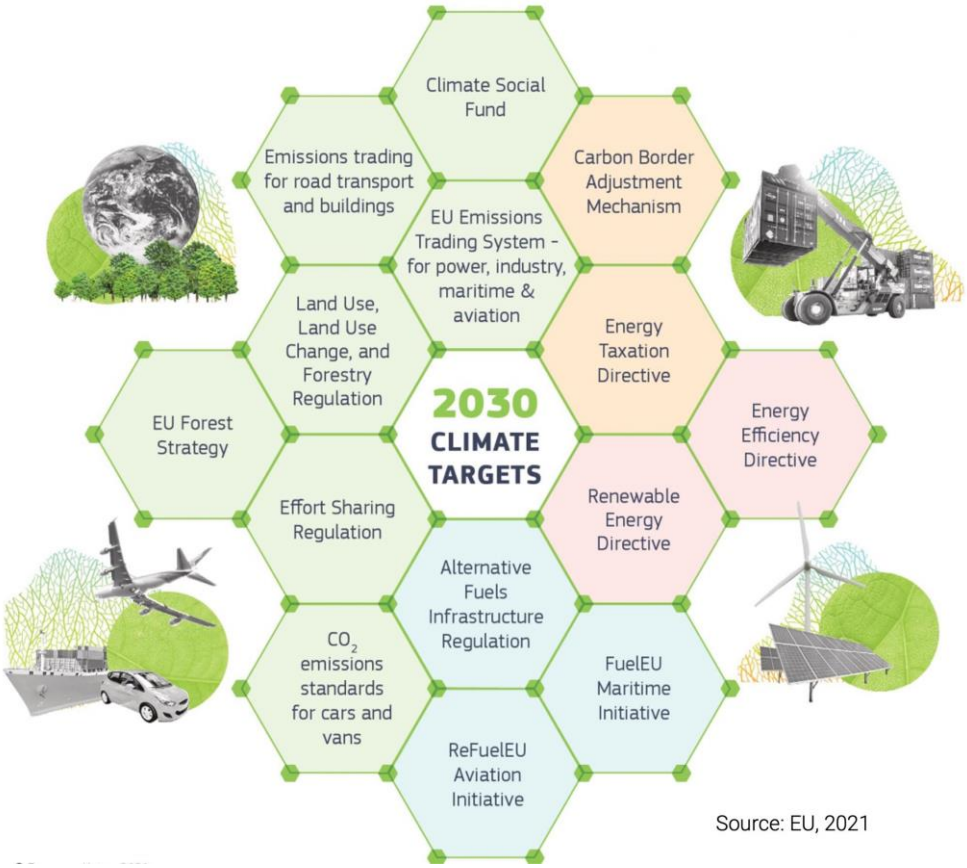
With the EU's commitment to reduce its net greenhouse gas emissions by at least 55% by 2030, an overhaul of existing energy and climate Union policy was needed to bring this in line with the increased ambition level. The **'Fit for 55' package** of legislation makes all sectors of the EU's economy fit to meet this target. It aims to set the EU on a path to reach its climate targets in a fair, cost-effective and competitive way. Between 2021 and 2023, the proposals of the Fit for 55 package (Figure 2-1) were presented and discussed In the normal legislative procedure. In the course of 2022 and 2023, agreements were reached, proposals adopted and even published. At the time of reporting by Member States (i.e., 15th March), the status on the most important energy and climate Union policies was:

- The European Council and the Parliament reached a provisional agreement on the **Energy Efficiency Directive** on 10 March 2023, just before the reporting deadline for policies and measures. The amended Energy Efficiency Directive (2023/1791) was published 20 September 2023 and entered into force on 10 October.
- On the **Effort Sharing Regulation**, a provisional agreement was reached already on 8 November 2022 after interinstitutional negotiations. This was adopted by the Parliament on 14 March and the Council on 28 March and subsequently published in the Official Journal of the EU on 26 April 2023 as Regulation 2023/857. The amended Effort Sharing Regulation entered into force on 16 May 2023.
- The **Renewable Energy Directive** was still under negotiation. On 30 March a provisional agreement was reached between the Council and the EU Parliament. The agreement includes the commitment to raise the share of renewable energy in the EU's overall energy consumption to 42.5% by 2030, with an additional 2.5% indicative top up that would allow to reach 45%.
- The amended **LULUCF regulation** was published on 21 April, one month after the reporting deadline for policies and measures. Nevertheless, a provisional agreement was already achieved end of 2022 and it was adopted by the European Parliament and the Council end of March 2023.

The invasion of Ukraine by Russia significantly disrupted energy markets, prompting the EU to respond with the **REPowerEU Plan** in May 2022, aimed at reducing dependency on Russian gas. The EU's strategy involves diversifying energy sources by establishing agreements with other nations for pipeline imports, investing in liquefied natural gas (LNG), and forming strategic partnerships for a sustainable supply of renewable hydrogen. To ensure energy security, the EU has implemented measures such as common gas procurement to secure affordable energy and prevent supply disruptions. Additionally, gas storage targets have been increased to guarantee an ample gas supply. Voluntary initiatives to reduce gas consumption by 15% were also proposed. Further efforts include investing in renewable energy sources and raising the

EU's renewable energy target for 2030. Ongoing initiatives focus on maintaining energy security, promoting industrial decarbonization, expanding renewable energy capacity, developing energy infrastructure, improving energy efficiency, and regulating hydrogen. Funding for the REPowerEU Plan involves mobilizing approximately €300 billion, primarily through grants and loans, to support these initiatives.

Figure 2-1 Schematic overview illustrating the different elements of the Fit for 55 package.



Source: EU, 2021.

The Governance Regulation required Member States to submit a draft and final Integrated National Energy and Climate Plan (NECP). These plans specify all Member States' national objectives and contributions to EU targets across the five dimensions of the Energy Union, including decarbonisation. The plans also define the actions and policies and measures needed to achieve these targets. The NECP process therefore has been an important factor in the development of new climate policies and measures in EU Member States.

The 27 plans submitted by the end of 2019 give an overview of how Member States are approaching the first phase of their transition towards climate neutrality and where they want to go in the period 2021–2030 across five areas: decarbonisation, energy efficiency, energy security, internal energy market, research and innovation and competitiveness. The full implementation of the plans would lead Europe to overachieve the previous 2030 greenhouse gas emissions reduction target of 40% reduction by 2030.

End of June 2023, Member States had to report a draft updated NECP. In it each Member State has to report on any updates of the national objective, target or contribution to reflect an increased ambition as compared to that set out in its latest integrated NECP. Member States should also make efforts to mitigate any adverse environmental impacts that became apparent as part of the integrated progress reporting.

The latest country-specific recommendations issued in the context of the European Semester and obligations deriving from the Paris Agreement also have to be considered in the updated NECP.

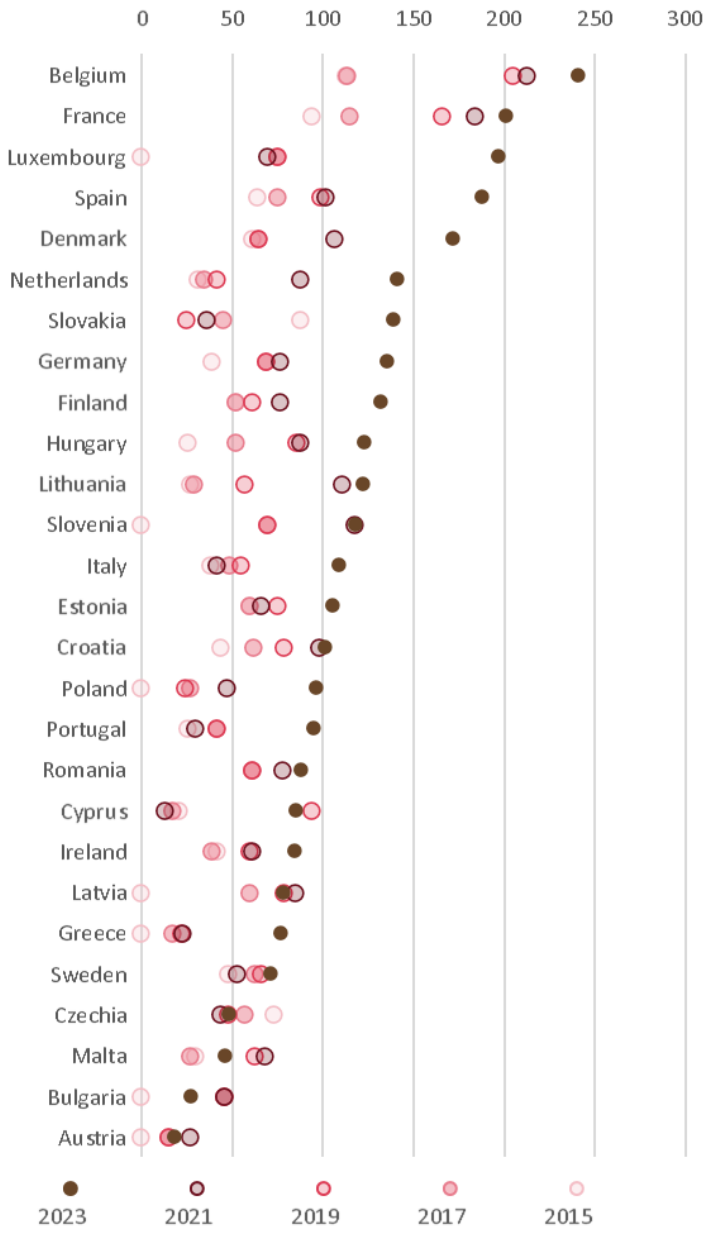
At the international level, further steps were taken to operationalize and implement the Paris Agreement. In December 2020, the EU enhanced its nationally determined contribution to at least a 55% reduction in economy-wide net domestic greenhouse gas emissions by 2030, compared to 1990. Thus bringing the international contribution in line with the EU ambition of the Green Deal.

Starting no later than 2024, all countries that have ratified the Paris Agreement will participate in a reporting process known as the enhanced transparency framework. This framework aims to collect comprehensive information on climate change actions and support, ensuring transparency in the implementation of the Paris Agreement. The gathered data will contribute to the global stock take process, which assesses the Agreement's progress. The enhanced transparency framework encompasses all aspects of the Paris Agreement, including the tracking of progress and the achievement of nationally determined contributions. The rules governing the enhanced transparency framework were already established in 2018. The remaining details required for countries to fully implement the enhanced transparency framework, such as the development of common reporting tables and formats, report outlines, and expert training programs, were finalized in 2021.

2.2 New national climate and energy policies and measures

The total number of single PaMs reported increased from 2 052 in 2021 (ETC CME, 2021) to 3 039 in 2023. There are on average 113 single PaMs per Member State. This is a 48% increase compared to 2021. In most countries, the number of reported single PaMs increases over time, with the highest number of single measures reported in 2023. This is the case for example for Luxembourg, Slovakia and Spain. There are only a few clear exceptions to this rule, such as Malta and Bulgaria. This can be explained by new PaMs that are planned, adopted and/or implemented between reporting years, but also because in some countries reporting of already implemented PaMs is further complemented, adjusted, and refined.

Figure 2-2 Number of single PaMs reported by Member States in different reporting years.

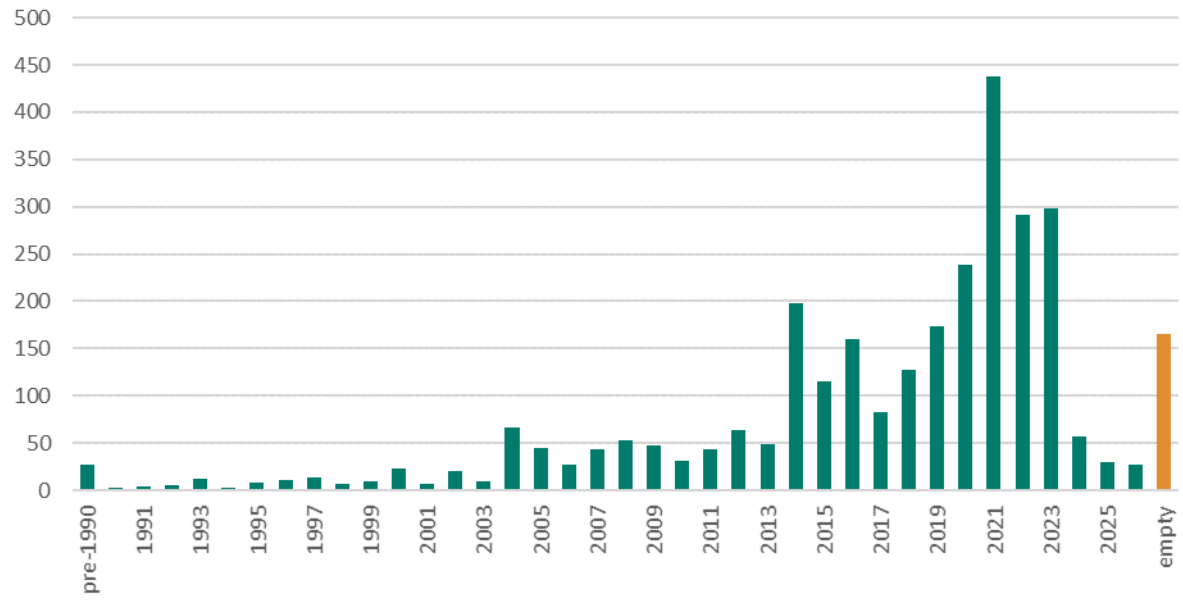


Source: ETC CM, 2023

There are still significant differences among Member States in the number of reported PaMs. The higher number of reported PaMs has made the difference between the country with the most and the least reported PaMs even larger in 2023. Belgium and France still report the most individual measures and Austria, Bulgaria and Malta the least (Figure 2-2). Both Belgium and France report their PaMs at a highly disaggregated level, while other Member States report their PaMs in a more aggregated level. For example, in the case of Belgium, many regional policies and measures are reported. This could be because of differences in reporting culture, understanding of the legislation and the existing reporting to the UNFCCC in the National Communications and Biennial Reports, which are both closely linked to Governance Regulation reporting. Some countries updated and expanded the PaM reporting to the other dimensions of the Energy Union very substantially. The number of PaMs in Luxembourg increased with 127 single PaMs and in Slovakia with 103 single PaMs in 2023. It is important to keep in mind that the number of single PaMs is not necessarily a good indicator of the past, current and future ambition level of Member States.

Looking at the starting year of these reported PaMs (Figure 2-2), there appear to be three periods of acceleration of policy development. In 2004 there are markedly more policies and measures implemented than before. This has also been the case in previous reporting years, but the effect is less outspoken and the number of PaMs with starting year 2004 is decreasing over time, with some of these PaMs expiring and being replaced by updated measures. In 2014, there is a second increase in the number of single PaMs that started. 2021 was the year with the greatest number of single PaMs starting. In the past, the reporting year tended to have the greatest number of single PaMs, which is not the case in 2023. Nevertheless, a substantial part, 34% of all single PaMs, started in the period 2021-2023. This high number of PaMs might reflect that many Member States have implement new policies and measures in order to meet their 2030 climate and energy objectives. Some of these policies and measures have been described and included in the NECPs and are now also reported under the Governance Regulation. In 2023, also a substantial number of PaMs did not include a start year (or zero was reported). This was used for planned PaMs for which the start year was not known. This suggests that for these PaMs it is very uncertain if or when these will be implemented.

Figure 2-3 Number of single PaMs reported by EU Member States per start year.



Source: ETC CM, 2023

Out of the 3 039 single PaMs from EU Member States, there were 1 306 that were implemented on or after 2021[(6)], which can be considered 'new' PaMs. The status of implementation of the reported PaMs can be classified as follows:

- planned: planned PaMs are options under discussion that have a realistic chance of being adopted and implemented in the future;
- adopted: adopted PaMs are those for which an official government decision has been made and for which a clear commitment to proceed with implementation exists;
- implemented: implemented PaMs are those for which one of the following applies: a) national legislation in force; b) one or more voluntary agreements have been established; c) financial resources have been allocated; d) human resources have been mobilized;
- expired: expired PaMs are those for which the timeline of the policy has passed. Expired policies may still have a long-term impact on greenhouse gas emissions savings.

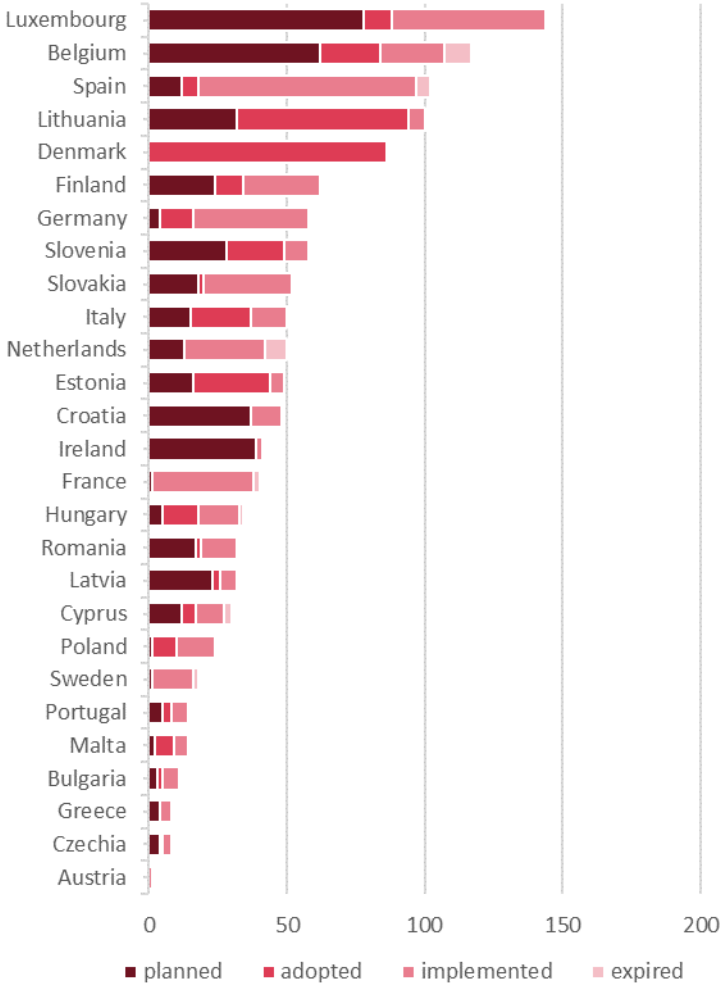
(6) PaMs for which the start year is not reported are also considered new.

Most of the single PaMs starting on or after 2021 are implemented (36%) or planned (35%), followed by PaMs that have been adopted (25%). A minority of the new PaMs were already expired at time of reporting (2%). For 2% of the single PaMs, the implementation status was not reported.

There was a higher rate of reporting planned PaMs in 2019 than in previous and subsequent years. In 2019 25% of all PaMs were planned, while this decreased in 2021 and 2023 to respectively 22% and 16%.

It should also be noted that Member States reporting is not always consistent with respect to implementation status, start/end year, and projection scenario. Especially when the start year is close to the reporting year. In this case, there are differences in interpretation when a PaM is implemented or adopted, reflecting national circumstances and alignment of the PaM reporting with the reporting of greenhouse gas projections. Guidelines are provided in this case, but it is evident that there could be a potential conflict between the consistency of start year and the status of the PaM and the consistency of the status and the projection scenario.

Figure 2-4 Number of expired, implemented, adopted, and planned single PaMs with start year on or after 2021.



Source: ETC CM, 2023

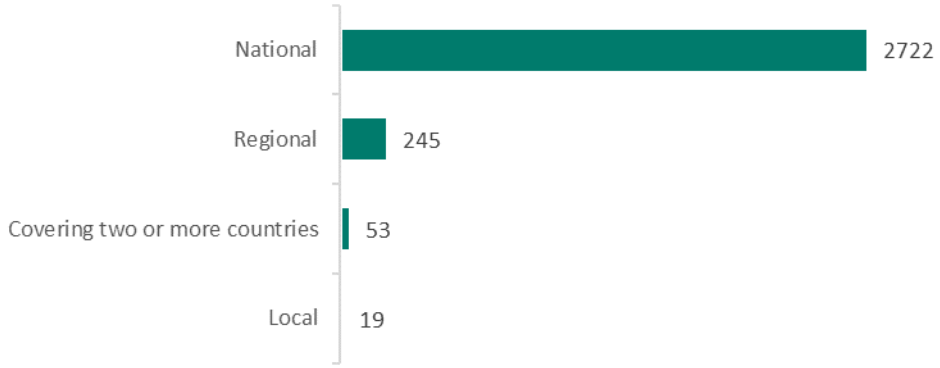
The characteristics of these new PaMs with start year 2021 or later ("*new PaMs*") are very similar to the PaMs starting before 2021 ("*old PaMs*"). The sectors with the most new PaMs are the sectors energy

supply (29%), energy consumption (27%) and transport (26%). The other sectors represent 14% (agriculture) or less of the reported PaMs.

With respect to the instrument type, new and older PaMs have a similar outcome. Economic and regulatory instrument types are predominantly used in new PaMs, respectively 45% and 31%, followed by planning instrument types with a share of 15%. The other instrument types, including education, information, fiscal, voluntary/negotiated agreements, and research have a share of less than 10%. Compared to the older PaMs, the PaMs that started in 2021 or later do have a higher share of planning instrument types and a lower share of regulatory instrument types.

As could be expected, most PaMs were national (Figure 2-5). A substantial share was also regional (almost 10%). Most of these PaMs were reported by Belgium, but also Czechia, France, Lithuania, the Netherlands, Poland, Slovakia, Spain, and Sweden reported one or more regional PaMs.

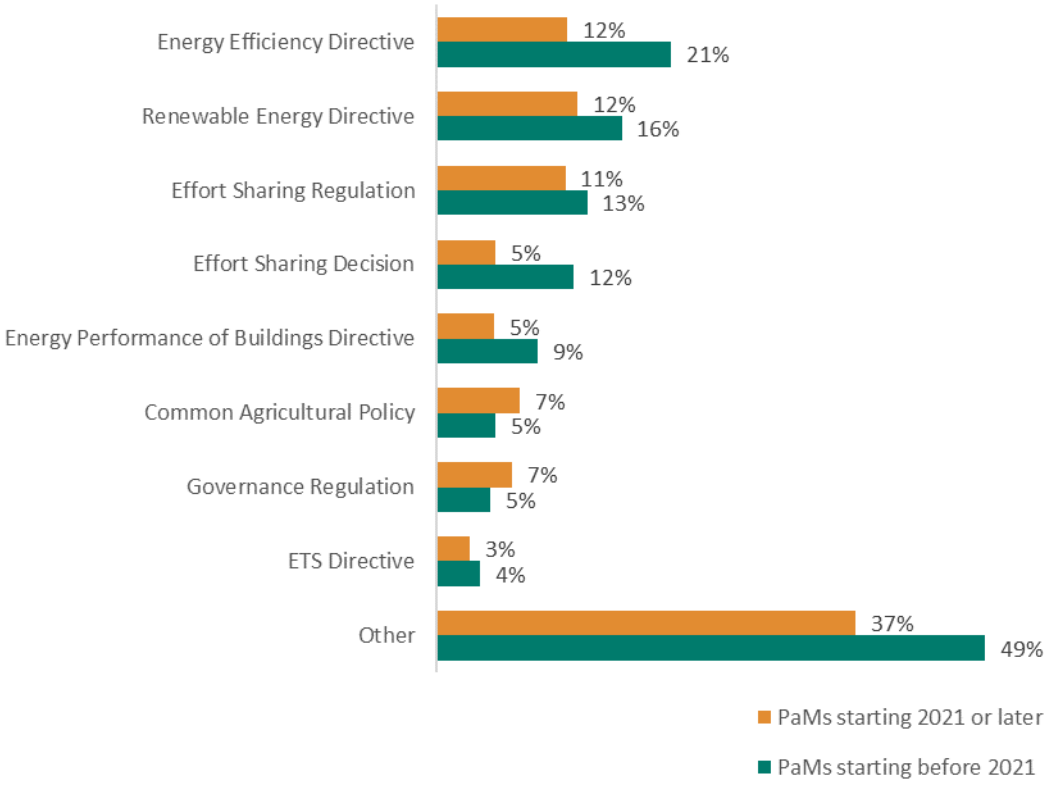
Figure 2-5 Geographical coverage of single PaMs reported by Member States (number of single PaMs).



Source: ETC CM, 2023

Most single national policies and measures are implemented in response to one or more Union policies. For the new PaMs the Union policies that were selected most were the Directive 2018/2001 on the promotion of the use of energy from renewable sources (12%), the Energy Efficiency Directive 2012/27/EU (12%), and the Effort Sharing Regulation EU 2018/842 (11%) and its predecessor the Effort Sharing Decision (5%). The latter is surprising considering that the Effort Sharing Decision ended in 2020. For the PaMs implemented before 2021, the Energy Efficiency Directive (21%), the Renewable Energy Directive (16%) and the Effort Sharing Regulation (13%) are the key Union policies triggering the adoption of national climate and energy policies and measures. The EU ETS is one of the most important Union climate mitigation policies, but because it requires fewer national policies and measures to implement in countries, is therefore selected relatively less.

Figure 2-6 **Share of single PaMs reported by Member States linked to the eight most common Union policies.**



Source: ETC CM, 2023

The Governance Regulation also introduced several new reporting requirements related to the characteristics of the PaMs in 2023 compared to the 2021 reporting. This included:

- the relevant Union dimension(s) affected and related reporting (see chapter 3);
- relevant objective, target or contribution the policy or measure contributes to;
- assessment of the contribution of the policy or measure to the achievement of the Union's climate-neutrality objective set out in Article 2(1) of Regulation 2021/1119 and to the achievement of the long-term strategy referred to in Article 15 Regulation (EU) 2018/1999;
- relevant provision(s);
- update since last submission;
- explanations of the update;
- progress against policy objective; and
- the progress against policy indicators.

Reporting is not always very complete regarding these new elements.

2.3 Link with the National Energy and Climate Plans (NECPs)

In December 2019, Member States had to submit their final NECPs and in June 2023 they had to submit their draft updated NECP. The plans include the policies and measures countries plan to adopt to meet the 2030 objectives in the area of energy efficiency, renewable energy, and the mitigation of greenhouse gas emissions. Since 2019, some of these PaMs that are presented in the first NECP will have been implemented. To assess how this affects the biennial reporting on greenhouse gas PaMs, the submissions were screened to check if Member States referred to the NECPs specifically. The new reporting template

has a specific field where Member States can report the NECP PaM id, if available. This was not always the case. 13 Member States did not make a link between the national integrated PaMs and the PaMs included in the NECP. Compared to 2019 reporting however, more countries made an explicit link with the NECP and this for far more PaMs.

Table 2-1 Number of PaMs linked to the NECP.

Country	Link with National Energy and Climate Plan
Austria	No PaMs explicitly linked to the Austrian NECP. This is the same as in 2019 reporting.
Belgium	184 PaMs explicitly linked to the Belgian NECP.
Bulgaria	No PaMs explicitly linked to the Bulgarian NECP.
Croatia	101 PaMs explicitly linked to the Bulgarian NECP.
Cyprus	81 PaMs explicitly linked to the Cypriot NECP.
Czechia	No PaMs explicitly linked to the Czech NECP.
Denmark	No PaMs explicitly linked to the Danish NECP.
Estonia	64 PaMs explicitly linked to the Estonian NECP.
Finland	No PaMs explicitly linked to the Finish NECP.
France	No PaMs explicitly linked to the French NECP.
Germany	32 PaMs explicitly linked to the German NECP.
Greece	No PaMs explicitly linked to the Irish NECP.
Hungary	85 PaMs explicitly linked to the Hungarian NECP.
Ireland	No PaMs explicitly linked to the Irish NECP.
Italy	No PaMs explicitly linked to the Irish NECP.
Latvia	No PaMs explicitly linked to the Latvian NECP.
Lithuania	122 PaMs explicitly linked to the Lithuanian NECP.
Luxembourg	197 PaMs explicitly linked to the Luxembourg NECP.
Malta	46 PaMs explicitly linked to the Maltese NECP.
Netherlands	108 PaMs explicitly linked to the Dutch NECP.
Poland	No PaMs explicitly linked to the Polish NECP.
Portugal	94 PaMs explicitly linked to the Portuguese NECP.
Romania	No PaMs explicitly linked to the Romanian NECP.
Slovakia	99 PaMs explicitly linked to the Slovakian NECP.
Slovenia	1 PaMs explicitly linked to the Slovenian NECP.
Spain	161 PaMs explicitly linked to the Spanish NECP.
Sweden	No PaMs explicitly linked to the Swedish NECP.

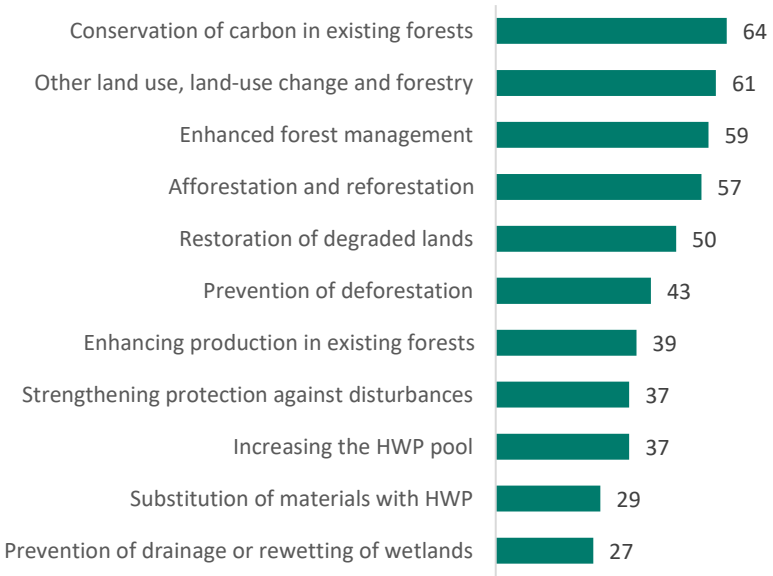
Box 1 Policies and measures to support carbon removal

EU, IPCC and IEA modelling shows that avoiding dangerous climate changes will require a rapid stabilization of atmospheric greenhouse gas concentrations. This will not only require global greenhouse gas emission reductions, but also measures and technologies to remove carbon from the atmosphere.

In the EU's long term strategy, it is already foreseen that carbon removal will need to increase after 2035 to meet net climate neutrality the latest in 2050. This removal will have to be achieved by increased carbon removal from the LULUCF sector and from carbon removal technologies.

Plants naturally will remove CO_2 from the air and use the carbon to grow. This is especially the case for trees, so reforestation, afforestation and restoring forests will increase carbon removal. Almost all Member States have implemented and/or plan national policies and measures to increase the capacity of forests to capture carbon. Austria, Belgium, Cyprus, Czechia, Denmark, Germany, Estonia, Greece, Spain, Finland, France, Croatia, Hungary, Ireland, Lithuania, Luxembourg, Latvia, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia and Slovakia all have at least one PaM in the sector LULUCF. Bulgaria, Malta and Italy did not report LULUCF PaMs. These PaMs are mainly aiming to conserve carbon in existing forest, enhancing forest management practices, and afforestation and reforestation.

Figure B1-1 Number of single PaMs per objective in the LULUCF sector



Source: ETC CM, 2023

Not only plants store carbon, soils do so as well. Changing farming practices can increase the carbon uptake capacity of soils, effectively removing carbon from the atmosphere. 57 single PaMs are aimed at improved management of organic soils and 62 are aimed at activities improving grazing land or grassland management.

Box 1 Policies and measures to support carbon removal (continued)

Concrete examples of PaMs promoting carbon stocks in soils are:

- Belgium which has a specific policy to maintain or increase the carbon stock in agricultural and forest soils.
- The Netherlands and the National Programme on Agricultural Soils
- Denmark banned burning of straw residues on fields, resulting in greater return of carbon to the soil as well as increased use of straw as a fuel.
- Latvia support extensification of crop rotation, this will increase carbon input into soil in conventional production systems and increase of soil carbon stock.

Apart from increased natural carbon absorption from vegetation and soils, there are also technological solutions. *Direct air capture* is the process of chemically scrubbing carbon dioxide from the atmosphere and sequestering it underground or in long-lived products like concrete. Some minerals react naturally with CO_2, which is referred to as *carbon mineralization* or enhanced weathering. While this normally only happens very slowly, the process can be sped up, e.g., by enhancing the exposure of these minerals to CO_2 in the air or ocean. These technologies are still in the early development phase and apart from test facilities are not yet deployed. There appear to be no national policies and measures outside the dimension research, innovation & competitiveness reported that support this. Luxembourg reported one planned policy to study the potential contribution of DAC and CCU, taking life cycle aspects into account, and possible support measures.

At the intersect between these two types of carbon removal solutions, are approaches that use biomass from plants to remove carbon dioxide from the air and then use technology to store it for long periods of time. Combining bioenergy or biomass gasification with carbon capture and storage (BECCS) for example results in net CO_2 removals (See also WRI, 2023).

The EU and many EU Member States have policies and measures in place to support CCS and CCU projects. The EU already funded four large-scale projects via the innovation fund, featuring components of the carbon capture and utilisation value chain. This includes one CHP biomass plant in Sweden that will be converted to a full BECCS facility. Sweden also reported national policies and measures to further support BECCS roll-out. The "Industrial Leap" is a long-term reform programme starting in 2018. It consists of a government scheme to support the development of technologies and processes to reduce process related GHG emissions in Swedish industry. The scope of the policy was amended in 2020 to allow for support of actions leading to negative emissions, such as BECCS. The budget increased over time and in June 2020 SEK 600 million was foreseen for the period 2020-2022. No other country reported as explicitly national PaMs supporting BECCS.

Many countries are supporting CCS and CCU projects via national PaMs, which could also be linked now or in future to biomass energy plants. Denmark for example has two funds that support CCS. The Danish Energy Agency recently awarded a contract as part of the CCUS subsidy scheme to two combined heat and power plants (in May 2023) with the capacity to remove more than 0.4 Mt CO_2 per year by 2026. The Danish Energy Agency is also consulting market participants for a DKK 2.6 billion (EUR 350 million) subsidy scheme targeted at negative emissions (the Negative Emissions CCS fund). In 2023, a total of ten countries reported specific national policies related to CCS and CCU: Croatia, Denmark, France, Greece, Hungary, the Netherlands, Luxembourg, Poland, Romania, and Sweden. This however does not exclude that actions have been taken in other countries as well to invest in CCS and CCU. For example, via the innovation fund, the EU is investing in projects in Belgium, the Netherlands, Norway, France, Sweden and Finland.

2.4 Iceland, Norway and Switzerland

In 2023, Iceland, Norway and Switzerland reported on their national greenhouse gas PaMs. Unlike EU Member States, EFTA countries only have to report on their greenhouse gas PaMs.

In total, 166 single PaMs were reported by the three countries or an average of 55 single PaMs per country. This is a small increase compared to 2021 when the three countries reported a total of 154 single PaMs. As the scope of the reporting did not change, it is not surprising that the number of PaMs is more stable than for the EU countries. The majority of the PaMs of Iceland, Norway and Switzerland have been implemented before 2021 (75%) and only a smaller share of the PaMs (25%) is new and have been or will be implemented in 2021 or later. In contrast, in the EU Member States 43% of all PaMs can be considered new.

Compared to the EU Member States, the PaMs are more evenly distributed over the different sectors. PaMs affecting emissions from transport are reported most frequently (26%) and share for the other sectors ranges from 7% for the sector waste/waste management and 17% for the sector others. There are thus relatively fewer PaMs affecting energy consumption (10%) and energy supply (10%) than in EU Member States.

The type of instruments that are used to reduce greenhouse gas emissions are also more alike. Regulations (44%) and economic (36%) instruments are most often reported, followed by fiscal and planning instrument types (both 16%). Also, voluntary/negotiated agreements are included relatively often (10%), while other instrument types are reported less than 10%.

3 Reported dimensions of policies and measures

3.1 Reported dimensions of policies and measures

The NECPs lay out how each Member State plans to achieve their respective national objectives and contributions to EU targets across the five dimensions of the Energy Union by 2030. These five dimensions are:

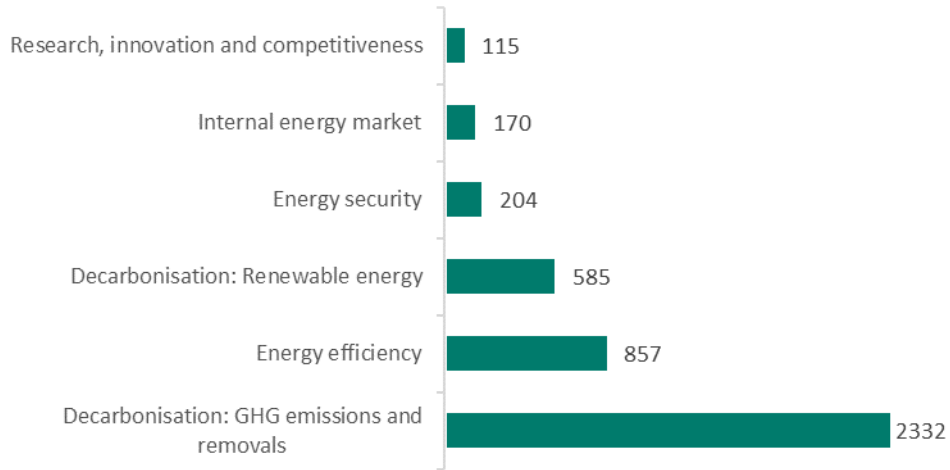
- Decarbonisation,
- Energy efficiency,
- Energy security,
- Internal energy market, and
- Research, innovation and competitiveness.

It is worth noting that a PaM may be reported under multiple different dimensions, e.g. a PaM may be associated with both energy security, and decarbonization: renewable energy. There are 12 countries which reported some PaMs without any associated dimension. There is likely some underreporting on dimensions other than decarbonisation, as these are new in this reporting year. Further dimension-specific information is requested from Member States, based on which dimensions they select in accordance with a PaM.

Across the EU, the number of PaMs per dimension is very varied. The most common dimension is decarbonisation (2 452 single PaMs), with 81% of PaMs listed under this dimension, which is 1 500 single PaMs more than the second most common dimension, energy efficiency.

As the dimension of decarbonisation is associated with such a large proportion of reported PaMs, it has been further split into two sub-dimensions – Decarbonisation: GHG emissions and removals and Decarbonisation: Renewable energy. Even within these further sub-dimensions, more than 1 700 PaMs associated with the decarbonisation dimension are listed under the GHG emissions and removals subcategory than renewable energy.

Figure 3-1 Number of PaMs per dimension reported by Member States.



Source: ETC CM, 2023

The dimensional distribution varies by country, although most Member States do assign the majority of their PaMs to the decarbonisation: GHG emissions and removals dimension. The distribution of PaMs per Member State for each dimension is displayed below in Table 3-1. For six countries (Austria, Czechia, Denmark, Ireland, Latvia and Sweden), all of the PaMs they have submitted correspond to the decarbonisation: GHG emissions and removals dimension. Only three Member States have a different dimension as the most commonly reported. The most common for Bulgaria is decarbonisation: renewable energy, at 56% of their PaMs, and for Greece the most commonly reported was the internal energy market dimension at a share of 25%. The energy efficiency dimension was the most commonly reported for Slovakia, accounting for 68% of their PaMs.

The research, innovation and competitiveness and the energy security dimensions are the two most common dimensions that countries are not reporting a single PaM under them. For both of these dimensions, 11 Member States did not report PaMs under them. However, a relatively significant proportion of both Greece's and Italy's reported PaMs fall under the research, innovation and competitiveness dimension at 15% and 13% of their PaMs, respectively.

Table 3-1 Number of single PaMs per dimension per Member State.

	Decarbonisation: GHG emissions and removals	Decarbonisation: renewable energy	Energy efficiency	Energy security	Internal energy market	Research, innovation and competitiveness	Total
Austria	18	6	7	1	1	1	18
Belgium	196	35	58	1	5	3	241
Bulgaria	2	15	10	0	0	0	27
Croatia	86	5	23	4	5	6	101
Cyprus	74	47	49	34	29	2	85
Czechia	48	0	2	0	0	0	48
Denmark	107	0	0	0	0	0	172
Estonia	102	25	20	0	0	1	105
Finland	121	24	37	7	5	2	132
France	156	22	41	2	3	15	201
Germany	75	4	42	12	2	0	136
Greece	17	10	7	18	19	10	77
Hungary	87	28	28	21	25	4	124
Ireland	84	6	53	0	0	0	84
Italy	72	48	38	8	16	16	109
Latvia	78	16	32	15	0	0	78
Lithuania	93	14	14	0	1	0	122
Luxembourg	159	57	42	12	8	5	197
Malta	30	5	12	3	4	1	46
Netherlands	122	13	35	2	6	11	141
Poland	53	31	0	0	0	0	95
Portugal	53	35	25	12	9	8	96
Romania	86	0	11	0	1	1	88
Slovakia	40	5	94	0	0	0	118
Slovenia	117	41	62	15	4	1	139
Spain	185	82	68	7	3	7	188
Sweden	71	11	13	2	3	2	71
EU27	**2 332**	**585**	**857**	**204**	**170**	**115**	**3 039**

Source: ETC CM, 2023

In the previous reporting round, Member States only had to report PaMs associated with GHG emissions and removals. For the current reporting round, five further dimensions have been added. Therefore, for a fair comparison to be made, Table 3-2 presents a comparison of the number of PaMs reported in 2023 and in the previous reporting period, that are associated with the decarbonisation: GHG emissions and removals. Overall, 280 more single PaMs, related to decarbonisation: GHG emissions and removals, were reported in the current reporting round.

Table 3-2 Number of single PaMs reported in 2023 under the Decarbonisation: GHG emissions and removals dimension compared to PaMs reported in the previous reporting period.

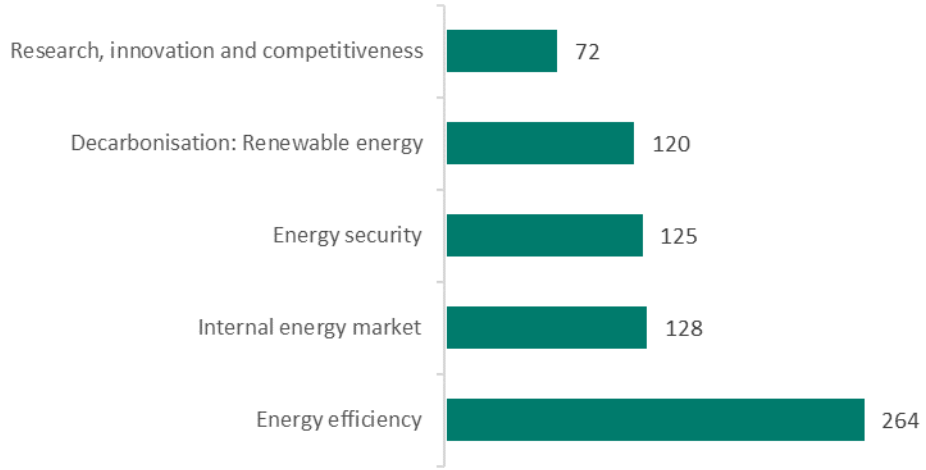
	2021/22	2023	Difference
Austria	27	18	-9
Belgium	213	196	-17
Bulgaria	46	2	-44
Croatia	13	86	73
Cyprus	44	74	30
Czechia	77	48	-29
Denmark	107	107	0
Estonia	66	102	36
Finland	23	121	98
France	102	156	54
Germany	77	75	-2
Greece	184	17	-167
Hungary	98	87	-11
Ireland	88	84	-4
Italy	61	72	11
Latvia	42	78	36
Lithuania	111	93	-18
Luxembourg	70	159	89
Malta	85	30	-55
Netherlands	68	122	54
Poland	88	53	-35
Portugal	47	53	6
Romania	30	86	56
Slovakia	78	40	-38
Slovenia	53	117	64
Spain	118	185	67
Sweden	36	71	35
EU27	**2 052**	**2 332**	**280**

Source: ETC CM, 2023

Across the Member States, 639 PaMs have been reported under dimensions which are not decarbonisation: GHG emissions and removals. These PaMs are associated with one or more other dimensions. Out of these, the most commonly reported dimension is energy efficiency. For the dimensions internal energy market, energy security, and research, innovation and competitiveness, 75%, 61% and 63%, respectively, of the PaMs reported under these categories are not associated with GHG emissions and removals. For the dimension decarbonisation: renewable energy and energy efficiency it is

recommended for Member States to report also the dimension decarbonisation: GHG emissions and removals as renewable energy or energy efficiency policies will also affect GHG emissions. For these PaMs, reporting on dimensions does not seem to be complete.

Figure 3-2 Number of PaMs reported per dimension for PaMs not associated with GHG emissions and removals.

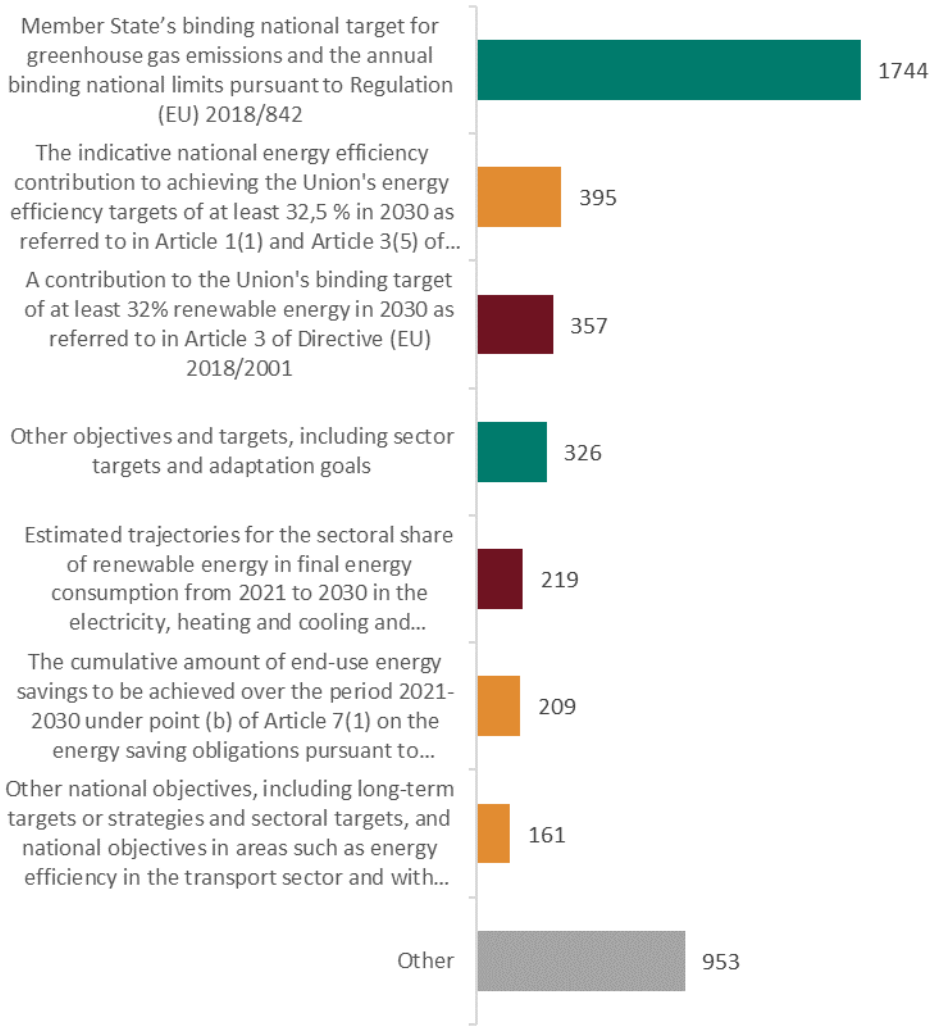


Source: ETC CM, 2023

3.2 Reported dimension-specific characteristics of policies and measures

Out of the 3 039 PaMs reported by the Member State countries, 2 723 of these are associated with one of the Energy Union's relevant objectives, targets or contributions (90%). The majority of these objectives, targets or contributions are associated with the decarbonisation: GHG emissions and removals dimension (2 187 PaMs), followed by objectives, targets or contributions from the decarbonisation: renewable energy (579 PaMs), energy efficiency (760 PaMs), energy security (203 PaMs), internal energy market (164 PaMs) and 113 PaMs that have been aligned with an Energy Union relevant objective, target or contribution are associated with the Research, innovation and competitiveness dimension.

Figure 3-3 Number of single PaMs reported per objective, target and contribution.



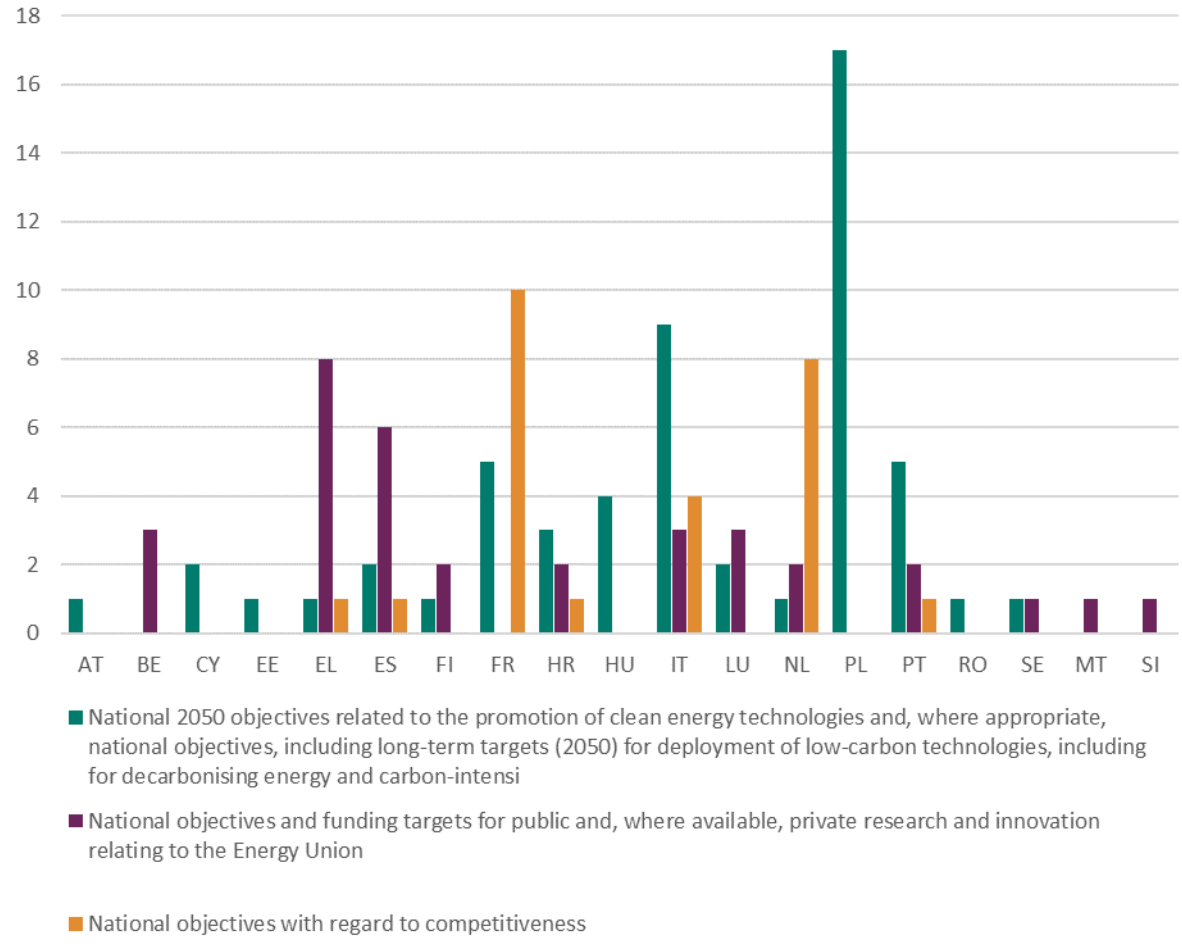
Notes: Green: objectives, targets and contributions to the dimension decarbonisation: GHG emissions and removals; orange: objectives, targets and contributions to the dimension energy efficiency, purple: objectives, targets and contributions to the decarbonisation: renewable energy; grey: remaining objectives, targets and contributions across all dimensions.

Source: ETC CM, 2023

For the PaMs associated with the Research, innovation and competitiveness dimension, 117 are aligned with one of the three objectives, targets or contributions below:

- National objectives and funding targets for public and, where available, private research and innovation relating to the Energy Union (34 PaMs)
- National objectives regarding competitiveness (26 PaMs)
- National 2050 objectives related to the promotion of clean energy technologies and, where appropriate, national objectives, including long-term targets (2050) for deployment of low-carbon technologies, including for decarbonising energy and carbon-intensive industrial sectors and, where applicable, for related carbon transport and storage infrastructure (57 PaMs)

Figure 3-4 **Number of PaMs aligned with the research, innovation and competitiveness dimension per Energy Union's relevant objectives, targets or contributions.**



Source: ETC CM, 2023

For PaMs associated with the research, innovation and competitiveness dimension, Member States can also select the Energy Union Research & Innovation (R&) priority most closely aligned with the PaM. These are outlined in Table 3-3, and cover all aspects of national energy systems from energy production to mobile energy sources.

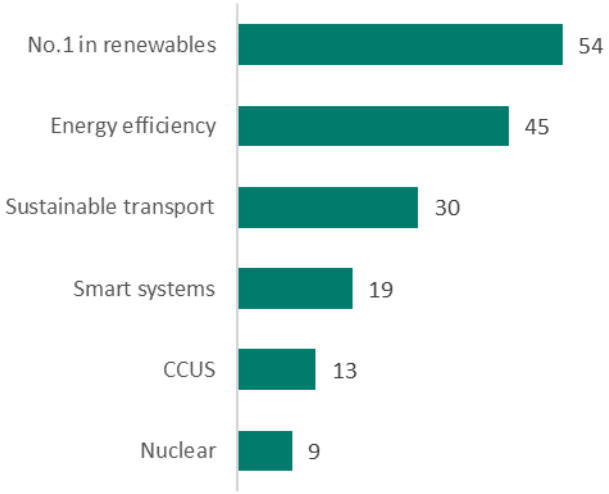
Table 3-3 **Energy Union Research & Innovation priorities.**

Energy Union Research & Innovation (R&I) priorities		
Energy efficiency	No.1 in renewables	Nuclear
Smart systems	Sustainable transport	CCUS

Source: ETC CM, 2023

19 Member States report a total of 115 PaMs associated with research, innovation and competitiveness. These PaMs are distributed between the above R&I priorities as shown in Figure 3-5. The most common priorities are no1 in renewable energy and energy efficiency.

Figure 3-5 **Distribution of PaMs associated with the Research, innovation and competitiveness dimension between the Energy Union R&I Priorities.**



Source: ETC CM, 2023

Every Energy Union R&I priority also has various clean energy/low carbon technology options which Member States can select from a drop-down menu to provide further detail on the PaM and the type of technology it relates to. The options open to Member States are visible in Table 3-4.

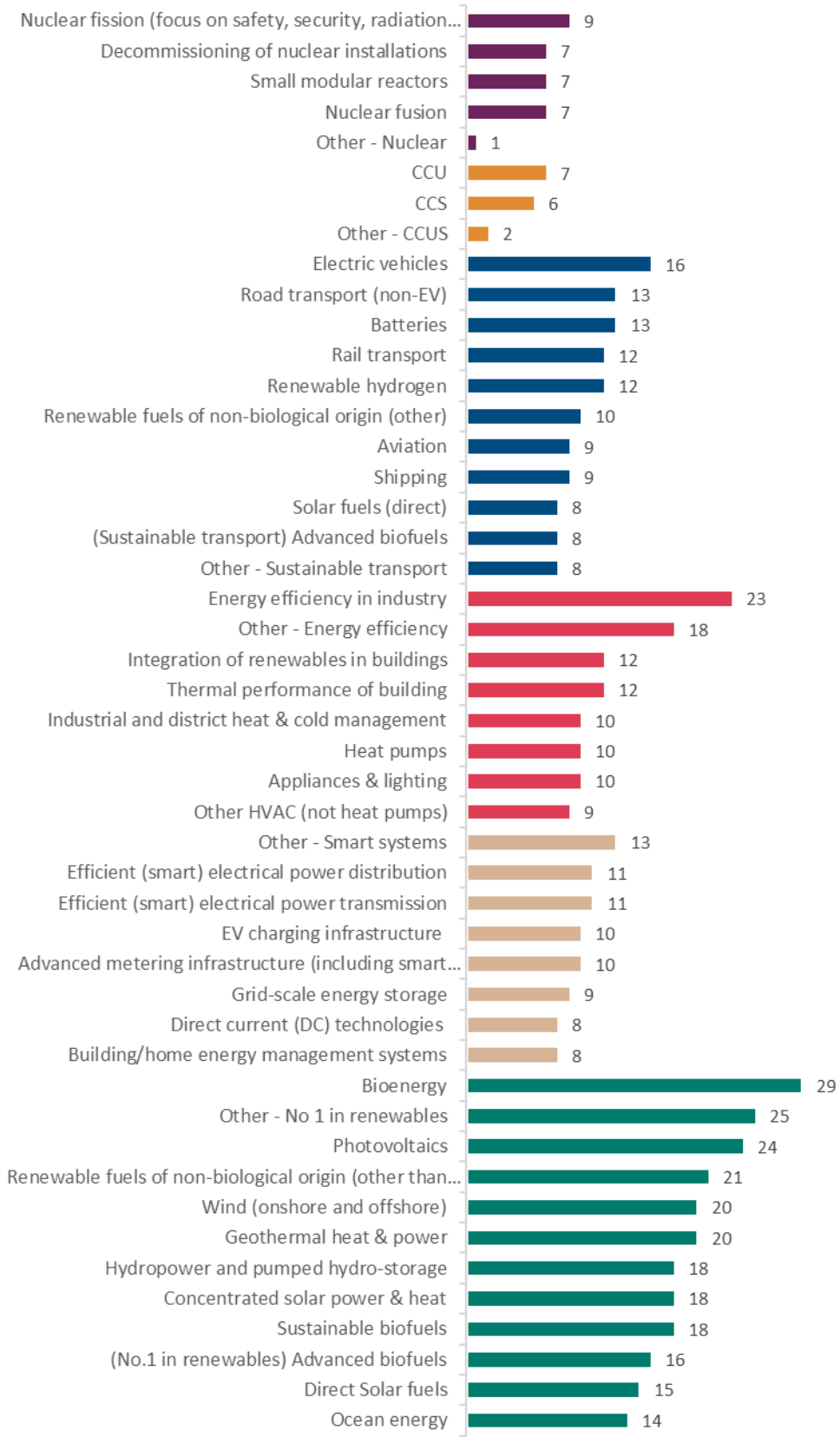
Table 3-4 Supported clean energy/low carbon technology options associated with each Energy Union R&I Priority.

No.1 in renewables	Smart systems	Energy efficiency	Sustainable transport	CCUS	Nuclear
Photovoltaics	Advanced metering infrastructure (including smart meters)	Integration of renewables in buildings	Batteries	CCS	Nuclear fusion
Geothermal heat & power	Building/home energy management systems	Thermal performance of building	Electric vehicles	CCU	Small modular reactors
Wind (onshore and offshore)	Grid-scale energy storage	Appliances & lighting	Road transport (non-EV)	Other – CCUS	Decommissioning of nuclear installations
Ocean energy	Direct current (DC) technologies	Heat pumps	Rail transport		Nuclear fission (focus on safety, security, radiation protection)
Concentrated solar power & heat, solar thermal electricity	EV charging infrastructure	Other HVAC (not heat pumps)	Shipping		Other - Nuclear
Hydropower and pumped hydro-storage	Efficient (smart) electrical power transmission	Energy efficiency in industry	Aviation		
Renewable fuels of non-biological origin (other than hydrogen)	Efficient (smart) electrical power distribution	Industrial and district heat & cold management	(Sustainable transport) Advanced biofuels		
Bioenergy	Other - Smart systems	Other - Energy efficiency	Solar fuels (direct)		
Sustainable biofuels			Renewable hydrogen		
Advanced biofuels			Renewable fuels of non-biological origin (other)		
Direct Solar fuels			Other - Sustainable transport		
Other - No 1 in renewables					

Source: ETC CM, 2023

The most reported clean energy/low carbon technology are photovoltaics and bioenergy which both fall under the "No.1 in renewables" category, with 31 and 36 associated PaMs, respectively. No PaMs were reported under the options Other – CCUS, and Small modular reactors and Other – Nuclear in the nuclear category . Figure 3-6 and Figure 3-7 display the distribution of clean energy/low carbon technologies per Energy Union R&I priority.

Figure 3-6 Distribution of PaMs between technology types.

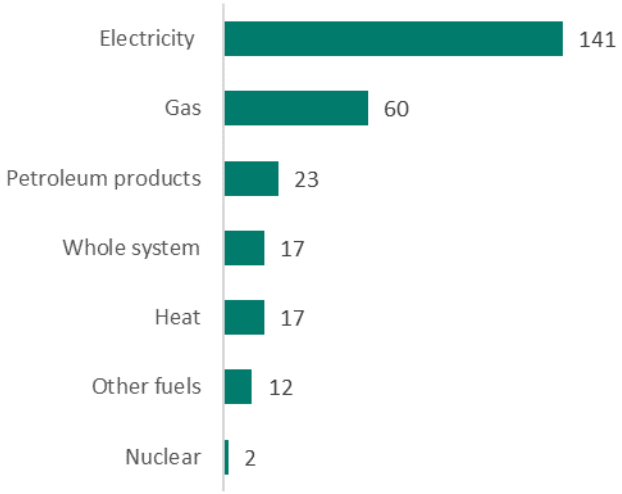


Notes: Technologies are grouped per priority and have a different colour. From top to bottom: Nuclear; CCUS; Sustainable transport; Energy efficiency; Smart systems; and No. 1 in renewable energy.

Source: ETC CM, 2023

When reporting PaMs under the Energy Security dimension, countries should also report an associated "Vector(s) affected" to provide further information. Out of the 241 PaMs reported under the Energy Security dimension, 22 PaMs have no associated vector, and 32 PaMs report that more than one vector will be affected by the PaM. Most PaMs are reported as affecting the electricity vector.

Figure 3-7 Distribution of PaMs between vectors affected within Energy Security dimension (number of PaMs).



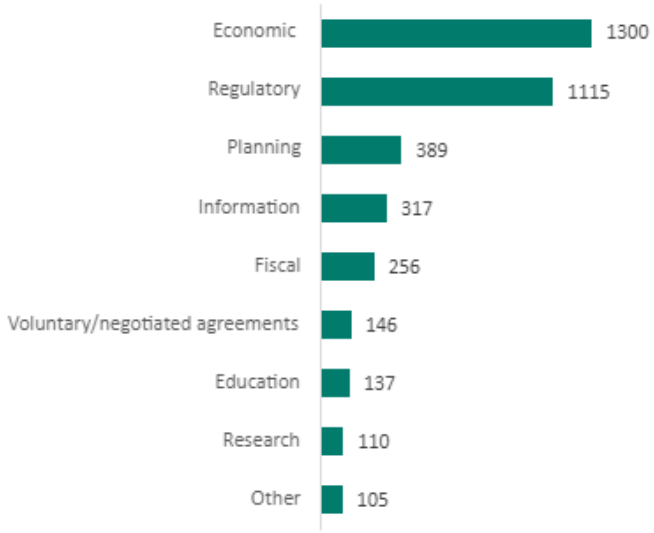
Source: ETC CM, 2023

Box 2 Reported instrument types of policies and measures

Member States were required to indicate the type of instrument implied by each reported PaM. It is worth noting that Member States could report several instrument types for each PaM. The types of instruments that may be reported are economic, education, fiscal, information, planning, regulatory, research, voluntary/negotiated agreements, and other.

The number of PaMs per instrument types varies across the EU27. Economic and regulatory are the two most common types of instruments, accounting for around 43% and 37% of the total 3 039 PaMs reported respectively. Each of these two types of instruments is around three times as popular as the third most common instrument type, planning. The instrument type research (aside from other) is least reported for the PaMs.

Figure B2-1 Distribution of PaMs between instrument types



Source: ETC CM, 2023

The instrument type distribution varies by country. However, aligning with the general distribution, in most cases most of the PaMs are reported under Economic and Regulatory instrument types. The detailed distribution of PaMs per Member State for each type of instrument is presented in Table 6. Most of the Member States' PaMs cover 7-8 types of instruments in this submission. Although the distribution of instrument types of each Member State is similar to the EU distribution, countries still show their own patterns. Countries like Belgium, Finland, and France have relatively large number of PaMs reported for the Information instrument type for example. In general, the Education and Voluntary/negotiated agreements types of instrument accounted for lower numbers of PaMs reported across each Member States.

The relationship between dimensions and types of instruments is also worth discussing here. Similar to the spread of instrument types in the EU and each Member State, Economic and Regulatory are the two most common types across each dimension, and especially for Decarbonisation: GHG emissions and removals and Decarbonisation: Renewable energy. The Regulatory type of instrument comprises a large

percentage (>50%) of the PaMs reported under Internal energy market and Energy security dimensions. As the name may suggest, in the dimension of Research, innovation and competitiveness, 43% of the PaMs are reported under the Research instrument type. In general, the instrument types Voluntary, Education, and Research are lower in terms of reported PaMs across most of the dimensions.

Table 3-5 Distribution of PaMs by instrument type across the different dimensions.

	Decarbonisation: GHG emissions and removals	Decarbonisation: Renewable energy	Energy efficiency	Energy security	Internal energy market	Research, innovation and competitiveness
Economic	1 062	305	387	55	51	63
Education	131	10	41	2		7
Fiscal	226	43	79	4	7	13
Information	275	40	110	13	7	13
Other	55	23	27	17	18	10
Planning	326	71	86	37	23	15
Regulatory	897	228	267	108	91	18
Research	65	10	8	2	1	50
Voluntary/negotiated agreements	134	11	40	3	1	5

Source: ETC CM, 2023

Box 3 Policies and measures contributing to the long-term strategy and net climate neutrality objective

Since 2021 Member States have to report on how policies and measures are contributing to the national long-term strategy and since 2023 also how they are contributing to the net climate-neutrality target of the EU. This is complex as many national policies and measures do not have a known end year or are expected to end in 2030 or before. Only 123 single PaMs have a reported end year that is later than 2030. This means that most existing and planned PaMs will have a short- to medium-term impact on the national and EU long-term objectives and targets, although almost all PaMs will also contribute indirectly by enabling further action in future. It is therefore not that surprising that for 2 780 single PaMs it was indicated that they contribute in one way or another to the long-term objectives and targets. However, details are often missing on how they are contributing. The provided information is generally very heterogenic, making it difficult to extract and summarize information. When more specific information is provided, it typically includes either:

- short- to medium-term impacts on GHG emissions, energy savings or other factors, e.g. 35% reduction of GHG emissions from transport sector by 2030 compared to 2005 (Belgium).
- qualitative information on how the PaM is contributing to the transition to net climate-neutrality, e.g. contribution to the Union's climate-neutrality target by deploying innovative, more energy-efficient technologies through the development of a competitive circular economy and a bioeconomy based on biomass feedstocks (Lithuania). Another example from Slovakia provides more detail: "According to the long-term strategy, this measure contributes to changes in the structure of the economy's industry, which will lead to a redistribution of the workforce across different sectors, taking into account the ageing factor of the population. Some sectors will grow, mainly services and export-oriented industry and sectors supplying goods and will recruit additional workforce. This will also create potential for the emergence of so-called green jobs (jobs related to new activities concerning electromobility and alternatively fueled vehicles, increasing EE and a higher use RES)".
- Several countries (e.g. Belgium, Portugal, Malta, Spain, Slovakia, Croatia) reported explicitly if a PaM was included in the long-term strategy or not. However, this was not always done consistently for all PaMs.

4 Reported effects and costs of policies and measures

4.1 Indicators used to monitor progress of policies and measures

For this overview information from indicators and policy indicators has been combined. These are two separate fields Member States can report on, with the indicators field relating to an *ex-ante* description and values of indicators used to monitor and evaluate the implementation and impact progress of PaMs, and the policy indicators field relating to an up-to-date measure of progress against the policy objective using these indicators. In 2023, 18 countries reported on indicators for at least one PaM, compared with 12 countries in 2021. 17 countries reported at least one policy indicator and 15 countries at least one indicator. This equates to a total of 468 PaMs in 2023 in relation to 239 in 2021. The full comparison by country is given in Table 4-1 below. Table 4-2 and Table 4-3 provide further disaggregation.

Table 4-1 Number of PaMs with at least one quantified indicator reported in 2021 and 2023.

	2021*	2023 Indicator	2023 Policy indicator
Austria	4	5	1
Belgium	0	11	20
Bulgaria	37	0	0
Croatia	0	0	0
Cyprus	0	22	12
Czechia	0	0	0
Denmark	0	0	0
Estonia	15	10	7
Finland	19	44	28
France	23	14	6
Germany	0	0	0
Greece	0	23	12
Hungary	5	6	12
Ireland	0	0	0
Italy	0	0	22
Latvia	15	28	0
Lithuania	0	15	6
Luxembourg	0	0	0
Malta	0	12	11
Netherlands	7	0	0
Poland	30	54	5
Portugal	0	0	3
Romania	0	0	0
Slovakia	16	19	12
Slovenia	18	26	18
Spain	50	2	1
Sweden	0	0	1
EU27	**239**	**291**	**177**

Note: Member States can report one or more indicators per PaM for which quantitative data is provided or not. *in 2021 only an indicator had to be reported.

Source: ETC CM, 2023

Table 4-2 Number of PaMs and policy indicators reported by Member States.

	Total number of PaMs	Number of PaMs with policy indicator	Number of PaMs with quantified policy indicator	Number of policy indicators	Number of quantified policy indicators	Number of quantified data
Austria	18	1	1	1	1	2
Belgium	241	20	20	29	29	31
Bulgaria	27	0	0	0	0	0
Cyprus	85	22	12	46	25	25
Czechia	101	34	0	34	0	0
Germany	136	0	0	0	0	0
Denmark	172	0	0	0	0	0
Estonia	105	8	7	18	17	17
Greece	77	18	1	19	1	1
Spain	188	44	28	62	39	52
Finland	132	6	6	6	6	6
France	201	29	12	31	12	12
Croatia	101	0	0	0	0	0
Hungary	124	12	12	28	28	27
Ireland	84	0	0	0	0	0
Italy	109	23	22	23	22	22
Lithuania	122	6	6	9	9	9
Luxembourg	197	0	0	0	0	0
Latvia	78	0	0	0	0	0
Malta	46	11	11	11	11	14
Netherlands	141	0	0	0	0	0
Poland	95	5	5	5	5	9
Portugal	96	3	3	4	4	4
Romania	88	0	0	0	0	0
Sweden	71	1	1	1	1	1
Slovenia	139	20	18	26	24	24
Slovakia	118	20	12	34	21	21
EU27	**3039**	**283**	**177**	**387**	**255**	**277**

Notes: Number of PaMs with policy indicator: number of PaMs with a least a description of a policy indicator; number of PaMs with quantified policy indicator: number of PaMs with a least a description of a policy indicator and one value for at least one year; Number of policy indicators: number of policy indicators per PaM with a description, indicators can be the same for different PaMs; Number of quantified policy indicators: number of policy indicators per PaM with a description and one value for at least one year; number of quantified data: number of values reported for each policy indicator and PaM, values can be reported for more than one year.

Source: ETC CM, 2023

Table 4-3 Number of PaMs and indicators reported by Member States.

	Number of PaMs with indicator	Number of PaMs with quantified indicator	Number of indicators	Number of quantified indicators	Number of quantified data
Austria	5	5	11	11	42
Belgium	11	11	20	20	40
Bulgaria	0	0	0	0	0
Cyprus	22	22	46	46	131
Czechia	34	0	34	0	0
Germany	0	0	0	0	0
Denmark	0	0	0	0	0
Estonia	10	10	21	21	66
Greece	20	2	25	6	6
Spain	88	44	175	102	181
Finland	14	14	14	14	47
France	43	23	51	29	58
Croatia	0	0	0	0	0
Hungary	6	6	13	13	14
Ireland	45	0	45	0	0
Italy	0	0	0	0	0
Lithuania	15	15	25	25	26
Luxembourg	0	0	0	0	0
Latvia	33	28	41	36	71
Malta	12	12	12	12	12
Netherlands	0	0	0	0	0
Poland	56	54	137	134	240
Portugal	0	0	0	0	0
Romania	0	0	0	0	0
Sweden	0	0	0	0	0
Slovenia	27	26	39	38	58
Slovakia	25	19	41	30	105
EU27	**466**	**291**	**750**	**537**	**1 097**

Notes: Number of PaMs with indicator: number of PaMs with a least a description of an indicator; number of PaMs with quantified indicator: number of PaMs with a least a description of an indicator and one value for at least one year; Number of indicators: number of indicators per PaM with a description, indicators can be the same for different PaMs; Number of quantified indicators: number of indicators per PaM with a description and one value for at least one year; number of quantified data: number of values reported for each indicator and PaM, values can be reported for more than one year.

Source: ETC CM, 2023

4.2 Reported *ex-post* GHG emission savings from policies and measures

Reporting of quantitative data is only mandatory when available. In 2023 seven EU Member States reported *ex-post* quantified data on at least one PaM (i.e. Belgium, Greece, Finland, France, Ireland, Poland and Slovenia). In 2021 ten Member States reported, of which Bulgaria, Spain, and Luxembourg did not report emission savings in 2023. The 2023 reporting relates to 142 PaMs and a total of 448 quantified

emission savings in 2023[7], as opposed to 167 PaMs and 640 quantified emission savings in 2021 (Table 4-4). In 2023, almost all savings were reported for single PaMs and only two grouped PaMs were included.

Table 4-4 shows the level of reporting on *ex-post* emissions savings for the countries which reported on at least one PaM. 2020 is the year for which the reporting was most complete. 25% of PaMs with *ex-post* emission savings were reported for 2020. The next most complete year for reporting is 2015 with a completeness level of 10% of PaMs for which *ex-post* data was provided. Belgium, Ireland, Finland and Poland reported data for 2020, for which the total emission savings per Member State in that year is given in Table 4-5.

Ireland is a good example of complete reporting in emissions savings, in terms of reporting of *ex-post* and *ex-ante* emissions savings, *ex-ante* energy savings, as well as *ex-post* and *ex-ante* renewable energy production. For example, in the case of emissions savings, quantitative information is provided for *ex-post* and *ex-ante* years for all reported PaMs. GHG emissions savings are estimated by the Environmental Protection Agency. These are underpinned by energy efficiency savings that are provided by the Sustainable Energy Authority of Ireland, which are based on updated analysis carried out in parallel with the energy projections modelling.

Table 4-4 Number of data points reported on *ex-post* emission savings by Member States in 2023.

	Number of PaMs	Number of quantified data	ETS emission savings *	ESD emission savings *	LULUCF emission savings *	Total emission savings
Belgium	27	295	294/142	294/255	294/0	294
Finland**	13	13	8/8	7/5	7/0	13
France	4	4	3/0	3/3	3/0	4
Greece	15	28	23/5	23/17	23/1	28
Ireland	64	64	64/20	64/54	64/0	64
Poland	20	43	31/7	29/22	32/3	43
Slovenia**	1	1	0	0	0	1
Total	**144**	**448**	**182**	**356**	**4**	**447**

Note: * the first value denotes the total number of PaMs for which a value is reported, including zero; the second value denotes the number of PaMs for which a non-zero value was reported for ETS, ESD/ESR and LULUCF emission savings.

** Finland and Slovenia each reported *ex-post* emission savings for one group of PaMs, of respectively seven and four single PaMs.

Source: ETC CM, 2023

Table 4-5 Total and disaggregated 2020 *ex-post* GHG emissions savings reported by Member States (kton CO_2e/yr).

	EU ETS	ESR	LULUCF	Total
Belgium	3 337	7 616	0	21 906
Finland	7 977	536	0	17 025
Ireland	12 416	9 161	0	43 154
Poland	12 939	8 956	498	73 135
Total	**36 669**	**26 269**	**498**	**155 220**

Source: ETC CM, 2023

[7] A Member State can report emission savings for multiple past years per PaM or group of PaMs.

4.3 Reported *ex-ante* GHG emissions savings from policies and measures

Reporting of quantitative *ex-ante* savings is again only mandatory when available. *ex-ante* estimates of PaMs emissions savings may be reported for a sequence of four years ending with zero or five immediately following the reporting year (i.e., 2025, 2030, 2035 and 2040). This ensures that data are obtained for the same years and for the same period across countries.

Ex-ante quantified data was more widely reported, with 18 countries reporting for at least one PaM in 2023. In comparison to previous reporting period, this indicates a decline in reporting, as 23 countries reported *ex-ante* quantified data in 2021. Reporting in 2023 relates to 523 PaMs with a total of 1 844 reported data points for emission savings for 2025, 2030, 2035 and 2040. This means that for 1 844 combinations of year and PaM, at least one value was reported. This could be a zero if for another year a non-zero value was reported. 83 of these reported emission savings cases (in 11 countries) relate to grouped PaMs in 2023. There is no specific guidance provided on methods for assessment of *ex-ante* impacts for reporting under the Governance Regulation (or its predecessor the Monitoring Mechanism Regulation), which means that there could be considerable differences across Member States in their approach and their assumptions used to calculate the emissions savings of PaMs. This makes comparison of emissions savings particularly difficult. Table 4-6 gives the number of data points reported on *ex-ante* emissions savings in 2023. Table 4-7 and Figure 4-1.

Table 4-6 Number of data reported on *ex-ante* emission savings by Member States in 2023.

	Number of PaMs	Number of quantified data*	ETS emission savings**	ESR emission savings**	LULUCF emission savings **	Total emission savings
Austria	4	8	8/2	8/6	8/0	8/8
Belgium	49	190	153/58	191/161	154/0	153/144
Bulgaria	0	0	0/0	0/0	0/0	0/0
Cyprus	0	0	0/0	0/0	0/0	0/0
Czechia	34	114	114/20	114/108	114/0	114/114
Germany	58	226	226/135	226/70	226/20	226/221
Denmark	0	0	0/0	0/0	0/0	0/0
Estonia	49	195	135/23	135/97	135/0	195/175
Greece	17	34	34/6	34/28	34/2	34/34
Spain	14	27	23/8	23/19	23/2	27/27
Finland	60	213	207/63	207/172	207/19	213/213
France	12	34	34/4	34/33	34/0	34/34
Croatia	15	60	60/20	60/52	60/4	60/60
Hungary	0	0	0/0	0/0	0/0	0/0
Ireland	81	324	324/84	324/267	324/12	324/324
Italy	0	0	0/0	0/0	0/0	0/0
Lithuania	0	0	0/0	0/0	0/0	0/0
Luxembourg	0	0	0/0	0/0	0/0	0/0
Latvia	51	180	175/33	175/132	175/38	180/180
Malta	7	19	28/5	28/15	28/0	27/19
Netherlands	6	12	12/8	12/10	12/2	12/12
Poland	24	49	32/9	32/19	32/4	49/49
Portugal	0	0	0/0	0/0	0/0	0/0
Romania	12	48	20/4	20/16	24/8	44/44
Sweden	0	0	0/0	0/0	0/0	0/0
Slovenia	27	108	108/20	108/92	108/4	108/108
Slovakia	1	3	3/3	3/3	3/0	3/3
EU27	**521**	**1 844**	**1 696/505**	**1 735/1 300**	**1 701/115**	**1 811/1 763**

Note: *Number of quantified data is the number of PaM and years for which ETS, ESR, LULUCF and/or total emission savings have been reported

** the first value denotes the total number of PaMs for which a value is reported, including zero; the second value denotes the number of PaMs for which a non-zero value was reported for ETS, ESD/ESR and LULUCF emission savings.

Source: ETC CM, 2023

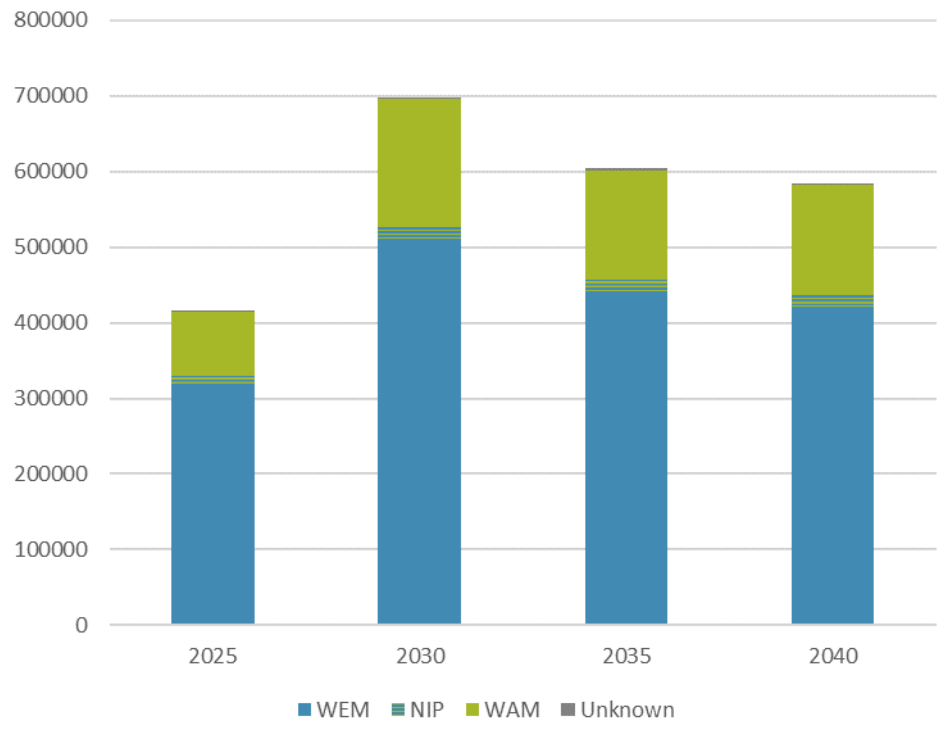
Table 4-7 Emissions savings by year reported by Member States (kt CO_2-eq).

	2025	2030	2035	2040
Austria	5 020	13 970	3 027	0
Belgium	32 484	47 091	47 059	48 106
Czechia	23 208	42 797	45 066	21 115
Germany	45 301	104 746	147 873	180 025
Estonia	1 767	6 237	8 558	8 963
Greece	51 009	59 209	0	0
Spain	-7 795	-5 027	0	0
Finland	48 282	58 656	61 983	45 029
France	41 285	36 427	39 132	0
Hungary	-2 074	-1 124	2 080	4 952
Ireland	34 449	51 940	65 389	74 980
Latvia	1 844	5 335	8 828	12 276
Malta	304	276	226	2
Netherlands	31 892	49 442	0	0
Poland	44 445	148 211	87 230	90 162
Romania	58 813	70 227	75 641	83 471
Slovenia	4 288	7 345	10 403	15 661
Slovakia	697	1 252	1 418	0
Total	**415 219**	**697 010**	**603 912**	**584 742**

Source: ETC CM, 2023

The emission savings are to a large extent reported for PaMs belonging to the "With Existing Measures" (WEM) projection scenario. This is not surprising considering that expired, implemented or adopted policies and measure make up a large share of the reported PaMs. Nevertheless, also substantial emission savings are reported for planned PaMs, suggesting that there is a higher completeness of reporting.

Figure 4-1 **Expected *ex-ante* emission savings of PaMs reported by Member States in 2023 (split between WEM, WAM, NIP and unknown) (kt CO_2-eq).**



Source: ETC CM, 2023

4.4 Reported *ex-post* and *ex-ante* energy savings from policies and measures

In 2023, only three countries reported quantitative data on *ex-ante* energy savings: Belgium, Ireland and Malta. No Member State reported *ex-post* energy savings. Belgium reported the energy savings for only one PaM and only indicated the *ex-ante* energy saving for year 2025. Malta reported *ex-ante* energy savings for five PaMs for years 2025 and 2030. Ireland reported *ex-ante* energy savings for 54 PaMs out of 84 PaMs, wherein they project a 60% increase in energy savings per year by 2040. Table 4-8 presents the detailed *ex-ante* saving for Belgium, Ireland, and Malta.

Table 4-8 ***Ex-ante* energy saving for 2023 reporting (ktoe).**

	***Ex-ante* energy savings (ktoe/year)**				***Ex-post* energy saving (ktoe/year)**
	2025	**2030**	**2035**	**2040**	
Belgium	1.2	N/A	N/A	N/A	N/A
Ireland	7464	10425	11268	11973	N/A
Malta	3.6	5.0	0	0	N/A
Total	**7469**	**10430**	**11268**	**11973**	N/A

Source: ETC CM, 2023

4.5 Reported *ex-post* and *ex-ante* renewable energy production from policies and measures

A similar picture is presented for data on renewable energy production. In 2023, only Malta, Ireland [and Poland] reported quantitative data on renewable energy production. Ireland provided *ex-ante* and *ex-post* information for six PAMs. Overall, it reported an energy production of more than 1 550 ktoe/year in 2020 and projected renewable energy production of about 5 183 ktoe/year in 2025, increasing to 16 187 ktoe/year by 2040.

Malta provided *ex-ante* data on renewable energy production for three PaMs. It expects a renewable energy production of 20 ktoe in 2025 and 11 ktoe in 2040. After 2030 no further new installations are envisaged in Malta. Table 4-9 shows renewable energy production impacts for *ex-ante* and *ex-post* assessments of Ireland and Malta.

Table 4-9 *Ex-ante* and *ex-post* renewable energy production impacts reported in 2023 (ktoe).

	***Ex-ante* renewable energy production (ktoe/year)**				***Ex-post* renewable energy production (ktoe/year)**
	2025	**2030**	**2035**	**2040**	
Ireland	1 417	2 823	4 039	4 819	1 068
	389	367	312	253	174
	660	1 059	1 537	1 907	309
	1 695	3 541	4 683	5 660	
	351	408	439	391	
	672	1 720	2 497	3 155	
IE Total	**5 183**	**9 917**	**13 506**	**16 187**	**1 551**
Malta	7	10	10	9.3	N/A
	0.7	1.3	1.3	1.3	N/A
	12	15	0	0	N/A
MT Total	**20**	**26**	**11**	**11**	**N/A**
Grand Total	**5 203**	**9 943**	**13 517**	**16 197**	**1 551**

Source : ETC CM, 2023

4.6 Reported *ex-ante* and *ex-post* costs and benefits of policies and measures

The Governance Regulation requires that Member States report information on the projected (*ex-ante*) and realised (*ex-post*) costs and benefits of climate and energy PaMs, when available. Historically under the Monitoring Mechanism Regulation reporting this data has been rather incomplete, and so it was in 2021 and again in 2023. Only five Member States (Belgium, Czechia, France, Latvia and Slovakia) reported data on costs and benefits for at least one PaM in 2023. In total, scattered information was provided for 30 PaMs. Most reported cost and benefits related to GHG emission savings. Only one Member State (Slovakia) provided information on one PaM on the cost and benefits related to energy savings and none on the costs and benefits related to renewable energy production.

Table 4-10 Number of data points reported on costs and benefits by Member States in 2023.

Data	Member States reporting data for at least one PaM	Number of single or grouped PaMs
Projected costs	Belgium, CzechiaZ, Latvia, Slovakia*	29
Projected benefits	Slovakia*	1
Projected net costs	Belgium, Czechia, Slovakia*	20
Realised costs	France	2
Realised benefits	France	1
Realised net costs	France	1

Note: *related to energy savings

Source: ETC CM, 2023

The completeness of reporting on this element, has decreased over the years. In 2017 ten Member States reported quantitative information on the costs of some of their climate PaMs. In 2019 the number of Member States reduced to nine, and in 2021 this number reduced to eight. This is in comparison to the five Member States that reported on costs or benefits in 2023.

Czechia reported the most data amongst all Member States. It provided information on projected costs for 21 PaMs. This is followed by Latvia with five PaMs and France and Belgium with two PaMs each.

4.7 Non-greenhouse gas mitigation benefits

Since 2021 reporting, information on the non-greenhouse gas mitigation benefits of PaMs is required. Only Greece and Spain provided information for this field in 2023. This aligns with the countries that reported in this field in 2021.

In the 2023 submission, Greece provided quantified expected air pollution emission reductions for five PaMs by 2030. Greece focused on reducing the air pollutants of NH_3, NO_x, SO_2, and $PM_{2.5}$. The number of PaMs is the same as 2021reporting. Spain provided information for 10 PaMs in 2023. The description of positive effects for Spain is more general, including promotion of circular economy, increase in employment, more efficient resource use, conservation and improvement to biodiversity, prevention of desertification and land erosion. Details of the reporting are shown in Table 4-11.

Similar to 2021 reporting, information on non-greenhouse gas mitigation benefits is still relatively scarce due to reasons of low response rate by reporting Member States.

Table 4-11 Non-greenhouse gas mitigation benefits reported by Greece and Spain in 2023 (number of PaMs).

	Description of projected non-GHG mitigation benefits	Number of PaMs
Greece	Reduction in air pollutant emissions for 2030. NH_3 4kt	1
	Reduction in air pollutant emissions for 2030. NH_3 5kt	1
	Reduction in air pollutant emissions for 2030. SO_2 275kt, NOx 105 kt, $PM_{2.5}$ 10 kt. The effect includes the additional measures of PaM 18.	1
	Reduction in air pollutant emissions for 2030. SO_2 6kt, NOx 18 kt	1
	Reduction in air pollutant emissions for 2030. SO2 95kt, NOx 35 kt, $PM_{2.5}$ 3kt. The effect includes the additional measures of PaM Id 21.	1
Greece Total		**5**
Spain	Circular economy. Employment. Minimize the impact on the environment. Institutional coordination.	1
	Generation of rural employment, conservation and improvement of biodiversity, contribution to the hydrological cycle, prevention of desertification and land erosion.	3
	Protect resources. Promote change in economic model. Efficient use of resources.	2
	Reduce the risk of water contamination. Reduce air pollution. Organic soil improvement. Others of social interest.	1
	Reduce impacts on the environment, air, water or soil and health.	1
	Efficient use of resources.	1
Spain Total		**10**
Total		**15**

Source: ETC CM, 2023

5 New reporting requirements under Annex X - XIV

5.1 Annex X

5.1.1 Introduction

Article 21 on integrated reporting on energy efficiency of the Governance Regulation stipulates that Member States shall report on the implementation of the following PaMs:

(1) implemented, adopted and planned policies, measures and programmes to achieve the indicative national energy efficiency contribution for 2030 as well as other objectives referred to in Article 6, including planned measures and instruments (also of a financial nature) to promote the energy performance of buildings, measures to utilise energy efficiency potentials of gas and electricity infrastructure and other measures to promote energy efficiency;
(2) where applicable, market-based instruments that incentivise energy efficiency improvements, including but not limited to energy taxes, levies and allowances;
(3) national energy efficiency obligation scheme (EEOS) and alternative measures pursuant to Article 7a and 7b of Directive 2012/27/EU;
(4) long-term renovation strategies in accordance with Article 2a of Directive 2010/31/EU;
(5) policy and measures to promote energy services in the public sector and measures to remove regulatory and non-regulatory barriers that impede the uptake of energy performance contracting and other energy efficiency service models;
(6) regional cooperation in the area of energy efficiency, where applicable;
(7) without prejudice to Articles 107 and 108 TFEU, financing measures, including Union support and the use of Union funds, in the area of energy efficiency at national level, where applicable.

When reporting on the new PaMs referred to in (3), Member States have to report the information as detailed in Annex III of the Governance Regulation and in accordance with the formats set out in Annex X to the Implementing Regulation 2022/2299.

Annex X thus collects important information related to Article 7 of the Energy Efficiency Directive. This Article obliges Member States to achieve cumulative end-use energy savings at least equivalent to:

(a) new savings each year from 1 January 2014 to 31 December 2020 of 1,5 % of annual energy sales to final customers;
(b) new savings each year from 1 January 2021 to 31 December 2030 of 0,8 % of annual final energy consumption[8].

5.1.2 Reported information

Member States can report on multiple single PaMs and/or a group of single PaMs. Eight EU Member States reported information on the EEOS. This includes seven countries that had a known EEOS from previous reporting and Hungary, which reported for the first time on the EEOS. The Hungarian EEOS was established in 2021. Hungary did not achieve the 2020 savings targets and the 2030 targets will require the introduction of additional policy measures on top of the existing ones. In 2020, the Government of Hungary adopted its NECP, which already set out the introduction of an EEOS[9]. The cumulative energy savings from the reported Member States' EEOS in the period 2021-2030 amounted to 109 391 ktoe.

(8) Cyprus and Malta only have to achieve new savings each year from 1 January 2021 to 31 December 2030 equivalent to 0,24 % of annual final energy consumption.
(9) https://mehi.hu/en/eeo-energy-efficiency-obligation-scheme/

Table 5-1 Reporting by EU Member States on Annex X in 2023 and in comparison to 2020.

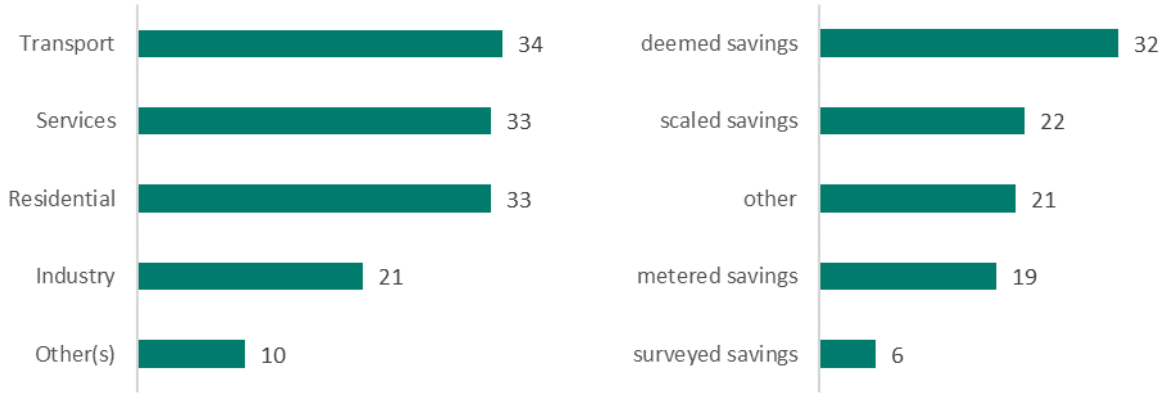
	Energy efficiency Obligation Schemes (EEOS)		Alternative policy measures referred to in Article 7b and Article 20(6)		Information on taxation measures
	Implemented 2020	Reported 2023	Implemented 2020	Reported 2023	Reported 2023
Austria	YES	NO	YES	YES	NO
Belgium	NO	NO	YES	NO	NO
Bulgaria	YES	NO	YES	YES	NO
Croatia	YES	YES	YES	YES	NO
Cyprus	NO	NO	YES	NO	NO
Czechia	NO	NO	YES	YES	NO
Denmark	YES	NO	NO	NO	YES
Estonia	NO	NO	YES	NO	NO
Finland	NO	NO	YES	NO	NO
France	YES	YES	NO	NO	NO
Germany	NO	NO	YES	NO	NO
Greece	YES	NO	YES	NO	NO
Hungary	NO	YES	YES	NO	NO
Ireland	YES	YES	YES	YES	YES
Italy	YES	NO	YES	NO	NO
Latvia	YES	NO	YES	YES	NO
Lithuania	NO	NO	YES	YES	YES
Luxembourg	YES	YES	NO	NO	NO
Malta	YES	NO	YES	YES	NO
Netherlands	NO	NO	YES	YES	YES
Poland	YES	YES	YES	YES	NO
Portugal	NO	NO	YES	YES	NO
Romania	NO	NO	YES	NO	NO
Slovakia	NO	NO	YES	NO	NO
Slovenia	YES	YES	YES	YES	NO
Spain	YES	YES	YES	YES	NO
Sweden	NO	NO	YES	NO	YES

Source: JRC, 2022; ETC CM, 2023.

While 15 EU Member States established an EEOS to achieve the energy savings target, few countries only rely on the EEOS to achieve the energy savings target of Article 7 (i.e. Luxembourg, France and Denmark). Most EU Member States rely in addition or solely on alternative policy measures. While not all reported new policy measures, 13 Member States did provide information for 86 new PaMs. This includes four PaMs for which only a reference is provided. These PaMs can affect one or more end-use sectors. The sector that is most selected is the transport sector (34 PaMs), closely followed by the services and residential sector (both 33 PaMs). The majority of the PaMs only affected one sector (53 PaMs).

Member States have to report the calculation methodology that is used to quantify energy savings. The options are deemed, metered, scaled, surveyed and other savings methods. More than one method can be selected, which is done for eight PaMs. For the majority of PaMs only one methodology was selected. Deemed savings was most often used, while surveyed savings was least popular.

Figure 5-1 Number of policy measures per selected sectors (left) and calculation methodology (right) for alternative policy measures.



Source: ETC CM, 2023

The energy savings reported for these 86 PaMs is most complete for the cumulative energy savings over the 2021-2023 period. 75 new PaMs are expected to deliver energy savings of 48 850 ktoe between 2021 and 2030. The average energy savings is 650 ktoe per policy measure, but this is largely influenced by some policy measures with a large impact; the median is 114 ktoe. For 60 PaMs also information is provided on an annual basis.

Only six new taxation measures were reported, by Denmark, Lithuania, Sweden, Netherlands, Ireland and Luxembourg. The Netherlands reported by making a reference to an external link.

5.2 Annex XI on EED Article 7

5.2.1 Introduction

Following Article 21(d) of the Governance Regulation, Member States have to provide additional information in the area of energy efficiency on:

- the cumulative amount of energy savings achieved through Article 7 of the EED in years X-3 and X-2;
- the amount of savings achieved by policy measures aimed at alleviation of energy poverty (in line with Article 7(11) of the EED);
- where applicable, the amount of savings achieved in accordance with point (c) of Article 7(4) of the EED, i.e., energy savings achieved in the energy transformation, distribution and transmission sectors, including efficient district heating and cooling infrastructure.

Member States shall report this information in accordance with the formats set out in Annex XI of the Implementing Regulation 2022/2299.

5.2.2 Reported information

Apart from Romania and Sweden, all Member States reported information on Annex XI by the cut-off date for this report. Member States can report on multiple single PaMs and/or a group of single PaMs. For example, Belgium reported on 21 single PaMs, while Austria reported on five single PaMs and one grouped PaM (consisting of two single PaMs).

Table 5-2 Reporting by EU Member States (number of entries – number of PaMs) on Annex XI in 2023.

	Final energy savings achieved through national EEOs referred to in Article 7a of Directive 2012/27/EU or alternative measures adopted in application of Article 7b of that Directive	Of which final energy savings achieved by PaMs aimed at alleviation of energy poverty in line with Article 7(11) of Directive 2012/27/EU	Amount of final energy savings achieved in accordance with Article 7(4), point (c) of Directive 2012/27/EU
Austria	YES (5 - 6)	NO	NO
Belgium	YES (21 - 21)	YES (2 – 2)	NO
Bulgaria	YES (5 - 5)	NO	NO
Croatia	YES (7 - 7)	YES (1 – 1)	YES (1 – 1)
Cyprus	YES (7 - 7)	YES (1 - 1)	NO
Czechia	YES (12 - 12)	NO	YES (12 – 12)
Denmark	YES (8-8)	NO	NO
Estonia	YES (11 – 24)	YES (3 – 3)	YES (11 – 24)
Finland	YES (1 - 1)	NO	NO
France	YES (1 - 1)	YES (1 – 1)	NO
Germany	YES (22 – 24)	YES (1 – 1)	NO
Greece	YES (1 – 3)	YES (1 – 3)	NO
Hungary	YES (6 – 12)	NO	NO
Ireland	YES (5 – 40)	YES (2 – 20)	NO
Italy	YES (11 - 11)	NO	NO
Latvia	YES (1 – 7)	NO	NO
Lithuania	YES (13 - 13)	NO	NO
Luxembourg	YES (1 - 1)	NO	NO
Malta	YES (1 - 1)	NO	NO
Netherlands	YES (4 - 4)	NO	NO
Poland	YES (4 – 5)	NO	NO
Portugal	YES (6 – 7)	YES (1 – 1)	NO
Romania	NO	NO	NO
Slovakia	YES (8 - 8)	NO	YES (2 – 2)
Slovenia	YES (39 - 39)	YES (1 – 1)	YES (1 – 1)
Spain	YES (15 - 15)	NO	NO
Sweden	NO	NO	NO

Source: ETC CM, 2023.

Total end-use savings reported in Table 5-3 below, and compared to 2020 (JRC, 2022). Germany and Italy reported the highest savings.

Table 5-3 Results of the reporting by EU Member States on Article 7 on end-use savings in 2023.

	Total annual end-use savings achieved in 2021 (ktoe)	Savings achieved in 2021 only from new actions (ktoe)	Savings achieved in 2020 from new actions (ktoe)
Austria	117	117	760
Belgium	276	276	221
Bulgaria	24	24	39
Croatia	83	83	13
Cyprus	54	54	63
Czechia	120	120	201
Denmark	64	64	103
Estonia	66	66	108
Finland	463	463	522
France	24	24	1639
Germany	3691	3691	2691
Greece	35	35	224
Hungary	45	45	NA
Ireland	66	66	89
Italy	1128	1128	832
Latvia	46	46	110
Lithuania	177	177	114
Luxembourg	20	20	20
Malta	2	2	6
Netherlands	752	752	749
Poland	552	552	227
Portugal	105	105	227
Romania	NA	NA	NA
Slovakia	106	106	52
Slovenia	52	52	54
Spain	270	270	727
Sweden	NA	NA	1496

Source: JRC, 2022; ETC CM, 2023.

5.3 Annex XII on EED Article 5

5.3.1 Introduction

The Governance Regulation specifies additional information in the area of energy efficiency in Annex IX, part 2. This includes, among other things, the total building floor area of heated and/or cooled buildings owned and occupied by the Member States' central government that was renovated in year X-3 and X-2 referred to in Article 5(1) of the Directive 2012/27/EU or the amount of energy savings in eligible buildings owned and occupied by their central government as referred to in Article 5(6) of Directive 2012/27/EU. The reporting format was laid down in Annex XII of the implement regulation 2022/2299.

In accordance with Article 5(1) of Directive 2012/27/EU, Member States are required to ensure that 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 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)), whereby they take other cost-effective measures, including deep renovations and measures for behavioural change of occupants, to achieve an amount of energy savings in eligible buildings owned and occupied by their central government that is at least equivalent to that required in Article 5(1).

5.3.2 Reported information

Most countries provided information on Article 5, either under 5(1) or 5(6). Member States can report on multiple single PaMs and/or a group of single PaMs. Czechia provided information in both tables, although it only has to report under 5(6). Only Denmark, Estonia, Germany, Hungary, Romania, and Portugal did not provide information before the 28th August.

Table 5-4 Reporting by EU Member States on Annex XII in 2023.

	Total renovated building floor area of heated and/or cooled buildings owned and occupied by the Member States' central government referred to in Article 5(1) of the Directive 2012/27/EU	The amount of energy savings in eligible buildings owned and occupied by their central government as referred to in Article 5(6) of Directive 2012/27/EU
Austria	NO	YES
Belgium	NO	YES
Bulgaria	YES	NO
Croatia	NO	YES
Cyprus	NO	YES
Czechia	YES	YES
Denmark	NO	NO
Estonia	NO	NO
Finland	NO	YES
France	NO	YES
Germany	NO	NO
Greece	YES	NO
Hungary	NO	NO
Ireland	NO	YES
Italy	YES	NO
Latvia	YES	NO
Lithuania	YES	NO
Luxembourg	YES	NO
Malta	NO	YES
Netherlands	NO	YES
Poland	NO	YES
Portugal	NO	NO
Romania	NO	NO
Slovakia	NO	YES
Slovenia	YES	NO
Spain	YES	NO
Sweden	NO	YES

Source: ETC CM, 2023.

The results are presented in Table 5-5 and Table 5-6 below for reporting on respectively Article 5(1) and Article 5(6). The data shows similarity with 2020 reporting. Estonia, Italy and Lithuania reported an

increased renovated floor area of governmental buildings in 2021 compared to 2020, while in Bulgaria, Spain, Luxembourg, Latvia and Slovenia the rate renovated area decreased.

Table 5-5 Results of the reporting by EU Member States on Article 5(1) in 2023.

	Renovated floor area (m²)	
	2021	2020*
Bulgaria	23 475	91 796
Estonia	18 681	9 471
Greece	0	0
Spain	234 688	304 763
Hungary	-	-
Italy	132 160	89 180
Lithuania	34 290	24 720
Luxembourg	0	1 955
Latvia	63 769	98 102
Portugal	-	3 107
Romania	-	-
Slovenia	0	2 528

Note: * Reporting for year 2020 was not required, although some Member States provided information. This matched with the information reported previously. Here information from JRC is combined with 2023 Member States data.

0 means that the country reported that no renovation of government buildings occurred in that year.

Source: JRC, 2022; ETC CM, 2023.

Table 5-6 Results of the reporting by EU Member States on Article 5(6) in 2023.

	Savings achieved (ktoe)		
	2021 FEC	2021 PEC	2020*
Austria	0.35	-	0.89
Belgium	-	0.97	1.13
Cyprus	0.28	0.53	0.17
Czechia	0.38	-	0.60
Germany	-	-	5.58 (2019)
Denmark	-	-	0.80
Finland	-	0.22	0.14
France	-24.00	-15.00	98.02
Croatia	0.20	0.27	0.00
Ireland	-	0.40	0.77
Malta	6.28	21.66	0.02
Netherlands	-0.20	-	1.87
Poland	-	0.50	0.58
Sweden	-0.59	-	-3.17
Slovakia	5.81	-	10.63

Note: * BE, DK, DE, CY, PL: primary energy savings; SK, SE: not clear if savings are primary or final; CZ, FR, HR, MT, NL, AT, FI, IE: final energy savings.

The reporting in 2021 combines the energy savings achieved in 2021 with corrections needed to the previous reporting on 2020 energy savings. Therefore some energy saving values are negative.

Source: JRC, 2022; ETC CM, 2023.

5.4 Annex XIII on Financing

5.4.1 Introduction

The Governance Regulation states the following in terms of reporting on progress towards financing: "Member States shall report the information on progress towards financing the policies and measures, or groups of policies and measures, referred to in Article 17(2), point (a), Article 20, point (b)(3), Article 21, point (b)(7), Article 22, point (g), Article 23(1), point (j) and Article 25, point (g) of Regulation (EU) 2018/1999 and reported in accordance with Article 7(1) of this Regulation, including a review of actual investment against initial investment assumptions, in accordance with the formats set out in Annex XIII to this Regulation." Therefore, Member States are to report on the progress of financing PaMs listed in their NECP, in comparison with initial investment assumptions.

5.4.2 Reported information

Table 5-6 provides data on whether any information was reported by each Member States under this annex, and the total number of PaMs for which information was reported.

Table 5-7 Information reported by Member States under Annex XIII in 2023.

	Information reported	Number of PaMs
Austria	NO	0
Belgium	YES	13
Bulgaria	YES	5
Croatia	YES	15
Cyprus	YES	23
Czechia	YES	6
Denmark	YES	53
Estonia	YES	65
Finland	YES	21
France	YES	12
Germany	NO	0
Greece	YES	80
Hungary	YES	22
Ireland	YES	87
Italy	NO	0
Latvia	YES	1
Lithuania	YES	22
Luxembourg	YES	119
Malta	YES	21
Netherlands	YES	22
Poland	YES	53
Portugal	YES	57
Romania	NO	0
Slovakia	YES	94
Slovenia	YES	11
Spain	YES	45
Sweden	YES	42
EU27		**889**

Source: ETC CM, 2023

Table 5-8 provides the comparison of initial investment assumption, funding up to the present, and funding still to be implemented, for each country. National public funding, EU RRF and ERDF and/or Cohesion Fund funding (which together make up total EU level funding), and private funding together comprise total funding up to the present year.

One point to make from this information is that the majority (300 out of 340 billion euros) of funding up to this point has come from national governments. The other clear point to make in terms of the general picture is that funding mobilised up to this point added to that still to be implemented is currently falling short of initial investment assumptions (592 billion in comparison to 671 billion), as reporting currently stands. There are variations for individual Member States on both of these points. However, Belgium, for example, is already exceeding their initial investment assumptions, and in the case of the Netherlands, private funding constitutes the main component of funding. Other such examples can be found in the table below.

Table 5-8 Disaggregated funding total reported by Member States in 2023 (in EUR_{2023} billion).

	Initial Investment Assumption	National Public Funding	Total EU Funding	EU RRF Funding	EU ERDF and/or Cohesion Fund	Private Funding	Still to be Implemented
Austria	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Belgium	3.3	2,1	0,0	0,0	0,0	1,0	0,6
Bulgaria	11.1	5,6	0,7	0,7	0,0	0,0	4,3
Croatia	10.0	0,4	0,2	0,0	0,1	0,0	8,8
Cyprus	6.6	0,1	0,0	0,0	0,0	0,1	6,1
Czechia	15.9	0,5	0,0	0,0	0,0	0,0	15,4
Denmark	0.0	0,0	0,0	0,0	0,0	0,0	0,0
Estonia	4.7	1,7	1,5	0,0	1,0	0,5	3,5
Finland	0.0	1,7	0,2	0,0	0,0	0,0	0,0
France	333.1	275,9	0,0	0,0	0,0	0,0	0,1
Germany	0.3	23,1	0,0	0,0	0,0	0,0	0,6
Greece	49.7	1,7	1,4	0,1	0,4	0,0	46,0
Hungary	21.7	3,2	3,4	0,0	3,4	0,4	12,9
Ireland	26.4	0,6	0,1	0,0	0,1	0,0	21,2
Italy	0.0	0,0	0,0	0,0	0,0	0,0	0,0
Latvia	0.1	0,0	0,0	0,0	0,0	0,0	0,1
Lithuania	1.3	0,1	0,4	0,0	0,4	0,1	0,1
Luxembourg	12.9	0,6	0,0	0,0	0,0	0,2	12,1
Malta	1.8	0,7	0,1	0,0	0,1	0,0	2,0
Netherlands	82.2	5,9	0,0	0,0	0,0	15,9	59,6
Poland	93.6	14,9	10,5	0,2	9,8	4,7	66,3
Portugal	7.5	2,1	0,7	0,3	0,4	0,1	4,7
Romania	0.0	0,0	0,0	0,0	0,0	0,0	0,0
Slovakia	15.3	0,1	0,4	0,0	0,0	2,4	4,1
Slovenia	0.0	0,1	0,0	0,0	0,0	0,3	0,0
Spain	49.2	0,2	0,0	0,0	0,0	1,7	0,0
Sweden	9.8	1,1	0,0	0,0	0,0	0,0	2,1
EU27	**756.5**	**342,3**	**19,7**	**1,4**	**15,7**	**27,5**	**270,3**

Note: The reported values are converted to 2023 real EUR values, based on annual EU27 HICP data for January (Eurostat).

Source: ETC CM, 2023

5.5 Annex XIV on Air quality

5.5.1 Introduction

The Governance Regulation states the following in terms of impact on air quality and on emissions of air pollutants:

"When reporting on quantification of the impact of the policies and measures, or groups of policies and measures, on air quality and on emissions of air pollutants, that are covered by the reports submitted in accordance with Article 7(1) and (2), Member States shall do so in accordance with the formats set out in Annex XIV".

Member States are therefore to report on any impacts on air quality resulting from their reported PaMs.

5.5.2 Reported information

Table 5-9 provides the data on whether any information was reported by each Member States under this annex, and the total number of PaMs information was reported for.

Table 5-9 Information reported by Member States under Annex XIV in 2023.

	Information reported	Number of PaMs
Austria	YES	11
Belgium	NO	0
Bulgaria	NO	0
Cyprus	YES	85
Czechia	YES	2
Germany	NO	0
Denmark	YES	3
Estonia	YES	82
Greece	YES	12
Spain	YES	10
Finland	NO	0
France	YES	14
Croatia	YES	8
Hungary	YES	30
Ireland	YES	65
Italy	NO	0
Lithuania	YES	62
Luxembourg	NO	0
Latvia	YES	56
Malta	YES	15
Netherlands	YES	6
Portugal	YES	131
Romania	YES	12
Sweden	YES	82
Slovenia	YES	4
Slovakia	NO	0
EU27		**679**

Source: ETC CM, 2023

Table 5-10, Table 5-11 and Table 5-12 provide more detailed information on the expected impacts of the PaMs of each Member State on NOx and PM2.5 pollutants by year, and the total impacts on each affected pollutant across the EU.

Table 5-10 Quantified expected emissions impacts by year reported by Member States in 2023, NOx (kt/yr).

	Quantified Expected Emissions Impacts 2025	Quantified Expected Emissions Impacts 2030	Quantified Expected Emissions Impacts 2035	Quantified Expected Emissions Impacts 2040	Quantified Expected Emissions Impacts 2045	Quantified Expected Emissions Impacts 2050
Austria	0.00	0.00	0.00	0.00	0.00	0.00
Bulgaria	80.00	70.00	0.00	0.00	0.00	0.00
Cyprus	-10.18	-8.86	0.00	0.00	0.00	0.00
Czechia	0.00	0.00	0.00	0.00	0.00	0.00
Denmark	0.00	-2.69	0.00	0.00	0.00	0.00
Estonia	-1.57	-4.94	-6.78	-7.48	-7.89	-8.12
Greece	0.00	-176.00	0.00	0.00	0.00	0.00
Spain	0.00	-8.96	0.00	0.00	0.00	0.00
France	-973.00	-1 092.00	0.00	0.00	0.00	-1 204.00
Croatia	-0.97	-1.74	0.00	0.00	0.00	0.00
Hungary	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-20.72	-28.05	-32.87	-37.08	-41.59	-45.70
Lithuania	0.00	0.00	0.00	0.00	0.00	0.00
Luxembourg	0.00	0.00	0.00	0.00	0.00	0.00
Latvia	0.00	0.00	0.00	0.00	0.00	0.00
Malta	-0.04	-0.03	0.00	0.00	0.00	0.00
Netherlands	-18.50	-41.35	-51.15	-57.15	0.00	0.00
Poland	-4.26	-0.05	-0.01	0.00	0.00	0.00
Romania	-90.61	-83.53	0.00	0.00	0.00	0.00
Slovenia	-1.23	-2.99	0.00	0.00	0.00	0.00
Total	**-1 041.08**	**-1 381.18**	**-90.81**	**-101.71**	**-49.48**	**-1 257.82**

Source: ETC CM, 2023

Table 5-11 Quantified expected emissions impacts by year reported by Member States in 2023, $PM_{2.5}$ (kt/yr).

	Quantified Expected Emissions Impacts 2025	Quantified Expected Emissions Impacts 2030	Quantified Expected Emissions Impacts 2035	Quantified Expected Emissions Impacts 2040	Quantified Expected Emissions Impacts 2045	Quantified Expected Emissions Impacts 2050
Austria	0.00	0.00	0.00	0.00	0.00	0.00
Bulgaria	24.40	16.80	0.00	0.00	0.00	0.00
Cyprus	-0.74	-0.62	0.00	0.00	0.00	0.00
Czechia	0.00	0.00	0.00	0.00	0.00	0.00
Denmark	0.00	-0.16	-0.54	0.00	0.00	0.00
Estonia	-0.56	-1.76	-2.29	-2.40	-2.40	-2.50
Greece	0.00	-17.00	0.00	0.00	0.00	0.00
France	-151.00	-163.00	0.00	0.00	0.00	-166.00
Croatia	-1.17	-2.05	0.00	0.00	0.00	0.00
Hungary	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	-2.41	-4.07	-4.15	-4.33	-4.54	-4.72
Lithuania	0.00	0.00	0.00	0.00	0.00	0.00
Luxembourg	0.00	0.00	0.00	0.00	0.00	0.00
Latvia	0.00	0.00	0.00	0.00	0.00	0.00
Malta	-0.02	-0.02	0.00	0.00	0.00	0.00
Netherlands	-0.80	-1.70	-2.20	-2.70	0.00	0.00
Poland	0.00	0.00	0.00	0.00	0.00	0.00
Romania	-62.22	-90.21	0.00	0.00	0.00	0.00
Slovenia	-0.43	-0.67	0.00	0.00	0.00	0.00
Total	**-194.94**	**-264.47**	**-9.18**	**-9.43**	**-6.94**	**-173.22**

Source: ETC CM, 2023

Table 5-12 Aggregated quantified expected emissions impacts by year by pollutant reported in 2023 (kt/yr).

	Quantified Expected Emissions Impacts 2025	Quantified Expected Emissions Impacts 2030	Quantified Expected Emissions Impacts 2035	Quantified Expected Emissions Impacts 2040	Quantified Expected Emissions Impacts 2045	Quantified Expected Emissions Impacts 2050
CH_4	-3.29	-1.84	-2.12	-1.62	-1.91	-1.71
NH_3	-161.46	-178.18	-28.97	-33.03	-16.87	-90.86
NMVOC	-760.67	-824.28	-48.69	-53.06	-7.62	-762.42
NOx	-1041.08	-1381.18	-90.81	-101.71	-49.48	-1257.82
other	-2.97	-214.52	0.00	0.00	0.00	0.00
$PM_{2.5}$	-194.94	-264.47	-9.18	-9.43	-6.94	-173.22
SO_2	-69.27	-561.78	-15.84	-16.12	-15.29	-15.40

Source: ETC CM, 2023

6 National System reporting

Reporting on the National System for reporting on policies and measures and greenhouse gas projections was already mandatory under the EU Monitoring Mechanism Regulation. In the Governance Regulation, the requirements have been further specified. Countries have to report on 12 different reporting items and for each, guidance has been provided in the implementing act and in the guidance document for reporters[10], as follows:

Reporting item	Guidance
Name and contact information for the entities with overall responsibility for the National System for policies and measures and projections	List only the responsible entity or entities, and their specific roles and responsibilities in preparing the reporting of policies and measures and greenhouse gas projections.
Institutional arrangements in place for preparation of reports on policies and measures and of projections as well as for reporting on them, including an organogram	Define the overall structure/set-up of your national system. List all organisations involved in the preparation of the report on policies and measures and projections and in the archiving of information, their responsibilities, and their interactions. Provide the organogram or the description of the organogram to show the organisational structure of the National System for policies and measures and projections, including the functional and hierarchical interrelationships between organisations.
Legal arrangements in place for preparation of reports on policies and measures and of projections	Report the legislation (name and reference) in force and describe concisely the scope, where applicable.
Procedural and administrative arrangements and timescales in place for the preparation of reports on policies and measures and of projections, to ensure the timeliness, transparency, accuracy, consistency, comparability and completeness of the information reported	Report the cycle for preparation of report on policies and measures and of projections. Summarise the methodologies and mechanisms how timeliness, transparency, accuracy, consistency, comparability and completeness of the information reported are ensured. Report on assurance of consistency with preparation of reports on policies and measures, where relevant, and of projections under Directive (EU)2016/2284. Optionally, provide diagrams that show the processes involved in the national system. These diagrams could include the information flows through the system, and at which points QC and QA measures are applied.
Description of the information collection process	Provide a summary of the process for collecting information for developing policies and measures, evaluating policies and measures and for developing projections. Explain if and how consistent processes are used for collecting and using information for policies and measures and projections.
Description of the alignment with the national inventory system	Provide information on the alignment with the national system for the greenhouse gas inventory, such as processes to ensure consistency of the data used.
Description of the links to arrangements on integrated national energy and climate reports pursuant to Art. 17 of Regulation (EU) 2018/1999	Provide a summary of the linkages between the processes used to collect data related to policies and measures and projections, and relevant processes to report on progress other dimensions of the Energy Union, e.g. processes to foster consistent use of energy-related data for the development of policies and measures and projections and for integrated progress reporting. As integrated progress reporting will only apply from 2023, it is enough for the 2021 reporting to briefly describe the linkages currently in place. One element could for example be if and how the energy projections underpinning the greenhouse gas projections are coordinated with or sourced from the ministry responsible for energy.

(10) https://www.eionet.europa.eu/reportnet/docs/govreg/national-systems/2021_reporting-guidelines-pams-and-projections_-national-systems_govregart39_v1.pdf/view

Reporting item	Guidance
Description of the quality assurance and quality control activities for reporting of policies and measures and projections	Provide a summary of the Quality Control activities applied to help ensure accuracy and completeness in the policies and measures and Projections reports. Report the Quality Assurance activities in place, such as the checks that are done and the responsible entities.
Description of the process for selecting assumptions, methodologies and models for making projections of anthropogenic greenhouse gas emissions	Describe the process behind the selection of assumptions, methodologies and models used. Member States may also report the reasons for their choices, or cross reference to other reports (please provide an URL or upload it on Reportnet) providing this information.
Description of procedures for the official consideration and approval of the Member States national system for policies and measures and projections	Describe the process for officially approving the national system or changes to the national system.
Information on relevant institutional administrative and procedural arrangements for domestic implementation of the EU's nationally determined contribution, or changes to such arrangements	Refer to the arrangements for implementing policies and measures as means of domestic implementation and to the arrangements for national projections of anthropogenic greenhouse gas emissions by sources and removals by sinks as means to track domestic progress.
Description of the stakeholder engagement undertaken in relation to the preparation of policies and measures and projections	Report a description of the stakeholder engagement undertaken in relation to the preparation of policies and measures and projections.

27 EU Member States and three non-EU Member States (Iceland, Norway, and Switzerland) reported information on their national system for reporting policies and measures and projections in 2021. As this was the first reporting year, reporting was mandatory.

In 2023, 21 Member States and two non-EU Member States updated this information. These countries were: Austria, Belgium, Bulgaria, Cyprus, Czechia, Denmark, Estonia, Greece, Spain, Finland, France, Hungary, Ireland, Lithuania, Latvia, Netherlands, Poland, Portugal, Romania, Sweden and Slovenia, and the non-EU countries Iceland and Switzerland. Most reports were in English, with the exception of four reports in German (Austria and Germany), French (France) and Spanish (Spain).

Table 6-1 Updated information on EU Member States national system (green is a change in the reporting).

	Name and contact information for the entities with overall responsibility	Institutional arrangements	Legal arrangements	Procedural and administrative arrangements	Information collection process	Alignment with the national inventory system	Description of the links to arrangements on NECPs	Quality assurance and quality control activities	Process for selecting assumptions, methodologies and models	Procedures for the official consideration and approval	Relevant arrangements for domestic implementation of the EU' s NDC	Stakeholder engagement
Austria												
Belgium												
Bulgaria												
Croatia*												
Cyprus												
Czechia												
Denmark												
Estonia												
Finland												
France												
Germany*												
Greece												
Hungary												
Ireland												
Italy*												
Latvia												
Lithuania												
Luxembourg*												
Malta*												
Netherlands												
Poland												
Portugal												
Romania												
Slovakia*												
Slovenia												
Spain												
Sweden												
Iceland												
Norway												
Switzerland												

Note: Countries with * did not submit updated information on their national system

In some cases, the differences in reporting could be very minor.

Source: ETC CM, 2023

The information reported by Member States on the National System is available on Reportnet (https://reportnet.europa.eu/public/dataflow/111), where the submissions and any additional information that countries provided can be consulted and downloaded. In addition, this information has also been combined by the European Environment Agency and published on the Climate and Energy Platform (https://climate-energy.eea.europa.eu/topics/climate-change-mitigation/national-systems/intro).

6.1 Overall responsibility

In most cases, overall responsibility lies with only one institute. This is the case for 24 countries (22 EU and two non-EU countries). Belgium, Estonia, Lithuania, Malta, Spain and Norway reported more entities with overall responsibility. For example, in the case of Estonia, this split reflects differences in entities with the overall responsibility (Ministry of Environment) and the institution that has the overall responsibility of maintaining the national systems for all greenhouse gas reporting. In Norway there are different responsible entities for reporting on policies and measures and projections.

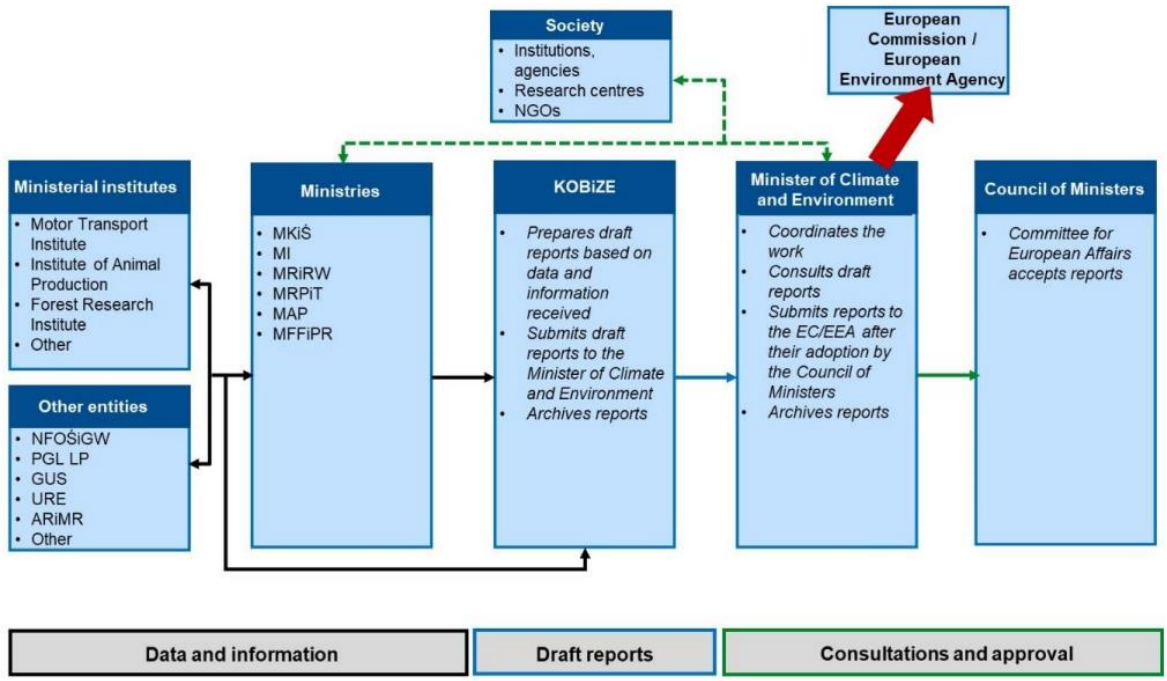
In most cases, the overall responsibility lies with different Ministries. Across all reporting countries, 34 different Ministries were included. Usually this is the Ministry for Climate and/or Environment, although that is not always the case. In Finland for example, the Ministry of Economic Affairs and Employment is responsible for the compilation and reporting of information collected from different sectoral ministries. Apart from Ministries, also environmental protection agencies (Portugal, Ireland and Lithuania), energy agencies (Denmark) and enterprise agencies (Netherlands) have a lead role in some countries.

Reporting has not changed substantially since 2021. France improved reporting by including contact information.

6.2 Institutional arrangements

In the most complete reporting this section includes the overall structure of the national system, with all organisations involved in the preparation of the report on policies and measures and projections and in the archiving of information, their responsibilities, and their interactions. To depict relations, organigrams can be a very useful tool. 22 countries added an organigram to the reporting. These organigrams can be quite extensive and detailed (such as for Denmark) or more concise (such as for Poland), but these help in understanding the different responsibilities and interactions of organisations involved in the national system.

Figure 6-1 Organigram included in the Polish report on National Systems.



Source: https://reportnet.europa.eu/public/country/PL

6.3 Legal arrangements

19 EU countries and one non-EU country reported on national legal arrangements in place for the preparation of reports on policies and measures and greenhouse gas projections. The type of legal arrangement differs among countries, from cooperation agreements, resolutions, acts, etc. For example, in the Netherlands the reporting is enshrined into the national climate act of 2019. This act sets the national target for the reduction of greenhouse gas emissions[11], mandates that the government has to adopt a national climate policy plan every five years with a time horizon of 10 years, and includes various provisions to monitor and evaluate the progress of the climate plan. This includes reporting on policies and measures and on greenhouse gas projections.

Some countries explicitly reported that no specific legal arrangements are in place. Collaboration for reporting in these cases could be based on the resolutions defining the overall responsibilities of the different ministries (e.g. Denmark). Slovenia and Slovakia reported that legislation is still under preparation.

Some countries updated the information more extensively (i.e. Finland, Latvia, Lithuania, and Slovenia).

Finland updated the information to reflect the new Climate Act of 2022. Since 2022, the Climate Act stipulates that a Climate Plan for the Land Use Sector shall be adopted by the Government once every second parliamentary term, at a minimum. The Ministry of Agriculture and Forestry coordinates the preparation of the plan. All relevant ministries are involved in the work.

(11) 49% by 2030 and 95% by 2050 compared to 1990 levels

Also Latvia, reported that since the 2021 reporting the previous Cabinet of Ministers Regulation No. 737 “Development and management of national system for greenhouse gas inventory and projections” was replaced to the new legislation CoM No. 675 “The procedure for Development and management of the greenhouse gas inventory system, the projections system and the system for reporting on adaptation to climate change” (25 October 2022) for the preparation of reports on PaMs and GHG projections including requirements of Paris Agreement consistent with Regulation (EU) 2018/1999.

Lithuania added the Law on Climate Change Management No XI-329 adopted on 07-07-2009 as being a part of the legal framework related to reporting PaMs and projections. Slovenia reported that the Ministry of the Environment, Climate and Energy is currently in the process of drafting the Climate law that would, amongst others, establish the competent authority for the preparation of reports on PaMs and projections and establish a yearly system, in which competent ministries will have to report data on PaMs to the Ministry of the Environment, Climate and Energy.

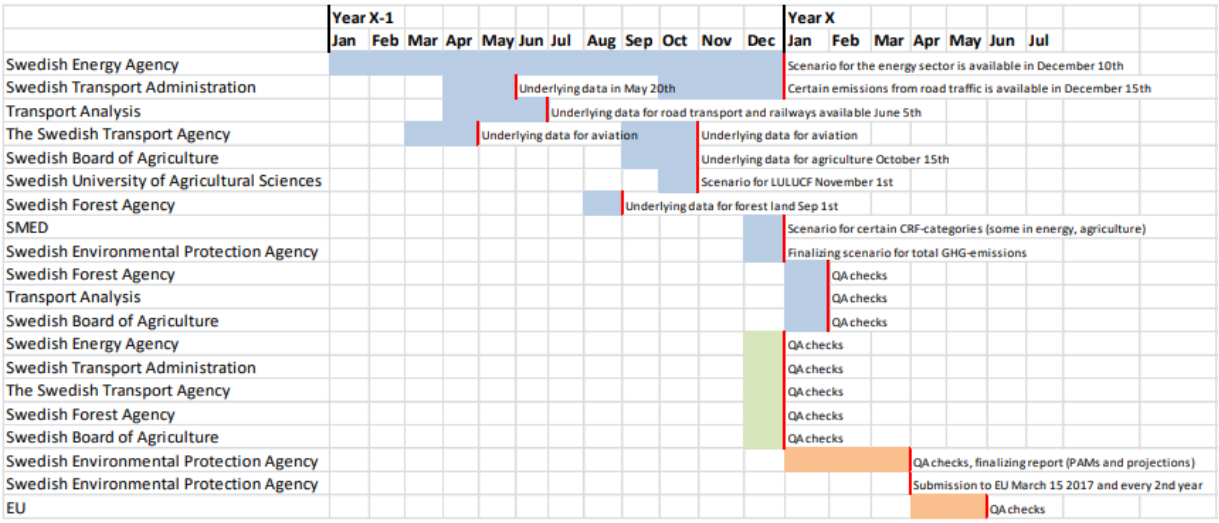
6.4 Procedural and administrative arrangements and timescales

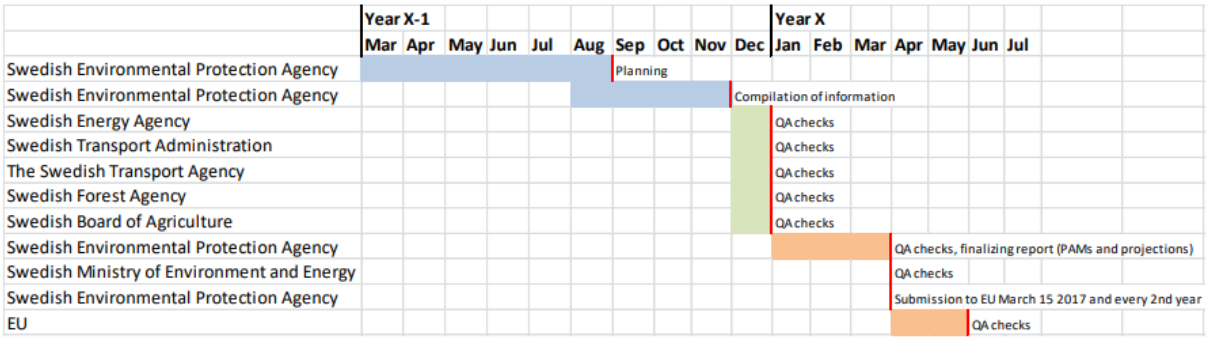
15 countries include a timescale for the preparation of reporting on policies and measures and projections. The level of detail differed among countries.

Other countries included a more elaborate overview of the timing of different steps in the preparation of the policies and measures and the greenhouse gas projections reporting.

Four Member States updated this information more extensively. Belgium improved the description here and in other fields to include the role of CONCERE, consultative group that strengthens cooperation between the federal and regional governments in the field of energy, in the procedural and administrative arrangements. France improved the reporting by including the timeline, which was missing in previous submission.

Figure 6-2 Timeline included in the Swedish report on National Systems.





Source: https://reportnet.europa.eu/public/country/SE

6.5 Information collection process

In the most detailed reporting, countries report the sources of the main data sources that are used to report on policies and measures and greenhouse gas projections.

6.6 Alignment with the national inventory reporting

This only applies for projections reporting. There are two different elements that are mentioned in the reporting to ensure alignment.

The first are methodological alignments. Member States report for example on how the data sources and methods for both inventory and projection reporting are coherent.

The second element are the institutional and procedural arrangements that have been taken to ensure alignment. Member States for example report on how the same entities are responsible for the inventory and the projections, or even that the same team of sectoral experts are responsible for both inventory and projection reporting.

6.7 Links to arrangements on integrated national energy and climate reports

Many countries updated this information to reflect the publication of the implementing act for Article 17 of the Governance Regulation (on Integrated national energy and climate progress reports). Denmark, Finland, France, Lithuania, Poland, and Romania updated information related to the integrated national energy and climate progress reports of Article 17.

Member States referred to the Integrated National Energy and Climate Plans and arrangements that were made to ensure integrated reporting on energy and climate. This is for example the case for Lithuania. Portugal, reported that the National System is under revision to better integrate the monitoring of policies and measures and projections that impact on the energy transition and will enable progress in the implementation of sectoral policies and mitigation measures to be assessed. Portugal also established the NECP 2030 Coordination Group, which includes the aim to coordinate and promote the preparation and review of the NECP along the different periods in collaboration with the entities of the National System.

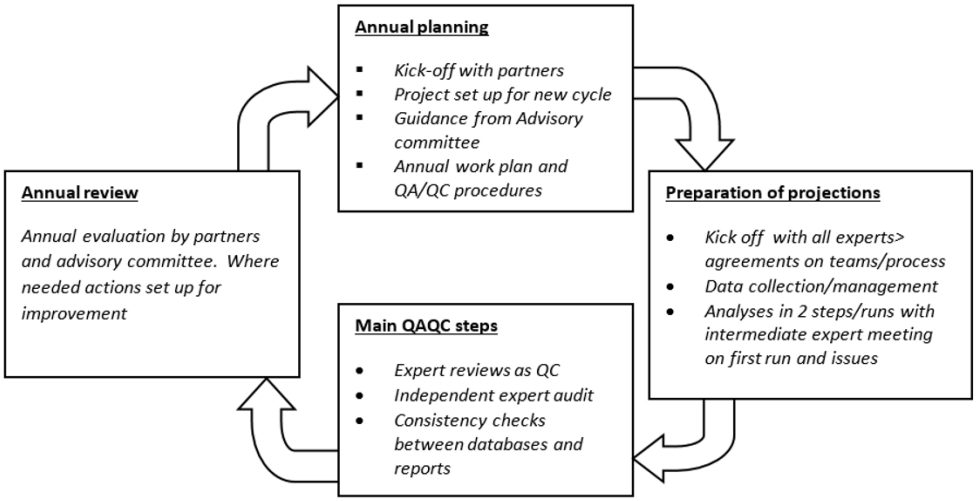
6.8 Quality assurance and control activities

A good example of reporting on the quality assurance and control activities is Greece. The report describes the different steps and arrangements that are taken to ensure that quantitative information on projections

is properly checked before it is submitted. The Netherlands included a graphical representation of how QA/QC (Quality Assurance and Quality Control) is part of the reporting cycle. This clearly depicts how QA/QC is not only used to check reporting, but also used to improve future reporting. The quality assurance can also be partly covered in good institutional, procedural and administrative processes.

France improved the reporting to include a short section on the quality assurance and control of information on PaMs. Latvia announced that Regulation No. 675 sets out information on Quality Assurance/Quality Control procedures for the preparation of projections (described in Chapter IV "Procedures and Activities for Ensuring the Quality of Inventory and Greenhouse Gas Projections and for Quality Control Thereof").

Figure 6-3 Steps in the annual QA/QC cycle included in the Dutch report on National Systems.



Source: https://reportnet.europa.eu/public/country/NL

6.9 Selecting assumptions, methodologies and models for projections

This section of the report complements the technical report that many countries submit with their greenhouse gas projections. This section can be quite short, although some countries provided a more elaborate description of the process and the models that are used to prepare greenhouse gas projections (e.g. Denmark, Belgium and Czechia).

6.10 Procedures for the official consideration and approval

13 countries interpreted this as the procedures for the official consideration and approval of the projections and policies and measures reporting. For many countries the national system is defined in a law, order or ministerial agreement and therefore changes can only be made with changes in the legal arrangements. In the case of Denmark and other countries were the national system for policies and measures and greenhouse gas projections reporting is founded on the general responsibilities of the different ministries no formal or official approval for changes is needed. Other countries, such as Belgium or Poland, on the other hand reported that the national system and any changes need approval by the responsible entity, whether a National Commission or Ministry.

6.11 Relevant institutional administrative and procedural arrangements for domestic implementation of the EU's nationally determined contribution

Examples of arrangements in place are presented in the table below.

Country	Arrangements for domestic implementation of the EU's NDC
Austria	The sectoral goals and procedures required for the corresponding Austrian contribution are set out in the Climate Protection Act. The Climate Protection Act and the Energy Efficiency Act also contain the obligation to submit annual national reports to present progress in terms of target achievement.
Belgium	As far as the Flemish Region is concerned, the Flemish Energy and Climate Plan 2021-2030 provides the general framework for the implementation and monitoring of energy and climate policy. This plan provides for annual Flemish progress reporting. This is also the case for the Brussels Energy and Climate Plan 2021-2030. In Wallonia, the Walloon Energy and Climate Plan 2021-2030 and the Walloon Air Energy and Climate Plan 2016 – 2022 (imposed by the climate decree) provide the general framework for the implementation and monitoring of energy and climate policy. In order to optimize the monitoring and the implementation of the transversal measures of the Plan, an inter-administration working group was recently created.
Denmark	The domestic implementation of Denmark's contribution to the EU's nationally determined contribution can be seen as Denmark's EU commitments under the Effort Sharing Regulation and the additional domestic commitments adopted with the Danish Climate Act (a target of reducing greenhouse gas emissions in Denmark by 70% by 2030 compared to a 1990 baseline and a long-term target for Denmark to be a climate-neutral society by 2050 at the latest). The Climate Act mandates the setting of a new national climate target every five years, with a 10-year perspective. This means that a new legally binding climate target for 2035 must be set in 2025. At the same time, the Climate Act stipulates that a new climate target must be no less ambitious than the most recently set target. The Agreement on a Climate Act also sets out that in connection with the 2020 climate action plan, the Government must propose an indicative target for 2025. The Climate Act requires the Government to present a climate action plan with a ten-year perspective, at least once every five years, and, as a minimum, in connection with setting the climate targets.
Finland	Domestic implementation of the EU's nationally determined contribution in the climate and energy sector is outlined and coordinated through national strategies and plans in different sectors. The most important documents are the overall Climate and Energy Strategy and the Medium-term Climate Policy Plan which are prepared once in a government term. Each sectoral ministry is responsible for policy preparation and implementation of climate change mitigation measures in its respective remit. The Annual Climate Report is a document that, under the Climate Change Act, the Government each calendar year submits to Parliament. The report examines the trends in greenhouse gas emissions and the achievement of the 2020 and 2030 targets in the effort-sharing sector, as well as the trends and projections of total emissions in relation to the 2035 carbon neutrality target. The report also contains information on the policy measures in the Energy and Climate Strategy, the Medium-term Climate Change Policy Plan and the National Climate Change Adaptation Plan.
France	The Energy Transition Law for Green Growth of 2015 sets France's carbon budgets until 2033 in 5-year periods. These budgets were drawn up on the basis of AMS 2018 scenario, which makes it possible to achieve France's various climate and energy objectives, including those adopted at European and international level. They thus ensure the achievement of France's objectives, including those expressed by the EU NDC, and allow for close monitoring of progress. Also, the energy and climate law of 2019 creates the High Council for the Climate, an independent body mandated to produce annual reports on the progress of France's climate policy, to which the government must respond to Parliament within six months. This strengthening of the governance system improves monitoring progress made. The Energy and Climate Law of 2019 also introduces the Energy and Climate Programming Law (LPEC) to be adopted before July 1, 2023, aiming to set the objectives of the Multiannual Energy Program and the National Low-Carbon Strategy. These three documents form the French energy and climate strategy and also integrate the national plan for adaptation to climate change. The Climate and Resilience Law of August 22, 2021 also provides for the development of sectoral decarbonization roadmaps for major industrial sectors, transport, construction, agriculture and waste.
Hungary	In 2018 the Deputy Secretariat of State for Climate Policy was established under the Ministry for Innovation and Technology. The Climate Policy Department (under the Deputy Secretariat of State for Climate Policy) is responsible for the elaboration and implementation of the second National Climate Change Strategy (NCCS-2) which was adopted in October 2018. The NCCS-2 contributes to the goals of Paris Agreement and has three main parts: National Decarbonisation Roadmap, National Adaptation Strategy and "Partnership for Climate" Awareness-Raising Plan. As NCCS-2 is a framework strategy, action plans specify the concrete actions. The First Climate Change Action Plan (CCAP-1) was approved by the Government on 8 January 2020. The Second Climate Change Action Plan (CCAP-2) is planned to be adopted in 2021. The set of measures of the CCAP-1 and the CCAP-2, was developed as a result of series of professional and thematic consultations implemented with wide involvement (e.g. other ministries, national authorities, background

Country	Arrangements for domestic implementation of the EU's NDC
	institutions). The outstanding results of the established partnership are the large number of developed measures, the high professional standard, as well as the communication and cooperation between the individual organizations. Furthermore, there is an inter-ministerial working group on climate change, which is usually convened by the Deputy Secretary of State for Climate Policy.
Ireland	The Climate Action Plan 2019 provides for enhanced governance arrangements for the implementation of national climate mitigation and adaptation policies and measures. The Plan provides for a mechanism of quarterly reporting to Government in relation to committed actions under the Climate Action Plan and for publication of these progress reports. The Plan also provides for the establishment of a Climate Action Delivery Board within the Department of the Taoiseach to oversee its delivery. The Climate Action Plan also provides for a number of other governance and implementation mechanisms which will be given statutory effect in 2021 through a Climate Action and Low Carbon Development (Amendment) Bill. The Bill will establish a 2050 climate neutrality objective in law and place all relevant climate plans and strategies on a statutory footing. The Minister for the Environment, Climate and Communications will be required to prepare an annual update to the Climate Action Plan commencing in 2021, and not less than once every five years, a National Long Term Climate Action Strategy. The Bill will define how five-year carbon budgets and related sectoral targets will be set. A carbon budget programme, consisting of three five-year budgets, will be proposed every five years by the Climate Change Advisory Council, for adoption by Government and endorsement by the Oireachtas (the national legislature of Ireland). Within the ceilings of each carbon budget programme, the Government will agree 'Sectoral Emission Ceilings,' identifying the sectors to which ceilings will apply and with the possibility that different ceilings may apply to different sectors. The Bill also provides appropriate oversight by Government, a strengthened Climate Change Advisory Council and a significantly strengthened accountability and oversight role by the Oireachtas. Each year, relevant Ministers will be required to give account annually to an Oireachtas Committee on their performance in adhering to their sector's sectoral emissions ceiling. Where Ministers are not in compliance with the targets, they will need to outline what consequential measures are envisaged and respond to any recommendations made by the Committee within three months. This 'comply or explain' approach will ensure greater oversight to drive delivery. The annual revision to the Climate Action Plan acts as a further review mechanism and opportunity to re-adjust or refocus actions, if required, to ensure targets are achieved. The annual process of updating policies and measures and related actions to deliver on these policies and measures through the Climate Action Plan will, in turn, inform the preparation of annual greenhouse gas emissions projections by the EPA.
Malta	The domestic implementation of the national determined contribution is underpinned by the legal framework provided by the Climate Action Act (Chapter 543), which establishes a number of obligations, both in terms of principles and tangible activities. Among these is the obligation on Government to prepare and regularly review a national Low Carbon Development Strategy (LCDS), and the transparent and accurate monitoring of the actual and projected progress made by the Government in fulfilling its obligations under the UNFCCC to limit or reduce anthropogenic greenhouse gas emissions. The implementation of the LCDS lies within the MECP.
Netherlands	The national climate act provides the legal institutional arrangements which ensure that adequate policies and measures are planned, implemented, monitored and evaluated in order to attain the climate targets for 2030 and 2050. In summary: • Every five years, the government is required to adopt a national climate policy plan for the next 10 years in which it stipulates what policies and measures will be implemented. The first climate plan for the period 2021-2030 was published in 2019 . The Council of State, the highest legal advisor of the government, is consulted before adoption of the climate plan; • The government reports annually to the Parliament on the progress of the climate plan. Every two years, the government evaluates the progress of the climate plan and proposes adjustments to the plan if deemed necessary; • The Netherlands Environmental Assessment Agency (PBL) publishes a climate and energy outlook (KEV) in order to assess the (expected) impact of policies and measures. The government includes the updated KEV and its implications for the climate plan to Parliament; • In order for the government to track the progress of the implementation of policies and measures, an annual Climate Policy Monitor is prepared by RVO. The first monitor was published in 2020 (12). This monitor is sent to Parliament together with the KEV. The purpose of the national climate policy plan is to ensure not only the attainment of national climate targets but also commitments to the EU and UN. Therefore, the legal institutional arrangements in the national climate act also ensure the domestic implementation of the contribution of the Netherlands to the EU's nationally determined contribution.
Portugal	In order to achieve the climate and energy targets, Portugal will review the two main climate action and energy instruments, the 2050 Carbon Neutrality Roadmap and the 2030 National Energy and Climate Plan.
Sweden	Sweden has set up a national climate policy framework consisting of a Climate Act, national climate targets and a Climate policy council. The climate act will impose responsibility on the current Government, and on future governments, to pursue a climate policy that is based on the national climate tar-gets and to provide clear feedback on the progress. The national climate tar-gets are in line with, or more ambitious, than the EU's nationally determined contribution, wherefore the institutional set up should be sufficient.

6.12 Stakeholder engagement

The reporting by countries can be divided into three main elements.

The first is the link to the stakeholder consultation and role during policy preparation, adoption and implementation. In total 13 countries made a reference to this.

The contribution of different stakeholders to the collections, combination, quality checking and reporting of information on policies and measures and greenhouse gas projections was also mentioned here by 14 countries. In this respect it often overlaps with other earlier reporting items, such as institutional, procedural and administrative arrangements.

Ten countries also made a reference to the consultation process for the NECPs. As part of the preparation of the NECPs, EU Member States had to describe the consultations and involvement of national and Union entities and their outcome. This included the national parliament, local and regional authorities, stakeholders (including the social partners, and engagement of civil society and the general public), other Member States and the Commission.

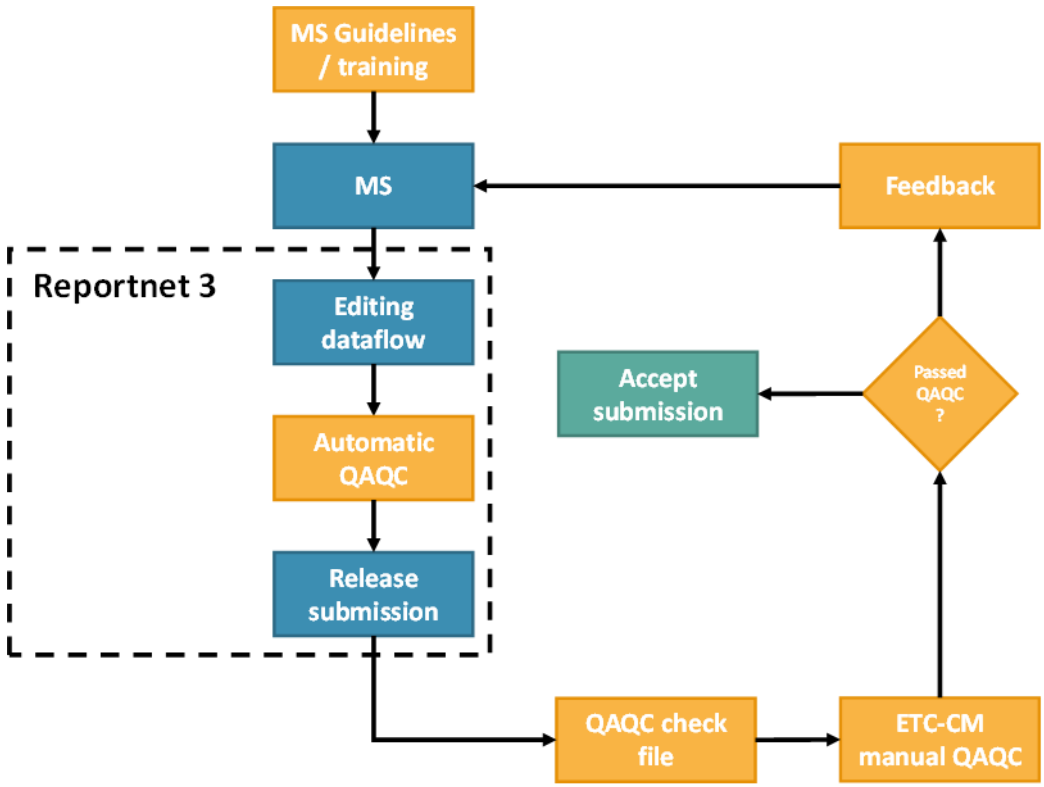
Finland updated the information in 2023. Stakeholder engagement into preparation of PaMs and projections is included in the process of preparing the Energy and Climate Strategy, Medium-term Climate Change Policy Plan, the Climate Plan for the Land Use Sector and National Energy and Climate Plan. The policy documents include descriptions of the many seminars, stakeholder meetings, consultations and citizen surveys that have been arranged at different stages of the policy preparation processes and that have full filled the requirement of stakeholder engagement. According to the Climate Act, the rights of the Sámi people must be taken into account, and negotiations with the Sámi Parliament must be conducted in the processes to prepare climate change policy plans. Finland also makes reference to the multidisciplinary science advisory body, Finland's Climate Change Panel, which was established under the Climate Act. The Finish Climate Policy Roundtable, established in 2020, brings all key stakeholders together to prepare Finland's national climate actions. It is a network for trade unions, municipalities, scientists, industrial sectors, interest groups, young people, and NGOs. The Climate Policy Roundtable does not make decisions; instead, it supports the national processes in pre-paring and implementing climate policy.

7 Summary of the QA/QC procedure

The QA/QC process is set up to improve the MS submission quality and involves direct communication with the Member State's reporter(s). It is not the purpose of this QA/QC procedure to assess the reported information against targets, objectives and the fulfilment of legal requirements (other than reporting requirements). The process consists of several steps which are illustrated in the schema on Figure 7-1.

The first step is capacity building, which is achieved via the preparation of Member States (reporter's) guidelines and training sessions. Subsequently, during the reporting, automated quality checks (QCs) within the reporting platform (Reportnet 3) are used to allow the reporter to already quality control their data prior to submission (even blocking submission if large defects are detected). Once the Member State makes a submission into the reporting platform, the EEA/ETC-CM will check the data and if necessary, prepare a feedback document to the Member State for review. This document details areas of the reported data that requires additional attention according to strict criteria. The Member State will then be requested to resubmit the data via the reporting platform. This can take multiple iterations until all questions are clarified.

Figure 7-1 Overview of the quality control process



Notes: Blue represents Member State processes, yellow represents EEA/ETC-CM processes and green represents the final accepted submission following the QA/QC procedure.

Source: ETC CM, 2023

The core of the manual QA/QC is based on the so-called TTACCC criteria, which builds the framework for the QA/QC procedure:

- Timeliness: has the report been submitted on time (15th March 2023)?
- Transparency: has data been provided transparently and are references and supporting information provided, where necessary?
- Accuracy: are data accurate and plausible? In the cycle of reporting in 2023, the existing reference data will only allow assessing plausibility.
- Completeness: is all mandatory information provided?
- Comparability: is reporting across Member States comparable?
- Consistency and coherence: is reporting consistent and in line with good practices and guidelines? Is reporting coherent with other relevant reporting obligations under the Governance Regulation?

The manual QA/QC was scheduled to take place from the reporting deadline (15th March 2023) until the 30th of June 2023, allowing for the possibility for multiple rounds of checking on the data quality. However, a large share of reporting countries reported after the deadline of the 15th of March. Due to the late submission, the outcome of the QA/QC for Poland is not included in this section.

7.1 Quality of the reported information on "Integrated National PaMs"

7.1.1 Automated QA/QC checks

The automated QA/QC is undertaken in Reportnet 3, via setting up a variety of checks on completeness and consistency (i.e., with other reported fields), as well as on data format. The checks are split into multiple levels of severity:

- Warning: minor issue or simple notification, data can be submitted but Member States should check,
- Error: clear issue, Member States are requested to check and amend where appropriate, however submission will not be blocked,
- Blocker: serious issues, the data cannot be submitted without resolving issue.

This dataflow implemented 101 different warnings, 469 different errors, and 46 different blockers in Reportnet 3.0. It is worth noting here that warning and error QC checks identify potential issues, but these are not necessarily definite errors. Therefore, a share of these errors and warning remain even after validation and resubmission of data.

7.1.2 Manual QA/QC

The EEA/ETC-CM are responsible for quality checking the reported information for the Integrated National PaMs through a manual QA/QC procedure. Checks are applied on the complete submission, through horizontal checks. Other checks are done on the individual PaM level. The quality checks cover all annexes and tables. This process is supported by a guidance document for internal reviewers and reviewer tools.

The feedback provided through the check file is intended to highlight areas that require additional attention according to the TTACCC criteria and/or to request clarification on the submitted information. Once, the feedback is sent out, the country is requested to resubmit the data via the reporting platform, triggering possible iterations of the procedure until all questions are clarified.

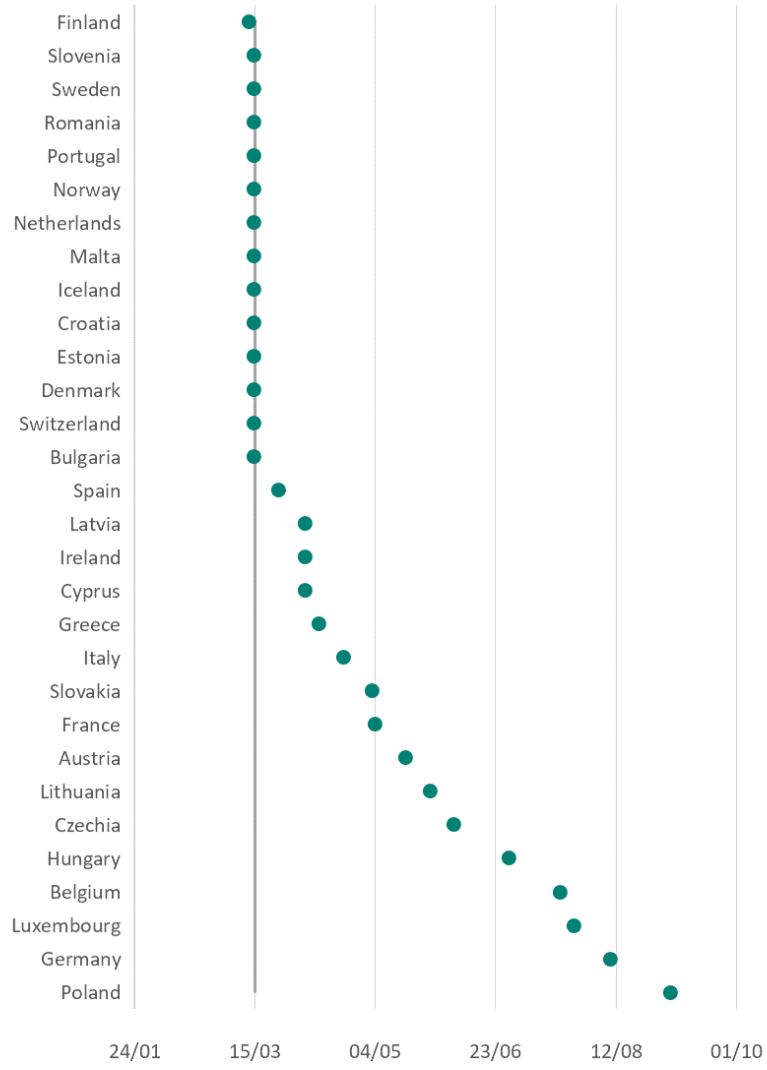
Timeliness

The Governance Regulation requires that countries report on the Integrated National PaMs by the 15th of March. Despite the new webform, the support provided to reporters prior to the reporting deadline (for

example, webinar, guidelines and tutorials) ensured that countries could report before or on the reporting deadline. 14 countries (11 EU Member States) submitted the report before or on the 15th of March. Only half of the countries (15 EU Member States) released the report in March. The last report was submitted on the 4th of September by Poland. However, since this submission came late, the QA/QC findings for this country are not considered in this section.

When comparing to reporting year 2021, the timeliness of submissions remained relatively similar but slightly more delayed in 2023, as by March 2021, 20 reports were already submitted compared to 15 in 2023. While information from previous reporting could be reused, this submission required more extensive integrated reporting on the five climate and energy dimensions as well as on new Annexes, than in previous reporting year. This could have mainly contributed to the delay in submission. Furthermore, the new webform in Reportnet demanded more learning time on how data can be inputted. Another explanation for delayed reporting by countries, is the preference to link reporting of both greenhouse gas projections and PaMs. Furthermore, by end of June 2023, Member States had to report a draft updated NECP, which in some countries, this may have impacted the political process of submitting data under these Annexes. Given the more extensive reporting, the QA/QC process also took more time in 2023.

Figure 7-2 First submission date of reporting on Integrated National PaMs



Note: This includes the EU-27 and countries that released data by 4th September 2023.

Source: ETC CM, 2023

Completeness

The completeness of the Member States submissions is checked by the QA/QC review team for various horizontal indicators. One check for completeness of reporting looked at whether information have been provided for all Annexes. Since not all Annex tables require mandatory reporting, this check resulted in questions for almost all Member States, asking whether there should have been any reporting for the missing tables. Six Member States provided clarification on the missing tables and/or updated reporting accordingly.

14 Member States reported on all dimensions in the first submission. On the other hand, two Member States reported on the GHG dimension only. Three of the remaining Member States updated their reporting to cover more dimensions. With regards to the objectives, targets and contributions, 14 Member States reported on almost all of them or covered the most important ones per dimension. Following questions to reporters, three countries updated their reporting.

In terms of the reported relevant provisions for PaMs contributing to the Energy Efficiency and Renewable Energy dimensions, only four Member States reported sufficiently. Amongst the 22 other Member States, nine Member States did not report on any provisions or reported on one or two provisions only in their first submission. On the other hand, seven countries updated their reporting following the reviewers' question to complete reporting.

Reporting on target sectors is generally more complete across all Member States, with 22 countries reporting on all sectors in their first submission and two Member States updating their reporting to cover all the relevant sectors in their resubmission.

In the Annex IX – key characteristics table, the most common finding amongst Member States was missing mandatory information on all relevant dimensions. Other common completeness errors were related to missing sector objectives, type of policy instrument, Union Policies, greenhouse gas emissions, implementation status and period, and relevant objective, target or contribution.

For some countries these fields were left empty for a number of PaMs, whilst for other countries reporting in the field was incomplete. Examples of the latter are incomplete list of key Union Policies and greenhouse gases which were likely to be relevant to the PaM. In the webform, several fields have an "other" option requiring further clarification by the reporter in a separate box. For example, this is the case for sector, objective and type of policy instrument.

Although difficult to attribute to one specific reason, to some extent this seemed to have been caused by the new reporting under the Governance Regulation, introducing new information to be reported for each PaM, and the new webform. It seemed that most of the fields which were left empty in the first submission were mainly the result of manual data entry errors and were usually corrected in resubmissions. On the other hand, in their feedback on missing data that required more effort to compile, a number of Member States commented that they did not have sufficient time to report completely on such fields. This was mainly the case for reporting of all the relevant dimensions that each PaM contribute to, as well as reporting on all relevant Union Policies and provisions (in the case of energy efficiency and renewable energy PaMs).

Since Annexes X to XIV tables were left completely empty by various countries, most of the questions on completeness were generic asking reporters to report in the tables or to confirm that there is no information to report on. Where more specific information was missing/incomplete in relation to a field, the most fields which raised questions were in Annex XI in relation to the final energy savings achieved at alleviating energy poverty, in Annex XIII in relation to eligible technologies, initial investment assumptions, actual investment for year X-2, and actual investment to be implemented, and in Annex XIV, details of the methodology. Around half of the questions were sufficiently addressed by reporters.

Transparency

All the reporting countries used the webform to report on their Integrated National PaMs. For five Member States reporting was not entirely in English, with a number of these countries reporting in another language in the open fields, including the name of the PaMs and descriptions, or attaching a technical report in another language.

A technical report was submitted together with the Integrated National PaM webform by 10 Member States and one other country. This technical report often combines information related to the PaMs, greenhouse gas projections, updates relevant to their long-term strategies and methodological notes on impact estimations. Some of the technical reports refer directly to the reporting of a specific Annex. Furthermore, references and URLs for the individual PaMs is generally provided by all countries, except for four Member States.

Similar to the other checks on the individual PaMs, the largest part of transparency questions to reporters originated from Annex IX – key characteristics table. Two-thirds of the transparency questions in this table were mainly about lack of transparency in the PaM name or description. Key issues in PaM names include the use of abbreviations in names, names of different PaMs which are too similar to each other and names which are the same as the transposed Union Policy. Main errors in the descriptions were related to being too short or lack the necessary detail to understand what the PaM is about.

A small number of transparency questions originated form Annex IX – GHG impacts table, related to lack of transparency in reporting of ex-ante impacts which generated ambiguity in the interpretation of inputs.

Accuracy

The assessment of the accuracy of reported quantitative information through horizontal checks is done through expert judgment. For greenhouse gas impacts, accuracy checks include the comparison of reported impacts of WEM PaMs against reported projections for the WEM scenario. Other comparisons include WEM and WAM impacts with WAM projections scenario and comparison of impacts of WEM and WAM PaMs to the corresponding previous reporting. Significantly large reported emission savings from PaMs compared to the projected greenhouse gas emissions could indicate potential errors or double counting.

Where impacts were reported in 2023, checks could not always be performed due to missing emissions projections data or due to no availability of impacts data from previous reporting. In total there were questions/requests for clarifications on the accuracy of greenhouse gas impacts to 14 Member States and one other country. Mostly questions were addressed by providing clarification on the data or by confirming that data inputs are correct.

On individual PaM level, the questions on accuracy were related to the use of negative or positive signs. The use of a comma as a decimal marker was another reason for various questions. For the GHG impacts in Annex IX, various questions related to the total emissions not being equal to the sum of the parts. In Annexes X and XI, a common question was about the cumulative energy savings over the period which did not correspond to new energy savings at each year. In Annex XII, some confusion was noted in the reporting of energy savings in year X-2 and/or period up to year X-2. In Annex XIII, questions for accuracy checks mainly related to values that do not correspond between initial investment assumptions, investment already implemented and/or investment yet to be implemented.

Coherence

From a horizontal perspective, coherence checks were carried out to assess whether differences between sectoral WEM and WAM projections scenario corresponds with the reported sectoral planned PaMs. For some countries this assessment was limited could not be performed due to by the unavailability of data, especially missing WAM projections or planned PaMs were grouped which resulted difficult to understand which planned PaMs in each group contributed to which sectoral WAM scenario. For the countries for which WEM and WAM scenarios were available (20 Member States, and three other countries), there were 13 questions for Member States and another one for non-Member State. Questions mainly related to occurrences where there was a difference between WEM and WAM scenario, however no planned PaMs were reported. Other questions related to occurrences where countries reported a number of planned PaMs, however their impact was not reflected in a difference between WEM and WAM scenarios.

Amongst the 13 Member States which were asked to clarify an incoherence, four provided a reasonable explanation to the observed differences. One of these countries also made changes to the choice of scenario and implementation status of the originally planned PaMs, which resolved the issues. In general, checking coherence between the sectoral WEM and WAM projections and planned PaMs is challenging and whilst possible issues were identified, it is difficult to understand with certainty whether an error exists or not. This is due to the interactions of multiple PaMs either within the same sector or with other sectors. For example, PAMs that result in electrification of the transport sector by end-users, result in higher electricity production (and thus emissions). It is therefore not always possible to link differences to specific planned PAMs. In turn, some countries opted to report planned PaMs in a group, possibly targeting different sectors, making it more difficult to assess coherence.

Consistency

In the key characteristics table, the most common finding amongst Member States was inconsistent information between the implementation status and period. Examples of these errors included implemented status when the end year has already passed, and adopted or planned status when the start year is before the reporting year. Inconsistencies between the implementation status and projections scenarios were also common. The latter inconsistency is mostly noticed in PaMs which have a start year close to the reporting year.

Other common errors were related to inconsistencies between PaM name or description and other information, such as the reported dimension(s), sector, policy instrument, relevant objective, target or contribution, and relevant provisions. The selected greenhouse gases are also checked by the reviewers for consistency with the description of the PaM and target sector.

Some of the above issues were corrected by the Member States during the QC process, resulting in 76% of the questions being resolved. However, this percentage covered just half of the identified errors in the PaMs. On some issues, such as what is a single PaM, the implementation status, projections scenario and relevant dimension, some Member States were reluctant to adjust their reporting. This was generally linked to Member States preferring to keeping their original reporting to maintain the same rationale followed under the NECP.

8 Conclusions and recommendations

8.1 Conclusions

The following conclusions can be drawn from the 2023 reporting. On the reported information by Member States:

- The number of single PaMs reported by Member States increased substantially. The share of new policies and measures (starting 2021 or later) remains high, with most PaMs starting in 2021 (14%).
- The increase in the number of single PaMs is an effect of the implementation of the NECPs by Member States and the extension of the reporting to other dimensions of the Energy Union than greenhouse gas emissions and removals.
- The number of single policies and measures of a Member State is not necessarily related to its ambition level. However, in order to achieve the 55% objective in 2030, additional action by Member States is needed. This requires further strengthening of existing and implementing new policies and measures.
- The Decarbonisation: GHG emissions and removals dimension was by far the most reported on, with the Research, innovation and competitiveness, Internal energy market and Energy security dimensions comparatively much less populated.
- Reporting on quantitative information remains incomplete, especially for *ex-post* emissions savings, cost and benefits, and indicators to monitor progress. Completeness reduced in reporting year 2023. New fields on *ex-post* and *ex-ante* energy savings and RE production were also poorly reported on, as was information on Non-greenhouse gas mitigation benefits.
- The reported PaMs are mostly regulations or economic policy instruments, targeted to the energy consumption, energy supply or transport sector and are implemented in response to a Union policy such as Energy Efficiency Directive, Renewable Energy Directive or Effort Sharing Decision/Regulation. For PaMs starting 2021 or later, also the Governance Regulation was an important factor. For these PaMs, economic policy is more common than regulation.
- According to current submissions, the vast majority of PaMs funding up to this point has come from national governments (300 out of 340 billion euros). Furthermore, funding mobilised up to this point added to that still to be implemented is currently falling short of initial investment assumptions (592 billion in comparison to 671 billion.
- This is the first complete NECPR reporting year and while more PaMs were reported than ever before, the completeness, consistency, accuracy, transparency and comparability of the qualitative and quantitative reporting deteriorated. Whenever reporting requirements change substantially it is to be expected that more errors are introduced, especially for relatively complex reporting as for PaMs. For Annex X, XI, and XII it was the first time that reporting had to be done via Reportnet 3. In addition, Member States had to prepare the draft updated NECP which meant many reporters had less time to engage in QA/QC.

8.2 Recommendations

High level recommendations after the QA/QC procedure are:

- Incorporate guidance from the reporter guidelines in the webform for each field, to ensure that the provided guidance is followed across all tables. In some cases, this might have to be further elaborated. The reporter guidelines document is already a very long document. Short guides with concise guidance on a specific topic could be useful.
- Automated checks in Reportnet 3.0 are very useful, but it remains challenging to communicate this effectively to reporters and for reporters to address them before submitting their information. This could be achieved by introducing more blockers in the webform for evident errors. On the other hand, the many automated checks also means that reporters receive many error or warning

messages. The automated QA/QC checks might also have to be re-evaluated and some further prioritization might be needed to avoid having validation checks that result in too many false positive results (example, errors for empty cells that could be left empty). For these checks manual QA/QC might be more appropriate.

- Collect feedback after the first reporting round from reporters to understand what are key barriers for reporters and what could enable reporting with less errors.

List of abbreviations

Abbreviation	Name
BECCS	Bioenergy with carbon capture and storage
CCS	Carbon capture and storage
CCU	Carbon capture and use
CCUS	Carbon capture, use and storage
CH_4	Methane
CHP	Combined heat and power plant
CO_2-eq	Carbon dioxide-equivalent
EEA	European Environment Agency
EED	Energy Efficiency Directive 2012/27/EU
EEOS	Energy Efficiency Obligation Schemes
EFTA	European Free Trade Association
ERDF	European Regional Development Fund
ESR	Effort Sharing Regulation
ETC CM	European Topic Centre on Climate Change Mitigation
EU ETS	EU Emission Trading System
EU	European Union
GHG	Greenhouse gas
HICP	Harmonised Indices of Consumer Prices
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
kt	Kilo tonne
ktoe	Kilo tonne of oil equivalent
LULUCF	Land Use, Land Use Change and Forestry
NECP	National Energy and Climate Plan
NH_3	Ammonia
NIP	Not included in projection
NMVOC	Non-methane volatile organic compound
NOx	Nitrogen oxides
PaMs	Policies and Measures
$PM_{2.5}$	Fine particulate matter
R&I	Research & Innovation
RRF	Recovery and Resilience Facility

SO_2	Sulphur dioxide
WAM	With additional measures
WEM	With existing measures

References

JRC, 2022, Analysis of the Reports on 2020 Targets under Article 27 of the Governance Regulation – Energy Efficiency.

ETC CME, 2021, Overview of reported national greenhouse gas policies and measures in Europe in 2021. Eionet report ETC/CME 5/2021

Annex 1 Reporting templates

PaMs attributes and progress

Annex IX - Key characteristics and progress towards implementing policies and measures

- *PaM Id*
- *PaM number in NECP*
- *Name of PaM or group of PaMs*
- *Name of PaM or group of PaMs in national language*
- *Is this a single PaM or a group of PaMs?*
- *Short description*
- *Geographical coverage*
- *Relevant Union dimension(s) affected*
  - Dimension specific reporting: Decarbonisation: GHG emissions and removals;
    - *GHG(s) affected*
    - *Projections scenario in which the PaM is included*
  - Dimension specific reporting: Energy security
    - *Vector(s) affected*
  - Dimension specific reporting: Research, Innovation and Deployment
    - *Relevant objective, target or contribution the policy or measure contributes to*
    - *Supported Energy Union R&I priority*
    - *Supported Clean energy / low carbon technologies*
    - *Sectors supported*
- *Relevant objective, target or contribution the policy or measure contributes to*
- *Sector affected*
- *Select Objective(s)*
- *Quantified Objective*
- *Assessment of the contribution of the policy or measure to the achievement of the Union's climate-neutrality objective set out in Article 2(1) of Regulation 2021/1119 and to the achievement of the long-term strategy referred to in Article 15 Regulation (EU) 2018/1999*
- *Type of policy Instrument*
- *Union policy which resulted in the implementation of the PaM*
- *Select Relevant Provision(s)*
- *Status of implementation*
- *Start year*
- *Finish year*
- *Comment on Implementation Period*
- *Entity type*
- *Entity name*
- *Indicators used to monitor and evaluate progress over time (ex-post or ex-ante)*
  - *Description*
  - *Unit*
  - *Year #1 - Year #2 - Year #3 - Year #4*
  - *Value #1 - Value #2 - Value #3 - Value #4*
- *Update since last submission*
- *Explanations of the update*
- *Progress against policy objective*
- *Progress against policy indicators*
  - *Indicator*
  - *Year*
  - *Value*
  - *Unit*
- *Reference to assessments and underpinning technical reports*
- *Reference*
- *General Comments*

GHG - Available results of ex-ante and ex-post assessments of the effects of individual or groups of policies and measures on mitigation of climate change

- *PaM Id*
- *Name of PaM or group of PaMs*
- *Policy impacting EU ETS, LULUCF and/or ESD/ESR emissions*
- *Ex-ante assessment:*
    - *GHG emissions reductions for year 2025 (kt CO2-equivalent per year):*
        - *EU ETS*
        - *ESR*
        - *LULUCF*
        - *Total*
    - *GHG emissions reductions for year 2030 (kt CO2-equivalent per year):*
        - *EU ETS*
        - *ESR*
        - *LULUCF*
        - *Total*
    - *GHG emissions reductions for year 2035 (kt CO2-equivalent per year):*
        - *EU ETS*
        - *ESR*
        - *LULUCF*
        - *Total*
    - *GHG emissions reductions for year 2040 (kt CO2-equivalent per year):*
        - *EU ETS*
        - *ESR*
        - *LULUCF*
        - *Total*
    - *Explanation of the basis for the mitigation estimates*
    - *Factors affected by the PaM*
    - *Documentation / Source of estimation if available*
- *Ex-post assessment:*
    GHG emissions reductions (kt CO2-equivalent per year):
        - *Year*
        - *EU ETS*
        - *ESD/ESR*
        - *LULUCF*
        - *Total*
    - *Explanation of the basis for the mitigation estimates*
    - *Factors affected by the PaM*
    - *Documentation / Source of estimation if available*

GHG - Available projected and realised costs and benefits of individual or groups of policies and measures on mitigation of climate change

- *PaM Id*
- *Name of PaM or group of PaMs*
- *Projected costs and benefits*
    - *Year(s) for which cost has been calculated*
    - *Price reference year*
    - *Cost*
        - *Gross costs in EUR per tonne CO2eq reduced/sequestered*
        - *Absolute gross costs per year in EUR*
    - *Benefit*
        - *Benefits in EUR per tonne CO2eq reduced/sequestered*
        - *Absolute benefit per year in EUR*
    - *Net Cost*
        - *Net costs in EUR per tonne CO2eq reduced/sequestered*
        - *Absolute net cost per year in EUR*
    - *Description of cost estimates (basis for cost estimate, what type of costs are included in the estimate, methodology)*
    - *Documentation / Source of cost estimation*
    - *Description of non-GHG mitigation benefits*

- *Realised costs and benefits*
  - *Year(s) for which cost has been calculated*
  - *Price reference year*
  - *Cost*
    - *Gross costs in EUR per tonne CO2eq reduced/sequestered*
    - *Absolute gross costs per year in EUR*
  - *Benefit*
    - *Benefits in EUR per tonne CO2eq reduced/sequestered*
    - *Absolute benefit per year in EUR*
  - *Net Cost*
    - *Net costs in EUR per tonne CO2eq reduced/sequestered*
    - *Absolute net cost per year in EUR*
  - *Description of cost estimates (basis for cost estimate, what type of costs are included in the estimate, methodology)*
  - *Documentation / Source of cost estimation*
  - *Description of non-GHG mitigation benefits*

Annex IX - Available results of ex-ante and ex-post assessments of the effects of individual or groups of policies and measures on renewable energy production

- *PaM Id:*
- *Name of PaM or group of PaMs:*
- *Ex-ante assessment:*
  - *Renewable energy production (ktoe/year):*
    - *Renewable energy in 2025*
    - *Renewable energy in 2030*
    - *Renewable energy in 2035*
    - *Renewable energy in 2040*
  - *Explanation of the basis for the estimate*
  - *Documentation / Source of ex-ante estimation if available*
- *Ex-post assessment:*
  - *Renewable energy production (ktoe/year):*
    - *Year for which production applies*
    - *Renewable energy production (ktoe/year)*
    - *Explanation of the basis for the estimate*

Annex IX - Available projected and realised costs and benefits of individual or groups of policies and measures on renewable energy production

- *PaM Id*
- *Name of PaM or group of PaMs*
- *Projected costs and benefits*
  - *Year(s) for which cost has been calculated*
  - *Price reference year*
  - *Cost*
    - *Gross costs in EUR per toe renewable energy production*
    - *Absolute gross costs per year in EUR*
  - *Benefit*
    - *Benefits in EUR per toe renewable energy production*
    - *Absolute benefit per year in EUR*
  - *Net Cost*
    - *Net costs in EUR per toe renewable energy production*
    - *Absolute net cost per year in EUR*
  - *Description of cost estimates (basis for cost estimate, what type of costs are included in the estimate, methodology)*
  - *Documentation / Source of cost estimation*
  - *Description of other benefits*
- *Realised costs and benefits*
  - *Year(s) for which cost has been calculated*
  - *Price reference year*
  - *Cost*

        - *Gross costs in EUR per toe renewable energy production*
        - *Absolute gross costs per year in EUR*
    - *Benefit*
        - *Benefits in EUR per toe renewable energy production*
        - *Absolute benefit per year in EUR*
    - *Net Cost*
        - *Net costs in EUR per toe renewable energy production*
        - *Absolute net cost per year in EUR*
    - *Description of cost estimates (basis for cost estimate, what type of costs are included in the estimate, methodology)*
    - *Documentation / Source of cost estimation*
    - *Description of other benefits*

Annex IX - Available results of ex-ante and ex-post assessments of the effects of individual or groups of policies and measures on energy efficiency

- *PaM Id:*
- *Name of PaM or group of PaMs:*
- *Ex-ante assessment:*
    - *Energy reductions (ktoe/year, final energy):*
        - *Energy reductions in 2025*
        - *Energy reductions in 2030*
        - *Energy reductions in 2035*
        - *Energy reductions in 2040*
    - *Explanation of the basis for the estimate*
    - *Documentation / Source of ex-ante estimation if available*
- *Ex-post assessment:*
    - *Energy reductions (ktoe/year, final energy):*
        - *Year for which production applies*
        - *Energy reductions (ktoe/year, final energy)*
        - *Explanation of the basis for the estimate*

Annex IX - Available projected and realised costs and benefits of individual or groups of policies and measures on energy efficiency

- *PaM Id*
- *Name of PaM or group of PaMs*
- *Projected costs and benefits*
    - *Year(s) for which cost has been calculated*
    - *Price reference year*
    - *Cost*
        - *Gross costs in EUR per toe final energy reduction*
        - *Absolute gross costs per year in EUR*
    - *Benefit*
        - *Benefits in EUR per toe final energy reduction*
        - *Absolute benefit per year in EUR*
    - *Net Cost*
        - *Net costs in EUR per toe final energy reduction*
        - *Absolute net cost per year in EUR*
    - *Description of cost estimates (basis for cost estimate, what type of costs are included in the estimate, methodology)*
    - *Documentation / Source of cost estimation*
    - *Description of other benefits*
- *Realised costs and benefits*
    - *Year(s) for which cost has been calculated*
    - *Price reference year*
    - *Cost*
        - *Gross costs in EUR per toe final energy reduction*
        - *Absolute gross costs per year in EUR*
    - *Benefit*
        - *Benefits in EUR per toe final energy reduction*

        - *Absolute benefit per year in EUR*
    - *Net Cost*
        - *Net costs in EUR per toe final energy reduction*
        - *Absolute net cost per year in EUR*
    - *Description of cost estimates (basis for cost estimate, what type of costs are included in the estimate, methodology)*
    - *Documentation / Source of cost estimation*
    - *Description of other benefits*

Annex X - new PaMs EED

Energy efficiency Obligation Schemes (EEOS) referred to in Article 7a of Directive 2012/27/EU

- *Select PaM ID as listed in Annex IX*
- *Source(s) of information (including the reference of the related law or other legal text(s))*
- *Expected savings for 2021-2030 and duration of the obligation period(s) (points 5(d) and 5(e) of Annex V to Directive 2012/27/EU)*
    - *Expected cumulative end-use energy savings for the period 2021-2030 (ktoe)*
    - *Expected new annual end-use energy savings (ktoe/year)*
    - *2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030*
    - *Duration of the obligation period(s)*
- *Key design features*
    - *Obligated parties and their responsibilities (point 5(b) of Annex V to Directive 2012/27/EU)*
    - *Target sectors (point 5(c) of Annex V to Directive 2012/27/EU)*
    - *Sectors where individual actions are eligible to the EEOS*
    - *Individual actions eligible to the EEOS*
    - *Main eligibility criteria provided as a separate file*
- *Information on the application of the following EED provisions:*
    - *Where applicable, specific actions and/or share of savings to be achieved in vulnerable households, including those affected by energy poverty, and, where appropriate, in social housing (article 7(11) to Directive 2012/27/EU)*
    - *Savings achieved by energy service providers or other third parties (Article 7a(6), point (a) of Directive 2012/27/EU of Directive 2012/27/EU)*
    - *Rules about banking and borrowing*
    - *Possibilities for trading of energy savings (where relevant)*
    - *Interactions with a National Energy Efficiency Fund in accordance with Article 20(6) of Directive 2012/27/EU (as considered in Article 7a(1) of that Directive)*
- *General information about the calculation methodology*
    - *Measurement method(s) used (point 1 of Annex V , to Directive 2012/27/EU)*
    - *Metric(s) used to express the energy savings (primary or final energy savings) (Article 7a(4), and point 3(d) of Annex V to Directive 2012/27/EU)*
    - *How are lifetimes (and possible changes in savings over time) taken into account in savings calculations (points 2(i) and 5(h) of Annex V to Directive 2012/27/EU)*
    - *Other sources of information or references (e.g. studies, evaluation reports) where more explanations and details about the savings calculations can be found*
- *Additionality and materiality (requirements related to points 2 and 5(g) of Annex V to Directive 2012/27/EU)*
    - *Description of the calculation methodology; including how additionality is taken into account in the calculation methodology (point 2(a) of Annex V to Directive 2012/27/EU)*
    - *Does the EEOS promote early replacements? If so, how is it taken into account in the calculation of the savings? (point 2(f) of Annex V to Directive 2012/27/EU)*
    - *Benchmarks used for deemed and scaled savings (in case deemed or scaled savings are used) (point 1(c) of Annex V to Directive 2012/27/EU)*
    - *How is materiality of savings ensured? (point 3(h) of Annex V to Directive 2012/27/EU)*
- *Possible overlaps (between policy measures and between individual actions) and double counting*
    - *Possible overlaps between individual actions eligible to the EEOS*
    - *Possible overlaps between the EEOS and alternative measure(s) reported to Article 7 of Directive 2012/27/EU*
    - *How are possible overlaps (between the EEOS and alternative measures) addressed to avoid any double counting of energy savings? (point 3(g) of Annex V to Directive 2012/27/EU)*
- *Climatic variations (where relevant) (points 2(h) and 5(i) of Annex V to Directive 2012/27/EU)*
    - *Are there climatic variations between regions? And can they affect the actions eligible to the EEOS?*
    - *How are climatic variations addressed in savings calculations where relevant?*
- *Monitoring and verification (M&V) of savings (point 5(j) of Annex V to Directive 2012/27/EU)*

    - *Brief description of the monitoring & verification system and of the process of verification*
    - *Authorities responsible for the M&V of the EEOS*
    - *Independence of the M&V from obligated parties (Article 7a (5) of Directive 2012/27/EU)*
    - *Verification of statistically representative samples (Article 7a (5) of Directive 2012/27/EU))*
    - *Reporting obligations for obligated parties (savings achieved by each obligated party, or each sub-category of obligated party, and in total under the scheme)*
    - *Publication of energy savings achieved each year under the EEOS (Article 7a (7) of Directive 2012/27/EU))*
    - *Penalties applied in case of non-compliance (and related references, including the law or other legal texts setting the penalties and related conditions)*
    - *Provision(s) in case the progress of the EEOS is not satisfactory (point 3(f) of Annex V to Directive 2012/27/EU))*
- *Information about quality standards (point 2(g) of Annex V to Directive 2012/27/EU)*
    - *How are quality standards (for products, services and installation of measures) promoted or required by the EEOS?*
- *Complementary information or explanations*
    - *Mention here any other information of explanation that can be useful for experience sharing*

Alternative policy measures referred to in Article 7b and Article 20(6) of Directive 2012/27/EU) (except taxation measures)

- *Select PaM ID as listed in Annex IX*
- *Source(s) of information (including the reference of the related law or other legal text(s))*
- *Budget planned or estimated, including the corresponding implementation period(s)*
- *Expected savings for 2021-2030 and duration of the obligation period(s) (points 5(d) and 5(e) of Annex V to Directive 2012/27/EU))*
    - *Expected cumulative end-use energy savings for the period 2021-2030 (ktoe)*
    - *Expected new annual end-use energy savings (ktoe/year)*
    - *2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030*
    - *Intermediate period(s), where relevant*
- *Key design features*
    - *Implementing public authorities, participating or entrusted parties and their responsibilities for implementing the policy measure (points 3(b) and 5(b) of Annex V to Directive 2012/27/EU))*
    - *Target sectors (point 5(c) of Annex V to Directive 2012/27/EU)*
    - *Individual actions eligible to the alternative measure (point 5(f) of Annex V to Directive 2012/27/EU)) and corresponding lifetimes (points 2(i) and 5(h) of Annex V to Directive 2012/27/EU))*
    - *Main eligibility criteria provided as a separate file*
    - *Specific policy measures or individual actions targeting energy poverty (where applicable)*
- *General information about the calculation methodology*
    - *Measurement method(s) used (point 1 of Annex V , to Directive 2012/27/EU)*
    - *Metric(s) used to express the energy savings (primary or final energy savings) (point 3(d) of Annex V to Directive 2012/27/EU))*
    - *How are lifetimes (and possible changes in savings over time) taken into account in savings calculations (points 2(i) and 5(h) of Annex V to Directive 2012/27/EU)*
    - *Other sources of information or references (e.g. studies, evaluation reports) where more explanations and details about the savings calculations can be found*
- *Additionality and materiality (requirements related to points 2 and 5(g) of Annex V to Directive 2012/27/EU)*
    - *Description of the calculation methodology; including how additionality is taken into account in the calculation methodology (point 2(a) of Annex V to Directive 2012/27/EU)*
    - *Does the policy measure promote early replacements? If so, how is it taken into account in the calculation of the savings? (point 2(f) of Annex V to Directive 2012/27/EU)*
    - *Benchmarks used for deemed and scaled savings (in case deemed or scaled savings are used) (point 1(c) of Annex V to Directive 2012/27/EU)*
    - *How is materiality of savings ensured? (point 3(h) of Annex V to Directive 2012/27/EU)*
- *Possible overlaps (between policy measures and between individual actions) and double counting*
    - *Possible overlaps between individual actions eligible to the policy measure*
    - *Possible overlaps among the EEOS (if any) and alternative measure(s) reported to Article 7*
    - *How are possible overlaps (among the EEOS, if any, and alternative measures) addressed to avoid any double counting of energy savings? (point 3(g) of Annex V)*
- *Climatic variations (where relevant) (points 2(h) and 5(i) of Annex V to Directive 2012/27/EU)*
    - *Are there climatic variations between regions? And can they affect the actions eligible to the policy measure?*
    - *How are climatic variations addressed in savings calculations where relevant?*
- *Monitoring and verification (M&V) of savings (point 5(j) of Annex V to Directive 2012/27/EU)*
    - *Brief description of the monitoring & verification system and of the process of verification*

    - *Authorities responsible for the M&V of the policy measure*
    - *Independence of the M&V from the participating or entrusted parties (Article 7b(2) of Directive 2012/27/EU)*
    - *Verification of statistically representative samples (Article 7b(2) of Directive 2012/27/EU)*
    - *Publication of energy savings achieved each year under the policy measure (point 3(e) of Annex V to Directive 2012/27/EU)*
    - *Penalties applied in case of non-compliance (and related references, including the law or other legal texts setting the penalties and related conditions)*
    - *Provision(s) in case the progress of the policy measure is not satisfactory (point 3(f) of Annex V to Directive 2012/27/EU))*
- *Information about quality standards (point 2(g) of Annex V to Directive 2012/27/EU)*
    - *How are quality standards (for products, services and installation of measures) promoted or required by the policy measure?*
- *Complementary information or explanations*
    - *Any other information of explanation that can be useful for experience sharing*

Information on taxation measures

- *Select PaM ID as listed in Annex IX*
- *Duration of taxation measure (point 5(iv) of Annex V to Directive 2012/27/EU)*
- *Implementing public authority (point 5(ii) of Annex V to Directive 2012/27/EU)*
- *Target sectors (point 5(i) of Annex V to Directive 2012/27/EU)*
- *Other target sectors*
- *Target segment of taxpayers (point 5(i) of Annex V to Directive 2012/27/EU)*
- *Source(s) of information (including the reference of the related law or other legal text(s))*
- *Expected savings for 2021-2030 and duration of the obligation period(s) (points 5(d) and 5(e) of Annex V to Directive 2012/27/EU)*
    - *Expected cumulative end-use energy savings for the period 2021-2030 (ktoe)*
    - *Expected new annual end-use energy savings (ktoe/year)*
    - *2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030*
- *Complementary explanations (when relevant)*
- *General information about the calculation methodology*
    - *Calculation method(s) used*
    - *Approach to calculating savings (point (4)(a) of Annex V to Directive 2012/27/EU)*
    - *Elasticities (short-term) (point (4)(b) of Annex V to Directive 2012/27/EU)*
    - *Elasticities (long-term) (point (4)(b) of Annex V to Directive 2012/27/EU)*
    - *How lifetimes are addressed in savings calculations (point 2(e) of Annex V to Directive 2012/27/EU)*
    - *How is double counting with other policy measure(s) avoided? (point (4)(c) of Annex V to Directive 2012/27/EU)*
    - *Independence from the implementing public authority*
    - *Complementary explanations and source(s) of information*

Information about the lifetime of the individual actions eligible to the policies and measures reported for Article 7 of Directive 2012/27/EU

- *Eligible action*
- *End-use sector*
- *Assumed lifetime value (in years)*
- *Assumptions about possible changes in the energy savings over time*
- *Source or method used to estimate the lifetime and related assumptions*

Annex XI - EED Article 7

Energy savings achieved through Article 7 of Directive 2012/27/EU in year X-2

- *Select PaM ID as listed in Annex IX*
- *Vulnerable households addressed*
- *Final energy savings achieved through national EEOs referred to in Article 7a of Directive 2012/27/EU or alternative measures adopted in application of Article 7b of that Directive (excl. Article 7(4), point (c) of that Directive)*
    - *Total annual end-use savings achieved in Year X-2*
    - *Thereof, savings achieved in Year X-2 only from new actions that were implemented in Year X-2*

    - *Total cumulative end-use savings achieved from 2021 to Year X-2*
- *Of which final energy savings achieved by PaMs aimed at alleviation of energy poverty in line with Article 7(11) of Directive 2012/27/EU*
    - *Total annual end-use savings achieved in Year X-2*
    - *Thereof, savings achieved in Year X-2 only from new actions that were implemented in Year X-2*
    - *Total cumulative end-use savings achieved from 2021 to Year X-2*
- *Amount of final energy savings achieved in accordance with Article 7(4), point (c) of Directive 2012/27/EU*
    - *Total annual end-use savings achieved in Year X-2*
    - *Thereof, savings achieved in Year X-2 only from new actions that were implemented in Year X-2*
    - *Total cumulative end-use savings achieved from 2021 to Year X-2*

Annex XII - EED Article 5

Total renovated building floor area of heated and/or cooled buildings owned and occupied by the Member States' central government referred to in Article 5(1) of the Directive 2012/27/EU

- *Select PaM ID as defined in Annex IX*
- *Year X-2*
    - *Total building floor area of buildings renovated (sq. m.)*
    - *Amount of energy savings achieved due to renovation of buildings (ktoe)*
        - *Primary Energy Consumption (PEC)*
        - *Final Energy Consumption (FEC)*
    - *Sum of new energy savings achieved due to renovation of buildings, over the time period 2021 - Year X-3 (X-2)(i.e. corresponding to 3% renovation rate)*
        - *Primary Energy Consumption (PEC)*
        - *Final Energy Consumption (FEC)*
    - *Additional Information*

The amount of energy savings in eligible buildings owned and occupied by their central government as referred to in Article 5(6) of Directive 2012/27/EU

- *Select PaM ID as defined in Annex IX **
- *Amount of energy savings achieved in eligible buildings owned and occupied by their central government in Year X-3 and X-2 (ktoe)*
    - *Primary Energy Consumption (PEC)*
    - *Final Energy Consumption (FEC)*
- *Sum of energy savings achieved in eligible buildings owned and occupied by their central government, over the time period 2021 ? Year X-3 (X-2) (i.e. corresponding to 3% renovation rate) (ktoe)*
    - *Primary Energy Consumption (PEC)*
    - *Final Energy Consumption (FEC)*
- *Additional Information*

Annex XIII - Financing

Progress towards financing

- *Select PaM ID as listed in Annex IX*
- *Eligible technologies/solutions*
- *Initial investment assumptions (EUR)*
- *Value*
- *Price year*
- *Actual investments up to and including year X-2 (EUR)*
    - *National public funding*
    - *Total EU funding*
        - *Of which RRF funding*
        - *Of which European Regional Development Fund and/or Cohesion Fund*
    - *Private funding (where available)*
    - *Price year*

    - *Description of source*
- *Actual investments still to be implemented (EUR)*
    - *Value*
    - *Price year*

Annex XIV - Air quality

Impacts on air quality and emissions to air

- *Select PaM ID as listed in Annex IX **
- *Reference year **
- *Details of the methodologies used for analysis (e.g., specific models or methods, underlying data)*
- *Qualitative description of uncertainties (where available)*
- *Documentation/ Source of methodologies*
- *General comments*

Affected pollutants

- *Select PaM ID as listed in Annex IX **
- *Affected pollutant(s) **
- *Quantified expected emission impacts (kt/yr)*
- *2025, 2030, 2035, 2040, 2045, 2050*
- *Qualitative assessment of expected emission impacts*

European Topic Centre on
Climate change mitigation

https://www.eionet.europa.eu/etcs/etc-cm

The European Topic Centre on Climate change mitigation (ETC-CM) is a consortium of European institutes under contract of the European Environment Agency.

European Environment Agency
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