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IMPACT ASSESSMENT

Accompanying the document

Proposal for a Directive of the European Parliament and of the Council

amending Directive 2003/87/EC

{ COM(2015) X final }
{ SWD(2015) X final }

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TABLE OF CONTENTS

1.	Procedural issues and consultation of interested parties	1
1.1.	Identification	1
1.2.	Organisation and timing	1
1.3.	Consultation and expertise.....	1
1.3.1.	Expertise used	1
1.3.2.	Consultation	2
1.4.	Subsidiarity	4
1.5.	Scrutiny by the Commission Impact Assessment Board	4
2.	Policy Context.....	4
3.	General evaluation and lessons learnt	5
4.	General problem definition.....	7
5.	Objectives.....	8
5.1.	General policy objectives.....	8
5.2.	Specific policy objective	9
5.3.	Consistency with other policies and objectives.....	9
6.	Implementation of the EU's GHG emission reduction target.....	10
6.1.	Linear reduction factor	10
6.2.	Auction share	11
7.	Free allocation and addressing the risk of carbon leakage	15
7.1.	Problem definition	15
7.1.1.	Underlying drivers of the problem.....	16
7.2.	Operational policy objectives.....	18
7.3.	Policy options for free allocation and other carbon leakage measures	18
7.3.1.	Benchmarks.....	18
7.3.1.1.	Lessons learned from the current system in phase 3 (2013-2020).....	18
7.3.1.2.	Policy options for updating benchmark values for 2021-30.....	21
7.3.1.3.	Screening	21
7.3.2.	Production level and adjustments	22
7.3.2.1.	Lessons learned from the current system in phase 3 (2013-20).....	22
7.3.2.2.	Policy options	25
7.3.2.3.	Screening	25
7.3.3.	Reserve for new entrants.....	26
7.3.3.1.	Lessons learned from the current system in phase 3 (2013-20).....	26
7.3.3.2.	Policy options	26
7.3.3.3.	Screening	27
7.3.4.	Compensation for indirect carbon costs	27
7.3.4.1.	Lessons learned from the current system in phase 3 (2013-20).....	27
7.3.4.2.	Policy options	29
7.3.4.3.	Screening	30
7.3.5.	Carbon leakage groups and criteria.....	31
7.3.5.1.	Lessons learned from the current system in phase 3 (2013-20).....	31
7.3.5.2.	Policy options	33
7.3.5.3.	Screening	36
7.4.	Option packages.....	37
7.5.	Analysis of impacts	40
7.5.1.	Direct and indirect effects	40
7.5.2.	Environmental impacts	40
7.5.3.	Economic impacts	41
7.5.3.1.	Competitiveness	41
7.5.3.2.	Administrative burden.....	43
7.5.4.	Social impacts.....	43
7.5.4.1.	Employment.....	43
7.5.4.2.	Energy prices for households	43
7.5.5.	Comparing the options	44
7.5.5.1.	Quantified environmental, economic and social impacts.....	44
7.5.5.2.	Reflect technological progress in industry sectors.....	44

ETS Limited

7.5.5.3.	Fully preserve incentives for industry to innovate	45
7.5.5.4.	Most efficient installations do not face undue carbon costs leading to carbon leakage.....	45
7.5.5.5.	Better alignment with production levels.....	46
7.5.5.6.	No increased administrative complexity.....	46
7.5.5.7.	Avoid windfall profits	47
7.5.5.8.	Concluding remarks.....	48
8.	Low-carbon funding mechanisms	49
8.1.	Innovation fund.....	50
8.1.1.	Problem definition	50
8.1.1.1.	Underlying drivers of the problem	50
8.1.1.2.	NER300 lessons learnt.....	51
8.1.2.	Operational policy objectives.....	54
8.1.3.	Policy options	54
8.1.3.1.	Screening of projects.....	54
8.1.3.2.	Conditionality of Awards.....	55
8.1.3.3.	Type of instrument	56
8.1.3.4.	Maximum rate of funding.....	56
8.1.3.5.	Parameters not varied in the options.....	57
8.1.4.	Option packages.....	58
8.1.5.	Analysis of impacts	59
8.1.5.1.	General impacts.....	59
8.1.5.2.	Economic impacts.....	60
8.1.5.3.	Environmental impacts.....	63
8.1.5.4.	Social impacts	64
8.1.6.	Comparing the options	64
8.2.	Modernisation fund	65
8.2.1.	Problem definition	65
8.2.1.1.	Context	65
8.2.1.2.	Underlying drivers of the problem	66
8.2.1.3.	Lessons learnt	66
8.2.2.	Policy Objectives.....	67
8.2.3.	Development and screening of policy options.....	67
8.2.3.1.	Baseline.....	67
8.2.3.2.	Policy options.....	68
8.2.3.3.	Retained options packages.....	69
8.2.3.4.	Dismissed option packages.....	71
8.2.4.	Analysis of Impacts.....	71
8.2.4.1.	Effectiveness.....	72
8.2.4.2.	Coherence.....	73
8.2.4.3.	Market Distortion.....	74
8.2.4.4.	Administrative Burden	75
8.2.5.	Comparing the Options.....	75
8.3.	Free allocation to promote investments for modernising the energy sector	76
8.3.1.	Policy objective and problem definition	76
8.3.2.	Conclusions on lessons learnt and policy context.....	77
8.3.3.	Operational policy objectives.....	77
8.3.4.	Development and screening of policy options.....	77
8.3.4.1.	Aspects not varied between the options.....	79
8.3.5.	Retained option packages.....	79
8.3.6.	Assessment of options	81
8.3.6.1.	Effectiveness.....	81
8.3.6.2.	Complexity and administrative burden / flexibility to adjust to MS circumstances	83
8.3.6.3.	Transparency.....	83
8.3.6.4.	Potential distortion of EU energy market / complementarity with regard to existing EU instruments	84
8.3.6.5.	Timing and distribution of investments and volume and timing of allowances on market / auction revenues of investments.....	84
8.3.6.6.	Potential decarbonisation	85
8.3.6.7.	Social impacts	86
8.3.7.	Comparing of options.....	86

ETS Limited

8.4.	Interlinkages between the low carbon funding mechanisms.....	87
9.	Monitoring and evaluation	88
	ANNEXES.....	2
1.	GLOSSARY	2
2.	SUMMARY OF RELEVANT FINDINGS OF THE 2030 IMPACT ASSESSMENT.....	6
3.	SUMMARY OF STAKEHOLDER CONSULTATIONS.....	8
3.1.	General consultation on the ETS revision.....	8
3.2.	Consultation on carbon leakage provisions and innovation support.....	8
4.	SUMMARY OF EVALUATION	9
4.1.	NER 300 - lessons learnt.....	9
4.1.1.	Introduction	9
4.1.2.	NER 300 principles.....	9
4.1.2.1.	Definition	9
4.1.2.2.	Legal basis.....	9
4.1.2.3.	Selection of projects	10
4.1.3.	State-of-play	11
4.1.3.1.	Results of calls for proposals.....	11
4.1.4.	Lessons learnt so far	13
4.1.4.1.	Geographical coverage	13
4.1.4.2.	Technological coverage	13
4.1.4.3.	Support to innovation	13
4.1.4.4.	Cost-effectiveness in the use of NER 300 funds	14
4.1.4.5.	Administrative simplification.....	14
4.1.4.6.	Monetisation of allowances for grants.....	15
4.1.4.7.	No ring-fencing.....	15
4.1.4.8.	Number and timing of calls	15
4.1.4.9.	Length of preparatory phase	16
4.1.4.10.	Impact of projects	16
4.1.4.11.	NER 300 and other financing instruments.....	16
4.1.5.	Main challenges encountered.....	17
4.1.5.1.	Financial barriers	17
4.1.5.2.	Management structure.....	18
4.1.6.	Conclusions.....	19
4.2.	Free allocation to the power sector.....	20
4.3.	Exclusion of small emitters – lessons learnt.....	23
4.4.	Guaranteeing a robust and secure EU ETS (registry fees) – lessons learnt.....	25
5.	FURTHER IMPROVEMENTS TO THE CURRENT SET OF RULES.....	27
5.1.	Validity of emission allowances.....	27
5.1.1.	Problem definition	27
5.1.2.	Operational policy objective	28
5.1.3.	Policy options	28
5.1.4.	Analysis of impacts	28
5.1.5.	Comparing the options	28
5.2.	Optional exclusion of small emitters.....	29
5.2.1.	Problem definition and general objective	29
5.2.2.	Operational policy objective	30
5.2.3.	Policy options	30
5.2.3.1.	Assessment of the options.....	30
5.2.3.2.	Comparing the options	32
5.3.	Guaranteeing a robust and secure EU ETS (registry fees).....	32
5.3.1.	Problem definition and general objective	32
5.3.2.	Operational policy objectives.....	33
5.3.3.	Policy options	34
5.3.3.1.	Screening of the options	34
5.3.3.2.	Analysis of impacts	34
6.	IMPACTS OF DIFFERENT OPTION PACKAGES FOR FREE ALLOCATION ON INDIVIDUAL SECTORS.....	36
(a)	Effect of carbon leakage groups on sectors.....	36
(b)	Cross sectoral correction factor	39
(c)	Estimated level of free allocation for selected sectors in phase 4	40
(d)	Estimated compliance cost per sector, taken into account cost pass through	44

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7.	IMPACTS OF DIFFERENT OPTION PACKAGES FOR FREE ALLOCATION: ADMINISTRATIVE BURDEN AND SOCIAL IMPACTS.....	46
7.1.	Analysis of administrative burden.....	46
7.2.	Analysis of social impacts	49
	<i>Employment</i>	49
	7.5.4.2. <i>Energy prices for households</i>	51
8.	LITERATURE REVIEW ON COST-PASS THROUGH RATES	53
8.1.	Theoretical studies on cost pass-through	54
8.2.	Ex-ante empirical studies on the EU ETS	56
8.3.	Ex-post empirical studies for the EU ETS	58
8.4.	Conclusions.....	62
9.	DESCRIPTION OF FINANCIAL BARRIERS FOR ENERGY SECTOR: POWER GENERATION, ENERGY EFFICIENCY AND NETWORKS.....	67
10.	IMPACTS OF CREATING THE MODERNISATION FUND COMPARED TO THE BASELINE.....	70
	Economic Impacts	70
	Environmental Impacts	73
	Social Impacts.....	74
11.	MORE COMPREHENSIVE OVERVIEW OF IMPACTS FOR DIFFERENT OPTIONS FOR CREATING THE MODERNISATION FUND.....	76
12.	TIMING AND APPROACH TO THE MONETISATION OF ALLOWANCES FOR THE INNOVATION FUND AND MODERNISATION FUND.....	78

ETS Limited

List of tables

Table 1: Screening of options for updating benchmark values	21
Table 2: Screening of options for production level and adjustments	25
Table 3: Screening of options for reserve for new entrants.....	27
Table 4: Screening of options for compensation for indirect cost.....	30
Table 5: Overview of cost pass through ranges found in existing literature	33
Table 6: Screening of options for carbon leakage groups and criteria	36
Table 7: Option packages for addressing the risk of carbon leakage	39
Table 8: Overview of assessment of policy option packages compared to 'Baseline B'.....	48
Table 9: Option packages for innovation fund	58
Table 10: Comparison of options for the innovation fund	64
Table 11: Retained options for examining for the Modernisation Fund.....	70
Table 12: Impact of policy options for the Modernisation Fund.....	75
Table 13: Option packages for the free allocation to the power sector	80
Table 14: Comparison of options for the free allocation to the power sector	86
Table 18: Stakeholder consultation on post-2020 carbon leakage provisions – submissions	8
Table 19: Projects submitted and awarded.....	12
Table 20: Distribution of awarded NER 300 funding	12
Table 15: Comparison of options	29
Table 16: Comparison of the options in relation to relevant problems and objectives.....	32
Table 17: Comparing the options in relation to relevant problems and objectives	35
Table 21: Estimated number of sectors, share of gross free allocation and GVA in the different groups.....	38
Table 22: Estimated carbon leakage status at sectoral level based on past data.....	39
Table 23: Estimated administrative costs for additional NIMs exercises:.....	46
Table 24: Estimated additional annual administrative costs for production level adjustments	47
Table 25: Estimated administrative costs for harmonised rules for indirect cost compensation (additional costs compared to national compensation currently applied in 6 MSs as baseline).....	48
Table 26: Estimated employment impacts of policy option packages compared to baseline B from the pass through of additional costs (annual average for 2021 – 2030, underlying assumptions in italics).....	50
Table 27: High estimate of employment impacts of policy option packages compared to baseline B from additional costs absorbed (annual average for 2021 – 2030, underlying assumptions in italics).....	50
Table 28: Analysis of impacts of policy option packages on the district heating sector 2021-30.....	51
Table 29 Estimate of cost pass-through rates from ex-post econometric studies	60
Table 30 Overview of the range of average cost pass-through in selected sectors from literature.....	63
Table 31: Comparison under baseline and creation of the Modernisation Fund for allocation of 2% of total allowances, 2021-2030.....	71
Table 32: Modernisation Fund allocation shares per beneficiary Member States, 2021-2030.....	72
Table 33: Monetised health benefits in 2030 as a percentage of GDP.....	74
Table 34: Reduced air pollution control costs by 2030 as a percentage of GDP.....	74
Table 35: EU28 jobs associated with investments in the power sector and energy efficiency, 2011-2030	75
Table 36: Overview of impacts for different options for creating the Modernisation Fund.....	76

ETS Limited

List of figures

Figure 1: Structure of the total quantity of allowances in phase 3	13
Figure 2: Annual allowances from fund by type	82
Figure 3: Combined free allocation trajectories	85
Figure 4: Distribution of installations in terms of amount of emissions	23
Figure 5: Annual Emissions from small installations (installations with annual emissions < 25 kt) and from opt-out installations	24
Figure 6: Indicative carbon leakage groups in the 'Limited changes' option package following a sectoral assessment at NACE-4 level based on 2009-2011 data	37
Figure 7: Indicative carbon leakage groups in the 'Targeted' option package following a sectoral assessment at NACE-4 level based on 2009-2011 data	37
Figure 8: Estimated average level of free allocation under different option packages in relation to gross allocation in Phase 4.....	40
Figure 9: Employment in selected energy-intensive industries	49
Figure 10 Cost pass-through rates derived by Vivid Economics (2014) in sectors investigated in reduced and full detail (2020, € 15/tCO ₂).....	58

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EXECUTIVE SUMMARY SHEET

Executive Summary Sheet

Impact assessment on Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC

A. Need for action

Why? What is the problem being addressed?

The EU's long-term goal, also agreed in the context of the UNFCCC, is to limit global average temperature increase to below 2°C compared to pre-industrial levels. Building on the Commission's Communication on a policy framework for climate and energy in the period from 2020 to 2030 and the accompanying Impact Assessment, the European Council agreed on the 2030 framework in October 2014, including a binding domestic reduction of GHG emissions of at least 40% in 2030 as compared to 1990. Setting a cap for EU Emissions Trading System (ETS) at the corresponding emission level would require a change in the linear reduction factor from 2021 onwards. At the same time, while current policies to prevent carbon leakage such as the allocation of free allowances in the ETS have been successful, these do not automatically apply beyond 2020. The required revision of the ETS Directive should also build on the lessons learnt on other aspects of the system, and an analysis on how the EU ETS has been performing should feed into the process of considering its future regulatory framework.

What is this initiative expected to achieve?

The specific policy objective is to align the EU ETS architecture with the 2030 emission reduction commitment and refine and improve the EU ETS post-2020 framework in the light of the lessons learnt in a context where:

- Fully comparable climate policy measures may not yet be undertaken by all other major economies;
- Reinforced research, development and innovation efforts should take place in order to maintain Europe's industrial base and competence, and support the 2030 climate and energy framework as well as the long-term goal of low-carbon economy;
- Reinforced investment efforts should take place in order to modernise the energy system;
- Experience gathered during the first years of phase 3 suggests that there is potential to reinforce efficiency.

What is the value added of action at the EU level?

The EU ETS Directive exists and will continue post 2020. It is an EU policy instrument. Climate change is a trans-boundary problem. Therefore coordination of climate action at European level and, where possible, at global level is necessary and EU action is justified on grounds of subsidiarity. Many of the policy options have an important internal market dimension and many of the required investments and infrastructures have an important European dimension. Therefore, the objectives can be better achieved by an EU framework for action. Delegating the legislative powers to Member States would lead to partitioning, an uneven playing field and decreased efficiency.

B. Solutions

What legislative and non-legislative policy options have been considered? Is there a preferred choice or not? Why?

The impact assessment was carried out for a number of aspects on which the European Council have strategic guidance allowing some discretion (addressing the risk of carbon leakage, establishment of a modernisation and an innovation fund, optional free allocation to modernise the electricity sector in some Member States) and aspect where the required revision of the ETS Directive should build on the lessons learnt (validity of emission allowances; guaranteeing a robust and secure Registry; and optional exclusion of small emitters). The options in these areas are screened preliminarily in view of achieving the operational objectives. There are numerous possible combinations of options on different elements that could be evaluated. Therefore, based on the pre-screening, option packages are formed. The combinations of options are selected to form coherent packages, representing different ends of a spectrum and differentiating across the different elements to evaluate their specific impacts, while also focusing on more realistic options. For addressing the risk of carbon leakage, options are considered concerning benchmarks, production levels, new entrant reserve, carbon leakage groups and indirect cost compensation. For the innovation fund, options are developed for the way that projects are screened and selected, and the way in which financial support is provided. For the modernisation fund, potential

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options are considered relating to its governance. For the optional free allocation to the energy sector, options are developed for improving its modalities compared to the current practice.

Who supports which option?

Often different stakeholders have different views, sometimes within the same sector, making it difficult to categorise homogenous groups of stakeholders supporting particular options. On addressing the risk of carbon leakage, there is considerable support for maintaining some of the existing features. A number of industry stakeholders are in favour of limited changes, while some others believe that more targeting or further harmonisation is needed. For the Innovation Fund, energy and industry stakeholders generally welcome continued support for low carbon innovation and the expansion of scope to include industry, with diverging views on how the risk sharing approach could be tailored for industry or CCS to improve the effectiveness compared to NER 300, for example by providing support at an earlier stage in the project life cycle or a higher rate of support. On the modernisation fund some stakeholders support the beneficiary Member States having a key role in managing it, while others ask for a stronger role for all Member States, the Commission and the European Investment Bank. On the optional free allocation to the energy sector, market participants generally support streamlined, common and simplified rules, and harmonised reporting guidelines.

C. Impacts of the preferred option

What are the benefits of the preferred option (if any, otherwise main ones)?

The general benefit of the main options is a EU ETS architecture for post-2020 that is better aligned with the 2030 emission reduction commitment as well as improved and refined in the light of the lessons learnt. Other specific benefits have been weighed against the cost incurred for each of the options for the key aspects assessed. Due to the inherent trade-offs between some of the impacts, the Impact Assessment outlines the options without choosing preferred ones. Main options in most cases have different specific impacts. However, the general benefit of measures to address the risk of carbon leakage is addressing competitiveness issues and the potential risk of carbon leakage, as long as comparable climate policies are not undertaken by other major economies. In general, the overall benefit of establishing the Innovation Fund is a stepped up effort to rapidly introduce new low-carbon technologies to the market in order for the EU to reach its long-term decarbonisation goals. The general benefit of establishing the Modernisation Fund and optional free allocation to the energy sector is realising emission reductions in the lower income Member States, in turn contributing to cost-effective reductions from a European perspective.

What are the costs of the preferred option (if any, otherwise main ones)?

Main options in most cases have different specific impacts. Cost must be seen in the overall context of contributing to achieving the EU climate objectives of limiting global average temperature increase to not more than 2°C above pre-industrial level. Measures to address the risk of carbon leakage directly affect primarily cost for industrial installations covered by the ETS or EU Member States' budgets. Options for the Modernisation Fund affect primarily the cost in the form of market distortion and administrative burden. Together with a possible impact on the carbon market, these types of costs are also relevant for the options for the optional free allocation to the energy sector.

How will businesses, SMEs and micro-enterprises be affected?

Businesses covered by the EU ETS are directly affected. The proposal also affects producers of renewable energy, and manufacturers of equipment for low carbon technologies. Innovative technologies will generate new business opportunities. The revision of the ETS also constitutes an important part of the work on the achievement of a resilient Energy Union with a forward looking climate change policy at its core, which has as one of its goal giving EU consumers – including businesses – secure, sustainable, competitive and affordable energy. The majority of installations under the EU ETS are in the energy intensive industries with market structures characterised by large enterprises. Small emitters (not necessarily owned by SMEs) should benefit from options related to the continuation of the possibility for Member States to exclude them.

Will there be significant impacts on national budgets and administrations?

National budgets and administrations are primarily affected due to the link to auctioning revenues. If Member States were to be required to share the EU-level costs of the Union registry, this would also have an impact on their national budgets, but not a significant one.

Will there be other significant impacts?

No, there are not expected be any other significant impacts.

D. Follow up

When will the policy be reviewed?

Not specifically foreseen. However, Articles 10(5) and 29 of Directive 2003/87/EC require the Commission to

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establish regular reports on the carbon market and to verify whether the carbon market is functioning properly.

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1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Identification

Lead Directorate-General (DG): Climate Action

Other services involved: Secretariat-General; Legal Service; DG Budget; DG Competition; DG Economic and Financial Affairs; DG Employment; DG Energy; DG Environment; DG Internal Market, Industry, Entrepreneurship and SMEs; DG Mobility and Transport; DG Regional and Urban Policy; DG Taxation and Customs Union; and DG Trade.

Work Programme 2015 reference: Included under initiative no. 5 *Strategic framework for the Energy Union*

Agenda Planning reference: 2015/CLIMA/001

1.2. Organisation and timing

The analysis on a policy framework for climate and energy in the period from 2020 to 2030 (hereafter 'the 2030 framework')¹ has played a central role in the work for the revision of the EU ETS for the period after 2020. The Impact Assessment for the 2030 framework² was the first step in the preparatory work for this Impact Assessment, which is a follow-up exercise focusing on certain ETS-specific methodological elements not already assessed there.

The work for this impact assessment (IA) continued in December 2014 with the launch of a 12-week online consultation on the revision of the EU ETS³. However, the work also builds on the results of the consultation on the 2030 framework⁴ and a separate consultation on the post-2020 carbon leakage provisions⁵.

DG Climate Action invited the above-mentioned Commission services to be part of an Impact Assessment Steering Group. Three meetings took place (on 18 December 2014, 26 February 2015 and 16 April 2015) where comments were exchanged and taken into due account. The final draft IA was submitted to the group on 13 April 2015.

An evaluation of the existing ETS Directive is part of the Impact Assessment work and has fed into the assessment of the policy options.

1.3. Consultation and expertise

1.3.1. Expertise used

The Impact Assessment builds on the Impact Assessment for the 2030 framework. In terms of external expertise, the Commission drew upon a study commissioned in 2014 for this Impact Assessment and evaluation of the EU Emissions Trading System (ETS), carried out by a consortium led by ICF International⁶. Furthermore, in 2014, a study⁷ was commissioned to assess the issue of costs being passed through from industrial sectors to their downstream customers, searching to determine the factors influencing such ability to pass through costs

¹ Communication on A policy framework for climate and energy in the period from 2020 to 2030, COM(2014)15 final

² Commission Staff Working Document accompanying the Communication on A policy framework for climate and energy in the period from 2020 to 2030, SWD(2014) 15 final

³ http://ec.europa.eu/clima/consultations/articles/0024_en.htm

⁴ <http://ec.europa.eu/energy/en/consultations/consultation-climate-and-energy-policies-until-2030>

⁵ See footnote 10

⁶ ICF International, Umweltbundesamt, SQ Consult, Ecologic Institut, Vivid Economics and ZEW

⁷ Ref

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and to quantify it for major energy intensive industry sectors. Another study⁸ was commissioned to evaluate the experience gathered with the harmonised benchmark-based allocation process, and in particular to evaluate whether the benchmarks have achieved the intended objectives. In 2013, a study⁹ was commissioned to assess the evidence for carbon leakage in the period 2005-2012 for ten major energy intensive manufacturing industry sectors.

In 2011-2013, Member States submitted their National Implementation Measures (NIMs) to the Commission pursuant to Commission Decision 2011/278/EU, which contain verified, detailed and commercially sensitive data on preliminary free allocation to industrial installations in the EU Member States. These were checked for compliance with the harmonised allocation rules and are used for the analysis of the amount of free allocation to industrial installations.

1.3.2. Consultation

Relevant stakeholders (Member States, industry representatives, NGOs, research and academic institutions, trade unions and citizens) were involved throughout the entire process. Complementing the consultation for the 2030 framework, an extensive follow-up stakeholder consultation was carried out on various technical aspects of the post-2020 carbon leakage provisions, as well as aspects related to innovation support. It included three stakeholder meetings (June, July and September 2014)¹⁰ and a written consultation (May–July 2014)¹¹.

This was followed by the online consultation (December 2014-March 2015) also on other aspects requiring consideration (free allocation for the power sector, innovation and modernisation funds, small and medium sized enterprises (SMEs), regulatory fees and general evaluation of the EU ETS). The Commission did its best to accept also late submissions. 529 contributions from a broad spectrum of stakeholders were received. The main findings of the public consultation are found in Box 1 and a comprehensive summary report in Annex 3.

All of the above consultations have been published on the DG Climate Action website. The Commission minimum standards on stakeholder consultation have all been met.

Moreover, there have been bilateral meetings with many of the stakeholders, allowing them to express their specific views on the future system, as well as dedicated efforts on certain aspects (questionnaire on benchmarks for industry stakeholders distributed in March 2015; modernisation fund conference).

The views of the stakeholders were taken into account to the extent possible (given their number, the sensitivity and complexity of the issues and the diverging opinions expressed by different stakeholder groups) in the context of this impact assessment.

Box 1: Main findings of the public consultation

A total of 529 responses were received. Several responses were coordinated, for example there were 104 identical submissions by different entities from the same sector. The majority (78%) of submissions were from business stakeholders, representing a wide variety of industry sectors and companies.

⁸ Ref

⁹ Ref.

¹⁰ Recordings of the meetings and the presentation can be found on the DG Climate Action website:

http://ec.europa.eu/clima/policies/ets/cap/leakage/documentation_en.htm

¹¹ A summary of the findings and the individual submissions can be found on the DG Climate Action website

http://ec.europa.eu/clima/consultations/articles/0023_en.htm

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The public consultation showed that the EU ETS is considered to correspond well to the EU climate policy objectives. There is overall support for the system as a central instrument to reduce greenhouse gas emissions in the EU and as a market-based system. The majority of stakeholders support continuation of existing principles, but with improvements on certain aspects.

Free allocation and addressing the risk of carbon leakage: There is overall support for free allocation as the measure to address direct costs. Industry stakeholders¹² supported the idea that the best performers should be fully compensated by free allocation and as a consequence a correction factor should not be applied. While the majority of other stakeholders prefers to continue with the existing principles and to base benchmarks on the most efficient EU installations, some respondents argue for worldwide performance benchmarks, or for changing the range for the determination of the benchmarks (e.g. to 5-20% most efficient installations instead of 10%). The energy intensive industry stakeholders support 'dynamic allocation' or allocation based on more recent production volumes. However, some energy sector stakeholders stress that defining the amount of free allowances available to industry should not create uncertainty with regard to available auction volumes, and therefore the amounts should be fixed *ex-ante*. They also argue that given the final objective for the EU of an international agreement, the system of free allocation should be continue to be considered as a transitional instrument only to address direct carbon leakage.

Many industry stakeholders argue that sectors which are able to pass through carbon costs should not receive any free allocation or at least not full free allocation, but it is generally claimed by industry sectors covered by the EU ETS that the energy intensive industry and sectors subject to international competition have difficulty passing through any carbon costs. Other stakeholders generally welcome setting up criteria to determine the ability to pass through cost.

Innovation fund: Stakeholders support continuation of the general modalities of the NER300 programme and increasing the amount of allowances dedicated to the new fund, while also highlighting the need for some improvements. Industry stakeholders typically support modalities adapted to ensure they match their needs, including those of SMEs. The energy sector stakeholders argue that the current NER 300 programme contains several lessons on pitfalls in energy innovation demonstration policy, such as insufficient coordination and Member State commitment. Some academics raise concerns about a lack of available information on the decisions process and especially on lessons learnt concerning the current NER 300 programme.

Modernisation fund: Regarding the investments, some energy-intensive industry stakeholders argue that as a principle, private and public projects should be on an equal footing, and that industrial actors should also be eligible. The energy sectors highlight inefficiency and high administrative cost of complex funding systems, and hence the importance for investors of having simple structures. Some beneficiary Member States expressed preference for the main responsibility to ensure an effective and transparent management to be at the Member State level. In contrast, some other Member States support an important and strong role for the European Investment Bank (EIB) to play in managing the use of the fund within the constraints of available EIB resources.

Optional free allocation to the energy sector: Stakeholders tend to in principle support agreeing on common, general EU level criteria for the selection of projects. Should free allocation to the electricity sector be introduced, it should at least ensure that the support does not subsidise investments in inefficient power generation.

General evaluation: Many energy intensive industry stakeholders support the EU ETS as a resilient and flexible solution to achieve EU emissions reductions in a cost effective manner. However, strong concerns are raised about absence of an international agreement and the EU ETS not being linked to any similar system. Also stakeholders from the energy sector and public authorities see the objectives of the EU ETS as being in line with EU's climate policy objectives for 2020 and 2030.

¹² SME, business, incl. associations, including energy intensive sectors and energy sectors

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1.4. Subsidiarity

The EU ETS Directive exists and will continue post 2020. It is an EU policy instrument. A revision of the EU ETS can only be implemented through proposals by the Commission to amend the Directive.

Climate change is a trans-boundary problem. Therefore coordination of climate action at European level and, where possible, at global level is necessary and EU action is justified on grounds of subsidiarity. Articles 191 to 193 of the TFEU confirm and further specify EU competencies in the area of climate change.

Many of the policy options have an important internal market dimension and many of the required investments and infrastructures have an important European dimension. Therefore, the objectives can be better achieved by an EU framework for action. Delegating the legislative powers to Member States would lead to partitioning, an uneven playing field and decreased efficiency.

1.5. Scrutiny by the Commission Impact Assessment Board

The Impact Assessment Board of the European Commission assessed a draft version of the present impact assessment and issued its opinion on X May 2015. [The Impact Assessment Board made several recommendations and, in the light of the latter, the final impact assessment report:

- Clarifies...
- Describes...]

2. POLICY CONTEXT

Building on the Commission Communication on the 2030 framework and the accompanying Impact Assessment, the European Council agreed on the 2030 framework in October 2014¹³, including a binding domestic reduction of GHG emissions of at least 40% in 2030 as compared to 1990. This has also been endorsed by the European Parliament¹⁴. To meet this target, the European Council also specifically agreed that the emissions in the EU ETS should be reduced, compared to 2005, by 43%. In addition, the European Council agreed on an EU target of at least 27% for the share of renewable energy consumed in the EU in 2030 and an indicative target at the EU level of at least 27% for improving energy efficiency. As a result of the measures needed to meet the increased ambition decided in the 2030 framework and the [proposed] Market Stability Reserve¹⁵, the EU ETS will deliver a meaningful price on carbon emissions and stimulate cost-efficient greenhouse gas emission reductions. A reformed EU ETS will play an important role in setting the right investment signals.

Furthermore, the European Council gave strategic guidance on several issues regarding the implementation of the emission reduction target, namely free allocation to industry, the establishment of a modernisation and an innovation fund, optional free allocation of allowances to modernise electricity generation in some Member States. Similarly, the European Parliament also highlighted the necessity of a revised and well-functioning ETS, including maintaining provisions regarding sectors deemed to be at risk of carbon leakage. The guidance is being translated into a legislative proposal to revise the EU ETS for the period post-2020. This IA focusses on choices to be taken to establish these rules for the

¹³ http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145397.pdf

¹⁴ European Parliament resolution on a 2030 framework for climate and energy policies (2013/2135(INI))

¹⁵ COM(2014) 20 final

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period after 2020 at the level of the Directive. It does not analyse detailed methodological options to establish the technical measures to implement these rules, which are to follow in due course.

The revision of the EU ETS also constitutes an important part of the work on the achievement of a resilient Energy Union¹⁶ with a forward looking climate change policy at its core. The goal of the Energy Union is to give EU consumers – households and businesses – secure, sustainable, competitive and affordable energy.

Together with the 2020 targets for renewable energy and energy savings, the target for greenhouse gas emissions has played a key role in driving this progress and sustaining the employment of more than 4.2 million people in various eco-industries¹⁷, with continuous growth during the crisis. The EU climate policy will continue contributing to a major shift away from expenditure on fuels towards innovative equipment with high added value that will stimulate investments for innovative products and services, create jobs and growth and improve the Union's trade balance¹⁸.

3. GENERAL EVALUATION AND LESSONS LEARNT

As the environmental outcome in the EU ETS is guaranteed by the cap, the EU is currently well on track to meet the 2020 targets for greenhouse gas emissions reduction for the sectors covered by the EU ETS, as well as for the EU as a whole. This means that in 2020, greenhouse gas emissions from the sectors covered by the EU ETS will be 21% lower than in 2005.

In periods when the carbon price was likely to increase, studies have also confirmed other impacts of the EU ETS through a broad range of mechanisms – notably via regulatory pressures that create incentives for cost-cutting, as well as via triggering attention, experimentation, learning and investment concerning low-carbon solutions outside business-as-usual for companies¹⁹. Studies show that due to the EU ETS a large proportion of firms pursued some measures to reduce GHG emissions and that CO₂ has now become part of the investment appraisal in power construction²⁰. However, at the start of the third trading period (2013-2020), the EU ETS was characterised by a large imbalance between supply and demand of allowances, resulting in a surplus of around 2 billion allowances that is expected to grow over the coming years to more than 2.6 billion allowances by 2020, and a correspondingly weak carbon price signal.

As a short term measure to mitigate the effects of the surplus it was decided to postpone (“back-load”) the auctioning of 900 million allowances in the early years of phase 3²¹. This was followed by a proposal for a long-term measure of establishing a Market Stability Reserve to make the auction supply of emission allowances more flexible and increase shock resilience. The reserve's architecture also captures changes in the demand of allowances due to renewables and improved energy efficiency and, if need be, adjusts the auction supply

¹⁶ COM(2015) 80 final

¹⁷ Eurostat data on the environmental good and services sector quoted in A policy framework for climate and energy in the period from 2020 to 2030 (COM(2014) 15 final)

¹⁸ Communication on A policy framework for climate and energy in the period from 2020 to 2030, COM(2014)15 final

¹⁹ Jon Birger Skjærseth and Per Ove Eikeland (eds), *Corporate Responses to EU Emissions Trading*, 2013

²⁰ E.g. literature review of studies in: Tim Laing et al, *Assessing the effectiveness of the EU Emissions Trading System*, 2013

²¹ Decision No 1359/2013 EU

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accordingly. Hence, the market stability reserve will, once fully functional, also strengthen the coherence between the EU ETS and energy efficiency and renewables policies, which also lead to lower emissions. The operation of the Market Stability Reserve is open-ended. It does not affect the total quantity of allowances (the cap).

According to some energy-intensive industry stakeholders, the EU ETS corresponded well to the EU climate objectives, namely to cost-effectively reduce GHG emissions, in its initial architecture. However, they argue that after back-loading and the [proposed] Market Stability Reserve²², the EU ETS sectors will be facing stricter GHG-target compared to EU climate policy objectives²³. In contrast, some other business stakeholders, including from renewables sector²⁴, believe that the EU ETS is currently giving neither a long-term price signal that impacts investment decisions nor a short-term signal for operating decisions. Hence, they advocate structural measures, such as earlier implementation of the Market Stability Reserve and additional measures to address the surplus in order to fix the EU ETS in the short and mid-term.

Some stakeholders responded that the EU ETS does not correspond to the EU's climate policy objectives, because no country in the world has accepted the EU ETS concept²⁵. However, it should be stressed that there are actually 17 emission trading systems in operation across four continents, accounting for 40% of global GDP²⁶.

A study aiming at evaluating the existing ETS Directive is currently being carried out and analyses the EU ETS in terms of relevance, effectiveness, efficiency, EU-added value and coherence with other Union policies. The preliminary findings²⁷ on the EU ETS in general indicate that despite criticism of details the EU ETS as a policy tool, which combines environmental regulation with a market instrument is working in practice and delivering on its targets. It is highly relevant for meeting the EU's climate targets, as it represents a cost-effective way for emission reductions. Emissions in the covered sectors have decreased steadily, and even though not all emission reductions can be attributed to the ETS alone, evidence has been found that the system does contribute effectively to emission reductions. At the same time, the study observes that the EU ETS has found its way to the board rooms of companies and thus facilitates the internalisation of CO₂ costs. The ETS contributes to investments decisions, even though with the current low carbon price, they are often included in the general envelope of energy costs. Smaller improvements in terms of GHG efficiency have become regular practice, but larger investments in GHG efficiency still remain the exception. Moreover, the EU ETS has a clear EU-added value since different ETS or other climate policies at Member State level would lead to a fragmented and costly situation for the regulated entities as well as different ambition levels and carbon prices throughout the EU. The EU ETS with an EU-wide carbon price and its harmonised infrastructure takes advantages of the synergies that EU level action can provide. Finally, in terms of coherence, the study observes that renewables and energy efficiency policies both overlap with the EU ETS and may affect the cost of achieving the ETS' target, but both policies fully support the environmental effectiveness of the EU ETS as they do not affect the cap. In terms of

²² Proposal for a Decision of the European Parliament and of the Council concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and amending Directive 2003/87/EC – COM(2014) 20

²³ E.g. CEPI response to the consultation

²⁴ E.g. EWEA response to the consultation

²⁵ Central Europe Energy Partners response to the consultation

²⁶ International Carbon Action Partnership, Status Report 2015: <https://icapcarbonaction.com/status-report-2015>

²⁷ At the time of writing, the final evaluation report has not yet been received.

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coherence with international climate policy, the study also finds that the EU ETS performs well. It is widely used as a model for emissions trading systems around the world, benefitting from the EU's learning effects.

In terms of the regulatory framework, the EU ETS was largely unchanged during the first eight years of its operation. However, with the start of phase 3 a significant number of architectural and regulatory changes took effect.

The following fundamental changes have been applied:

- an EU-wide cap on allowances, as opposed to individual Member State caps, decreasing by 1.74% annually, up to and beyond 2020, providing much greater regulatory predictability and stability;
- auctioning as the default system of allocation in phase 3, including no free allocation in respect of electricity production;
- harmonised rules for transitional free allocation, based on performance benchmarks established prior to phase 3;
- stricter rules on the type and quantity of international credits that are allowed for use in phase 3 of the EU ETS;
- replacement of national electronic registries by a single Union registry;
- Furthermore with the latest revision of the financial markets legislation²⁸ emission allowances were classified as a financial instrument in 2014.

The revised EU ETS Directive can be considered as fairly recent legislation. However, it is already clear that the present institutional framework with auctioning and EU-wide harmonised free allocation rules constitutes a significant improvement compared to the previous trading periods that still had national allocations plans. Specific evaluation and lessons learnt on the different aspects of the EU ETS infrastructure are presented in the corresponding chapters.

A comprehensive evaluation summary report on individual aspects can be found in Annex 4.

4. GENERAL PROBLEM DEFINITION

General problem analysis has been done in the Impact Assessment on the 2030 climate and energy framework. The binding EU target of an at least 40% domestic reduction by 2030 compared to 1990 should be delivered collectively by the EU in the most cost-effective manner possible, with the reductions in the ETS sectors amounting to 43% by 2030 compared to 2005 and by 30% in the non-ETS sector. Setting a cap for EU ETS at this emission level would require a change in the linear reduction factor from 2021 onwards.

At the same time, while current policies to prevent carbon leakage such as the allocation of free allowances in the ETS have been successful, these do not automatically apply beyond 2020. In its strategic guidance the European Council has been clear that free allocation should not expire. Existing measures should continue after 2020 to prevent the risk of carbon leakage due to climate policy, as long as no comparable efforts are undertaken in other major economies, with the objective of providing appropriate levels of support for sectors at risk of losing international competitiveness.

²⁸ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse (market abuse regulation)

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Furthermore, the Impact Assessment of the 2030 climate and energy framework indicated that significant investments will be needed in EU in the period through 2030 related to energy system modernisation and to reach the proposed objectives of the 2030 climate and energy framework. In this context, European Council has also given clear guidance that Member States with a GDP per capita below 60% of the EU average may opt to continue giving free allowances to modernise the energy sector up to 2030. In addition, a new reserve of 2% of the total quantity of allowances should be set aside to address particularly high additional investment needs in these Member States (so-called Modernisation Fund).

Last but not least, European Union will have to step up its efforts on research and innovation policy to support the post-2020 climate and energy framework. The European Council conclusions provide clear guidance that the existing NER 300 facility should be renewed, including for CCS and renewables, with the scope extended to low carbon innovation in industrial sectors and the initial endowment increased to 400 million allowances (so-called Innovation Fund).

The above-mentioned elements are the aspects for which options will be developed in this Impact Assessment in chapters 7 and 8, where more comprehensive specific problem definitions can be found. The required revision of the ETS Directive should also build on the lessons learnt on other aspects of the system, and an analysis on how the EU ETS has been performing should feed into the process of considering its future regulatory framework. While the current architecture of the EU ETS is relatively recent, based on experience gathered, certain additional technical changes to the current set of rules in the Directive should also be considered for the period post-2020. Options for these are developed in Annex 5.

In contrast, the European Council conclusions already foresee certain methodological elements for the implementation of the EU's GHG emission reduction target, for which no options were hence developed. These include the change in the annual linear reduction factor reducing the EU ETS cap from 2021 onwards and the share of allowances to be auctioned outlined in chapter 6.

This impact assessment explicitly does not address issues related to aviation emissions as covered under the ETS. As indicated in Regulation (EU) No 421/2014, the Commission shall regularly, and at least once a year, inform the European Parliament and the Council of the progress of the International Civil Aviation Organization negotiations as well as of its efforts to promote the international acceptance of market-based mechanisms among third countries. Following the 2016 ICAO Assembly, the Commission shall report to the European Parliament and to the Council on actions to implement an international agreement on a global market-based measure from 2020, that will reduce greenhouse gas emissions from aviation in a non-discriminatory manner.

5. OBJECTIVES

5.1. General policy objectives

The general objective of climate action policy, and of EU ETS as a key instrument, is to contribute to achieving the EU climate objective of limiting global average temperature increase to not more than 2 degrees Celsius above pre-industrial level. EU action against climate change was translated into a greenhouse gas reduction target of 20% compared to 2005 as adopted in the 2020 Climate and Energy Package and included in the headline targets of the Europe 2020 Strategy. For the period 2020-2030, the greenhouse gas emission target of

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at least 40% domestic reductions compared to 2005 by 2030, ensures the EU is on the path of low-carbon transition to emission reductions of 80-95% by 2050.

5.2. Specific policy objective

The specific policy objective is to align the EU ETS architecture with the 2030 emission reduction commitment and refine and improve the EU ETS post-2020 framework in the light of the lessons learnt in a context where:

- Fully comparable climate policy measures may not yet be undertaken by all other major economies;
- Reinforced research, development and innovation efforts should take place in order to maintain Europe's industrial base and competence, and support the 2030 climate and energy framework as well as the long-term goal of low-carbon economy;
- Reinforced investment efforts should take place in order to modernise the energy system, and support the 2030 climate and energy framework;
- Experience gathered during the first years of phase 3 suggests that there is still potential to reinforce efficiency of the system.

5.3. Consistency with other policies and objectives

As outlined in the 2030 Impact Assessment, the aim of the 2030 framework was to set consistent climate and energy targets up to 2030. A well-functioning EU ETS is a key instrument to achieve the GHG reduction target and cornerstone of Europe's climate policy. In line with the Energy Union strategy, through its price formation at EU level the EU ETS reinforces the functioning of the internal energy market and stimulates the uptake of renewables and other low-carbon and energy-efficient technologies. In general, consistency of a revised EU ETS with any related policies is addressed in this impact assessment when specific issues are discussed, such as a forward-looking approach to carbon capture and storage for the power and industrial sectors and the assessed innovation fund.

There is a need to continue to drive progress towards a low-carbon economy, as this ensures competitive and affordable energy for all consumers, creates new opportunities for growth and jobs and provides greater security of energy supplies and reduced import dependence for the Union as a whole. This initiative is coherent with these objectives. The impact assessment analyses the implementation of the EU ETS, including the modalities of supplementary low-carbon funding mechanisms within the EU ETS. In terms of international competitiveness, the analyses of energy prices and costs have shown that there has been little impact on the EU's relative competitiveness which could be directly attributed to the carbon price under the ETS in the context of energy prices, although in the future the carbon price is assumed to be reflected in electricity retail prices²⁹. However, as long as there are no comparable efforts undertaken in other major economies, measures (including a system of free allocation of allowances) are appropriate after 2020 in order to ensure the competitiveness of Europe's energy-intensive industries.

²⁹ COM(2014) 21; SWD(2014) 19; SWD(2014) 20

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6. IMPLEMENTATION OF THE EU'S GHG EMISSION REDUCTION TARGET

6.1. Linear reduction factor

The outcome of the ETS in terms of emissions is determined by its cap on the total number of allowances. According to the ETS Directive and the present target of -21% by 2020 compared to 2005, the ETS cap for stationary sources declines linearly, by an annual amount equal to 1.74% of the average annual allocation during phase 2 (2008-2012), referred to as the linear reduction factor. Setting a cap at the 2030 emission level of -43% compared to 2005 requires a change in the linear reduction factor from 2021 onwards. This change is also needed in line with the EU's longer-term GHG emission reductions objectives. According to the analysis in the impact assessment accompanying the 2030 framework³⁰, a revised linear reduction factor of 2.2% from 2021 onwards is required to be coherent with a 2030 cap equal to 43% reductions. The change from 1.74% to 2.2% reduces the supply of allowances by around 556 million in 2021-2030.

The European Parliament has called for legislation to be proposed at the earliest appropriate date with a view to adjusting the 1.74% annual linear reduction requirement so as to meet the requirements of the 2050 emission reduction target. The European Council also explicitly endorsed the linear reduction factor of 2.2%. As the Commission proposal for the ETS Revision has to achieve the objective of reductions in the ETS sectors of 43%, meeting the specific requirements of the European Council conclusions, no diverting policy options for the linear reduction factor post-2020 could be developed.

The impact assessment for the 2030 framework provides a comprehensive analysis of the impacts of emission reductions in the ETS of 43% by 2030 compared to 2005, and hence of the required linear reduction factor of 2.2%³¹.

Although the [proposed] Market Stability Reserve was not explicitly included in the modelling work for the impact assessment for the 2030 framework, it should be noted that in the analysis emission reductions were required to reach 40% GHG reductions in 2030 and 80% in 2050, and carbon prices were determined accordingly to achieve these emission reductions cost efficiently assuming rational behaviour³². In reality, however, businesses seem to base their abatement decisions on a shorter outlook for their industry than the 2030 reduction target would imply.³³ This is likely to mean that the current large supply-demand imbalance in the ETS reduces the incentives for low-carbon investment and thereby negatively affects the cost-efficiency of the system and of the final achievement of EU emission reduction goals. Hence, by simulating the achievement of the 40% target the model actually acts as capturing in a simplified way the expected impact of the Market Stability Reserve of addressing the surplus, increasing the confidence of market participants, and in turn delivering a meaningful price on carbon emissions and ensuring the emissions evolve in line with the cap by stimulating cost-efficient greenhouse gas emission reductions.

³⁰ SWD(2014) 15 final

³¹ The relevant scenario that achieves this is the scenario with 40% GHG reductions and moderate energy efficiency and renewables policies up to 2030.

³² The PRIMES model simulates emission reductions in ETS sectors as a response to current and future ETS prices. Furthermore the model assumes perfect foresight of the ETS carbon price progression in the period 2020-50, allowing as such sufficient investor confidence in the carbon market to make long term optimal investment decisions.

³³ Luca Taschini and Corina Comendant. Report on cost-containment mechanisms and market oversight, 2012: http://entracte-project.eu/uploads/media/ENTRACTE_Report_EU-ETS_Reform_and_Expansion.pdf

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Concerning changes in the underlying assumptions in the work for the impact assessment for the 2030 framework, notably the recently lower oil prices, this price drop is not expected to lead to any major changes in the modelling results, even if it was sustained. It has had no major impact on the carbon price because of the reduced supply due to back-loading and the increasing expectation of the market stability reserve being established. According to the International Energy Agency, the recent developments have made non-OPEC production more responsive to price swings than previously, which would likely set the stage for a relatively swift recovery³⁴.

6.2. Auction share

In phase 2 (2008-2012), the overall cap that limits the amount of emissions and thereby sets the ambition level of the ETS was equal to the sum of national caps determined by the Member States in their national allocation plans (NAPs). These national caps translated into different allocations at sector and installation level between the Member States. Allocating allowances on the basis of historical emissions (grandfathering) was the general rule, the auctioning of allowances the exception leading to non-optimal investment and undesired distributional effects. As part of the EU's climate and energy package for 2020 it was thus agreed that as of 2013 a single EU-wide cap would be set and that auctioning would become the rule with transitional free allocation of allowances at declining levels.

For the EU-wide total cap, the ETS Directive contained rules, timing and procedures to collect relevant data from the Member States. In brief, the total cap was based on the quantity of allowances issued by Member States in phase 2, adjusted to take into account the extended scope of the EU ETS as of 2013. It was published in September 2013³⁵ as being 2.084 billion allowances, annually decreasing by the linear reduction factor.

The total cap is divided into a part that is made available to installations for free and a part that is auctioned. While the rule is that everything that is not allocated for free is auctioned and the volume of allowances auctioned increases over time, the maximum amount that is for free allocation is currently a fixed share of the total cap³⁶. Setting a maximum to the free allocation constitutes a backstop to ensure long term environmental integrity of the system, effectively implementing the polluter-pays-principle while recognising the need for maintaining the international competitiveness of industrial sectors exposed to the risk of carbon leakage.

The maximum amount for free allocation was also determined on the basis of rules, procedures and timing laid down in Article 10a(5) the ETS Directive. Relevant data was collected from the Member States mainly relating to the industry's share in the total emissions covered by the ETS versus the share of emissions generated by the power sector. This accounts for the fact that the power generating sector has to satisfy its demand for allowances entirely through auctions or on the secondary market. In 2013, the maximum amount available for free was around 809 million allowances³⁷. The determination of the maximum amount for free has been a lengthy process, in particular due to the amount and nature of the data that needed to be collected. The wider public generally perceived the relevant procedures complex and not sufficiently transparent. Over the period from 2013 to 2020, free allocation

³⁴ IEA. Medium-Term Oil Market Report 2015:

<http://www.iea.org/newsroomandevents/pressreleases/2015/february/a-business-as-unusual-outlook-for-oil-in-the-medium-term.html>

³⁵ Commission Decision 2013/448/EU

³⁶ see Article 10a(5) of Directive 2003/87/EC

³⁷ Commission Decision 2013/448/EU

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is provided on the basis of EU-wide harmonised rules and product benchmarks. Because the aggregate amount of gross free allocation calculated by Member States on the basis of these rules exceeded the maximum amount of free allocation available to industry, the allocation for all installations over the period up to 2020 is reduced by the same proportion through the application of the cross-sectoral correction factor (Article 10a(5) of the ETS Directive).

As an exception to the general rule that electricity generators should not receive any free allocation, additional allocation is provided in case these installations produce heat. Since this allocation benefits the power generation sector, this free allocation is not subject to the maximum amount for free allocation, but the quantity of allowances auctioned by Member States is reduced accordingly.

Additional free allocation is made available from the new entrant's reserve for newly built plants or in case installations extend their capacity by more than 10%. The new entrants' reserve is constituted from 5% of the total cap, amounting to a total of around 780 million allowances for the period 2013 to 2020. 300 million of the allowances in the new entrants' reserve have, however, been earmarked and used to support carbon capture and storage (CCS) or innovative renewable energy projects under the NER300 facility.

Since, according to the Directive, everything that is not allocated for free is auctioned, some allowances are foreseen to be added to the auction volume at the end of the third trading period in 2020. In particular allowances that remain unused in the new entrants' reserve and allowances that are not handed out to installations because they stop operations (closures) or reduce their production (partial cessations) will be auctioned at the end of the period.³⁸

Certain Member States have the option to provide free allocation to the power sector in return for investments modernising power generation. This option constitutes a derogation from the general principle that no free allowances are made available to installations generating electricity. However, considering the investment needs in this sector in certain Member States, the ETS Directive foresees that allowances may be given for free provided that investments of an amount corresponding to the value of free allowances into the modernisation of the sector are made. While this is qualified as free allocation, the amount of allowances given to the power companies are provided from the Member States' auction volumes if, and to the extent of which, they make use of this option. If not used to the full extent, the allowances are auctioned on behalf of the Member State concerned.

³⁸ In the context of the legislative discussions on the Market Stability Reserve, it is currently being discussed whether these allowances should rather be transferred into the Market Stability Reserve so as to avoid that auctioning them would create another supply peak adversely affecting the market balance in 2020. A final decision has not yet been taken in this regard.

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Figure 1: Structure of the total quantity of allowances in phase 3

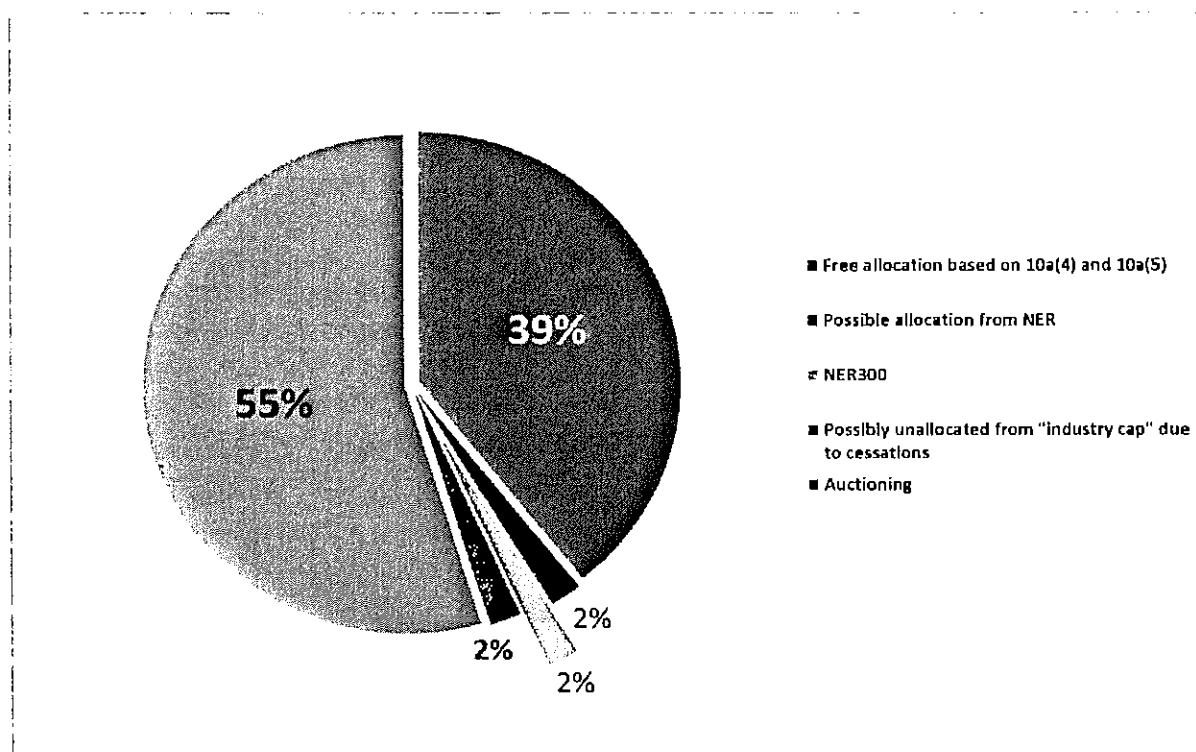


Figure 1 illustrates the auction share over phase 3 (2013-2020). It translates the starting point of the Directive, according to which, in principle, all allowances should be auctioned, but free allocation is granted transitionally. Over phase 3, 39% of the total quantity available will be allocated for free to industry and electricity generating installations for the heat they produce. This share of free allocation will be further increased due to allocations to new entrants until 2020. Today, it is not yet known how much of the NER will be used in the coming years. However, up until January 2015, 247 installations have received an allocation from the NER, which will amount to 69.6 million allowances to be allocated from the NER by 2020, representing 14% of the total of 480.2 million allowances. Based on these trends, it is thus expected that not more than 2% of the cap may additionally be allocated for free from the NER. In total, the free allocation over phase 3 is thus expected to be around 41%.

To the same extent that the allocations from the NER are not yet known today, it will also only be known at the end of the period, how many installations that currently receive an allocation will stop operations or reduce their capacity or production. Where installations no longer receive allowances, the legal default is that these allowances will be auctioned on behalf of the Member States. In respect of 2013 and 2014, the allocations to around 1100 installations were revised downwards by 85.7 million allowances. In general, the uptake from the NER and the return from closures and reductions are expected to be within the same order of magnitude³⁹, so that another 2% are expected to remain within the auction share.

Another 2% of the total cap is used to fund the NER300 programme for CCS and innovative renewables projects. As explained above, free allowances provided to the power sector in

³⁹ Returns because of partial cessations and closures and additional allocations from the new entrants' reserve depend on the economic development over the coming years. In case of more returns of allowances due to closures, partial cessations and capacity reductions than requests for new entrants' allocations, the auction share would increase; in the opposite case, i.e. lower new entrants' allocations than reductions, it would lower. As a working assumption, it is considered that they balance out over phase 3.

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return for investments modernising power generation are deducted or added to the auction share from the relevant Member State and, as such, remain part of the auctioned volumes even though they are given for free to the energy sector⁴⁰. Taking into account these different elements, the average auction share over phase 3 amounts to 57%.

For phase 4, these elements should not fundamentally change. As was the case for the NER300 programme, 400 million allowances should be made available for innovation support. Free allocation provided to the power sector in return for investments modernising power generation should be continued and allowances used for this purpose would remain part of the auction volumes which individual Member States can decide to allocate for free in return for investments. In line with the starting point in the Directive, that in principle all allowances should be auctioned, allowances that according to the European Council should be auctioned for a new fund for the modernisation of the energy systems in certain low-income Member States are part of the auction share in phase 4⁴¹.

The "backloading", i.e. postponing auction volumes into the latter part of phase 3, and the functioning of the proposed Market Stability Reserve to address the structural surplus of allowances in the EU carbon market both relate to the amount of allowances auctioned by Member States. For example, in case of the Market Stability Reserve, auction volumes will be reduced when allowances are transferred into the reserve and increased at the time allowances are released from the reserve. Both these mechanisms have a neutral effect on the overall auction share.⁴²

The European Council agreed that the share of allowances to be auctioned under the EU ETS post-2020 should not be reduced⁴³. This principle of not reducing the auction share was an important and integral part of the agreement to which Member States attach particular importance. Any change to the auction share would have distributional implications and adversely affect the balance of the European Council agreement⁴⁴.

⁴⁰ A theoretical total of around 680 million allowances may be allocated for free by the 8 Member States that have chosen to make use of the option in the period 2013-2020. For most of those Member States, actual allocations have, however, so far been below the annual maximum (see status tables at: http://ec.europa.eu/clima/policies/ets/cap/auctioning/documentation_en.htm).

⁴¹ To note that the European Council conclusions provide that the "allowances from the reserve will be auctioned according to the same principles and modalities as for other allowances". See EUCO 169/14 European Council (23 and 24 October 2014) – Conclusions, point 2.7.

⁴² The proposal to establish a Market Stability Reserve has not yet been adopted by the co-legislators. One option that is currently discussed is a start of the Market Stability Reserve earlier than 2021. Even if such an earlier start is agreed by the co-legislators and allowances are transferred into the Market Stability Reserve in phase 3, the allowances in the reserve would count towards the auction share. The proposal foresees that allowances in the reserve will be banked, just as allowances held, for example, on operator holding accounts at the end of each phase. The banking operation converts "old" phase allowances into "new" phase allowances, but it does not change their period of origin. This is in particular demonstrated by the fact that allowances banked at the end of phase 2 are not counted towards the auction share or share of free allocation in phase 3. That these allowances have been issued in phase 2 has already been accounted for when the cap was set in the beginning of phase 3 and the same principle would apply to allowances transferred into the Market Stability Reserve in phase 3 if so decided by the co-legislators.

⁴³ For more information on the impact of auctioning or free allocation in respect of a 40% GHG emission reduction target by 2030, see the Impact Assessment as regards the policy framework for climate and energy in the period from 2020-2030: SWD(2014) 15 final

⁴⁴ For example, 10% of the EU ETS allowances to be auctioned by the Member States will be redistributed to the benefit the low-income Member States and only if the overall auction share is known the Member States concerned have clarity on how much this would be. The same applies to Member States that make use of the transitional free allocation for the modernisation of the power sector (see section XX), who may hand out for

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The high complexity at the beginning of phase 3 as regards determining the amounts auctioned and allocated for free, respectively, as well as regards the procedures by which these have been determined will not have to be repeated since the system builds on phase 3. The shares of auctioned allowances between Member States are already set in the Directive and, to meet the specific requirement of the European Council conclusions, it is appropriate to provide for the auction share expressed as a percentage figure in the legislation. The environmental integrity of the system guaranteed by the cap would remain entirely preserved, while providing a percentage figure for the auction share in the legislation would have considerable positive impacts on the functioning of the carbon market. It would enhance planning certainty as regards investment decisions and transparency for market participants inside and outside the system as well as for the wider public. It would render the system simpler, more transparent, more easily understandable and thus positively impact the confidence in the EU ETS.

7. FREE ALLOCATION AND ADDRESSING THE RISK OF CARBON LEAKAGE

7.1. Problem definition

Free allocation of allowances to industry is designed to address competitiveness issues and the potential risk of carbon leakage (increase in greenhouse gas emissions in third countries where industry is not subject to comparable carbon constraints), as long as comparable climate policy measures are not undertaken by other major economies. This gives the justification to deviate from the guiding principles of the "polluter pays principle" and "internalisation of external cost", whereby the costs of measures to deal with pollution should be borne by the polluter who causes the pollution and, in order to ensure efficient markets, all costs associated with the protection of the environment should be included in the companies' production costs⁴⁵.

In the first two phases of the ETS (2005-2007 and 2008-2012), most allowances were given to ETS installations free of charge, and the largest share was allocated based on historical emissions. Allocation was decided nationally, and the use of auctioning was limited.

The ETS Directive, as revised for 2013 onwards, harmonised the approach for allocation of allowances across the EU to ensure a level-playing field across the internal market and address potential market distortion concerns.

From 2013, the amount of free allocation⁴⁶ is determined mainly based on product-specific benchmarks and historical production data. Industrial sectors which are 'deemed to be exposed to a significant risk of carbon leakage' receive a significantly higher share of free allowances⁴⁷. In addition to free allocation, companies purchase additional allowances at the market to cover their total emissions, or may use the spare allowances unused in earlier years. Within limits, they can also buy credits from certain types of approved emission-saving projects around the world. The ETS system is therefore flexible in allowing companies to

free after 2020 up to 40% of the allowances allocated for auctioning to them and needed to know what the auction share will be to determine this maximum.

⁴⁵ Commission Staff Working Document accompanying document to the Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system, Impact Assessment, SEC(2008)52

⁴⁶ Commission Decision 2011/278/EU of 27 April 2011 sets out the rules for free allocation, including the benchmarks.

⁴⁷ Sectors deemed to be exposed to a significant risk of carbon leakage receive 100% of the amount determined based on the benchmark-based methodology. Free allocation for other sectors is decreasing from 80% in 2013 to 30% in 2020.

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choose the most cost-effective options to address their emissions, either in purchasing the additional allowances or credits on the market, or opting for less-carbon intensive technologies.

In line with the EU's climate policy to reduce GHG emissions ensuring cost-effective contribution by all sectors, the ETS cap (maximum amount of allowances available) decreases gradually but steadily over time. The total amount of allowances available for free allocation to industry is a share of the total cap and therefore decreases correspondingly. While Article 191(2) of the EU Treaty states that Union policy shall be based on the principle that the polluter should pay, and hence the co-legislators decided in 2008 that there should be transition to full auctioning over time, avoiding carbon leakage is a justification to postpone this transition.

By legal default the ETS Directive as it stands would result in a significant decrease of free allocation after 2020: all industries would receive free allocation corresponding to 30% of the amount determined based on the benchmarks, as higher allocation for sectors deemed to be exposed to the risk of carbon leakage ends⁴⁸.

Industries can also be compensated by Member States for some indirect carbon costs, i.e. higher electricity prices due to the impact of EU ETS. Currently, this is done through compensation at national level under the relevant State Aid Guidelines⁴⁹.

Concerning the future design of the ETS, the European Council has agreed that, as long as no comparable efforts are undertaken in other major economies, free allocation to industry should continue after 2020 with the objective of providing appropriate levels of support for sectors at risk of losing international competitiveness. Considering that the amount of free allowances will continue to be limited and declining, in line with the necessary emission reductions, the future system needs to be appropriate and targeted. At the same time, the system needs to ensure that incentives for industry to innovate will be fully preserved and windfall profits avoided, without reducing the share of allowances to be auctioned. **The problem to be addressed regarding the future rules for free allocation is how to optimally allocate the limited and declining number of free allowances available.**

7.1.1. Underlying drivers of the problem

The overall aim of the free allocation system is to address the risk of carbon leakage in the most efficient and effective way possible, with the limited and declining amount of allowances that are available for this purpose. Certain elements of the harmonised benchmark-based system introduced in 2013 end in 2020.

Since the European Council decided that a similar system as the current one should be in place also during the period 2021 to 2030, the problem is how to design the new system in the most fair and efficient way, taking into account the limited⁵⁰ but useful experience that is so far available.

The starting point for the analysis is therefore the existing system. Some general observations can be made: overall, the harmonised free allocation system in phase 3 (2013-2020) is

⁴⁸ See Article 10a(12) of the ETS Directive

⁴⁹ Guidelines on certain State aid measures in the context of the greenhouse gas emission allowance trading scheme post-2012 (2012/C 158/04)

⁵⁰ The benchmark-based allocation system has been functioning for little more two years at the time this assessment is prepared.

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functioning well⁵¹ and the risk of carbon leakage seems to be properly addressed⁵², while emission reduction incentives are also preserved⁵³.

However, while the total amount of allowances available for free allocation was higher than the emissions from activities eligible for free allocation in 2013, the gross free allocation⁵⁴ exceeded the available amount of free allowances already in that year. As a consequence, and as foreseen in the ETS Directive, a uniform cross-sectoral correction factor was triggered⁵⁵. While this approach was effective in ensuring the compliance with the overall allocation limit, it did not differentiate among sectors: a uniform correction factor does not account for differences in terms of ability to decarbonise over time, exposure to the risk of carbon leakage, the pass through of costs in product prices, etc.

The correction factor has been subject to strong criticism by stakeholders for these reasons, as due to its application the system did not automatically guarantee that the most efficient installations in each sector do not face undue direct carbon costs, even when the total amount of allowances distributed for free exceeded the estimated emissions from activities eligible for free allocation.

Several design features in the current free allocation system resulted in application of the correction factor.

One feature is that, based on criteria currently defined in the ETS Directive⁵⁶, sectors responsible for more than 97% of industrial emissions under the ETS are covered by the most generous allocation rules (100% of the benchmark-based quantity) as they are 'deemed to be exposed to a significant risk of carbon leakage' (i.e. are on the 'carbon leakage list'). The system is implicitly based on the assumption that carbon costs are fully borne by the sectors on the carbon leakage list, i.e. carbon costs are not even partially passed on in product prices.

Another feature is that the current implementing rules allowed operators to choose between two historical production baseline periods for determination of their free allocation, which led to a significantly higher demand for free allocation than would have been the case if the same baseline period was used for all. Actual production levels in 2013 and 2014 were significantly lower in certain sectors compared to the baseline production, while such lower production levels are not fully reflected in lower amounts of free allocation under the current allocation rules.

⁵¹ OECD's study finds that the EU ETS has stimulated substantial emissions abatement (up to 28% compared to business-as-usual), while, at the same time, not causing the disadvantages for the competitive position of the EU ETS firms. For details, please refer to Arlinghaus, J. (2015), "Impacts of Carbon Prices on Indicators of Competitiveness: A Review of Empirical Findings", OECD Environment Working Papers, No. 87, OECD Publishing, Paris.

⁵² See *inter alia* Ecorys' Carbon Leakage Evidence Project: Factsheets for selected sectors, September 2013. CE Delft study Carbon leakage and the future of the EU ETS market (April 2013) implies the abundance of carbon leakage protection, noting that different assumptions regarding carbon price, supply and trade conditions would significantly reduce the number of sectors eligible for additional free allowances. At the same time, this can also be seen as the result of surplus of allowances coming from previous phases as well as activity levels for many sectors still below pre-crisis levels. The situation needs therefore to be continually monitored.

⁵³ See Stakeholder consultation analysis (Annex 1. Impact Assessment. Carbon leakage list 2015-2019), as over 90% of respondents confirmed that free allocation ensures the incentives to innovate for reducing emissions. Furthermore, the EU is on track to meet its Kyoto and EU2020 GHG emission reduction targets (COM(2014) 689).

⁵⁴ 'Gross' free allocation is the amount of free allocation determined by applying the benchmark values to the production data, before the application of any further factors, such as carbon leakage factor and the correction factor.

⁵⁵ Commission Decision 2013/448/EU.

⁵⁶ See Article 10a(15-17) of the ETS Directive

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Benchmarks are another important element in the allocation formula, which determine the allocation per tonne of product. The starting point for the determination of the benchmark values in phase 3 was the average emission performance of the 10% most efficient installations in a sector in the years 2007-08. Technological progress between 2007-08 and the year of allocation is not reflected in the formula to calculate allocation and thereby erodes gradually over time the initial ambition level of the benchmark values.

Since the correction factor is a less efficient way of directing free allowances to those sectors most exposed to the risk of carbon leakage, an objective of the ETS Directive revision should be to create a more focused and fair system, resulting in a reduced likelihood of triggering a significant correction factor post-2020. Aiming to retain predictability for companies covered by the system, this goal should be achieved while maintaining the basic ETS architecture, only modifying some design elements (benchmarks, production levels, the reflection of cost-pass through abilities, etc.).

7.2. Operational policy objectives

As mentioned above, the overall objective of the free allocation system is to address the risk of carbon leakage by providing appropriate levels of support to sectors at risk of losing international competitiveness, as long as no comparable efforts are undertaken in other major economies. In line with the European Council Conclusions of October 2014⁵⁷, this general objective is operationalized in the following operational objectives:

- Reflect technological progress in industry sectors;
- Fully preserve incentives for industry to innovate;
- Most efficient installations do not face undue carbon costs leading to carbon leakage;
- Better alignment with production levels;
- No increased administrative complexity;
- Avoid windfall profits.

The options will be screened preliminarily for the effectiveness, efficiency and feasibility in achieving the operational objectives. Not increasing administrative complexity reflects the efficiency and feasibility criteria, while all the other operational objectives relate to the effectiveness. Some operational objectives are particularly relevant for some aspects of the free allocation rules, but not for others, so when screening and comparing options, preference will be given to the most relevant operational objective(s). As a result of this analysis, the degree of fulfilling an objective is indicated with pluses and minuses.

7.3. Policy options for free allocation and other carbon leakage measures

For all the elements of the free allocation system (benchmarks, production levels, new entrant reserve, carbon leakage groups) and for the indirect cost compensation issue, lessons learned and options are presented below.

7.3.1. Benchmarks

7.3.1.1. Lessons learned from the current system in phase 3 (2013-2020)

A benchmark determines the quantity of free allocation in terms of allowances per tonne of product. For the harmonised system of free allocation of allowances, benchmarks were established on the basis of the principle of "one product = one benchmark", i.e. without

⁵⁷ EUCO 169/14 European Council (23 and 24 October 2014) – Conclusions.

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differentiation based on technology or fuel used, the size of an installation, or its geographical location. The impact assessment accompanying the ETS Directive revision in 2008 concluded that basing the benchmarks on capacity or inputs is less efficient than basing it on products, and that differentiating benchmarks according to Member States or to other geographical criteria inevitably distorts competition and is therefore not recommended.

The benchmarks are used to calculate the amount of free allocation per installation and were developed prior to the start of the third trading period based on 2007-08 data⁵⁸. Article 10a(1) of the ETS Directive stipulates that benchmarks should be developed for each sector and subsector, to the extent feasible. The implementation led to 52 product benchmarks⁵⁹ and two fall-back⁶⁰ benchmarks.

The benchmarking system is a fair and transparent allocation method that preserves incentives to innovate. Benchmarks are not meant to be a regulatory standard, but purely serve as a tool to calculate free allocation to installations.

It can be concluded that the general benchmarking approach with its basic requirements as specified by the Directive has proven feasible. It is a clear and transparent way of calculating the free allocation in a manner that rewards the most carbon efficient installations and thus providing the necessary incentives to reduce emissions, as intended. There is broad agreement that the system has worked well and there are no plausible alternatives achieving the same results in terms of environmental integrity, innovation incentives and addressing the risk of carbon leakage⁶¹. The majority of stakeholders support the continuation of the existing benchmarking principles, including basing benchmarks on the 10% of the best performing installations (for details, see Annex 8– stakeholder consultation analysis). Therefore, and also to ensure regulatory predictability, the European Council endorsed to maintain the benchmark-based approach and this issue is not subject to further assessment in this document⁶².

The European Council requested to regularly update the benchmarks. The question therefore is how to update the existing system to ensure that it is up to date and continues to provide allocation efficiently and preserves incentives to innovate, i.e. how to update the benchmarks with new values to take into account the technological development.

A product benchmark is based on a value reflecting the average greenhouse gas emission performance of the 10% best performing installations in the EU producing that product. The determination of benchmark values based on performance data was feasible for most

⁵⁸ See Commission Decision 2011/278/EU

⁵⁹ Most of the 52 product benchmarks are based on products (and not inputs) to maximise the incentive for GHG efficient production. Exceptions from this output-based approach have been applied to traded intermediate products (e.g. in the steel, paper and chemical industry) to ensure a level-playing field for integrated and disintegrated production facilities and different permitting practises in Member States.

⁶⁰ Allocation based on so-called fall-back approaches for processes not covered by a product benchmark: based on the heat benchmark, the fuel benchmark or process emissions. In Phase 3, about two thirds of the available allowances are allocated for free based on product benchmarks, and one third is allocated based on fall-back approaches.

⁶¹ The EU opted for the use of free allowances as measures to reduce the risk of carbon leakage. While there were some initiatives to implement a border tax mechanism to tackle the risk of carbon leakage, it is considered as a significantly less appropriate tool. Such border measures would be in potential conflict with World Trade Organization's rules, and UNFCCC principle of Common but Differentiated Responsibility (CDR). The risk of retaliation and trade conflicts with third countries should also be considered. In that context, EU's focus remains on implementation of current free allocation rules, as well as strengthened carbon leakage measures in Phase 4.

⁶² The 2008 ETS Directive impact assessment assessed this aspect in more detail

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benchmarks: most benchmark values are derived from real-life historical industrial production in 2007-08⁶³.

However, the consideration of most efficient techniques available etc. has been applied for 9 out of 52 benchmarks due to a lack of performance data available⁶⁴.

For processes where deriving a product benchmark was not feasible, but emissions eligible for free allocation occur, allowances are allocated on the basis of generic fall-back approaches. There is a hierarchy of the three fall-back approaches: (i) the heat benchmark is applicable for heat consumption processes where a measurable heat carrier is used⁶⁵; (ii) the fuel benchmark is applicable where non-measurable heat is consumed⁶⁶, and (iii) for process emissions, emission allowances are allocated on the basis of historical emissions⁶⁷, when not covered by a product benchmark. The heat and fuel benchmark values were derived based on the reference efficiency of a widely available fuel (natural gas), consumed in an efficient way⁶⁸.

An important lesson learnt is that the fact that benchmark values based on collected performance data are by definition achievable seems to make them more acceptable for the sectors concerned: none of the 43 product benchmark values based on actual performance data have been legally challenged, while one of the 9 product benchmark values based on alternative approaches is currently subject to a legal procedure⁶⁹. Calculating benchmark values based on collected performance data can also guarantee that they represent the same level of ambition for all sectors. Therefore, the use of alternative approaches should be minimised.

For a few products with rapidly decreasing emissions due to advancements in abatement technologies, the ever increasing time lag between the reference years of the benchmarks and the actual years of using benchmarks has led to significant surplus allocations.

The benchmark data collection in 2009-10 and the separate data collection for the national implementing measures in 2011 led to extra work for Member States, industry and the Commission. A single data collection exercise would better ensure consistency of benchmark determination and application and reduce the administrative burden. In addition, modified Monitoring, Reporting and Verification (MRV) rules could overcome the challenge of assigning emissions to individual products which occurred in a number of sectors (e.g. pulp and paper, ceramics) which often produce several products within one installation⁷⁰.

⁶³ The verified data used for setting the benchmarks was voluntarily submitted by the concerned industry sectors. This voluntary data collection with a high level of participation was carried out in 2009-2010 out prior to the determination of the free allocation to individual installations. Member States had to submit national implementation measures to determine the allocation for each installations in their territory by 30/09/2011 according to Article 11(1)

⁶⁴ For details please see Commission Decision 2011/278/EU

⁶⁵ In Phase 3 ca.22% of free allocation is based on the heat benchmark

⁶⁶ In Phase 3 ca.9% of free allocation is based on the fuel benchmark

⁶⁷ In Phase 3 ca.2% of free allocation (always combined with allocation based on either the heat or the fuel benchmark).

⁶⁸ While a pragmatic option, it could be regarded as second-best in terms of greenhouse gas efficiency, considering that the 10% most efficient fuel normally would be biomass.

⁶⁹ The steel industry challenged the value of the 'hot metal' benchmark, which is among the ones determined based on the most efficient techniques derived from the BREF documents since no data in compliance with the benchmarking methodology was available.

⁷⁰ In case operators would report activity data in line with the benchmark definitions, and emissions as broken down per benchmarked activities, it could facilitate the data collection for updating benchmark values

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7.3.1.2. Policy options for updating benchmark values for 2021-30

The benchmark values need to be updated to reflect the recent technological progress, otherwise by 2030 they would be based on data more than two decades old. Updating benchmark values is important for retaining the economic incentive for further emission reductions, thereby supporting the transition to more carbon- and fuel-efficient production, and also for a more targeted allocation where the need to apply a cross-sectoral correction factor is avoided or minimised.

'Baseline A': Using existing benchmark values. No update.

'Baseline B': Recalculating benchmark values based on new data: benchmarks are updated once before 2021 based on actual data reported by operators on a mandatory basis. Benchmarks are kept constant thereafter (2021-30).

Option 1. Reducing all benchmark values by the same percentage once: all benchmarks are updated once before 2021 based on a flat-rate that reflects the average relative decrease in emission intensity since 2007-08 as a result of technological development. Benchmarks are kept constant thereafter (2021-30).

Option 2. Reducing all benchmark values by the same percentage regularly: all benchmarks are updated regularly (i.e. either annually, bi-annually, etc.) based on a flat-rate that reflects the average relative decrease in emission intensity as a result of technological development. Benchmark values decrease thereafter by a pre-defined rate.

Option 3. Recalculating benchmark values based on new data, and then regularly updating them by a standard percentage: benchmarks are updated once before 2021 based on actual data reported by operators on a mandatory basis. Benchmark values decrease thereafter by a pre-defined rate.

Option 4. Recalculating benchmark values based on new data every five years: benchmarks are updated once before 2021 based on data reported by operators to the national competent authorities, and once before 2026 (i.e. mid-term review based on new data). Benchmarks are kept constant for five year periods (2021-25 and 2026-30).

7.3.1.3. Screening

Better alignment with production levels is not relevant for the options, and by using a benchmark-based approach it is assured that incentives for industry to innovate are fully preserved.

Table 1: Screening of options for updating benchmark values

	Technical progress reflected	No undue costs for most efficient installations	No increased administrative complexity	Avoid windfall profits
'Baseline A'	--	()	+	--
'Baseline B'	()	()	()	()
Option 1.	-	-/()	+	-
Option 2.	()	--	() / +	-
Option 3.	+	()	- / ()	() / +
Option 4.	++	+	-	+

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'Baseline A' does not reflect any technical progress and scores very low on the avoidance of windfall profits for obvious reasons, but is further used as the legal baseline.

'Baseline B' reflects best the continuation of the current rules and therefore serves as part of 'Baseline B' package, but is also used in another option package given that results for the four screening criteria are at least 'medium'.

Options 1 and 2 have as main advantage their simplicity as no data collection for a benchmark value update is required. Furthermore, once the improvement rate is fixed, these options provide an advanced degree of certainty to industry regarding the future benchmark values. Based on latest emissions data from EUTL and production levels, it is estimated that the improvement rate should be in the range of some 15-20% in order to properly reflect technological development since 2007-08. For the purpose of this impact assessment, a 15% flat-rate reduction is assumed.

However, currently not all benchmark values are based on real performance data which might lead to the risk of prolonging unintended and unwarranted more advantageous treatment of some sectors. Furthermore, to the extent that past and / or future technological progress differs substantially in some sectors, flat-rate approaches could lead to unduly different levels of ambitions of some updated benchmark values. The regular update in option 2 better reflects the continuous technological progress, while the risk of undue carbon costs for the most efficient installations might be slightly higher, and the administrative complexity is somewhat increased due to the regular changes of benchmark values. Therefore, option 1, as the least complex and entailing least administrative burden, is used in one of the option packages.

Options 3 and 4 score highly on most criteria as real performance of sectors is well reflected. The main difference between the two options is the further updating either by applying a flat-rate (option 3) or based on an additional full data collection (option 4). The latter increases the administrative complexity and reduces certainty to some extent, but better reflects the changes in real performance. The future benchmark values would only be known together with the other parameters of the allocation formula (production levels and possible correction factors) which might somewhat reduce predictability for industry. However, fixing the benchmarks in advance of the other parameters of the allocation formula does not lead to significantly improved predictability in terms of the amount of free allocation to be expected by operators, since the benchmarks are only one of the elements in the formula. Given that option 4 shows high results in three of the four screening criteria, it is part of one of the option packages.

7.3.2. Production level and adjustments

7.3.2.1. Lessons learned from the current system in phase 3 (2013-20)

a) Production levels used for allocation

The second main element to determine free allocation to installations in a benchmark-based system is the activity (i.e. production) level of each installation. The ETS Directive does not have provisions on which years' production levels should be used for this purpose, but states that allocations must be fixed prior to the trading period so as to enable the market to function properly⁷¹.

⁷¹ Article 11 of the ETS Directive requires Member States to publish and submit by September 2011, the list of installations in its territory and any free allocation to each of them calculated in accordance with the rules

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In the current implementing legislation, these production levels are determined in advance, for the entire 8-year period, based on most recent historical data (at the time). The historical data was defined⁷² as median annual historical production of a particular product at the installation level, during the 4-year baseline period (2005-08) or, alternatively, a 2-year baseline period (2009-10), depending on which value is higher. The justification for this was that the economic crisis of 2009 had a significant negative impact on production in many sectors, and therefore was allowed to be excluded from the baseline.

This approach of pre-determined allocation for the entire 8-year period provides a high level of certainty and predictability for the ETS installations. This approach also fully preserves the incentive to reduce emissions.

However, it has several drawbacks. For installations that reduced production after the selected baseline period, allocation could remain at an unduly high level – until specific rules concerning reduction would be triggered. Installations that increase production without increasing capacity do not get additional allocation. The use of two periods inflated the 'gross' free allocation, since each installation used the baseline period most favourable to them.

Both these aspects, an 8-year fixed allocation and the use of two historical baselines, triggered the need for a substantially higher cross-sectoral correction factor than would have been case otherwise. The Commission estimates that, alongside increasing allocation for many installations, the use of two historical baselines increased the overall correction factor by some 5-6%⁷³. It is also estimated that in case the allocation in phase 3 would be based on two separate decisions for 4-years each, the correction factor would be lower by some 9-10% in the years 2017-20.

b) Changes in production

Installations in some cases significantly change their output compared to their baseline production level. The ETS Directive addresses this in three ways. As benchmarks are not regulatory standards, installations can acquire allowances from the large and liquid market. Secondly, there is a new entrants' reserve for installations increasing their production following a significant capacity increase⁷⁴. Thirdly, there are rules to reduce free allocation to installations that produce considerably less than in the baseline period, or significantly reduce their capacity⁷⁵.

In the implementing legislation⁷⁶, changes in production were addressed by a set of rules for significant capacity changes and production reductions (so called partial cessations), with several defined thresholds.⁷⁷

referred to in Article 10a(1). Determining allocation for the whole trading period in advance is possible only in an *ex-ante* system, i.e. when allocation is based on constant production levels.

⁷² Historical activity levels were defined by the Commission Decision 2011/278/EU.

⁷³ i.e. it is estimated that most probably the correction factor would not have been necessary for 2013 and would have been triggered only in 2014 onwards (with a much lower value), in case the same baseline period was used for all installations

⁷⁴ Installations get an extra allocation after a significant capacity extension from the reserve set aside for new entrants based on Article 10a(7) of the ETS Directive.

⁷⁵ See Article 10a(20) of the ETS Directive.

⁷⁶ Commission Decision 2011/278/EU determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of the ETS Directive

⁷⁷ See Commission Decision 2011/278/EU on free allocation rules for the ETS, as well as Guidance Document n°7 on the harmonised free allocation methodology for the EU-ETS post 2012: Guidance on New Entrants and Closures.

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Some criticisms of the existing rules have been expressed related to the Directive foreseeing adjustment of free allocation for installations that reduce production, but not for installations increasing production. The justification for this is that it is easier to reduce production while maintaining existing capacity, but any significant production increase would necessitate a capacity increase, for which additional allowances can be drawn out of the new entrants' reserve.

Some industrial stakeholders call for *ex-post* allocation⁷⁸. In such a system, allocation would be determined *ex-post* based on annual production data instead of historical production. In their view, such an approach would improve the flexibility of free allocation and facilitate long-term planning by investors. Such a system would make allocation more closely reflect production levels. This would be an advantage for installations producing more than in the baseline. It would also reduce excess allocations for installations producing systematically less than in the baseline period (e.g. in an economic recession).

However, such a system could significantly undermine the emission reduction incentives for installations receiving allocation based on the fall-back benchmarks, since for example an installation that reduced heat consumption would be directly penalised with a lower allocation⁷⁹. Incentives to substitute carbon-intensive semi-products with less carbon-intensive ones would also be compromised, since such substitution would also be directly penalised with a lower allocation⁸⁰. As a result, by compromising the incentive for some cost effective emission reductions, it makes the attainment of EU emission reduction targets more costly, which would be reflected in higher carbon price for all participants in the system.

Additionally, a fully 'dynamic' allocation system would put large administrative burden on installations, Member States and the Commission, since this would imply an annual recalculation of allocation to some 11000 installations eligible for free allocation. Experience shows that the full cycle of data collection, verification, calculation and final assessment cannot be completed within less than two to three years, so in case of an annual system there would need to be two or three parallel processes of recalculating allocation leading to significant administrative complexity. The business confidentiality of data would also be a significant constraint, as for installations using product benchmarks production figures of individual installations could be easily calculated from their allocations.

Last but not least, an *ex-post* system would also lead to significant uncertainties, as the need for a correction factor would have to be recalculated each year, and thus operators would not know in advance the amount of free allocation for their installations.

A full *ex-post* dynamic free allocation system therefore does not seem realistic and able to address the concerns expressed by industrial stakeholders. An *ex-ante* system with more frequent production data adjustments than the current 8-year phase, as included in some options below, would be better suited to address the need for stability, predictability and flexibility. A number of industrial stakeholders also support this latter approach, highlighting the benefits of predictability as conducive to new investments.

⁷⁸ For example, see Ecofys report Dynamic allocation for the EU Emissions Trading System, May 2014

⁷⁹ Similarly; an installation receiving allocation based on the fuel benchmark would be directly penalised with lower allocation if reducing fuel consumption.

⁸⁰ The producer of the less carbon-intensive semi-product would be eligible for a lower allocation than the producer of the alternative (more carbon-intensive) product.

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7.3.2.2. Policy options

'Baseline A': Baseline production levels⁸¹ defined once, adjustments based on only capacity reductions, closures and (partial) cessation rules⁸²

'Baseline B': Baseline production levels defined once, with existing rules for production changes. Under this option, the baseline, historical production levels would be defined as average of 5 baseline years (2014-18) for the entire 10-year period, with application of current rules for capacity changes and partial cessations.

Option 1. Baseline production levels defined once, with modified rules: annual adjustments for significant production changes. The baseline historical production levels would be defined as the average of 5 baseline years (2014-18) for the entire 10-year period. Annual adjustments symmetrically address significant production increases and decreases⁸³. Allocation for increased production comes from the new entrants' reserve.

Option 2. Baseline production levels defined twice, with modified rules: annual adjustment for significant production changes. The baseline historical production levels would be defined consecutively twice, as average of 5 baseline years (2014-18, then 2019-23) for 5-year periods⁸⁴. Annual adjustments symmetrically address significant production increases and decreases, as in option 3.

7.3.2.3. Screening

Reflecting technological progress in sectors and fully preserving the incentives to innovate are not relevant operational objectives for the production levels and adjustments debate.

Table 2: Screening of options for production level and adjustments

	Better alignment with production levels	No increased administrative complexity	Avoid windfall profits
'Baseline A'	--	+	+
'Baseline B'	0	0	0
Option 1.	+	0	+
Option 2.	++	-	++

'Baseline A' scores low on the alignment with production levels because it provides for reduction in case of production decreases, but does not allow for increases in case of increased production, even when capacity is increased. It would nevertheless decrease the administrative complexity, and the lack of allocation for increased production would also lead to reduced risks of windfall profits.

'Baseline B' is slightly better in terms of alignment with production levels, because it allows for changes of free allocation both for increases and decreases of production. Production

⁸¹ Data collection for production levels described in all options could be undertaken jointly with data collection for updating benchmarks, in order to minimise administrative burden.

⁸² Given that no reserve for new entrants or capacity increases is foreseen in the Directive for the post-2020 period

⁸³ The exact threshold for significant changes are to be determined in implementing legislation. For the purposes of this IA we assume the threshold to be 15% difference compared to the baseline production level.

⁸⁴ As mentioned above, data collection for production levels could be undertaken jointly with data collection for updating benchmarks, in order to minimise administrative burden.

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increases would have to be linked to capacity increases. The continuation of this system assumes the maintaining of the 'capacity' notion and the accompanying implementing rules, therefore it leads to higher administrative complexity than other options.

Options 1 and 2 foresee annual adjustments in both directions, i.e. both options foresee allocation for significantly increased production even without a capacity increase. This also means that there is no need to calculate the capacity of installations under these options, which leads to decreased administrative complexity.

Option 2 in addition ensures better alignment of production levels by using two consecutive baseline periods, thus avoiding that allocation at the end of the period is based on more than a decade old production data. For the same reason, this option scores somewhat better than option 3 in avoiding windfall profits. However, data collection should take place twice in the trading period which leads to somehow higher administrative burden.

In addition to the two baselines, options 3 and 4 are further considered given their strength regarding the avoidance of windfall profits and the better alignment with production levels.

7.3.3. Reserve for new entrants

7.3.3.1. Lessons learned from the current system in phase 3 (2013-20)

While the Commission has stated that companies should take care to factor climate change into their investment decisions⁸⁵, over the period from 2013-20, five percent of the allowances have been set aside at the EU level as a reserve for new entrants⁸⁶ in order to promote new investments. All new entrants are eligible subject to availability of free allowances from the reserve under the same allocation rules defined in implementing legislation.

This harmonised approach for new entrants in phase 3 has established a level playing field, as it provides equal treatment to similar installations across the EU. This is a major improvement compared to the previous trading periods with different national approaches.

The size of the reserve is expected to be sufficient to meet the demand for allowances throughout the third trading period, and this objective remains relevant in the post-2020 period. Providing a reserve from 2021-30 will give an incentive for new investments. Furthermore, considering the longer fourth period (10 years, as compared to 8 years), it is also worth exploring whether the system could be rendered more adaptable, i.e. not limited by a fixed amount of allowances.

7.3.3.2. Policy options

'Baseline A': No reserve for new entrants⁸⁷.

'Baseline B': New entrants reserve with fixed amount of allowances. This option reflects the current rules for 2021-30, i.e. 5%.

⁸⁵ Commission Staff Working Document, accompanying document to the Proposal for a Directive of the European Parliament and of the Council, amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system:., Impact Assessment (SEC(2008) 52)..

⁸⁶ 'New entrants' are installations which enter(ed) the ETS for the first time after 30 June 2011, and also those which significantly extend(ed) their capacity after 30 June 2011 (these latter only in so far as this extension is concerned).

⁸⁷ This is the legal baseline, as article 10a(7) of the ETS Directive sets aside 5% of the cap in the period 2013 to 2020. A similar set-aside for new entrants post-2020 is not foreseen in the Directive.

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Option 1. New entrants reserve replenished with unused allowances. The reserve is established with a fixed amount of allowances, but is replenished with allowances flowing back as a result of production level decreases and installation closures.

7.3.3.3. Screening

Reflecting technological progress in sectors, preserving incentives to innovate, and avoidance of windfall profits are not relevant for the analysis below.

Table 3: Screening of options for reserve for new entrants

	Most efficient installation not facing undue costs	Better alignment with production levels	No increased administrative complexity
'Baseline A'	--	--	++
'Baseline B'	0	0	0
Option 1	+	+	0

'Baseline A' contains no reserve for new entrants and thus in this option there would be no allocation for new entrants. Therefore, it scores high on administrative simplicity, but could lead to undue costs for new entrants.

The option of setting aside a fixed amount of allowances for new entrants ('Baseline B') has worked well in phase 3, and the amount set aside⁸⁸ is expected to be sufficient to cater for the new investments in this period. Nevertheless, considering the longer time period (10 years) of phase 4, setting aside 5% of the total amount of allowances for new entrants might not be sufficient in case there will be only one allocation decision for 10 years⁸⁹, and therefore could lead to undue costs for new entrants by the end of the period. Thus it scores better than the 'Baseline A' on the first two criteria. It does incorporate some administrative burden, but considering the experiences of Phase 3, it is assessed as medium.

Option 1 foresees adding leftover allowances from closures and partial cessations to the reserve for new entrants, instead of auctioning them at the end of the trading period. This mitigates the risk of a depleted reserve by the end of the trading period, and therefore reduces the possibility of most efficient installations facing undue costs. It also provides better alignment with production levels. Given its advantages, this option scores highest and is used for three option packages.

7.3.4. Compensation for indirect carbon costs

7.3.4.1. *Lessons learned from the current system in phase 3 (2013-20)*

Indirect carbon costs are associated with the costs of CO₂ emissions related to producing power which are passed through to industrial consumers of electricity. As marginal cost pricing is applied on the wholesale market, the carbon price could have an impact on the final price when fossil fuels operate at the margin. Hence, if industrial consumers purchase power

⁸⁸ 5% of total amount available, minus 300 million allowances which are available to help stimulate the construction and operation of environmentally safe CCS projects, as well as demonstration projects of innovative renewable energy technologies, i.e. NER300 (see Article 10a(7-8) of the ETS Directive). As outlined in the October 2014 European Council Conclusions, the existing NER300 facility will be renewed in the post-2020 period, and extended in scope and scale.)

⁸⁹ Given that a new entrant would be eligible to receive allowances from the reserve throughout until allocation is recalculated based on a new historical activity period, the length of the allocation periods (i.e. the number of allocation decision in phase 4) will have a big impact on the demand from the new entrant reserve. The longer the allocation periods, the higher the demand for new entrant allowances, as it cumulatively increases with time.

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based on wholesale electricity prices, the carbon price would have an impact to the extent fossil fuels act as marginal technologies in the power supply.

Since the carbon costs of electricity production is assumed to be passed on to electricity consumers through increased electricity prices, Article 10a(6) of the ETS Directive gives Member States the possibility to compensate certain electro-intensive industries for these indirect carbon costs from national resources⁹⁰, aiming to minimise the risk of carbon leakage due to indirect costs. The State aid guidelines provide safeguards to limit negative effects that might result from these compensatory measures. The degressive nature of the aid and the formula for its calculation ensure that the aid is proportionate and that it maintains the incentives for electricity efficiency and the transition from 'grey' to 'green' electricity⁹¹. As it stands in 2015, some Member States⁹² have opted to compensate for indirect carbon costs.

Some industries with high electricity intensity have criticised that Member States have the option to grant indirect cost compensation⁹³. They claim it does not efficiently tackle the risk of carbon leakage, and highlight the risk of distortion of competition as results of a lack of harmonisation across the EU. They have therefore asked for compensation of indirect costs through an EU-wide and harmonised scheme, by allocating additional free allowances.⁹⁴

A recent study⁹⁵ concluded that indirect costs did not have a significant effect on carbon leakage risk in the majority of industries, while producers using a large amount of electricity may have faced some cost increase due to indirect carbon costs, although some of them may have been passed on⁹⁶.

However, any type of subsidies is finally financed by consumers or taxpayers, so limited public resources should be carefully targeted without adjusting to the carbon price effect.

Looking at the post-2020 perspective, the use of public funds for financial compensation of indirect costs should not lead to a lock-in into carbon-intensive electricity production. Any future compensation system needs to be able to properly reflect future further increasing decarbonisation of the power system, as expected until 2030.

⁹⁰ These measures are subject to State aid control. The current measures are assessed under the Commission's 2012 Guidelines on state aid measures related to the ETS.

[http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012XC0605\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012XC0605(01)&from=EN)

⁹¹ The formula includes, *inter alia*, the installation's baseline production levels or baseline electricity consumption levels and specific regional CO₂ emission factors.

⁹² Currently, the Netherlands, Germany, Greece, UK, Spain, Belgium (Flanders) and Norway are compensating for indirect costs, probably due to relatively low carbon price as reflected in the low EUA forward prices.

⁹³ These views have been also reiterated during the stakeholder consultations. A part of energy intensive industry asked for the development of an EU-wide instrument to replace the national state aid mechanisms. However, a significant number of industrial sectors have also highlighted the fragmentation of the EU energy market, noting that the impact of the ETS is marginal compared to the large variation of electricity prices across Member States. These industries have underlined the need for strengthened EU market, and competitive energy prices, as of greater importance.

⁹⁴ By 'harmonised system' in the analysis is understood a system under which all Member States compensate indirect costs to the same level.

⁹⁵ Ecorys: Carbon Leakage Evidence Project - Factsheets for selected sectors, September 2013.

⁹⁶ The extent to which indirect costs are passed through by manufacturing industry into product prices depends on the general cost pass through ability of each sector. When a sector is able to pass through the costs induced by the EU ETS, it does not differentiate between direct and indirect costs. In this sense, full compensation for indirect costs can lead to overcompensation in case of costs being passed through in the same manner as for direct cost compensation.

See http://ec.europa.eu/competition/sectors/energy/impact_assessment_main%20report_en.pdf

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A difficulty with providing the same level of compensation to all eligible industries is that it is not always clear what the actual retail power prices paid by industry are. A number of Member States provide significant tax and levy exemptions for some energy intensive industries but consistent data on such exemptions is not available. Some industries also enjoy preferential prices negotiated in long-term contractual arrangements which do not (fully) reflect the carbon costs of electricity production. To avoid the risk of overcompensation, an EU-wide harmonised system compensating all eligible industries to the same level would require a detailed control and verification system company by company leading to a significant administrative burden.

A system providing compensation for indirect costs has a high risk of providing windfall profits if the allowances are distributed based on single harmonised parameters across Member States, for instance in low-carbon electricity markets. Alternatively, rules can address national and regional differences and mitigate the risk of windfall profit at the expense of some additional administrative complexity.

In exploring the options for full harmonisation, the discontinuation of the EU compensation scheme for indirect costs could also be an alternative approach, as the level of compensation across the Member States would be identical in this case (zero). However, as this would entail risks of undue costs for the most efficient installations, it is not in line with the European Council Conclusions and therefore not considered in the further analysis.

In sum, and as analysed in the 2008 ETS impact assessment⁹⁷, the compensation for indirect costs needs to be approached with care since this would convert free allocation into production subsidies for these indirect costs which are passed through to varying degrees anyway.

7.3.4.2. Policy options

Baseline: Continued optional compensation by Member States. In this option compensation for indirect costs at national level continues⁹⁸. The key features for compensation are determined at the EU level, but the decision to grant compensation is discretionary and depends on the respective Member State (and is subject to State aid control).

Option 1. Mandatory Union compensation scheme, financed by using national auction revenues. The compensation would be triggered on an objective criterion and there would be a minimum "floor" amount of compensation to be given by all Member States, subject to certain criteria and pre-defined eligible costs for compensation via a formula similar to the one in Baseline. It would be financed by using national auction revenues. Compensation would, like in baseline, be limited to certain sectors deemed at risk of carbon leakage due to their indirect carbon costs.

Option 2. Mandatory Union compensation scheme financed through free allocation. Compensation is given at EU level to installations in sectors deemed at risk of carbon leakage due to their indirect carbon costs, and is financed through free allocation of ETS allowances. Compensation is assumed via a formula similar to the one in Baseline.

Option 3. Mandatory Union compensation scheme, financed through free allocation plus optional compensation at national level (subject to State aid control). The mandatory compensation is given at EU level to installations in sectors deemed at risk of carbon leakage

⁹⁷ Commission Staff Working Document, accompanying document to the Proposal for a Directive of the European Parliament and of the Council, amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system. Impact Assessment (SEC(2008) 52).,

⁹⁸ This remains subject to State aid approval by the Commission, based essentially on the current principles.

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due to their indirect carbon costs, and is financed through free allocation of ETS allowances. Member States can top up the compensation from national resource subject to Commission approval. Compensation is assumed via a formula similar to the one in Baseline.

7.3.4.3. Screening

Table 4: Screening of options for compensation for indirect cost

	Fully preserve innovation incentives	Most efficient installations not facing undue costs	Avoid windfall profits	Not increasing administrative complexity
Baseline	0	0	0	0
Option 1	0	+	-	-
Option 2	0	+	-	-
Option 3	0	++	--	--

Under the baseline option, some Member States may decide not to compensate for indirect carbon costs (e.g. considering there is no risk of carbon leakage due to indirect costs or due to other national priorities)⁹⁹. This option retains the innovation incentives as the maximum aid intensity ensure only partial recovery of costs¹⁰⁰. To avoid windfall profits, the general principles in ETS Phase 3 (consideration of cost pass through and partial compensation) remain relevant and the current level of administrative complexity remains unchanged. However, this option could distort intra-EU trade as company decisions regarding location of their activities could be driven by subsidies instead of underlying market fundamentals.

In Option 1, all Member States provide the harmonised compensation for indirect costs using national auction revenues. The overall compensation can only be partial in view of the objectives set out above, preserving innovation incentives and avoiding over-compensation. The level of compensation is triggered by an objective criterion which is to be defined. As compensation is mandatory for all Member States, the overall volume of windfall profits may increase. At the same time, all companies could be put on equal footing since compensation will not depend on the Member States' decision. This option requires capacity for design and implementation in potentially each Member State, and consequently increases the administrative burden for the Commission and national authorities. As all Member States would need to grant some compensation, aggregate public spending would increase¹⁰¹. At the same time, the effect of limiting market distortions can be positive. Member States with a high share of electricity-intensive industry relative to GDP may experience relatively more strain on public resources.

Unlike the direct carbon costs, indirect carbon costs are also driven by the conditions on the electricity market and not only by the individual behaviour of the energy consumer. Options 2 and 3 score low on avoiding windfall profits as allocation might be provided also to installations that have low or no carbon costs. Options 2 and 3 would also increase the pressure on the total amount of allowances available for free allocation (for direct emissions),

⁹⁹ The Commissions' approval of State aid schemes is required.

¹⁰⁰ Otherwise, poorly targeted aid would transfer the emission reduction costs from the installations to the other sectors of the economy, and consequently limit these incentives.

¹⁰¹ Auctioning revenues as a potential source of funding may also be used for a variety of objectives, including compensation for indirect costs (currently optional). For example, Member States may use revenues from auctioning of allowances, between 2013 and 2016, to support the construction of highly efficient power plants, including new power plants that are carbon capture and storage (CCS)-ready. In general, at least 50 % of auctioning revenues or the equivalent in financial value of these revenues need to be used by Member States for climate and energy related purposes.

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requiring more stringent rules for free allocation to mitigate direct carbon costs and possibly increased exposure to the risk of carbon leakage for many industrial installations¹⁰².

To conclude, a harmonised system can reduce distortions in competition between Member States, though with increased administrative burden. While financing compensation through free allowances would limit the impact on national auction revenues (State budget), it would also reduce the amount available for compensation of direct ETS costs. Due to the above shortcomings of options 2 and 3, and their low overall scoring compared to the other two options, only options Baseline and 1 are included in the policy packages.

7.3.5. Carbon leakage groups and criteria

7.3.5.1. Lessons learned from the current system in phase 3 (2013-20)

The ETS Directive suggests that the level of carbon leakage risk depends on the extent to which it is possible for sectors to pass through their carbon costs¹⁰³.

Currently there are *de facto* three categories depending on the level of exposure to the risk of carbon leakage, with different levels of free allocation provided to them:

- Electricity production is not deemed to be exposed to the risk of carbon leakage, and electricity producers are assumed to be able to pass on their carbon costs in increased electricity prices to their consumers. Therefore, electricity production is not eligible for free allocation in phase 3.
- Sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage are identified in the 'carbon leakage list' and are allocated allowances free of charge at 100% of the quantity determined based on the benchmarks and the applicable correction factor¹⁰⁴ until 2020¹⁰⁵
- Installations in other sectors (not in any of the above two categories) receive a lower (and each year decreasing) level of free allocation¹⁰⁶.

The ETS Directive requires that the extent to which it is possible for sectors to pass on carbon costs should be assessed in order to determine the carbon leakage list. This objective is operationalized by more easily measurable and quantifiable criteria due to data availability limitations.

A sector or sub-sector is deemed to be exposed to a significant risk of carbon leakage in case in that sector or sub-sector:

- the sum of direct and indirect additional costs induced by the ETS is at least 30% of gross value added (GVA); or
- the intensity of trade with third countries is above 30%; or
- the trade intensity with third countries is above 10% and the costs induced by the ETS amount to at least 5% of GVA¹⁰⁷.

¹⁰² In the hypothetical case of a fully harmonised system, industry itself has estimated a need of 2.3 billion allowances in 2021-30, or 36% of all allowances available for free allocation in this period. This would lead to a very high cross-sectoral correction factor for direct emissions.

¹⁰³ See Article 10a(14)

¹⁰⁴ Either the linear factor as foreseen in Article 10a(4) or the cross-sectoral correction factor foreseen in Article 10a(5) of the ETS Directive

¹⁰⁵ See Article 10a(12) of the ETS Directive

¹⁰⁶ Installations in sectors or subsectors not on the carbon leakage list but eligible for free allocation received 80% of the quantity determined based on the benchmarks and the applicable correction factor in 2013, and the free allocation decreases every year resulting in 30% free allocation in 2020. See Article 10a(11)

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The Directive provides that the quantitative assessment based on the above criteria may be supplemented by a qualitative assessment based on the abatement potential, market characteristics and profit margins of sectors where relevant data are available¹⁰⁷.

The Commission is required to draw up the list of sectors and sub-sectors deemed to be exposed to a significant risk of carbon leakage ('carbon leakage list') based on the above criteria in five-year intervals. The first carbon leakage list¹⁰⁹ was adopted by the Commission at the end of 2009 and was applicable for free allocation of allowances in 2013-14. The second carbon leakage list¹¹⁰ was adopted in 2014 and applies for 2015-19.

The lists have been determined following analyses of all mining and manufacturing industry sectors¹¹¹ against the criteria defined in the ETS Directive. The outcome is that the vast majority of assessed sectors are on both carbon leakage lists. Both lists include activities that collectively are responsible for more than 97% of industrial emissions covered by the ETS. While for a sector to be on the carbon leakage list is described in the recitals of the Directive as an exception, it has *de facto* become the norm.

In practice, despite the recognition already in 2008 that many industrial operators were able to pass through at least a part of their carbon costs¹¹², there is very limited differentiation among industrial sectors and almost all industrial activities receive the same treatment irrespective of the differences in their actual needs and degree of exposure to carbon leakage risks and in their capability to pass-through carbon costs.

A more targeted approach whereby differences in terms of exposure to carbon leakage risk is reflected in differentiated allocation levels could have made it possible to limit or even avoid the need to apply a cross-sectoral correction factor. Therefore, it is pertinent to explore the possibility of better differentiation among sectors within the larger group that can be deemed exposed to a risk of carbon leakage, and adjust the level of free allocation accordingly.

The ability to pass-through carbon costs into product prices for final customers has been assessed in preparation for the ETS revision. Based on an extensive literature review of theoretical and empirical studies (see Annex 8), it can be observed that the cost pass-through rates are not homogenous among different products, as well as among different countries and markets. While it may be difficult to quantify cost pass-through rates, it can be concluded that most carbon-intensive sectors have been able to pass through at least part of the carbon costs according to the literature and stakeholders' views¹¹³. The following table gives an overview

¹⁰⁷ Article 10a(15-16) of the ETS Directive

¹⁰⁸ See Article 10a(17) of the ETS Directive

¹⁰⁹ See Commission Decision 2010/2/EU. The list was amended (i.e. additional sectors and sub-sectors were added) three times: by Decisions 2011/745/EU, 2012/498/EU and 2014/9/EU.

¹¹⁰ See 2014/746/EU: Commission Decision of 27 October 2014 determining, pursuant to Directive 2003/87/EC of the European Parliament and of the Council, a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage, for the period 2015 to 2019 See Commission Decision 2014/746/EU

¹¹¹ 258 sectors were assessed at NACE-4 level for the first list, and 245 for the second. The number of sectors assessed at NACE-4 level varied only due to changes in statistical classification, all mining and manufacturing industries were assessed in both cases.

¹¹² Commission Staff Working Document, accompanying document to the Proposal for a Directive of the European Parliament and of the Council, amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system; Impact Assessment (, SEC(2008) 52).

¹¹³ During the stakeholder consultations, energy-intensive industrial sectors have mainly emphasized the difficulties in providing the evidence for cost pass-through. Electricity sector noted that companies able to pass on carbon costs should be excluded from free allocation. Similarly, a number of public authorities/Member States propose that the free allocation for such sectors are reduced or removed. NGOs claim that all sectors have the ability to pass through costs to a certain extent, and argue for an ex-post deduction of free allowances.

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of the average estimated cost-pass-through in some industrial sectors based on a literature review. For further details and the exact references please see Annex 8.

Table 5: Overview of cost pass through ranges found in existing literature¹¹⁴

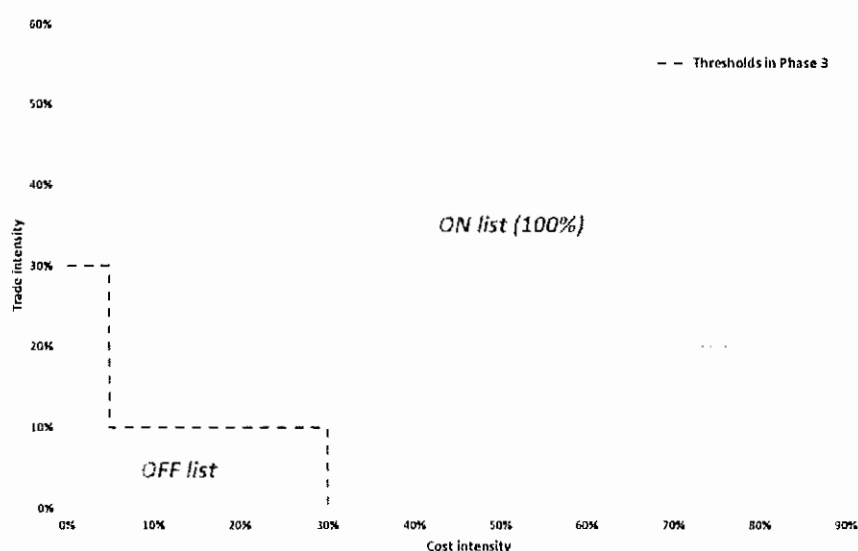
	Ex-ante results		Ex-post results	
	Min	Max	Min	Max
Iron and steel	6%	77%	110%	120%
Cement	15%	75%	0	30%
Glass	60%	80%	20%	60%
Refineries	25%	75%	50%	300%
Petrochemicals		90%	33%	100%
Fertilizers		75%	16%	-

To conclude, it is noted that sectors able to pass through a significant part of carbon costs have to bear only the remaining part of costs (i.e. the costs not passed through to costumers) and therefore are at a lower risk of carbon leakage. In the case of sectors that can pass through costs only to a limited extent, and therefore need to absorb most of the carbon costs, it can be assumed that they face a higher risk of carbon leakage.

7.3.5.2. Policy options

'Baseline A': Uniform carbon leakage factor of 30% is used for all installations. In this option there is no need for differentiation into carbon leakage groups¹¹⁵.

'Baseline B': Two groups based on cost intensity and trade intensity criteria. The binary approach is maintained (sectors are either on the carbon leakage list or not). Criteria and thresholds currently in the Directive (illustrated by the chart below), including the qualitative criteria, remain.



Option 1. No groups, uniform carbon leakage factor. No differentiation among sectors and activities. A uniform carbon leakage factor is used for all installations based on an estimated

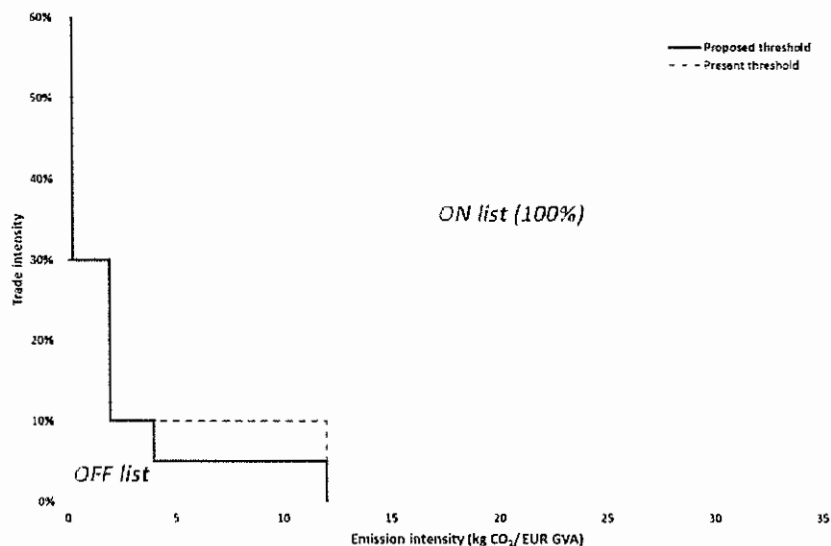
¹¹⁴ For further details and exact references please see Annex 8.

¹¹⁵ Article 10a(12) of the ETS Directive foresees an increased level of free allocation for sectors and sub-sectors on the carbon leakage list until 2020 only.

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average cost pass-through rate. For the purpose of this impact assessment, a generic factor of 90% is assumed.

Option 2. Two groups based on emissions intensity and trade intensity criteria. The binary approach is maintained (sectors are either on the carbon leakage list or not). Criteria and thresholds similar to those currently in the Directive, but emission intensity and cost intensity always regarded in combination, and the thresholds are somewhat modified, as illustrated by the chart below¹¹⁶.



Option 3. Four groups based on emission intensity and trade intensity criteria: 'Very high', 'High', 'Medium' and 'Low' level of carbon leakage risk¹¹⁷, as illustrated by the chart below¹¹⁸.

¹¹⁶ As illustrated by the chart, the option builds on the current thresholds applied for the determination of the carbon leakage list.

A sector is added to the carbon leakage list in case:

- emission intensity is above 12 kg CO₂ / EUR GVA (irrespective of trade intensity), or
- emission intensity is above 4 kg CO₂ / EUR GVA and trade intensity of at least 5%, or
- emission intensity is above 2 kg CO₂ / EUR GVA and trade intensity of at least 10%; or
- emission intensity is above 0.3 kg CO₂ / EUR GVA and trade intensity of at least 30%.

¹¹⁷ 'Very high': sectors with emission intensity above 9 kg CO₂ / EUR GVA and trade intensity at least 20%;

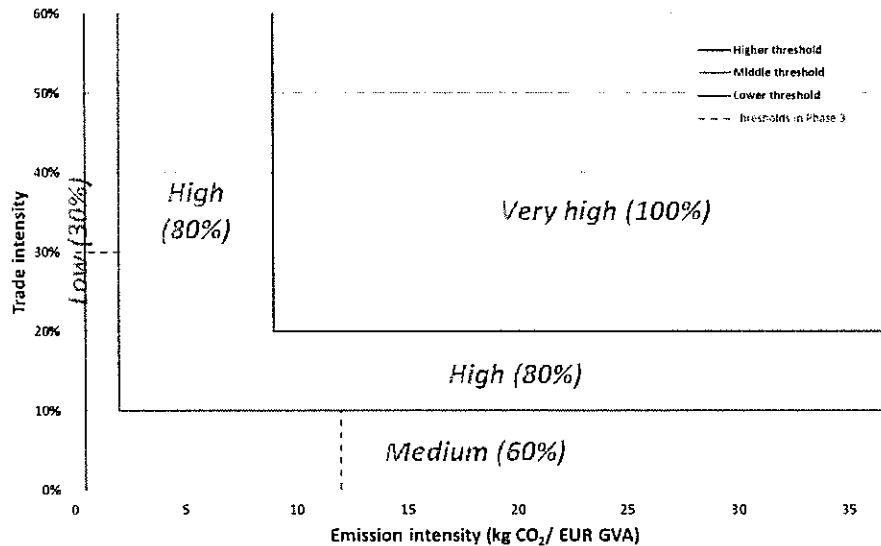
'High': sectors with emission intensity above 2 kg CO₂ / EUR GVA and trade intensity at least 10% (and not in the 'Very high' group);

'Medium': sectors with emission intensity above 0.5 kgCO₂/EUR GVA (and not in the two groups above);

'Low': other sectors.

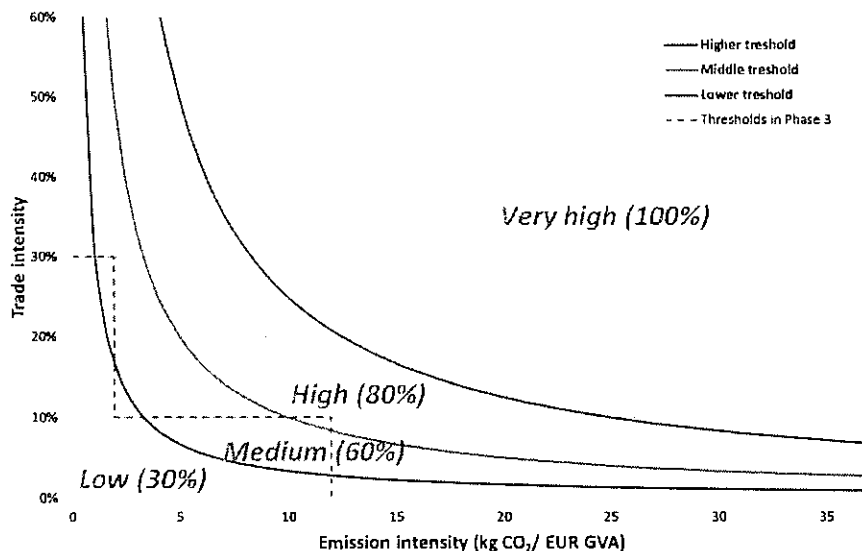
¹¹⁸ For illustration purposes, the chart also indicates with a dotted red line the present thresholds in the ETS Directive for Phase 3. As illustrated by the chart, the threshold between the 'High' and 'Medium' groups is *in essence* equivalent to the threshold currently in Article 10a(15) and applied for the determination of the carbon leakage list (the present 5% cost intensity threshold is translated into emission intensity based on the parameters that have been used for the assessments carried out to determine the two carbon leakage lists – see Decisions 2010/2/EU and 2014/746/EU). The threshold between the 'Very high' and 'High' groups follows the same approach and is intended to make further differentiation among the sectors deemed to be highly exposed to the carbon leakage risk. Finally, a further threshold is proposed to identify those sectors for which carbon costs represent a marginal share in their GVA; these sectors will be in the 'Low' group.

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Free allocation is 100%, 80%, 60% and 30% of the benchmark in the 'Very high', 'High', 'Medium' and 'Low' groups, respectively. Groups are formed based on the emissions intensity and trade intensity criteria.

Option 4. Four groups based on a combined indicator resulting from the multiplication of the emission intensity and trade intensity rates: 'Very high', 'High', 'Medium' and 'Low' level of carbon leakage risk, as illustrated by the chart below¹¹⁹.



Free allocation is 100%, 80%, 60% and 30% of the benchmark in the 'Very high', 'High', 'Medium' and 'Low' groups, respectively

¹¹⁹ This option also follows the present approach in terms of using the same more easily quantifiable indicators to estimate the level of exposure to the risk of carbon leakage. The only difference to the previous option is that it assumes a more continuous relation between the two indicators, and thus applies step-less thresholds.

The groups under this option are formed based on an indicator, which is calculated as a product of trade intensity and emissions intensity, with the following thresholds:

'Very high': indicator value above 2.5;

'High': indicator value between 1 and 2.5;

'Medium': indicator value between 0.33 and 1;

'Low': indicator value below 0.33.

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Option 5. Carbon leakage factors based on cost-pass through rates. Detailed methodology to assess cost pass-through rates will be developed for the largest sectors, and a default pass-through rate applied to all others. This approach results in several carbon leakage groups.

7.3.5.3. Screening

Reflecting technological progress in sectors and better reflection of production levels are not relevant for the options above.

Table 6: Screening of options for carbon leakage groups and criteria

	Most efficient installations not facing undue costs	Avoid windfall profits	Not increasing administrative complexity
'Baseline A'	--	++	++
'Baseline B'	0	0	0
Option 1.	0	0	++
Option 2.	0	0	0
Option 3.	++	+	-
Option 4.	+	+	-
Option 5.	++	++	--

The objectives of avoiding undue costs for most efficient installations and windfall profits are interlinked. These two objectives can be achieved simultaneously via well-targeted free allocation of allowances. Such system would also minimise the need to apply (or lower the magnitude of) a cross-sectoral correction factor.

Windfall profits are avoided if the system provides compensation only for costs that are actually assumed by the operators, i.e. costs which cannot be passed on into product prices without a significant loss of market share. A well-targeted allocation system aims to achieve this objective. At the same time, avoiding the need to apply (or lowering the magnitude of) a correction factor would allow the most efficient installations to get 100% (or close to 100%) of the amount determined based on the benchmarks in sectors deemed to be at the highest risk of carbon leakage.

Therefore, the options leading to a higher level of differentiation based on the level of risk of carbon leakage (options 3 to 5) are deemed to deliver best results in terms of effectiveness.

'Baseline B' reflects the current system, where there is differentiation between industrial activities and non-industrial activities (mainly district heating and other services). However, only a minor share of industrial emissions originates from sectors not on the carbon leakage list, making the differentiation among industrial sectors very limited. This option delivers very limited value added in increasing the focus of the allocation system to the sectors at highest risk of carbon leakage.

In terms of administrative simplicity, 'Baseline A' and option 1 score the highest, as these options do not differentiate among sectors and all activities receive the same level of free allocation. These options thus do not require any assessments of sectors' ability to pass through costs as they assume no carbon leakage lists or groups. This leads also to more

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moderate data needs¹²⁰ and administrative complexity when calculating the allocation to individual installations.

Option 2 differs from 'Baseline B' in terms of removing from the carbon leakage list those sectors for which carbon costs represent a marginal share in their GVA¹²¹. It also foresees a lower level of allocation¹²² for sectors not on the carbon leakage list (most importantly: district heating). This would result in removing some two thirds of the 156 sectors currently on the carbon leakage list¹²³. However, as the 'gross' free allocation to these sectors represents a very small share of all industry, the overall impact is very small.

Options 3 and 4 both offer a relatively high level of differentiation among sectors based on the same indicators which are applied in phase 3 and proved feasible to use. At the same time, increasing the number of carbon leakage groups increases somewhat the administrative complexity of the allocation system.

Option 5 offers the most focused approach and promises to deliver the most appropriate level of free allocation, reflecting the individual characteristics of the largest ETS sectors. However, it remains at this stage difficult to quantify the exact rate of costs passed through per sectors or products, and it is uncertain whether such quantification would be feasible to complete for the largest sectors before the start of phase 4 (i.e. 2021). In addition, it could trigger significantly increased administrative complexity.

Therefore, while option 5 can be regarded as the most appropriate from a theoretical point of view, its feasibility remains questionable and thus, at this stage, it is not considered in further analysis.

7.4. Option packages

To facilitate the assessment of impacts of policy options for free allocation and other carbon leakage measures, option packages are created combining options for all relevant elements.

The legal baseline (unchanged Directive, referred to as 'Baseline A') is complemented by 'Baseline B' which is based on the continuation of current rules, but would require amendments to the Directive. This second baseline allows for easier comparisons between policy options as 'Baseline A' does not contain any continuing provisions for important elements such as increased free allocation for sectors deemed to be exposed to a significant risk of carbon leakage.

Furthermore, while similar to the 'Baseline B' option, additional 'Baseline Bbis' package is developed, with two carbon leakage groups based on emissions intensity and trade intensity criteria.

Based on the initial screening performed in previous section, and aiming to retain the manageable level of complexity, three additional option packages are introduced,. These option packages are created on the following guiding principles:

- The 'Simple' package aims for minimum level of administrative burden, while retaining the objectives of better alignment with changing production levels, and considering the indirect carbon costs. The minimum level of administrative

¹²⁰ For example, when determining the free allocation for individual installations, there would be no need to distinguish heat used for activities on the carbon leakage list from the heat used for other purposes, etc.

¹²¹ Those that emit less than 0.3 kg CO₂ / EUR GVA

¹²² Decreasing to 0% from 2027 onwards

¹²³ In addition, sub-sectors from another 10 sectors are currently on the carbon leakage list, i.e. these 10 sectors can be regarded as being partially on the list.

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complexity would still entail occasional data collection, in order to fulfil the objectives and meet the strategic guidance provided by the European Council on 24 October 2014.

- The 'Targeted' package is based on policy options aiming to ensure that the most efficient installations are not facing undue costs, while, at the same time, avoiding windfall profits. This should be achieved by providing an optimal level of free allocation (regularly updated benchmarks, 2 allocation decisions, 4 carbon leakage groups) and compensation for indirect costs to installations on a mandatory basis. It can be noted that the 'Simple' and 'Targeted' packages could be considered as a trade-off between main guiding principles, as most of the policy options used for 'Targeted' require intensive data collection.
- The third package, 'Limited changes', uses a more conservative approach in trying to achieve the operational objectives, while building upon the current rules. This package therefore entails only moderate changes compared to 'Baseline B', instead of more ambitious exercise presented in 'Simple' and 'Targeted' packages. The 'Limited changes' mainly concerns the number of allocation decisions (two instead of one per phase) and the number of carbon leakage groups (4 instead of 2).

The table below summarises the main features of the option packages.

Table 7: Option packages for addressing the risk of carbon leakage

Policy option package	Benchmark update	Production levels and reserve for new entrants	Indirect cost compensation	Carbon Leakage groups and criteria / Cost pass-through rates
Baseline A: Directive unchanged ¹²⁴	No update, existing benchmarks	1 NIMs exercise for 10 yrs; Same rules for capacity reductions, closures and (partial) cessations No adjustments for production level increases	National compensation (subject to state aid rules)	No groups, 30% for all No criteria needed
Baseline B: Current rules continued ¹²⁵	Once before 2021 based on real data	1 NIMs exercise for 10 yrs; Same rules for capacity changes and (partial) cessations New entrant reserve: 5% minus NER300 (i.e. ca.3.1% of the cap available for new entrants)	National compensation (subject to state aid rules)	2 groups: • 100% - CL-exposed; • 30% - non CL-exposed Same criteria and thresholds as in Phase 3
Baseline B bis: Current rules continued with adjustment of carbon leakage criteria	Once before 2021 based on real data ('Baseline B')	1 NIMs exercise for 10 yrs; Same rules for capacity changes and (partial) cessations ('Baseline B') New entrant reserve: 5% minus NER400 (i.e. ca.2.4% of the cap available for new entrants) ('Baseline B')	National compensation (subject to state aid rules)	2 groups: • 100% - CL-exposed; • 30% - non CL-exposed Somewhat modified criteria and thresholds as in Phase 3 (option 2)
Simple	Reducing all benchmark values by a same uniform percentage to reflect technological development (option 1)	1 NIMs exercise for 10 yrs. Annual adjustments for significant production level changes (both directions: up and down) (option 1) New entrant reserve: 5% minus NER400 (i.e. ca.2.4% of the cap) replenished by allowances from cessations available for new entrants (option 1)	National compensation (subject to state aid rules)	No groups, '100% of costs not passed through' reflected by default value (e.g. 90% for all) ¹²⁶ No criteria needed (option 1)
Limited changes	Once before 2021 based on real data ('Baseline B')	2 separate NIMs exercises for 5 years each. Annual adjustments for significant production level changes (both directions) (option 2) New entrant reserve: 5% minus NER400 (i.e. ca.2.4% of the cap) ('Baseline B')	National compensation (subject to state aid rules)	4 groups according to cost pass through capability with fixed allocation rates Emission intensity and trade criteria (option 3)
Targeted	Two updates (before 2021 and mid-term) based on real data (option 4)	2 separate NIMs exercises for 5 years each. Annual adjustments for significant production level changes (both directions) (option 2) New entrant reserve: fixed amounts (i.e. 2.4% of the cap) ('Baseline B')	Mandatory financial support by Member States from auction revenues (option 1)	4 groups according to cost pass through capability with fixed allocation rates Emission intensity and trade criteria (option 4)

¹²⁴ Current ETS Directive unchanged.

¹²⁵ Extrapolation of current rules with some assumptions, in line with the spirit of the presently applicable rules

¹²⁶ Default level of costs not passed through.

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7.5. Analysis of impacts

The impacts of option packages presented in section 7.4 are compared to 'Baseline B'¹²⁷ and assessed in terms of achieving operational objectives.

7.5.1. Direct and indirect effects

Free allocation and addressing the risk of carbon leakage directly affect primarily industrial installations covered by ETS and EU Member States' budgets. The amount of allowances allocated to companies for free has an effect on their cash-flows and profit margins. As free allocation decreases total carbon costs for the companies, it can be argued that free allocation also indirectly affects companies' clients and final consumers, depending on the ability of each element of the supply chain to pass through the carbon costs downstream. Due to multiple variables and uncertainties, however, it is not possible to quantitatively assess these latter effects and they will not be taken into account in the further analysis of impacts.

Instead, the analysis will focus on the economic perspective, in terms of competitiveness considerations for industrial installations, as well as environmental and social impacts.

The administrative burden associated with the free allocation modalities affects operators, Member States' competent authorities implementing the EU ETS Directive and the European Commission.

The majority of installations under the EU ETS are in the energy intensive industries with market structure characterised by large enterprises.

7.5.2. Environmental impacts

The environmental outcome of the ETS is determined by its overall cap and the EU ambition to reduce GHG emissions by 43% in the ETS sectors by 2030 as determined by the Commission Communication on the 2030 climate and energy framework and endorsed by October 2014 European Council. In the EU ETS there is a predefined maximum amount of emissions allowed, corresponding to allowances, to ensure the attainment of the foreseen emission reductions.

EU policies may impact on the climate and other policy choices of third countries. However, this is not a pertinent impact for free allocation, since, as outlined in Commission Communication "The Paris Protocol – A blueprint for tackling global climate change beyond 2020"¹²⁸, the EU's Intended Nationally Determined Contribution (INDC) is a binding, economy-wide emission reduction of at least 40% by 2030 compared to 1990, which includes the sectors benefitting from free allocation. In this sense, any options for the modalities of distribution of free allocation are not likely to impact directly or indirectly the policy choices of third countries. The general setup of the EU ETS, and the benchmarking system in particular, has served as input for the design of other emissions trading systems worldwide. In this sense, the policy choices made for free allocation in phase 4 may have environmental implications in third countries. Nevertheless such impacts can hardly be quantified and hence cannot serve as a basis for comparing option packages.

¹²⁷ 'Baseline A' reflects the current text of the ETS Directive, and is the 'legal' baseline. 'Baseline B' takes into account the current ETS Directive and assumes that current rules will continue beyond 2020, in line with the spirit of the Directive. As such, this is a 'pragmatic' baseline. This is the primary baseline for the impact assessment.

¹²⁸ COM(2015) 81

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Many installations covered by the ETS emit significant amounts of air pollutants, mainly as a result of fuel combustion processes. Therefore, some correlation between CO₂ emissions and emissions such as NO_x, SO_x and particulate matters can be assumed. Nevertheless, as the overall emission reduction goal is not affected by the policy choices on free allocation, no differences in impacts on air quality between the option packages can be expected.

To conclude, the option packages show no markedly different impacts on the GHG emissions, as the overall environmental goal remains unchanged irrespective of the exact methodology to allocate allowances for free.

7.5.3. Economic impacts

Detailed modelling of the economic impacts, including sectoral impacts, has been conducted in 2014¹²⁹. The analysis concluded that free allocation of allowances would be an effective means of reducing the risk of carbon leakage and preserve the output of those industries. It also notes that understanding of different levels of cost pass-through is needed to elaborate carbon leakage measures that provide adequate safeguards, but avoid over-compensation of industry for costs recovered in the market.

To illustrate the order of magnitude of the economic impacts of free allocation modalities, it is noted that the total amount of allowances available for free allocation in 2021-30 is estimated to be about 6.3 billion allowances, which could amount to some €150 billion¹³⁰.

7.5.3.1. Competitiveness

The purpose of free allocation is to address the costs which installations included in the ETS may be facing due to the ETS which may be putting them at disadvantage vis-à-vis international competitors that do not face comparable climate policy costs. If installations in third countries face such costs, for instance as a result of the conclusion of an international binding agreement on climate change or the implementation of climate policies at national level, it could level the playing field with EU competitors. Other countries may also combine carbon costs with some degree of free allocation or similar measures. However, the more countries taking action against climate change, the less there is a necessity for individual countries to provide for free allocation.

The carbon price is not directly impacted by modalities for distribution of free allocation, as the total amount of allowances available (the cap) is not affected by the modalities of allocation (auctioning or free allocation). The carbon price is rather influenced by other factors, such as the surplus of allowances in the system, the level of industrial production, level of emissions, etc.

Therefore, the total carbon costs at macro level are determined by the 40 % overall GHG reduction target, and the specific 43% reduction target for the ETS. The effects of these targets have been studied in the impact assessment for the Climate and energy policy framework 2030.

The different choices about free allocation and other carbon leakage measures can be regarded as largely a zero sum game: whenever one sector faces less cost, other sectors have to face a correspondingly higher cost.

The impacts of option packages on the competitive position of ETS sectors have been analysed and compared to the outcome under 'Baseline B'¹³¹. Other factors affecting competitiveness, but

¹²⁹ See Impact Assessment for the 2030 Climate and Energy Framework (e.g. Section 5.1.4.).

¹³⁰ Calculated with the allowance prices estimated in the "EU Energy, Transport and GHG emissions Trends to 2050 – Reference scenario 2013 (http://ec.europa.eu/clima/policies/2030/docs/eu_trends_2050_en.pdf)

¹³¹ Please see the more detailed analysis results in Annex 6.

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not related to the EU ETS (e.g. global change of demand and trade patterns, labour costs, access to finance and capacity to invest etc.) are not analysed since they are independent from the ETS revision.

The potential financial impact on sectors depends on the carbon price, level of free allocation, the future emissions from production and the extent to which carbon costs can be passed through in product prices to consumers¹³².

In general, it is concluded that **the 'Simple' option package** offers a similar level of free allocation as 'Baseline B' and 'Baseline Bbis' for the industry sectors on the carbon leakage list. There are some limited differences among sectors in terms of level of free allocation compared to 'Baseline B', because the flat-rate benchmark value update can have different effects for different sectors, due to varying rates of emission intensity reductions as a result of technological improvements and investment cycles.

At the same time, the 'Simple' option package would lead to significantly higher levels of free allocation than 'Baseline B' for those industry sectors not on the carbon leakage list, and for other activities eligible for free allocation (mainly district heating, but also some other services).

'Baseline Bbis' would reduce the number of sectors eligible for increased level of free allocation, but still lead to similar levels of free allocation as 'Baseline B'. It would also entail some redistribution from the sectors not on the carbon leakage list to those on the list: industrial sectors on the carbon leakage list could receive a somewhat higher level of free allocation at the expense of lower level of allocation (0% from 2027 onwards) to other sectors, most importantly to the district heating sector.

For **the 'Limited changes' and the 'Targeted' options packages** the level of free allocation compared to 'Baseline B' highly depends on which carbon leakage groups¹³³ the given sector is classified. Both packages lead to a significantly higher level of free allocation than 'Baseline B' for the sectors and sub-sectors in the 'Very high' carbon leakage group, mainly because it's estimated that there would be no need for a cross-sectoral correction factor under these two option packages.

For sectors and sub-sectors in the 'High' carbon leakage group, the total amount of free allocation in phase 4 under these two option packages would be similar to allocation under 'Baseline B' as the difference in carbon leakage factors¹³⁴ (80% instead of 100% under 'Baseline B') is estimated to be in the same order of magnitude as the average cross sectoral correction factor estimated for 'Baseline B' over phase 4. The distribution of free allocation received within the period would be different though: somewhat lower level of free allocation at the beginning of phase 4 under these two option packages compared to 'Baseline B', and vice versa towards the end of the phase.

¹³² OECD study found that substantial cost pass-through of EU ETS allowance price is found in the empirical literature, both in electricity and manufacturing sectors. Especially in electricity markets, cost pass-through rates to wholesale prices are found to lie between 60% and larger than 100%. In manufacturing, the extent of cost pass-through is varied. Pass-through rates found in the literature vary between 0% pass-through for UK glass production to 20% in ceramics, and more than 100% in iron, steel, chemicals and refineries. This implies that in all markets investigated, producers do not bear the full carbon costs and that in most markets investigated, producers can pass on a large share of the carbon cost to product prices and do thus not bear more than a minor share of carbon costs. For details, please refer to Arlinghaus, J. (2015), "Impacts of Carbon Prices on Indicators of Competitiveness: A Review of Empirical Findings", OECD Environment Working Papers, No. 87, OECD Publishing, Paris.

¹³³ Very high, High, Medium or Low

¹³⁴ The carbon leakage factors define what percentage of the 'gross' free allocation sectors in the given carbon leakage group receive

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For sectors and sub-sectors in the 'Medium' and 'Low' groups, the level of free allocation will be lower ('Medium' group) or significantly lower ('Low' group) than under 'Baseline B' provided that these sectors (or sub-sectors) would be on the carbon leakage list under 'Baseline B'. If they are not on the carbon leakage list (i.e. in the case of district heating and some other sector not on the carbon leakage list), the level of free allocation under 'Limited changes' and the 'Targeted' option packages would be similar for the 'Low' group and higher in the 'Medium' group compared to 'Baseline B'.

More detailed analysis results on sectoral effects are presented Annex 36.

7.5.3.2. Administrative burden

Not increasing administrative complexity is an operational objective relevant for all elements of the option packages. For the purposes of this impact assessment, the level of administrative complexity was quantified using the EU Standard Cost Model, complemented with qualitative expert judgment. In particular, the costs were estimated separately for the data collection needed for NIMs exercises, annual adjustments for production level changes compared to baseline (capacity changes and cessations); and financial compensation for indirect emissions.

The underlying methodology and detailed calculations are presented in Annex 7.1. In conclusion, the option packages 'limited changes' and 'targeted' lead to higher costs compared to 'Baseline B' (82 million € for 'limited changes' and 110 million € for 'Targeted') reflecting a higher level of administrative complexity (due to additional NIMs exercise). The annual adjustment for significant production level changes is not expected to trigger substantial additional administrative costs as they replace the activities required for 'Baseline B' (capacity changes and partial cessations). For that reason, the administrative costs of the 'Simple' package and 'Baseline B' are not expected to differ significantly. The 'Targeted' package shows the highest administrative complexity due to the mandatory financial support for indirect cost compensation.

7.5.4. Social impacts

7.5.4.1. Employment

The analysis of social impacts has been conducted (presented in detail in Annex 7.2), concluding that the estimated impacts across different option packages are limited in nature.

Total employment impact has been estimated by considering whether the additional costs are absorbed by the manufacturing sectors, or are being passed through in higher prices, resulting in decreasing sales (i.e. not absorbed by the sector).

For the option packages 'Simple', 'Limited changes' and 'Targeted', small positive impacts on employment compared to 'Baseline B' are expected in the order of magnitude of up to 5000 jobs, representing an increase of 0.1%.

The employment impact of 'Baseline A' is slightly negative reflecting the additional cost for companies.

In the lower estimate case, where all absorbed costs are reflected in changed profits, the total employment impact will reflect the consequences of the costs passed through. In this case the employment impacts are even more negligible.

7.5.4.2. Energy prices for households

The impacts on the energy prices for households were also assessed (Annex 7.2).

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Overall, the estimated impacts of the 'Simple' and 'Limited changes' option packages as well as of 'Baseline A' compared to 'Baseline B' are reductions in heat prices of € 0.77/GJ (almost 3% of baseline price) for 'Simple' and less significant reductions for 'Limited changes' and 'Baseline A'. Only the 'Targeted' package is expected to lead to an increase in heat prices of € 0.22/GJ (0.8% of baseline price).

The 'Simple' option package results in the highest reduction due to the significantly more generous carbon leakage factor compared to 'Baseline B' which outweighs the effect of a reduced benchmark value. The limited cost reduction for 'Limited changes' and 'Baseline A' results from the fact that no cross sector correction factor is expected for these options.

The 'Targeted' option package only grants very limited free allocation to district heating due to the declining carbon leakage factor which is on average only 9% in phase 4.

7.5.5. Comparing the options

In the following assessment step, in addition to the quantified impacts, the operational objectives as described in section 7.2 are used to compare the option packages.

7.5.5.1. Quantified environmental, economic and social impacts

No significant differences of the policy option packages in environmental impacts including GHG emissions and air pollution have been identified as those impacts are mainly determined by the emissions cap and to less extent the predefined auctioning share.

Two main social impacts have been assessed. Regarding impacts on the level of employment, no significant differences between policy option packages and 'Baseline B' have been identified. However, 'Baseline A' could lead to a limited risk of job losses.

With the exception of the 'Simple' package, no significant impacts on prices for district heating have been identified. The 'Simple' package is expected to lead to lower prices in the order of magnitude of 3% of the baseline price. Only for the 'Targeted' package, a limited price increase of 0.8% is estimated.

Overall for social impacts, differences between the options packages are rather small, but the 'Simple' package could be considered as slightly better than 'Baseline B' due to the positive impact on district heating prices for households. 'Baseline A' could be ranked below 'Baseline B' due to a somewhat higher risk of job losses, while 'Baseline Bbis' and the 'Targeted' packages could be regarded as less beneficial due to slightly higher district heating prices. The 'Limited changes' package shows no significant difference compared to 'Baseline B'.

7.5.5.2. Reflect technological progress in industry sectors

The 'Targeted' package reflects technological progress in the benchmark values more closely than other packages due to the sector-specific approach and the two benchmark value updates (prior and during the period). However, there may be trade-offs of reflecting technological progress and fully preserving incentives to innovate, as too short-lived advantages from innovation may discourage such innovation in the first place.

The 'Simple' package reflects progress with a flat-rate percentage used on all benchmark values and may therefore score better to fully preserve incentives to innovate. At the same time, this simple approach to update benchmarks cannot account for differences in sectors in terms of their historic ability to reduce GHG emissions. Such differences could be driven by the share of process emissions of individual sectors. A flat-rate figure could in turn be adjusted to account for process emission intensity of sectors.

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'Limited changes', 'Baseline B' and 'Baseline Bbis' imply an update of benchmarks prior to 2021. This allows for a reflection of technical progress made by then. However, technical developments after this update cannot be considered. Therefore, these packages can be ranked between 'Targeted' as the best package and 'Simple'.

'Baseline A' does not reflect technological progress at all as no benchmark updates are part of this package.

7.5.5.3. Fully preserve incentives for industry to innovate

The benchmarking approach with allocation based on ex-ante production data, which is the basis for all policy option packages including both baselines, ensures that incentives for innovation towards low-carbon technologies are preserved.

To fulfil the objective of retaining the incentives to improve electricity-efficiency by electro-intensive industries, it is important that compensation for indirect emissions should remain limited. As discussed above (see section 7.3.4.2), this can be ensured to different extent by all option packages, for example through the use of consumption benchmarks.

Furthermore, 'Limited changes' and 'Targeted' offer the highest assurance that new entrants and investments will get needed allowances, and thus provides highest incentives for investments as the reserve is supplemented by allowances from cessations.

It can be noted that 'Baseline A' preserves incentives for industry to innovate via the phasing out of the preferential treatment of sectors deemed at high risk of carbon leakage.

Finally, there are no significant differences between 'Baseline B' and 'Baseline Bbis' in this regard.

7.5.5.4. Most efficient installations do not face undue carbon costs leading to carbon leakage

To ensure that the most efficient installations do not face undue carbon costs leading to carbon leakage, it is important that those installations that can operate at a carbon-efficiency level close to the applicable benchmarks receive a level of free allocation that covers their carbon costs which are not passed through to consumers. This can be guaranteed by a high carbon leakage factor (close to 100%) for sectors not being able to pass through a significant part of their carbon costs (and lower for sectors that can pass through some of the costs) in combination with no substantial cross-sectoral correction factor. High carbon leakage factors are part of the option packages except 'Baseline A', and the cross sectoral correction factor is expected to be avoided (or very small) under option packages 'Limited changes', 'Targeted' and 'Baseline A'. The estimated average (over the period 2021 – 2030) cross-sectoral correction factor for 'Simple' is some 5-10% and 10-20% for 'Baseline B' and 'Baseline Bbis'.

The benchmarking approach in general leads to a low risk of undue carbon costs for the most efficient installations as those *de facto* set the benchmark values. However, the 'Simple' package is not sector-specific (reducing values of 2007-08 benchmarks by a flat-rate percentage) and some sectors might not be able to reduce their emissions to the same extent as others. Examples are activities with a significant share of CO₂ process emissions, e.g. lime and cement production (see also above), which could be addressed in the design of the flat-rate approach. Therefore, the other two packages and 'Baseline B' with their sector-specific benchmark updates score better to ensure that the most efficient installations can operate at benchmark levels.

As no update is foreseen for 'Baseline A', it can be expected that during phase 4 a high number of installations will be able to operate more efficiently than the benchmarks based on 2007/8 performance data.

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As part of the 'Targeted' package, mandatory financial support to compensate for indirect costs (passed through carbon costs of electricity production) would minimise the risk that the most efficient installations of electro-intensive sectors could face undue carbon costs. An optional national approach is less effective for the operational objective to avoid undue carbon costs for the most efficient installations. However, this is only valid for the limited number of ETS sub-sectors with very high relative electricity consumption.

To conclude, the 'Targeted' package offers a range of elements to ensure the most efficient installations do not face undue carbon costs. 'Limited changes' address indirect costs to a lesser extent, but has a clearly higher capability to avoid undue costs for most efficient installations than 'Baseline B' (no need for cross-sectoral correction expected). 'Baseline Bbis' leads to similar results as 'Baseline B'. The 'Simple' package contains a flat-rate benchmark update which could potentially lead to undue costs for most efficient installations in some sectors, where the benchmark value is reduced more than what the sector was able to reduce emissions and pass through costs in practice. 'Baseline A' could hardly avoid undue costs due to the lack of specific carbon leakage provisions and a low level of free allocation for all sectors.

7.5.5.5. Better alignment with production levels

The 'Limited changes' and 'Targeted' packages ensure a very high level of alignment with production levels as they use two baseline periods, thus avoiding that allocation at the end of the period is based on more than a decade old production data. Furthermore, they allow annual adjustments for changing production levels in both directions, i.e. both packages foresee allocation for significantly increased production even without a capacity increase.

For the 'Simple' package, the alignment with production levels is better than for 'Baseline B' due to the annual adjustments for changing production levels in both directions. However, only one NIMs exercise for 10 years is part of this package.

'Baseline B' only allows adjustments for production level decreases (partial cessation rules) and significant capacity increases.

Baseline A does not ensure an alignment with production levels, it only provides for correction in case of production decreases. This package does not foresee corrections in case of increased production, not even in case capacity is increased.

7.5.5.6. No increased administrative complexity

The administrative complexity is reflected by the estimated administrative costs of the policy option packages. Some option packages lead to higher costs. .

The option packages 'Limited changes' and 'Targeted' lead to higher costs compared to 'Baseline B' (and 'Baseline Bbis') indicating a higher level of administrative complexity (additional NIMs exercise). The administrative costs of the 'Simple' package and 'Baseline B' are not expected to differ significantly as both packages are based on one NIMs exercise and the annual adjustment for significant production level changes is not expected to trigger substantial additional administrative costs, as they replace the complicated procedures required for 'Baseline B' in case of capacity changes and partial cessations.

Another element which could impact on the administrative complexity is the number of carbon leakage groups. Any differentiation requires more data from installations, especially from installations exporting or using heat for several activities. In this respect, the 'Simple' package (no groups) can be considered easier than 'Baseline B' (two groups), and in particular easier than the 'Limited changes' and 'Targeted' packages (four groups).

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The 'Targeted' package foresees mandatory financial support to compensate for indirect costs. This could lead to higher administrative complexity compared to the other policy option packages (including the baselines), although some reduced burden can also stem from a more common approach. However, the related costs are difficult to quantify as they highly depend on the decision of the eligibility of sectors. Nevertheless it can be concluded that the 'Targeted' package shows a lower capability to avoid increased administrative complexity compared to other packages.

Overall, regarding the operational objective of no increased administrative complexity, the 'Simple' package can be regarded as better than 'Baseline B' (advantages concerning data needs for carbon leakage groups). The 'Limited changes' is expected to lead to higher costs and shows higher complexity on carbon leakage groups than 'Baseline B'. In addition to these disadvantages, the 'Targeted' package is expected to trigger additional complexity to deal with indirect costs. This package is therefore considered even more complex than 'Limited changes'.

To note that 'Baseline A' offers the lowest administrative complexity as no data collection is required either for benchmark updates or carbon leakage assessments.

7.5.5.7. Avoid windfall profits

Windfall profits are avoided if the allocation system provides compensation only for costs that are actually assumed by the operators, i.e. costs which cannot be passed on into product prices without a significant loss of market share to installations in third countries which are not subject to similar carbon pricing. A well-targeted allocation system aims to achieve this objective.

The 'Limited changes' and 'Targeted' packages are highly targeted with their four carbon leakage groups and benchmark values reflecting updated performance data, and thus these two option packages represent a lower level of risk of windfall profits than 'Baseline B'. In addition, the 'Targeted' package is more capable to avoid windfall profits than 'Limited changes', as the benchmarks reflect more recent technological progress in the second half of phase 4¹³⁵.

On the contrary, in the 'Simple' package (with no differentiation of cost pass through capabilities and emission abatement potentials¹³⁶) the risk of windfall profits in certain sectors is higher than 'Baseline B' (two groups and differentiated benchmark update).

A very low risk of windfall profits can be noted for 'Baseline A' due to the low level (30%) of free allocation in all sectors.

Furthermore, the high level of alignment with production levels of the 'Limited changes' and 'Targeted' packages lead to a lower risk of windfall profits from overestimated production levels for those two packages. The 'Simple' package allows such adjustments to a lesser extent, but is still somewhat better in that respect than 'Baseline B'.

'Baseline Bbis' leads to similar results as 'Baseline B'.

To conclude, the 'Targeted' package offers a range of safeguard measures to avoid windfall profits (high level of carbon leakage risk differentiation, benchmarks reflecting recent performance during the period and high level of adjustments to production level changes). Similar to 'Targeted' in terms of avoiding windfall profits, 'Limited changes' differs mainly because of not containing a benchmark update during the period. The 'Simple' package lacks

¹³⁵ As a result of the mid-term update of benchmark values

¹³⁶ The benchmark values of the 'Simple' package risk wind fall profits in some sectors benefiting from technical progress exceeding the uniform improvement rate.

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important elements to avoid windfall profits, namely a differentiation for the capability to pass through costs (through carbon leakage groups) and sector-specific benchmark updates. 'Baseline A' prevents windfall profits to a high degree as no installation receives more than 30% of the 'gross' free allocation.

7.5.5.8. Concluding remarks

Error! Reference source not found. summarises the comparison of policy option packages based on the explanations given in the previous sections.

Table 8: Overview of assessment of policy option packages compared to 'Baseline B'

Operational objectives	Baseline A	Baseline B	Baseline B bis	Simple	Limited changes	Targeted
Technological progress reflected	--	0	0	-	0	++
Incentives to innovate fully preserved	0	0	0	0	0	-
No undue costs for most efficient installations	--	0	0	-	++	++
Better alignment with production levels	--	0	0	+	++	++
No increased administrative complexity	++	0	0	++	-	--
Avoid windfall profits	++	0	0	-	+	++

'Baseline A' scores well on three of the operational objectives, but fails to deliver on the reflection of technical progress, avoidance of undue costs for the most efficient installations and a better alignment with production levels. In addition, the low rankings for social and economic impacts of this legal baseline option allow the conclusion that EU action (amending the existing Directive) would have an added value.

'Baseline Bbis' leads to similar results as 'Baseline B', but is estimated to lead to marginally higher levels of free allocation to industry at the expense of somewhat higher district heating prices.

The assessment shows that there is an important trade-off between administrative simplicity and targeted allocation to avoid undue costs for most efficient installations and windfall profits. The 'Simple' package offers on the one hand – as the name suggests – an allocation system with the lowest administrative complexity of all options (except 'Baseline A' not requiring any data collection). On the other hand, the lack of differentiation triggers risks of undue carbon costs for the most efficient installations in some sectors and risks of windfall profits in some other sectors. The 'Targeted' package and, to a somewhat less extent, 'Limited changes' minimise these risks at the price of higher administrative complexity.

Considering all six operational objectives, the 'Simple' package can be considered as marginally better than 'Baseline B'. Beside its simplicity, this package allows for a better alignment with production levels and offers the advantage of lower district heating prices (positive social

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impact). However, as mentioned above, the rather un-targeted approach, leading to a higher risk of windfall profits, can be considered as a clear drawback.

A direct comparison of the 'Limited changes' and 'Targeted' packages show that both have similar advantages. However, regarding the reflection of technical progress and the avoidance of undue costs for most efficient installations and of windfall profits, 'Targeted' scores better. The 'Limited changes' package is considered as less administratively complex. Finally, it can be noted that for the 'Targeted' and 'Baseline Bbis' packages a limited negative social impact is foreseen due to the price increase of district heating.

8. LOW-CARBON FUNDING MECHANISMS

The Impact Assessment of the 2030 climate and energy framework indicated that significant investments will be needed in the EU in the period through 2030 related to energy system modernisation and to reach the proposed objectives of the 2030 climate and energy framework. According to the Impact Assessment, the investments related to meeting the 2030 objectives would be higher relative to GDP for lower income Member States, reflecting their relatively higher carbon intensity, lower energy efficiency and more limited financial resources. Lower income Member States may face general and financial barriers to mobilise the required investments which may prevent them being fully financed by the market. Less liquid local financial markets, high risk profile and limited creditworthiness of several key actors limit the potential to finance the needed investments without public support. Realising the emission reductions in the lower income Member States could thus contribute to cost-effective reductions from a European perspective. It could also contribute towards the priorities of the European Energy Union with a forward looking climate policy that aims to create more sustainable, secure, competitive and affordable energy for both citizens and businesses.

In this context, the European Council has agreed that a reserve of 2% of the allowances in the EU ETS will be set aside between 2021 and 2030, and the proceeds from this reserve will be used to create a Modernisation Fund to support the EU Member States with lower income (with GDP per capita below 60% of the EU average) in improving energy efficiency and modernising their energy systems, while ensuring simplified arrangements for small scale projects. Furthermore, the existing option for low-income Member States to allocate free allowances to their power sector is to be continued, up to a maximum of 40% of their allowances before redistribution is taken into account. Such investments will need to be aligned with European climate and energy policies and where State aid is involved; the support will be subject to State aid control.

In addition, the ETS Directive supports low carbon innovation in the form of support for renewables and carbon capture and storage through the existing NER 300 mechanism. Recognising the continuing importance of European technological development, the European Council agreed to widen EU support to also include industrial innovation as part of the 2030 framework. To this end, it was agreed to set up an Innovation Fund with such an extended scope and the initial endowment increased to 400 million allowances.

This chapter of the impact assessment analyses the relevant options for the implementation of these low carbon funding mechanisms at the level of the ETS Directive, building on existing experiences.

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8.1. Innovation fund

8.1.1. Problem definition

In order to reach its long term decarbonisation goals¹³⁷, the EU needs to step up its efforts to rapidly introduce new low carbon technologies to the market. An innovation-driven transition to a low-carbon economy not only contributes to the EU climate objectives but offers opportunities for growth and jobs. This has been recognized in the EU's framework strategy for a resilient Energy Union with a forward looking climate change policy¹³⁸, which highlighted as key priorities for research and development renewable energies and CCS for the power sector and industry. To reach the EU objectives, further efforts are needed to support innovative low carbon technologies and processes in the demonstration phase, which is a crucial step towards commercialising and deploying them.

At the end of 2014, the Special Task Force (Member States, Commission, EIB) on Investment¹³⁹ report indicated that while the EU remains a world leader in a number of medium- and high-technology sectors (including clean energy technologies), the EU position is increasingly being challenged by our global competitors, such as USA and China. As indicated in the report, an increasing number of Member States have started to cut back direct public R&D spending in their fiscal consolidation efforts. Complementary action at EU level is an effective way to maximise the development of highly innovative, low-carbon demonstration projects through EU-wide competition. Therefore, the Commission has identified the expansion of renewable energy and resource efficiency as well R&D as priority areas of the European Fund for Strategic Investment (EFSI) that will generate EUR 315 billion of additional investment in the EU in the next three years. These efforts could be complemented by using revenues generated through the sale of EU ETS allowances to promote cost-effective emission reductions in line with the aim of the ETS.

This impact assessment analyses how to design the Innovation Fund to enable highly innovative, low-carbon first-of-a-kind (FOAK) projects in the European energy and industry sectors to support innovative low carbon technologies and processes, especially in the demonstration phase.

8.1.1.1. Underlying drivers of the problem

Together with the price of EU ETS allowances, the need for companies to remain competitive and to develop new products incentivises the development of innovative low-carbon technologies. Irrespective of the level of the carbon prices, the ETS by itself may be insufficient to drive investment in R&D and trigger pre-commercial demonstration phase of new low carbon technologies, thus additional support may be needed. Other factors such as the high inherent level of technological risk can contribute to this. Still, the long-term development of the carbon price will be a key driver for the projects to be effectively supported by the Innovation Fund. The prevailing low carbon price has further underlined the need for public support for highly innovative technologies necessary to achieve emission reductions.

Innovative technologies, notably those involving FOAK projects, face considerable risks and often require public financial support to make the transition between R&D and commercialisation to overcome the so-called "valley of death", i.e. the transition between R&D and market uptake, when new products have to be produced and tested at commercial scale for the first time. The risk profile of demonstration investments in low carbon innovations is often too high to attract

¹³⁷ In line with the EU Roadmap for moving to a competitive low-carbon economy. COM(2011) 112 final

¹³⁸ http://ec.europa.eu/priorities/energy-union/docs/energyunion_en.pdf

¹³⁹ http://ec.europa.eu/priorities/jobs-growth-investment/plan/docs/special-task-force-report-on-investment-in-the-eu_en.pdf

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conventional commercial finance and there is a considerable technological risk relating to construction and implementation of new technologies for industrial-end users. Once the technologies are proven and performance is validated, the market can provide private finance to scale up the technologies and to commercialize them.

Most EU energy-intensive industries and low-carbon energy sectors have developed sectoral 2050 low-carbon roadmaps, identifying promising future technologies to decrease CO₂ emissions¹⁴⁰. However, in an uncertain environment many companies might be reluctant to commit to innovation cycles, which put notable strain on their human and financial resources, and are a liability on their balance sheets. This uncertainty, in particular during the construction phase, forms a financial barrier for both small companies, who often suffer from a lack of access to capital, and large ones, who may lack sufficient financial incentives in the decision-making process to justify innovative and therefore risky investments. A stable carbon price signal can also improve the investment climate for low carbon investments.

The need to provide additional incentives to trigger private investments in new low carbon technologies has been confirmed by the analysis carried out by the Commission in 2014 of the need for European industrial renaissance. The analysis highlighted the importance of speeding up investments in breakthrough technologies and that access to finance is a key challenge to be addressed¹⁴¹. There is a need to channel public funds to support investments that contribute to achieving the EU policy objectives, including both those related to climate and economic growth.

Financial support for innovation could be provided through traditional grants and/or through financial instruments. The Commission¹⁴² has highlighted that financial instruments as a form of policy intervention can have several benefits, including increased effectiveness of and multiplier effects for limited public resources.

At the same time, existing support has not always provided the financing required for deployment of all new technologies due to the high level of risk and large size of the projects. The Innovation Fund could help to bridge this financing gap by providing grants and/or financial instruments specifically targeted at the risk profile of low carbon demonstration projects for renewable energy sources (RES), CCS and industry.

For these reasons, this impact analysis focuses on how to address the financial barriers preventing investments in low carbon innovation, with the existing approach of the NER 300 as the starting point.

8.1.1.2. NER300 lessons learnt

The lessons learnt from the existing NER 300 programme are the starting point for the analysis of how to provide financial support under the Innovation Fund.

The awarded NER 300 funding totalling €2.1 billion will leverage approximately €2.7 billion of private investments and mobilise €700 million from other public sources. This leverage is the result of the design of the NER 300, which funds projects through performance-based cash

¹⁴⁰ The European Strategic Energy Technology Plan (SET-Plan) supports this process through the European Industrial Initiatives (EIIs) which bring together industry, the research community, the Member States and the Commission in risk-sharing, public-private partnerships aimed at the rapid development of key energy technologies at European level.

¹⁴¹ COM(2014) 14 final - For a European Industrial Renaissance

¹⁴² COM(2011) 662 final: A framework for the next generation of innovative financial instruments - the EU equity and debt platforms

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grants. Up to 50% of the additional costs of the innovation is granted, with a possibility to grant upfront funding upon a Member State's guarantee, and disbursed upon achievement of operational performance. In order to cover some of the project's technological risk, a project receives 100% of the funding when reaching at least 75% of the performance over the first years of operation. In addition, the funding cap for any individual project was set at 15% of the total NER 300 resources.

The monetisation approach of the 300 million allowances was designed to allow the EIB to generate revenue reflecting the secondary market price at the time of monetisation. The available funds from the monetisation were lower than had been expected at the outset of the programme. This is a result of the heavy supply-demand imbalance in the carbon market at the time of selling the allowances, but also due to the front-loaded time-profile of selling the allowances and awarding the NER300 grants. The average sales price was €7.19 per allowance. Annex 12 provides a further discussion of this aspect, showing that the monetisation through auctioning of a steady amount of the allowances for the Innovation Fund (and the Modernisation Fund) between 2021 and 2030 would allow for a minimal price risk and market impact, when compared to front-loading the allowances. At the same time, depending on the number of allowances per call, organising 2-4 calls for projects for the Innovation Fund with a start in 2021 would require the timely monetisation of the corresponding share of the total number of allowances. A balanced approach is needed to time the auctioning of allowances in such a way as to provide certainty of available funds, while also avoiding a negative impact on the carbon market.

Under the NER 300 programme, the funds have been fully allocated through two calls for proposals to 38 innovative RES projects and one CCS project in 20 EU Member States. The geographical and technological coverage of the programme was mainly achieved by the 'maximum 3 projects per Member State' rule set in the NER 300 decision and through the definition in advance of innovative technology categories (see table 2 in Annex 4.1). An approach ignoring geographical and technological spread would focus purely on cost per unit performance and create competition between technologies at different stages of maturity.

Out of the 8 Member States which have not received an award, 6 have an GDP < 60% of the EU average and 4 of them have not submitted any proposal to the NER 300 programme. No projects for the technology categories related to hydropower were submitted. Member States have a key role to ensure that promising projects for low-carbon innovation are developed. For the design of the Innovation Fund, a trade-off will need to be made between such safeguards that can help to ensure a spread between Member States and across technologies, and the resulting limitations to the competition between proposals based exclusively on the quality of the proposals. Use of the existing derogation rule for small-scale projects, as successfully applied by the NER 300 project in Croatia, as well as the possibilities to provide some of the funding upfront helped to facilitate projects in certain Member States. These provisions contribute to ensuring a level playing field for project proposals in different Member States.

Targets were set for the share of RES and CCS projects in awards (up to 8 CCS projects, 1 RES project per renewable sub-category). These were not met for CCS, primarily due to the low rate of confirmation of CCS projects by Member States because of the challenges relating to realising the necessary additional funding beyond the NER 300 grant which would have been needed to make these projects financially viable. Consequently, the possibility for a smooth spill-over between the RES and CCS group was crucial to avoid a significant amount of funds remaining unspent (for example by allocating 50% of the allowances to CCS, €750 million of the €2.1 billion available would not have been awarded).

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For CCS projects, the lower than expected revenues from the 300 million allowances combined with the rule on maximum 15% of funding for any single project seem to have compromised the programme's ability to fund the portfolio of CCS technologies. 10 out of 11 CCS projects initially proposed passed the assessment and the capacity threshold, but were in the end not confirmed by Member States. The low final coverage is rather due to financial barriers. In combination with the influence of the carbon price on the underlying business case for these projects, the large scale of such projects necessitated a high level of up front funding in addition to the NER 300 grant which proved to be too high for most Member States to confirm their commitment to the projects after the initial assessment. An additional factor was the funding cap for any individual project set at 15% of the total NER 300 resources, which due to their larger scale was binding for CCS projects but not for renewables, effectively setting a ceiling of 300 million euros¹⁴³ for the level of support provided. A higher rate of funding could help to reduce this financial barrier, in combination with the increase from 300 to 400 million allowances that will lead to a corresponding increase in the maximum limit per project for the Innovation Fund.

As part of the eligibility check, NER 300 applications were rated from 1 to 4 as to their degree of innovation¹⁴⁴. Almost 80% of awarded projects were deemed highly innovative or even potentially game changing¹⁴⁵. Using innovative categories to define projects' eligibility therefore worked properly, although the number and definition of sub-categories should be adjusted to the future potential and need of specific technologies, and possibly more evenly spread, and thresholds carefully considered. The bioenergy and wind energy categories received the highest number of awards, which reflects the choices of the Member States but also the high number of bioenergy sub-categories. Following the eligibility check, the ranking of the projects was based on the cost-efficiency of their performance reflecting the cost-efficient avoidance of CO2 emissions, as required by the ETS Directive.

NER 300 grants are in principle disbursed once projects get into operation and on the basis of their performance. Consequently, the possibility of upfront funding and combining NER 300 support with other EU and national sources, as well as financial instruments such as the Risk Sharing Finance Facility was advised to help projects to address those barriers. Nevertheless, the link between the funding and the operational performance, together with the requirement for Member States to guarantee any upfront funding, means that the NER 300 does not directly address technological risks that occur during the construction phase.

The EIB identified a number of financial barriers for almost all awarded renewable energy projects, such as a lack or uncertainty of national funding, feed-in-tariffs, access to long-term finance or revenues. Similar issues can be expected for innovative FOAK projects in the industry sector, where technological risks play a major role. The existing experience shows that such hurdles relating to the technical and financial implementation affect the time needed to start a project. The deadlines for reaching the final investment decision within two years and getting into operation within four years proved to be too ambitious in NER 300 due to the long preparation, construction and permitting timelines of FOAK projects. The possibility for extension by two years should therefore be maintained for the Innovation Fund. Making part of the funding at an

¹⁴³ 300 million is equivalent to 15% of the total available resources following the monetisation of allowances.

¹⁴⁴ 1. Little or no innovation 2. Some innovation demonstrated, but mainly incremental. 3. Highly innovative project for some component or aspect of the technology. 4. Highly innovative project that is likely to represent a game changing step in technology.

¹⁴⁵ For example, this includes rather risky projects building the first large scale concentrated solar power plants in Southern Europe, gasification plants for advanced biofuels in Northern Europe, a floating wind energy installation in the Atlantic or ocean energy turbine arrays in the North Sea.

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earlier stage, for example upon the completion of specific milestones during the construction phase of a project, could help to speed up project implementation.

Annex 4.1 provides more details on the NER 300 lessons learnt.

8.1.2. Operational policy objectives

Based on the underlying problem drivers and the lessons learned from the experiences with the existing NER 300 mechanism, the operational objectives for the design of the Innovation Fund are the following:

- Achieve breakthrough innovation in the energy and industry sectors in Europe, while targeting support to ensure best use of limited funds;
- Address financial barriers that the project developer needs to overcome when starting the project and provide incentives to commercial-scale low-carbon FOAK projects;
- Avoid distortion of competition and minimise the impact of the mechanism on the general functioning of the European carbon market;
- Set up an efficient, simple management structure.

The operational objectives will be used to derive criteria for comparing policy options and assessing their impacts.

8.1.3. Policy options

A key challenge in developing the policy options is to appropriately cover the different breakthrough technologies and proposals within the RES, CCS and industry sectors to ensure the selection of sufficiently innovative proposals. The Innovation Fund also has to ensure that appropriate types and levels of support can be offered. On the other hand, the question of how to address risk – both in terms of the funding rate and of reducing the operational risk – needs to be properly addressed. To this end, potential options are considered both in relation to the way that projects are screened and selected, as well as to the way in which financial support is provided.

8.1.3.1. *Screening of projects*

As was the case under the NER 300, projects should be classified into the innovative technology categories defined in the NER 300 Decision to be eligible and be rated according to their degree of innovativeness to clarify what could receive funding. Eligible projects should then be ranked based on the cost-effectiveness of their performance.

Industry projects might need a different approach, since there is a risk that putting projects with different characteristics and needs in direct competition might not deliver a good technological spread of proposals. Ranking industry projects only on the basis of their performance would likely reward only the large ones, which may benefit from economies of scale and, thus, have better overall cost performance. Further, the selection would then risk primarily reflecting the differences between sectors and in physical boundaries, rather than level of innovation.

Certain sectoral 2050 roadmaps developed for the industry have identified possible future technologies with a high level of detail, such for instance in the forest and fibre sector¹⁴⁶.

¹⁴⁶In the forest and fibre sectors, the identified technologies potentially offer significant leaps of more than a 20% improvement that could be demonstrated within a few years.

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However, more work is still needed to identify innovative low carbon breakthroughs in many other industrial sectors.

Capturing the relative merits of proposals for industry with regard to innovation based on a directly comparable criterion could be done through a qualitative assessment, which would make a direct comparison more difficult compared to a quantitative criterion such as cost per unit performance. Special attention must be paid to maintaining an objective way of comparing diverse industry projects, to ensure that funding will deliver breakthroughs in innovation representing EU value added. For these reasons, comparing improvements to a pre-defined benchmark¹⁴⁷ or the replicability potential of a technology¹⁴⁸ could be considered as eligibility criteria when making the support scheme operational.

Alternatively, innovation could be used as a ranking criterion. Industry projects' innovative potential could for example be rated from 1 to 4¹⁴⁹ by comparing projects' technologies to the state-of-the-art and measuring their availability amongst multiple vendors, degree of development and potential for scale-up. Where the innovative quality is judged to be equal and the funds are insufficient to fund all proposals within the same rating, the cost-effectiveness of performance could be used as a second criterion.

It should be noted that innovation should be used either as an eligibility criterion or as a ranking one, to avoid confusion in the selection process.

8.1.3.2. Conditionality of Awards

NER 300 awards are linked to projects achieving operational performance. In order to cover some of the risks, the project can receive a certain degree of upfront funding upon a Member State's guarantee, followed by 100% of funding when demonstrating at least 75% of the targeted performance.

An alternative approach in order to widen risk coverage in the Innovation Fund would be to award part of the funding on the basis of achieving milestones in the construction phase. A fixed percentage (e.g. 30%) of the additional costs of innovation could be conditional on finalising steps in design, permitting and construction. This is the approach followed by the US ARPA-E programme¹⁵⁰, advancing high-potential, high-impact energy technologies. ARPA-E selectees may request a Budget Plan Payment (BPP), to obtain reimbursements on a prospective basis in order to purchase the necessary equipment or services required to achieve specific milestones.

Linking funding to the achievement of specific milestones has proved beneficial also in the EU based on one of the lessons from the 2009 European Energy Programme for Recovery (EEPR). Under this programme, grants were awarded to highly strategic projects in gas and electricity

¹⁴⁷ This would be the indicator of progress compared to products' benchmarks, based on the best available technologies, e.g. a 20% reduction compared to current product benchmarks for ETS free allocations.

¹⁴⁸ Replicability is important to streamline technologies across the board in a specific sector, e.g. measured in terms of EU installations that could implement the same solution. This can be ensured for example via licencing agreements, continuous development in excellence centres or multi-year consortia agreements, aiming to achieve a certain number of industry installations.

¹⁴⁹ See footnote 9

¹⁵⁰ Bill Text Versions 111th Congress (2009-2010) H.R.5116 - America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Reauthorization Act of 2010 (Enrolled Bill [Final as Passed Both House and Senate])

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infrastructure, offshore wind and carbon capture and storage¹⁵¹. This could apply to both energy and industry projects, since there is no material difference in the construction process.

As an example, the hypothetical steps in the construction of an innovative offshore wind farm could be considered to identify some steps which could be considered milestones: reaching final investment decision (FID), construction of all foundations, construction of all turbines or installation of all turbines and the start of the delivery of power to the grid. All milestones should be relevant in terms of justifying the partial granting of investment support.

8.1.3.3. Type of instrument

NER 300 provides cash grants. Such support is attractive both for financial institutions, for which innovative projects are often not bankable, and for project sponsors, which find in grants an effective way of improving their financial standing (see also section 8.1.5.2). The NER 300 programme has linked such grants to operational performance to deliver funding to highly innovative FOAK projects characterised by long planning and construction times, a high risk profile and hard-to-predict budgets.

An alternative could be to switch to a financial instrument. Financial instruments are designed to address market failures or sub-optimal investment situations which have proven to be economically viable but do not give rise to sufficient funding from market sources due to their particular risk structure. As an illustration, financial instruments can include guarantees on first loss that could allow banks to provide loans to riskier projects than they would otherwise support. An alternative could be to invest public equity, in which case projects would be selected through a permanent financing facility on an open-call basis. Due to the high risk involved in FOAK demonstration, the Innovation Fund should target projects with higher risk levels when compared to the investments supported through existing financial instruments.

8.1.3.4. Maximum rate of funding

NER 300 covers up to 50% of projects' additional costs of the innovation (for example, the CCS part of a power plant or additional costs for a RES plant compared to a fossil fuel reference plant). RES projects on average requested NER 300 funding equivalent to 39% of their additional costs. Due to the limit of maximum 15% of total NER 300 funding for any one project, no more than €300 million could be awarded to the only CCS project, which covers only 34% of the additional costs.

In the consultation on carbon leakage provisions and innovation support, more than half of the industry respondents indicated that in their view, there is a particular need to strengthen the EU's innovation support for the implementation of large-scale pilots. When it comes to the risk sharing approach, in the general consultation on the ETS revision, different industrial sectors, Member States civil society members (including trade associations and ngo's) have highlighted the importance of appropriate risk sharing in the innovation process, for example through an increase in the current co-financing rate. For industry innovation, the projects are not as large as for CCS. They are thus not as likely to be limited by a 15% share of the total amount available. However, if there was a low limit on the funding rate per project, this could have a negative impact on the success of industrial projects.

For these reasons and to reduce projects' significant financial barriers (including lacking or not ensured national funding, additional operating support, feed-in-tariffs or similar national support

¹⁵¹ Report from the Commission to the European Parliament and the Council on the implementation of The European Energy Programme for Recovery, COM(2013) 791

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schemes, equity, long-term debt financing or revenues, as indicated in the sections on lessons learned) as well as the level of technological risk, the maximum funding rate could be increased to up to 75% in the Innovation Fund. The specific needs can be assessed for RES, CCS and industry in the context of the implementing legislation for the Innovation Fund. However, if the rate were applied to all technologies and projects are selected through a ranking based on targeted cost-per-unit-performance, existing experience suggests that for most subcategories of RES projects, the actual requested funding for such projects will on average be lower than the maximum that is allowed.

If support was provided through financial instruments rather than grants, this would imply a different approach. While the detailed parameters for such support would need to be further elaborated, financial instruments could for example take the form of equity participation or of a guarantee on the first loss covering a certain percentage of the additional cost of the innovation. With such an approach, there would be no directly comparable level of funding, but rather a maximum coverage of risk related to the investment with the aim to increase the financial viability of the project.

8.1.3.5. Parameters not varied in the options

There are a number of design features, which have proven appropriate under the NER 300 programme and are proposed not to be varied in the options, except for an adjustment to the higher volume (400 instead of 300 million allowances) and longer duration (10 instead of 5 years) of the Innovation Fund:

The NER 300 management structure, consisting of cooperation between the European Commission, Member States and the EIB, was effective for developing and selecting projects, to monetise allowances and to manage revenues. While the simplification of the interaction between the three bodies and a reduction of administrative burden for project sponsors should be considered, this is mainly related to an implementing measure to the Innovation Fund.

The limit of maximum 15% allowances per project is proposed to be maintained¹⁵². A higher limit would increase the potential for large projects to participate but would result in a lower total number of projects funded.

The limit of 3 projects per Member State introduced in the NER 300 decision was appropriate to ensure adequate geographical coverage under the programme (see section 8.1.1.2). It could be maintained or adjusted to 4, dependent on other design features such as the maximum funding rate and the resulting total number of projects.

Two calls for proposals within 5 years were adequate under the NER 300 programme, to ensure stability in funding and monetisation of allowances. This could be maintained or adjusted to 4, depending on the appropriate timing of monetising 400 million allowances, as is described in Section 8.1.1.2.

The current knowledge-sharing provisions are perceived as cumbersome, and should therefore be streamlined to ensure smoother implementation, although an element of knowledge sharing should be kept as there is a clear public interest in replicability of the projects. As with the management structure, these provisions are not set at the level of the Directive. Industrial sectors that have a sectoral cooperation already incorporated (having developed their low-carbon roadmaps) could have better possibilities of developing breakthrough technologies than

¹⁵² The resulting amount will be higher, due to the increase from 300 million to 400 million allowances.

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individual companies doing it alone. Previous examples, such as e.g. the ULCOS¹⁵³ process of the steel sector, illustrate that such approach is possible and accepted by industry. In the case of several companies of a particular sector joining resources, the benefits of knowledge sharing – and of their possible licensing – could be included as one of the design features, taking into account respect of competition rules.

Indicative shares for CCS and RES projects with a smooth spill over possibility between the groups were crucial under the NER 300 programme to ensure the allocation of all available funds. A similar indicative share could be set for industry projects.

8.1.4. Option packages

Four option packages are taken into consideration, by combining the options set out in chapter 8.1.3. The legal baseline scenario would imply no changes to the ETS Directive and hence no continuation of support to innovation. The alternative baseline scenario represents a continuation of the current practice by extending the current NER 300 rules to industry. Option 1 envisages tailored rules and selection criteria applying for industry. The risk approach would be changed for industry, renewables and CCS by higher co-funding rates and early disbursement of part of the funds following the achievement of construction milestones. The essence of this option is to provide alternatives to share investors' risks and make innovative investments more conducive. Option 2 foresees the creation of a permanent financing facility selecting projects continuously on a first-come-first-serve basis based on the innovation merits of the proposal. This option assumes the application of financial instruments instead of grants.

Table 9: Option packages for innovation fund

	Screening of projects		Conditionality of awards	Type of instrument / risk approach	Maximum rate of funding (for all categories)
	Eligibility	Ranking			
Baseline (Directive unchanged)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Alternative baseline Current rules continued	Innovation	Performance (CPUP)	Achieving operational performance (funds awarded based on realising 75% of performance)	Grant (2-4 rounds / calls for proposals)	Up to 50% of additional costs
Option 1 Amended approach for all sectors with tailoring for industry	For industry: Innovation (e.g. certain percentage improvement of benchmark, where applicable) AND Replicability	Performance (CPUP) potentially complemented with "innovation criterion" for industry	Achieving milestones in construction phase (e.g. 30% of additional costs, awarded for finalising steps in design, construction) AND Operational performance (e.g. 45% of additional	Grant (2-4 rounds / calls for proposals)	Up to 75% of additional costs

¹⁵³ ¹⁵³ ULCOS (Ultra-Low Carbon dioxide(CO₂) Steelmaking) is a consortium of 48 European companies and organisations from 15 European countries that launched a cooperative R&D initiative to enable substantial reductions in CO₂ emissions from steel production. The consortium consists of all major EU steel companies, of energy and engineering partners, research institutes and universities and has been supported by the European commission. The consortium brings together the shared knowledge so that for a particular technology developed, patents may be owned by different companies and licencing rights for new plants may have been agreed with other partners

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	(e.g. applicable in installations representing a minimum share of ETS emissions) Current rules for RES and CCS		costs, upon realising 75% of performance)		
Option 2 Permanent financing facility	Innovation	Selection based on due diligence - projects are approved on 1 st come 1 st served basis if eligible	Not award but financial instrument (e.g. guarantee on first loss covered, loan or equity)	Financial instrument with continuous open window	Not applicable, depends on design of financial instrument

8.1.5. Analysis of impacts

8.1.5.1. General impacts

Complexity and administrative burden

In the alternative baseline and Option 1 the innovation support would be awarded via calls for proposals, primarily carried out under the responsibility of the European Commission. Building on the NER 300 experience, well organised and managed calls would not increase the complexity or administrative burden from current levels. However, specific rules for the inclusion of industrial projects might increase the complexity of the selection assessment, since elements such as the assessment of replicability and ranking based on innovation and cost-effectiveness of performance would need to be considered.

In case of Option 2, the permanent financing facility would allocate support to projects selected on a first-come-first-served basis. This continuous selection would provide applicants with more flexibility as their proposals would not be tied to the timing of calls for proposals. In terms of project evaluation, for a comparable number of projects to be reviewed, no substantial differences are expected in the overall burden between Options 1 and 2. Structuring financial instruments to address the specific needs of different technologies would require considerable know-how to assess and allocate the risks properly and could increase complexity. At the same time under Option 2, this role would need to be assumed by financial institutions such as the EIB that already has extensive experience in structuring complex deals. An expanded role for such a financial institution may be reflected in the fees that are charged for the activities carried out when compared to the baseline scenarios. The transparency of the level of support should also be ensured. The experience in setting up and operationalizing the new European Fund for Strategic Investments under the EU Investment Plan would also be relevant.

Complementarity to other EU instruments

A range of instruments has been developed at EU level to support the development of innovation activities, and research and development more broadly¹⁵⁴, which are expected to support total R&D investments of approximately €48 billion through 2020¹⁵⁵. Additionally, at the end of 2014 the Commission unveiled the new European Fund for Strategic Investments under the EU

¹⁵⁴ For example as part of InnovFin under Horizon 2020.

¹⁵⁵ http://europa.eu/rapid/press-release_IP-14-670_en.htm

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Investment Plan¹⁵⁶. It is expected to make an important contribution in the short term to the climate and energy investments, highlighting the importance of infrastructure, energy efficiency and renewables¹⁵⁷.

While it cannot be anticipated what EU level instruments will exist in 2021, the complementarity of the Innovation Fund in relation to existing policy instruments would come from the specific focus on providing support for low carbon innovation at the pre-commercial demonstration phase. By managing the Innovation Fund at EU level, it can be ensured that it complements and reinforces other existing instruments.

Providing support in the form of a performance-based grant (as in the alternative baseline or option 1) or through a financial instrument which explicitly targets projects with a higher level of risk when compared to other existing EU-wide instruments, such as the existing InnovFin programme (as in option 2) can be complementary to other EU instruments.

8.1.5.2. Economic impacts

Effectiveness in addressing barriers for low-carbon innovation

The NER 300 lessons learned (see Annex 4.1) showed that the current NER 300 rules, i.e. the alternative baseline option, were effective in encouraging the development of projects for RES innovation. However, the deadlines for reaching the final investment decision within two years and starting operations within four years proved to be too ambitious due to factors including the long preparation, construction and permitting timelines of FOAK projects. In addition, this approach does not seem to adequately address the risks for pre-commercial demonstration projects in energy intensive industries and CCS projects. This is supported both by the NER 300 experience of only 1 CCS project awarded and the recent 2014 stakeholder consultation on the future EU-ETS carbon leakage and innovation rules.

Various stakeholders indicated that the current NER 300 rules would not be sufficient to trigger innovation for the energy intensive industry, since project sponsors would have to bear the high financial and technical risks of capital intensive investments. Since the return on such investments can be reaped only in the longer term, in the short run such projects do not seem to be ranked as a first priority in companies' internal decision making processes. As a result, innovation might not occur at the speed needed to meet the EU's long term decarbonisation objectives. It is likely that such investments would rather be realised in those Member States where higher levels of national public support are offered, while in others potential could remain underdeveloped.

In that regard, Option 1 could substantially lower the co-finance needs of project sponsors, given the higher funding rate and the early disbursement of part of the funds following the achievement of milestones. The funding provided through the grant would lower the costs borne by project sponsors, improving the financial viability of the project. At the same time, linking the grant to the achievement of milestones would be more attractive when compared to the alternative baseline. Under the alternative baseline, the funding is tied to operational performance at a later stage and discounts will be applied to reflect this.

¹⁵⁶ http://ec.europa.eu/priorities/jobs-growth-investment/plan/index_en.htm

¹⁵⁷ It should be noted that the NER 300 and the Innovation Fund differ from the new European Fund for Strategic Investments. EFSI will work through financial instruments only, lending to existing projects ready to start within three years and will have a wider scope covering variety of sectors such as the digital economy and education.

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Option 2 which envisages the creation of a financial instrument (e.g. guarantees, loans or equity investments, and risk-sharing instruments)¹⁵⁸, can also address barriers faced by project promoters. If providing public equity, the projects could be supported from the beginning stages of development. Such public equity investment could lower the need for project promoters to raise debt and private equity. As an alternative, if the financial instrument is implemented as a guarantee that would cover for a percentage of the losses in case of a loan default, this would allow financial institutions such as the EIB, national promotional banks and/or commercial banks to lend to riskier projects than they would have otherwise. This also addresses the project in the earlier stage of development compared to the alternative baseline. In certain cases financial instruments might not address the large financing gap in the demonstration of FOAK projects (e.g. CCS projects). Financial instruments can stimulate a significantly higher level of private investments, but this will likely be in technologies that are closer to commercial scale deployment.

Potential to attract innovative projects

The lessons learned from the existing NER 300 mechanism (Section 8.1.1.2) show that the current rules and selection mechanism have resulted in a portfolio of projects for renewables that were identified in many cases as highly innovative or even game changing (80%) according to the existing framework. At the same time, while multiple proposals were initially submitted, only 1 CCS project has been confirmed.

The alternative baseline would imply applying a one-size-fits-all approach, using the existing rules for renewables, CCS and industry. As discussed in Section 8.1.5.2, there is a risk of not attracting a similar number of innovative project proposals in the CCS and industry sectors. As a result, in particular CCS projects could still face similar risks as the existing NER 300 projects, such as uncertain national funding, lack of private equity or long-term debt financing.

Option 1 has a higher potential to attract innovative projects with its risk sharing elements. Raising the maximum funding rate to 75% has the potential to encourage more innovative project proposals to be submitted for the Innovation Fund for RES, CCS and industry. In addition, directly targeting innovation for proposals from industry as the basis for the ranking of proposals during the selection process (compared to the current practice of it being an eligibility criterion) is expected to make the system more attractive for innovative projects with a lower technological maturity. As discussed above, increasing the maximum funding rate would also facilitate addressing the financial barriers of such innovative projects, if they are selected.

Option 2 involves providing financial support to projects through financial instruments, such as loans, guarantees or equity which would target projects with a higher risk level compared to existing instruments (e.g. the current InnovFin programme). This could enable a pipeline of more innovative projects with a higher risk profile to access financing when compared to existing EU and EIB financial instruments, for example by covering the first loss which would be incurred or through co-investing equity (See Section 8.1.5.2). A decision on supporting a project would be carried out by an entrusted financial entity such as the EIB that would evaluate the projects based on economic, financial, technical and environmental criteria. There is a risk that such an approach would be more beneficial to closer to market pre-commercial technologies that have higher short term revenue generating potential, overlooking technologies that take longer to develop but are more interesting in the long term. Therefore under Option 2 financial instruments might not be

¹⁵⁸ As an illustration, the funds could be used to invest in equity alongside project promoters. This would lower the costs for private investors, while also lowering their expected revenues from the project.

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sufficient to fully address the financial barriers faced by break-through innovation projects without additional public interventions, such as grants.

Leverage

A similar leverage as for the NER 300 funding (see Annex 4.1) is expected for the alternative baseline. The leverage of Option 1 would likely be lower due to the higher co-financing rate and hence the lower need for private investments. Additionally under Option 1 part of the funds would be reimbursed prior to proof of performance. While funding partial success or failure can still deliver benefits in the form of knowledge sharing, from a financial perspective this would imply the loss of some of the funds compared to disbursement based on proving operational performance.

On the other hand, significantly higher overall leverage could be reached under Option 2. Preliminary evidence shows that the EU contribution to financial instruments mobilises a global investment exceeding the EU contribution by 4 to 10 times on average¹⁵⁹. Since the Innovation Fund addresses inherently riskier innovation projects, the leverage realized would likely be in the lower range but still significantly higher than for traditional grants under Options 1 and the alternative baseline. While project failures may lead to overall higher losses than under grants or debt instruments, on the other hand under financial instruments proceeds might reflow to the fund and be used to finance additional projects.

Competitiveness

Low-carbon innovation in the energy and industry sectors would improve the overall EU competitiveness by supporting low-carbon technologies where the EU has global technological leadership. Better and more efficient technologies will benefit the entire supply value chain and ultimately consumers. Furthermore, such innovative technologies can create a substantial number of new jobs and generate new business opportunities. There is also evidence that low-carbon technologies induce larger overall economic benefits, as they generate more knowledge in the economy, which in turn can be used by other innovators to further develop new technologies.¹⁶⁰

Additionally, knowledge-sharing requirements under the Innovation Fund would contribute to the dissemination of the results across borders, technology exchange and associated catching-up effects. It could also help to reduce the innovation gap between sectors and/or Member States.

The Innovation Fund could improve the prospects for EU companies to increase exports in rapidly growing low-carbon markets.

The extent to which the different options would improve EU competitiveness would depend on how effectively the fund incentivises innovation in new low carbon technologies and processes. The alternative baseline and Option 1 would strengthen the global competitive position of EU businesses selling low-carbon technologies. The inclusion of replicability as an eligibility criterion for industry projects in the assessment would also ensure a measure of the overall potential for improved competitiveness through a significant contribution to overall industrial emissions across the energy intensive industry sector in the EU. This could help to ensure higher benefits for competitiveness.

¹⁵⁹ Report from the Commission to the European Parliament and the Council on financial instruments supported by the general budget according to Art. 140.8 of the Financial Regulation as at 31 December 2013, COM(2014) 686.

¹⁶⁰ The impacts of environmental regulations on competitiveness, Grantham Research Institute on Climate Change and the Environment, UK, 2014

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Option 2 is expected to result in higher leverage and may be more attractive to investments which are close to commercialisation. This could lead to quicker realisation of the projects and a more rapid diffusion of the technologies supporting competitiveness, but there is a risk that to enable breakthrough innovative FOAK demonstration projects additional support might be needed in the form of grants.

Consequently, Options 1 and 2 both have the potential to improve competitiveness compared to the alternative baseline.

EU added value and geographical distribution

The Innovation fund would target support towards projects with EU-wide significance. Through EU-wide coordination, it would be possible to reach the requisite scale for highly capital intensive demonstration in RES, CCS and industry projects across the Member States in particular compared to a scenario where only national schemes exist. The EU focus could provide additional benefits in terms of the development of technological standards at the EU-level. Under the alternative baseline and options 1 and 2 such benefits would also be extended to the energy intensive industry sectors.

The purpose of the Innovation Fund is to ensure a diverse geographical distribution and cover projects in industry, CCS and RES. The experience with the NER 300 projects, selected and ranked through two calls for proposals by EU-wide competition, showed the EU value added of the programme in terms of maximising innovation and decarbonisation benefits. The geographical and technological spread of innovative projects (see Section 8.1.1.2), combined with the knowledge sharing requirement for project sponsors, is likely to result in an effective knowledge spill-over throughout Europe. As indicated in Section 8.1.1.2, the rules relating to the maximum number of projects per Member State did not guarantee that projects were funded in all Member States, but acted as a relatively light safeguard against a high number of project proposals being approved in one Member State. The alternative baseline for the Innovation Fund would lead to a comparable outcome in terms of geographical distribution and contribution of EU-value added. On the other hand, for both options 1 and 2, the expansion of scope to include industry is an opportunity to develop a promising project pipeline in low income Member States which also have high potential for economic growth. This could contribute to a wide geographical distribution.

Since Option 1 also includes replicability as one of the eligibility criteria for industry projects, this could help ensuring an even higher EU added value, since projects' technology could be deployed / licensed at a larger scale to other similar installations. Additionally, under the baseline, project promoters should have received a guarantee from Member States to receive up-front financing. Regarding Option 2, financial instruments would need to include a provision for maximum geographical concentration ratio to ensure geographical balance. In fact, through a large portfolio of projects with different risk profile, an optimal level of portfolio risk could be achieved. As a result, both Option 1 and Option 2 can be considered to represent a higher potential EU added value than the alternative baseline.

8.1.5.3. Environmental impacts

The Innovation Fund addresses investments in low carbon innovation for CCS, RES and energy intensive industry. All three scenarios would facilitate the commercialization of new low carbon technologies that would facilitate achieving the long term decarbonisation objectives in the EU. The environmental benefits of low carbon technologies will increase over time as the technologies are replicated and deployed on a larger scale.

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In the longer term, more direct environmental benefits such as increased use of renewable resources, improved energy efficiency, improved local air quality and related health benefits are expected.

It should be noted that projects supported under the three options could have a different impact regarding verified avoidance of CO₂ emissions. Under the alternative baseline would continue to be disbursed strictly upon proof of avoided CO₂ emissions. Option 1 and 2 would be less directly linked to such reductions, as the support could be paid before the project enters into operation.

8.1.5.4. Social impacts

Although it is not possible to quantify the impacts on employment in the individual Member States, a positive impact on employment such as the creation of new high value-added jobs across the entire supply chain, could be expected in proportion to the level of investments, triggered by the Innovation Fund.

As indicated in the impact assessment accompanying the Communication from the Commission "Horizon 2020 - The Framework Programme for Research and Innovation"¹⁶¹, a wealth of evidence demonstrates the crucial role that research and innovation play for the creation of more and better jobs, for productivity growth and competitiveness, and for structural economic growth. To boost future productivity and growth, it is critically important to generate breakthrough technologies and translate them into innovations that are taken up by the wider economy.

8.1.6. Comparing the options

In the previous section, seven different impacts, in particular economic impacts, were analysed as presented in the table below.

Table 10: Comparison of options for the innovation fund

	Baseline (directive unchanged / no support for innovation)	Alternative baseline (Current rules continued)	Option 1 (Amended approach for all sectors with tailoring for industry)	Option 2 (Permanent financing facility)
Minimise complexity and administrative burden	Not applicable	0	-	-
Complementarity with other EU instruments	Not applicable	0	+	+
Effectiveness in addressing barriers for low-carbon innovation	Not applicable	0	++	+
Potential to attract innovative projects	Not applicable	0	++	0
Leverage	Not applicable	0	-	+
Competitiveness	Not applicable	0	++	++
EU added value and geographical distribution	Not applicable	0	+	+

The analysis of the options shows that the options involve several trade-offs with regard to the resulting impacts. While all seven criteria presented above are relevant to comparison of the options, relative to the other criteria the 'Effectiveness in addressing barriers for low-carbon

¹⁶¹ Commission Staff Working Paper – Impact Assessment accompanying the Communication from the Commission "Horizon 2020 - The Framework Programme for Research and Innovation", SEC(2011) 1427

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innovation' and 'Potential to attract innovative projects' are key factors contributing towards the fund objectives.

Option 1 would be very effective in addressing specific barriers for low-carbon innovation by substantially lowering the financial barriers for project sponsors. It would provide cash grants (opposed to a financial instrument such as equity or a guarantee in Option 2) combined with a higher funding rate (up to 75%, as opposed to 50% in the alternative baseline) and the option for early disbursement of part of the funds following the achievement of construction milestones (opposed to the disbursement of funds only on the basis of achieving operational performance as in the alternative baseline).

While it would be expected to result in a lower leverage and a lower number of projects being supported than either the alternative baseline or Option 2, Option 1 represents the highest potential to address the specific barriers to support the commercialization of break-through innovation for CCS, RES and energy intensive industry. This package would likely attract the highest number of applications of innovative FOAK projects in the energy and industry sectors and ensure effective project implementation.

Option 1 could also deliver significant EU added value by taking into account replicability of industry projects, while still rules providing safeguards to help allow a wide variety in the geographical and technological spread of projects within the EU and achieving a critical mass in terms of funding which would not be attainable by Member States alone.

Similar outcomes could also be realised by the first-come-first-serve selection process provided by Option 2, but this option would offer less scope for a comparison between numerous project proposals and may need to be combined with additional public support in order to enable more far reaching innovative projects to be realised. Both Option 1 and Option 2 are expected to provide significant benefits with regard to competitiveness and to be complementary to existing EU instruments.

An Innovation Fund implemented through Option 1 (provision of grants), could be closely coordinated with other EU-level and national level support schemes. To increase the impact of the Innovation Fund under Option 1, an increased level of coordination between grants and financial instruments could be beneficial to address market failures. Duplication should be avoided, but a combination of such instruments could cater to a wider set of technologies and projects as grants and financial instruments normally do not fully cover the same underlying risks and could be regarded as complementary.

8.2. Modernisation fund

8.2.1. Problem definition

8.2.1.1. Context

The European Council has agreed that a reserve of 2% of the allowances in the EU ETS will be set aside between 2021 and 2030, and the proceeds from this reserve will be used to create a Modernisation Fund to support the EU Member States with lower income (with GDP per capita below 60% of the EU average) in improving energy efficiency and modernising their energy systems, while ensuring simplified arrangements for small scale projects. There are 10 beneficiary Member States: Bulgaria, the Czech Republic, Estonia, Croatia, Latvia, Lithuania, Hungary, Poland, Romania, and Slovakia¹⁶². The creation of the Modernisation Fund implies a

¹⁶² Eurostat, 2013 GDP per capita at market prices.

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net transfer of 223 million allowances to the beneficiary Member States from the remaining EU Member States (See Table 31 in Annex 10).

8.2.1.2. Underlying drivers of the problem

At the end of 2014, the Special Task Force (Member States, Commission, EIB) on Investment¹⁶³ as one of its tasks analysed the market barriers for investments to various sectors in the EU. It concluded that across sectors macroeconomic uncertainty, insufficient structural reforms, incomplete single market as well as regulatory constraints negatively affect the investment climate. Administrative burden has also been identified as a major bottleneck. The report specifically looked into market barriers for different sectors and highlighted that for the energy sector the barriers to investment, and hence potential solutions, differ between grids, production projects, energy efficiency and distributed renewable energy projects. See Annex 9 for details on the financial barriers for investment in the energy sector.

The Modernisation Fund could play a role in addressing such specific financial barriers. While the European Council already agreed on the establishment of the fund, it did not define the governance structure, including the details of the respective roles of the beneficiary Member States, EIB and other institutions to modernise the energy sector and improve energy efficiency.

Since the governance structure matters for the effectiveness of funding mechanisms, this Impact Assessment focuses on the design of the fund to make best use of the expertise and knowledge of the various institutions involved. Further details on the modalities of the fund, including eligibility criteria and specific type of support used (grant, financial instrument or a mix of the two) would need to be detailed in a subsequent implementing legislation and/or decided by the board of the fund.

8.2.1.3. Lessons learnt

The Modernisation Fund is a new policy mechanism, so it is necessary to draw on the experience of implementing existing initiatives related to the ETS such as the free allocation to the power sector under Article 10c of the ETS Directive and the funding of innovative investments through the NER300 initiative. More general lessons on governance of investment platforms can be drawn from the Commission, EIB and Member States' experience in implementing financial instruments, and from the work related to setting up of the European Fund for Strategic Investments under the EU Investment Plan.¹⁶⁴

One element that has been highlighted by private stakeholders in the recent discussions of the EU Investment Plan is the importance of robust project quality criteria and an independent selection of projects¹⁶⁵. Additionally, there is an emerging lesson from the implementation of Cohesion policy in the EU. While Member States have expressed political commitment¹⁶⁶ to have financial instruments play a more important role in the multiannual financial framework for 2014-2020, currently these represent less than 10% of total support¹⁶⁷. More generally regarding financial instruments, based on the experience gained during the 2007-2013 implementation period with

¹⁶³ http://ec.europa.eu/priorities/jobs-growth-investment/plan/docs/special-task-force-report-on-investment-in-the-eu_en.pdf

¹⁶⁴ http://ec.europa.eu/priorities/jobs-growth-investment/plan/index_en.htm

¹⁶⁵ http://ec.europa.eu/priorities/jobs-growth-investment/plan/docs/proposal_regulation_efs_en.pdf

¹⁶⁶ EUCO 169/13

¹⁶⁷ http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/cohesion6/6cr_en.pdf

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financial instruments¹⁶⁸ developed by the EU and EIB, it can be concluded that the effectiveness and efficiency of financial instruments can be enhanced by implementing fewer financial instruments with larger volumes to ensure critical mass¹⁶⁹.

As discussed in Section 8.2.5, the free allocation to the power sector in the lower income Member States indicates the need for a simple, transparent and clear approach to make effective use of available resources. Finally, the NER300 programme (see Section 8.1), demonstrates the EIB's expertise to cooperate with the Commission and Member States in due diligence to select projects and act as an agent to monetize allowances. An important element to ensure that the Modernisation Fund can start financing projects in 2021 is to time the auctioning of allowances in such a way as to provide certainty of available funds, while also avoiding a negative impact on the carbon market.

8.2.2. Policy Objectives

As discussed above, the Impact Assessment focuses on the governance structure of the Modernisation Fund. The fund should contribute to ensuring EU-value added and support the completion of the EU internal energy market, while ensuring that the specific market barriers and national priorities in the beneficiary Member States are addressed. In this respect, the Impact Assessment will also assess the potential role the Commission could play. This reflects also the views of stakeholders. On the one hand, many stakeholders highlighted the importance of reflecting national priorities, while on the other hand, many indicated the importance of minimizing distortion to the internal market and contributing to the EU long term climate objectives¹⁷⁰.

An additional concern raised by many stakeholders is that the governance structure and decision making process should minimize administrative burden, be feasible for operational implementation, and be coherent in order to catalyse additional investments. In particular, the process should be simplified for small scale projects.

8.2.3. Development and screening of policy options

8.2.3.1. Baseline

The current Directive¹⁷¹ provides that Member States should spend at least 50% of the auctioning revenues for climate and energy related purposes¹⁷² but does not have provisions for the creation of a Modernisation Fund. Therefore from a legal perspective, in the baseline scenario there would be no specific fund for the modernisation of energy systems and improving energy efficiency in the lower income Member States. Under current legislation, the 2% of the ETS allowances would instead be allocated to all EU28 Member States. The lower income Member States would in this case receive some 87 million allowances, less than a third of the 310 million they are allocated under the Modernisation Fund.

¹⁶⁸ Financial instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments, examples include credit enhancement mechanisms (e.g. Project Bond Initiative), risk sharing for financial intermediaries (e.g. PF4EE) and the setting-up of funds, including senior and junior loans, guarantees and equity participation (e.g. Marguerite).

¹⁶⁹ COM(2014) 686 final

¹⁷⁰ Stakeholder consultation to the revision of the EU ETS directive.

¹⁷¹ Article 10(3)

¹⁷² Under the Monitoring Mechanism Regulation, Member States for the first time in 2014 reported on the use for auctioning revenues for 2013. The 10 lower income Member States have all indicated they would use between 50% to 100% of revenues for energy and climate purposes, which may include, for example, support for RES development or energy efficiency. (COM(2014) 689 final)

8.2.3.2. Policy options

The main options assessed in the Impact Assessment relate to the governance structure of the Modernisation Fund and in particular the different roles that Member States, the European Commission and the EIB can play to advance its objectives.

Selecting the governance structure needs to reflect the specific strengths of the different institutions involved. Member States, for example, have the flexibility to define their low-carbon transition according to their specific national circumstances and preferred energy mix. The Commission can ensure an EU-wide approach and transparency, which would further contribute to the integrated internal energy market and EU objectives. National and Regional Promotional Banks could contribute in identifying synergies at national level. Finally, the EIB already has expertise in financing the energy sector¹⁷³ and operates in an objective way, in alignment with EU objectives and in accordance with strategies agreed by all Member States. The roles of the actors can be varied in different steps: defining eligibility and selection criteria, defining investment guidelines and overall monitoring, and selecting projects (and/or programmes) and/or financial instruments.

The role of Member States and the Commission in the eligibility, selection criteria, investment guidelines and monitoring: There are two main factors that can be varied: 1) the extent to which the details on eligibility, selection and investment guidelines are defined in the implementing legislation, which is decided by the Commission, and 2) the composition of the Steering Board, which will further define the rules and guidelines insofar as this has not been done in the implementing legislation. Membership of the Steering Board could either be primarily reserved for the beneficiary Member States, or it could feature a balanced representation of all 28 Member States (donors and beneficiaries) and the Commission.

- *Variation 1:* Beneficiary Member States have strong control over defining the eligibility criteria, selection criteria and investment guidelines of the fund and monitoring its performance. The Commission provides general guidance.
- *Variation 2:* the 28 Member States together with the Commission are involved in defining eligibility, selection criteria and investment guidelines and monitoring the operations of the fund.
- *Variation 3:* The Commission defines the eligibility, selection criteria and investment guidelines and monitors performance. Within this framework beneficiary Member States pre-approve the project pipeline in line with these criteria, but do not have control over the priorities of the fund.

The role of the EIB and other institutions in the project selection

The role of the EIB in the Impact Assessment is evaluated with regard to the management of the fund (the selection of projects and programmes).

There are two general options of how the EIB can be involved in the governance of the fund:

- *Variation 1:* the EIB is involved in due diligence and takes an advisory role. The Commission and beneficiary Member States are responsible for project selection and

¹⁷³ Over the last five years the EIB has provided EUR 57 billion worth of financing to projects in the EU energy sector.

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approval following advice by the EIB (the Steering Board would need to justify investment decisions that deviate from the EIB advice).

- *Variation 2:* the EIB is delegated to take the role of a fund manager on behalf of the beneficiary Member States and the Commission, and therefore takes investment decisions in line with investment guidelines (the Steering Board would need to justify a refusal to support investment decisions taken by the EIB).

The EIB could also act as an agent to monetize the EU ETS allowances.

Finally the EIB may be one of the institutions that implements the financial instruments selected under the Modernisation Fund, together with national and regional promotional banks.

8.2.3.3. Retained options packages

A number of combinations that reflect different options in the governance structure of the Modernisation Fund are examined in this Impact Assessment. The options were selected to be differentiated to evaluate the specific impacts. They also reflect the differences in stakeholder views where some stakeholders highlight that beneficiary Member States should have a key role in managing the Modernisation Fund, while other stakeholders ask for a stronger role for all EU 28 Member States, the Commission and the EIB¹⁷⁴.

Option 1

Option 1 gives large discretion and responsibility to the beneficiary Member States to tailor the implementation of the Modernisation Fund to specific national needs. In this option the beneficiary Member States are the only representatives on the Steering Board, which sets the eligibility criteria and defines the projects to be prioritised. The implementing legislation of the Modernisation Fund would include some general guidance to be used by the beneficiary Member States, while the detailed decisions will be taken by the Steering Board. In this case, the Steering Board could agree, for example, by qualified or simple majority.

The Commission (or an authorized agency) could help to administer any calls for proposal to disburse grants, for which the EIB would perform due diligence. On the side of financial instruments, the EIB could take an advisory role, while the final decisions on the selection of the financial instruments would be taken by the Steering Board where the EIB could also be a consulted observer in particular when setting the investment guidelines.

Option 2

In this option, there is higher cooperation between all EU Member States and the Commission. Detailed eligibility criteria and general principles for project selection would be set in advance in the implementing legislation. Based on this, detailed investment guidelines would be agreed by the Steering Board. All Member States would be represented in the Steering Board, which will also include a representative from the Commission. For example, the Steering Board could include 10 representatives from the beneficiary Member States, 10 representatives from the

¹⁷⁴ Stakeholder consultation to the revision of the EU ETS directive.

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remaining Member States (working on a rotating basis) and 1 representative from the Commission.

Similar to Option 1, the Commission (or an authorised agency) could administer any calls for proposals, for which the EIB would perform due diligence. On the side of financial instruments, the EIB could have an enhanced role as fund manager, assessing individual programmes, projects, and financial instruments, and monitoring performance indicators. However it would remain accountable to the Steering Board to which it would report. The EIB could also be a consulted observer in the decisions of the investment guidance made by the Steering Board.

Option 3

Under Option 3 the beneficiary Member States would identify a pipeline of projects to which funds should be allocated. The projects would conform to eligibility criteria and general principles for project selection that would already be set in the implementing legislation in close consultation with the 28 Member States. The Commission would administer any calls for proposals, for which the EIB would perform due diligence. As above, the EIB would be responsible for the due diligence of the submitted projects.

For the purposes of the analysis, the implementation would be through a grant rather than financial instruments¹⁷⁵.

The retained options are summarized below:

Table 11: Retained options for examining for the Modernisation Fund

	Eligibility and Selection Criteria	Investment Guidelines & Monitoring done by	Day-to-Day Management done by
Baseline	No Modernisation Fund	No Modernisation Fund	No Modernisation Fund
Option 1	Implementing legislation: general principles; Steering board of beneficiary MS decides further details	Steering board of Beneficiary MS	Financial instruments: beneficiary MS approval; EIB advisory role Grants: COM organizes call for proposals; EIB performs due diligence
Option 2	Implementing legislation: detailed principles	Steering board of COM and 28 MS with input from EIB	Financial instruments: EIB acts as fund manager Grants: COM organizes call for proposals; EIB performs due diligence
Option 3	Implementing legislation:	COM	Grants: beneficiary MS approve project

¹⁷⁵ It should be noted that financial instruments could also be used under Option 3. However, to reflect the Council conclusions that beneficiary Member States should have a role in the Modernisation Fund, and to ensure sufficient differences between the options, for the purposes of the analysis, the implementation assumed is through grants with beneficiary Member States involvement in approving a project pipeline.

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	detailed principles		pipeline: COM organizes call for proposals; EIB performs due diligence
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8.2.3.4. *Dismissed option packages*

The focus of the Impact Assessment is to evaluate realistic options that also present a varying degree of involvement of the institutions in order to evaluate the impacts. One option in particular that has been pre-screened is a national option in which each beneficiary Member State implements the funds at national level. Under the free allocation to the power sector and the European Structural and Investment Funds, Member States have instruments at their disposal, managed at national level. Moreover such an option has the potential to have higher distortive effect on the common energy market and to be less suited to opportunities to promote investments with beneficial cross-border spill-over effects. Finally, it would result in relatively small proceeds per year for the smaller Member States to manage, with the risk to lead to higher administrative burden compared to facilitating this at EU level.

8.2.4. Analysis of Impacts

The environmental, social and economic implications of the creation of the Modernisation Fund are driven by the European Council strategic guidance that determined the number of allowances available for the creation of the fund, the criteria based on which Member States are determined as eligible beneficiaries, as well as the method for allocation among Member States. Annex 10 assesses these impacts against the baseline scenario. It provides the context for comparing the three policy options identified and presented in Section 8.2.2 in order to assess the relevant differences in achieving the Specific Policy Objectives, categorized as follows:

- Effectiveness: Represent a governance structure that can catalyse additional investments, addressing specific barriers that limit investments in the modernisation of the energy sector and in increased energy efficiency in lower income Member States, including for small scale projects. Since a different set of instruments might be needed to address the market barriers in the different sectors, the implications of the options on the possibility to use grants, financial instruments or a mix of both would be considered.
- Coherence: Represent a coherent governance structure that appropriately aligns the interests of the institutions involved, while achieving transparency in the use of the funds. The coherence evaluates the extent to which the options present a governance structure that would give confidence to private investors. In this context, the transparency of the fund is evaluated against the possibility for the European citizens and the private sector to be informed about the setting up and operations of the Modernisation Fund.
- Market distortion: Evaluate to what extent there is a risk of distorting the internal energy market.
- Administrative burden: Minimize the complexity and the administrative burden of setting up and operating the Modernisation Fund. This includes consideration of the administrative burden for project promoters.

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8.2.4.1. Effectiveness

Depending on the barriers faced, the different types of projects in the lower income Member States may require public intervention in the form of grants, financial instruments, or a mix of the two (see Annex 9 for discussion on the barriers in different sectors, including networks, energy efficiency, and power generation). The specific type of support provided would depend on the project eligibility that would be determined at a later stage. Based on this a suitable form of public intervention would need to be determined based on the specific market needs. It may be needed to contribute part of the funding towards providing technical assistance facilities to speed up project preparation, and improve the quality of projects.

At the same time, the options on governance have some implications for the design of any future grants and/or financial instruments. Options 1 and 2 allow flexibility to balance between addressing sub-optimal investment situations that need grant support, and maximizing leverage by using the funds through financial instruments. On the other hand, under Option 3, the proceeds would be disbursed through grants so focus will likely be given to specific sub-sectors where providing grant support would not distort the internal energy market.

Under Option 1 the use of financial instruments would potentially be more limited than under Option 2. As discussed in Section 8.2.1.3, the experience with the European Structural and Investment Funds indicates that the use of financial instruments in Member States may be limited due to bottlenecks in administrative capacity and in some cases market maturity. Therefore, under Option 1, the beneficiary Member States might opt for more traditional means of supporting investments such as grants. Under Option 2, the EIB can use its extensive experience with financial instruments and the expertise to ensure the effectiveness and competitiveness of such instruments. Therefore, once project eligibility is determined under this option it is more likely that the use of grants would be limited only to situations where financial instruments cannot help adequately.

Regarding the possible use of financial instruments, under Option 1, it is more likely that national and regional promotional banks would be more involved in structuring the financial instruments, which, in turn, could lead to a more fragmented approach resulting in different structures and financial terms offered in the different Member States for similar projects. This may result in a suboptimal level of risk sharing and diversification. On the other hand, it would allow promotional banks in the beneficiary Member States to strictly tailor these instruments to the specificity of the domestic market, in particular to support small scale projects.

On the other hand, in Option 2 the management role of the EIB could allow applying a harmonised approach across the beneficiary Member States. Standardised financial instruments have the advantage to offer consistent financial terms to project promoters and intermediary financial institutions. They could also contribute to a more optimal level of risk sharing, which can be achieved with a larger portfolio of projects with different risk profile across the beneficiary Member States. The EIB could play a pivotal role in providing more assurances to project promoters and ensuring that evaluation and selection are performed ensuring value for money. Regarding small scale projects, under Option 2 it will be necessary to work with financial intermediaries¹⁷⁶. It allows to aggregate together similar projects of smaller size across the beneficiary Member States to build a critical mass, diversify the risks and make them more

¹⁷⁶ For example, the EIB and the Commission are already using this approach with the Private Finance for Energy Efficiency financial instrument. It provides guarantees managed by the EIB to commercial banks in Member States to support small scale energy efficiency projects.

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attractive to private investors. Specific targeted calls for proposals could be organized for small scale projects (e.g. less than EUR 5 million) under Option 3, as well as for awarding grants under Options 1 and 2.

Option 1 gives the highest discretion to the beneficiary Member States to address national priorities but there is a risk that projects with higher EU-wide value added, such as cross-border projects might not be sufficiently included. This is addressed or at least mitigated through a stronger role for the Commission and all EU 28 Member States in Option 2. Certainty that EU-wide value added will be achieved is maximised under Option 3, under which the Commission will have high discretion, ensuring alignment with EU objectives. Under this option the pre-approval of a project pipeline by beneficiary Member States would give them flexibility to align the fund to their national priorities.

Under the three options, the EIB would be involved in the technical and financial due diligence of the projects supported by grant schemes. This would ensure that the grants are provided to maximise the environmental and economic impact and in the minimum needed amount. The organisation of calls for proposals by the Commission would avoid the issue of fragmentation and also create better visibility for the Modernisation Fund, which could improve the quality of the submitted projects. Specific targeted calls for proposals could be organized for small scale projects (e.g. less than EUR 5 million) under Option 3, as well as for awarding grants under Options 1 and 2.

8.2.4.2. Coherence

Since the three options provide different balance of the roles between the institutions, there are varying impacts on coherence.

Under Option 1, since the rules of the fund are agreed only among the beneficiary Member States, these might introduce fragmented approaches based on national preferences, not necessarily aligned with internal rules of the EIB¹⁷⁷ or with EU value added. Therefore this might limit the scope of the role of the EIB with regard to implementation and increase the uncertainty for investors about how projects will be assessed.

Under Option 2, with a wider representation at the Steering Board, it is more likely that the guidelines for selection of projects will be consistent with internal guidelines of the Commission and the EIB. This would make it more likely to enhance the EIB role, which would provide certainty for private investors. Under such circumstances it is more likely that the EIB may decide to be involved in risk-sharing or co-financing of projects, which could decrease the cost of capital for project promoters who can take advantage of the EIB's favourable financial terms.

On complementarity with existing instruments, Option 1 may facilitate coordination with existing national schemes and the use of the European Structural and Investment Funds, which are distributed at national level, but it will be more challenging to ensure complementarity with EU-level instruments. On the other hand, in Option 3, the Commission will have higher discretion in setting priorities and selecting projects, ensuring alignment with EU objectives. The involvement of the beneficiary Member States through pre-approval of projects that can apply for funding would ensure that the selected projects are in line with the national investment plans. As a more balanced distribution of the roles, Option 2 would ensure that consideration is given to

¹⁷⁷ The EIB has internal energy lending criteria, set at EU level with the agreement of all 28 Member States (<http://www.eib.org/infocentre/publications/all/eib-energy-lending-criteria.htm>).

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consistency with existing initiatives both at beneficiary Member State and at EU level, while maximising the respective strengths of the Member States, Commission and the EIB.

In terms of transparency, under Options 1 and 2, the operational details of the fund will be set by a Steering Board, rather than during the process of defining implementing legislation. This may reduce the transparency in how investment criteria are set. However, stronger involvement of the Commission, which is accountable to the European Parliament, would likely improve transparency vis-à-vis European citizens in designing the rules of the fund and monitoring the operations, notably for Option 2. In that vein, Option 3 provides the highest level of transparency as the majority of the operational rules would be included in the implementing legislation. The Commission would ensure an EU level competitive process, including appropriate reporting on the use of funds and the timely review of the Modernisation Fund.

8.2.4.3. Market Distortion

Since the energy sector is commercially driven and revenue bearing, public intervention should use the least distortive tools with the aim of addressing situations when the market fails to deliver or the investment level is sub-optimal. Any support provided should maintain a level playing field in the internal energy market, so as to ensure open access for possible use of infrastructures. Support should avoid overcompensation and wasteful duplication of investments.

Under Option 1, beneficiary Member States are strongly involved in the investment decisions. As discussed, this might result in more fragmented approach with different criteria and terms applied in each beneficiary Member State and a risk of less consideration of minimizing the distortion of the internal market. The support granted by Member States would need to be subject to of State aid control (where relevant).

Option 2 would differ from Option 1 through the introduction of more detailed eligibility criteria but the way in which support is granted could still lead to distortions (again subject to State aid control). The EIB and the Commission would act under mandate from the EU28 Member States to ensure consistent selection and treatment of financing for equivalent projects granted across the beneficiary Member States. This would make distortion of the internal market less likely.

Option 3, would lead to the most extensive rules and procedures to avoid the risk of market distortion, by setting detailed eligibility and selection criteria out in advance, including requiring the use of competitive bidding processes where possible. The involvement of the Commission would ensure that the fund conforms to the EU law, in particular in relation to concerns of market distortion and would take into account the EU-value added (for example through contributing to creating an Energy Union and completing an internal energy market).

Across the options it is possible for small scale projects to fall under categories which exempt them from ex ante notification under state aid rules or benefit from low support levels. Under the currently existing regulations, small scale projects could qualify for an exemption from state aid rules under a de minimis regulation¹⁷⁸ (currently, if less than EUR 200,000 of aid over 3 years is provided) or from ex ante notification under a possible future general block exemption regulation¹⁷⁹ (if certain conditions on amount, intensity and recipients are met) as the Commission evaluated that the provision of such aid does not unduly distort competition in the Single Market. While the existing regulations apply until 2020 and the fund would be operational only as of 2021, in principle, small scale projects or projects addressed towards SMEs may

¹⁷⁸ http://ec.europa.eu/competition/state_aid/legislation/de_minimis_regulation_en.pdf

¹⁷⁹ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

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receive reduced Commission scrutiny, in view of their lower expected distortive impact on the internal market.

8.2.4.4. Administrative Burden

Under all options, promoters need to provide information to facilitate an assessment of the necessity and proportionality of support and to assist the selection process. As such, all options involve administrative burdens for project promoters, Member States the EIB and the Commission.

On administrative burden for the institutions involved in managing the Modernisation Fund, Option 3 is the least burdensome for Member States since it involves the setup of a single mechanism – a competitive call for proposals across the beneficiary Member States. Option 1 and 2 may involve higher administrative burden due to the setting-up of additional financial instruments. This burden would fall on the financial institutions that would be entrusted to implement the instruments, unless the Steering Board decides to implement the funds through already existing instruments. Under Option 1, a decentralized solution to financial instruments may increase the management complexity and costs and might be less efficient in ensuring the due diligence process is conducted in a uniform manner. Compared to Option 1, Option 2 could limit the administrative burden through the implementation of standardized financial instruments.

Administrative simplification for project promoters is important for facilitating investment, in particular for small scale projects. Two aspects are important in that regard: 1) the extent to which there is clarity for project promoters and investors on project selection and investment criteria, and 2) the administrative burden faced by project promoters in applying for funding.

Option 3 provides the highest clarity on the criteria for project selection - they would be defined in the implementing legislation and be applicable to all beneficiary Member States. Compared to this, Option 1, results in a fragmented national approach with different criteria per Member State. This could result in confusion for project promoters, in particular for international investors, and become an obstacle to effective implementation. Option 2 would simplify the procedures for international investors through the introduction of standard financial instruments across the beneficiary Member States. It would improve visibility through the one-stop shop approach. It will be particularly important to ensure simplified procedures for financing of small scale projects to facilitate the specific challenges these projects face. Under all Options, calls for proposals could target small scale projects applying for grant schemes. Compared to Option 2, under Option 1 there would be closer proximity between local project promoters (that tend to support smaller ticket projects) and the managing financial institutions and this would facilitate the support for small scale projects. On the other hand, Option 2 could address small scale projects through local financial intermediaries. This would mean simplified rules for project promoters, but it would create additional burden for setting up such intermediary arrangements with the financial institutions. Specific technical barriers could be addressed by dedicated technical assistance facilities.

8.2.5. Comparing the Options

The table below lists the evaluation of impacts of the three different options.

Table 12: Impact of policy options for the Modernisation Fund

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	Increase effectiveness	Increase coherence	Minimise risk of market distortion	Minimise administrative burden
Baseline	No Modernisation Fund	No Modernisation Fund	No Modernisation Fund	No Modernisation Fund
Option 1	+	0	-	-
Option 2	++	+	+	+
Option 3	0	+	++	+

The Modernisation Fund is a new funding mechanism that will be operational as of 2021. The detailed operational modalities of the Modernisation Fund would ultimately need to reflect the types of projects that would be eligible and the specific barriers that need to be addressed to realize these investments.

The three examined options illustrate some key trade-offs to be considered in the overall governance of the fund. While all four criteria (effectiveness, coherence, market distortion and administrative burden) contribute to comparison of the options, relative to the other criteria the 'effectiveness' is key in ensuring the governance structure contributes towards the fund objectives to modernise the energy sector and improve energy efficiency.

While Option 3 provides for a clear and simple governance structure, it may have a more limited impact on mobilizing private investments if implemented by grants and would therefore have a more limited effect on the modernisation of the energy systems.

Option 1 has clear advantages in addressing national priorities and specificities, but it may not fully reflect European priorities. Furthermore the risk of distortions to the internal energy market is higher and fragmentation may be too burdensome for larger investors resulting in lower effectiveness compared with Option 2. Option 2 presents a balanced approach that would allow to maximize private investments, while taking in account both national and European priorities. However, appropriate structure of intermediation would be needed to finance small scale projects.

8.3. Free allocation to promote investments for modernising the energy sector

8.3.1. Policy objective and problem definition

Also in the period after 2020, low-income Member States can opt to allocate free allowances to their power sector. Specifically, the European Council has agreed that from 2021 to 2030 Member States with a GDP of less than 60% of the EU average in 2013 can choose to provide free allocation to the power sector, up to a maximum of 40% of their allowances before redistribution is taken into account. If all eligible Member States make full use of this option, the maximum amount given for free could be more than twice as much as the number of allowances used for the Modernisation Fund. The policy objective of the optional free allocation (FA) to the power sector is similar to that of the Modernisation Fund - to enable low-income Member States to modernize their energy sector. As indicated in Annex 9, besides the scale of the relevant investment challenges in the energy sector in these Member States between 2021 and 2030, common barriers to realising the investments also occur, such as underdeveloped financial markets, split incentives for realising improvements to energy efficiency and a higher perceived level of risk, which can form challenges to mobilising the necessary investments in the energy sector.

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Free allocation to the power sector differs from the Modernisation Fund because the allowances which can be given for free are deducted from the auction volume of the Member State concerned, while the Modernisation Fund has a collective funding basis and thus redistributive characteristics. Consequently, free allocation is optional, and during the current trading period (2013-2020) several Member States have chosen not to make use or only make limited use of this possibility. The free allowances can only be given subject to carrying out investments that are aimed at modernising the energy sector in the Member State. The investments must be at least equal in value to the free allocation. In order to assess the potential options for continuation of this policy, the lessons learned from implementation of the existing arrangements to make use of free allocation to the power sector are first considered.

8.3.2. Conclusions on lessons learnt and policy context

An extensive discussion of the lessons learnt from the current implementation of free allocation to power can be found in Annex 4.2. The initial results from the experience of the first year of implementation of free allocation to the power sector indicate that while many of the investments which the beneficiary Member States included in their national investment plans linked to free allocation to the power sector are taking place, the modalities for the implementation of the derogation differ significantly. These differences between Member States make a direct comparison difficult and result in limited transparency.

There is scope for streamlining and providing for a simpler, clearer and more transparent approach for the Member States that will choose to make use of the derogation after 2020. Care should be taken to avoid distortion of the energy market, for example by more clearly establishing the need for investments.

The European Council has indicated that the continuation of free allocation should be based on improved modalities to ensure the funds are used to promote real investments in modernising the energy sector, while avoiding distortions of the energy market. In this context, and taking into account the lessons learned, this impact assessment focuses on the options for how these modalities could be improved compared to current practice.

8.3.3. Operational policy objectives

The operational policy objectives for free allocation to the power sector relate to the key areas for improvement identified in relation to the existing mechanism. The main operational objectives are to improve transparency to ensure that the funds are used to promote real investments modernising the energy sector while lowering the complexity and the administrative burden related to the implementation and allocation mechanisms that limit distortions. In this context, "real" is considered to refer to additional investments compared to what would have been invested in the absence of the free allocation. At the same time, care must be taken to ensure that distortions of the internal energy market are avoided and that the impact of the mechanism on the general functioning of the European carbon market is minimized.

8.3.4. Development and screening of policy options

The main options that are assessed for the free allocation to the power sector relate directly to the timing and selection of investments and to transparency requirements. These elements are key issues for which the implementation currently varies by Member States and which can affect either the volume of allowances coming to the market (timing of investments and auctioning of unused allowances), or the achievement of the operational objectives, such as transparency and simplicity (selection of investments and transparency requirements).

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With regard to the **selection of investments**, the current practice based on national plans designed by Member States based on common principles¹⁸⁰ could be replaced by the selection of investments at the national level through an open competition based on targeted performance. For example, it could be organised through a tender or competitive bidding with the investment representing the best value for money being selected / prioritised.

A change which could be considered to reflect the longer period covered (2021-2030) and potentially changing investment priorities would be an optional revision or update of the national investment plan, for example midway through the trading period. This could allow changes to the design of proposed investments to be evaluated. At the same time, ensuring equal treatment for revised and initial investments could necessitate an approval process for such an update that would be similar to that carried out for the initial national plan. This would result in a significantly higher administrative burden for operators, Member States and the Commission.

If a competitive bidding process were used, this would be envisaged to take place in advance of the trading period, in order to determine the investments eligible to justify free allocation. The bidding process could take the form of a tender based on pre-determined criteria and cost per unit of performance, to provide an objective way to assess which investments would offer value for money.¹⁸¹ A further change that could be considered would be to apply this process for large investments, while allowing smaller investments to be approved without the selection process based on general block exemption under state aid rules¹⁸².

With regard to **transparency**, instead of reporting at the Member State level, the Commission could, for example, be mandated to make the relevant information public centrally in a timely manner. In addition, the selection of investments through an open competition mentioned previously would likely also enhance transparency.

With regard to **timing**, a flat or consistent share of free allocation (equal amount per year) could be considered instead of the current approach. The current trajectory was in line with the transitional nature of the provisions in phase 3 and requires the highest level of investment at the start of the period and a decline to zero at the end of the trading/derogation period. From 2021 to 2030, a similar distribution could be maintained or a choice could be made for a flatter distribution of allocation (and corresponding investments) over the derogation period. For example, the share could be a consistent percentage of the auctioning volume of the Member State for each year, or the amount over the period could simply be divided over the years with a high start and a linear decline to zero to the end of the period. Changing the timing would potentially affect both, the distribution of investments over the period and the supply of allowances to the market.

One other issue identified in the lessons learnt is that currently the provisions for the **auctioning of unused allowances** vary across beneficiary Member States. Harmonised rules on auctioning after a specified time or during the same year if the allowances are not given for free could be

¹⁸⁰ For example, principle 5 in the guidance document on the optional application of Article 10c (2011/C 99/03) states that "Investments identified in the national plan should contribute to diversification, and reduction in carbon intensity, of the electricity mix and the sources of energy supply for electricity production.

¹⁸¹ For example, investments in renewable energy could be compared based on the cost per unit of renewable energy produced, investments in modernising existing power plants could be compared based on the cost per unit of reduction in emissions intensity achieved or the reduction in energy use could be compared based on the cost per unit of reduction in primary energy use.

¹⁸² Under the currently existing regulations, small projects can qualify for an exemption from state aid rules under the de minimis regulation (if less than EUR 200,000 of aid over 3 years is provided) or under the general block exemption regulation (if certain conditions on amount, intensity and recipients are met).

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envisaged. This would reduce the variation between Member States and set a clear timetable for auctioning of unused allowances.

8.3.4.1. Aspects not to varied between the options

Two aspects which under the current legislation are regulated in different ways are the use of either benchmarks or verified emissions as the basis for determining potential free allocation to individual installations and the use of a reference price determined in advance or based on observed market prices in the year concerned to calculate the market value of free allowances. As is described in the lessons learnt, this results in differentiation between Member States, increasing the complexity of the implementation and making it considerably more difficult for outside parties to understand what is the basis for the free allocation to individual installations.

In order to ensure a more consistent and transparent approach, it would be easiest to simplify by using one approach rather than allowing several alternatives which differ mainly in terms of the methodology used, rather than the underlying principles. To determine the maximum allocation for an individual operator, the existing benchmark methodology could for example be applied to all installations. To determine the reference price for free allowances, the approach applied by several Member States to use the average market price in primary auctions for the calendar year¹⁸³ could be generalised. These methods more closely reflect market conditions and could be easily applied. To ensure a consistent implementation, it is proposed to use only one approach in each case.

The existing approach now taken by almost all Member States to base the request for free allocation by operators on proof that the investments have been carried out is foreseen to be continued for all assessed options. Several Member States that currently apply the derogation, such as the Czech Republic and Estonia, emphasised the importance of this practice for the monitoring of the investments in the consultation.

8.3.5. Retained option packages

Four coherent combinations of options are proposed to be investigated for the purpose of the Impact Assessment. These represent an increasing level of change compared to the continuation of the current practice in particular reducing the variation in certain aspects which are now implemented differently in individual Member States and moving towards a competition as the basis for the selection of investments by Member States.

Baseline A: a strict legal baseline would imply no continuation of free allocation to the power sector after 2020. The allowances in question would then be auctioned rather than allocated for free and the revenues would be at the disposal of the individual Member States. The same result would be achieved, if Member States choose not to make use of the derogation for free allocation to the power sector.

Alternative baseline B: this scenario most closely represents a continuation of current practice with regard to the implementation of free allocation to the power sector.

Option 1: Streamlined: this scenario envisages more consistent rules and procedures compared to current practice, excluding delays for investments and with the reports to be published by the Commission. This means that the allowances are either given for free for a specific calendar year, or otherwise auctioned in the following calendar year. The relevant information reported in order

¹⁸³ If this is more than 20% lower compared to the value set in advance based on the guidance document

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to justify the free allocation would no longer be reported separately by the individual Member States, but directly and centrally by the Commission.

Assuming that the determination of the maximum allocation per installation and the reference price are also replaced by one method, this could be seen as a more standardised version of current practice, reducing differences in methodologies that are now varied between Member States while leaving in place most of the principles for free allocation to the power sector.

For this option, it is assumed that the timing of the free allocation remains as it is now, with a high start and a declining trajectory. As indicated in the previous section, the option for a revision of the national plan could be included in such an approach.

Option 2: Open selection: this option would involve further changes to those provisions when compared to the current practice for the selection of investments which can be used to justify the free allocation. Changing the selection can concern the effectiveness in promoting investments and the transparency of the basis for this selection. The relevant change compared to option 1 is that for large investments, any potential risk of market distortion would be reduced by requiring an open competition of the investments based on best value for money. The Member States would set out the objective to which the investments should contribute and then carry out a competitive selection process to compare the investments based on value for money rather than drawing up a national plan as was the case for the current free allocation. At the same time, smaller investments could be approved without the selection process provided they comply with the general block exemption under state aid rules¹⁸⁴.

Finally, the possibility to delay the auctioning of unused allowances for 1 or 2 years is maintained. For this option, it is assumed that the timing of the free allocation remains as it is now, with a high start and a declining trajectory.

Option 3: Annual basis and open selection: this option would imply the greatest level of standardisation, by applying the permitted percentage of free allocation on an annual basis. This "use it or lose it" approach has the benefit of being fully predictable for the market in terms of timing of the supply be it as free allocation or via auctions. As in option 2 this option also assumes that the selection of the investments is changed to take place through an open competition based on best value for money.

Finally this option provides the additional possibility to opt-in the allowances which could be given through free allocation to the power sector to the Member State's share of resources for the Modernisation Fund. Doing so would allow for implementation through the single governance structure of the Modernisation Fund rather than through two parallel administrative procedures. Although in principle this is possible for each option, it is indicated specifically here because this package of changes represents the greatest number of changes compared to current practice.

Table 13: Option packages for the free allocation to the power sector

	Timing of investments	Selection of investments	Auctioning of unused allowances	Reporting
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¹⁸⁴ Under the currently existing regulations, small projects can qualify for an exemption from state aid rules under the de minimis regulation (if less than EUR 200.000 of aid over 3 years is provided) or under the general block exemption regulation (if certain conditions on amount, intensity and recipients are met).

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Baseline (Directive unchanged – 10c discontinued)	Not applicable	Not applicable	No free allowances	Not applicable
Alternative baseline (current rules continued)	High allocation in 2021 and declining trajectory to 0 in 2030	National plan with investments selected by Member States	1 or 2 years after planned allocation if not used	Application and annual reports published by Member States
Option 1 As base case (+ streamlined)	High allocation in 2021 and declining trajectory to 0 in 2030	National plan with investments selected by Member States	Same year if not used	Application and annual reports published by Commission
Option 2 As base case (+open selection)	High allocation in 2021 and declining trajectory to 0 in 2030	Open competition for large scale investments based on value for money at Member State level, small projects under state aid rules	1 or 2 years after planned allocation if not used	Application and annual reports published by Commission
Option 3 (Annual basis and open selection)	Start in 2021 and equal amount per year or share of auctioning	Open competition for all investments based on value for money at Member State level (with possibility to add allowances to the MS share for the Modernisation Fund)	Same year if not used	Application and annual reports published by Commission

8.3.6. Assessment of options

The assessment of the impacts focuses on the economic, environmental and social impacts of the relevant policy options. In addition, specific impacts relating to the operational objectives that have been identified are outlined in a section on general impacts. *General impacts/operational objectives*

8.3.6.1. *Effectiveness*

A strict legal baseline would imply that the current provisions for free allocation to the power sector expire after 2020. This would exclude the possibility for Member States to give free allowances to their power sector in return for investments in modernising the energy sector and could slow the modernisation of the energy sector. On the other hand, the Member States would receive higher revenues from the auctioning of the allowances which would otherwise be allocated for free. 50% of these revenues should then be spent on climate action in accordance with the existing provisions of the ETS Directive. Such revenues could be spent on modernisation of the energy sector.¹⁸⁵

The level of investment is not quantified for the options under consideration. However, in general it could be expected that the options which have a higher amount of allocation in the early years of the trading period lead to a proportionally higher level of investment for these years. The provisions for delays could affect the investment in two ways. If a longer delay is allowed, this

¹⁸⁵ 50% of these revenues would be expected to be spent on climate action in accordance with the existing provisions of the ETS Directive. Where applicable, such spending should comply with State aid rules.

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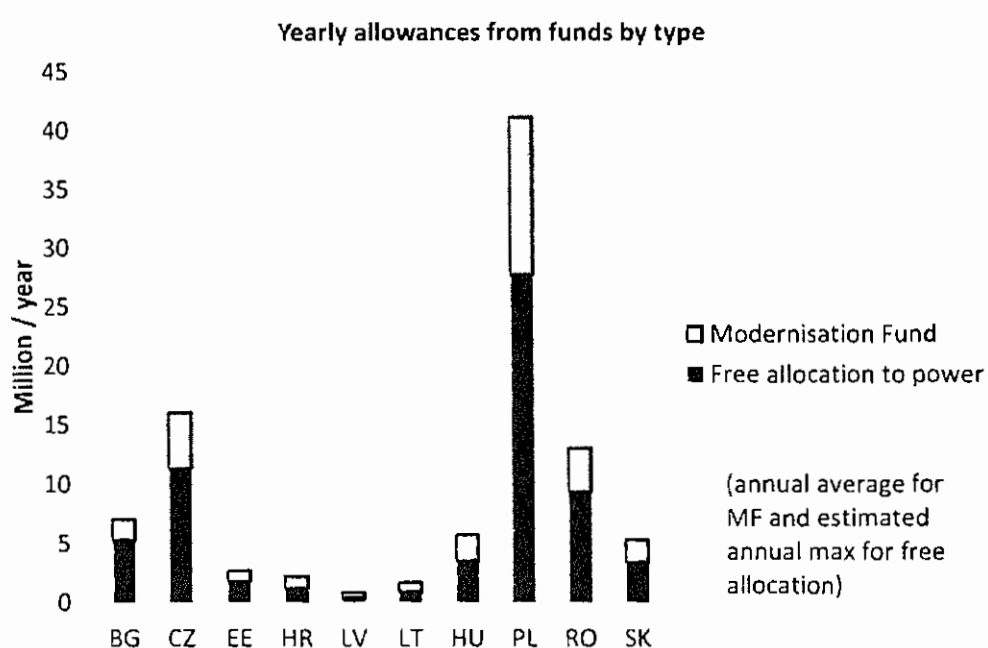
may allow for investments to be counted for free allocation which would otherwise not be eligible, thus increasing the potential investment that can be triggered by free allocation. However, the use of such delay provisions can also make it easier for investments to take place later than planned. This could affect the distribution over time with more investments taking place later in the trading period, and such delays may also be associated with cost increases.

The scenarios involving an open selection of projects would be more effective at encouraging private investment, given that the winning projects in such a competitive selection would be expected to be those scoring best in terms of the value for money. On the other hand, scenarios based on national plans may lead to a diverging outcome, depending on the priorities and energy policy objectives of the individual Member States.

A final consideration relates to the possibility to add allowances to the Member States share in the Modernisation Fund. Because this fund will involve the EIB, this option may allow Member States to avoid the administrative burden and complexity of having to implement two programmes with overlapping objectives. The governance structure for the Modernisation Fund will also provide a mechanism for the selection and guidelines for support for investments aimed at modernising their energy sector.

For Member States with the lowest absolute number of allowances under the derogation in particular, the ability to combine both resources may also be a valuable way to ensure a critical mass that can make the use of public resources more effective. For instance, it could allow Member States to support larger projects than would otherwise be the case, assuming that otherwise combining funding from the Modernisation Fund and free allocation to the power sector is not possible. For more than half of the beneficiary Member States, the combined resources from the Modernisation Fund and the optional free allocation to the power sector would amount to less than 5 million allowances per year. Although the level of the resulting resources depends on the timing of the allocation and the applied market value, this clearly indicates that combining the resources could contribute to less fragmentation and more effective use of public resources.

Figure 2: Annual allowances from fund by type



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8.3.6.2. Complexity and administrative burden / flexibility to adjust to MS circumstances

If a delay of 1 or 2 years is allowed with regard to the realisation of investments, this will require monitoring and verification by the Member State and the assessment of the associated annual reports by Commission to track these investments and the allocation linked to them over a period of 2 or 3 years. This significantly increases the complexity and administrative burden as the reference price used to estimate the market value of the allowances can also differ from year to year, and also leads to uncertainty regarding the number of allowances that will be allocated in any individual year. On the other hand, if allowances are either issued or auctioned in a single year, the monitoring and reporting would be simpler. It could however mean that investments which take place one or two years later than planned become ineligible for justifying free allocation, providing less certainty to investors.

Drawing up an individual national plan with a full framework of specific rules per Member State places a significant administrative burden on the Member State involved. By contrast, if the selection of investments is based on an open competition and general principles (ensuring limiting market distortions) the process could be relatively straightforward. However, depending on the number of different types of projects for which a competitive bidding process would be organised, it could also pose an administrative burden in organising these. For option 2, the possibility for smaller investments to be approved based on compliance with the state aid guidelines could facilitate a simpler approval process leading to a lower complexity.

If as part of Option 1, an optional revision or update of the national plan was included, this would be expected to significantly increase the administrative burden.

8.3.6.3. Transparency

Transparency is related to both, the accessibility of information and the level of detail of the information provided in the public domain with regard to the preparation and implementation of the free allocation to the power sector. As indicated in the lessons learned, transparency is affected by both, the general process for the selection of investments and the implementation of the free allocation, but also by the wide variation in reporting and the difficulty in some cases of accessing the available information online.

With regard to the options presented, first, those scenarios involving a centralised publication by the Commission would increase the transparency compared to the current practice. The clarity of the information and transparency of the process would benefit from utilizing using a single consistent format for the reporting.

Second, having the harmonised rules for auctioning of unused allowances would improve the clarity and predictability of market supply of allowances, while a direct link to the actual year in question (a "use it or lose it" approach) would perform best in this regard. If it is known that all unused allowances are auctioned either 1 or 2 years later, then it is much easier to assess the range of the potential quantity of allowances that could be issued under the derogation or auctioned if unused. If all unused allowances are auctioned in the following year, the volume can immediately and automatically be identified once the allocation for a year is known. The greatest uncertainty would arise from continuing the current variation, which makes it difficult for outside market analysts to interpret which quantity of allowances will be allocated or auctioned at which stage.

A third way in which the options differ with regard to the current degree of transparency is in the way the investments are selected. If this is done by Member States through an open competition based on clear pre-defined criteria, representing a clear measure of value for money, this is likely

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to contribute to a more transparent process when compared to each Member State drawing up a distinct national investment plan.

8.3.6.4. Potential distortion of EU energy market / complementarity with regard to existing EU instruments

Giving allowances for free from 2021 to companies operating on the energy market in specific Member States in return for realising investments in the modernising the energy sector has the potential to distort competition on the energy market. It can also lead to a fragmentation of the internal market along national borders. Assuming a range for the average annual total quantity of between 1-25 MT and a price per allowance of €25 this could represent between €25 million and €625 million annually. In particular, if the free allocation is distributed selectively to power producers in a Member State, but not to potential competitors in the market or in neighbouring Member States where no free allocation is given to the power sector, this can lead to an undue advantage and thus a distortion of the market.

The potential distortion of the energy market also depends on the progress to market liberalisation by 2021 and on the types of investments are used to justify free allocation. If these relate solely to activities for which there are clear market failures (e.g. renewable energy or energy efficiency), or to activities which are related to infrastructure investments which are regulated markets (such as energy grids), the risk of distortion of competition is considerably lower than if they are open to investments in conventional power generation. The latter risks to fragment the internal market or to prevent alternative solutions to be developed (e.g. demand response).

This is also the case where there are rules which specify that investments related to power generation must be strictly limited to the modernisation of installations. For example, this is currently regulated through requirements to de-commission an equivalent amount of capacity if an investment would otherwise lead to a net increase in the level of generating capacity.

Another potentially significant factor relates to the basis for selection between investments of a comparable type. If the selection is based on a competitive open procedure as is the case for large investments in Option 2 or for all investments in Option 3, i.e. a tender or bidding process based on value for money that is open to all the operators, this would be less likely to lead to an undue distortion of the market, as there would be an objective basis ensuring selection of the investments based on best value for money. The scenarios based on such a selection mechanism are thus assumed to involve a lower risk of market distortion than those based on national plans.

8.3.6.5. Timing and distribution of investments and volume and timing of allowances on market / auction revenues of investments

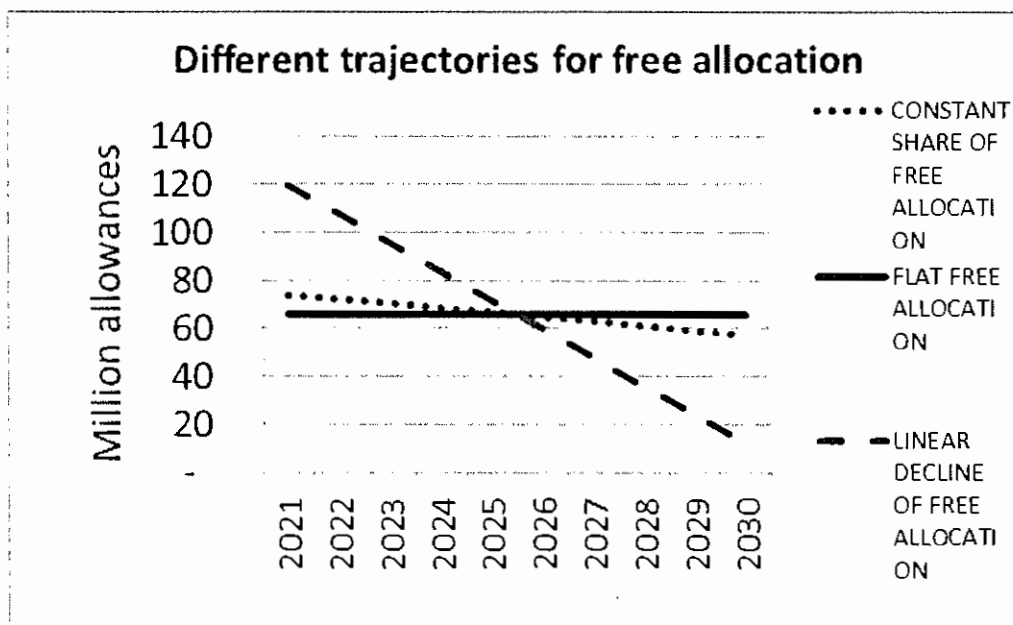
The volume and timing of market supply of allowances depends on the trajectory for free allocation, which varies for the options considered. Specifically, the impact is determined by how this differs from what would happen if the Member State chose to auction all the allowances.

If this trajectory is assumed to decline in a linear manner from a high start, as is the case in the current free allocation, a relatively higher amount of allowances will be issued in the initial years of the period ("front-loading") compared to what would otherwise have been auctioned, while a lower amount is issued in the later years of the period. The degree of any front-loading also has implications for the transfer of allowances into the Market Stability Reserve (MSR) if agreed. In case individual Member States decide to front-load a substantial amount, the surplus would be

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higher and relatively more allowances would be transferred to the MSR¹⁸⁶. If by contrast the share of allowances allocated for free is kept constant relative to the annual auctions, the impact is much lower. Similarly, if an equal amount of allowances is allocated for free each year, the impact on the market in terms of additional supply is relatively low. This is shown in a stylised example illustrated below. Thus the scenarios with a constant share or flat amount of allowances per year will have a more limited impact on the carbon market.

Figure 3: Combined free allocation trajectories



This aspect, however, interacts with another factor which further determines the impact on the carbon market: the rules governing the auctioning of unused allowances. If an investment is allowed to be delayed for one or more years, then this creates uncertainty about when these allowances will enter the market, either through free allocation or auctioning. The quantity of allowances for which this uncertainty applies is highest during the early years of the trading period, in particular if a linear trajectory with a high start is assumed in combination with a longer delay. If on the other hand unused allowances are auctioned in the same year, there is no underlying uncertainty because regardless of the way they are put in circulation, it is known which quantity of allowances reaches the market.

Environmental impacts

8.3.6.6. Potential decarbonisation

At the EU level, the reduction in greenhouse gas emissions within the sectors covered by the EU ETS is guaranteed by the declining cap. As a result, the different options described here are assumed to have no impact on emissions at the EU level, although if additional investments take place as a result of the free allocation to the power sector these could ensure that a relatively larger share of the expected reduction takes place in the Member States concerned. A higher level

¹⁸⁶ Under the MSR proposal (COM/2014/20), each year 12% of the total number of allowances in circulation are transferred in the MSR provided this total number is higher than 833 million allowances.

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of reductions in greenhouse gas emissions can also deliver a corresponding improvement in other pollutants which negatively affect air quality.

Direct environmental benefits may occur at the Member State level, in particular through improved local air quality and the related health benefits. Certain investments relating to energy efficiency such as renewing heat networks may also lead to a larger reduction of carbon emissions in sectors outside the EU ETS.

8.3.6.7. Social impacts

It is not possible to quantify the impacts on employment in the individual Member States, although a positive impact on employment may be expected in proportion to the level of increased investment, if this is realised as a result of the free allocation to the power sector. At the same time, if such investments lead to the replacement of existing assets in the power sector, there may be a net shift in employment rather than an expansion.

On the other hand, if Member States choose not to provide free allocation to the power sector, they will have more revenues from the auctioned allowances to be used for climate action, in line with the existing provisions of the Directive that at least 50% of revenues should be used for these purposes, including all revenues from allowances redistributed to lower income Member States¹⁸⁷.

8.3.7. Comparing of options

The outcomes with regard to impacts for the different options are displayed in the Table 14 below.

Table 14: Comparison of options for the free allocation to the power sector

	Effectiveness	Minimise administrative burden	Increase transparency	Minimise risk of market distortion	Minimise impact on carbon market
Baseline (Directive unchanged – 10c discontinued)	No support for modernisation -	Not applicable +	Not applicable +	No risk ++	No impact ++
Alternative baseline (current rules continued)	0	0	0	0	0
Option 1 As base case (+ streamlined)	No change	+	+	+	+
Option 2 As base case (+open selection)	+	-	++	+	No change
Option 3 (annual basis and open selection)	+	-	++	+	+

In terms of comparison of the options, the strict legal baseline would imply discontinuation of free allocation to the power sector. If this is the case, the policy objective of supporting investment in the eligible low-income Member States may not be met.

The alternative baseline by contrast implies the continuation of current practice. As is indicated in the section on lessons learnt, this is expected to lead to a continued high administrative burden for

¹⁸⁷ Article 10(3)

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implementing Member States and to a continuation of the current perceived lack of transparency. It also offers little scope for improvement with regard to the potential risk of distortion of the energy markets. As a result, this option would not allow the objectives to be met.

As is clear from the table, the streamlined approach would provide some improvements on most of the criteria considered. It's expected that this option would help to improve transparency and lead to reduce the administrative burden because the implementation would be simpler with fewer exceptions to the rules. If as part of Option 1, an optional revision or update of the national plan was included, this would however be expected to significantly increase the administrative burden. Transparency would be expected to benefit from centralised reporting. At the same time this option would not involve radical changes to the way in which the investments are selected and in which free allocation is provided, which is the reason that the effectiveness is assumed not to change compared to the current practice.

Increasing the scope of proposed changes to the selection process to include changes to the trajectory of free allocation and to include specific procedures for the selection of investments based on a competitive selection process may lead to a higher administrative burden, in particular for option 3 where this is applied to all investments. However at the same time this also offers a greater potential to improve transparency because a clear and consistent basis would be used for the selection of investments. A competitive selection based on value for money could also lead to a higher level of effectiveness in realising investments in modernising the energy sector.

A possibility to provide additional benefits would be to allow those Member States that choose to do so to make use of the governance structure of the Modernisation Fund to efficiently select and fund projects aimed at modernisation of their energy sector. This offers the perspective of avoiding unnecessary duplication of bureaucratic structures, reduced overhead and the potential to make use of the expertise of the EIB in project selection. Making use of this option would also provide a single and therefore simpler structure for potential investors in these Member States.

In conclusion, no single option clearly scores best on all the criteria considered in this Impact Assessment. The final choice depends on whether limited changes implied by Option 1 are considered sufficient in light of the main operational objectives of improved transparency to ensure that the funds are used to promote real investments modernising the energy sector, while lowering the complexity and the administrative burden related to the implementation. Options 2 and 3 offer the potential for further reaching improvements, but may result in an increased administrative burden unless use is made of the governance structure of the modernisation fund.

8.4. Interlinkages between the low carbon funding mechanisms

Three main interlinkages can be identified between the low carbon funding mechanisms described in this chapter.

Both the Innovation Fund and the Modernisation Fund will involve the monetisation of allowances in order to provide funds for investment. Annex 12 provides a further discussion of the relevant choices and impacts related to the timing of the monetisation, showing that the auctioning of a steady amount of the allowances between 2021 and 2030 would allow for a minimal price risk and market impact when compared to front loading the allowances. At the same time, ensuring that both the Innovation Fund and the Modernisation Fund can become operational from 2021 would require the timely monetisation of the corresponding share of the total number of allowances. A balanced approach is therefore needed to time the auctioning of allowances in such a way as to provide certainty of available funds, while also avoiding a negative impact on the carbon market.

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Both the Modernisation Fund and the optional free allocation to the power sector aim to support investments to improve energy efficiency and to modernise the energy systems in 10 lower income Member States. While under the Modernisation Fund, specific investments may receive financing, the second mechanism would directly provide free allowances from the auctioning share of the Member State concerned to operators in return for investments having been carried out. Specific barriers for such investments are described in Annex 9. In order to prevent the same investment receiving aid from two different sources, which would reduce the efficiency of the use of scarce public resources, it is proposed to include a provision in relation to the potential accumulation between free allocation to the power sector and the Modernisation Fund. Several stakeholders indicated support for such rules as part of the consultation.

A possibility to make use of a single approach to achieve modernisation of the energy sector would be an option to add free allowances to the Member States share in the Modernisation Fund. This would allow beneficiary Member States to avoid the administrative burden and complexity implementing two programmes with overlapping objectives, while taking advantage of the governance structure offered by the Modernisation Fund. For Member States with the lowest absolute number of allowances under the derogation in particular, the ability to combine both resources may be a valuable way to ensure critical mass that can make the use of public resources more effective.

9. MONITORING AND EVALUATION

The Commission will continue to monitor and evaluate the functioning of the EU ETS in its annual Carbon Market Report, as foreseen under Article 10(5) of the Directive. This covers also the impacts of the revision of the EU ETS. Furthermore, evaluation of progress on the application of the Directive is regulated in Article 21, which requires Member States to submit to the Commission an annual report paying particular attention to issues including the allocation of allowances, operation of the Registry, application of monitoring and reporting, verification and accreditation and issues relating to compliance. The envisaged Energy Union integrated governance and monitoring process is also expected to make sure that energy-related actions at European, as well as regional, national and local level, including the EU ETS, contribute to the Energy Union's objectives.