

Enhanced flexibilities for the EU's 2030 Effort Sharing Decision

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1. Background

1.1. Principles for a new Effort Sharing Decision

On 23/24 October the European Council adopted conclusions on a 2030 Climate and Energy Policy Framework (European Council 2014). As part of the conclusions the council laid down some principles for an EU Effort Sharing Decision for the period 2021-2030 (ESD II):

- Target setting
 - a binding domestic EU target of a reduction of at least -40% below 1990 and a target of -30% below 2005 levels for the sectors covered by the ESD;
 - distribution of efforts according to GDP per capita ranging from 0% to -40% below 2005 levels;
 - targets for the Member States with a GDP per capita above the EU average will be relatively adjusted to reflect cost-effectiveness in a fair and balanced manner;
 - the methodology to set the national reduction targets with all the elements as applied in the Effort Sharing Decision for 2020 will be continued;
- Flexibilities
 - the availability and use of existing flexibility instruments within the non-ETS sectors will be significantly enhanced; and
 - a new one-off flexibility between ETS and ESD will be established for certain Member States.

1.2. ESD II targets

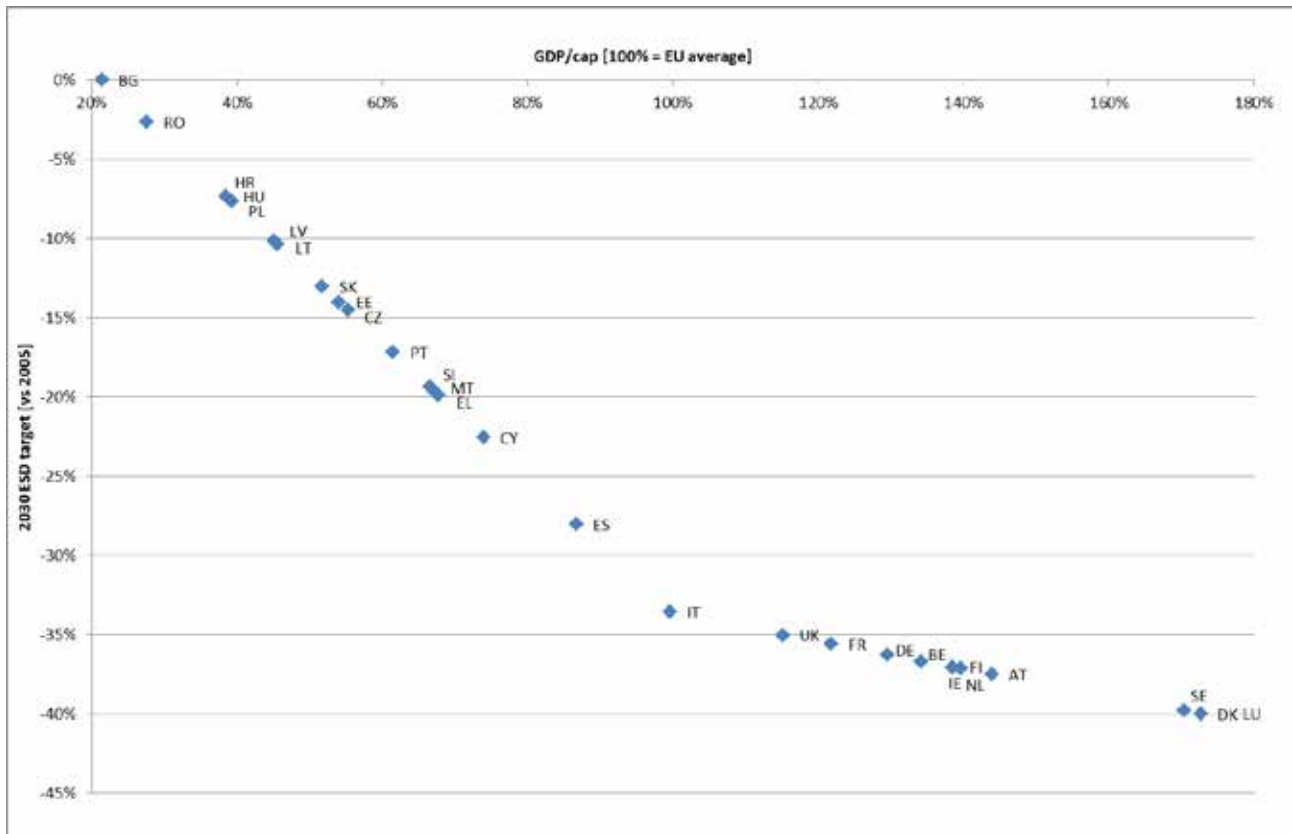
1.2.1. 2030 emission targets

2030 targets are to be distributed according GDP/capita applying the methodology for the 2020 ESD:

- The target for the Member State with the lowest GDP/cap (Bulgaria) is set to 0% below 2005 and for the two Member States with the highest GDP/cap (Denmark and Luxembourg) is set to -40% below 2005.
- All other Member States are distributed according to their GDP/cap along a line between Bulgaria and Denmark
- To achieve the overall reduction of -30% the line is pulled down at the EU average.

The approach and resulting targets by Member State are included in Figure 1-1 and Annex I.

Figure 1-1: Member States' 2030 targets based on GDP/capita



Source: Eurostat, own calculations

Based on the Council Conclusions these targets shall be relatively adjusted based on the cost-effective reduction potential for Member States with a GDP/capita above the EU average in a fair and balanced manner. It is not yet clear how this adjustment will be applied. The Impact Assessment accompanying the Commission Communication *A policy framework for climate and energy in the period from 2020 up to 2030* includes cost-effective reduction potentials by Member State (European Commission 2014b). Table 1-1 shows final 2030 targets for Member States with above average GDP/capita under different interpretations of the council conclusions. The calculations have been slightly adjusted to ensure that the overall EU target will be achieved. For an explanation and analysis of these options see Öko-Institut 2015a. For the purposes of this analysis it is assumed that the target will be the average of the lower cost-effective reduction potential and the distribution based on GDP/capita (column in bold).

Table 1-1: Member States' targets including cost-effective potential

	Starting Points			Member States' targets				Add. cost-effective potent.	
	GDP/cap [0%-40%]	Cost-effective potential		Full cost-effective potential				Min	Max
		Min	Max	25% cost eff (Min)	50% cost eff (Min)	25% cost eff (Max)	50% cost eff (Max)		
Austria	37.5%	27.0%	32.0%	35.4%	33.3%	35.3%	33.2%	38.7%	38.4%
Belgium	36.7%	24.0%	32.0%	34.0%	31.3%	34.7%	32.9%	40.0%	38.7%
Denmark	40.0%	31.0%	33.0%	38.4%	36.8%	37.2%	34.5%	40.0%	40.0%
Finland	37.0%	30.0%	33.0%	35.8%	34.5%	35.2%	33.5%	38.4%	40.0%
France	35.6%	34.0%	38.0%	35.6%	35.6%	35.5%	35.5%	36.2%	35.9%
Germany	36.3%	41.0%	47.0%	37.9%	39.5%	38.2%	40.0%	35.1%	35.6%
Ireland	37.0%	21.0%	25.0%	33.5%	30.0%	33.2%	29.5%	40.0%	40.0%
Italy ¹	33.5%	31.0%	35.0%	32.9%	32.3%	33.9%	34.3%	--	--
Luxembourg	40.0%	20.0%	27.0%	36.3%	32.5%	34.7%	29.5%	40.0%	40.0%
Netherlands	37.1%	28.0%	32.0%	35.3%	33.6%	35.0%	33.0%	40.0%	40.0%
Sweden	39.8%	29.0%	33.0%	37.7%	35.6%	37.1%	34.5%	40.0%	40.0%
United Kingdom	35.0%	35.0%	39.0%	35.4%	35.8%	35.4%	35.8%	33.5%	33.4%

Notes: ¹ The 2013 GDP/cap of Italy is 99.6% of the EU average; Italy is included here to show the range of targets if it is included in the group of Member States with above average GDP/cap.

Source: Öko-Institut 2015a

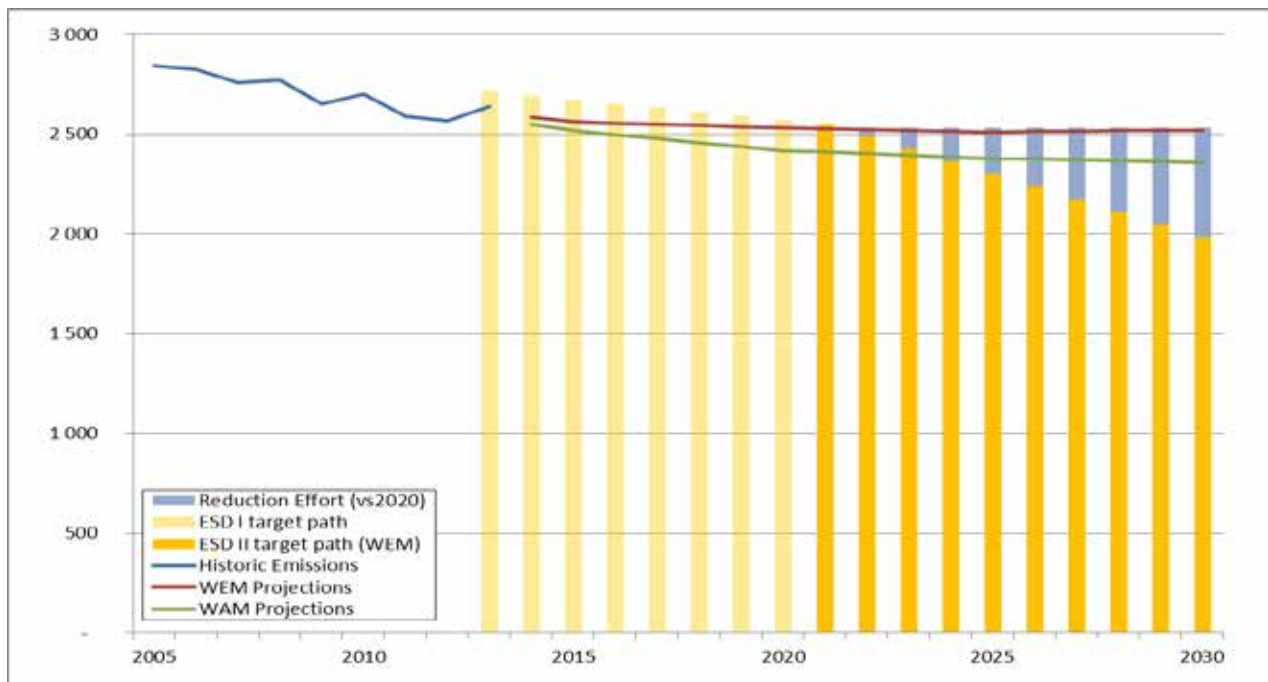
1.2.2. The linear target path 2021-30

In addition to the 2030 target Member States also have to comply with annual emission reduction limits for all years from 2021-2030. A linear target path is drawn between a starting point in the first year and the final target. If the approach used for the first effort sharing is applied again the starting point in 2021 will be the average of the greenhouse gas emissions from sectors covered by the ESD in the years 2016-18. Based on Member States projections published by the EEA it is possible to estimate the total emissions for the ESD II and the overall reduction effort. For this paper the total reduction effort is calculated as the difference between constant 2020 emissions and the linear target path for the years 2021-30 (Figure 1-2). The linear target path and the reduction effort depend on the projected emissions until 2020 and are therefore still uncertain. Alternatively, the reduction effort could also be calculated against projections for 2030. Depending on the definition and emissions scenario, the reduction effort is expected to lie between approx. 1 500 Mt CO₂eq to 2 600 Mt CO₂eq (Table 1-2).

Despite having negative emission reduction targets compared to 2005 Cyprus, Hungary, Portugal and Slovakia are expected to be able to increase emissions during the ESD II. The reason for this is that 2020 emission projections are below their respective 2030 targets.¹

¹ Under the ESD I some Member States had positive targets, i.e. were allowed to increase their emissions until 2020 compared to 2005. The linear trajectory for these Member States was calculated slightly differently and it could be argued that this approach should be used for Cyprus, Hungary, Portugal and Slovakia for the ESD II. The differences between the two calculation approaches for the EU as a whole are negligible and this option is not further investigated in this paper.

Figure 1-2: EU 28 target path and reduction effort



Source: Öko-Institut based on EEA 2014b

Table 1-2: Cumulated emissions 2021-30 and reduction effort by Member State

	ESD targets		With Existing Measures Projections						With Additional Measures Projections					
	2020	2030	2020 projections	2030 projections	2021 emission target	Cumulative target path 2021-2030	Cumulative reduction effort vs 2020 ¹	Cumulative reduction effort vs projections ²	2020 projections	2030 projections	2021 emission target	Cumulative target path 2021-2030	Cumulative reduction effort vs 2020 ¹	Cumulative reduction effort vs projections ²
	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]	[Mt CO2eq]
Austria	47.9	38.0	51.7	50.2	52.2	451.1	-65.4	-57.0	48.1	45.9	49.5	437.7	-43.6	-31.2
Belgium	66.7	53.9	75.5	74.7	75.9	649.3	-105.3	-97.6	75.0	74.2	75.5	647.3	-102.3	-94.6
Bulgaria	27.2	22.7	27.8	26.9	25.7	241.8	-36.3	-29.5	24.8	24.2	23.3	229.8	-18.5	-13.2
Croatia	20.4	16.9	17.3	17.2	17.3	171.3	-1.3	-1.4	17.3	17.2	17.3	171.3	-1.3	-1.4
Cyprus	5.5	4.5	2.8	3.4	2.9	37.1	8.9	5.6	2.7	3.3	2.9	37.0	9.8	6.6
Czech Republic	65.7	51.5	55.9	52.8	56.8	541.7	-16.8	4.7	54.7	50.9	56.0	537.8	-8.8	17.8
Denmark	29.7	23.5	29.1	29.5	30.8	271.5	-19.9	-20.6	29.1	29.5	30.8	271.5	-19.9	-20.6
Estonia	6.3	4.9	6.0	5.7	6.0	54.1	-5.9	-4.3	5.7	5.4	5.8	53.1	-4.3	-2.6
Finland	27.7	21.6	29.1	27.0	30.4	260.0	-31.4	-19.1	28.1	25.8	29.8	257.0	-23.7	-10.3
France	350.1	262.1	342.3	324.3	351.5	3 068.0	-355.2	-242.5	312.4	298.4	330.3	2 961.7	-162.5	-65.7
Germany	417.3	293.4	420.7	366.6	436.8	3 650.9	-556.1	-256.4	399.8	319.6	421.3	3 573.4	-424.8	3.1
Greece	58.9	49.1	58.2	67.6	53.2	511.5	-70.8	-114.7	56.3	52.3	52.1	506.1	-56.5	-13.0
Hungary	56.6	47.7	43.0	42.0	43.6	456.4	26.5	32.2	40.5	39.2	41.6	446.4	41.7	49.6
Ireland	37.2	32.5	45.1	50.4	43.3	379.4	-71.2	-98.7	41.8	46.6	41.2	368.8	-49.5	-74.4
Italy	287.9	219.9	299.4	297.4	290.2	2 550.8	-443.3	-421.3	269.9	263.0	279.4	2 496.4	-202.2	-179.9
Latvia	9.6	7.4	9.7	11.3	9.1	82.5	-14.7	-22.9	9.4	10.8	8.9	81.6	-12.6	-19.9
Lithuania	14.9	11.6	15.1	15.4	14.9	132.6	-18.6	-18.8	13.1	14.3	13.7	126.6	-4.9	-11.7
Luxembourg	8.1	6.8	10.4	11.5	10.2	84.9	-19.1	-25.1	9.7	10.5	9.7	82.5	-14.4	-18.9
Malta	1.1	0.8	1.1	1.2	1.1	9.7	-1.3	-1.8	1.1	1.1	1.1	9.6	-1.1	-1.5
Netherlands	104.5	82.7	105.5	105.9	104.7	936.9	-118.3	-127.6	101.0	98.9	101.6	921.2	-88.8	-84.3
Poland	195.0	157.9	178.0	200.7	179.1	1 685.0	-95.3	-211.3	178.0	200.7	179.1	1 685.0	-95.3	-211.3
Portugal	49.0	40.2	33.6	38.9	37.0	385.8	49.5	14.6	33.6	38.9	37.0	385.8	49.5	14.6
Romania	83.6	68.4	75.5	86.3	72.3	703.2	-51.3	-114.4	73.0	83.5	69.9	691.6	-38.0	-97.5
Slovakia	25.4	19.6	17.1	18.7	18.2	188.7	18.2	10.0	16.7	18.4	18.0	187.7	20.2	12.1
Slovenia	12.1	9.4	12.1	12.0	12.1	107.3	-13.9	-12.8	10.4	10.2	10.5	99.6	-4.5	-3.1
Spain	208.6	166.8	228.5	244.2	222.0	1 943.7	-340.9	-413.2	224.7	239.1	219.2	1 930.1	-316.9	-379.5
Sweden	36.4	28.2	35.4	33.7	36.5	323.4	-30.4	-20.8	35.0	33.3	36.2	321.9	-27.6	-18.3
United Kingdom	319.5	244.3	306.6	305.6	317.3	2 807.9	-258.3	-237.6	306.6	305.6	317.3	2 807.9	-258.3	-237.6
EU-28	2 553.8	1 986.3	2 532.5	2 521.0	2 551.0	22 686.7	-2 638.0	-2 502.4	2 418.5	2 360.8	2 478.9	22 326.2	-1 859.1	-1 486.8

Notes: ¹ Calculated as the difference between constant 2020 emissions and the linear target path.

² Calculated as the difference between projected annual emissions 2021-2030 and the linear target path.

Source: Öko-Institut based on EEA 2014b

1.3. Flexibility in the Effort Sharing Decision

1.3.1. Flexibility in the ESD I

The Effort Sharing Decision contains flexibility mechanisms to help Member States achieve their targets until 2020. The current flexibilities can be grouped in three categories:

- a) Within a Member State: banking and borrowing between years
- b) Between Member States: trading of AEA² and project-based mechanisms
- c) International: credits from CDM/JI projects

The details of these flexibilities are shown in Table 1-3. The purpose of these flexibilities is to reduce the overall EU-wide costs for achieving the GHG targets, to provide a short-term response to annual emission fluctuations (e.g. due to an especially cold winter) and to help in unlocking the reduction potentials especially in the poorer Member States. At the same time these flexibilities need to be limited to ensure that all Member States and all sectors embark on a long-term decarbonisation path: the EU aims to reduce GHG emissions by 80-95% below 1990 levels.³ Such a reduction will not be possible if some countries or sectors avoid own reductions through offsetting mechanisms. So far no data exists on the application of these flexibilities.

Table 1-3: Current flexibility mechanisms under the ESD I

Flexibility	Details
Annual Emission Allocation (AEA)	
Carry forward (borrowing)	§ 3.3: Up to 5 % from the following year until 2019
	§ 3.3: Increased rate in 2013/ 2014 in case of extreme meteorological conditions
Carry over (banking)	§ 3.3: Unlimited until 2020
Transfer	§ 3.4: Up to 5 % of its AEA for a given year
	§ 3.5: Unlimited transfer of surplus AEA
Credits from Project Activities	
International Projects	§ 5.4: Up to 3 % of 2005 emissions annually until 2020
	§ 5.5: Up to 1 % of 2005 emissions annually in addition to § 5.4 for the 12 Member States listed in Annex III until 2020
Carry over (banking)	§ 5.6: Unlimited for the rights under § 5.4. Does not apply to § 5.5.
Transfer	§ 5.6: Unlimited transfer of unused part of § 5.4. Does not apply to § 5.5.
Community-level projects	§ 5.7: Unlimited use of credits issued pursuant to Art. 24a of the EU ETS Directive ⁴

Notes: Restrictions apply to some flexibilities if a MS is not in compliance. Not shown are eligibility criteria for international projects.

Source: Öko-Institut based on Decision 406/2009/EC

² The emission budgets under the ESD are called Annual Emission Allocations (AEA)

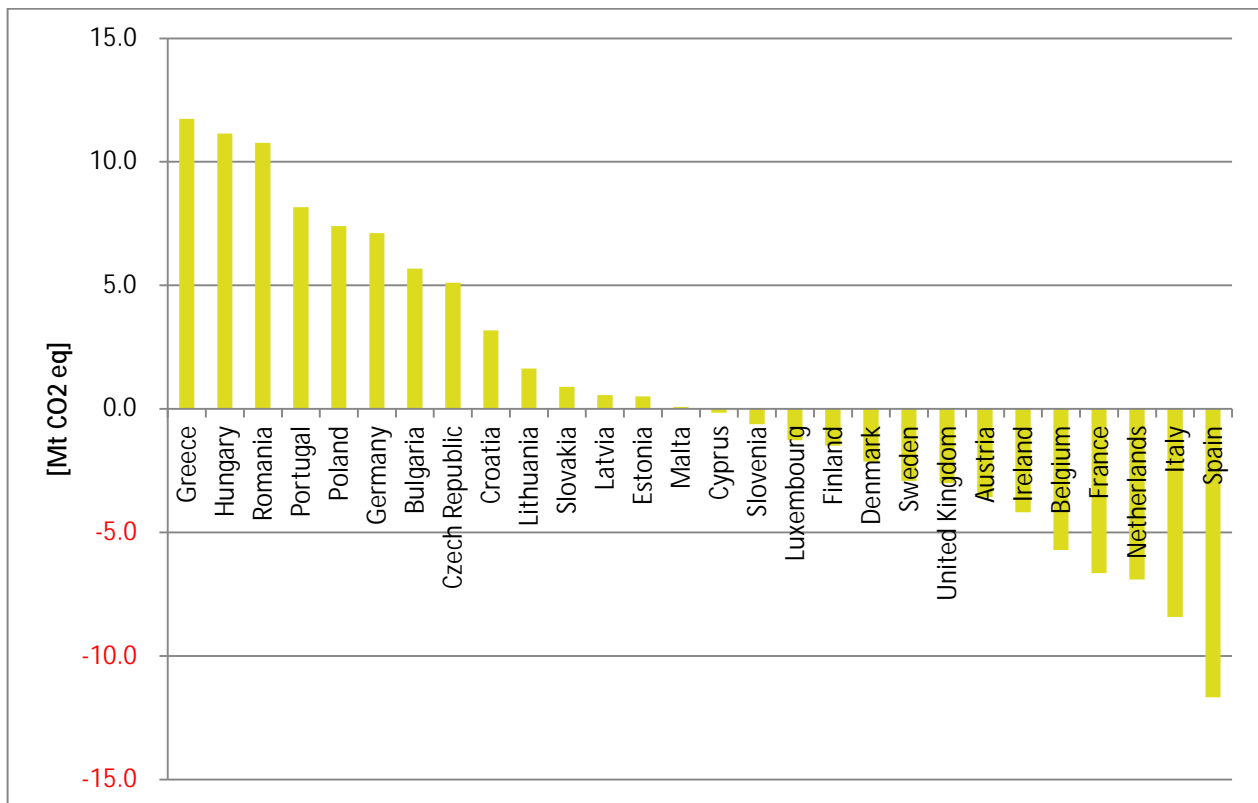
³ See for example <http://ec.europa.eu/clima/policies/brief/eu/>, accessed on 18 May 2015

⁴ Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.2003L0087, 25.6.2009.

1.3.2. The need for enhanced flexibility until 2030

The cumulative reduction need as the difference between constant 2020 emissions and the linear target path is shown in Table 1-2. The distribution of the total reduction effort across Member States is mainly based on income; cost-effective reduction potentials are partially reflected in the targets for those Member States with above-average GDP/capita. For the impact assessment a cost effective reduction potential by Member States was calculated at a carbon price of 40 EUR/t CO₂. Figure 1-3 shows the difference between the cost-effective reduction potential and the ESD II target for the year 2030⁵. Some Member States such as Spain, Italy and the Netherlands will need to take actions at costs above 40 EUR/t CO₂ if they intend to achieve their targets at home while others such as Greece, Hungary and Romania can limit themselves to actions with lower than EU average costs.

Figure 1-3: Difference between cost-effective reduction potentials and targets in 2030



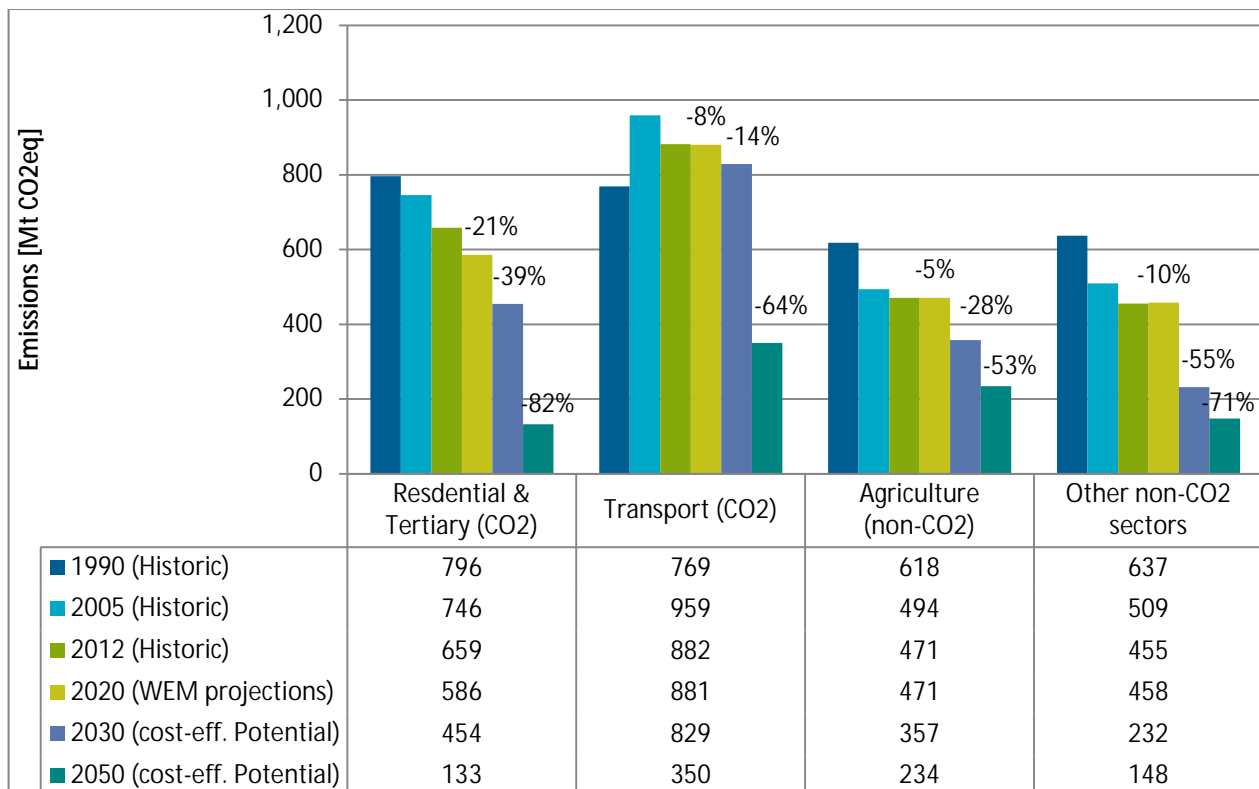
Note: A positive sign means that the cost-effective reduction potential is higher than the ESD II target
 Source: Öko-Institut based on European Commission 2014b and EEA 2014a

Figure 1-4 shows the cost-effective reduction potential by ESD sector for the EU 28. Until 2030 the largest absolute and relative cost-effective reductions potentials lie in the Residential & Tertiary and the Other non-CO₂ sectors. In the long term the highest absolute emission reductions will need to come from the transport sector. A breakdown of ESD emissions by sector and Member State is included in Annex II.

⁵ The document does not contain the cost-effective potential by Member States for other years than 2030; it is therefore not possible to compare cumulative reduction effort with the cumulative cost-effective reduction potential.

With the decision to achieve the 40% reduction below 1990 levels through domestic action alone the Council has chosen to discontinue the use of international project mechanisms as a flexibility to achieve the ESD target. International credits could still be used by Member States and the EU as a whole to go beyond 40% reduction. As a compensation and in light of the much more stringent 2030 targets compared to the AEA surplus until 2020 the Council called for an enhancement of the existing flexibilities and the introduction of a new mechanism between the ETS and the ESD. The options for an enhancement and the new flexibility will be discussed in chapter 2.

Figure 1-4: Historic emissions and cost-effective reduction targets by ESD sector



Notes:

- Some of the emissions included under "Other non-CO2 sectors" are covered by the EU ETS.
- Values for 2020, 2030 and 2050 have been normalized with historic emissions to ensure consistency across different data sources.
- Percentage values in the graph are expressed versus 2005.

Source: Öko-Institut based on EEA 2014a, EEA 2014b and European Commission 2014b

1.4. LULUCF and Agriculture

The current EU climate policy framework consists of two main elements: the EU Emissions Trading System (EU ETS) and the Effort Sharing Decision (ESD). CO₂ emissions and removals from Land Use, Land Use Change and Forestry (LULUCF) were not included in either. Agriculture, forestry and other land use are at present only partly regulated in the overall EU climate policy framework. Non-CO₂ emissions from agriculture are covered under the Effort Sharing Decision while CO₂ emissions and removals from LULUCF are covered only under the Kyoto Protocol. This is in contrast to the EU's 2020 climate framework. According to the European Council conclusions (European Council 2014) the LULUCF sector should be fully included in the EU's 2030 climate

policy framework. The EU is currently consulting stakeholders on how to integrate LULUCF. Three principal options for a future policy design were identified:

Option 1: LULUCF pillar: Maintain non-CO₂ Agriculture sector emissions in the Effort Sharing Decision, and further develop a LULUCF sector policy approach separately

Option 2: Land Sector Pillar: Merging the LULUCF and non-CO₂ Agriculture sector emissions into one new independent pillar of the EU's climate policy

Option 3: Include LULUCF in the Effort Sharing Decision

The implications of the different options for the 2030 Climate and Energy Framework depend to a large degree on the accounting rules for different land use activities. We assess the implications of the three options on the level of ambition required to meet the EU's target of reducing emissions by at least 40% by 2030.

The LULUCF sector has several particularities and differs from energy, industrial processes, waste and agriculture (non-CO₂) emissions in a number of ways (Iversen P. et al. 2014). Adequate rules are therefore essential to reflect the changes in LULUCF and to assess progress towards targets. The most specific particularity is that the sector includes activities that cause not only emissions but that carbon is taken up and stored (e.g. through biomass accumulation). These removals are not permanent. Moreover, the release of carbon e.g. when forests are converted or soils drained, is typically much faster than the build-up. Currently LULUCF is a net sink in the EU, though this sink is projected to decline until 2030. Another particularity is that not all emissions and removals are directly human-induced. The legacy of past land use practices drives emission levels and trends in the sector often much more than current activities. This is especially true for emissions and removals from forest management. One more general particularity is data uncertainty. Average uncertainty ranges reported by Member States that are associated with estimates of the level of emissions and removals are relatively high (32%) compared to emissions from fossil fuel combustion (1%) for EU-15 countries (Iversen P. et al. 2014).

To simulate the implications of the three options historical data (1990-2012) for LULUCF emissions based on data reported by Member States to UNFCCC including the LULUCF activities Afforestation and Reforestation (AR), Deforestation (D), Forest Management (FM), Cropland Management (CM), and Grazing Land Management (GM) is used. The data is included in the JRC LULUCF tool (JRC 2013)⁶. In addition reported historical non-CO₂ emissions from Agriculture are used.

Kyoto Protocol accounting for LULUCF is based on an effort to reflect emissions and removals from direct human-induced LULUCF activities. It is based on two paragraphs of the Protocol: article 3.3 and Article 3.4. Mandatory (Article 3.3) and voluntary (Article 3.4) activities exist. Afforestation, Reforestation and Deforestation and since 2013 Forest Management are mandatory. Other activities (Cropland Management, Grazing Land Management, Wetland Drainage and Rewetting) can be accounted on a voluntary basis, but once included have to be accounted continuously in the future. More details of existing accounting options under the Kyoto Protocol are illustrated in Box 1-1.

⁶ For this report a version of May 2015 has been used (personal communication by G. Grassi).

Box 1-1: Illustration of accounting methods

Under the Kyoto Protocol different accounting methods exist. **Net-net accounting** is applied to several activities under KP Article 3.4, such as cropland and grazing land management and to all other sectors except LULUCF. They are accounted using the reported net emissions during the accounting period compared to net emissions in a base year (e.g. 1990, see Figure B1 a). A country with decreasing net emissions would generate credits under this approach; a country with a declining sink would have to accept debits (see example in Figure B1 a).

Gross-net accounting considers only emissions and removals during the commitment period. No comparison with any historic or future reference is made (actually it is compared to zero, see Figure B1 b). It is applied to deforestation and afforestation/ reforestation under the KP and was the accounting method for forest management in the first commitment period. A country with a declining sink would receive credits if the sink still exists in the commitment period (see example in Figure B1 b). Due to the fact that gross-net accounting of forest management includes for many countries large removals, a cap was introduced to limit excessive credits.

In the second commitment period of the KP, a **reference level accounting approach** was adopted for forest management. It is applied by introducing a forest management reference level (FMRL), against which emissions and removals during the commitment period are compared. The FMRL is derived for most countries from forward looking scenarios (see FM projection in Figure B1 c).

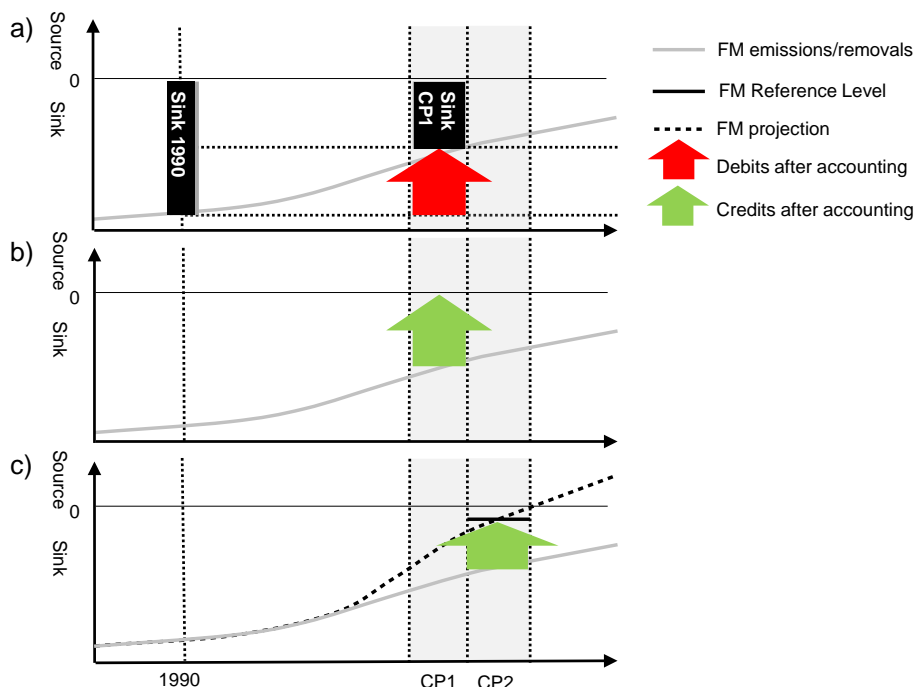


Figure B1: Illustration of different accounting methods existing under the Kyoto Protocol.

This study focuses on the period after the second commitment period of the Kyoto Protocol (CP2), a hypothetical third commitment period, that for the purposes of this study is called 'CP3', covering years 2021-2030. Emissions in this future period can be estimated by using projections. Projections make assumptions about the development of emission drivers and describe a future trajectory of how emissions might develop if the assumptions hold. The projections published by the European Commission in the Trends to 2050 Report (EC, 2014) are used in this report. It describes the so-called EU Reference scenario projection 2013 and includes all binding targets set out in EU legislation regarding development of renewable energies and reductions of GHG emissions, as well as the latest legislation promoting energy efficiency. Regarding LULUCF the scenario considers population growth, income growth, demand for bioenergy, wood, food and feed as well as land use policies up to 2012.

In section 3.1 emissions and removals are analysed using different combinations of accounting rules:

- Accounting case A) –scaled Forest Management Reference Level (FMRL) of CP2
- Accounting case B) - constructed high FMRL
- Accounting case C) - constructed low FMRL
- Accounting case D) - historical reference period for Forest Management (1991-2000)
- Accounting case E) - alternative Afforestation and Reforestation accounting

For more details on assumptions we refer to (Öko-Institut 2015b). All cases assume the same historic and future emissions and removals but make different assumptions on accounting. Due to different assumptions the cases result in different volumes of credits and debits, increasing (in case of debits) or reducing (in case of credits) efforts of emission reduction in other sectors. Credits or debits from LULUCF are compared to the effort of emissions reduction needed in the Agriculture sector, the ESD for the period 2021-2030 and to the overall emission reduction target of 40% in 2030.

2. New and enhanced flexibility

2.1. Annual Emission Allocation

2.1.1. Carry forward (borrowing)

To enhance flexibility the limited use of 5% of an AEA of the following year could be increased. At the same time this increases the risk of compliance problems at the end of the period and provides an opening to delay mitigation action into the future. One option would be to start with a higher carry forward rate in 2021 that decreases over the years. In the final years of the period borrowing should not be higher than 5%.

An alternative approach would be to further restrict borrowing to help jump-starting the other flexibilities and especially the internal project mechanism. Limiting carry forward to one year's worth of the reduction effort would achieve this. At the same time Member States would have an increased incentive to take action at home earlier. The annual reduction effort in the ESD II is approx. 1.9-2.2% of 2005 emissions depending on the assumptions for 2020 emission levels.

In the beginning of the second ESD period Member States will not have had the possibility to bank allowances for future use. In line with the ESD I additional flexibility for extreme meteorological events for the years 2021 and 2022 could be possible.

2.1.2. Carry over (banking)

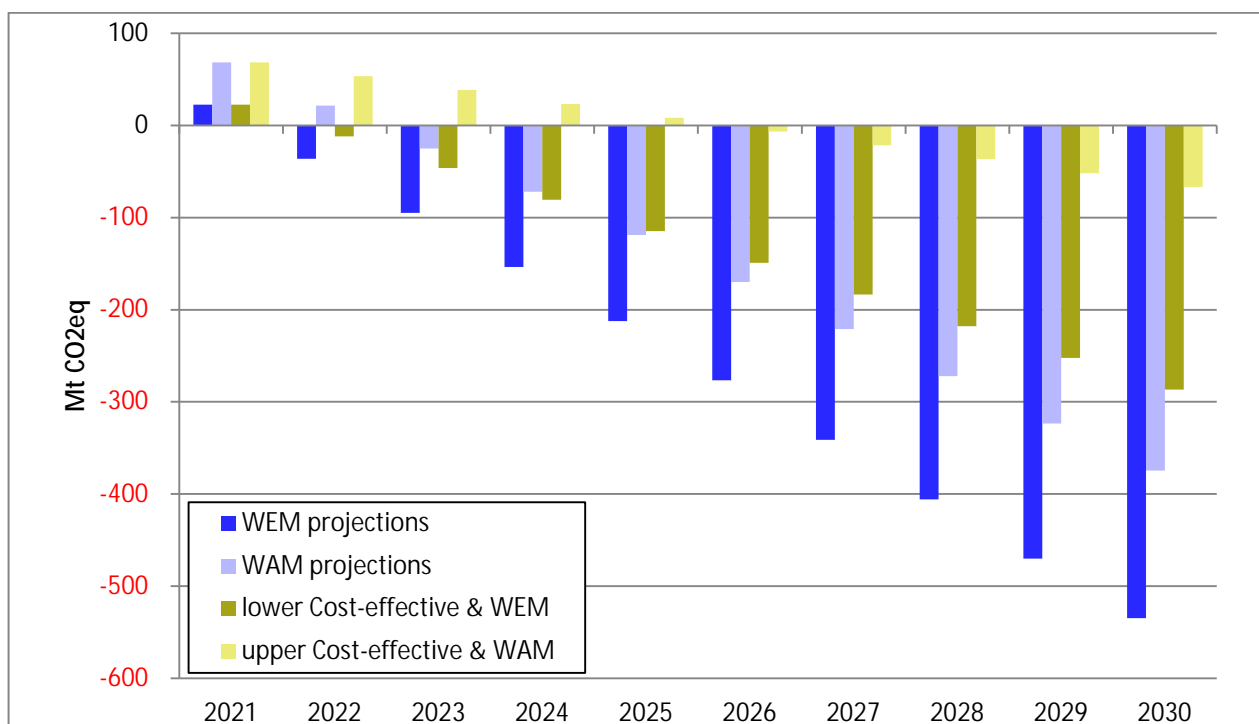
The possibilities to bank unused AEA within the ESD period should remain unchanged. These unused AEA reflect a reduction effort beyond the required limit; banking is a necessary provision to encourage early action and help Member States prepare for exceptional years with higher emissions in the future.

Based on Member States projections the current policies and measures are not sufficient to meet the 2030 target in both the WEM and the WAM scenario; without further action the ESD II is

expected to have a cumulated deficit of 1.500-2.500 Mt CO₂eq. Figure 2-1 shows the annual difference between different projections and the linear target path:

- Under the WEM scenario there is a total deficit of approx. 2 500 Mt CO₂eq; only for 2021 are projected emissions below the linear target path (dark blue bars). This scenario is very similar to the constant 2020 emissions scenario in Figure 1-2.
- Under the WAM scenario the deficit shrinks to approx. 1 500 Mt CO₂eq and there would be surplus allowances in the first two years of the period (light blue bars).
- Assuming that Member States do not implement any new measures until 2020 and afterwards only the actions included in the lower cost-effective reduction potential the deficit would decrease slightly to approx. 1 300 Mt CO₂eq (dark green bars).
- To reduce the deficit to zero Member States would need to take additional action until 2020 (WAM scenario) and achieve the cost-effective upper reduction potential. A small surplus in the first half of the period would be sufficient to compensate a small deficit in the second half (light green bars).

Figure 2-1: Difference between the linear target path 2021-30 and different emission scenarios



Notes: The blue bars show the annual difference between the linear target path and the EU projections until 2030 based on Member States' data. A positive sign means that projected emissions are below the target path (overachievement/ surplus); a negative sign means that projected emissions are above the target path (deficit).

The green bars show the annual difference compared to the cost-effective upper and lower scenario included in Table 32 of European Commission 2014b.

Source: Öko-Institut based on European Commission 2014b and EEA 2014a

Carry over from ESD I to ESD II (2020 to 2021) is not possible and not foreseen:

- The Directive states clearly that the banking mechanism is only valid until 2020 and therefore does not apply to a carry-over between ESD periods.
- The idea of a carry-over between ESD periods was discussed prior to the October 2014 Council but discarded and not included in the Conclusions.
- The banking of unused allowances between ESD I and ESD II would lead to a significant reduction of ambition and overall integrity of the EU commitment. According to EEA estimates Member States will have a total surplus of 700 – 2 000 Mt CO₂ eq.⁷ In comparison, the 2030 emission target under the ESD is just under 2 000 Mt CO₂ eq for the EU 28.

2.1.3. Transfer and Auctioning

The transfer of unused AEA is already unlimited. To enhance flexibility the limit of 5 % of a Member States' AEA for a given year could be increased. Similarly to the discussion under carry-forward a higher limit could lead to compliance problems. If at all it should therefore only be increased moderately and/ or for the first years of the period.

In addition or complementary to the quantities of AEA available for transfer flexibility could also be enhanced by creating an AEA market. Under current rules it is up to Member States to decide how and – within the limits – how many AEA will be sold/ transferred and for which price. Bilateral deals as well as auctions in various formats are possible if a Member State decides to sell AEA at all. Increased transparency and liquidity in the market could enhance the use of and availability of this flexibility. Options to do so ordered from least to most invasive include:

- 1) Central information platform: only difference to ESD I would be the introduction of a central site where all AEA sales would need to be announced ex-ante and/ or disclosed ex-post.
- 2) Obligatory use of centralized auctioning mechanism: all sales would need to be auctioned through one central institution.
- 3) Obligatory surplus auctioning or cancelling: beyond a certain reserve all surplus AEA would need to be auctioned; if a Member State would not want to auction these AEA they would automatically be cancelled.
- 4) Obligatory AEA auctioning: a share of all annual AEA would need to be auctioned by a central institution. All Member States would receive fewer AEA independently of their own needs but could buy AEA on the market.

Options 1 and 2 would primarily aim at enhancing the participation and transparency in AEA sales but not directly increase the number of AEA available for sale. While there are few to none drawbacks to these options the impact on enhancing the flexibility would most likely be very limited.

⁷ The 700 Mt are based on the With Existing Measures Projections by Member States. The 2 000 Mt are based on the With Additional Measures Projections and the full right to use CDM/JI under the ESD I (EEA 2014b).

Depending on the levels set in options 3 and especially 4 the number of allowances for sale could be enhanced considerably:

- Option 3: Based on the WEM/ WAM projections by Member States (see Table 1-2) the annual surplus in those Member States with emissions below their linear target path is equal to about 0.5% of the annual EU wide emission limit. In contrast, the annual difference deficit in those Member States with emissions above their linear target path and the projections is around 7-12% of the annual EU wide emission limit. In absolute quantities this relates to an annual surplus of approx. 100 Mt CO₂eq in 4-6 countries compared to an annual deficit of approx. 1.600-2.800 Mt CO₂eq in the other countries (see also Figure 2-1). An obligatory auctioning of all surplus AEA would cover 3-6% of the annual emission reductions of the EU.⁸
- Option 4: This option would ensure a predictable amount of AEA available for purchasing and establish an AEA price. Such a price could then be used for other transfers as well and provide some certainties for potential revenues from internal projects (see section 2.2). Assuming that 30 million AEA⁹ would be auctioned every year and the AEA price would rise from 20 EUR/AEA in 2020 to 40 EUR/AEA in 2030 annual revenues would rise from EUR 600m to EUR 1 200m during the same period. The total revenue would be EUR 9 300m.

One of the objectives for achieving a surplus is to have some reserve if a Member State has a deficit in the future. Obligatory auctioning of all surplus under option 3 would severely impact Member States' abilities to prepare themselves for "bad" years. This could be alleviated by defining a quota of AEA each Member State could bank without obligatory auctioning. The reason for including the option of cancelling instead of auctioning under option 3 allows Member States to achieve more than their target under the ESD. Some countries have national emission targets which are more ambitious than their obligations under EU legislations. Even without such national targets countries might want to cancel surplus AEA to increase the overall EU ambition. Due to the very limited expected surplus, the need for a free quota and voluntary cancellation implies that only very few AEA would be auctioned under this provision.

Putting a price on carbon could strengthen the position of environment ministries in national discussion on climate policy. Especially under option 4 the cost of GHG emissions in ESD sectors would be seen directly in the national budget. On the other hand such an increased liquidity would allow richer Member States to rely heavily on offsetting; it would force poorer Member States to reduce more emissions domestically if they cannot compete with the available budget for AEA acquisitions in richer Member States. The auctioning revenues could be used to alleviate this and to support the transition towards low emission economies in poorer Member States. A distribution mechanism similar to the solidarity fund under the EU ETS could be set up to support reduction efforts in Member States below a certain GDP/cap. A minimum (floor) prize could be established to ensure sufficient revenues and remove surplus AEA from the market if there is no substantial demand (i.e. additional reduction necessary). Such a floor prize could be linked to the carbon price in the EU ETS.

⁸ These figures are based on Member States' projections until 2030 and are highly uncertain. In addition to inherent uncertainties in any GHG projections 15 years into the future the underlying assumptions on the policies included in the two scenarios do not yet reflect the 2030 ESD targets in most Member States.

⁹ The value has been chosen for two reasons: It is (i) approx. 1% of 2005 emissions under the ESD and (ii) half of the annual reduction effort; the linear target path for the EU decreases by about 60 Mt CO₂eq per year from 2021-2030.

2.2. EU project based mechanisms

Project based mechanisms could help unlock emission reduction potentials which might not be realised otherwise, e.g. due to missing financial resources or other non-financial barriers. EU internal project based mechanisms similar to the CDM/JI are an option to involve the private sector and can have spill over effects in the host countries as local knowledge is enhanced and best practices are developed. On the other hand adequate quantification of project based reductions is challenging: a baseline scenario has to be constructed to which the actual emissions can be compared to in order to quantify reductions.

There are several options in how far crediting of project based mechanisms could be harmonized at EU level:

- Option 1 – Unregulated: In this option Member States would have to agree bilaterally and with the project developers on all rules and procedures similar to the current rules for JI First Track. This would imply minimum restrictions for Member States but could lead to substantial transaction costs for all involved actors in order to identify interested parties, agree the accounting rules as well as procedures for transfer etc. This might hamper the willingness of Member States to host projects and make it more difficult for Member States interested in buying AEAs to find partners.
- Option 2 – Enhanced transparency without common rules: A first step to increase transparency would be a common platform to publish contact persons, offers and expressions of interest as well as information on approved projects (e.g. methodology, expected reduction, involved parties and AEA price). Member States and project developers would still have to agree on specific rules but information costs would be reduced to some extent.
- Option 3 – Common rules and procedures but bilateral trade: To reduce transaction costs both for both project developers and Member States the development of European wide recognized methodologies is advisable additionally to the transparency measures outlined in option 2. Based on common rules the same project type can be implemented in a number of Member States; project developers can be sure that the methodology will be accepted and Member States can rely on the set of methodologies jointly developed and scrutinized. The methodologies can build on the extensive experiences with other project based mechanisms (especially JI/CDM) and should reflect a critical assessment of those. Host Member States would then only have to check for additionality related to national policies and measures and the parameters used in the baseline calculation. Furthermore, the involved Member States and project developers would have to agree on the details of their trade and the distribution of the related risks.
- Option 4 – Clearing house for project based mechanisms: A centralized clearing house would yield the highest degree of harmonization and transparency. Common rules and procedures would be agreed and the clearing house could broker demand and supply. This could also include some distribution of the related risks that projects might not deliver reductions as planned and make sure all Member States interested in buying may get a share.

As long as the EU has no structural AEA surplus the environmental integrity of the projects is ensured by the emission caps of participating Member States even if projects generating credits might not be additional or reductions are overestimated. But if the credited emission reduction is not or not fully achieved, host Member States will have to make additional reduction efforts to

compensate for it. Host Member States thus have an interest in a strict methodology for the quantification of emission reductions and might even be reluctant to host projects. To gain host Member States support it could be agreed that not all achieved reduction is credited and sold, e.g. 10% of the generated reduction stays with the host country and 90% is transferred to the seller. In that way projects would contribute to the achievement of targets not only for the buying but also for the selling Member States.

In conclusions project based mechanisms might deliver additional reduction and enhance flexibility. As long as the Member States' caps are binding and there is no systematic surplus, the environmental integrity of the EU target is ensured. If project based mechanisms are permitted, it seems advisable to enhance transparency and agree on common rules in order to reduce insecurities and related transaction costs. A clearing house e.g. along the lines as suggested by Climate Strategies (2015) would lead to the highest degree of harmonization but would require a more sophisticated institutional set-up. Alternatively, common rules could be defined and trades agreed bilaterally (option 3) – in combination with an information platform this could increase transparency and reduce transaction costs substantially.

2.3. New flexibility

The Council agreed a new flexibility mechanism for certain Member States *through a limited, one-off, reduction of the ETS allowances, to be decided before 2020, while preserving predictability and environmental integrity* (European Council 2014). This new flexibility could be based on the following elements:

- i. One-off reduction of the ETS allowances from the respective Member State's quantities reserved for auctioning. To avoid an undue impact in a single year the flexibility could be decided once (one-off) but the EUAs deduced from the ETS over various years.
- ii. The level of the flexibility expressed versus total AEA of a year or the cumulative deficit for the period 2021-30.
- iii. The additional AEA could be made available to Member States in the same year or distributed over various years.
- iv. To ensure environmental integrity and to help achieve the **at least** 40 % EU wide target a discounting factor needs to be applied. This would mean that for every increase of the AEA a larger amount of EUAs would need to be cancelled.

This new flexibility applies to Member States *with national reduction targets significantly above both the EU average and their cost effective reduction potential as well as for Member States that did not have free allocation for industrial installations in 2013*. Figure 2-2 shows the 2030 GHG reduction target (blue bar) and the cost-efficient potential in the upper and lower scenario (blue/green dots) as included in the Impact Assessment (European Commission 2014b) for those Member States with targets beyond the EU average of 30% (orange line).

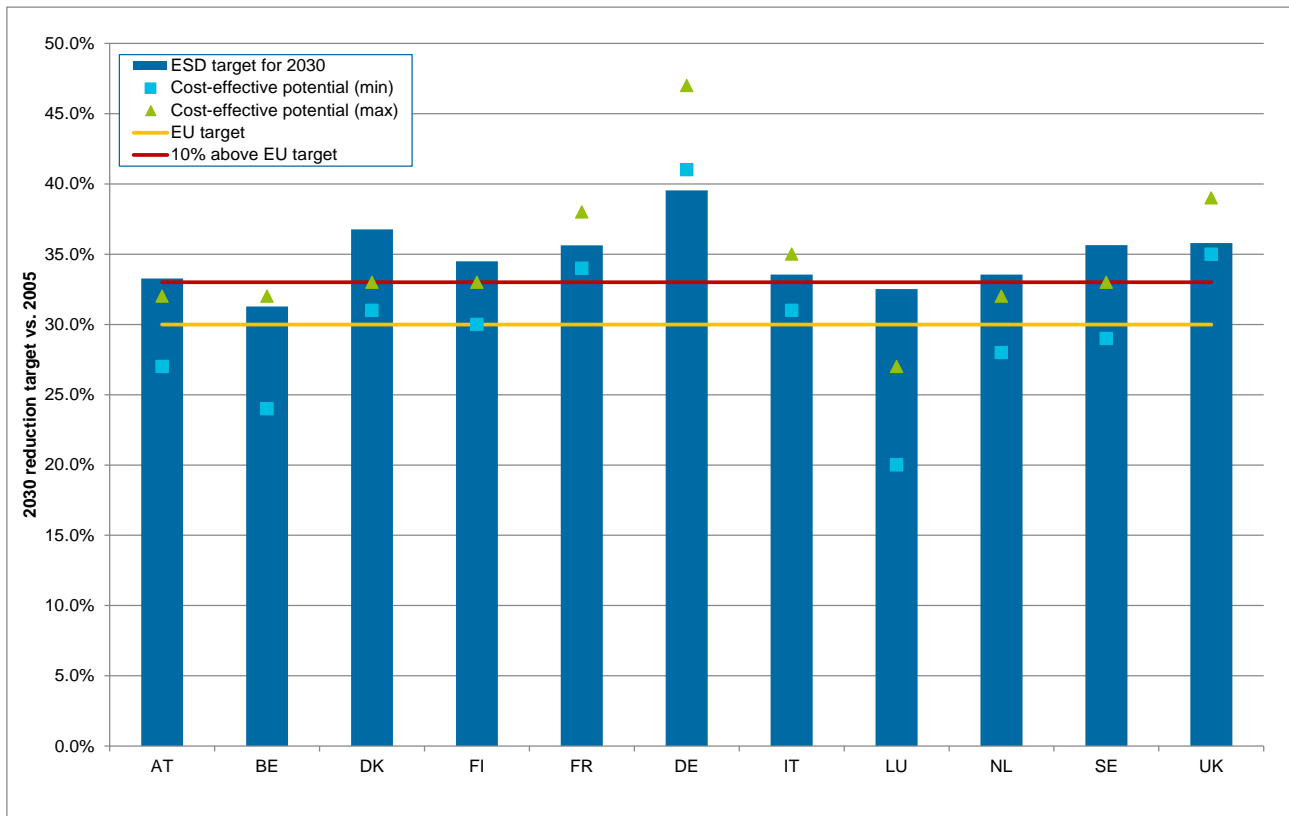
Malta is the only country with no free allocation for industrial installations in 2013 (industry clause) and always qualifies for the new flexibility. For other Member States it depends on the interpretation of the term "significantly".

Two options are presented in Figure 2-2 and in Table 2-1:

- a. Narrow interpretation: new flexibility applies to Member States with national targets
 - o at least **10% above the EU average** (i.e. at least -33% below 2005 emissions, red line in Figure 2-2); **and**
 - o above their **maximum cost-effective potential** (green triangle within the blue bar).
- b. Broad interpretation: new flexibility applies to all Member States with national targets
 - o **above the EU average** (i.e. at least -30% below 2005 emissions, yellow line); **and**
 - o above their **minimum cost-effective potential** (blue square within the blue bar).

Six Member States fulfil the requirements for the narrow interpretation whereas twelve would do so in the broad interpretation. Table 2-1 shows Member States' data and the potential size of the new flexibility for countries with targets above the EU average as well as for Malta. Under the broad interpretation and allowing for the use of up to 20% of the 2021 AEA the mechanism could increase the allowable emissions under the ESD by 269 million. This is about 10 % of the AEA for 2021 or just over 1 % of the total AEA for the period 2021-2030. This value could increase to up to 304 million AEA if the basis for the flexibility is 20% of the cumulative deficit in the period 2021-30 compared to constant 2020 WEM emissions. While the exact interpretation of the term *limited* in the conclusions is unclear the 20% used here is already quite large. Thus, Table 2-1 shows the likely range of the new flexibility for the EU as a whole and potentially eligible Member States.

Figure 2-2: New flexibility: targets and cost-effective potential



Source: Öko-Institut.

Table 2-1: Member States potentially eligible for the new flexibility mechanism

	2030 target [%]	cost-eff. potential (min) [%]	cost-eff. potential (max) [%]	Eligible Member States		Level of flexibility				estimated EUA auctioning volumes per year 2021-30 [Million EUA]
				Narrow above 33% and cost-eff (max)	Broad above 30% and cost-eff (min)	5% of 2021 AEA [Million AEA]	20% of 2021 AEA [Million AEA]	5% of cumulative deficit vs constant 2020 [Million AEA]	20% of cumulative deficit vs constant 2020 [Million AEA]	
Austria	33.3%	27.0%	32.0%	X	X	2.6	10.3	3.3	13.1	11.6
Belgium	31.3%	24.0%	32.0%		X	3.8	15.1	5.3	21.1	19.2
Denmark	36.8%	31.0%	33.0%	X	X	1.5	5.8	1.0	4.0	10.4
Finland	34.5%	30.0%	33.0%	X	X	1.5	5.8	1.6	6.3	13.9
France	35.6%	34.0%	38.0%		X	17.1	68.5	17.8	71.0	45.5
Germany	39.5%	41.0%	47.0%			21.0	84.1	27.8	111.2	166.6
Ireland	30.0%	21.0%	25.0%		(X)	2.3	9.0	3.6	14.2	7.8
Italy	33.5%	31.0%	35.0%		X	15.0	59.9	22.2	88.7	78.6
Luxembourg	32.5%	20.0%	27.0%		X	0.5	2.1	1.0	3.8	0.9
Malta	19.5%	27.0%	29.0%	Ind. clause	Ind. clause	0.1	0.2	0.1	0.3	0.9
Netherlands	33.6%	28.0%	32.0%	X	X	5.3	21.1	5.9	23.7	27.9
Sweden	35.6%	29.0%	33.0%	X	X	1.8	7.1	1.5	6.1	6.7
United Kingdom	35.8%	35.0%	39.0%		X	15.3	61.3	12.9	51.7	86.8
Total (Narrow interpretation)						12.6	50.4	13.3	53.3	71.4
Total (Broad interpretation)						66.6	266.2	76.0	303.8	310.2

Notes: - For an explanation on the cumulative deficit see section 1.2.2.
- Calculations are based on 50%/50% cost-effectiveness (min) and GDP/cap split. The 2021 starting point is based on the with existing measures projections by Member States for the years 2016-18 in line with the starting point rule as applied for ESD I.
- Cyprus, Slovenia and Spain have targets above their cost-effective potential but below the EU average of 30% and are therefore not included. The Irish target is 29.99% below 2005 emission levels according to our calculations. Due to the uncertainty in these figures Ireland is included in the broad application to show the potential upper end of the flexibility.
- The estimated EUA auctioning volume is based on various assumptions concerning emissions development, share of EUAs available for auctioning and the interpretation of the council conclusions. It includes the effect of the Market Stability Reserve and is given as the average of the period 2021-30. The values are of an indicative nature to show the size of the new flexibility in relation to the EUAs available for auctioning in the potentially eligible Member States.

Source: Öko-Institut based on European Commission 2014b, EEA 2014band Eurostat.

From an environmental perspective this new flexibility is counter-productive: the deduction of EUAs will reduce the surplus in the ETS but not have a significant effect on ETS emissions until 2030¹⁰. On the contrary, it could provide an easy way out for sectors covered by the ESD for eligible Member States. The result could mean postponed action in these sectors and overall higher emission levels in the EU until 2030 and beyond. To ensure that the new flexibility is beneficial to the climate a strong discounting factor needs to be applied. Justifications for the factor are:

- The Council called for an emission reduction of at least 40%. A discounting factor should help operationalise the aim of reducing emissions beyond 40%.
- Without a discounting factor total EU emissions until 2030 would increase; no extra reduction is likely in the ETS due to the structural EUA surplus while ESD emissions would increase. The necessary reduction effort in the ESD would decrease by up to 15% in the period 2021-2030 as a result of the new flexibility; the EU's overall emissions reduction in the same period would decrease by up to 5%.
- The discounting factor needs to be high enough to disincentive delaying actions in sectors such as transport and housing.
- The discounting factor could help reduce the ETS surplus.

Based on these considerations a discounting factor of 4:1 should be applied: for each AEA generated through the new flexibility four EUA would need to be cancelled. The source of these

¹⁰ Even after the adoption of the Market Stability Reserve the ETS-market is likely to be long until around 2030 (for example see <http://www.sandbag.org.uk/data/msr/>). The new flexibility will help reduce the surplus but not be able to solve the structural problems in the ETS.

EUA would need to be the auctioning quantities of the eligible Member States after the deductions for the various funds and reserves incl. the MSR. To avoid a short-term shortage of EUA in the market the flexibility could be applied over various years; the decision is once (one-off) but the application would be stretched. Alternatively, *one-off* could require that all EUA should come from a single year. In that case the quantity of AEA to be generated would be limited by the available quantity of EUA for auctioning in a Member State. Table 2-1 shows estimated auctioning quantities by Member State. Together with a 4:1 discounting factor, this one-off reduction could only be implemented using the narrow interpretation for the term “limited” of the 2030 council conclusions.

3. Special sectors

In addition to laying down the overall principles for the ETS and the ESD in the period 2021-30 the October Council also highlighted transport as well as agriculture and land-use in the conclusion on the non-ETS sectors. This chapter analyses some of the relationships between these sectors and the ESD II.

3.1. LULUCF and Agriculture

This chapter provides input for questions 7, 8 and 9 of the stakeholder consultation on Agriculture and Land Use, Land Use Change and Forestry (LULUCF) in the context of the 2030 EU climate and energy framework¹¹. Specifically it addresses the following questions:

- Estimated projected emissions and removals from 2020 and 2030 for all LULUCF activities (Cropland, grazing land, afforestation, reforestation and deforestation).
- Forest management accounting options and the impact on the 2030 target.
- Analysis of the three policy options described in Chapter 6 of the consultation questionnaire.

3.1.1. Development of LULUCF and agriculture emissions until 2030

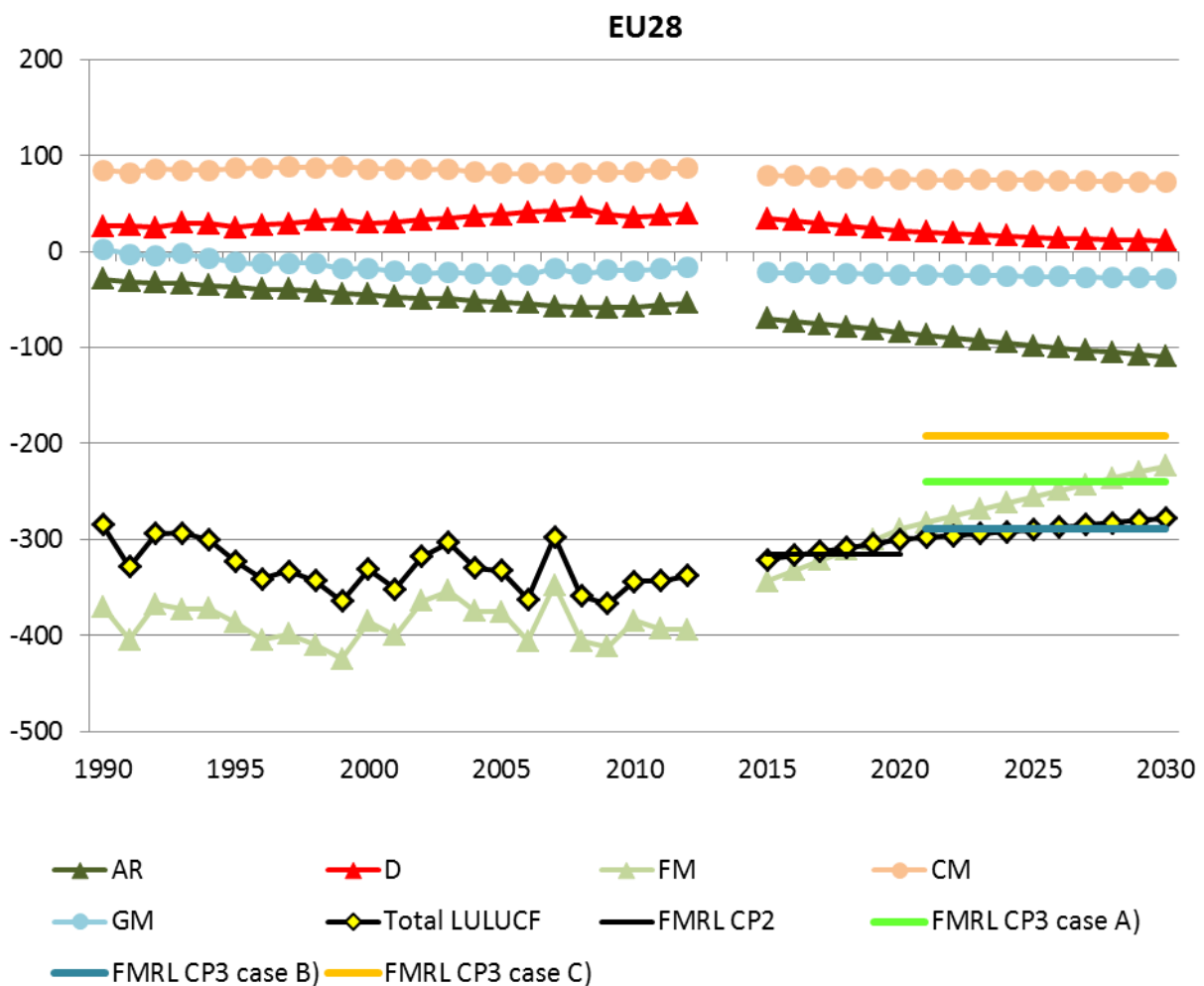
Figure 3-1 describes the development of emissions and removals of different activities in the LULUCF sector for the historic period 1990-2012 (based on reported data) and the projection 2015-2030 based on the EU projection (European Commission 2014a). In the past, the EU reported that uptake and storing of carbon through LULUCF activities was higher than emissions from this sector. The LULUCF sector thus acted as a relatively stable net sink of emissions at around -300 to -350 Mt CO₂/yr. In the projection presented by the European Commission to the UNFCCC this trend is reversed and sees the net sink declining rather constantly at an unprecedented rate of 12 Mt CO₂ per decade, reaching 278 Mt CO₂ in 2030. According to the models used for the projection this is due to increased harvest rates expected for the future caused inter alia by increased demand for bioenergy and age-class shifts in EU forests.

Since the FMRL has not yet been set for the period 2021-2030, this report has built a model that estimates the impact that different choices for the FMRL would have on LULUCF credits and debits. If the EU were to choose a FMRL based on (too) low estimates for carbon uptake and storage, forest management could potentially generate credits that would be gained ‘artificially’ as

¹¹ Online available under http://ec.europa.eu/clima/consultations/articles/0026_en.htm (last accessed on 12 June 2015).

a result of artificial rules. A relatively high FMRL could potentially lead to debits from FM. Besides the accounting of forest management, the rules for afforestation accounting are significant for EU 28. Afforestation is almost always a sink of emissions and therefore could have an impact on the overall ambition needed to reach the EU emission reduction target of at least 40% by 2030, depending on how LULUCF is included. Under CP2 accounting rules all afforestation that has occurred since 1990 can be accounted for using gross-net accounting. This means that emissions and removals reported in the commitment period are not compared against a reference but fully accounted for (see Box 1-1). An alternative leaves only the most recent afforestation areas in gross-net accounting. Older afforestation area would then enter FM and be accounted for against the FMRL.

Figure 3-1: EU 28 development of historical and projected emissions and removals from LULUCF-sector activities [Mt CO₂eq]



Source: Öko-Institut based on JRC 2013, EEA 2014a and European Commission 2014a

3.1.2. Effect of accounting rules

When included, emissions and removals of the LULUCF sector will not directly impact the emission reduction target. Emissions and removals will be accounted for following specific accounting rules. In the following different accounting cases applied to emissions and removals for the EU 28 are examined. In order to be able to assess impacts of assumptions, options are changed one by one ceteris paribus. A focus is on alternative assumptions on the level of FMRL. Results are summarised in Table 3-1.

Table 3-1: EU 28 credits and debits from LULUCF and Agriculture and emission reductions needed in 2030 using different accounting rules

Activity		A) CP2 rules - scaled FMRL of CP2	B) CP2 rules – high FMRL	C) CP2 rules – low FMRL	D) CP2 rules – FM base period 1991- 2000	E) CP2 rules – alternative AR accounting
Afforestation	[Mt CO ₂]	98.7	98.7	98.7	98.7	42.1
Deforestation	[Mt CO ₂]	-15.1	-15.1	-15.1	-15.1	-15.1
Forest management	[Mt CO ₂]	12.1	-36.0	60.2	-140.2	12.1
Cropland management	[Mt CO ₂]	11.0	11.0	11.0	11.0	11.0
Grazing land management	[Mt CO ₂]	28.3	28.3	28.3	28.3	28.3
Total LULUCF		135.0	86.9	183.1	-17.3	78.4
Avg. agriculture reduction (2021-2030)	92.5	145.9%	93.9%	197.9%	-18.8%	84.7%
Avg. total ESD reduction (2021-2030)	191.3	47.6%	30.6%	64.5%	-6.1%	27.6%
Avg. total emission reduction (2021-2030)	576.6	23.4%	15%	31.9%	-3%	13.6%
2030 reduction target if LULUCF is included		35.3%	37%	33.6%	40.6%	37.2%

Notes: Credits (emission removals) have a positive sign; debits (emissions) have a negative sign.

Across all accounting alternatives looked at in this study, for the EU 28 the credits from LULUCF applying alternative accounting rules would reduce the effort needed between 2021 and 2030 to reach the EU's 2030 emission reduction target of at least 40% by -3 to 32% of total emission, -6 to 65% of ESD and -19 to 198% of Agriculture reduction efforts under the ESD (assuming the sector has to reduce by 30% in 2030 compared to 1990). Effects are different for different Member States. While accounting rules are equal for all Member States, methods for estimating the FMRL can differ according to data availability. For the most plausible setting of accounting rules (a translation of CP2 rules to 2021-2030) LULUCF credits would correspond to more than 146% of emission reduction needed in the Agriculture sector, 48% of ESD emission reduction efforts and contribute with 23.4% to the overall EU emission reduction target of 40% between 2021 and 2030. In other words: allowing LULUCF credits to undermine efforts in other sectors would reduce EU's GHG emissions reduction target of 40% to a target of 35.3% only (see Table 3-1).

3.1.3. Recommendations for the LULUCF sector

The impacts of forest management inclusion on the target can potentially be reduced when a historic base period is used for forest management rather than a reference level (comparing cases D and A). This applies for the sum of EU 28 under the assumed trends and data sets used. The situation is different for individual Member States. Such an accounting, however, would not exclude adequately indirect human-induced effects (e.g. through age-class shifts) and could also be considered as back-sliding in terms of methodology.

Besides forest management, credits from afforestation form a large share of the net LULUCF emissions and removals. The impact of afforestation on the target can be reduced using an accounting rule that resembles UNFCCC reporting rather than Kyoto reporting. Under Kyoto rules, the carbon sinks of forests that have been established since 1990 are all fully accounted for as afforestation independent of age; under UNFCCC rules they would enter the category of Forest Management after 20 years. The large amounts of afforestation credits that countries receive for activities far before the actual commitment period can thus be reduced by changing accounting rules for afforestation by including only recently afforested areas (see case E)).

Option 1: LULUCF pillar

A separate LULUCF pillar, that limits considerably or excludes fungibility with the other pillars of EU climate policy, seems to be the most appropriate way to include a sector that is different from all other sectors regarding its dynamics of emissions and removals and regarding risks of accounting. It can be designed to best reflect LULUCF specific particularities (e.g. lack of permanence, long time-cycles, high natural inter-annual variability) and can ensure that learning and improvements over time as well as international developments can be fully reflected. As a separate pillar, future amendments are much easier than a reform of the entire ESD. Potential risks for Member States of non-compliance in the ESD and for overall environmental integrity are lowest for this option compared to the two alternatives. However, due to reduced flexibility with other sectors, the risk of non-compliance of MS regarding potential country-specific LULUCF targets would be larger.

Most importantly, this option ensures continuity with respect to the ESD that in any of the other option would require an amendment. Moreover, for this option accounting rules and guidelines exist already and do not need to be changed. Continued reporting and accounting ensures consistent time series that are needed to better assess mitigation potentials and monitor the sector.

Option 2: AFOLU pillar

If forced into a pillar with Agriculture, the sink effect in LULUCF can potentially fully alleviate any need to reduce non-CO₂ emissions of the Agriculture sector. Net LULUCF credits would make up at least 6% of the required effort in agricultural emission reduction (case D), but alternative assumptions on accounting conditions can drive the effect up to 100% at EU level (case C).

Pulling Agriculture out of the ESD and putting it into a separate pillar with LULUCF would complicate the target setting and effort sharing of both the future Effort Sharing Decision as well as the LULUCF pillar. To not affect the overall 40% GHG reduction target, Agriculture in the AFOLU pillar would have to adopt the same level of stringency as under the 2030 non-ETS target to ensure that the overall target is not undermined. Any other assumption would water down EU's climate ambition.

Option 3: Inclusion in Effort sharing

Including the LULUCF sector in the future ESD can have a significant impact on the 2030 emission reductions, as the LULUCF sink could be used to displace efforts in the other sectors. This can increase EU's overall greenhouse gas emissions by up to 16% in the 2021-2030 period and could lead to 65% higher emissions in the ESD, depending on the accounting rules of different activities and assumptions made for the FMRL. The contribution of the LULUCF sector was not included in the 1990 base year emissions and hence, not taken into account when determining the cost-effective targets for the ETS and non-ETS sectors.

Due to the fact that this option would describe the most integrated approach, it also increases complexity and raises methodological issues, including concerns related to environmental integrity and technical compliance. An integration of LULUCF into ESD would require re-thinking the notion of cost-effectiveness in the agreed effort sharing formula and of the cost-effective split between ETS and non-ETS due to the uneven distribution of cost-effective potentials in this sector across Member States. A new impact assessment would be required to estimate cost-effective mitigation potentials. An integration applying current accounting rules would then require an upgrade of the target to ensure the level of ambition is not lowered. Until accounting rules are not finally decided, the impact of LULUCF on the ESD target remains fairly unclear. Even after accounting rules are decided, challenges like setting appropriate FMRLs remain and make contributions of the sector unpredictable.

3.1.4. Conclusion

An integrating of the LULUCF sector into the 2030 mitigation framework can best be achieved by creating a separate LULUCF pillar (see also Table 3-2). There are a number of prerequisites that need to be established to ensure environmental integrity and stringency of the overall target:

- The LULUCF pillar would need to have a separate target, in line with the EU's overall 40% reduction target compared to 1990 emission (and removal) levels.
- A LULUCF pillar would have to exclude flexibility regarding exchanges with the 2030 ESD or reduce it to a minimum under strict rules.
- The sector requires a clear strategy for reducing greenhouse gas emissions which sets out mid- and long-term objectives that ensures that land use policies addressing food security and other services of the sector are not opposing climate targets
- Clear guidance for the construction of FMRLs is needed to avoid inappropriate FMRLs and to achieve consistency of FMRLs between countries

Table 3-2: Summary of pros and cons of the three options

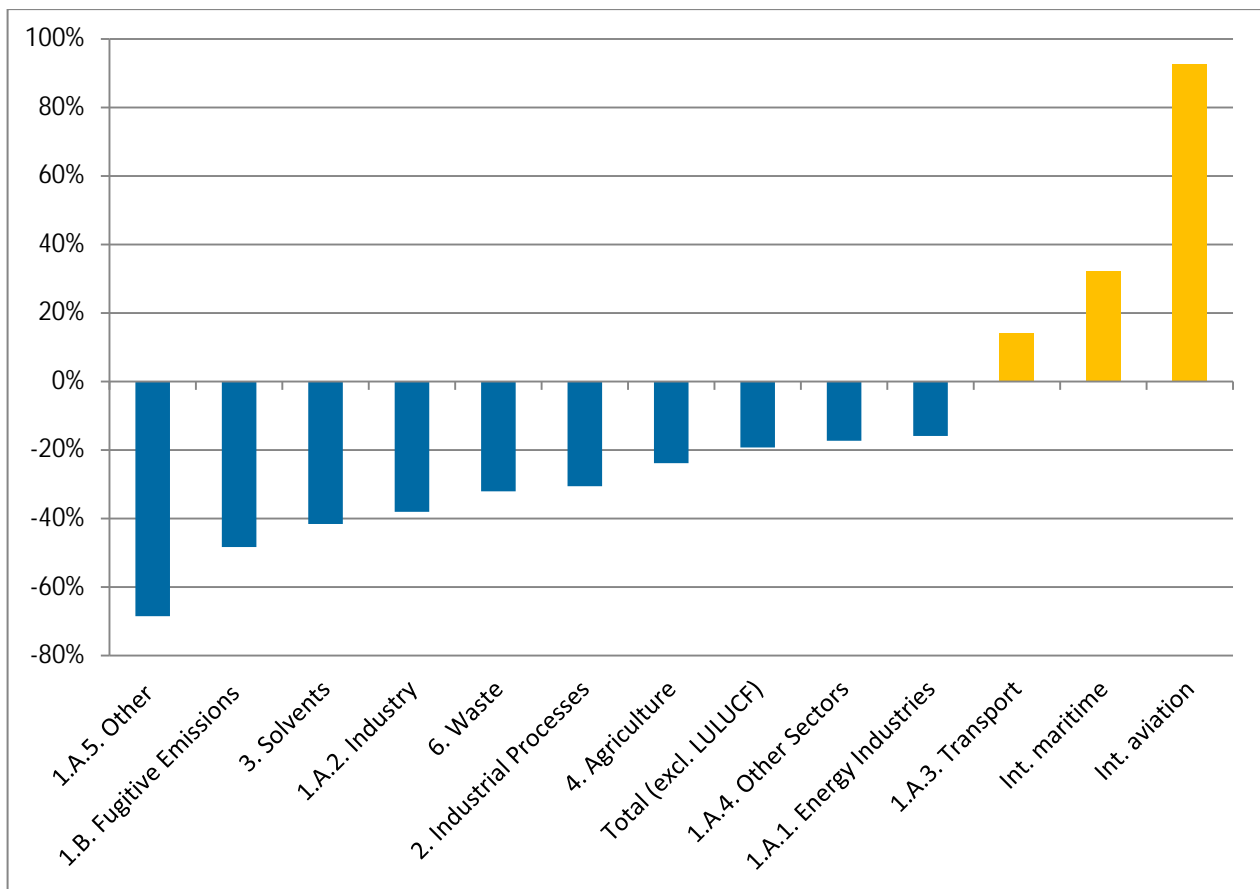
	Pros	Cons
Option 1 (LULUCF pillar)	Reflects best LULUCF specific particularities (e.g. lack of permanence, long time-cycles, high natural inter-annual variability);	Agricultural and LULUCF continue to be addressed by different policy tools, reducing coherence and increasing complexity;
	Ensures that learning and improvements over time as well as international developments can be fully reflected because a future LULUCF Decision is easier to amend than the entire ESD; Potential risks for MS's ESD compliance and for overall environmental integrity rather limited; Does not imply further adjusting the ESD as it does not alter its scope; Is the option for which accounting rules and guidelines exist already and do not need to be changed. Continued reporting and accounting ensures consistent time series needed to better monitor the sector;	Less likelihood for mitigation action in the sector; approach would require ambitious LULUCF target;
Option 2 (AFOLU pillar)	Increases potentially visibility of Agriculture (assuming that it has a target);	No flexibility between sectors within ESD; There is the risk of non-compliance for MS that have difficulties achieving the reductions in Agriculture and LULUCF; There is no strong link between non-CO2 emissions from agriculture and LULUCF to justify integrating the two sectors; agricultural emissions are directly linked to human activities; LULUCF emissions and removals follow a much more indirect logic;
		Accounting rules for agriculture are in line with the other ESD sectors whereas LULUCF rules are not;
Option 3 (Effort sharing)	Increases flexibility for MS to achieve overall target;	Increases complexity and raises methodological issues, including concerns related to environmental integrity and technical compliance;
	Most integrated approach;	Integration of LULUCF would require re-thinking the notion of cost-effectiveness in the agreed effort sharing formula and of the cost-effective split between ETS and non-ETS due to the uneven distribution of cost-effective potentials in this sector across Member States Net sink from LULUCF in ESD would decrease EU ambition if target is not upgraded; Until accounting rules are not finally decided impact on ESD target unclear; even after accounting rules are decided fundamental uncertainties due to data quality; Annual variability of LULUCF not compatible with linear target path;

3.2. Road transport

Transport is a special sector in the sense that it is the only one where greenhouse gas emissions in the EU have increased since 1990 (Figure 3-2). Despite various actions by Member States and the EU as a whole policies and measures have only managed to slow the growth of emissions. Reasons for this include at least short-term high economic and political costs for many of the more effective actions. The Council recognised the role of transport for the overall EU target by highlighting the need for emission reductions and further European action in the sector. In a final statement it recalled that *a Member State can opt to include the transport sector within the framework of the ETS* (European Council 2014). Unilateral inclusion of further activities is regulated by Art. 24 of the ETS Directive (European Union (EU) 25.10.2003); it has been applied a few times so far, especially for the early inclusion of N₂O emissions from the chemical industry into the trading scheme.

If transport would be included in the ETS most likely fuel suppliers and not individual car owners would have to participate in the ETS; this is the approach chosen for energy taxes and would minimise the number of new participants. The suppliers would then include the CO₂ costs in the fuel price and ultimately the consumers would see the increased cost.

Figure 3-2: GHG Emissions trend by sector from 1990 – 2012 for the EU 28



Source: EEA 2014a

For a Member State struggling with achieving the ESD II target such a step would be an attractive option: the responsibility for reducing emissions from transport would shift from the government to private actors. Instead of having to adopt potentially unpopular and/ or costly policies and measures to achieve absolute reductions from transport emissions could be compensated by buying certificates from other sectors. Unfortunately, such a step would most likely not be beneficial for the environment.

An inclusion of road transport in the ETS would not reduce emissions from the sector by itself:

- Current fuel taxes are much higher than the carbon price. Even at EUR 40/t CO₂ the price impact on gasoline would be about 10 ct/litre if the full carbon costs would be passed through to the consumer. The minimum value for petrol taxes allowed under EU legislation is 36 ct/litre; in practice all Member States charge more (European Commission 2015). With current CO₂ prices the impact on fuel prices would be negligible. Based on these comparisons a significant emission reduction from road transport through an inclusion of the sector in the ETS is not to be expected.
- Structural changes are needed: An emission trading scheme is most effective in utilizing short-term low-cost reduction potentials. Typically very high allowance prices are needed to initiate structural changes. For example, in addition to the ETS Member States have implemented policies to promote renewable energies for electricity generation. For transport, the ETS alone would not be able to drive such a shift; CO₂ prizes around EUR 400/t CO₂ would be needed to achieve similar levels of avoided emissions as the EU CO₂ emission standards for vehicles (Öko-Institut 2015c).

On the contrary, an inclusion of transport in the ETS before 2030 is likely to increase overall EU emissions:

- **Emissions from the transport sector would be higher:** if transport remains in the ESD Member States and the Commission will need to propose and adopt more ambitious policies to reduce emissions from the sector to achieve their 2030 target. In contrast, the need for additional measures would be much lower if cheap compensation of emissions through the ETS would be possible.
- **Emissions from other ETS sectors would not decrease:** Due to the large surplus of allowances in the ETS the inclusion of transport as a net buyer in the ETS would help in reducing the surplus. It would not force other participants of the trading scheme to reduce their emissions until 2030.

For a more detailed analysis of the inclusion of road transport into the EU ETS including price elasticities see Öko-Institut (2015c).

If a Member State opts to unilaterally include transport the Commission may *authorize the issue of additional Allowances* (European Union (EU) 25.10.2003). This would need to lead to a respective reduction of AEA under the ESD to ensure that the overall cap remains unchanged. Deciding the quantity of these additional allowances is not trivial. Member States would have an interest in converting as few AEAs in EUAs as possible to facilitate their ESD target achievement. While this would also be beneficial for the surplus reduction under the ETS it could lead to reduced reduction efforts in the remaining ESD sectors. Higher levels (e.g. based on projections for the road transport sector until 2030) would ensure that the other non-trading sectors would need to keep reducing emissions but this would not help Member States in achieving their ESD targets.

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Annex

Annex I. Targets and background data by Member State

	2005 ESD emissions [Mt CO ₂ eq]	GDP/cap relative to EU average [%]	2020 targets [% vs 2005]	2021 targets		2030 targets	
				WEM projections [% vs 2005]	WAM projections [% vs 2005]	based only on GDP/cap [% vs 2005]	incl. full cost-eff potential (min., 50%) [% vs 2005]
Austria	57.0	144%	-16%	-8%	-13%	-38%	-33%
Belgium	78.4	134%	-15%	-3%	-4%	-37%	-31%
Bulgaria	22.7	21%	20%	13%	3%	0%	0%
Croatia	18.3	39%	11%	-6%	-6%	-8%	-8%
Cyprus	5.8	74%	-5%	-49%	-50%	-23%	-23%
Czech Republic	60.3	55%	9%	-6%	-7%	-15%	-15%
Denmark	37.2	173%	-20%	-17%	-17%	-40%	-37%
Estonia	5.6	54%	11%	5%	2%	-14%	-14%
Finland	33.0	139%	-16%	-8%	-10%	-37%	-34%
France	407.1	122%	-14%	-14%	-19%	-36%	-36%
Germany	485.2	130%	-14%	-10%	-13%	-36%	-40%
Greece	61.3	68%	-4%	-13%	-15%	-20%	-20%
Hungary	51.5	39%	10%	-15%	-19%	-7%	-7%
Ireland	46.5	139%	-20%	-7%	-11%	-37%	-30%
Italy	330.9	100%	-13%	-12%	-16%	-34%	-34%
Latvia	8.2	45%	17%	11%	9%	-10%	-10%
Lithuania	12.9	46%	15%	15%	6%	-10%	-10%
Luxembourg	10.1	325%	-20%	1%	-4%	-40%	-33%
Malta	1.1	67%	5%	3%	2%	-20%	-20%
Netherlands	124.4	140%	-16%	-16%	-18%	-37%	-34%
Poland	171.0	39%	14%	5%	5%	-8%	-8%
Portugal	48.5	61%	1%	-24%	-24%	-17%	-17%
Romania	70.2	28%	19%	3%	0%	-3%	-3%
Slovakia	22.5	52%	13%	-19%	-20%	-13%	-13%
Slovenia	11.7	67%	4%	4%	-10%	-19%	-19%
Spain	231.8	87%	-10%	-4%	-5%	-28%	-28%
Sweden	43.9	170%	-17%	-17%	-18%	-40%	-36%
United Kingdom	380.4	115%	-16%	-17%	-17%	-35%	-36%
EU-28	2 837.6	100%	-10%	-10%	-13%	-30%	-30%

Source: Öko-Institut based on EEA 2014b and Öko-Institut 2015a

Annex II. Relevance of the different non-ETS sectors by Member State

	ESD emissions profile (2012)									
	Commercial/ Residential		Transport		Agriculture		Waste		Other	
	[Mt CO2 eq]	[% of ESD]	[Mt CO2 eq]	[% of ESD]	[Mt CO2 eq]	[% of ESD]	[Mt CO2 eq]	[% of ESD]	[Mt CO2 eq]	[% of ESD]
Austria	9.5	19.1%	21.6	43.6%	7.5	15.1%	1.7	3.3%	9.4	18.9%
Belgium	25.1	36.1%	24.9	35.9%	9.3	13.3%	1.5	2.2%	8.6	12.5%
Bulgaria	2.2	9.3%	8.4	34.8%	6.3	26.1%	3.6	14.9%	3.6	14.9%
Croatia	3.1	17.8%	5.7	33.2%	3.4	19.5%	1.1	6.5%	4.0	23.0%
Cyprus	0.5	10.3%	2.1	42.6%	0.8	16.8%	1.0	20.6%	0.5	9.6%
Czech Republic	11.0	18.5%	16.9	28.6%	8.1	13.6%	3.8	6.4%	19.4	32.9%
Denmark	5.3	15.9%	12.2	36.8%	9.6	28.8%	1.1	3.2%	5.1	15.3%
Estonia	0.6	11.4%	2.3	40.4%	1.3	23.5%	0.3	5.4%	1.1	19.3%
Finland	4.3	14.5%	12.7	43.0%	5.7	19.4%	2.1	7.0%	4.8	16.1%
France	98.0	26.7%	132.5	36.2%	89.3	24.4%	12.6	3.4%	34.0	9.3%
Germany	139.1	30.1%	155.5	33.7%	69.5	15.1%	13.6	2.9%	83.8	18.2%
Greece	9.4	20.0%	16.1	34.3%	9.1	19.3%	4.7	10.1%	7.7	16.4%
Hungary	11.9	29.5%	10.8	26.9%	8.7	21.6%	3.2	7.9%	5.7	14.1%
Ireland	9.1	22.0%	10.9	26.4%	18.0	43.5%	1.0	2.4%	2.3	5.7%
Italy	85.0	31.6%	106.1	39.4%	34.3	12.7%	16.2	6.0%	27.7	10.3%
Latvia	1.5	18.6%	2.8	34.0%	2.4	29.4%	0.6	7.3%	0.9	10.7%
Lithuania	1.4	12.0%	4.5	39.1%	5.1	43.6%	1.0	8.3%	-0.4	-3.0%
Luxembourg	1.6	17.0%	6.5	68.1%	0.7	7.0%	0.1	0.5%	0.7	7.4%
Malta	0.1	12.9%	0.6	50.7%	0.1	7.3%	0.1	6.0%	0.3	23.0%
Netherlands	39.6	34.9%	34.0	30.0%	15.9	14.0%	3.7	3.3%	20.2	17.8%
Poland	56.3	29.4%	46.8	24.5%	36.7	19.1%	15.2	8.0%	36.5	19.0%
Portugal	4.5	10.6%	17.0	39.9%	7.2	17.0%	8.2	19.2%	5.6	13.3%
Romania	10.8	17.0%	15.1	23.8%	18.2	28.7%	5.8	9.2%	13.4	21.2%
Slovakia	3.9	20.0%	6.6	33.6%	3.1	15.9%	2.2	11.0%	3.8	19.5%
Slovenia	1.7	15.3%	5.8	50.9%	1.9	16.5%	0.5	4.3%	1.5	13.0%
Spain	42.2	21.7%	80.7	41.6%	37.7	19.4%	12.9	6.6%	20.6	10.6%
Sweden	3.2	8.5%	19.1	51.3%	7.6	20.5%	1.6	4.4%	5.7	15.3%
United Kingdom	98.4	28.3%	114.8	33.0%	51.8	14.9%	21.6	6.2%	61.1	17.6%
EU-28	679.3	26.4%	893.1	34.8%	469.1	18.3%	140.8	5.5%	387.6	15.1%

Notes: For certain emissions categories it is not possible to calculate the share of emissions covered by the ESD due to different scopes and definitions used in the ETS and the GHG inventories. These emissions are included under "Other"; it is calculated as the difference of total ESD emissions and ETS emissions.

Source: Öko-Institut based on EEA 2014b