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Trends and projections under the Effort Sharing Legislation

Overview on developments and drivers

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Abbreviations

AEAs	Annual Emission Allocations
EC	European Commission
EEA	European Environment Agency
ESD	Effort Sharing Decision
ESR	Effort Sharing Regulation
ETC	European Topic Centre
ETS	Emissions Trading Scheme
EU	European Union
F-gases	Fluorinated gases
GHG	Greenhouse gas
GDP	Gross domestic product
Gov Reg	Governance Regulation of the Energy Union and Climate Action (EU) 2018/1999
LULUCF	Land Use, Land Use Change and Forestry
MMR	Monitoring Mechanism Regulation
Mt CO_2e	Million tonnes carbon dioxide equivalent
NECP	National Energy and Climate Plans
PaMs	Policies and Measures
PFC	Perfluorocarbon
QA/QC	Quality assurance/quality control
RES	Renewable energy sources
WAM	With additional measures
WEM	With existing measures
WPM	With planned measures

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Summary

About this report

This report provides an analysis of the progress of the EU, its Member States as well as Iceland, Norway and the UK in reducing greenhouse gas (GHG) emissions under the Effort Sharing legislation between 2005 and 2030. The Effort Sharing legislations covers greenhouse gas emissions in the transport, buildings, agriculture, waste and small industry not included in the EU emission trading system.

The report also discusses the sectoral development of greenhouse gas emissions by country and tries to identify the main quantified policies and measures driving emission reductions. For this reason, reported additional and planned policies and measures are analysed by sector and Member State. While quantified effects of additional and planned policies and measures of all Member States are analysed to the extent possible, more details are presented for Member States reporting the highest emission reduction effects in each sector. The report focusses on the sectors transport, building and agriculture, being the largest sectors included in the Effort Sharing. For waste and small industries no in-depth assessment was performed.

This report is based on information provided by EU Member States, Iceland, Norway and the United Kingdom in their submissions under the EU Monitoring Mechanism Regulation (MMR) in the years 2019 and 2020. Both submissions were prepared before the COVID-19 virus hit Europe and do not reflect any effects of this pandemic. The submitted emission projections have been prepared before the publication of the European Green Deal, and more recent achievements such as the European Climate Law, enshrining the 2050 carbon neutrality target for the EU into legislation and the 2030 Climate Target Plan, increasing the ambition levels of the EU's 2030 targets. They therefore reflect the European climate policy architecture in view of a 40 % reduction target of greenhouse gases compared to 1990.

Main findings

Surplus and deficit of annual emission allocations at EU level

The national greenhouse gas emission reduction targets for the years 2021-2030 were defined in the Effort Sharing Regulation (ESR) and are translated into annual emission allocations (AEAs)[1]. Compared to the sum of national AEA's for the entire period from 2021 to 2030, the emission projections with existing policies and measures (WEM scenario) would result in a total mitigation gap of about 1 300 Mt CO_2e by 2030. Considering the additional effect of planned policies and measures in the with additional measures (WAM scenario) of the reported greenhouse gas emission projections, the resulting emission reductions would be sufficient to meet the obligations under the Effort Sharing Regulation and lead to a surplus of AEA's at EU level.

Bulgaria, Cyprus, Denmark, Germany, Netherlands and Sweden did not report a planned measures (WAM) scenario in their submissions under the MMR by March 2020 but did include such a scenario in their National Energy and Climate Plans (NECP). Taking these scenarios into account, the cumulated surplus by 2030 would amount to 650 Mt CO_2e. The resulting overall reduction of 32 % compared to 2005 would overachieve the EU-wide minimum reductions of 30 % for emissions under the ESR (EC 2020). This is an important step in the right direction for the contribution of the ESR to the very recently increased ambition level of the EU's 2030 target.

(1) The annual emission allocations (i.e. emission quantities assigned to Member States) were published on 16 December 2020 when the assessment of this report was already concluded. The AEAs used in this report are therefore approximated estimates calculated according to the methodology used in the EEA's Trends and Projections report 2020.

Importantly, the annual surplus in earlier years is higher than at the end of the period. This means that such an AEA surplus at the end of the ESR period would only be achieved, if planned policies and measures were implemented already in the beginning of the period.

Surplus and deficit of annual emission allocations at national level

Under MMR reporting, Member States project that the impact of their planned and additional measures would reduce greenhouse gas emissions in the Effort Sharing sectors by approx. 1 600 Mt CO_2e in the period 2021-2030. This difference between the WEM and WAM scenario is mainly due to France, Spain, Italy, Poland and Belgium who together intend to achieve 80 % of this additional emission reduction. Germany projects a gap between its ESR targets and its scenario with existing measures of almost 400 Mt CO_2e, which is by far the largest deficit of all Member States. Germany has not provided a WAM scenario under the MMR but has done so in its NECP.

Sectoral Development in EU Member States

General analysis:

Information on policies and measures (PaMs) and their quantified effects is significantly underreported by Member States. It is therefore very difficult to draw conclusions on the effectiveness of specific PaMs at a national level. Also, the datasets from Member States often show inconsistencies, such as the total PaMs effect being larger than the total effect of the WAM scenario for 2030 without any information given on the reasons for this. Member States will need to improve the quality of their reporting in terms of completeness, consistency and transparency to ensure that the impacts of their policies can be evaluated. Even though there is only limited information available on the expected effects of specific PaMs in the future, it is clear from this analysis that the ambition in all Effort Sharing sectors needs to be further increased.

Transport:

Road transport is responsible for the largest part of transport emissions in the EU. An increasing transport demand driven by GDP growth has offset efficiency improvements in the transport sector in the past. In addition, the average CO_2 emissions from new passenger cars increased in recent years due to an increase in new registrations in the SUV segment.

In the greenhouse gas emission projections with existing measures (WEM scenario), ten Member States report increasing emissions until 2030 compared to 2018. Sixteen Member States reported additional measures (WAM scenario), of which five projected increasing emissions until 2030 even when considering their planned measures. Emission projections with additional measures show that in 2030 the EU will only reach the emission levels of 1990. Thus, a necessary turnaround of the trend is still not noticeable, and it is evident from recent trends and projections that the currently reported existing and planned measures do not sufficiently lead to the required decarbonisation of the transport sector.

Countries with the highest relative emission reductions in the WAM scenario in 2030 (Spain, Belgium and Estonia) have reported diverse additional measures, such as the further increase of bio-fuel shares, increased road pricing, stronger promotion of electric vehicles and further modal shift to public or non-motorised transport often with a focus on urban areas. There is no clear indication which of the planned measures lead to the highest emission reductions, as specific information on the mitigation impact per Policy and Measure (PaM) is not available for all reported PaMs. However, in all three countries' reports the use of biofuels is highlighted to have a significant impact on the emissions reductions.

Buildings:

Most of the emissions in the building sector result from space heating. In the past years, emissions decreased due to warmer winter temperatures concomitant with decreased heating demand and due to a fuel switch from liquid and solid fuels to natural gas. Also, technological developments such as more efficient heating systems and thermal insulation led to lower energy consumption for space heating. However, emission reductions were partly offset due to the increased number of dwellings and larger floor areas of buildings.

Current emission projections show that emissions will continue to decrease following more or less the same trend as in the historical years; with the additional measures, further emission reductions of -21 % are projected to be achieved by 2030. The historical and projected emission trends in the building sector show that effective measures have already been put in place by many Member States, but not all countries have yet reported on additional measures in the building sector to further increase their ambition. In any case, further measures are needed to reduce emissions, especially when rebound and counterbalancing effects cancel out efficiency improvements. Nine Member States still report increasing emissions in the WEM scenario and five countries also report increasing emissions in the WAM scenario.

The focus of the countries with highest relative emission reductions in the WAM scenario in 2030 compared to the WEM scenario (Belgium, Spain and Hungary) lies on energy efficiency measures namely to accelerate building renovation rates, but also to promote efficient heating systems. Another focus is the increase of low carbon fuels (including biomass and biofuels). The three countries do not provide sufficient PaM - specific information on the impacts and therefore it is unclear how much these measures contribute to the emission reductions.

Agriculture:

Enteric fermentation from cattle and direct N_2O emissions from agricultural soils are responsible for the largest part of emission from the agriculture sector, but also for the largest reductions in historical agricultural emissions. Since 2005, emissions in this sector have been close to stable in the EU, meaning that the agriculture sector hardly contributed to reductions in the Effort Sharing sectors during that time.

In the WEM scenario 13 Member States report increasing emissions until 2030 compared to 2018. Emission projections with additional measures show that in 2030 the EU will reach 25% below emission levels of 1990, only anticipating a reduction of 4 % during the period 2018-2030.

Croatia, Spain and France, the countries with the highest relative emission reductions in the WAM scenario in 2030, have reported diverse additional measures, mainly targeting the reduction of fertilizer/manure use, the improvement of animal waste management systems, the improvement of management of organic soils and the improvement of livestock management. The three countries do not provide sufficient information on the PaM - specific impacts and therefore it is unclear how much these measures contribute to the emission reductions.

Waste:

Solid waste disposal and wastewater treatment are the main contributors to emissions in this sector. Compared to 1990, emission in the sector decreased by 36 % until 2019. Except for Croatia and Malta all Member States project a continuous decline of emissions in the WEM scenario until 2030.

Small industry:

The sector “Small industry” contain emissions from smaller energy and industrial activities, which are not covered under the EU ETS. There are no specific policies and measures reported which are specifically

targeting Effort Sharing emissions of small energy industries, manufacturing and construction or process emissions, but there are many policies and measures reported to reduce F-Gases, which are relevant for projected emission reductions in many Member States. Highest absolute and relative emission decreases are projected by France, followed by Slovakia, if relative reductions are considered.

1 Introduction

The Effort Sharing legislation sets national targets for EU Member States. It covers emissions which are neither included under the EU Emissions Trading System (ETS) nor under the Land use and Land use Change and Forestry (LULUCF) Regulation. Historical emission reductions under the Effort Sharing legislation have been considerably lower than those under the EU ETS: While emissions decreased by 33 % between 2005 and 2019 under the EU ETS in EU-27, the reduction under the Effort Sharing legislation was only 10 % in the same period. While these reductions will be sufficient to achieve the EU's 2020 reduction target, emission reductions especially under the Effort Sharing need to speed up considerably to deliver the emission cuts foreseen by 2030. Effort Sharing emissions have significantly different drivers and reduction potentials. Reducing these emissions to meet national Effort Sharing targets requires a diversified and well adapted policy mix at the national level. Having reported a large number of planned policies and measures under the Monitoring Mechanism Regulation in 2019 and partly in 2020, EU Member States must now fully implement them to allow the EU to deliver on its decarbonization objectives and need to add further planned measures for higher reduction needs.

Box 1 Effort Sharing legislation

The EU's Effort Sharing legislation aims to cut greenhouse gas emissions in the sectors that are not included in the EU Emissions Trading System (EU ETS). This represents a wide range of sources, such as petrol and diesel use for road transport, energy use for heating and cooling in households and commercial buildings, animal digestion and fertilizer use in agriculture, waste treatment and small industries. Altogether, these emissions make up about 59 % of total greenhouse gas emissions at EU level. The Effort Sharing legislation does not apply to emissions and removals from land use, land use change and forestry (LULUCF), which are covered by the Kyoto Protocol and from 2021 by the LULUCF Regulation. It also does not apply to emissions from international maritime transport nor to aviation outside of the scope of the EU ETS (apart from N_2O and CH_4 from domestic aviation). Until 2020 it excludes NF_3 emissions, while from 2021 onwards these are included.
The legislation sets national annual greenhouse gas emission targets for the periods 2013-2020 (Effort Sharing Decision, ESD) and 2021-2030 (Effort Sharing Regulation, ESR). These annual targets are different for each country: The national emission targets for 2020 range from a 20 % reduction by 2020 (from 2005 levels) for the richest country to a 20 % increase for the poorest one, Bulgaria. Taken together, the national 2020 targets represent a 10 % reduction in EU Effort Sharing emissions compared with 2005, which is in line with the EU target of a 20 % reduction in all greenhouse gas emissions by 2020 (including those in the EU ETS), compared with 1990.
For 2030, the national emission targets range from 0 % (no change from 2005 levels) to 40 % below 2005 levels (applicable to Effort Sharing emissions only). These targets correspond to an EU reduction of 30 % from 2005 levels by 2030, as a contribution towards the current reduction target of 40 % below 1990 levels for all greenhouse gas emissions in the EU Member States and the United Kingdom.

For further information about the Effort Sharing legislation see EEA (2020e).

This report provides an updated overview of sectoral trends, projections of greenhouse gas emissions, and planned policies and measures in the EU Effort Sharing sectors. It complements the EEA's recent Trends and Projections report (EEA 2020h), which assesses progress towards the EU's climate and energy targets, and the EEA's Trends and drivers of EU greenhouse gas emissions report which analysis the development of GHG emissions since 1990 (EEA 2020f) . The findings are based on preliminary estimates of greenhouse gas emissions for 2019 (proxy data) and historic and projected greenhouse gas emissions, as well as policies and measures that Member States reported to the EEA in March 2019 under the Monitoring Mechanism Regulation. The EEA has published historic emissions (EEA 2020c), projections by Member State (EEA 2020b) and the database of policies and measures (EEA 2019a) online as interactive tools.

The report can be seen in the context of two other reports on trends and drivers of emissions under the Effort Sharing legislation, published both in 2018 by the ETC/ACM. While the first report (ETC/ACM 2018a) looked into drivers of specific sectors, the second (ETC/ACM 2018b) analysed sectoral historical and projected trends. This third report includes an update of the sectoral trend analysis and takes a thorough look into reported additional policies and measures and their reported effects on emission development.

Box 2 Brexit, COVID-19 and the European Green Deal

This report is based on the information reported by EU Member States, the United Kingdom, Norway and Iceland under the Monitoring Mechanism Regulation in 2019 and 2020. It is based on the political framework agreed prior to the European Green Deal: A total greenhouse gas reduction of 40% below 1990 levels for the EU 28. Since then, the political and economic situation has changed considerably.

The United Kingdom has left the EU at the end of January 2020. During the transition period until 31 December 2020 the UK will continue to apply EU law including the Effort Sharing Decision. In this report the terms "EU" and "Member State" only apply to the remaining 27 countries. The discussion of the 2020 target includes the UK; assessments looking at the period until 2030 are based on the EU-27 only.

In December 2019 the European Commission published the European Green Deal. In it, the Commission proposes to increase the EU's 2030 GHG reduction target to at least 50 % and towards 55 % below 1990 levels in order to achieve climate neutrality by 2050 (European Commission (EC) 2019). In its Climate Target Plan the Commission proposes an EU-wide GHG target of 55% below 1990 levels (European Commission (EC) 2020). Compared to the current targets the scope is expanded: it includes intra-EU international shipping and LULUCF. The accompanying Impact Assessment underlines the feasibility of the new target but does not yet propose a new climate architecture. It opens the discussion by exploring different options to achieve the enhanced target. While the European council followed this proposal, the European Parliament agreed to a 60 % reduction target. The final decision on level and scope of the target will be agreed in trialogue discussions around the end of the year 2020. Only afterwards the design of the climate target architecture is under consideration, in June 2021 proposals are expected by the European Commission.

The reporting by Member States under the MMR in 2019 and 2020 does not yet include the European Green Deal and enhanced targets for the sectors covered by the Effort Sharing legislation. This report therefore mainly looks at the progress towards the current targets with some insights on raising ambition where appropriate.

The ongoing COVID-19 pandemic has had a major impact on GHG emissions in 2020 from the EU and the United Kingdom. The European Commission expects the EU-27 economy to shrink by 7.4 per cent in 2020 and a recovery of 4.1 per cent in 2021 (EC 2020). GHG will follow a similar development. The information by Member States and the United Kingdom used in this report does not yet include the impacts of the pandemic. Projections for the short-term will therefore be much higher than the real development; the impact of COVID-19 on 2030 emissions depends not only on the speed of recovery but also on the type of recovery: the greener the recovery the lower the mid-term emissions.

2 Progress in reducing emissions under the Effort Sharing

2.1 Surplus and deficit of annual emission allocations at EU level

The Effort Sharing legislation covers emissions that are neither covered under the EU ETS nor related to the LULUCF sector. These emissions are produced by a diverse range of sectors and activities, including road transport, energy consumption in buildings, agriculture (animals and soils), smaller industrial installations, smaller energy generation facilities and waste management. These represent altogether about 59 % of total EU GHG emissions.

The legislation sets annual emission trajectories for each Member State for the periods 2013-2020 (ESD) (EU, 2013b, 2017a) and 2021-2030 (Effort Sharing Regulation, ESR) (EU, 2018g). These are translated into national annual emission allocations (AEAs) by implementing decisions[2]. Member States should stay within the limits of their allocations or can make use of several flexibilities stipulated in the corresponding legislation. The responsibility lies with Member States to implement a combination of national and EU-driven policies and measures to meet their commitments under the Effort Sharing legislation.

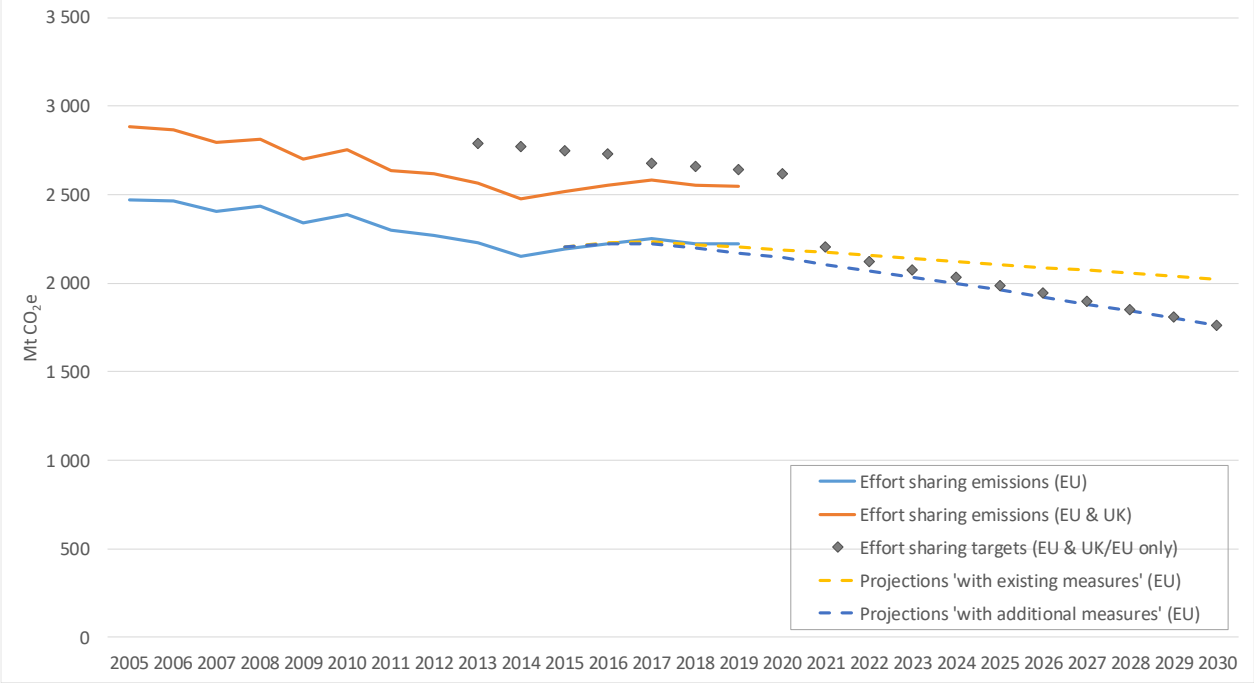
In 2019, Effort Sharing emissions aggregated at EU-28 (EU and UK) level were 12 % below 2005 ESD emissions. With the effects of the Covid-19 pandemic in 2020 emissions reductions will exceed the overall EU-wide minimum reduction of 10 % of emissions under the Effort Sharing legislation (2013-2020). From 2021 on, the legislation only refers to EU-27; the difference between the two scopes is depicted in Figure 1.

The decrease of Effort Sharing emissions is projected to continue: aggregated national projections with existing and adopted policies and measures (WEM scenario) that were reported by Member States under the MMR result in a 18 % reduction of Effort Sharing emissions by 2030 compared with 2005 base year emissions. If additional polices and measures are considered, emissions are projected to decrease by 29 % compared to ESD base year emissions[3].

(2) For the years 2021-2030, AEAs were not available at the time when the assessment for this report was performed. They have therefore been calculated with ESD base year emissions 2005 and latest inventory data, see EEA (2020i).

(3) ESR base year emissions will be different to ESD base year emissions, they are fixed in the Implementing Decision on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842. The ESR base year emissions were not available when the assessment of this report was performed.

Figure 1 **Greenhouse gas emission trends, Effort Sharing targets and projections 'with existing' and 'with additional' measures, 2005-2030, EU and the United Kingdom.**



Notes: Historic emissions for the EU and the UK are represented in solid lines. Projections from 2015 to 2030 are represented in dashed lines (EU only). Annual targets under the Effort Sharing legislation are represented as bullets. The depicted targets are those in force in 2020, i.e. a 30 % ESR target for 2030 in line with an overall EU ambition of 40 %. Until 2020 the targets include the United Kingdom, afterwards the targets are for the EU only.
Source: EEA (2020h).

The Effort Sharing Decision (ESD) allows Member States to use flexibility provisions to meet their annual targets, with certain limitations (EEA 2020h):

- Within a Member State, any overachievement in a year during the period 2013-2019 can be carried over to subsequent years, up to 2020. Up to 5 % of a Member State's annual emission allocation (AEA) may be carried forward to the following year during the period 2013-2019. Member States may transfer up to 5 % of their AEAs to other Member States, which may use this emission allocation until 2020 (*ex-ante*). Any overachievement in a year during the period 2013-2019 may also be transferred to other Member States, which may use this emission allocation until 2020 (*ex post*). The latter can take place only after emission data for the relevant year have been confirmed.

The Effort Sharing Regulation (ESR) for 2030 targets maintains existing flexibilities under the current ESD with some adjustments:

- Banking of unused AEAs is capped at a total of 30 % of the cumulative AEA of the year in question from 2022 to 2029.
- Borrowing is limited to 10 % of the AEA of the following year from 2021 to 2025 and to 5 % from 2026 to 2029.
- The limit for transfers of AEAs to other Member States is increased to 10 % of the AEA of respective years in the period 2026-2030. The recipient Member State can use these AEAs for the respective years or for later years.
- International project credits are excluded as the EU target is to be met domestically.
- The ESR allows nine Member States the choice of using a limited amount of ETS allowances for offsetting emissions in the Effort Sharing sectors in the period 2021-2030. It concerns Member States

that have national reduction targets significantly above both the EU average and their cost-effective reduction potential or that did not allocate any EU ETS allowances for free to industrial installations in 2013. The Member States having this option are Austria, Belgium, Denmark, Finland, Ireland, Luxembourg, the Netherlands, Malta and Sweden.
Eligible Member States needed to notify the Commission by 31 December 2019 how much of the maximum amount of this flexibility they intend to use during the Effort Sharing compliance period 2021-2030. Iceland and Norway are also eligible as they have agreed with the EU to implement the ESR.
The maximum limit that can be used annually in the period 2021-2030 is set at 2 % of each country's Effort Sharing emissions in 2005, except for Ireland, Luxembourg and Iceland, which are allowed a limit of up to 4 %. The total maximum amount for all 11 eligible countries is limited to 107 million tons. Six Member States, as well as Iceland and Norway, have given notice that they intend to use their full amount of this flexibility, whereas Belgium intends to use 1.89 %. The Netherlands and Sweden have decided not to use the flexibility. Member States may request downward revisions of their percentages for later years during the compliance period in 2024 and 2027, respectively.

- There is a new flexibility to use credits from the land use sector. Land mitigation units (LMUs) from afforested land, managed cropland and managed grassland allow Member States to use up to 280 million credits over the entire period 2021-2030 in the whole of the EU to comply with their national targets. All Member States are eligible to make use of this flexibility, but Member States with a larger proportion of emissions from agriculture have greater access to it. In line with EU leaders' guidance, this recognizes that there is a relatively low mitigation potential for emissions from the agriculture sector. Iceland and Norway also have access to this flexibility since both are part of the ESR and Land use, land use change and forestry Regulation for the period 2021-2030.

Figure 2 shows the annual and cumulated difference between projected Effort Sharing emissions 2021 and 2030 and the AEAs for the EU-27. It shows the results of the MMR scenario with existing policies and measures (WEM scenario) and with additional policies and measures (WAM scenario)[4]. If emissions are below annual AEAs, a surplus is depicted with positive bars, while higher emissions than AEAs result in negative bars. The lines show the cumulated surplus or deficit, if the effects are summed up from one year to the next.

In case of the WEM scenario, emissions are above the annual emission allocations for all years after 2021 (compare to Figure 1). Consequently, the line with cumulated results ends up with a deficit of 1 285 Mt CO_2e. But if additional measures are considered, annual emissions are below annual emission allocations for all years. These additional measures lead to a total cumulated surplus of about 300 Mt CO_2e in 2030[5]. The annual surplus in earlier years is higher than at the end of the period. This shows that the early implementation of additional policies and measures and taking in early reduction effects are essential to achieve the targets set under the Effort Sharing Regulation. If additional policies and measures were implemented as planned in WAM scenarios reported under the MMR in 2019 and 2020, an AEA surplus would result at the end of the ESR period.

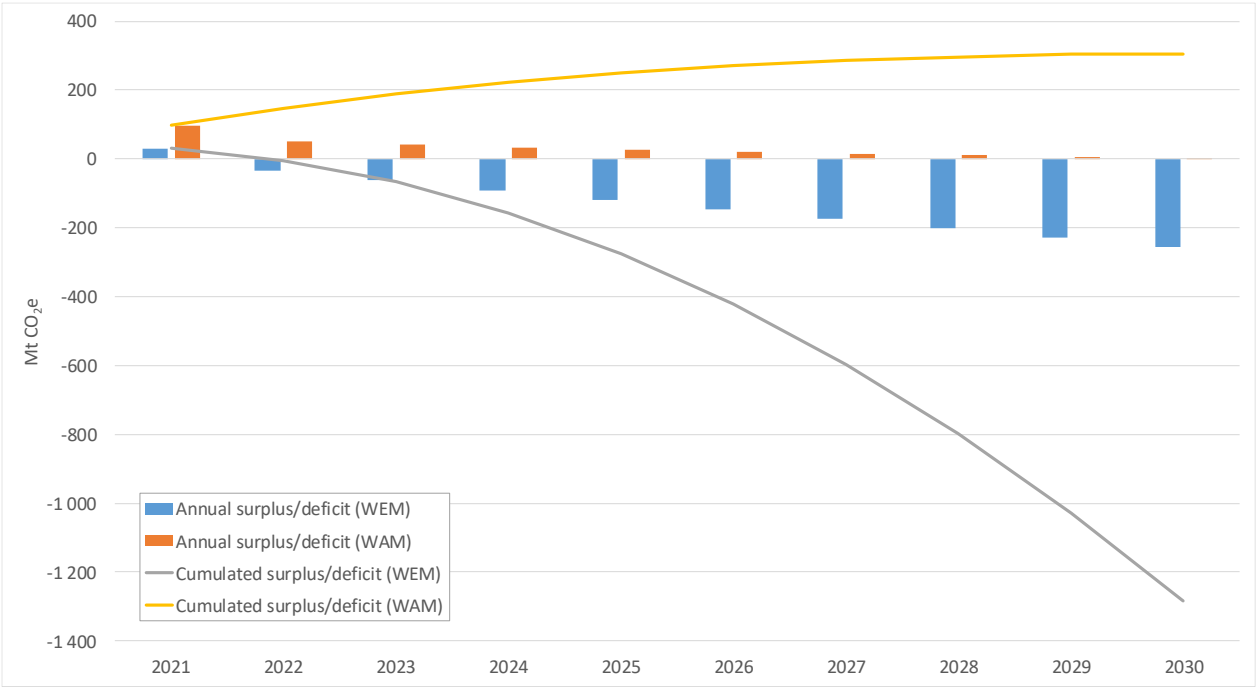
This result was calculated even though not all Member States reported additional policies and measures. Bulgaria, Cyprus, Denmark, Germany, Malta, Netherlands and Sweden did not report an emission scenario including additional policies and measures (WAM scenario). Out of these, all but Malta have

(4) While compliance under the Effort Sharing Decision takes place on an annual basis, compliance under the Effort Sharing Regulation takes place in two periods: 2021-2025 in 2026 and 2026-2030 in 2032. Nevertheless, annual differences are considered here.

(5) For this calculation, the ETS flexibility has been included as reported on page 3. The LULUCF flexibility has not been considered; actual use depends on the actual removals in a compliance period and emissions from the ESR sectors. Maximum usage is 280 million allowances, but it is unlikely that Member States will be able to use the full amount.

provided updated projections in their National Energy and Climate Plans to the Commission mid-2020 (NECPs)[6]. The additional reduction in the year 2030 calculated as the difference between the WEM scenario and the planned policy scenario in the NECP of these countries adds up to 78 Mt CO_2e. These would increase the surplus in 2030 from about 300 Mt CO_2e as depicted in Figure 2 by about 350 Mt CO_2e to approximately 650 Mt CO_2e.

Figure 2 **Annual and cumulated surplus/deficit in the 'with existing' and 'with additional' measures projections, 2021-2030, EU-27**



Notes: A positive sign means a surplus of AEAs - theemissions are lower than the AEAs. A negative sign means a deficit of AEAs – the emissions are above the annually allocated emissions.
Source: ETC/CME, EEA (2020h).

2.2 Surplus and deficit of annual emission allocations at national level

In Figure 3 the cumulated surplus of the years 2021-2030 which can be calculated with MMR projections 2019 and 2020 is shown by country (EU Member States as well as Iceland and Norway)[7]. The countries are sorted from left to right according to their results based on their WAM scenarios. If no WAM scenario has been provided, the WEM scenario has been used.

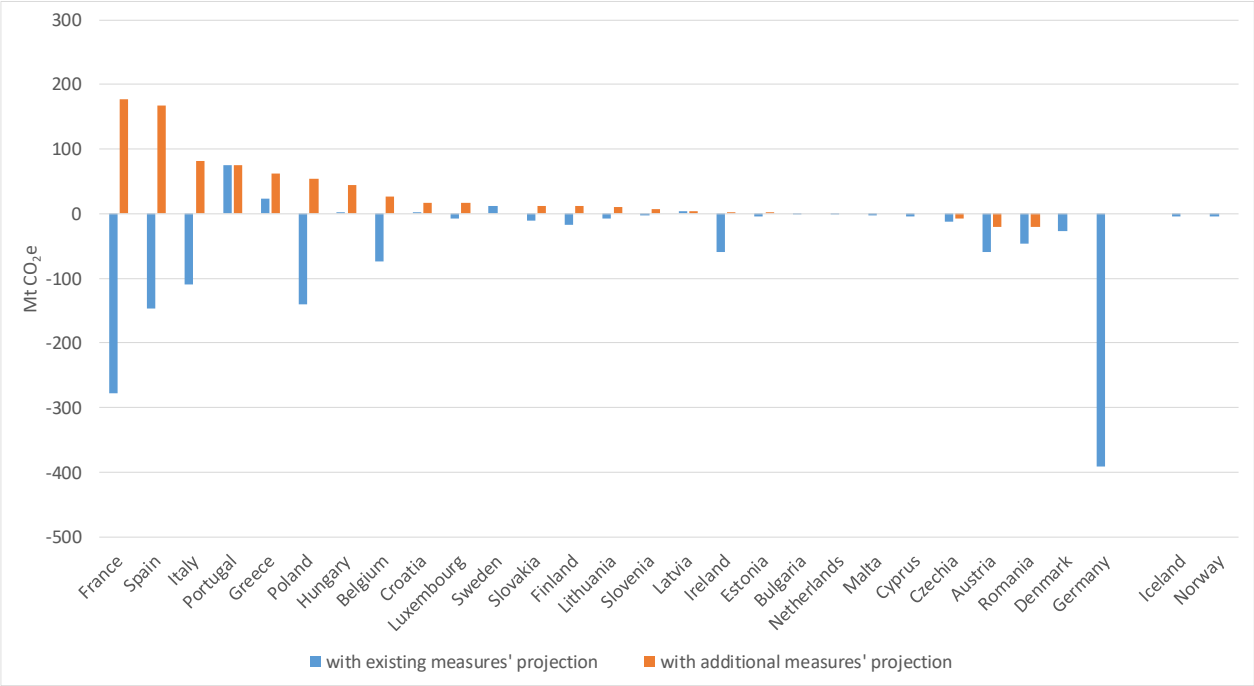
Member States project that the impact of their planned and additional measures would reduce greenhouse gas emissions in the Effort Sharing sectors by approximately 1 600 Mt CO_2e in the period 2021-2030. France, Spain, Italy, Poland and Belgium who together intend to achieve 80 % of this additional emission reduction. Germany projects a gap between its ESR targets and its scenario with

(6) The EEA projections dataset includes Member States' most recent updates of their greenhouse gas emission projections reported under the MMR in 2019 and 2020. For many countries, the 'with additional measures' scenarios differ from those submitted in their national energy and climate plans (NECPs), as does the method to gap fill missing scenarios. For a comparison of the projections submitted under the MMR and those included in the NECPs, see EEA (2020g).

(7) Iceland and Norway have joined the Effort Sharing from 2021 onwards; the Commission has indicated that their respective targets will be a reduction of 29% for Iceland and 40% below 2005 levels for Norway (EEA (2019f)).

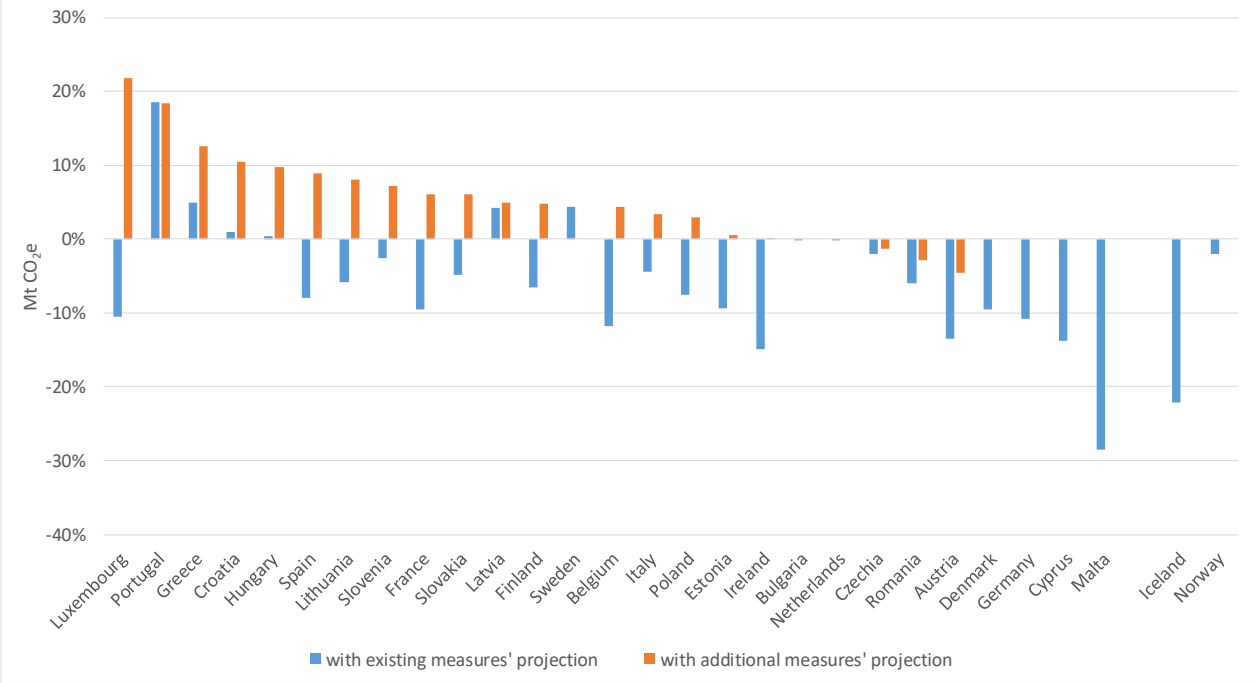
existing measures of almost 400 Mt CO_2e, which is by far the largest deficit of all Member States. Germany has not provided a WAM scenario under the MMR but has done so in its NECP.

Figure 3 **Absolute cumulated surplus/deficit in the 'with existing' and 'with additional' measures projections until 2030 by country**



Notes: A positive sign (surplus) means that cumulated emissions are lower than the cumulated target over the 2021 to 2030 period and vice versa. Countries without orange bars did not report WAM projections under the MMR.
Source: ETC/CME, EEA (2020e).

Figure 4 **Relative cumulated surplus/deficit in the 'with existing' and 'with additional' measures projections until 2030 by country**



Notes: A positive sign (surplus) means that cumulated emissions are lower than the cumulated AEAs over the 2021 to 2030 period and vice versa. Countries without orange bars did not report WAM projections under the MMR.
Source: ETC/CME, EEA (2020e).

3 Sectoral Development in EU Member States

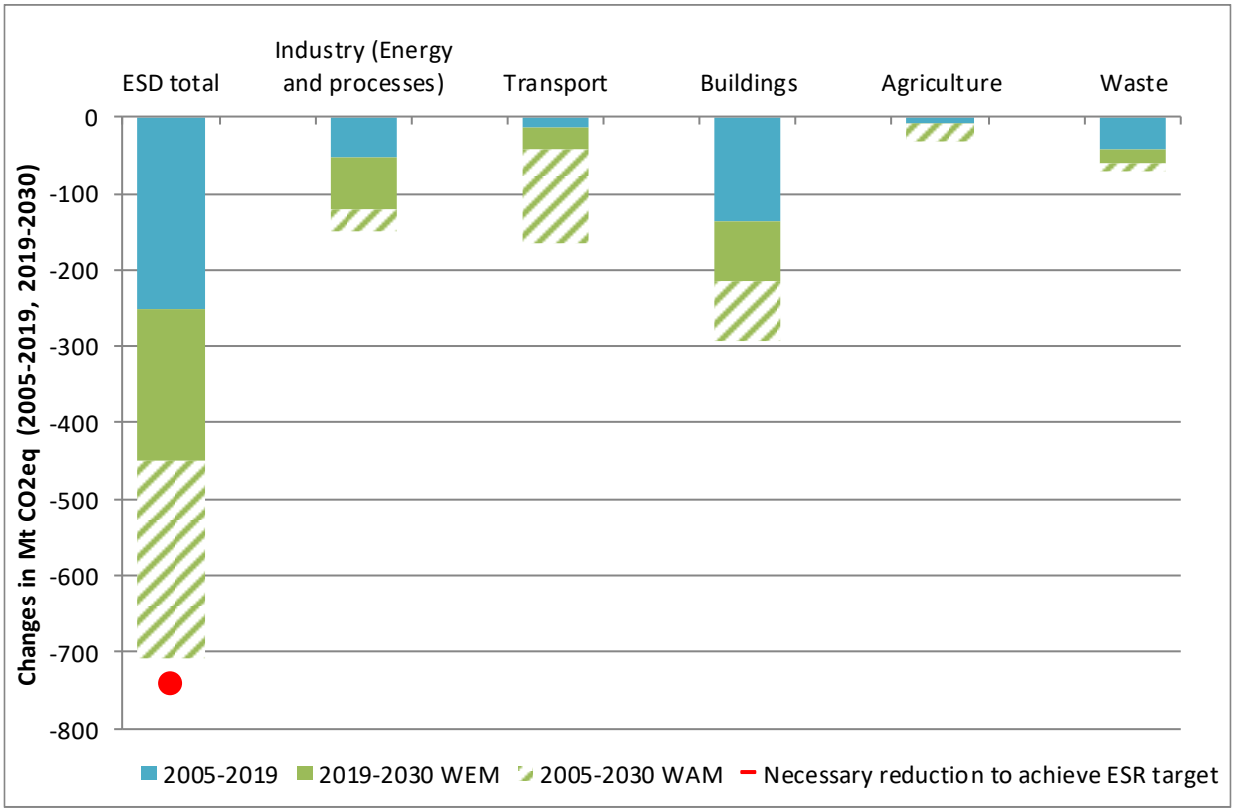
3.1 General discussion

The national emission reduction targets under the ESR correspond to an EU-wide minimum reduction of 30 % by 2030 compared to 2005. This means that the emissions covered under the ESR need to be reduced by 741 Mt CO_2e between 2005 and 2030. So far, a third of these needed reductions (250 Mt CO_2e) have been cut. Looking ahead, Member States expect to reduce emissions by about 200 Mt CO_2e in the WEM scenario and by another 260 Mt CO_2e in the WAM scenario. With this, the ESR emissions would fall short of the 30 % reduction by 33 Mt CO_2e. However, additional contributions reported by seven Member States in their NECPs could turn this gap into an overachievement.[8]

The buildings sector has contributed to more than half of the greenhouse gas emission reductions between 2005 and 2019, which is by far the highest share. Small industry[9] with 21 % of the reductions achieved so far and waste with 17 % are the second and third largest contributors to past emission reductions in the Effort Sharing sectors. The transport sector, despite being responsible for 36 % of ESR emissions in 2019, has so far only reduced emissions by 13 Mt CO2e, merely 5 % of the total Effort Sharing reduction between 2005 and 2019. Transport is also the sector with the highest intended reduction in the future: 50 % of the additional reduction is planned to take place in this sector. The waste sector has achieved the highest relative reduction by 2019, 27 % below 2005, followed by the buildings sector with a reduction of 20 %. The agriculture sector, which is responsible for 18 % of the ESR emissions, only plays a minor both for the achieved and planned reductions until 2030.

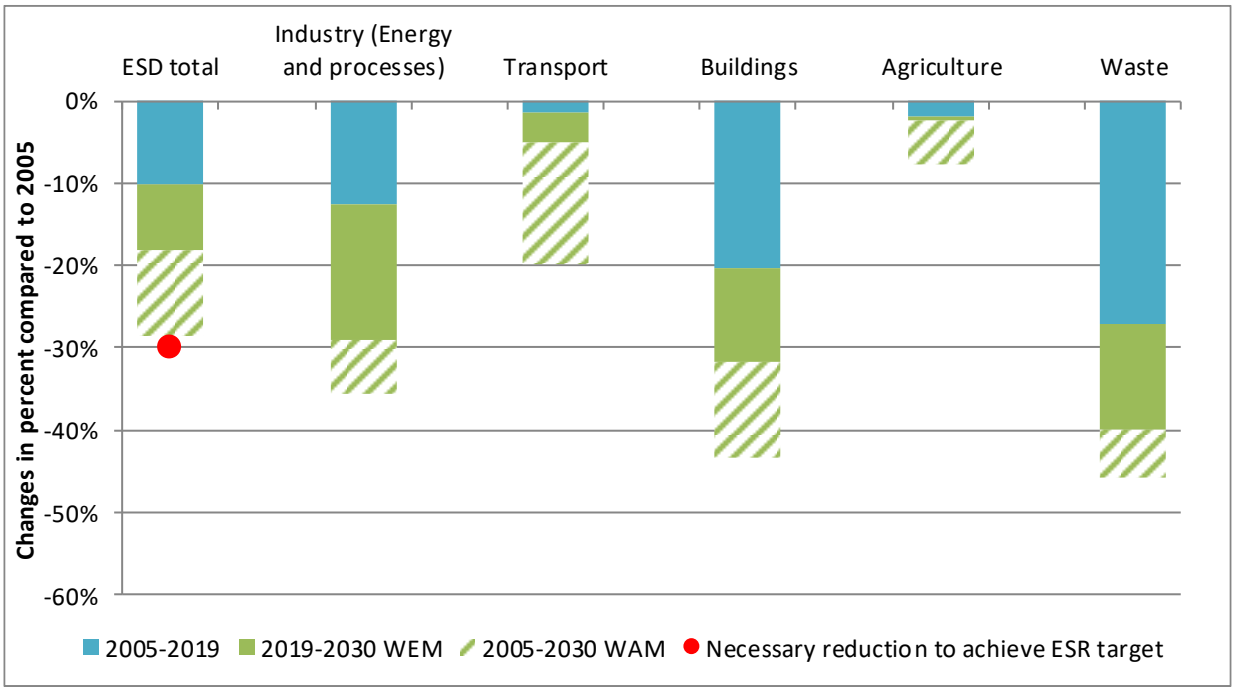
(8) See footnote 6 for more details on the NECP projections.
(9) The sector "Small industry" contains emissions from industrial activities not covered by the ETS and emissions from installations that fall below the minimum threshold for participation in the ETS.

Figure 5 **Historic and projected developments in the Effort Sharing sector for EU-27, absolute**



Note: This graph is based on the latest projections submitted by countries in 2020. The assessment in the following chapters is based on the 2019 data submission for consistency reasons (see footnote 10).
Source: ETC/CME, Projections: EEA (2020b), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 6 **Historic and projected developments in the Effort Sharing sector for EU-27, percentages**



Note: This graph is based on the latest projections submitted by countries in 2020. The assessment in the following chapters is based on the 2019 data submission for consistency reasons (see footnote 10).
Source: ETC/CME, Projections: EEA (2020b), Inventory data: EEA (2020c), ETS data: EEA (2020i).

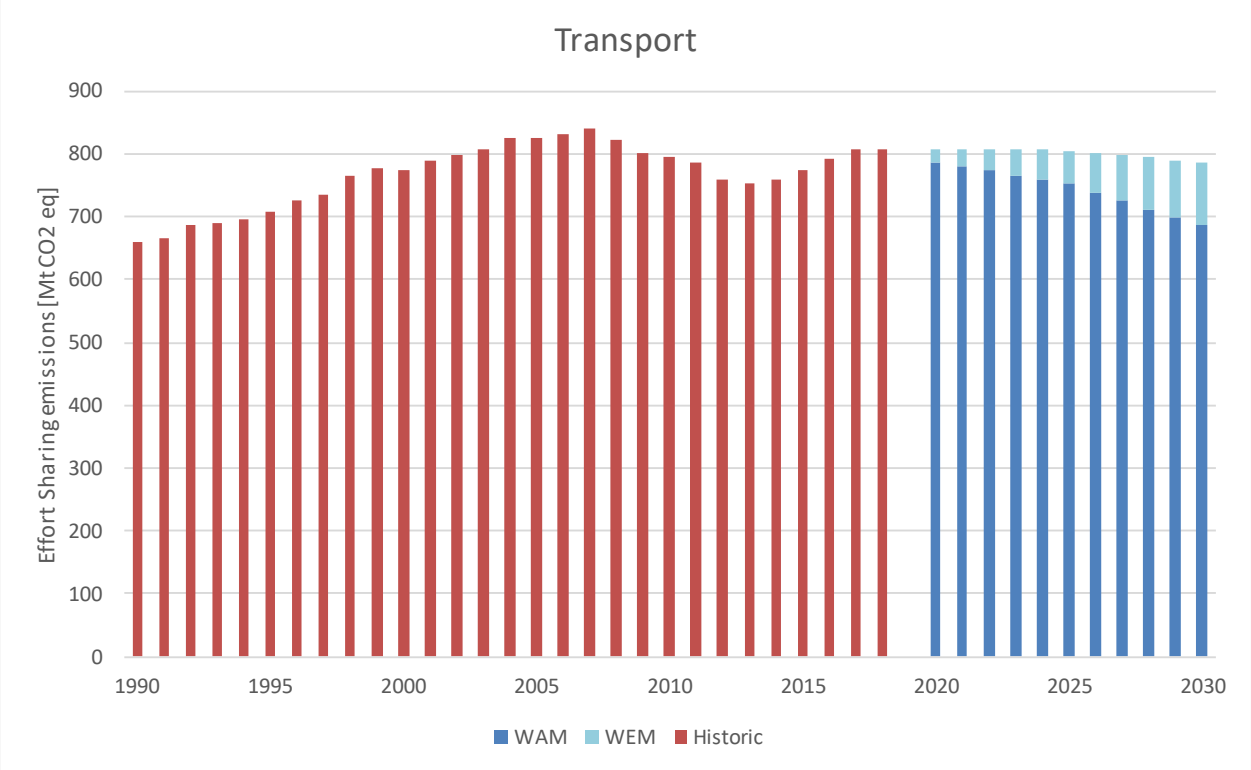
In the following chapter, GHG developments are discussed on sectoral level, with a specific focus on the effects of policies and measures. The idea is to better understand the relation between these effects and reported GHG projections. The analysis focusses on the three most important Effort Sharing sectors: transport, buildings and agriculture. For the other two sectors, waste and small industry, no analysis of policies and measures has been conducted.

3.2 Transport

3.2.1 EU trends along the timeline

In the transport sector emissions in EU increased by 22 % between 1990 and 2018. Current projections show that with existing policies and measures, in 2030 emissions will still be above the level of 1990 emissions. With additional policies and measures, emissions will decrease after 2020 and reach the level of 1990. Recent analyses by EEA show that efficiency improvements in the transport sector are often offset by growing demand for transportation which is strongly linked to the GDP development (EEA 2019e). Road transport causes the majority of transport emissions (about 70 %) due to a significant rise in passenger-kilometres and ton-kilometres (EEA 2019c). The latest EEA report on the CO_2 monitoring of cars (EEA 2020d) mentions that between 2016 and 2018 the average CO_2 emissions from new passenger cars increased, after a period of decline from 2010-2016, due to the growing share of petrol cars, especially in the SUV segment, in new registrations and a low share of zero and low-emission vehicles. In addition, this report concludes that the average fuel efficiency of fuel and petrol cars has worsened in 2018 compared to 2017.

Figure 7 Historical and projected developments in the transport sector for EU-27 1990-2030



Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

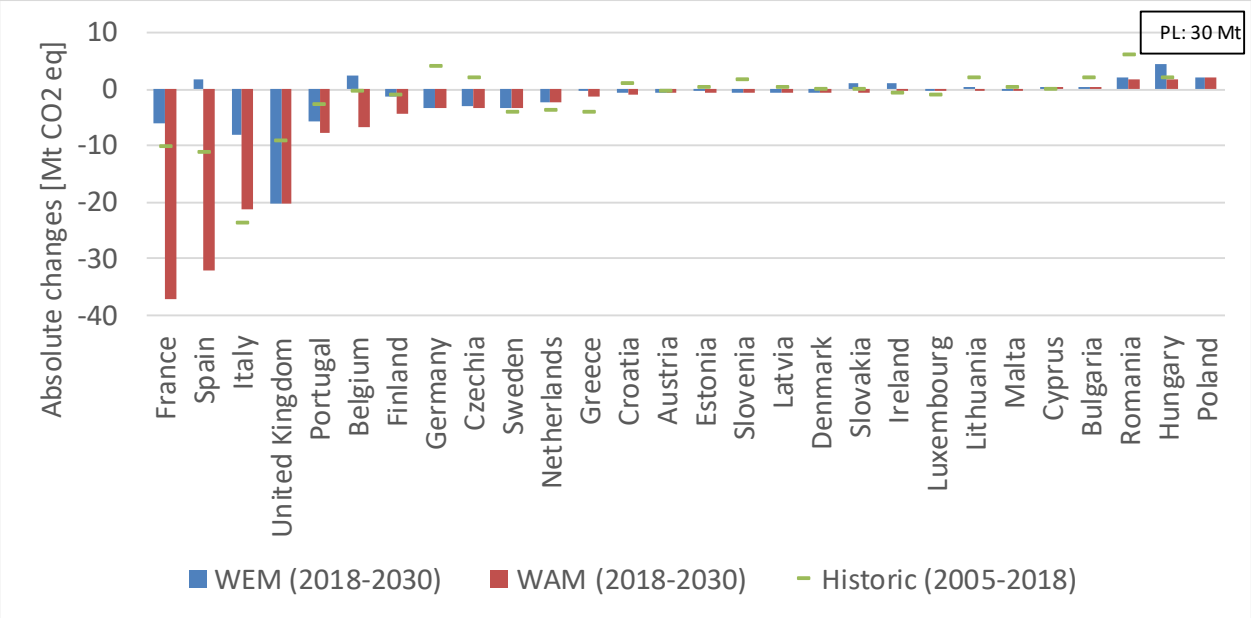
3.2.2 *Projection of progress by Member States*

At EU level, emissions decreased by 2 % between 2005 and 2018.[10] In 12 Member States emissions increased in this time period and in 15 Member States emission decreases have been reported. In projections with existing policies and measures, there are still 10 Member States showing increasing emission. This number is reduced to three Member States (Cyprus, Hungary and Romania) for projections with additional policies and measures (see Figure 8); Bulgaria and Poland did not submit a WAM scenario.

In the transport sector, the highest absolute greenhouse gas emission reductions have been projected in France, Spain and Italy, all including planned policies and measures (see Figure 8). These emissions reductions are between 37 and 21 Mt CO_2e. In Italy, the historical emission reductions between 2005 and 2018 were about the same level as what is projected for 2018-2030, while the historical emission reductions were less than half of the projected reductions in Spain and France.

The three Member States (Cyprus, Hungary and Romania) with projected emission increases in both the WEM and WAM scenario showed historical emission increases between 2005 and 2018 as well. Especially the historical emission increases in Poland, Romania and Bulgaria were higher than projected increases with additional policies and measures. This indicates that at least the growth rate of emissions is expected decrease.

Figure 8 **Historical and projected developments in the transport sector by country 2018-2030 (absolute)**

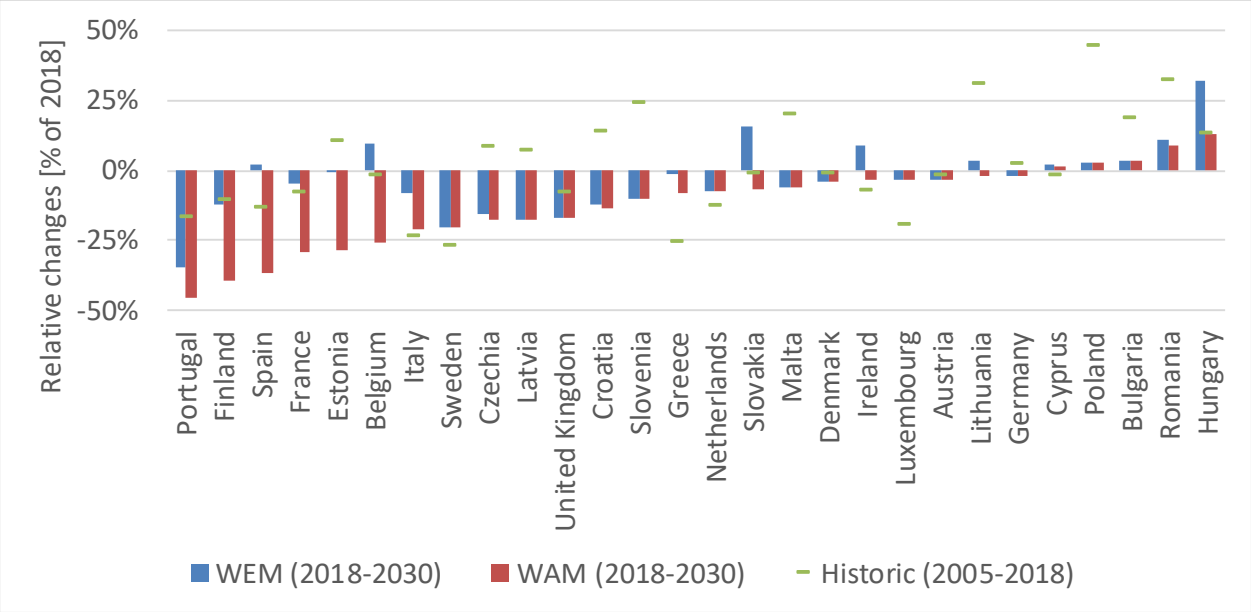


Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

If relative developments are considered, Portugal, Finland and Spain show highest projected decreases in scenarios with additional measures. On the other hand, Cyprus, Hungary and Romania not only show the highest absolute but also show the highest relative projected emission increases with additional measures.

(10) Chapters 3.2 to 3.6 compare the reported effects of policies and measures with the projected greenhouse gas emissions. The latest submission of policies and measures and their effects was in 2019; to ensure consistency the projections from 2019 have been used for the analysis in these chapters, even though a relevant number of updates for GHG projections were submitted in 2020. Chapters 2 and 3.1 are based on the latest projections and results are not necessarily identical to the values presented here.

Figure 9 **Historical and projected developments in the transport sector by country 2018-2030 (percentage points)**



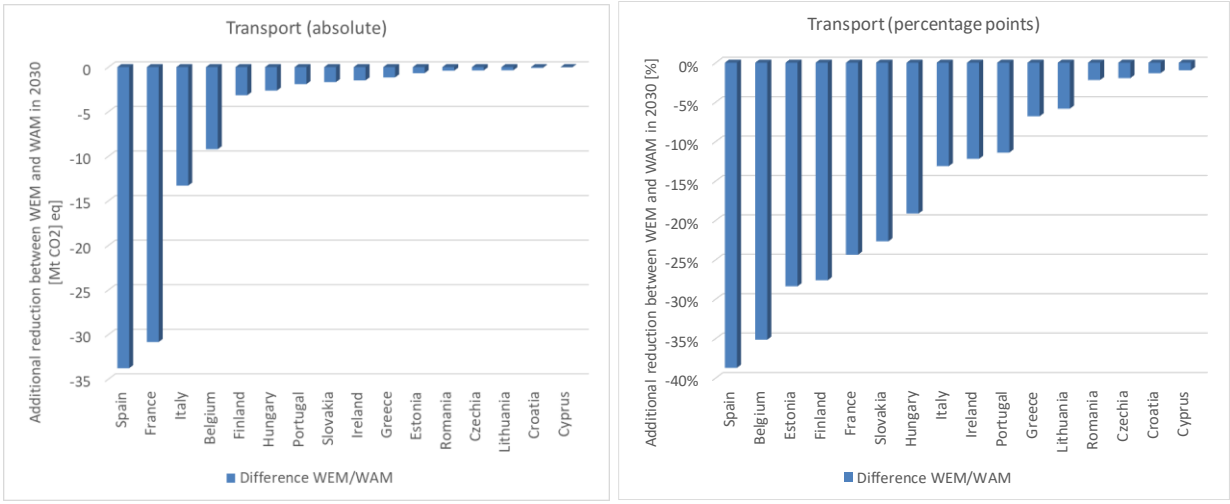
Note: To make the GHG developments comparable between Member States, emissions have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 10 provides further insight in planned emission reductions from additional policies and measures by showing the difference between WEM and WAM scenarios. 16 Member States reported emissions from additional measures in the transport sector, these are depicted below.

Largest projected emission reductions from additional policies and measures in absolute terms can be observed from Spain, France and Italy with total additional emission reductions between 34 and 13 Mt CO_2e compared to projections with existing measures (see Figure 10, left).

Highest relative emission reductions from additional policies and measures compared to the scenario with existing measures in the year 2030 have been reported by Spain, Belgium and Estonia (see Figure 10, right). In these three countries emissions are projected to decrease in WAM scenarios by 39 to 28 percentage points compared to the WEM scenario.

Figure 10 **Difference between WEM and WAM projections in the transport sector by Member State**



Note: To make the GHG developments comparable between Member States, reductions in the right figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Insights about effects of policies and measures in WAM scenarios are presented in section 3.2.3., with a special focus on those Member States which project the highest relative effects of emission reductions achieved by additional policies and measures (WAM scenario), which includes Spain, Belgium and Estonia.

3.2.3 Reported planned PaM of Member States

In 2019, 15 Member States reported 111 additional PaMs for the transport sector of which 28 PaMs are quantified by eight Member States (Czechia, Germany, Estonia, Finland, Greece, Ireland, Lithuania and Spain). It should be noted that DE reported additional PaMs which were related to the previous submission (2017) and no WAM projections were reported in 2019. In the following table the quantified PaMs are summarised.

Box 3 **Methodological remarks**

The PaMs objectives have been summarized for the quantified PaMs to provide an overview on the focus of the planned measures. It should be noted that the number of reported policies and measures varies among the Member States and this may also have an impact on the number of reported objectives per PaM per Member State.
The total effect on Effort Sharing emissions is presented as the sum of all quantified effects reported for planned PaMs for the year 2030 ("PaMs effect"). It can be understood as the additional reduction in emissions due to the planned PaMs in 2030. This number is put in relation to the total effect of planned PaMs according to the GHG projections for the WAM scenario compared to the WEM scenario. The grey bars show how much of the WAM emission reductions (WAM projections minus WEM projections) are explained by the effect of the quantified planned PaMs. For some countries the quantified PaMs effect exactly matches the WAM effect of the projection's scenario (e.g. Greece), but in most countries there remains a gap. According to the Eionet Report (Dauwe et al. 2019) this is related to the incompleteness of the PaMs quantification but also to the different approaches applied by Member State. Information on the PaMs effect is reported for less than 40 % of the total reported PaMs (existing and planned). To put the estimated PaMs effect in 2030 in relation with the sectoral emissions, the share of the quantified PaMs effect in the total sectoral WEM emissions in 2030 is included. In some countries the planned PaMs are expected to contribute to reductions in the sectoral emissions of up to one quarter.

When concluding on the following results, it is important to understand that:

- the absolute number of PaMs reported for a sector does not indicate a Member States commitment to greenhouse gas emission reductions, because there are different approaches how Member States report their PaMs depending on their national system. Some countries prefer to report fewer, more general and comprehensive PaMs, whereas some countries report many very specific PaMs and
- the PaMs reported with a quantified reduction effect may not be the PaMs that contribute the largest reduction effects to a sector in a Member State. It might well be that the PaM with the largest reduction effect has not been quantified.

Table 1 Overview of quantified planned PaMs in the transport sector

Member State	No of PaMs (quantified/ not quantified)	PaMs objectives	Total PaMs effect (reduction effect of all sectoral planned PaMs) in 2030 (ESR) kt CO_2e	% share of PaMs effect in the WEM/WAM difference of the transport sector	% share of PaMs effect in total sectoral WEM emissions in 2030	Planned PaM with highest effect
Czechia	2/0	Efficiency improvements of vehicles, Demand management/reduction	142	38%	1 %	Road toll
Estonia	7/0	Modal shift to public transport or non-motorized transport; Demand management/reduction; Improved behaviour, Improved transport infrastructure; Low carbon fuels/electric cars	604	89%	25 %	Additional spatial and land-use measures for urban transport energy savings to increase and improve the efficiency of the transport system
Finland	4/0	Low carbon fuels/electric cars, Efficiency improvements of vehicles Modal shift to public transport or non-motorized transport; Demand management/reduction	713	90%	28 %	Promoting the use of biofuels in the transport sector (additional measure)
Germany	5/0	Improved behaviour; Improved transport infrastructure Efficiency improvements of vehicles Low carbon fuels/electric cars	11000	NA (DE reported WAM measures from 2017, but no WAM projections in 2019)	7 %	Continuing the CO_2 regulations for newly registered cars to 60g/vkm in 2030 and include trucks
Greece	2/0	Low carbon fuels/electric cars Efficiency improvements of vehicles Modal shift to public transport or non-motorized transport Improved transport infrastructure;	1157	100%	7 %	Further biofuel use in transportation
Ireland	2/0	Low carbon fuels/electric cars	1257	84%	9 %	Directive 2009/28/EC – on the promotion of the use of energy from renewable sources – Transport component

Member State	No of PaMs (quantified/ not quantified)	PaMs objectives	Total PaMs effect (reduction effect of all sectoral planned PaMs) in 2030 (ESR) kt CO_2e	% share of PaMs effect in the WEM/WAM difference of the transport sector	% share of PaMs effect in total sectoral WEM emissions in 2030	Planned PaM with highest effect
Lithuania	4/2	Improved behaviour; Modal shift to public transport or non-motorized transport Other transport Improved behaviour Low carbon fuels/electric cars	1376	387%	22 %	Implementation of incentives for the use of combined freight transport
Spain	2/8	Demand management/reduction	44	0.13%	0.05 %	Introduction of advanced biofuels in maritime transport

Source: EEA (2019a)

According to this analysis, 7 % of the total WAM effect (difference of WEM and WAM scenario) of the EU GHG projections can be directly linked to quantified PaMs reported by Member States (excluding Germany because no WAM reported). Due to the limited information on the ex-ante quantification of PaMs, for the large part of the WAM effect in the transport sector it is not possible to link this effect to specific policies and to draw conclusions on the effectiveness of PaMs.

However, from those quantified, the PaMs with the highest impact in the WAM scenario are quite diverse and refer to the increase of biofuels, e.g.:

- Finland plans to set minimum biofuel shares to reach a share of 30 % biofuels in transport fuels in 2030,
- Greece wants to continue the obligation to blend diesel with biodiesel and extend the measure to other transport sectors.
- Estonia plans a very comprehensive PaM which includes several sub-measures, e.g. to develop light traffic routes, promotion of car sharing, reduction of subsidies for parking space, etc.
- In Czechia the extension of the road toll to trucks with more than 3.5 tons and the change of road pricing for freight transport (inclusion of first- and second-class roads) is the planned and quantified measure that lead to the largest reduction in the WAM scenario.
- Spain reported effects for two single PaMs related to the introduction of biofuels, which make up for only very small portion of the total WAM effect.

However, there are **some inconsistencies** in the reported data. Germany reports WAM measures which seem to be related to the 2017 submission, because they do not provide a WAM projections scenario[11]. For Lithuania the total PaMs effect is larger than the total effect of the WAM scenario for 2030. There is no information provided in the report. For Czechia both planned PaMs were quantified but they only explain 38 % of the WAM effect, but there is no explanation for this provided in the report.

In the following, selected countries are analysed for their additional PaMs as they have reported the highest relative emission reductions in the transport sector for their WAM scenario compared to the WEM in 2030 (see Figure 10). As not all Member States provide the ex-ante impacts for their PaMs, additional information from their PaMs and projections reports were summarized in the following in order to help understanding the projected reductions in the WAM.

Belgium

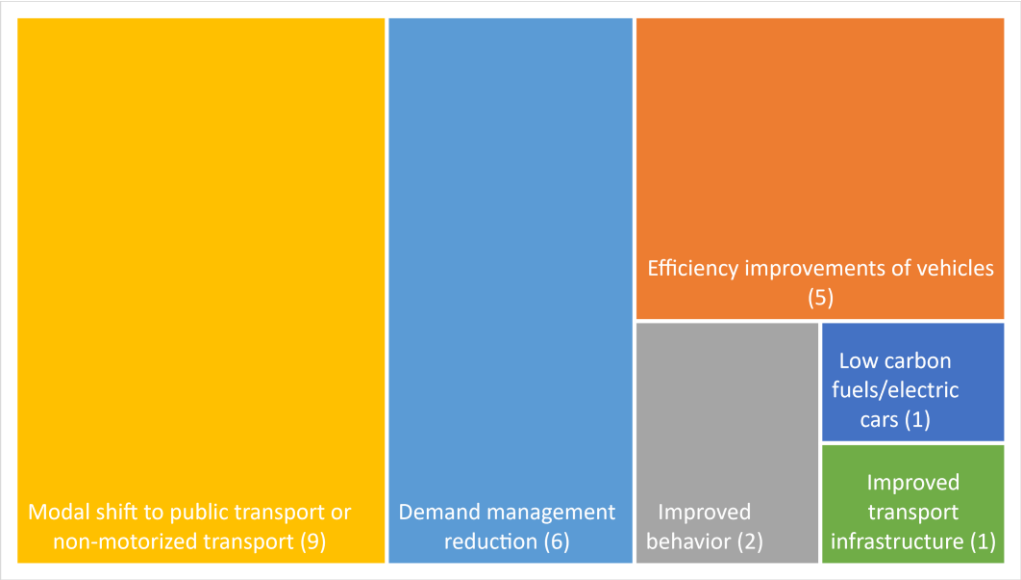
Belgium is responsible for 3 % of transport emissions in EU in the year 2018. It reports slightly increasing transport emissions in the WEM scenario (+9 % between 2018 and 2030), but in the WAM scenario the emissions are projected to decrease by -24 % by 2030 due to the implementation of additional policies. In 2030 the emissions in the WAM scenario are lower by 9 211 kt CO_2e than in the WEM scenario. 23 additional policies and measures have been reported, their specific effects have not been quantified.

According to the projections report[12], the most determining factor driving the emissions in the transport sector is the share of biofuels in road transport, which is increased in the WAM scenario. Other additional measures for the Flemish region aim to reduce the vehicle kilometres and the shift to electric or hybrid vehicles. The latter is also formulated in a strategic document that foresees a share of 50 % of zero emission vehicles sold as new cars in 2030. In this context Belgium also underlines the importance of kilometre charges for passenger cars. For Wallonia the share of electric vehicles will also be increased. For the Brussels region the main additional measures are reduction of cars and the greening of the fleet.

(11) Note that in 2020 DE provided an update of its PaMs reporting, however for consistency reasons only the submissions of 2019 were considered.

(12) Belgium report on „Projections of greenhouse gas emissions by sources and removal by sinks: Information on the assumptions, parameters and methods - Reporting under Article 14 of Regulation (EU) n° 525/2013" (2019)

Figure 11 Most common objectives of additional transport PaMs in Belgium



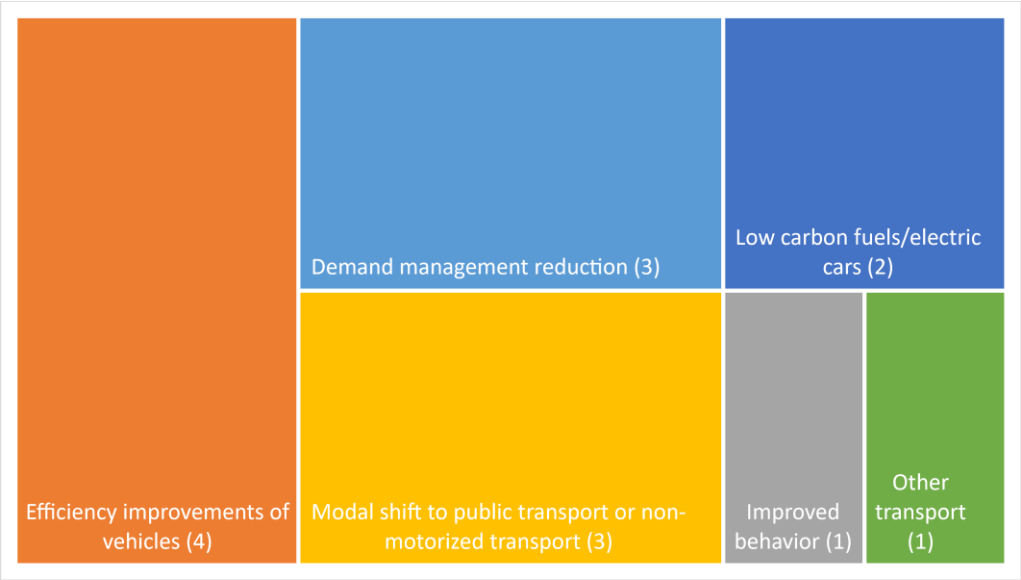
Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

Spain

11 % of EU emissions in the transport sector in 2018 are reported from Spain. There, emissions in the transport sector are expected to increase in the WEM scenario by 4 % by 2030 compared to 2018. On the other hand, with additional measures the emissions are projected to decrease by -34 % by 2030. The overall effect of the WAM measures in 2030 amounts to a reduction of 33 779 kt CO_2e compared to WEM. Spain reports two quantified PaMs which aim to increase biofuels in air and maritime transport (referring to the Renewable Energy Directive). The estimated effect of these measures in 2030 is 44 kt CO_2e, However, in the projections report[13] a table with overall WAM effects for ESR emissions per policy package is provided. For the planned aviation PaMs the reduction effect in 2030 compared to the WEM is estimated at – 5 kt CO_2e. The additional PaMs related to road transport are expected to reduce emissions by -34 142 kt CO_2e in 2030. Planned PaMs for maritime transport result in a slight emission reduction of -38.5 kt CO_2e, whereby in the railway sector emissions are expected to increase by 436.5 kt CO_2e due to additional PaMs in 2030. The main reduction is achieved in the road transport sector. These measures include the use of biofuel for road transport. Furthermore, Spain plans to reduce the passenger km in urban areas by 35 % until 2030. The car fleet shall be renewed and replaced by electric vehicles. This is projected to lead to cumulated savings in final energy consumption of 2 520 ktoe in the period 2021-2030 which corresponds to 18 % of the total final energy consumption in the transport sector[14].

([13]) Spain's GHG projections report: "Proyecciones de emisiones a la atmósfera edición 2019 - Sumario de resultados"
([14]) PaMs database 2019

Figure 12 Most common objectives of additional transport PaMs in Spain



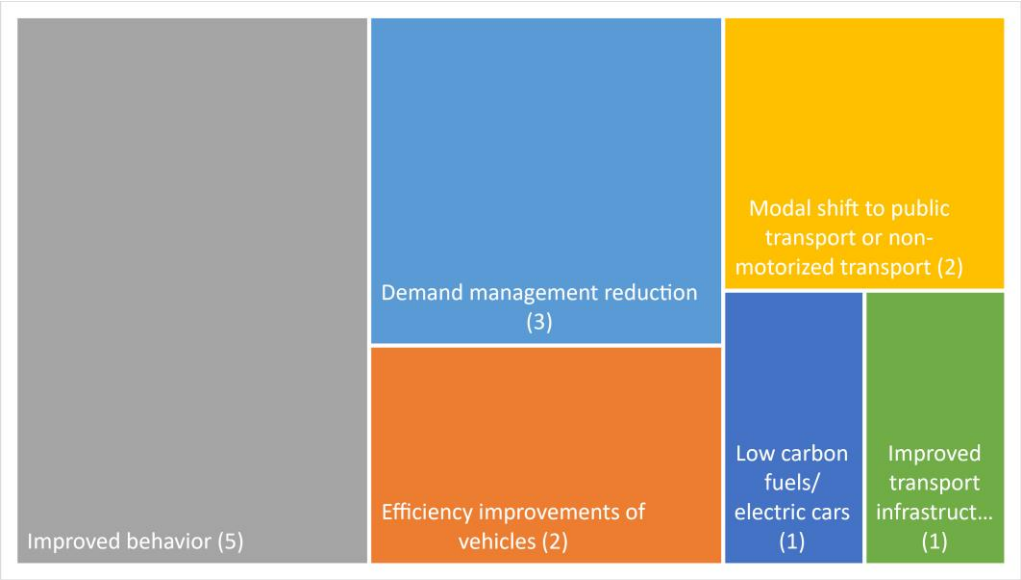
Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

Estonia

Estonia's transport emissions make up for 0.3 % of EU transport emissions in 2018. In the WEM scenario, Estonian emissions are projected to increase by 2 % between 2018 and 2030, whereby in the WAM scenario they are expected to decrease by -27 % due to additional measures. The emission reduction by the seven reported additional measures in 2030 amounts to 681 kt CO_2e and Estonia has quantified all transport PaMs covering 89 % of this effect. In the report there is no explanation provided why the sum of all PaMs effects are not fully covering the WAM effect, however it is mentioned that a PaM on railway electrification has not been quantified yet, because it is still under development. This PaM is also not reported in the PaMs database. The PaM on spatial planning and land use measures for urban transport leads to the highest emission savings in the WAM scenario. This measure includes the development of traffic routes for "light traffic", promotion of car sharing, updates in the urban parking systems and reduction of subsidies for parking spots and the reduction of the use of private cars[15]. Other additional measures reported by Estonia are the further development of public transport, support scheme for electric cars, development of the rail infrastructure, further promotion of eco-driving, improved efficiency of tyres and aerodynamics of cars and road usage fees. In the WEM scenario the PaM aiming to increase the share in biofuels has the highest impact in 2030, but this PaM is not intensified in the WAM scenario.

([15]) Estonia's report on GHG projections Report pursuant to Articles 13 and 14 of Regulation (EU) 525/2013 submitted in 2019

Figure 13 Most common objectives of additional transport PaMs in Estonia



Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

3.3 Buildings

Under the buildings category for this analysis we include the sectors 1.A.4 and 1.A.5, although we are aware that there is a small portion of emissions from mobile sources included in both sectors. However, the projections data set does not allow for a further disaggregation of the sectors 1.A.4 and 1.A.5, therefore we use the sum of both sectors as "building sector".

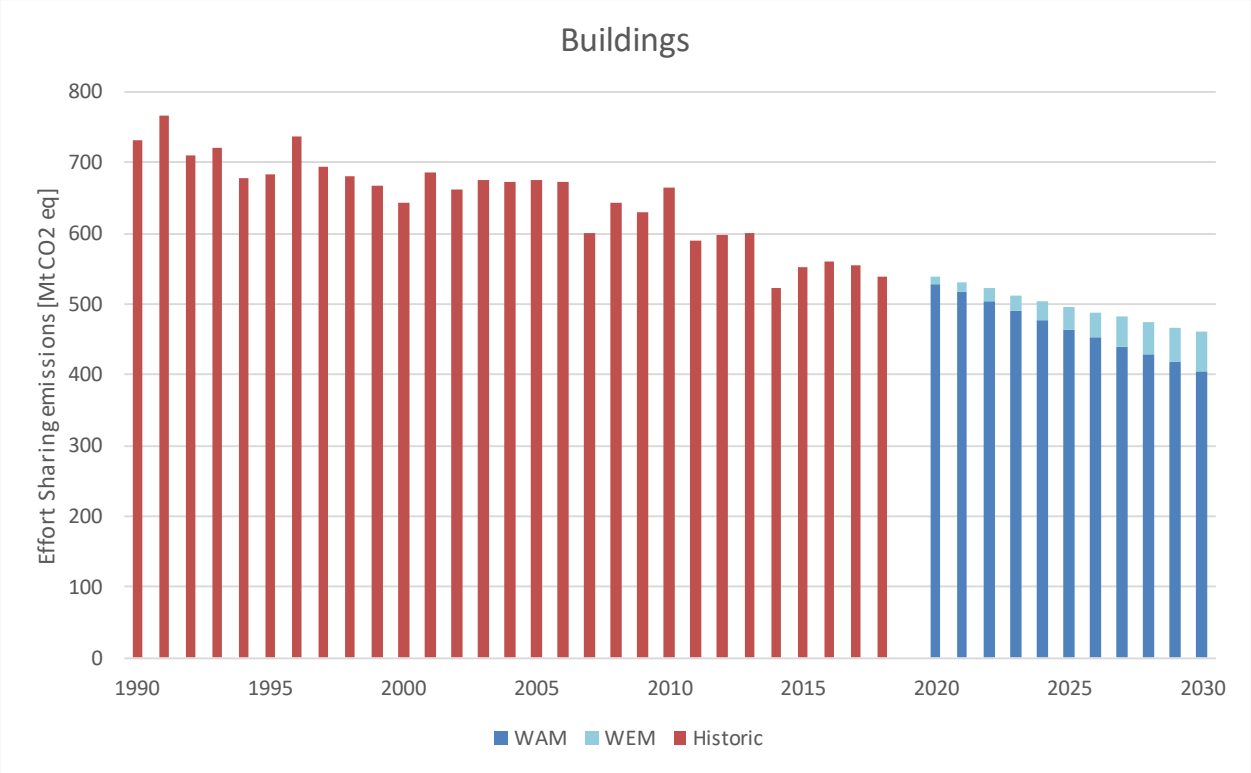
3.3.1 EU trends along the timeline

Most emissions in the building sector stem from the combustion of fossil fuels for space heating. The long-term trend of the EU buildings sector shows decreasing emissions, which is result of the implementation of higher standards for new buildings but also due to measures to increase energy efficiency in existing buildings (e.g. through changing of heating systems, thermal insulation and more efficient heating systems). The latest data of the EU NIR (EEA 2020a) shows a strong decrease in emissions from liquid and solid fuels and an increase of gaseous fuels in the sector, which leads to overall lower emissions in the sector. But also, outdoor temperatures, the size of the total building stock and areas are important factors that influence the emission trend. In the latest EEA analysis on trends and drivers of GHG emissions, it is noted that there is a trend of decreased heating demand due to warmer temperatures (EEA 2019b). On the other hand, according to the decomposition analysis of the ODYSSEE-MURE database for space heating in households, the effect of technical energy savings has a large impact on the reduction of fuel consumption in households, but at the same time the increased number of dwellings and larger floor areas of the buildings partly counterbalanced this effect (Odyssee-Mure 2020). According to the EEA indicators, the consumption of energy for space heating per sqm has decreased by approximately 25 % in 2016 compared to 1990, whereby the floor area has increased by 25 % in the same time period (EEA 2019c).

Current projections show that that the historical trend in reducing emissions is expected to continue. With existing measures, emissions will further decrease by 13 % by 2030 compared to 2018. With additional measures, emission reductions will amount to -21 % by 2030 compared 2018 (see Figure 6 and Figure 14).

It should be noted that any changes in the buildings sector, might reduce emissions from this sector, but likely causes a shift of emissions to other sectors, which could be covered in the ETS. In case of the exchange of the heating system by district heating emissions in the buildings sector are reduced, but this will increase emissions e.g. in the energy supply sector (1.A.1) in which the energy is produced instead. Similarly, the direct or indirect use of electricity in the building sector increases emissions in the energy sector. As far as the additional demand in the energy sector is not covered by renewable energies, this leads to higher emissions in this sector, which is largely covered under the EU ETS.

Figure 14 Historical and projected developments in the building sector for EU-27 1990-2030



Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

3.3.2 Projection of progress by Member States

At EU level, emissions in the buildings sector decreased by 25 % between 2005 and 2018. In only four Member States (Estonia, Lithuania, Luxembourg and Malta) emissions increased in this time period whereas in all other Member States emission decreases have been reported.

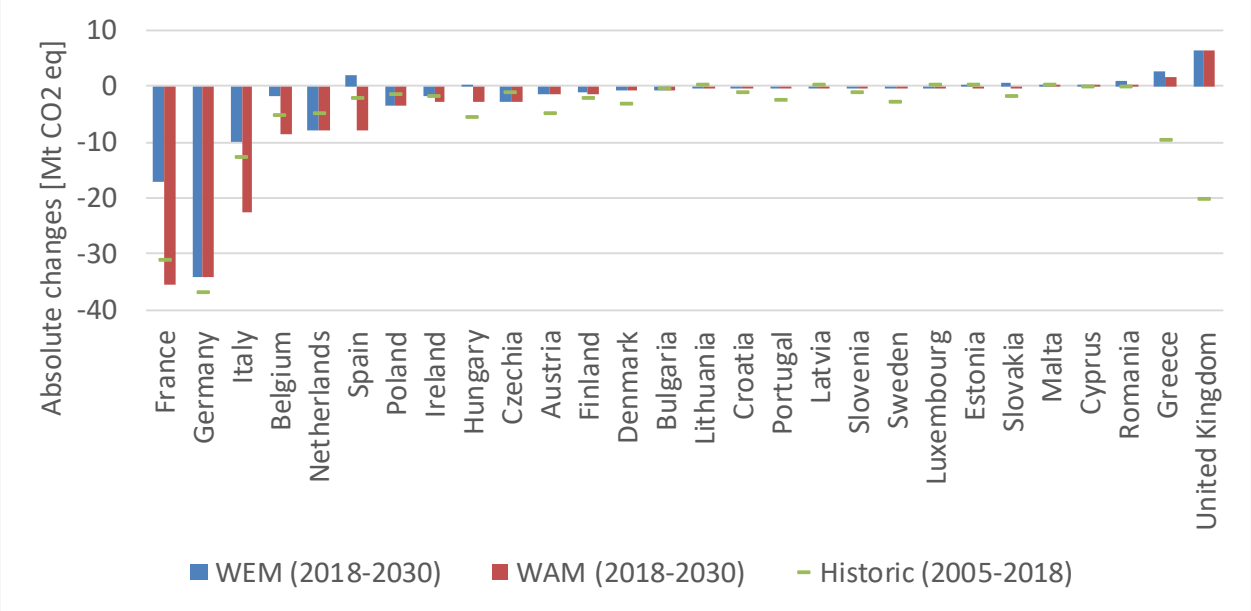
In projections with existing policies and measures, eight Member States projected increasing emissions (Cyprus, Estonia, Greece, Hungary, Malta, Romania, Slovakia and Spain). However, even with additional policies and measures there remain only three Member States (Cyprus, Greece and Romania) which report increasing emissions in their projections (see Figure 15) although they have reported decreasing emissions in the past.

The highest absolute greenhouse gas emission reductions in the buildings sector have been projected in France, Germany and Italy (see Figure 15). These emissions reductions are between 35 and 22 Mt CO2e. In Germany, the historical emission reductions between 2005 and 2018 were about the same level as what is projected with existing measures for 2018-2030. In France and Italy, historical emission reductions between 2005 and 2018 were higher than in the scenario with existing measures for 2018-

2030, but with additional measures reduction levels are projected to be higher than the historical reductions.

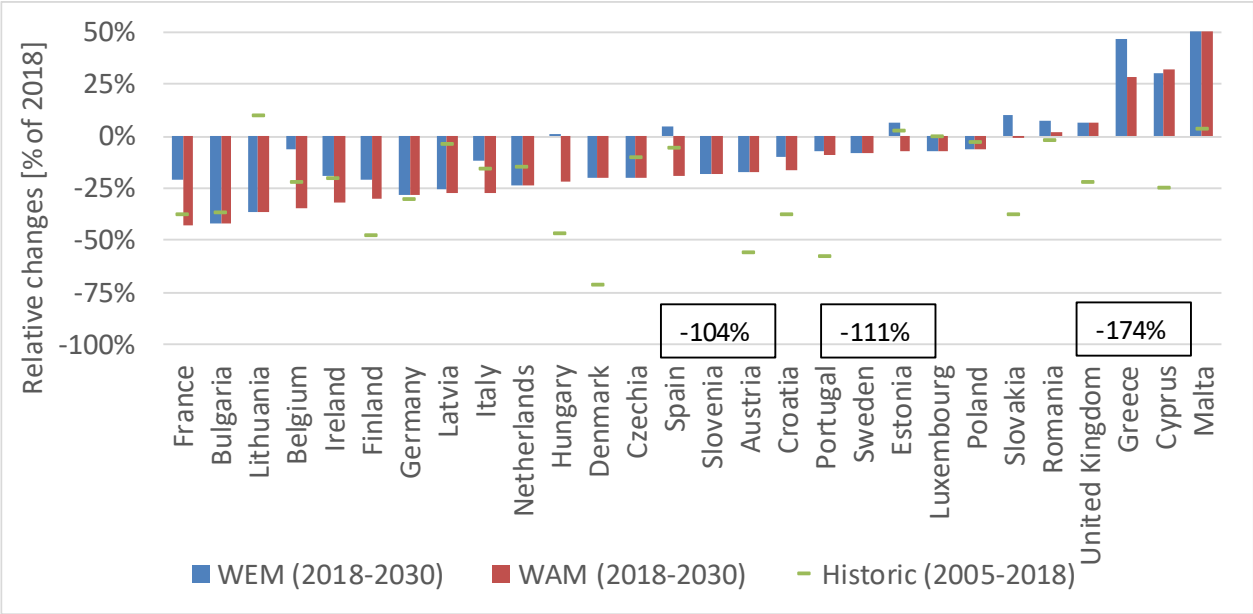
Regarding the relative changes, France, Bulgaria and Lithuania show highest projected decreases in their scenarios. Figure 16 also highlights three countries which reported very high relative changes in historical years (Slovenia, Sweden and Greece). The highest relative increases between 2018 and 2030 with additional measures are reported by Cyprus, Greece and Romania which also report the highest absolute emissions increases.

Figure 15 **Historical and projected developments in the buildings sector by country 2018-2030 (absolute)**



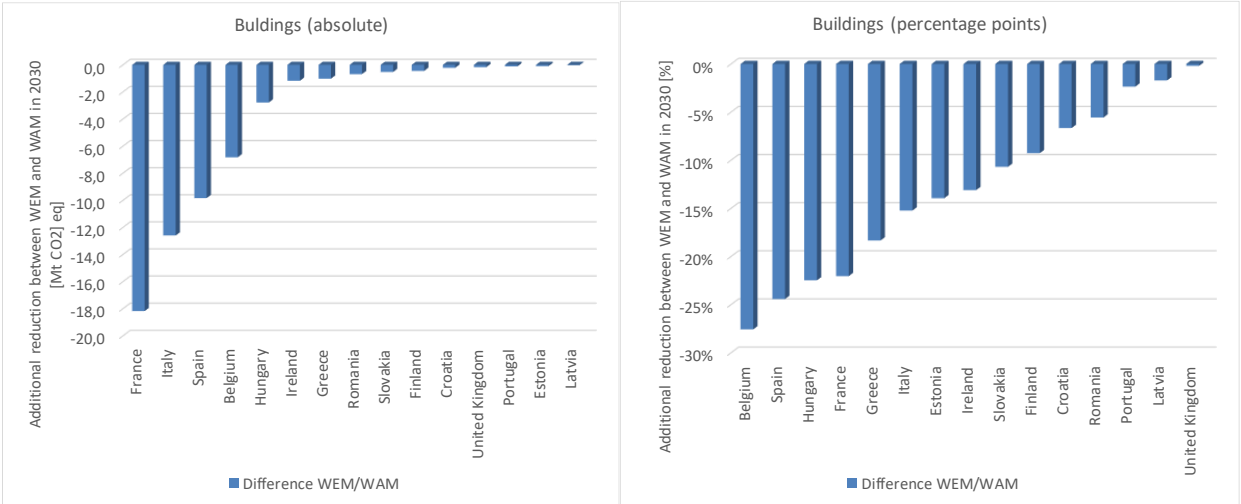
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 16 **Historical and projected developments in the buildings sector by country 2018-2030 (percentage points)**



Note: To make the GHG developments comparable between Member States, emissions in this figure have been divided by sectoral ESD emissions 2018 of the respective Member States. Especially in the buildings sector there are high deviations in emissions between the years, depending on annual heating and cooling degree days. Due to this, relative historical changes are partly highly depending on the timeframe chosen. Apart from this, emissions declined constantly and considerably since 2005 in some Member States. This is especially the case for Slovenia, Sweden and Greece, where the reduction from 2005 to 2018 is lower than -100 %, outside of the range of the figure.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 17 **Difference between WEM and WAM projections in the buildings sector by country**



Note: To make the GHG developments comparable between Member States, reductions in the right figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Insights about effects of policies and measures in WAM scenarios are presented in section 3.3.3., with a special focus on those Member States which project highest effects in their scenarios with additional policies and measures (Belgium, Spain and Hungary).

3.3.3 Reported planned PaM of Member States

The analysis of PaMs is more challenging for the building sector compared to other sectors.[16] The effects of PaMs are often interlinked or overlapping with other sector's PaMs and emission reduction efforts can be counterbalanced by rebound effects. This is also a challenge for modelling and quantifying the impact of the PaMs and therefore only a small share of planned measures is quantified. In 2019, the countries reported 74 planned measures related to the building sector, which were selected because the description or the objectives related to the building sector. Only 21 PaMs were quantified by six Member States (Estonia, Finland, Germany, Greece, Ireland and Slovakia).

([16]) For a description of the methodological approach used see chapter 3.2.3.

Table 2 Overview of quantified planned PaMs in the buildings sector

Member State	No of PaMs (quantified/ not quantified)	PaMs objectives	Total PaMs effect (reduction effect of all sectoral PaMs) in 2030 (ESR) kt CO_2e	% share of PaMs effect in the WEM/WAM difference of the building sector	% share of PaMs effect in total sectoral WEM emissions in 2030	Planned PaM with highest effect
Germany	04/05	Efficiency improvements of buildings Other energy consumption Increase in renewable energy Efficiency improvement of appliances Efficiency improvement in industrial end-use sectors Efficiency improvement in services/ tertiary sector	7900	NA (DE reported WAM measures from 2017, but no WAM projections in 2019)	9 %	Prolongation and further development of grants for efficient heat pumps and solar heating installations through the Market Incentive Programme for Renewable Energies (MAP)
Estonia	03/03	Efficiency improvements of buildings; Efficiency improvement in services/ tertiary sector; Demand management/reduction	79	84%	11 %	Additional reconstruction of private houses and apartment buildings
Finland	01/01	Demand management/reduction	407	91%	11 %	Promoting the use of bioliquids in heating of buildings
Greece	01/01	Efficiency improvements of buildings; Efficiency improvement in services/ tertiary sector Efficiency improvement of appliances	1012	100%	12 %	Further promotion of natural gas in residential and tertiary sectors and implementation of additional energy efficiency measures in Residential and Tertiary Sector (National Energy Efficiency Action Plan)
Ireland	11/13	Efficiency improvements of buildings Efficiency improvement in services/ tertiary sector; Efficiency improvement in industrial end-use sectors Increase in renewable energy Demand management/reduction	893	76%	12 %	Better Energy Homes (With Additional Measures)

Source: . EEA (2019a)

The total reported effect of these planned PaMs only covers 3 % of the total WAM effect of the GHG projections. Most countries report key planned PaMs that focus on efficiency measures, e.g.

- Estonia which plans the reconstruction of 20 % of existing public and commercial buildings by 2030.
- Finland and Greece have their focus rather on fuel switch.
- In Finland the share of bioliquids for heating shall be increased to 10 % by 2030.
- The main measure in Greece has multiple objectives, namely to create tax incentives for renewable energy facilities (for heating and cooling) in the residential and tertiary sector; to implement financing programs for the renovation of public and private tertiary sector buildings under the new programming period after 2020; to set up regulatory measures to promote buildings of nearly zero energy; and to promote Energy Efficiency Agreements in the private sector through targeted financial programs.
- The planned measure of Ireland with the highest effect provides grant-aids to householders who want to make their homes more energy-efficient by providing incentives towards the implementation of energy efficiency measures including attic and wall insulation and heating controls with efficient boilers and/or solar thermal.
- The Slovakian planned PaM aims to supporting faster renovation of old buildings, including insulation and strict building codes for new constructions.

As for the transport sector also for the building sector **some inconsistencies** occur in the dataset. Germany reports WAM measures which seem to be related to the 2017 submission, because they do not provide a WAM projections scenario. For Estonia, Finland and Ireland the PaMs effect is not fully matching with the total WAM effect. However, there is no information provided in the reports on any reasons for this. For Slovakia the effect is more than 100 % of the sectoral WAM effect, as according to the PaMs description other sectors (Industry and transport) are also covered by this measure. For Lithuania the total PaMs effect is larger than the total effect of the WAM scenario for 2030. There is no information provided in the report, but it could be that the figures reported for the planned PaMs in the PaMs database are the cumulated effects from 2021-2030 and not the annual effect for 2030. For Czechia both planned PaMs were quantified but they only explain 38 % of the WAM effect, but there is no explanation for this provided in the report.

The following, selected countries are analysed for their additional PaMs as they have reported the highest relative emission reductions for their WAM scenario compared to the WEM (see Figure 17).

Belgium

Belgium's emissions from the building sector make up for 5 % in the EU-27 emissions in 2018. In the WEM scenario the emissions are projected to decrease by -1 % by 2030 compared to 2018. In the WAM scenario the emission reduction is expected to be -29 % in the same time period. Belgium reports about 21 planned PaMs which can be attributed to the building sector for the three regions. None of these measures is quantified. According to the report for the Flemish region, the Flemish renovation pact provides the main target of reducing the energy demand of residential buildings by 76 % in 2050 compared to 2012. This is translated into different measures with a strong focus on the decarbonisation and increased efficiency of heating systems. For Wallonia the additional measures aim at building renovation, improve energy consumption of new buildings and the use of renewable energy sources for heating. For Brussels capital region the planned measures include the exchange of fossil fuel-based heating systems and the renovation of buildings. There is no information provided which PaMs have the highest impact on emission reduction.

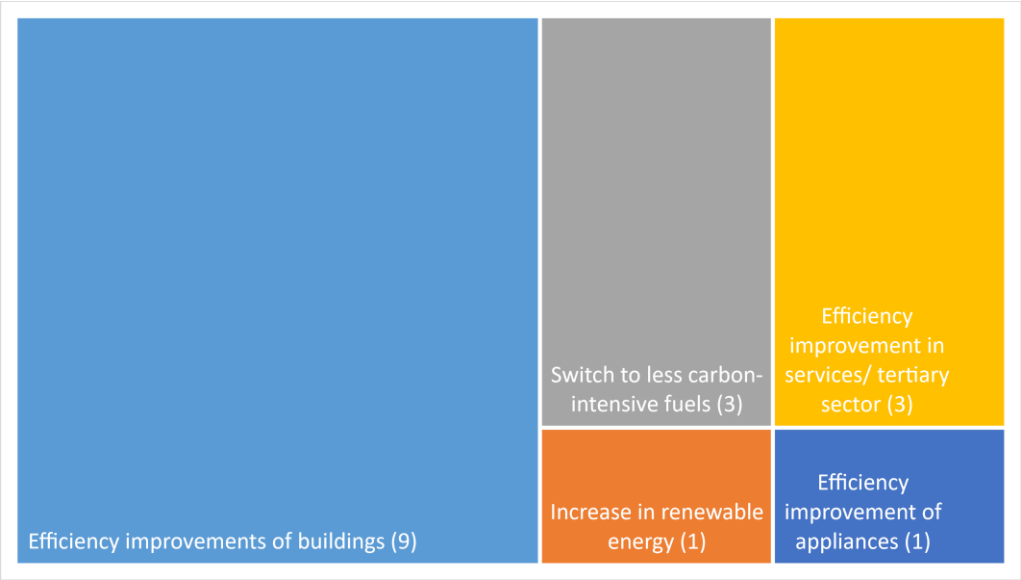
Figure 18 Most common objectives of additional building PaMs in Belgium

Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

Spain

Emissions in the building sector are expected to decrease by 1 % by 2030 in the WEM and by 20 % by 2030 in the WAM scenario compared to 2018. The whole sector contributes with 5 % to the EU-27 emissions. Spain reports nine planned PaMs which can be associated with the buildings sector and are not quantified. They include the promotion of renewable gases and biomass use to replace fossil fuels, but also building renovation (about 1.2 million buildings shall be thermally renovated until 2030). The renovation rate shall be gradually increased from 2021 to 2030, starting with 30 000 homes per year in 2021 and ending with 300 000 homes in 2030. Through setting up a guarantee of origin scheme, support programmes and the revision of the building code, the renewable energy share in the heating and cooling sector shall be improved. Additional measures also aim at improving large air-condition installations and renovation of refrigeration equipment in the public sector, as well as the promotion of self-consumption. In the projections report, it is stated that the planned PaMs of the policy package for the residential sector contribute to an additional emission reduction of 5 347 kt CO_2e in 2030 compared to the WEM scenario (Spanish Projections report 2019, see footnote 9).

Figure 19 Most common objectives of additional building PaMs in Spain



Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

Hungary

Hungary's emissions from the building sector make up for 2.5 % of the EU-27emissions in this sector in 2018. In the WEM scenario emissions are projected to decrease by -4 % in 2030 compared to 2018, in the WAM scenario emissions are expected to decrease by 25 % in the same time period. Hungary reports five planned measures which are attributed to the building sector. Estimated impacts on GHG emissions are not provided. There is no information on PaMs in the report and the information in the database is rather limited. For two measures related to the accelerated exchange of the existing building stock and to the promotion of heat pumps, energy saving objectives are provided in the PaMs database (429 ktoe and 38 ktoe, respectively), but without mentioning a time horizon until when these savings shall be achieved. The other PaMs focus on the promotion of exchange of heating systems, use of modern biomass-based fuels. The budget for energy efficiency programmes for buildings is planned to be increased and the resources shall be allocated towards climate related measures and another PaM is focusing on grants and credits for in the framework of the energy efficiency programme for buildings.

Figure 20 Most common objectives of additional building PaMs in Hungary

Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

3.4 Agriculture

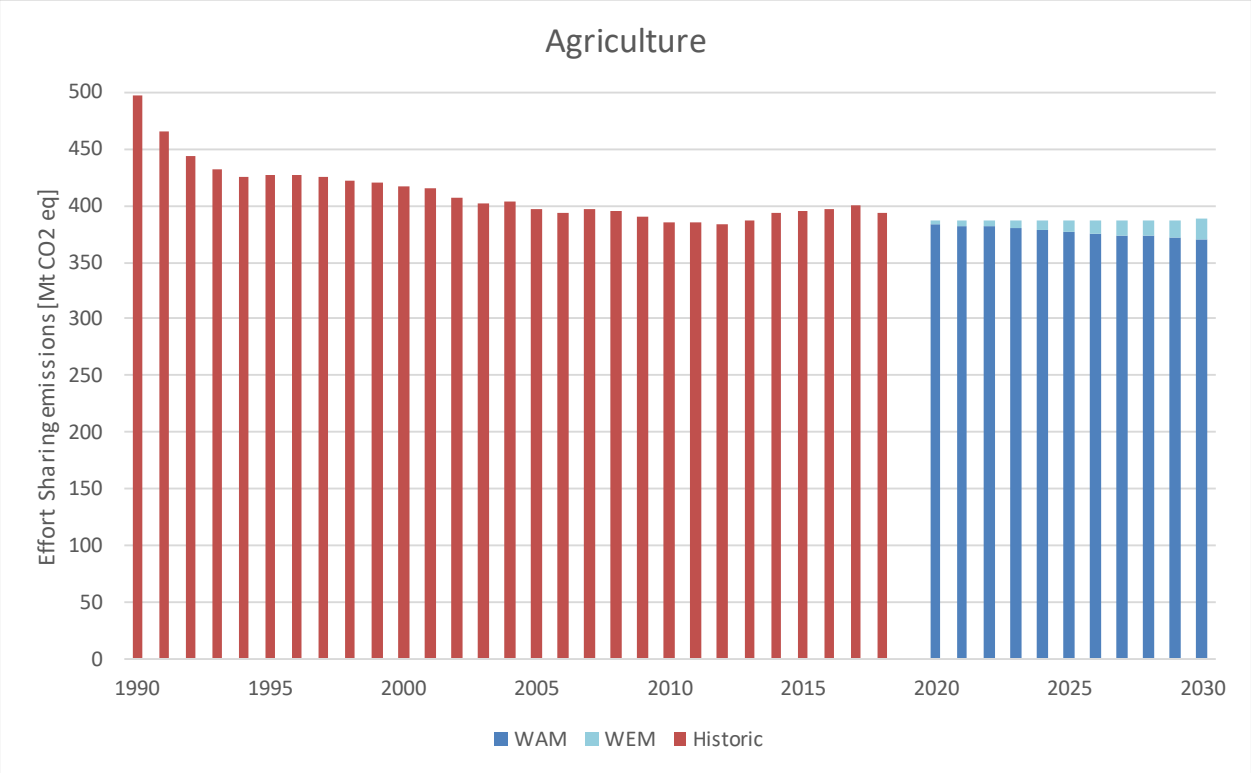
3.4.1 EU trends along the timeline

About 39 % of the European Union's land is farmland (Cook 2019). Since 1957 agriculture in Europe is determined by the Common Agricultural Policy (CAP) of the European Union. Initially the CAP was mainly aiming on higher agricultural productivity. With the MacSharry reform of 1992 the EU took steps to shift CAP subsidies away from price and market support towards direct support for farmers. This was continuously pursued with the Agenda 2000 reform, focusing more on the maintenance and enhancement of the rural environment and a better recognition of agriculture as a multifunctional activity. The 2003 CAP reform focused on making the European agriculture more market oriented and at the same time targeted on environmental protection (EEA 2020a).

With 17 % of total Effort Sharing emissions at EU level, agriculture is the third largest source of emissions in the Effort Sharing sectors. Agricultural emissions in EU decreased by 21 % between 1990 and 2018. This reduction was mainly driven by the two largest emission sectors in agriculture. Emissions from enteric fermentation from cattle decreased due to a reduction in cattle population in Europe and direct N_2O emissions from agricultural soils decreased due to less quantities of applied fertilizer (EEA 2020a). With emission trends in this sector nearly constant between 2005 and 2018, this sector has hardly contributed to reductions in the Effort Sharing sectors during that time.

Current projections show that that the latest historical trend is likely to continue as countries plan rather low emission reductions in this sector. Even with additional measures emissions in this sector will reach no further than 25 % below 1990 level by 2030, predicting a reduction of only 4 % in the period 2018 – 2030 (see Figure 21).

Figure 21 Historical and projected developments in the agriculture sector for EU-27 1990-2030



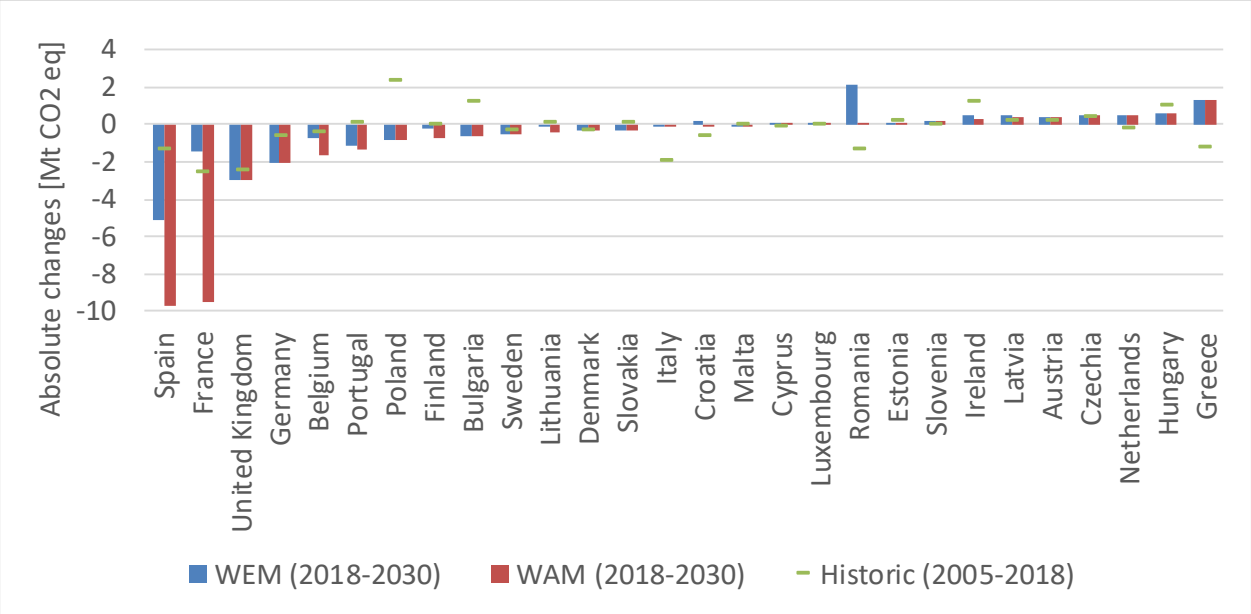
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

3.4.2 Projection of progress by Member States

Current projections indicate that countries plan rather low emission reductions in this sector.
With existing policies and measures emissions will only be reduced by another 2 % in 2030 in relation to 2018. With additional policies and measures, emissions will reach 25 % below 1990 level.
In projections with existing policies and measures, fourteen Member States projected slightly increasing emissions (Austria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Ireland, Luxembourg, Malta, the Netherlands, Romania, Slovenia and Spain). However, even with additional policies and measures all but one of these Member States (Croatia) still report increasing emissions in their projections (see Figure 22).
The highest absolute greenhouse gas emission reductions in the agriculture sector have been projected in Spain, France and the UK (see Figure 22). These emissions reductions are between 10 and 3 Mt CO2e.

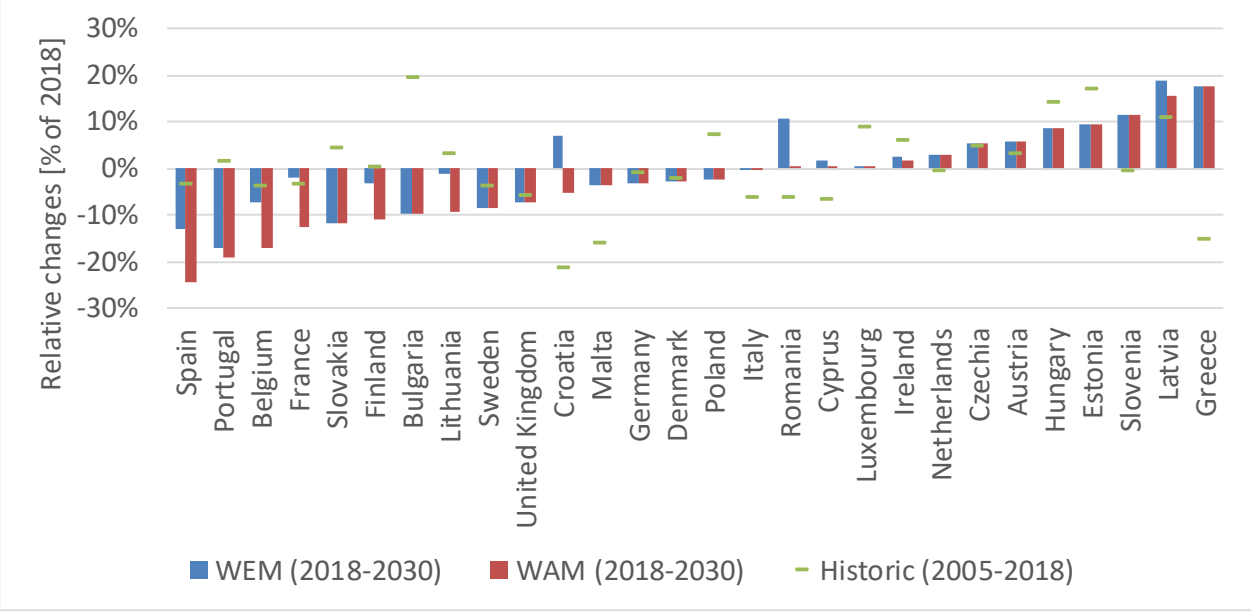
Regarding the relative changes, Spain, Portugal and Belgium show highest projected decreases in their scenarios. The highest absolute changes between the WEM and the WAM scenario are reported by Croatia, Spain, France and Romania for the period 2018 to2030 (Figure 25).

Figure 22 **Historical and projected developments in the agriculture sector by country 2018-2030 (absolute)**



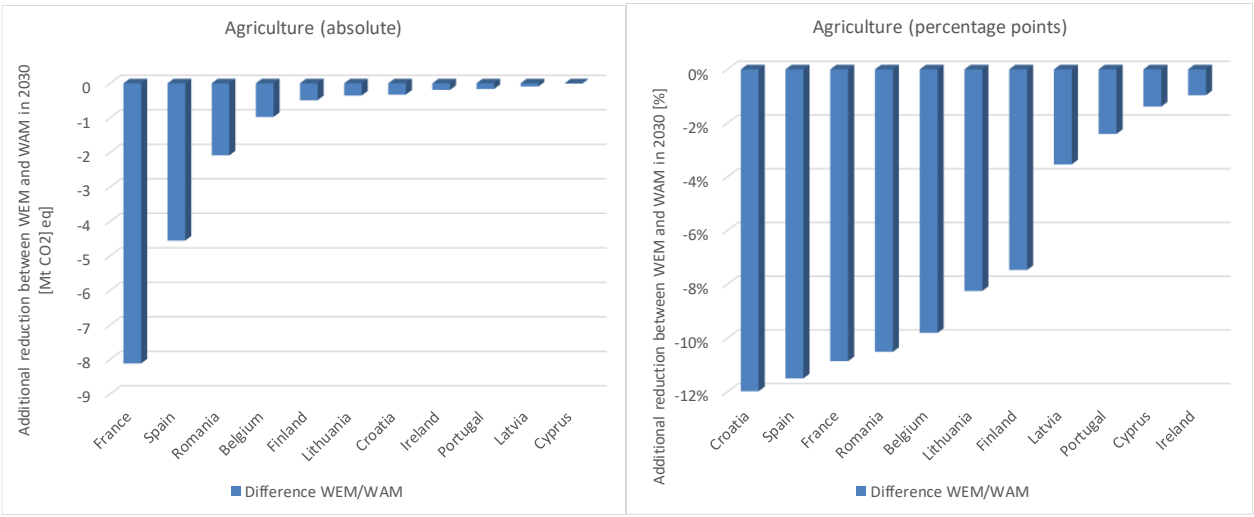
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 23 **Historical and projected developments in the agriculture sector by country 2018-2030 (percentage points)**



Note: To make the GHG developments comparable between Member States, emissions in this figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 24 **Difference between WEM and WAM projections in the agriculture sector by Member State**



Note: To make the GHG developments comparable between Member States, reductions in the right figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Insights about effects of policies and measures in WAM scenarios are presented in section 3.4.3 with a special focus on those Member States which project highest effects in their scenarios with additional policies and measures (**Croatia, Spain and France)**.

3.4.3 Reported planned PaMs of Member States

In 2019 13 Member States reported 55 additional PaMs related to the agriculture sector of which only 12 PaMs have been quantified from five Member States(DE, FI, ES, IE, LT). These measures most commonly aim at improving cropland management, reducing fertilizer use and manure application on cropland improving livestock management.

PaMs reported are mostly related to the implementation of European policies such as the Common Agricultural Policy, the Nitrates Directive and the Renewable Energy Directive.
Again, it should be noted that additional PaMs reported by Germany are related to its previous submission from 2017 and no WAM projections were reported in 2019. In the following table the quantified PaMs are summarized. [17]

([17]) For a description of the methodological approach used see chapter 3.2.3.

Table 3 Overview of quantified planned PaMs in the agriculture sector

Member State	No of PaMs (quantified/ not quantified)	PaMs objectives	Total PaMs effect (reduction effect of all sectoral PaMs) in 2030 (ESR) kt CO_2e	% share of PaMs effect in WEM/WAM difference of the agriculture sector	% share of PaMs effect in sectoral WEM emissions in 2030	Planned PaM with highest effect
Germany	02/02	Reduction of fertilizer/manure use on cropland Other agriculture	2980	NA	5 %	Amendment of the fertilizer ordinance
Finland	01/01	Improved management of organic soils	440	90%	7 %	Activities to reduce emissions from organic soils
Spain	02/02	Reduction of fertilizer/manure use on cropland Other activities improving cropland management Improved management of organic soils Improved animal waste management systems	4921	108%	14 %	Improving the management and treatment of slurry
Ireland	01/01	Reduction of fertilizer/manure use on cropland	188	98%	0.9 %	Nitrogen Fertilizer Use Efficiency in Agriculture
Lithuania	06/09	Improved management of organic soils Other activities improving cropland management Activities improving grazing land or grassland management Reduction of fertilizer/manure use on cropland Other agriculture Improved livestock management	2784	788%	66 %	Amendment of mandatory requirements for the use of mineral nitrogen fertilizers

Source: . EEA (2019a)

According to this analysis, 24 % of the total WAM effect of the EU GHG projections can be directly linked to quantified planned PaMs reported by Member States (excluding DE because no WAM reported), this is by far a higher proportion than for the transport or buildings sector.

- The main quantified planned PaM in Lithuania is the amendment of the mandatory requirements for the use of mineral nitrogen fertilizers with the aim to enhance efficiency of fertilization and thereby reduce the application of mineral fertilizers.
- In Spain the planned PaM with the highest impact is a set of measures supporting the improvement of animal waste management systems such as the cover of slurry rafts and the separation of solid and liquid slurry during its management. This PaM is followed by the impact of another set of measures focusing on the promotion of the rotations of dry arable crops and the adjustment of nitrogen supply to the needs of the crop.

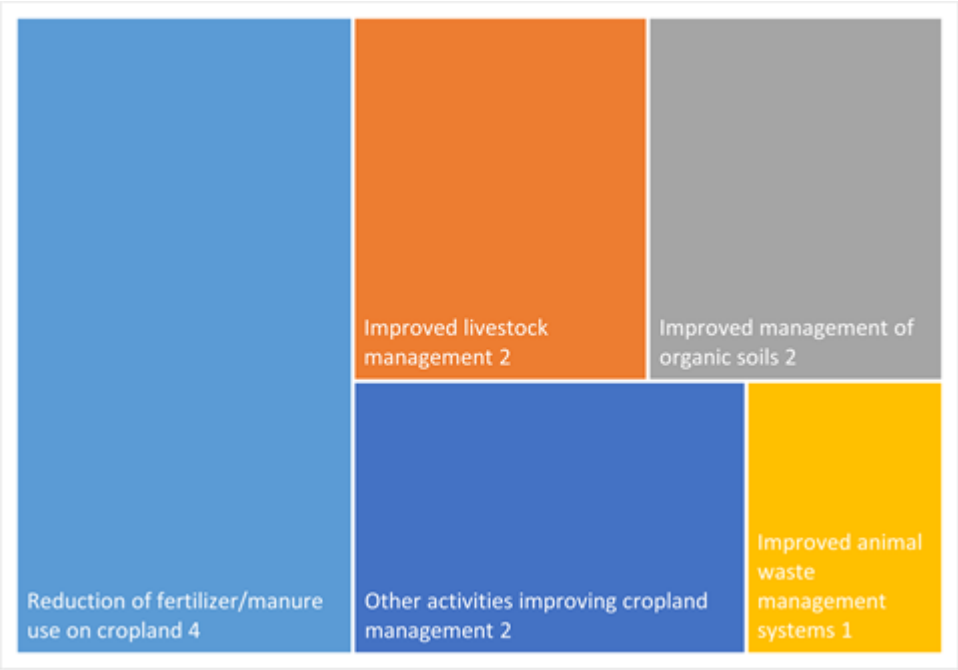
As for other sectors there are **some inconsistences** in the dataset. Germany, like for all other sectors, reports WAM measures which seem to be related to the 2017 submission, because they do not provide a WAM projections scenario. For Lithuania the total PaMs effect is larger than the total effect of the WAM scenario for 2030. There is no information provided in the report on this, but possibly figures reported for the planned PaMs in the PaMs database represent the cumulated effects from 2021-2030 and not the annual effect for 2030 (see also explanation in Transport chapter). Also, Spain's WAM effect in the agriculture sector is slightly above 100 %, with no explanation given in their report. For Finland and Ireland, the quantification of the planned PaMs explains about 90 % respectively 98 % of the WAM effect.

The following, selected countries are analysed for their additional PaMs as they have reported the highest emission reductions for their WAM scenario compared to the WEM (see Figure 24)

Croatia

In 2018 0.7 % of EU emissions in the agriculture sector are reported from Croatia. In the WEM scenario the emissions are reported to increase by 7 % by 2030 compared to 2018. In the WAM scenario the emissions are expected to decrease again and reach a level of -5 % during the same period. Croatia reports 9 planned PaMs associated with the Agriculture sector but none of them is quantified. Six of these additional PaMs are linked to the CAP reform, two to the Nitrate Directive and one to the RES Directive. Four of these PaMs are mainly aiming at the reduction of fertilizer/manure use on cropland, two on improving of animal waste management systems, one on the improvement of livestock management and one on the improvement of organic soils. The remaining PaM is planned to facilitate the development of a biomass market for Croatian small-scale farms.

Figure 25 Most common objectives of additional agriculture PaMs in Croatia

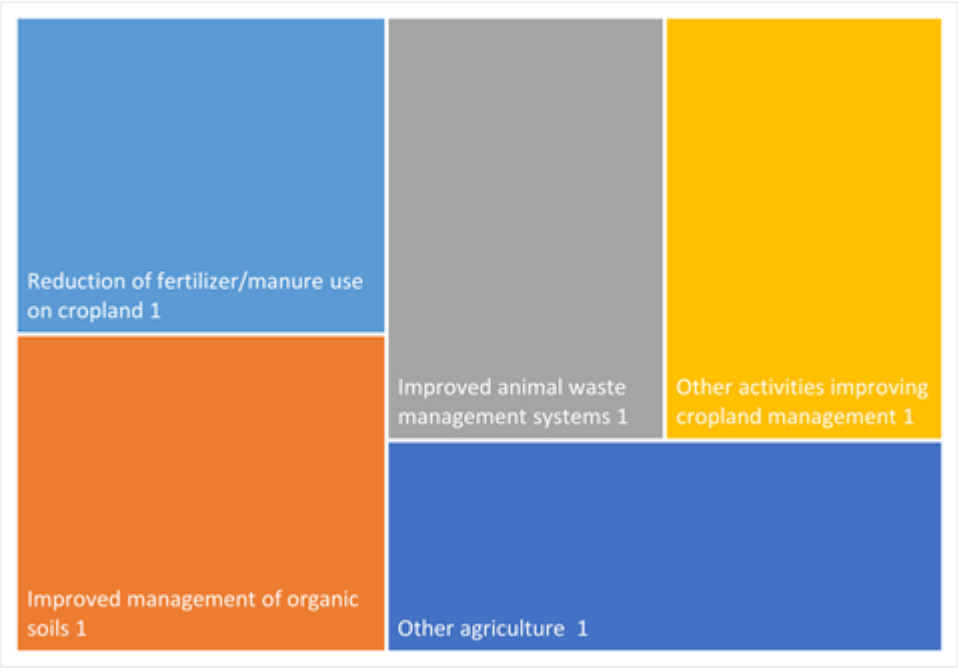


Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

Spain

10 % of EU-27 emissions in the agriculture sector in 2018 are reported from Spain. In the WEM scenario the emissions are reported to decrease by 13 % by 2030 compared to 2018, in the WAM by 24 %. Spain reports 2 planned PaMs in the Agriculture sector. These two PaMs include a wide range of measures. These two PaMs include a wide range of measures. Their estimated impact on GHG emissions is shown in Table 3. One of these PaMs is supporting the improvement of animal waste management systems such as the covering of slurry rafts and the separation of solid and liquid slurry during its management. The other one is focusing on the promotion of the rotations of dry arable crops and the adjustment of nitrogen supply to the needs of the crop.

Figure 26 Most common objectives of additional agriculture PaMs in Spain



Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

France

France emissions in the agriculture sector reported in 2018 make up for 19 % of EU-27 emissions. In the WEM scenario the emissions are reported to decrease by only 2 % by 2030 compared to 2018, in the WAM by 13 %. France reports 10 planned PaMs associated with the Agriculture sector. Estimated impacts on GHG emissions are not provided.

These additional reported agricultural PaMs cover a wide set of objectives. These include two PaMs explicitly promoting organic farming and the use of organic products in restaurants. One PaM is facilitating the use of renewable energy on agricultural holdings while another PaM aims at the decline of urbanization and the limitation of the artificiality of land.

The majority of PaMs is focusing on the reduction of fertilizer/manure use, the improvement of grazing land or grassland management and on improving animal waste management systems.

Figure 27 Most common objectives of additional agriculture PaMs in France

Note: The size of each rectangle and the number indicates how many times the objective was mentioned
Source: ETC/CME, EEA (2019a).

3.5 Waste

Solid waste disposal and wastewater treatment are the main contributors to emissions in this sector. Landfills generate methane emissions if the dumped waste with carbon content (e.g. food waste, wood, plastics) decompose under anaerobic conditions. The same can occur in wastewater containing human effluent. Biological treatment of solid waste and waste incineration do not play a significant role. In total, the waste sector only contributes by 3.1 % of total EU greenhouse gas emissions.

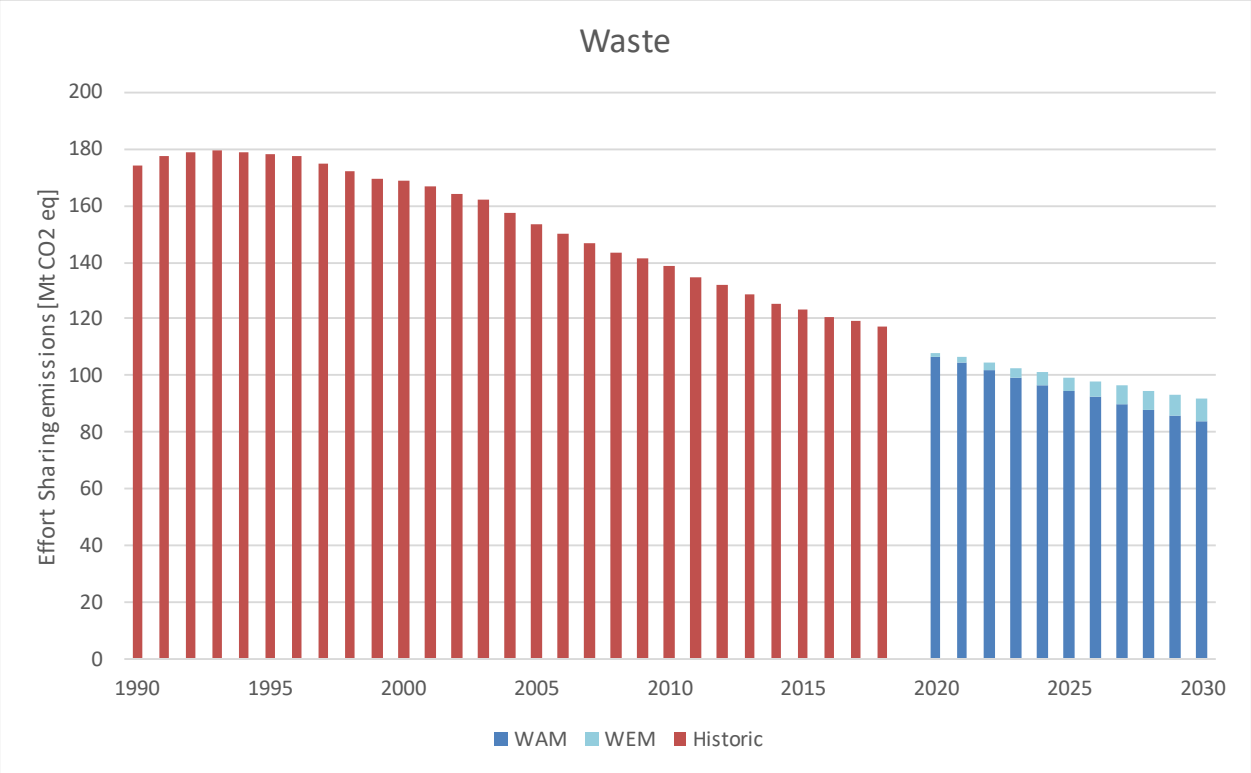
3.5.1 EU trends along the timeline

Compared to 1990, emission in the sector decreased by 36 % until 2019, faster than total GHG emissions (26 %). Emissions from solid waste disposal sites are controlled by the Landfill Directive (1999/31/EC). It requires that the amount of biodegradable waste going to landfills by 2016 is no more than 35 % of the respective value in 1995[18]. Instead, biodegradable waste needs to be composted, recycled or sent to waste incineration facilities. The impact on methane emission from landfills from the Directive is delayed, the degradation process depends on the local climate and can take up to 20 years. For this reason, emissions are not declining a quickly as the quantity of biodegradable waste being sent to landfills. In addition, the Landfill Directive requires the capture and treatment of landfill gas from solid waste disposal sites. Landfill gas capture might not be feasible for all sites and cannot capture all emissions.

Member States expect a continued decrease of emissions from waste until 2030 with little difference between the WEM and the WAM scenario. With the continued degradation of waste in the remaining landfills emissions will continue to decline in the future.

([18]) For some Member States the deadline is 2020 instead of 2016.

Figure 28 Historical and projected developments in the waste sector for EU-27 1990-2030

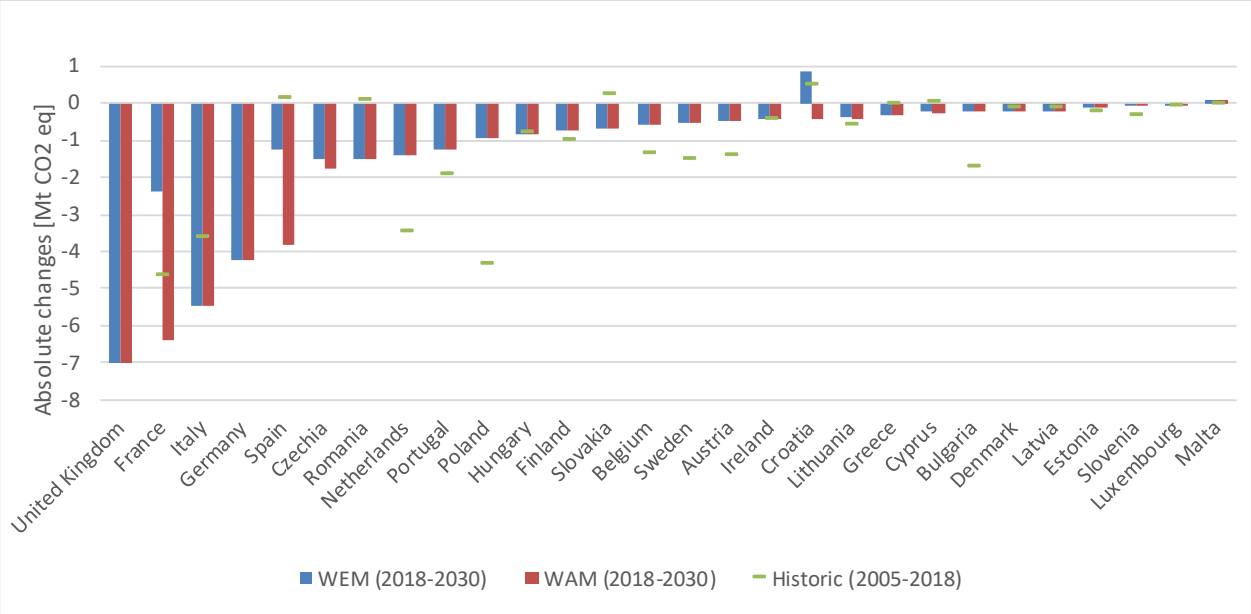


Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

3.5.2 Projection of progress by Member States

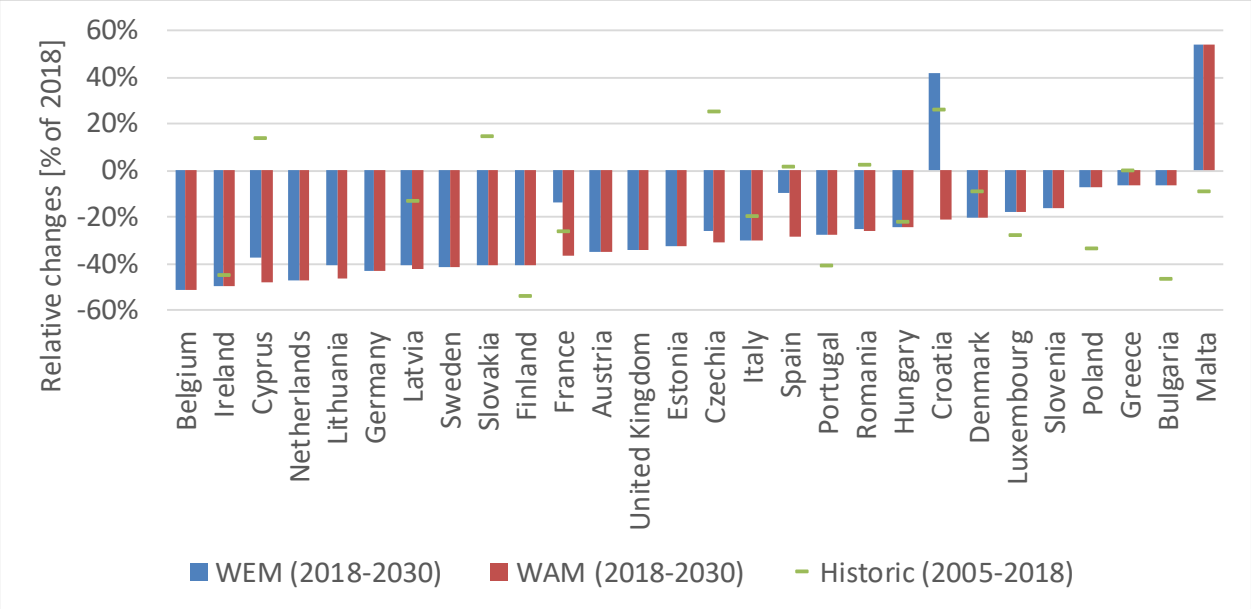
Except for Croatia and Malta, all Member States expect a continued decrease of emissions from waste in the WEM scenario. In the WAM scenario, only Malta projects an emission increase compared to 2018. Only few Member States show higher reductions in the WAM scenario, most notably Croatia which intends to decrease emissions by over 20 % in 2030 compared to 2018; in the WEM scenario, emissions are projected to be over 40 % above current levels. In absolute terms, the difference between the WEM and WAM scenario for the EU-27 is less than 10 Mt CO_2e.

Figure 29 **Historical and projected developments in the waste sector by country 2018-2030 (absolute)**



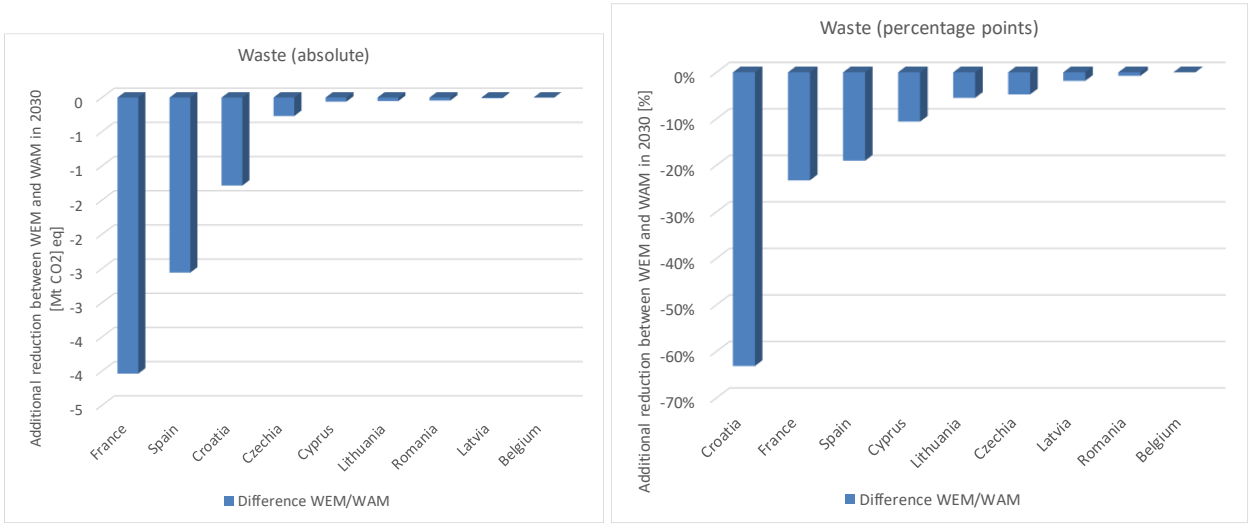
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 30 **Historical and projected developments in the waste sector by country 2018-2030 (percentage points)**



Note: To make the GHG developments comparable between Member States, emissions in this figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 31 Difference between WEM and WAM projections in the waste sector by Member State



Note: To make the GHG developments comparable between Member States, reductions in the right figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

3.6 Small industry

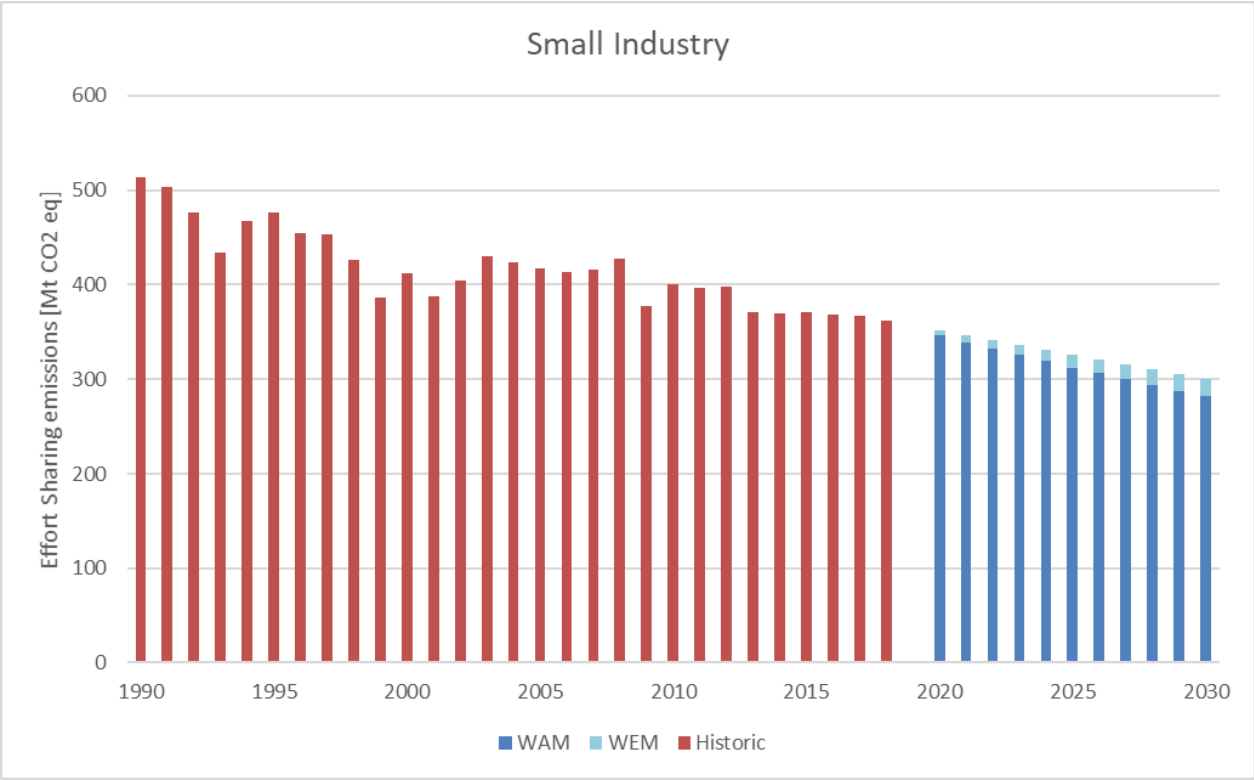
The sector "Small industry" aggregates sectors which although mainly covered by the EU ETS contain emissions from smaller energy and industrial activities, which are not covered under the EU ETS. These sectors are Energy Industries (1A1, 1B and 1C), Manufacturing and Construction (1A2) and Industrial processes (2). ESD emissions of these sectors can be seen as the residual emissions between total ESD emissions and ESD emissions of the other sectors, mentioned before.

3.6.1 EU trends along the timeline

At the level of total EU emissions, ETS emissions are decreasing at a rate which is considerably higher than emissions covered under the ESD. While ETS emissions decreased by 43 % between 1990 and 2019, reductions of ESD emissions have been reduced by 14 %, less than a third. Projections show future decreases, but at a slower rate. The reduction rate of ESD emissions of "Small industry" is more than twice as high than the average ESD reduction between 1990 and 2019, with a lower rate since 2005.

For the group of sectors covered under "Small industry", the rates of ESD reductions are heterogeneous (see also (ETC/ACM 2018a)). Between 2005 and 2019 a small increase of ESD emissions from energy industries is visible, while emissions decreased by 19 % in both other sectors (1.A.2 and 2). Increasing ESD emissions of energy industries can be explained by higher decentralized energy system structures which include a higher share of smaller energy stations below the ETS threshold of 20 MW. ESD emission developments in sector 2 are often driven by F-gases. While there are no specific policies and measures reported which are targeting ESD emissions of energy industries, manufacturing and construction or process emissions, there are many policies and measures reported to reduce F-Gases.

Figure 32 Historical and projected developments in the agriculture sector for EU-27 1990-2030

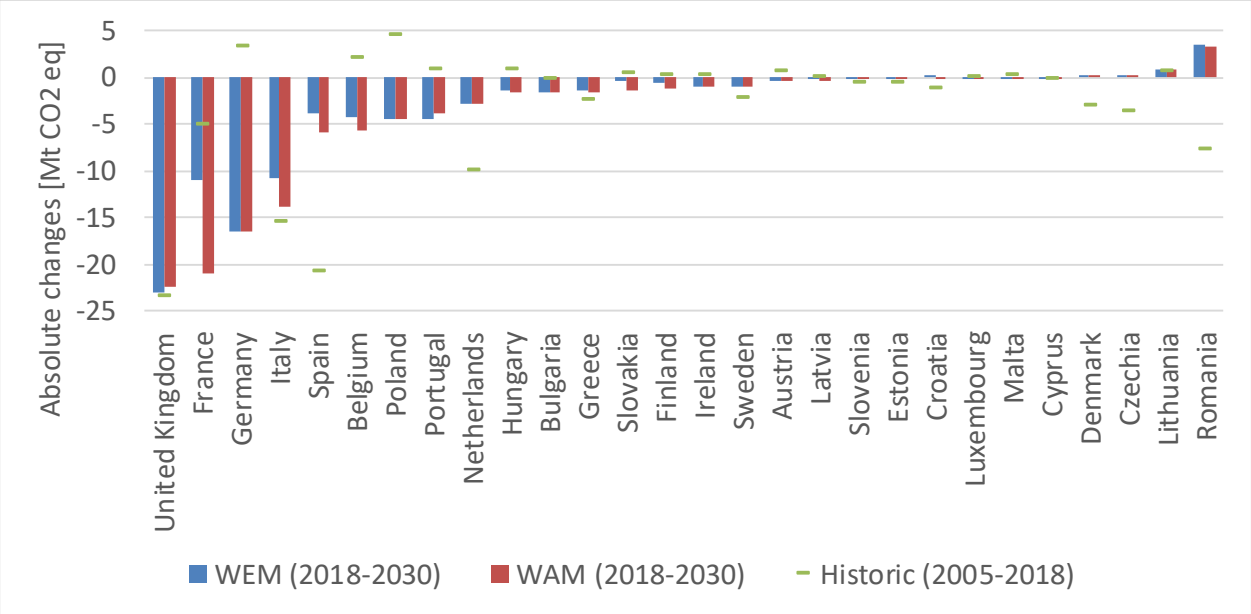


Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

3.6.2 Projection of progress by Member States

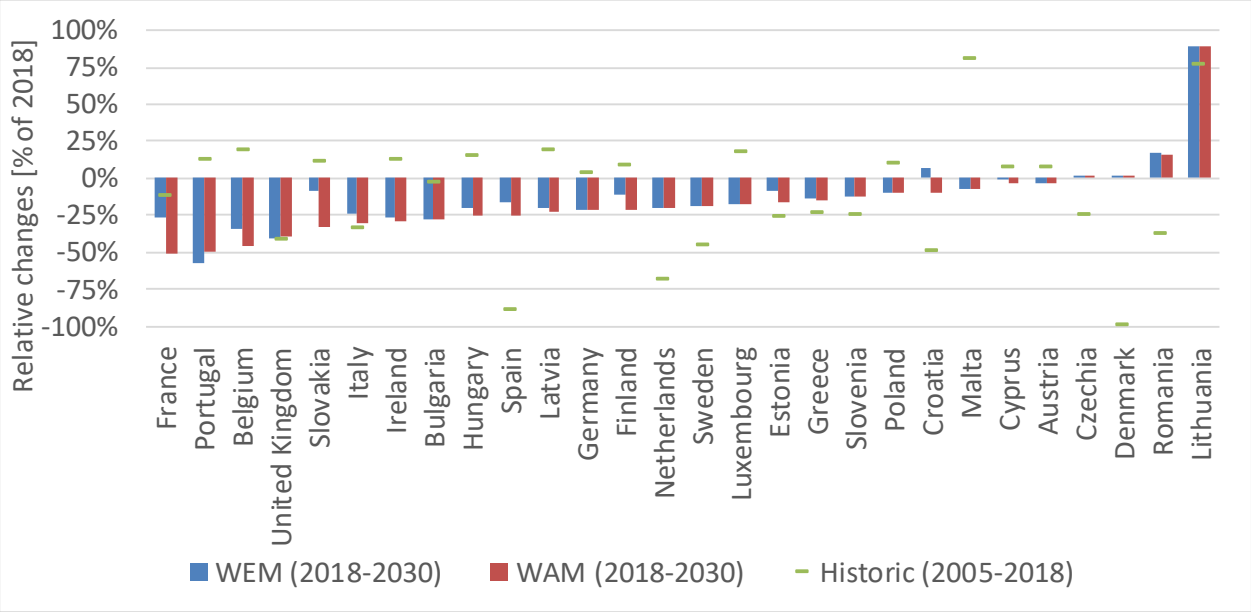
Development on Member State level is very divers and often driven by the development of F-Gases. This has been discussed in detail in (ETC/ACM 2018b). Highest relative historic reductions in this sector are seen by Denmark, Spain and the Netherlands, with highest increases in Malta and Lithuania, (see Figure 33, right and compare to (ETC/ACM 2018b). Emissions in this sector have been increasing between 2005 and 2018 in many countries. Nevertheless, emission reductions are projected for all but four Member States (Czechia, Romania, Denmark and Lithuania) until 2030 (see Figure 34). Relative differences between WEM and WAM scenarios are highest in France and Slovakia (see Figure 35).

Figure 33 **Historical and projected developments in the small industry sector by country 2018-2030 (absolute)**



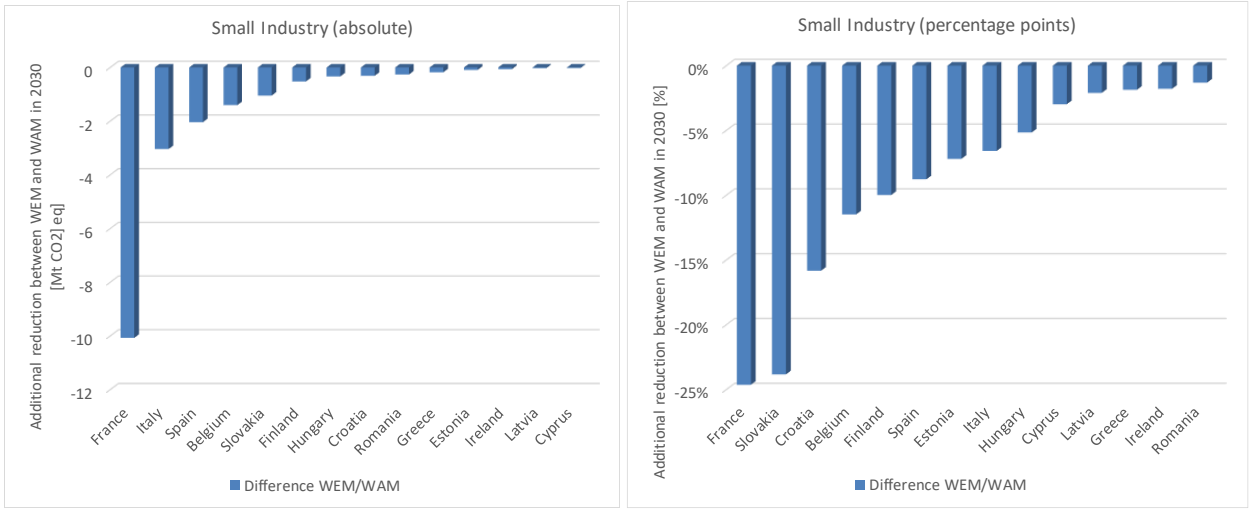
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 34 **Historical and projected developments in the small industry sector by country 2018-2030 (percentage points)**



Note: To make the GHG developments comparable between Member States, emissions in this figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

Figure 35 **Difference between WEM and WAM projections in the small industry sector by Member State**



Note: To make the GHG developments comparable between Member States, reductions in the right figure have been divided by sectoral ESD emissions 2018 of the respective Member States.
Source: ETC/CME, Projections: EEA (2019d), Inventory data: EEA (2020c), ETS data: EEA (2020i).

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