



*Project co-financed by the European Regional Development Fund through OPTA 2007 – 2013*

## *Romania Climate Change and Low Carbon Green Growth Program*

### **Output D1.1**

# **The EU ETS up to 2030: Decoding Auctioning Challenges for Romania**

October 2015



*This report corresponds to the deliverable “Report on the methodology for identifying and assessing projects capitalizing the provisions concerning the market mechanisms under the Kyoto Protocol and the United Nations Framework Convention on Climate Change, consistent also with the requirements of the EU Emissions Trading System (ETS)” (Output D1.1) in the Advisory Services Agreement on Romania Climate Change and Low Carbon Green Growth Program signed between the Ministry of Environment, Water and Forests and the International Bank for Reconstruction and Development on July 23, 2013.*

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## Abbreviations and Acronyms

AFOLU	Agriculture, Forestry and Land Use
CC	Climate Change
CDM	Clean Development Mechanism
CITL	Community Independent Transaction Log
CCS	Carbon Capture and Storage
CER	Certified Emission Reduction
EEA	European Economic Area
EE	Energy Efficiency
EEX	European Energy Exchange
EC	European Commission
ERU	Emission Reduction Unit
ETS	Emissions Trading System
EU	European Union
EUA	European Union Allowance
EUA	European Union Aviation Allowance
EU ETS	European Union Emissions Trading System
EUTL	European Union Transaction Log
GHG	Greenhouse Gas
ICAO	International Civil Aviation Organization
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
LDCs	Least Developed Countries
M€	Million Euros
MIFID II	Markets in Financial Instruments Directive II
MS	Member States
MSR	Market Stability Reserve
NAP	National Allocation Plan
NER	New Entrants' Reserve
NMM	New Market Mechanism
RAS	Reimbursable Advisory Services
R&D	Research and Development
RE	Renewable Energy
UK	United Kingdom
VAT	Value Added Tax

## Acknowledgements

This Report has been prepared by the World Bank for the Government of Romania as an output of the World Bank Advisory Services Program on Climate Change and Low-Carbon Green Growth in Romania, at the request of the Government of Romania through its Ministry of Environment and Climate Change. The World Bank program is managed by Jian Xie and Erika Jorgensen, under the general guidance of Paula Caballero, Kulsum Ahmed, and Elisabetta Capannelli from the World Bank.

The document was prepared by Anaïs Delbosc, with inputs from Philippe Ambrosi and Yevgen Yesyrkenov. The work was carried out over the period of September 2014 – August 2015 and is based upon discussions with and information received from the officials from a number of government departments and agencies, including the Ministry of Environment and Climate Change.

The World Bank would also like to express gratitude to the Romanian Government for the excellent working relations established during this assignment and especially the support of Nicoleta Rosu, Mihaela Smarandache, from the MECC Climate Change General Directorate, the staff and members of the Project Implementing Unit in the Ministry of Environment and Climate Change, namely, Narcis Jeler, Alexandra Ulmeanu, Gabriela Popescu.

## Executive Summary

At the request of the Government of Romania, the World Bank launched a two-year Reimbursable Advisory Services (RAS) Program on climate change and low-carbon green growth in July 2013. Component D of the RAS Program will target supporting Government institutions in implementing, monitoring, and evaluating climate change actions and sharing their experiences. A first deliverable will focus on prioritization criteria for mitigation opportunities in Romania that could be financed from revenues obtained from the auctioning of EU Allowances during the period 2013 – 2020 as well as other sources of financing. In this context, the present report provides a background overview and analysis on the EU Emissions Trading System (EU ETS), as well as on the participation and compliance of Romanian EU ETS installations.

Since its inception in 2005, the EU ETS has imposed a cap on GHG emissions from energy-intensive industries, power plants and, since 2012, from commercial aviation in Europe. Aiming to achieving the general European mitigation targets, such a cap is materialized through a corresponding quantity of allowances distributed to targeted emitters—one allowance covering one ton of GHG emissions. The tradability of allowances gives emitters the opportunity to adjust their emission levels based on the market price for allowances, minimizing the overall compliance cost.

A number of achievements can be attributed to the EU ETS. First, it has introduced a common, reliable and efficient European price for carbon emissions, based on clear market drivers—the regulatory framework, climate and economic conditions, relative fuel prices, and emissions abatement possibilities. Despite the economic downturn and the resulting drop in economic output levels, it has brought about additional emissions reductions without a detectable effect on EU competitiveness or carbon leakage. The EU ETS has supported innovation, and low-carbon investment in particular, through dedicated provisions in favor of CCS and innovative renewable energy technologies. The EU ETS has also enabled the European Union and its Member States to leverage new funding for international and national climate-friendly actions and policies. Finally, as the first large-scale ETS in the world, it has generated a number of lessons and experience for both EU and other jurisdictions.

This report presents some figures exploring the way Romanian installations have been operating under the EU ETS. In 2013, 201 installations and operators were included in Romania's EU ETS. Among them, 185 actually emitted GHG emissions, the majority (58%) pertain to the fuel combustion sector. The Romanian installations are bigger, in terms of emissions, than the European average. While free allocation was considerably reduced between phase 1 and phase 3 (-46%), the surplus in allowances reached 113 MtCO<sub>2e</sub> in 2013.

As the result of acquired experience, the EU evolved key features of the EU ETS over time, in particular when entering the third phase of the scheme in 2013, a time when auctioning became the main rule for allocating allowances. In Romania, the combustion sector remains the most affected. However, the transitional free allocation provision diminished the combustion sector's deficit in allowances by 66% in 2013.

At the European level, work is already advanced in the preparation of phase 4 (2021-2030). Main challenges include the revision of the free allocation process, which is expected to be more restrictive in terms of both sector coverage and individual entitlements. Also, the implementation of the Market Stability Reserve in 2018-2019 will be closely examined, as this measure is expected to modify the market equilibrium for allowances, thus auctioning revenues for Member States. The review of the EU

ETS ambition, included in the 2030 legislative proposal published by the Commission on 15 July 2015, will also impact price expectations as it highlights an accelerated decrease in the allocation, in coherence with the European target of reducing GHG emissions by 40% by 2030.

The auctioning regulatory framework is composed of Directive 2009/29/EC (Article 10) and the revised Auctioning Regulation, which leaves little room for Member States to maneuver in the management of the allowances they have to auction. The chosen methodology is a sealed-bid, one-round, uniform price auction. Adjustments to the auction calendar, once published for a given year, are severely restricted by article 14 of auctioning regulations. Member States have the last word regarding the use of revenues from their auctioned allowances. Nevertheless, Directive 2009/29/EC stipulates that at least 50% of the revenues generated from allowances auctioning—100% for allowances auctioned for intra-European redistributive purposes—should be used to fund mitigation and adaptation actions through fiscal or financial support policies in the EU or in developing countries.

Romania is entitled to auction 324 million EU allowances over the period 2013-20. Revenue estimates will depend on the future market price. Because large uncertainties remain related to the legislative framework, as well as the evolution of the supply and demand equilibrium on the market, price forecasts over the long term should be viewed cautiously, keeping in mind that they reflect simplified socio-economic hypotheses. The MSR is expected to significantly increase the carbon price when implemented, with estimates of the prices for carbon in 2030 ranging from 30€ to more than 80€ per allowance. On average, the value of 50 to 60€ can be retained—for 2020, estimates are below 10€, even if in practice the price difference between phase 3 and 4 will be lessened by the financing of market participants. It means potential revenues for Romania could amount to around 4 bn€ per year by 2030.

Some experience in the use of auctioning revenues is already available in other Member States. The report presents a review of policies and measures showing that Member States have to consider a number of parameters in their use of auction revenues. One in particular is that policies funded by auction revenues face a quantitative risk linked to the difficulty in foreseeing the actual amount of money raised, instead of pledges for an ex-post earmarking.

In 2013, of the 2,712 M€ aimed at financing climate and energy related policies, and for which the split between domestic and international actions was declared, more than 80% was dedicated to domestic policies. This shows that recycling of auctioning revenues can be a decisive instrument for financing climate-friendly actions in Europe, in coherence with EU long-term objectives and Member States national strategy and priorities.

## 1. Introduction

At the request of the Government of Romania (through its Ministry of Environment and Climate Change and Ministry of European Funds), a two-year Reimbursable Advisory Services (RAS) Program on climate change and low-carbon green growth was launched by the World Bank in July 2013. The RAS project focuses on operationalizing Romania's national climate change strategy and action plan, identifying and integrating climate-related actions in new operational programs, building a solid analytical base for impact assessments and climate-related decision making, and enhancing climate-friendly practices and monitoring systems.

Component D aims at supporting the Government institutions in implementing, monitoring, and evaluating climate change actions and sharing their experiences. A first deliverable is to focus on prioritization criteria for mitigation opportunities in Romania that could be financed from revenues obtained from the auctioning of EU Allowances in the period 2013 – 2020 and other sources of financing.

In this context, the present report provides a background overview and analysis on EU Emissions Trading System (EU ETS) in general, as well as on the participation and compliance of Romanian EU ETS installations.

## 2. Overview of the EU Emissions Trading System (EU ETS)

Emissions Trading Systems (ETSs) are tradable environmental rights schemes in which public authorities seek to **regulate the use of environmental goods** – fresh water, fish stocks, air... - **thanks to market mechanisms**. A number of ETSs have been implemented to curb air pollution, in particular greenhouse gas (GHG) emissions, in order to mitigate climate change.

While the theoretical framework for ETSs was initiated in the 1960s, one of the first effectively implemented systems was launched in the US in the 1990s to limit industrial SO<sub>2</sub> emissions causing acid rains. Another major milestone was the implementation of an ETS to regulate GHG emissions from industrialized countries between 2008 and 2012 under the Kyoto protocol framework, signed in December 1997.

**Worldwide, the largest system to date, in terms of both emissions covered and number of countries involved, nevertheless remains the EU ETS<sup>1</sup>.** In total, the EU ETS covers more than 11,000 combustion and industrial installations as well as 4,000 airline operators, responsible together for 45% of EU GHG emissions.

### 2.1. Reducing European emissions at the lowest cost

The EU ETS works as a **cap-and-trade scheme** in which European authorities set the overall emissions “cap” that should not be exceeded by energy-intensive industries, power plants and commercial aviation in Europe. Such a cap translates the general European mitigation targets for a given period.

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<sup>1</sup> See World Bank, *State & Trends of Carbon Pricing 2014*, June 2014, for more information on other ETSs and carbon pricing. Available at <http://documents.worldbank.org/curated/en/2014/05/19572833/state-trends-carbon-pricing-2014>

To do so, a limited quantity of permits – corresponding to the « cap » - is distributed to the targeted GHG emitters, the **incumbents**.

#### Box 1 – The EU ETS in a nutshell

The EU ETS aims at reducing greenhouse gas (GHG) emissions on the EU territory in a cost-efficient manner. It sets a ceiling on 45% of EU GHG emissions, through the downstream cap imposed on the +11,000 highest emitting power plants and industrial installations on the European territory - now the 28 EU member states plus 3 countries of the European Economic Area (EEA). It also limits CO<sub>2</sub> emissions from commercial flights departing and arriving in the EEA, with specific provisions.

The EU ETS has now been in operations for 10 years. The current period (2013-20) saw significant changes with:

- A European-level emissions cap setting, in line with Europe's 2020 GHG emissions targets;
- The inclusion of additional sectors and gases;
- The harmonization of the allocation process, auctioning becoming the default allocation mode and the remaining free allocation being based on benchmarking;
- Fewer international credits allowed for compliance until international negotiations lead to a binding emissions reduction agreement; cost containment is achieved mainly through flexibility provisions and the allocation of free allowances to trade-exposed sectors.
- The increasing role of the European Commission in the EU ETS regulation and market surveillance.

Among the main lessons that can be drawn, the first is that the EU ETS has been actually working and providing a reliable and efficient price for GHG emissions, by reflecting the evolution of supply and demand for allowances. It has reduced emissions, in the order 460-580 million tCO<sub>2</sub> from 2005 to 2009; since 2009 and the economic downturn, its impact might have been lower, including by other energy policies, but there is no consensus on the matter.

The emissions reductions have not impacted short-term European competitiveness on international markets, through the combination of the lower-than-expected carbon price, some flexibility features (banking, borrowing, use of international offsets), pass-through on to consumers and free allocation to exposed industries.

The EU ETS is also believed to favor innovation and low-carbon investment in Europe, while beyond anecdotal evidence is hard to gather at this stage. It nevertheless provides very concrete incentives to develop carbon capture and storage, and renewable technologies, and has contributed to leveraging funds for climate action both at the international –through CDM/JI imports- and European levels – through the recycling of phase 3 auctions revenues.

Those lessons helped to improve the phase 3 regulatory framework and also contributed to the design of other ETSs under development worldwide.

Once distributed, those electronic permits, known as **European Union Allowances (EUAs)**<sup>2</sup>, can be transacted freely – the « trading » side - by incumbents as well as any other participant allowed

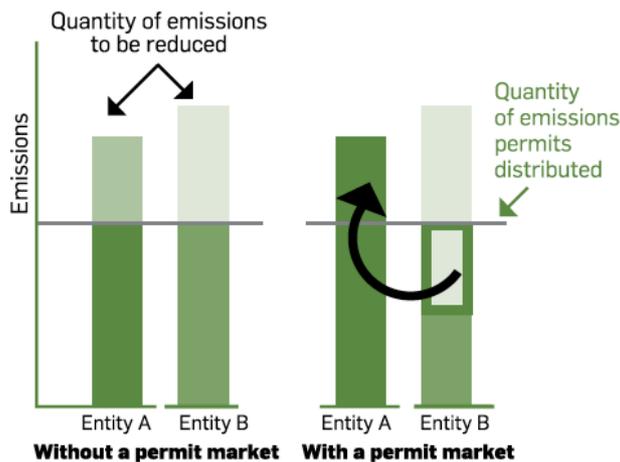
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<sup>2</sup> Commercial aviation is allocated European Union Aviation Allowances (EUAs), which cannot be used by industrial and power installations.

(financial intermediaries, citizens, NGOs...). Demand is driven by the obligation incumbents have to surrender to public authorities, for each compliance period, as many allowances as their emissions, one allowance corresponding to one ton of greenhouse gas expressed in CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) (see Figure 1).

Incumbents may also offset a limited share of their emissions by buying **emissions credits** from the Clean Development Mechanism (CDM) or the Joint Implementation (JI) mechanism.

**Figure 1 - The principle of a cap-and-trade system**



Consider two industrial installations emitting greenhouse gases (GHGs). Abatement costs are lower for Entity B than for Entity A.

A regulator wishes to cap their emissions to a given level, symbolized by the grey line.

A permit market allows entity A to buy permits from entity B, a solution that is economically efficient.

Source: from Delbosq & De Perthuis, Carbon Markets: the simple facts, 2009.

[http://www.cdclimat.com/IMG/pdf/09-09\\_c4c-carbonmarkets\\_the\\_simple\\_facts.pdf](http://www.cdclimat.com/IMG/pdf/09-09_c4c-carbonmarkets_the_simple_facts.pdf)

Trading allowances results in the emergence of a **market price** that allows incumbents to arbitrate on the cheapest option given their individual situations, assuming perfect rationality:

- If emissions reduction costs are higher than the market price, incumbents would buy allowances or credits rather than reducing their emissions, if they foresee they will miss some to ensure their compliance, or if they anticipate an increase in the carbon price over time;
- If emissions reduction costs are lower than the market price, incumbents would engage into operational changes and/or low carbon investments (e.g. shifting to less carbon-intensive energy sources, optimizing the existing technologies, investing in more efficient technology). They would either keep the spared allowances or sell them on the market, depending on their expectations regarding the evolution of the market price and their future compliance needs.

**Accurate and reliable market information** is essential to ensure the abatement options with the lowest costs are undertaken. **The overall compliance cost is minimized for each incumbent, meaning the environmental target (reducing emissions to the set cap) is achieved cost-effectively.**

The “market” for allowances or credits is the set of all transactions, which occur either bilaterally, through professional brokers (over-the-counter -OTC- trading) or through organized exchanges, which make public the prices and amounts of allowances traded. Traded products include spot contracts with immediate delivery, futures/forward contracts in which the delivery is delayed by several days, months or years, and derived contracts.

## 2.2. Key design features and their evolution since 2005

The EU ETS was proposed in 2001 by the European Commission to help EU countries meet their national commitments under the Kyoto Protocol. It has been endorsed as the central tool of the EU climate policy since its inception on January 1<sup>st</sup>, 2005.

Its original design provided for two periods: **a trial phase (2005-07)** to enable stakeholders to gain experience with emissions trading<sup>3</sup>, and **a second phase (2008-12)** corresponding to the first Commitment Period of the Kyoto Protocol. It was further extended in 2009 for **an undefined number of 8-year periods, starting with the third period (2013-20)**.

**Table 1 – Key design features of the EU ETS over time**

	<b>Phase 1: 2005-07</b>	<b>Phase 2: 2008-12</b>	<b>Phase 3: 2013-20</b>
<b>EMISSIONS REDUCTION TARGET</b>	Not explicit	National, compatible with Kyoto Protocol targets.	EU: -21% from 2005 by 2020
<b>SCOPE</b>			
<b>Countries</b>	EU 25 + Romania and Bulgaria in 2007	EU 27 + Norway, Iceland and Liechtenstein (EEA)	EU 28 (inclusion of Croatia in 2013) + EEA
<b>Sectors and gases covered by default</b>	<ul style="list-style-type: none"> <li>• Combustion including production of electricity (CO<sub>2</sub>)</li> <li>• Refinery (CO<sub>2</sub>)</li> <li>• Iron and steel (CO<sub>2</sub>)</li> <li>• Cement (CO<sub>2</sub>)</li> <li>• Ceramic and glass (CO<sub>2</sub>)</li> <li>• Pulp, paper and board (CO<sub>2</sub>)</li> </ul>	<ul style="list-style-type: none"> <li>+ Extension of the combustion and steel scopes</li> <li>+ Intra-European flights (CO<sub>2</sub>) from 2012</li> </ul>	<ul style="list-style-type: none"> <li>+ Chemical and petro chemical industry incl. hydrogen (N<sub>2</sub>O and CO<sub>2</sub>)</li> <li>+ Plaster (CO<sub>2</sub>)</li> <li>+ Aluminum (PFCs)</li> <li>+ Non ferrous metals (CO<sub>2</sub>)</li> <li>+ Geological storage sites (CO<sub>2</sub>)</li> <li>+ Commercial flights from <u>or</u> to EU ETS-covered countries (CO<sub>2</sub>) in 2017 if no international agreement reached within the International Civil Aviation Organization (ICAO)</li> </ul>
<b>Sectors and gases opted-in (on MS demand)</b>	<ul style="list-style-type: none"> <li>• Small combustion installations (CO<sub>2</sub>) in Austria, Finland, Latvia, Slovenia and Sweden = 2 MtCO<sub>2</sub>/yr.</li> </ul>	<ul style="list-style-type: none"> <li>• Small combustion installations (CO<sub>2</sub>) in Estonia = 0.08 MtCO<sub>2</sub>/yr</li> <li>• Chemical industry (nitric acid-N<sub>2</sub>O) in the Netherlands, Italy, the UK and</li> </ul>	

<sup>3</sup> Romania was involved only partially as the country joined the EU only on 1 January 2007.

	Phase 1: 2005-07	Phase 2: 2008-12	Phase 3: 2013-20
		Austria = 8.6 MtCO <sub>2</sub> e/yr.	
<b>Sectors and gases opted-out</b> <i>(on MS demand, if equivalent constraint in place)</i>	Belgium, the Netherlands and the UK excluded 570 installations ~ 38 MtCO <sub>2</sub> /yr.	Not possible	Installations emitting less than 25,000 tCO <sub>2</sub> e/yr. (and capacity > 35 MW in the combustion sector)  Hospitals
<b>Cap in Mt</b> <i>(average, per year)</i>			
- Energy and industrial sectors	2,156	2,083	2,084 in 2013 then -38 MtCO <sub>2</sub> e/yr. (=1.74% of 2008-12 allocation)
- Commercial aviation	-	210	210

## ALLOCATION

<b>Institutional organization</b>	Decentralized through National Allocation Plans (NAPs)  Submitted to the European Commission (EC) who could ask for modifications.	Decentralized though NAPs  Stronger implication of the EC in national cap setting.	Centralized. Single EU-wide ETS emission cap.  Strong harmonization of the allocation process.  Increased role of the EC in preparing and adopting regulations (e.g. auctioning regulation) and in supervising.
<b>Auctioning</b>	Legal maximum: 5% of the allocation  Actual share of auctioned allowances: 0.13%	Legal maximum: 10% of the allocation  Actual share of auctioned allowances: 3%  Aviation: 15%	40% of allowances auctioned in 2013, up to ~70% by 2020 = minimum 48% of phase 3 allocation. - <u>Power sector</u> : 100% with exceptions. - <u>Non-power sectors</u> : 20% in 2013, regularly increased to achieve 70% in 2020 and 100% in 2027, to the exception of sectors exposed to a risk of carbon leakage. - <u>Aviation</u> : 15%

	<b>Phase 1: 2005-07</b>	<b>Phase 2: 2008-12</b>	<b>Phase 3: 2013-20</b>
<b>Free allocation</b>	<p>Legal minimum: 95% of the allocation</p> <p>Mostly based on historical emissions ('grandfathering'), excepted for some countries and sectors (e.g. new entrants) where allocation was based on benchmarks (based on best available technologies, production capacity or expected production)</p>	<p>Legal minimum: 90% of the allocation</p> <p>Mostly based on historical emissions ('grandfathering'), excepted for some countries and sectors (e.g. new entrants) where allocation was based on benchmarks.</p> <p>Increased used of benchmarking.</p> <p>Aviation: 85%</p>	<p>Maximum 52% of phase 3 allocation, based on community-wide sectoral benchmarks corresponding to the performance of the 10 % most efficient installations in each sector or subsector in 2007-08.</p> <p>- <u>Power sector</u>: only district and industrial heating uses. 8 MS (Bulgaria, Cyprus, Czech Rep., Estonia, Hungary, Lithuania, Poland and Romania) allowed to grant free allowances to existing power plants (70% of 2005-07 verified emissions in 2013, down to 0% in 2020) against energy sector modernization.</p> <p>- <u>Non-power sectors</u>: 80% in 2013, down to 30% in 2020 (and 0% in 2027). Sectors with a significant risk of carbon leakage receive 100% free allowances.</p> <p>- <u>Aviation</u>: 85%</p>
<b>New entrants treatment</b>	<p>New entrants' allocation reserve (NER) designed by each MS</p> <p>Usually allocated freely</p>	<p>NER designed by each MS</p> <p>Usually allocated freely</p>	<p>5% of the annual EU-wide free allocation is set-aside for new entrants, in industrial sectors only.</p> <p>Allocation based on benchmarking</p>
<b>Treatment of installations closures</b>	<p>Installation whose production falls under a nationally-fixed limit have to forfeit their allocation</p>	<p>Installation whose production falls under a nationally-fixed limit have to forfeit their allocation</p>	<p>Allocation is adjusted the following year:</p> <ul style="list-style-type: none"> <li>- To 50% if partial closure of 50-75% of production capacity,</li> <li>- To 25% if 75-90% partial closure,</li> <li>- To 0% if more than 90% closure.</li> </ul>
<b>COMPLIANCE</b>			
<b>Allowance banking/borrowing</b>	Intra-phase banking and borrowing	Inter-phase banking and intra-phase borrowing	Inter-phase banking and intra-phase borrowing

	Phase 1: 2005-07	Phase 2: 2008-12	Phase 3: 2013-20
<b>Non discharging penalty per missing allowance/credit</b>	40 €	100 €	100€ in 2013, adjusted for inflation from 2014 on
<b>Use of CDM/JI credits</b>	CDM credits allowed but not used due to unavailability of credits	National limits on use of 13.4% of the allocation on average, 10% in Romania  Few qualitative restrictions (no nuclear and forestry credits, conditioned use of large hydro projects' credits)	<u>Phase 2-covered installations:</u> limited to credits not used in phase 2 or to 11% of 2008-12 allocation, whichever is the highest <u>New industrial installations:</u> limited to 4.5% of actual emissions <u>Aviation:</u> limited to 1.5% of verified emissions + credits not used in 2012  Credits issued from projects registered from 2013 have to come from LDCs or countries with which Europe has an agreement. Exclusion of industrial HFC23 and N <sub>2</sub> O destruction projects.
<b>Price containment</b>	-	-	Extraordinary measures in case the allowance price skyrockets for more than six consecutive months (art. 29a of Directive 2009/29/EC).  Market Stability Reserve under discussion
<b>MARKET INFRASTRUCTURE</b>			
<b>Keeping track of allowances</b>	National registries linked to the Community Independent Transaction Log (CITL)	National registries linked to the Community Independent Transaction Log (CITL)	Central electronic registry holding the accounts of EU ETS actors and recording their transactions; co-controlled by the EC and MS.  Coupled with the European Union Transaction Log (EUTL), which records the allocation, transfer and cancellation of allowances and checks operations consistency.
<b>Auctioning</b>	Under MS responsibility	Under MS responsibility	Common auctioning platform (opt-out provision used by the UK, Germany and Poland)

Phase 1: 2005-07	Phase 2: 2008-12	Phase 3: 2013-20
		Auction monitor to be appointed

Notes: MS=Member States, EEA=European Economic Area, EC=European Commission.

## 2.3. Major achievements

### 2.3.1 Providing a reliable and efficient price for carbon emissions

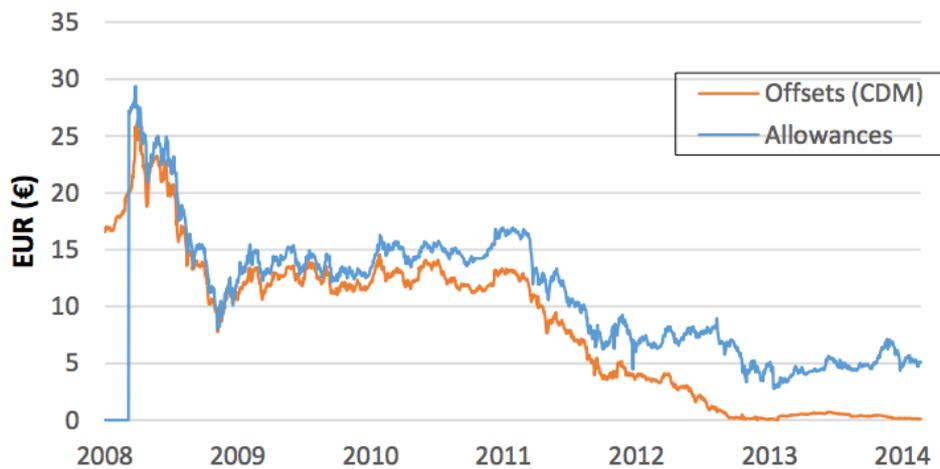
The first achievement of the EU ETS has been to create the conditions for the emergence of a reliable, single price for GHG emissions. **The carbon price has been reflecting the expectations of market players regarding the allowances supply and demand equilibrium.**

**a) The institutional and regulatory framework governs supply:** the cap fixed to incumbents, compliance requisites (e.g. the types of CDM/JI credits allowed), implications of international negotiations, etc. Future evolutions are also under scrutiny because of the banking provision, which makes decreasing caps an incentive to save allowances already today. **Because the EU ETS is a pure regulatory market, the institutional framework plays a key role in driving the carbon price.**

**b) Allowance demand corresponds to the incumbents' needs to cover their emissions. It is also driven by clearly identified market fundamentals:**

- **Climate conditions impact power and heat demand and production:** higher or lower than normal temperatures modify heating and air-conditioning demand; rainfall impacts CO<sub>2</sub>-free hydropower production. For instance, mild and wet climate conditions in winter 2006 and summer 2007 led to lower electricity consumption and CO<sub>2</sub> emissions.
- **Economic activity increases energy demand and industrial production,** leading to higher GHG emissions. On the contrary, the 2009-10 economic downturn in Europe led to a drop in industrial emissions.
- **Relative fuel prices** influence the merit order of power plants and may favor higher CO<sub>2</sub>-emitting fuels: calling a natural gas-fired power plant instead of a coal-fired power plant, for example, saves approximately 1.7 tCO<sub>2</sub> per ton of oil equivalent. The low cost of coal observed in Europe, since mid-2011 in particular, has led to increased emissions.
- **Emissions abatement:** short-term (e.g. switching to less carbon-intensive fuels or increasing energy efficiency) as well as longer-term abatement (investments in low-carbon technologies or capacities) lead to decreased emissions (see
- 
- 
- Figure 2).

Figure 2 – Evolution of the European Union Allowances price



Source: Sandbag, Briefing: An introduction to the EU Emissions Trading Scheme, July 2014.  
[http://www.sandbag.org.uk/site\\_media/pdfs/reports/140701\\_new\\_mep\\_brochure\\_v12.pdf](http://www.sandbag.org.uk/site_media/pdfs/reports/140701_new_mep_brochure_v12.pdf)

It should be noted that **the carbon price is still significant despite the current surplus in allowances observed on the market** (see section 2.4.2). Indeed, cap-and-trade systems can only be in a surplus situation, as the emissions cap cannot be exceeded. The carbon price thus reflects the long-term constraint imposed through the EU ETS cap, thanks to the possibility of banking allowances from one period to the following one.

### 2.3.2 Reduced EU emissions

Installations integrate the cost of emissions allowances in their production costs, being them “short” (i.e. having received less allowances than their actual emissions) or “long” (i.e. having received more allowances than their compliance needs). The EU ETS carbon price affects **operational choices** of existing installations as well as **investment decisions** for new and existing installations.

**The EU ETS contributed to reducing EU emissions, despite over-allocation in some sectors and Member States in the first period, and consequences of the 2009 economic downturn.**

- The pre-downturn period showed attributable emission savings of **between 40 and 80 MtCO<sub>2</sub>/yr on average, about 2-4% of capped emissions**, which constitutes a strong impact for an individual energy-environmental policy instrument. For example, Ellerman et al. (2010) estimated abatements due to the EU ETS from 2005 through 2007 in the range of 120 to 300 MtCO<sub>2</sub>, i.e. 2 to 5% below the business-as-usual scenario. In the first 2 years of the second period, additional

reductions were estimated at approximately 340 MtCO<sub>2</sub>e, i.e. **8% below projected business-as-usual emissions**.

- From 2009 on, fewer studies are available and no consensual effect of the EU ETS on emissions reduction can be drawn. For instance, Egenhofer et al. (2011) estimate emission-intensity improvements attributable to the EU ETS at 3.35% per year. Another study by New Carbon Finance (2009) shows that 40% of the 3% fall in 2008 emissions compared to 2007 can be attributed to EU ETS abatement. Finally, Gloaguen and Alberola (2013) find a 0-10% effect of carbon pricing on emissions reductions, due to interactions with energy policies and the economic downturn<sup>4</sup>.

It should be noted that despite the current issue of allowances surplus, **prospects for long-term ambitious targets and potential structural reforms of the EU ETS have maintained an incentive to reduce emissions, even if at a reduced pace** (see section 2.4.2).

### 2.3.3 No effect has been detected on EU competitiveness and carbon leakage

**With the EU ETS, emitters in Europe have to take into account an additional cost for carbon emissions in their production function.** Because most industrial sectors (and even some power producers at the European borders) and commercial aviation compete with installations and companies not covered by similar carbon costs, two risks have been put forward:

- On the short term, a **relative loss of competitiveness** for EU industries on international markets, leading to reduced EU economic outputs;
- On the medium and long terms, the **delocalization or relocalization of emitting activities outside the EU ETS geographical scope**.

**The resulting potential carbon leakage decreases the environmental efficiency of the EU ETS as emissions are artificially reduced in Europe while increased elsewhere; it also threatens the economic efficiency of the system by reducing the economic activities.**

Nevertheless, as reported by Vivid Economics & Ecofys (2014), **no consensus emerges on carbon leakage estimates**. Empirical studies, based on ex-post evaluation, conclude that no substantial carbon leakage is provoked by the implementation of the EU carbon price. Other macro-economic factors (labor costs, energy prices, etc.) appear more important for economic choices than carbon, especially in economically dynamic times and when the allowance price is low. Theoretical studies, based on ex-ante estimates, can conclude differently, but caution has to be taken as regards simplified assumptions used in models<sup>5</sup>. Also, they usually present long-term effects rather than immediate ones.

The characteristics of the EU ETS explain why, despite strong concerns, limited impacts of the carbon price on the overall economy have been detected. Indeed, **flexibility provisions, the carbon price pass-**

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<sup>4</sup> Egenhofer et al. (2011), *The EU Emissions Trading System and Climate Policy towards 2050: Real incentives to reduce emissions and drive innovation?*, <http://www.ceps.be/book/eu-emissions-trading-system-and-climate-policy-towards-2050-real-incentives-reduce-emissions-an>; New Carbon Finance (2009) quoted in Laing et al. (2013); Gloaguen and Alberola (2013), *Assessing the factors behind CO<sub>2</sub> emissions changes over the phases 1 and 2 of the EU ETS: an econometric analysis*, CDC Climat, [http://www.cdclimat.com/IMG/pdf/13-10\\_cdc\\_climat\\_r\\_wp\\_13-15\\_assessing\\_the\\_factors\\_behing\\_co2\\_emissions\\_changes.pdf](http://www.cdclimat.com/IMG/pdf/13-10_cdc_climat_r_wp_13-15_assessing_the_factors_behing_co2_emissions_changes.pdf)

<sup>5</sup> For example: no carbon abatement measures are undertaken when the carbon price goes up, no carbon regulation is implemented in competing markets (while carbon pricing is developing in other countries), no counter-balancing policies are put in place to protect EU firms...

through and continued free allocation have mitigated compliance costs for sectors deemed to be sensible to international competition.

### 2.3.3.1 *The flexibility provisions in the EU ETS*

The EU ETS, which intrinsically aims at minimizing the cost of reducing emissions, provides flexibility provisions, which facilitate capital investment cycles and industry planning:

- **Banking is unlimited:** allowances can be used for compliance any time, whatever their issuance vintage. Banking thus provides incentives for early abatement.
- **Informal year-on-year borrowing is possible with free allocation, but within the limits of each period:** incumbents can surrender allowances issued for year N+1 for their year N compliance<sup>6</sup>. Borrowing is forbidden from one period to another, meaning borrowing has to be compensated ultimately at the last compliance of the period.
- **Use of offset credits:** by enlarging the scope of possible abatements, the possibility to use credits from CDM and JI mechanisms provides lower-costs abatement options, which is reflected in lower prices. Maximizing the use of offset credits thus diminishes the cost of compliance for incumbents.

Also, the EU ETS has demonstrated its **counter-cyclical effect**: when economic growth is down, emissions tend to diminish because of lower production demand, leading to reduced GHG emissions. In that case, demand on the carbon market is also reduced and the carbon price drops, alleviating the compliance costs for incumbents.

#### Box 2 - Limited transaction costs

**Firms incur EU ETS transaction costs, but the European Commission and governments also do.** Public authorities have invested into dedicated teams in charge of developing and implementing the regulatory framework and the EU ETS infrastructure. No estimate is available for the public costs incurred, but it is likely they would not be significantly different from those incurred by another regulatory instrument (e.g. taxation incurs recovery costs and similar data management).

As regards EU ETS incumbents, costs are linked to **early-implementation issues** (e.g. human resources training), **emissions monitoring, reporting and verification**, and **trading** (e.g. brokerage fees). Jaraite et al. (2009)<sup>7</sup> showed that those costs were limited, at 0,14€/tCO<sub>2</sub> emitted on average<sup>8</sup>.

### 2.3.3.2 *The carbon price pass-through and the windfall profits*

The increase in input costs due to carbon pricing is born by all incumbents, who face an **opportunity cost** when using allowances to cover their emissions while they could have sold them at the market price. **It is true whatever the allocation was free or auctioned.**

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<sup>6</sup> Incumbents receive their free allocation for year N+1 on February 28 at the latest, while they have to surrender allowances for year N compliance by April 30 of year N+1. They can also surrender allowances bought at auctions before that date.

<sup>7</sup> Quoted by Ellerman et al. (2010).

<sup>8</sup> Nevertheless, discrepancies were recorded between small (less than 22,300 allowances allocated/yr), medium (between 22,300 and 446,000 allowances allocated/yr) and large emitters (more than 446,000 allowances allocated/yr). The overall costs were estimated respectively at 2.07€/tCO<sub>2</sub>, 0,87€/tCO<sub>2</sub> and 0,11€/tCO<sub>2</sub>.

The opportunity cost is incorporated through a combination of three strategies: by reducing profit margins, by improving efficiency to reduce emissions, and by passing the additional costs onto the consumer. The latest, known as the **carbon cost pass-through**, is desirable as it drives demand towards lower carbon-intensive goods.

The literature review by Laing et al. (2013) concludes that **there is robust evidence of the existence of carbon cost pass-through, with rates ranging from low (30%) for some sectors to high (over 100%) for others.**

**Combustion** is one of the sectors that benefitted the most from carbon cost pass-through as power and heat are not transferable on long distance and are thus less sensible to international competition. Profits derived from the inclusion of the carbon price, in the power price in particular on the gross market and unregulated detail market, were huge in phases 1 and 2 because of the then free allocation. CarbonTradeWatch (2011)<sup>9</sup> estimated the order of magnitude to €19 billion in phase 1 and expected it would reach up to €71 billion in phase 2.

**Other industrial sectors** also received windfall profits due to free allocation, especially after the drop in emissions following the economic downturn. Surplus allowances could then be sold on the market and sometimes provided important gains. A study by De Bruyn et al. (2010)<sup>10</sup> estimated that the full cost-pass-through rates in the refineries and iron and steel sectors could have generated windfall profits of €14 billion between 2005 and 2008.

**Windfall profits represent a transfer of income from consumers and states to power and industrial emitters.** To address the issue, the combustion sector in phase 3 is now submitted to full auctioning, the only derogations ending in 2020. Also, when they receive free allocation, industrial sectors are now submitted to output-based benchmarking aligned on the 10% most efficient installations of their sector.

### *2.3.3.3 Protecting the EU competitiveness through free allocation and compensations*

European industries have long warned European authorities of the possible adverse effects of carbon pricing on their competitiveness on international markets. When reinforcing the carbon constraint in phase 3 and deciding that auctioning should become the basic allocation principle, the EU also decided of **special provisions for “energy-intensive sectors or subsectors that have been determined to be exposed to significant risks of carbon leakage”** (article 10b of Directive 09/29/EC).

The methodology used to determine the corresponding industrial sectors at risk of carbon leakage is based on two criteria: carbon cost intensity and trade exposure. One of the following conditions shall be met:

- Direct and indirect additional costs induced by the EU ETS would lead to an increase of production cost of at least 5% of the Gross Value Added; and the trade intensity (imports and exports) of the sector with countries outside the EU is above 10%.
- Direct and indirect additional costs is at least 30%;

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<sup>9</sup> [http://www.carbontradewatch.org/downloads/publications/ETS\\_briefing\\_april2011.pdf](http://www.carbontradewatch.org/downloads/publications/ETS_briefing_april2011.pdf)

<sup>10</sup>

[http://www.ce.nl/publicatie/does\\_the\\_energy\\_intensive\\_industry\\_obtain\\_windfall\\_profits\\_through\\_the\\_eu\\_ets/1038](http://www.ce.nl/publicatie/does_the_energy_intensive_industry_obtain_windfall_profits_through_the_eu_ets/1038)

- Non-EU trade intensity is above 30%.

The European Commission may include in the carbon leakage list some sectors or sub-sectors that do not respect the above-mentioned quantitative criteria, based on a **qualitative analysis of the socio-economic situation of the considered sectors and of the evolution of third-countries' climate policies**<sup>11</sup>.

**Industrial installations responding the criteria receive 100% free allowances over the 2013-2020 period**, while other industrial installations received 80% free allocation in 2013, the ratio diminishing each year down to 30% in 2020. Free allocation is calculated in both cases on the basis of **product-specific benchmarks** corresponding to the performance of the 10% most efficient installations. Benchmarks are multiplied by the historical production figure and adjusted to fit the annually decreasing total EU ETS cap.

With such allocation methodology, installations falling short of the benchmark receive a proportionately lower free allocation compared to their emissions, raising their needs for emissions abatement or allowances purchase, compared to installations at or below the benchmark.

**Such free allocation is thus expected to counterbalance the risk of carbon leakage while providing more incentive to reduce EU emissions than the grandfathering allocation process used in phases 1 and 2.** It should be noted that a great proportion of industrial sectors were found to be at risk of carbon leakage (around 95% of industrial emissions); nevertheless the carbon price used in calculations -30€ in 2020- is criticized as disconnected from the actual carbon market price and is a much debated issue in the current revision of the leakage list (see section 2.4).

**The cost of CO<sub>2</sub> that is passed on in electricity prices could also expose indirectly electricity-intensive installations to the risk of carbon leakage.** Article 10a(6) of the revised ETS Directive gives Member States the possibility to compensate them for increases in electricity costs resulting from the ETS through national state aid schemes. The Commission has published guidelines to ensure that such measures are coherent with the EU's state aid rules, and is responsible for approving national state aid schemes.

#### **2.3.4 Support to innovation and low-carbon investment**

The implementation of a carbon price gives an advantage to low-carbon products and services, and is thus expected to **stimulate technical as well as organizational innovation**. In return, such innovation could improve the international competitiveness of carbon-constrained firms. Apart from technological and organizational changes, the carbon price is also expected to **modify the investment profile of investors**, as GHG emissions constitute a new liability.

Evidence of EU ETS support to innovation and low-carbon investment is scarce as the system is still quite new. As underlined by Laing et al. (2013) such changes would depend on the magnitude and long-term credibility of the carbon price signal and would have a full effect only on the timescale of decades. Also, public and private decision-makers not only face the carbon cost but other factors like fuel prices, technology-specific support policies, economic policies, etc., which makes it difficult to disentangle the sole EU ETS impact.

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<sup>11</sup> See paragraphs 17 and 18 of Article 10a of Directive 2009/29/EC.

Nevertheless, Cael and Dechezleprêtre (2013) investigated for the first time the impact of the EU ETS on technological change through firms patenting. The conclusion is that **the EU ETS has increased low-carbon innovation among regulated firms only, by as much as 10%**, but has had no effect on the patenting volume for non low-carbon technologies.

Finally the EU ETS also contributes in a targeted way to developing low-carbon technologies thanks to two specific provisions:

- The **inclusion of sequestered carbon emissions in its scope since 2013**, which provides an incentive to develop Carbon Capture and Storage (CCS) technologies to reduce operational costs of big emitters;
- The **set-aside of 300 million allowances from the third phase New Entrants Reserve, to be auctioned to fund large-scale CCS and innovation renewable energy projects**. The NER 300 programme has awarded €2.1 billion in total to 39 projects, most of them relating to innovative energy and only one dedicated to a large-scale CCS project in the EU<sup>12</sup>.

### 2.3.5 Leveraging funds for climate actions at the international and European levels

Since the very beginning of the EU ETS, Europe has made clear that its instrument was also aimed at **promoting the development of carbon pricing worldwide** in order to achieve both European emissions reduction at the lowest cost and internationally agreed mitigation goals.

In that regard, the Clean Development Mechanism (CDM) and the Joint Implementation (JI) mechanisms created under the Kyoto Protocol were considered as « important to achieve the goals of both reducing global greenhouse gas emissions and increasing the cost-effective functioning of the Community scheme (recital 19 of the original Directive 2003/87/EC). The 2004/101/EC Linking Directive completed Directive 2003/87/EC by specifying how credits issued from CDM or JI projects may be used for EU ETS compliance until 2012.

**The link between the EU ETS and the international Kyoto credit market has been a key driver of the development of CDM projects in developing countries.** It also contributed to **additional emissions reductions in Europe and other industrialized countries through JI projects**. The maximum amount of international credits that can be used by 2020 is estimated around 1.6 and 1.7 billion, while 1.058 billion were used in phase 2. Retaining an average capital investment per tonne of CO<sub>2</sub> reduced of USD200<sup>13</sup>, the EU ETS contributed to investments in an **order of magnitude of 250 billion euros**, mostly in developing countries.

At the European level, two mechanisms aim at **redistributing the carbon value created by the EU ETS**:

- **Within Member States**: 88% of the auctioned allowances are first allocated to Member States on the basis of their share in the EU ETS verified emissions in 2005. But 10% are allocated to the least wealthy Member States to help them invest in **reducing the carbon intensity of their economies and adapting to climate change**. The remaining 2% constitute an **early-action bonus** to nine Member States whose GHG emissions were down by at least 20% in 2005 compared to their Kyoto Protocol baseline (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania

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<sup>12</sup> For details, please consult [http://ec.europa.eu/clima/policies/lowcarbon/ner300/index\\_en.htm](http://ec.europa.eu/clima/policies/lowcarbon/ner300/index_en.htm)

<sup>13</sup> UNFCCC (*Benefits of the Clean Development Mechanism 2012, 2013*) estimated the capital investment per tonne of CO<sub>2</sub> reduced between USD9 and USD4,004 depending on the project type [http://cdm.unfccc.int/about/dev\\_ben/ABC\\_2012.pdf](http://cdm.unfccc.int/about/dev_ben/ABC_2012.pdf)

and Slovakia). Romania thus receives in phase 3 the entitlement to auction 152% of its 2005 EU ETS emissions (Ellerman et al., 2010).

- **Recycling auction revenues towards climate-friendly actions:** at least 50% of revenues from auctioning should be used to finance climate-friendly actions, this ratio raising to 100% of the revenues for the auctioned allowances attributed to the least wealthy Member States and early bonus actions (see article 10 of Directive 2009/29/EC).

### 2.3.6 Generation of lessons and experience for both EU and other jurisdictions

As the first large-scale ETS, the EU ETS has been closely followed since its inception by other jurisdictions willing to curb their GHG emissions. **Youth defaults as well as success stories have provided a valuable experience to improve the regulatory framework of a number of ETSs implemented or on their way to be implemented:** the Californian/Quebec ETS, the 7 pilot Chinese ETSs, the Korean ETSs...

The European Commission and EU Member States are also supporting international initiatives aiming at developing the understanding and the used of market mechanisms to mitigate climate change, including:

- The International Carbon Action Partnership (ICAP)<sup>14</sup>, which provides a forum for sharing experience and knowledge on the development of ETSs
- The Partnership for Market Readiness (PMR)<sup>15</sup>, which provides grant financing and technical assistance for capacity building and piloting of market-based tools for GHG emissions reduction.
- The Carbon Pricing Statement<sup>16</sup>, a call of the World Bank on governments and companies to support putting a price on carbon.

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<sup>14</sup> <https://icapcarbonaction.com/>

<sup>15</sup> <https://www.thepmr.org/>

<sup>16</sup> <http://www.worldbank.org/en/programs/pricing-carbon#1>

### Box 3 – Detection and amendment of initial flaws

Because few ETSs have been functioning before, and no one with such a scope, the design of the European cap-and-trade system was a fierce challenge to the European authorities. If economists could warn of potentially undesirable effects (e.g. the second-best option of allocating allowances for free instead of auctioning them), other difficulties the EU ETS encountered could not be foreseen. The best example is that of criminal activity which emerged over 2009-11 and obliged the EU to strengthen its regulatory and market surveillance frameworks.

Two rather “classic” frauds were evidenced: a fraud on carbon transactions’ VAT; and phishing attacks on EU ETS registries, in the same way phishing can be used to steel money from bank accounts<sup>17</sup>.

The first alerts on the VAT fraud appeared in 2009 when authorities realized allowances were bought in one European country (without paying for VAT as cross-border sales were exempted) then resold with VAT added in a domestic transaction without paying the VAT collected to the State. Because end customer businesses could claim the VAT refund from the State, the State ended up paying out tax refunds for tax money it never received. The answer was the cancelling of VAT on carbon market transactions.

Phishing attacks developed in several waves, first in January and November 2010 in Germany and Romania. In January 2011, national emissions allowance registries of 5 Member States (Austria, Romania, Czech Republic, Greece and Italy) were also attacked, resulting in the theft of several million EUAs, quickly resold into the market by cyber-criminals who took advantage of defaults in the registries’ security. To protect the market, the European Commission decided to suspend allowances transfers until the security of registries in all 27 EU Member States could be verified, freezing the spot market.

In parallel to the amendment of VAT regulation and improvement of registry security, the European Commission also engaged into the review of the carbon market oversight and regulation. If the futures market appeared adequately regulated, oversight in the spot market had to be improved. The new Markets in Financial Instruments Directive II (MiFID II) and Regulation (MiFIR) adopted by the European Parliament and Council in April and May 2014 respectively will cover both spot and derivative contracts relating to EU ETS allowances by early 2017 (30 months after the entry into force of MiFID II on 2 July 2014).

More information on the exemptions and consequences for EU ETS participants can be found on the European Commission website ([http://ec.europa.eu/clima/policies/ets/oversight/faq\\_en.htm](http://ec.europa.eu/clima/policies/ets/oversight/faq_en.htm)) or in IETA’s briefing paper (<https://magic.piktochart.com/embed/1990818-mifid-ii>)

## 2.4. Major challenges today: the EU ETS towards phase 4

A number of works have been launched by the European Commission over the last couple of years to deal with the future of the EU ETS, in particular to solve its low carbon price, and more broadly to clarify long-term targets of European climate and energy policies.

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<sup>17</sup> For details, please consult Sartor O. (2011), Closing the door to fraud in the EU ETS, available at [http://www.cdclimat.com/IMG/pdf/11-02\\_climate\\_brief\\_4\\_-\\_closing\\_the\\_door\\_to\\_fraud\\_in\\_the\\_eu\\_ets.pdf](http://www.cdclimat.com/IMG/pdf/11-02_climate_brief_4_-_closing_the_door_to_fraud_in_the_eu_ets.pdf)

## 2.4.1 The revision of the carbon leakage list: changes only in 2020 at the earliest

### 2.4.1.1 Pre-2020 period

The first list specifying the sectors and sub-sectors exposed to a risk of carbon leakage was prepared in December 2009. It has to be updated every five years thereafter according to Directive 2009/29/EC. The European Commission has therefore drafted a **revised list for the 2015-19 period**.

Critics reported by stakeholders during the consultation period have concentrated on the carbon price used to model the risk of carbon leakage. A report by De Bruyn et al. (2013) finds three major outdated assumptions:

- A carbon price of €30 by 2020, although De Bruyn et al. (2013) considers it unlikely to exceed €12;
- Emissions from exposed sectors would exceed the benchmarked free allocation by 60%; De Bruyn et al. (2013) reckons a figure of 20% seems more likely;
- Non-EU countries are not part of the EU ETS; but inclusion of Croatia, Iceland, Norway and Liechtenstein in the EU ETS with potential linkage with Switzerland in the coming years may change the picture.

If such new assumptions were to be applied, the sectors deemed at risk of carbon leakage would have fallen from the current 60% of sectors, representing 95% of industrial emissions, to 33% of sectors, accounting for only 10% of emissions. It is important to note that in that case revenues would increase for Member States, as the share of auctioning would not be null anymore for 90% of covered emissions. Also, it would reduce the risks that a cross-sectoral correction factor is applied to all free allocations, including for sectors not deemed to be exposed to carbon leakage.

Nevertheless, **the draft regulation prepared by European Commission maintains the current criteria and existing assumptions**, to account for the impacts of structural reforms of the EU ETS and the implementation of 2030 long-term targets. They are supposed to significantly raise the carbon price even before 2020 because of the banking of allowances, which ensure continuity in demand over phases 3 and 4. It means that the composition of the carbon leakage list is not significantly changed<sup>18</sup>.

**The revised carbon leakage list for 2015-19 was adopted by the European Commission on 27 October 2014<sup>19</sup> and will apply to determine free allocations as from 2015.**

### 2.4.1.2 Post-2020 period

2014 also saw the start of consultations on the future of free allocation for the post-2020 period. The European Commission recognizes the « need to continue with an **improved and better focused system of free allocation post-2020**, as long as there are no comparable efforts undertaken in other major economies, in order to ensure the competitiveness of Europe's energy-intensive industries »<sup>20</sup>. It also

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<sup>18</sup> See the comparison chart prepared by the European Commission:

[http://ec.europa.eu/clima/policies/ets/cap/leakage/docs/carbon\\_leakage\\_comparison\\_en.pdf](http://ec.europa.eu/clima/policies/ets/cap/leakage/docs/carbon_leakage_comparison_en.pdf)

<sup>19</sup> [http://ec.europa.eu/clima/news/articles/news\\_2014102701\\_en.htm](http://ec.europa.eu/clima/news/articles/news_2014102701_en.htm)

<sup>20</sup> "Stakeholder consultation process on post-2020 carbon leakage provisions for the EU emissions trading system", note of the European Commission available at:

[http://ec.europa.eu/clima/policies/ets/cap/leakage/docs/sh\\_meeting\\_process\\_note\\_en.pdf](http://ec.europa.eu/clima/policies/ets/cap/leakage/docs/sh_meeting_process_note_en.pdf)

suggest the future framework will have to be designed as a complement to policies supporting low-carbon innovation, like the NER300 program.

Results of the consultation opened until the end of July 2014, as well as proceeds from three stakeholder meetings organized were used by the European Commission to draft a proposal, which was published on 15 July 2015. Only limited changes to the existing rules are proposed, including a more targeted approach to free allocation – meaning the number of sectors deemed to be exposed to carbon leakage would be reduced to 50, the updating of benchmarks based on technological progress achieved over time and a better alignment of free allocation to actual production levels by a more frequent calculation of individual allocations.

#### 2.4.2 Structural reforms to regulate indirectly the carbon price

The economic downturn and the subsequent fall in EU emissions since 2009, the possibility to use a significant amount of international credits and the depressing effect of energy policies on GHG emissions, have logically reduced demand for allowances, hence their price. But **this economically-rational evolution questions the role the EU ETS should play in driving a carbon price signal that is compatible with Europe’s long-term mitigation targets**. A too low carbon price is feared to override low-carbon actions by reducing abatement and innovation efforts. If that were the case, mitigation options for the next decades would be reduced and would lead to increased emissions reduction costs in the future, damaging the inter-temporal efficiency of the EU ETS (European Commission, Executive summary of the Impact assessment, 2014).

So is the current EU ETS price the “fair price” for short- and long-term carbon abatement? The answer by many stakeholders is no. The European Commission started to address this economic and political issue in 2010 by proposing to reduce the EU ETS cap in the revised Energy Efficiency Directive. As no political agreement could be reached, the European Commission proposed in November 2012 to **re-schedule the auctioning of 900 million allowances from the years 2013 and 2015 to the years 2019 and 2020**. This proposal was much debated, but was finally adopted in February 2014<sup>21</sup>. However, **the backloading proposal does not modify the overall supply-demand equilibrium**, as allowances will be put back on the market at the end of phase 3. So the early bullish effect on prices would probably be followed by a bearish effect in the last years, possibly increased by the higher abatement due to a higher carbon price at the beginning of the phase, unless demand grows significantly meanwhile.

This is why the European Commission started in parallel a large reflection on “**structural measures**” that would ensure the European carbon price would remain at a significant level. Six proposals were put on the table in November 2012:

- To tighten the emissions reduction target from 20% to 30% of 1990 emissions by 2020, which implies the retirement of 1.4 billion of allowances from phase 3.
- To permanently retire allowances from those foreseen for auction between 2013 and 2020, leaving the amount of freely allocated EUAs untouched.
- To increase the 1.74% linear factor by which the overall EU cap decreases annually below the 2008-2012 average emissions, in line with the first proposal (the 30% target).

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<sup>21</sup> Commission Regulation No 176/2014. See section 3 for details on auctioning.

- To increase the demand of allowances by including new sectors within the scheme, which are less responsive to economic cycles (e.g. fuel consumption).
- To impose a limit on the use of the offsets.
- To introduce a discretionary price mechanism. This would include an auction price floor and a price management reserve, similar to the design of the newly implemented Californian ETS.

**The European Commission concluded from the stakeholders’ consultation that a seventh option, the establishment of a Market Stability Reserve, would be the best option by dealing directly with the allowances surplus issue<sup>22</sup>.**

The design of the MSR was proposed by the European Commission on 22 January 2014. It was approved by the EU Parliament and Council on 8 July and 18 September 2015 respectively. The MSR will enter into force in 2019 and will **automatically adjust the volume of auctions**. The adjustment will be done on the basis of the **estimated surplus level on the market**. The surplus will be calculated as the number of allowances in circulation i.e. the difference between, on the one hand, distributed allowances and the amount of international CDM/JI credits used for compliance, and on the other hand, verified emissions. Note that this calculation method does not estimate the actual amount of allowances available on the market – which would have been extremely difficult; EU ETS participants may choose to keep their surplus instead of selling them thanks to the banking provision, raising the issue of the interaction between the MSR and companies’ compliance strategies.

#### **How would the MSR work in practice?**

- In 2018, 900 million allowances which were withheld under the backloading measure will be added to the MSR rather than coming back to the market via government auctions in 2019 and 2020, as set out in the EU’s original legislation.
- In 2020, unallocated allowances for the period 2013-2020 will be added to the MSR.
- Beginning in 2019, 12% of the surplus allowances in circulation at the end of year x-2 shall be placed in the MSR, unless it amounts to less than 100 million allowances. It means that the MSR would be fed in only when the estimated surplus of allowances is higher than 833 millions.
- Any year, if the number of surplus allowances in circulation is lower than 400 millions, 100 million allowances — or what remains in the MSR if it is less than 100 million allowances — shall be released from the MSR.

The MSR would also be used in case of “excessive price fluctuations”, as defined in article 29a of Directive 2009/29/EC. In complement, 100 million allowances taken from the MSR would be auctioned.

**Table 2 – Pros and cons of the MSR**

<b>Arguments in favor of the MSR</b>	<b>Arguments against the MSR</b>
Provides flexibility to adapt to unforeseen events	Not clear how the rules can accommodate to possible ‘unknown unknowns’

<sup>22</sup> Explanatory memorandum and proposal of the European Commission concerning the establishment and operation of a market stability reserve, available at: [http://ec.europa.eu/clima/policies/ets/reform/docs/com\\_2014\\_20\\_en.pdf](http://ec.europa.eu/clima/policies/ets/reform/docs/com_2014_20_en.pdf)

Ensures scarcity pricing on the short term by absorbing part of the allowances surplus	No clear effect on the long-term carbon pricing, as no allowances will be cancelled. Asymmetry in the design and not accounting for hedging positions may lead to higher scarcity than expected.
Simple and transparent to market participants	May be impacted by changed in hedging behavior, with more renewable energies in the power sector and more auctioning in the industrial sector.
Cap-neutral	Two-year correction delay could reduce effectiveness and increase price volatility. Correction pace too slow to address the current surplus, likely to persist well into phase 4.
Mitigates the risk of future ad hoc and unjustified interventions	Periodic revision creates additional policy uncertainty

Source: adapted from Acworth W. (2014), "Can the Market Stability Reserve Stabilise the EU ETS: Commentators Hedge Their Bets", DIW Berlin, 5 June 2014.

[http://www.diw.de/de/diw\\_01.c.465890.de/presse/diw\\_roundup/can\\_the\\_market\\_stability\\_reserve\\_stabilise\\_the\\_eu\\_ets\\_commentators\\_hedge\\_their\\_bets.html](http://www.diw.de/de/diw_01.c.465890.de/presse/diw_roundup/can_the_market_stability_reserve_stabilise_the_eu_ets_commentators_hedge_their_bets.html)

### 2.4.3 Reviewing the EU ETS ambition, taking into account interactions with the energy policies and competitiveness worries

#### 2.4.3.1 The proposed 2030 package

The EU ETS is one of the building blocks for achieving the European energy and climate targets by 2020. The European Commission proposed on 22 January 2014 an energy-climate package for 2030 whose first target would be to reduce EU emissions by 40% by 2030 compared to 1990 level. It would ensure the EU is on track to achieve the emissions reduction of at least 80% by 2050 set out in the 2050 roadmap<sup>23</sup>. **To achieve the overall 40% target, the sectors covered by the EU ETS would have to reduce their emissions by 43% by 2030 compared to 2005<sup>24</sup>.** This estimate takes into account the interactions between climate and energy policies. Indeed, other policies of the 2020 package will also be pursued: the European Council agreed on 23 October 2014 on the European Commission's proposals to increase the share of renewable energy to at least 27% of the EU's energy consumption and to increase energy efficiency by 27% by 2030 compared to forecasts. The energy efficiency target should be reviewed by 2020 "having in mind an EU level of 30%" (European Council, 2014).

It should be noted that the EU climate and energy policies are not the only source of potential overlap with the EU ETS. **Member states' national policies can impact ETS-covered emissions and therefore the EU ETS supply-demand equilibrium**, hence the distribution of abatement. Ellerman et al. (2014) quotes two examples: 1/ the German phase-out of nuclear power in the aftermaths of the Fukushima accident, implying more emissions from fossil-fuelled power plants before renewable energies can

<sup>23</sup> Other components of the package include an increased share of renewable energy to at least 27% of the EU's energy consumption by 2030, and increasing energy efficiency by 30%.

<sup>24</sup> Non EU-ETS sectors would be subject to a 30% cut below the 2005 level by 2030.

take over and higher abatement demand in the EU ETS perimeter; and 2/ the UK's carbon price floor on fossil fuel supplies to power facilities, which imposes a significantly higher carbon price on the UK power sector with effects on the dispatch of existing capacity and the demand for allowances.

#### *2.4.3.2 Potential evolutions of the EU ETS in phase 4 — the European Commission outlook*

In its assessment of the 2030 package, the European Commission assessed potential evolutions of the EU ETS and presents its position on a number of issues.

- **No unconditional import of international credits from 2021?**

The European Commission advocates for not allowing an additional import of international credits in the EU ETS, to avoid increasing the expected surplus; nevertheless to facilitate higher ambition by 2030 in the rest of the world, a conditional target could be envisaged with a large share of additional efforts being met through international credits.

- **Continued support to linking with other carbon markets**

Europe has been promoting bottom-up initiatives through linking between EU ETS and ETSs compatible in design and ambition. Nevertheless prospects for linking are limited to Switzerland for the time being.

- **A necessary modification of the annual linear reduction factor from 1.74% to around 2.2%**

To ensure the 40% emissions reduction target by 2030, the constraint in the EU ETS has to be reinforced, meaning the annual linear reduction factor applying to the allowance cap should be increased. The three scenarios developed in the impact assessment conclude on similar targets from 2.1% to 2.3%. This is why the European Commission proposes to increase the annual linear reduction factor to 2.2%, to be complemented by specific measures to reduce the allowance surplus to make sure the 2030 emissions target is achieved. The European Council agreed to this proposal in its conclusions of 23 October 2014.

- **Free allocation kept as a safeguard against carbon leakage, if no comparable climate action from other major economies**

The European Commission acknowledges there is no evidence of carbon leakage already, but indicates that future emissions limits, if not comparable to other regions' efforts, may constitute a risk for industries who cannot influence the price of their products on international markets. The European Commission thus advocates for continued free allocation on the basis of periodically updated benchmarks.

Regarding indirect impacts from carbon prices on electricity prices, the European Commission estimates improvements are needed regarding state aids to avoid distortion of intra-EU competition. It evokes the possibility to foster innovation in industries through dedicated schemes, similar to the NER300 mechanism, to both reduce costs to meet long-term objectives and create a technological advantage.

In its conclusions of the 23 October 2014 summit, the European Council indicates it supports such provisions as well as the continuation of specific support to low-income EU Member States through the redistribution of a share of allowances to be auctioned and the possibility to continue to allocate free allowances to the power sector for modernization purposes. A new reserve made of 2% of the

allocation is also proposed to “address high additional investment needs in low income Member States”<sup>25</sup>.

On 15 July 2015, the European Commission published its proposal for the 2020-2030 EU ETS legislation including provisions corresponding to its previous analysis.

#### 2.4.4 Inclusion of new EU members, additional sectors & gases

The inclusion of new sectors and gases in the EU ETS is conditioned by a favorable cost-benefit analysis, compared to other forms of public regulation. It has not been included in the EU ETS 2020-2030 legislative proposal by the European Commission.

Three inclusions may be considered:

- **International flights from and to Europe**

Because of the “stop-the-clock” procedure<sup>26</sup>, flights departing from or arriving in Europe are not covered by the EU ETS, pending an international agreement obtained by the International Civil Aviation Organization (ICAO). ICAO has started its work to provide by 2016 such an agreement, to be operational from 2020 on.

However, if the agreement was not to be reached, the EU may consider covering international flights from and to Europe in the EU ETS, while it would not be politically easy as discussions with third parties showed before the “stop-the-clock” proposal was made.

- **Covering diffuse energy-consumption emissions through an upstream approach**

Instead of covering direct emitters, which would be too many and would incur disproportionate administrative costs, including fuel suppliers, tax warehouse keepers or excise duty points in the EU ETS seems feasible. Such an upstream approach is already functioning in some ETSs like the Californian one.

The European Commission nevertheless warns against some difficulties that may arise, in particular linked to different taxation practices among Member States, and the interaction with existing measures addressing CO<sub>2</sub> emissions and energy consumption in sectors such as transport and the housing segment.

An upstream inclusion of fossil fuel combustion in the residential, services and transport sectors (road, rail and inland navigation) would result in a 37% emissions reduction by 2030 in the EU ETS compared to 2005 emissions

- **Including (non-energy related) emissions from agriculture, forestry and land use (AFOLU)**

The conclusions of the European Commission are that there are benefits in cointegrating sectoral mitigation policies. The first option would be **to include AFOLU emissions in the Effort Sharing Directive**, which may be complicated due to annual variations in AFOLU emissions, complex verification processes and the differences in national abatement potentials among Member States.

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<sup>25</sup> Technical discussions will continue in the following months in the European Council, in parallel to the European Parliament’s examination of the proposal, which incurred some delay due to the European elections.

<sup>26</sup> For further detail, see Decision No 377/2013/EU, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D0377>

Another option would be **a dedicated policy, which can build on the Common Agriculture Policy**, including through improved incentives for climate friendly and smart agriculture.

On the contrary, the European Commission has not promoted **the inclusion of other sectors or gases through a domestic offset projects scheme**. This option, which was included in Directive 2009/29/EC (article 24a), may be problematic to the European Commission as it only creates a new source of carbon credit supply while not increasing at the same time demand. It has nevertheless proven it could favor low-cost abatement innovation in sectors where emissions could be difficult to cap, either by lack of information on abatement costs or because the abatement potential is too little to justify the inclusion in the EU ETS with a somewhat heavy administration burden.

Nevertheless, domestic offset schemes are developing in other ETSs (e.g. Californian ETS, Chinese ETSs, etc.), proving they can be an efficient answer to reduce emissions domestically without formally expanding the scope of an ETS.

#### 2.4.5 Linking prospects and international negotiations

Besides its domestic role in limiting European emissions, **the EU ETS has given credibility to the EU foreign climate diplomacy**. It has been presented by the European Commission as a building block for developing an international network of emission trading systems. Such a network involves informal cooperation to support design and experience sharing, but has also resulted in more **formal discussions to establish a direct link between the EU ETS and other trading schemes**. The rationale is that it reduces the overall cost of cutting emissions, increase market liquidity and stabilize the carbon price. It also contributes to leveling the international playing field for ETS participants. Finally, linking supports cooperation on climate change, facilitating international negotiations on tougher mitigation targets.

To date, the EU ETS has already achieved two linking processes: with the international CDM/JI credit markets, although not an ETS as such, and with the three countries of the European Economic Area. It implied in particular that the Norwegian ETS was adapted to fit with the EU ETS provisions.

Over the last past years, **discussions have been well advanced with both Australia and Switzerland** to link their projected or existing ETSs with the EU one:

- The agreement with Australia was announced in August 2012, as a full two-way link to start no later than 1 July 2018. Businesses would then have been able to use carbon units indifferently from the Australian or the European ETS for compliance. An interim link was to be established from 1 July 2015 enabling Australian incumbents to use EU allowances. Nevertheless, the Australian government nominated in September 2013 repealed the ETS and bilateral linking talks are on hold.
- The European Commission is also negotiating with Switzerland but subsequent to the vote in Switzerland on 9 February 2014 for the reintroduction of immigration quotas with the European Union, ETS linking talks are currently on hold.

**The EU domestic policy has also been designed to give incentives for ambitious international climate targets.** The 2020 package foresaw that the European emissions reduction target would be increased from -20% to -30% if a binding international agreement was to be found for the post-2012 period. But the adoption of a second commitment period of the Kyoto Protocol without a legally binding agreement did not meet the European criteria.

Similar provisions might have been included in the design of the EU ETS Phase 4. For example, the use of international offset credits might have been allowed if Europe was to take on additional efforts and possibly restricted to projects originating from countries taking on mitigation targets. Europe has also been pushing for the development of a **New Market Mechanism** (NMM) in developing countries that would cover whole economic sectors and not only projects as the CDM does. If NMM materializes, its credits might be usable for compliance in the EU ETS, to an extent to be determined.

## 2.5. Selected references

### 2.5.1 EU legislation

- DIRECTIVE 2009/29/EC of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community:
  - <http://eur-lex.europa.eu/legal-content/FR/TXT/?uri=CELEX:32009L0029>
  - Unofficial consolidated version of Directive 2003/87/EC  
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF>
- COMMISSION REGULATION (EU) No 1123/2013 of 8 November 2013 on determining international credit entitlements pursuant to Directive 2003/87/EC  
<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1123&from=EN>
- European Council (2014), Conclusions on 2030 Climate and Energy Policy Framework, 23 October 2014. [http://www.consilium.europa.eu/uedocs/cms\\_data/docs/pressdata/en/ec/145356.pdf](http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145356.pdf)

### 2.5.2 Analysis of the EU ETS

- Calel R. and Dechezleprêtre A. (2013), *Environmental Policy and Directed Technological Change: Evidence from the European carbon market*, Working Paper Series n°2012-08, Climate Economics Chair, Paris, Feb. 2013. <http://www.chaireconomieduclimat.org/wp-content/uploads/2013/02/12-06-Cahier-R-2012-08-Calel-Dechezlepretre-v2.pdf>
- Creti A., Jouvet P.A. and Mignon V. (2011), *Carbon Price Drivers: Phase I versus Phase II Equilibrium?*, CEPII, April 2011. [http://www.cepii.fr/PDF\\_PUB/wp/2011/wp2011-09.pdf](http://www.cepii.fr/PDF_PUB/wp/2011/wp2011-09.pdf)
- De Bruyn S., Nelissen D. and Koopman M. (2013), *Carbon leakage and the future of the EU ETS- Impact of recent developments in the EU ETS on the list of sectors deemed to be exposed to carbon leakage review (Political brief and summary)*, CE Delft, Apr. 2013. [http://www.cedelft.eu/?go=home.downloadPub&id=1361&file=CE\\_Delft\\_7917\\_Political\\_brief\\_and\\_summary.pdf](http://www.cedelft.eu/?go=home.downloadPub&id=1361&file=CE_Delft_7917_Political_brief_and_summary.pdf)
- Ellerman A.D., Convery F. and De Perthuis C., *Pricing Carbon- The European Union Emissions Trading Scheme*, Cambridge University Press, Feb. 2010.
- Ellerman A.D., Marcantonini C. and Zaklan A. (2014), *The EU ETS: Eight Years and Counting*, European University Institute, Jan. 2014. [http://cadmus.eui.eu/bitstream/handle/1814/29517/RSCAS\\_2014\\_04.pdf?sequence=1](http://cadmus.eui.eu/bitstream/handle/1814/29517/RSCAS_2014_04.pdf?sequence=1)

- Laing T., Sato M., Grubb M. and Comberti C. (2013), *Assessing the effectiveness of the EU Emissions Trading System*, Jan. 2013. <http://www.cccep.ac.uk/Publications/Working-papers/Papers/120-129/WP126-effectiveness-eu-emissions-trading-system.pdf>
- Vivid Economics and Ecofys (2014), *Carbon leakage prospects under Phase III of the EU ETS and beyond, Report prepared for DECC*, Jun. 2014. <https://www.gov.uk/government/publications/carbon-leakage-prospects-under-phase-iii-of-the-eu-ets-and-beyond>

### 2.5.3 Useful websites

European Commission, DG Clima, EU ETS dedicated webpage: [http://ec.europa.eu/clima/policies/ets/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/index_en.htm)

## 3. Expected prices up to 2030 and auction revenues for Member States

### 3.1. A constrained auctioning framework

The auctioning regulatory framework is composed of Directive 2009/29/EC (Article 10) and the revised Auctioning Regulation, which leaves only few room of manoeuvre for Member States in the management of the allowances they have to auction.

Indeed, the stated objective is that *“to provide predictability to the secondary market, this Regulation should provide (...) for determining the volumes of any allowances to be auctioned in 2011 and 2012, (...) clear and transparent rules that determine the volume of allowances to be auctioned in each year thereafter, (...) rules and procedures to establish for each calendar year a detailed auction calendar, with all relevant information for each individual auction well before the beginning of that calendar year. Any subsequent changes to the auction calendar should only be possible in a limited number of prescribed situations. Any adjustments should be made in a manner least affecting the predictability of the auction calendar.”* (Recital 19 of the Auctioning Regulation).

#### 3.1.1 Auctions in practice

Article 10.4 of Directive 2009/29 determined that **the auction procedure is to be conducted in an “open, transparent, harmonised and non-discriminatory manner”**.

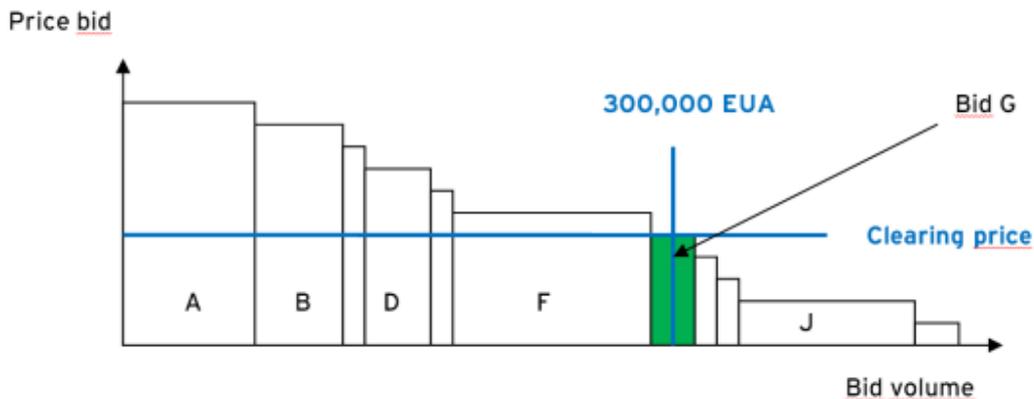
##### 3.1.1.1 Methodology

The chosen methodology is a **sealed-bid, one-round, uniform price auction**. Participants to the auction can propose an unlimited number of bids during the 2-hour auction window — provided they transfer the corresponding requested collateral to the platform.

As shown in Figure 3, at the end of the auction window, bids are sorted by descending bidding price. Bidders are served as long as the total quantity of allowances that was available for the auction is not

reached. In the example below, the ceiling of 300,000 allowances offered is met with Bid G. Bid G thus determines the auction's clearing price, the same for all successful bids<sup>27</sup>.

**Figure 3 – The auctioning procedure – how bids are sorted out**



Source: DEHst (2012), *Evaluation of five years' sales and auctions of emission allowances*, [http://www.dehst.de/SharedDocs/Downloads/EN/Publications/Auctioning\\_5-years.pdf?\\_\\_blob=publicationFile](http://www.dehst.de/SharedDocs/Downloads/EN/Publications/Auctioning_5-years.pdf?__blob=publicationFile)

### 3.1.1.2 Two auction platforms

The European Commission and 24 Member States appointed the **European Energy Exchange (EEX)** as the transitional common auction platform. Croatia also joined in when entering the EU. The three EEA countries have indicated they would contract EEX too for the auctioning of their allowances. The common auction platform is to be appointed following the on-going tender procedure launched on 21 June 2014 by the European Commission. Pending the completion of this procedure, the transitional auctioning platforms continue to assure the auctioning of EU allowances.

Germany, the United Kingdom and Poland chose to opt-out from the common auctioning platform. Germany appointed EEX as its permanent auction platform while the UK appointed **ICE Futures Europe**. Poland finally contracted EEX on an independent basis to conduct its auctions.

### 3.1.1.3 A detailed framework for the auctions organization

The Auctioning Regulation applies to all auctioning platforms and constitutes the detailed framework of how auctions work, in particular:

- On the **timing and sequencing of auctions** as well as on the **estimated volumes of allowances to be auctioned**; to avoid market abuse, all information should be given to all participants at the same time.
- On **eligible participants**, i.e. financial intermediaries and operators, including small emitters; any auction is open to all eligible participants, whatever their countries or the auctioning platform.
- On **monitoring**; the Commission is responsible for monitoring the functioning of the market with the support of Member States. It should in particular report on the cost-effectiveness of the scheme and ensure that "undue administrative costs are avoided".

<sup>27</sup> Nevertheless, Bid G will only receive the amount of allowances remaining after bids A to F are served. If another bid (or more) had been made at the same price as Bid G, the remaining allowances would have been attributed randomly to one of the ex-aequo bidders.

Adjustments to the auction calendar once published for a given year<sup>28</sup> are severely restricted by article 14 of the auctioning regulation, as shown in Table 3. Whenever allowances have to be retained from auctioning, the equivalent amount is spread evenly over the next auctions – the exact number depends on the circumstances but is usually between 2 and 4. As allowances are auctioned with a high frequency<sup>29</sup>, the actual delay incurred in the auction process is very limited.

**Table 3 – Conditions allowing the auctioning calendar to be modified**

<b>Article 14 exemptions</b>	<b>Explanation</b>
<b>(a) the cancellation of an auction pursuant to Article 7(5) and (6), Articles 9 and 32(5);</b>	Auctions are cancelled when the clearing price is significantly under the price on the secondary market; they may be cancelled if the proper conduct of those auctions is disrupted – in that case the allowances are auctioned in subsequent auctions.
<b>(b) any suspension of an auction platform other than the auction platforms appointed pursuant to Article 26(1) or (2) of this Regulation;</b>	Auctions are suspended if an auction platform is suspended (apart from the common auctioning platform).
<b>(c) any decision by a Member State made pursuant to Article 30(8);</b>	Auctions initially scheduled on individual auctioning platform can be organized on the common auctioning platform; allowances are then spread evenly
<b>(d) any settlement failure referred to in Article 45(5);</b>	If a participant fails to settle his auction transaction, the corresponding amount of allowances is added evenly to the 2 next auctions.
<b>(e) any allowances remaining in the special reserve referred to in Article 3f of Directive 2003/87/EC;</b>	Aviation allowances remaining in the new entrants reserve are to be auctioned.
<b>(f) the cessation of operations of an installation pursuant to Article 10a(19) of Directive 2003/87/EC, any adaptation of the level of free allocation pursuant to Article 10a(20) of that Directive or allowances remaining in the reserve for new entrants provided for in Article 10a(7) of that Directive;</b>	Free allocations taken back following the cessation of operation of an incumbent or a reduction of its activity, or any allowance remaining in the new entrants reserve, are to be auctioned.

<sup>28</sup> See for example the 2014 auctioning calendar published by EEX on <http://www.eex.com/blob/68856/ea8f2b4010630d2d72058594323f32ab/2014-auction-calendar-pdf-data.pdf>

<sup>29</sup> Auctions on the EEX platform are organized on a weekly basis — for the common auctioning platform on Mondays, Tuesdays and Thursdays; for Germany on Fridays — and on a monthly basis for Poland. British auctions on the ICE are organized on a fortnightly basis on Wednesdays.

<b>(g) any unilateral inclusion of additional activities and gases pursuant to Article 24 of Directive 2003/87/EC;</b>	Unilateral inclusion may induce an upward revision of the number of allowances to be auctioned.
<b>(h) any measures adopted pursuant to Article 29a of Directive 2003/87/EC;</b>	In the case of excessive price fluctuation, part of the auctions can be moved forward and MS can auction up to 25 % of what remains in the new entrants reserve.
<b>(i) the entry into force of amendments to this Regulation or to Directive 2003/87/EC.</b>	-
<b>(j) any withholding of allowances from the auctions pursuant to Article 22(5) or the second subparagraph of Article 24(1);</b>	Auctions are withheld if a MS has not appointed and contracted with an auction monitor (Note that in this case, the MS may face legal consequences as it would fail to fulfil its obligations under paragraphs 1 to 4 of Article 22).
<b>(k) the necessity for an auction platform to avoid conducting an auction in breach of this Regulation or Directive 2003/87/EC.</b>	-

*Source: adapted from EC Regulation n° 1031/2010.*

### 3.1.2 How the amount of auctioned allowances is calculated and distributed among Member States

Directive 2009/29/EC states that the total quantity of auctioned allowances for Phase 3 and subsequent periods is the **difference between the overall EU ETS cap and the amount of free allocation** (including free allocation to industries, temporary free allocation for the power sector in 8 Member States, the new entrants reserve). This is why any change in the free allocation - e.g. through the revision of the carbon leakage list, see section 2.4 - will have an impact on the amount of allowances auctioned, hence on Member States' revenues.

Following the adoption of National Implementation Measures (NIMs), the European Commission calculated that **the total amount of EU allowances to be auctioned over 2013-20 was expected to reach 8,176,193,157** (i.e. 1, 022 million allowances per year or 48% of allocation on average).<sup>30</sup>

Regarding the 15% of the EU aviation allowances to be auctioned in phase 3, the European Commission estimates it to 11,940,329 million for 2012 and 5.8 million annually from 2013 to 2016. This amount will be revised for 2017 when the « stop-the-clock » proposal ends.

<sup>30</sup> Decision of 5 September 2013, [http://ec.europa.eu/clima/policies/ets/cap/allocation/docs/20130905\\_nim\\_en.pdf](http://ec.europa.eu/clima/policies/ets/cap/allocation/docs/20130905_nim_en.pdf)

**Table 4 – Indicative number of EU allowances to be auctioned by year**

Year	Estimated Amount	Amount after deducting transitional free allocations to the power sector	Amount auctioned/foreseen to be auctioned with back-loading	Share of auctioning in annual allocation (phase 3)
<b>2012</b>	(120,000,000)*		89,701,500	
<b>2013</b>	1,066,444,135	914,878,081	808,146,500	39%
<b>2014</b>	1,055,457,778	925,952,714	549,910,000	27%
<b>2015</b>	1,043,568,216	929,045,057	622,882,525	31%
<b>2016</b>	1,030,777,152	932,391,882	731,873,854	37%
<b>2017</b>	1,017,062,324	935,934,943	935,688,302	48%
<b>2018</b>	1,002,630,749	939,881,250	939,881,250	50%
<b>2019</b>	987,734,136	945,663,458	1,245,663,457	67%
<b>2020</b>	972,518,667	972,518,667	1,572,518,664	87%
<b>Total</b>	<b>8,176,193,157</b>	<b>7,496,266,052</b>	<b>7,496,266,052</b>	<b>48%</b>

\* Volume for early auctions<sup>31</sup>, deducted in subsequent years.

Volumes reflect the backloading decision, free allocation to the power sector in 8 Member States and the current carbon leakage list under revision.

Source: European Commission, June 2014, [http://ec.europa.eu/clima/policies/ets/cap/auctioning/faq\\_en.htm](http://ec.europa.eu/clima/policies/ets/cap/auctioning/faq_en.htm)

**Because of the partial redistribution of auctions revenues agreed in Directive 2009/29/EC (see section 2.3.5), Romania is entitled to auction 324 million EU allowances over the 2013-20 period.** This volume takes into account the fact that Romania was allowed to allocate a maximum of 71.4 million free allowances on a transitional basis to 39 power plants over Phase 3<sup>32</sup>.

**Table 5 – Amount of EU allowances to be auctioned by Member States in phase 3 (in millions)**

	2013	2014	2015	2016	2017	2018	2019	2020
<b>Austria</b>	14.3	8.8	10.0	11.2	13.7	13.5	17.3	21.1
<b>Belgium</b>	29.1	16.1	18.2	20.3	24.9	24.5	31.5	38.5
<b>Bulgaria</b>	15.3	6.1	10.4	14.7	21.6	23.2	32.8	42.4
<b>Croatia</b>	0.0	0.0	3.4	3.8	4.7	4.6	5.9	7.2
<b>Cyprus</b>	0.3	0.1	0.0	0.5	1.3	1.6	2.7	4.0
<b>Czech Republic</b>	24.1	9.4	14.4	22.2	34.4	37.6	54.4	71.1
<b>Denmark</b>	14.2	8.0	9.0	10.0	12.3	12.1	15.6	19.0
<b>Estonia</b>	5.2	1.2	2.8	4.3	6.7	7.3	10.6	13.8
<b>Finland</b>	17.2	10.6	12.0	13.4	16.4	16.2	20.8	25.4
<b>France</b>	56.3	34.8	39.3	43.9	53.7	52.9	68.0	83.1
<b>Germany</b>	206.1	127.1	143.6	160.4	196.4	193.6	248.7	303.9
<b>Greece</b>	37.5	22.0	24.9	27.8	34.0	33.6	43.1	52.7

<sup>31</sup> Early auctions were implemented by Regulation No 1210/2011 of 23 November 2011. To provide liquidity to the market and allow incumbents (in particular the power sector) to hedge their production costs for Phase 3, 120 million Phase 3 allowances were to be taken from Phase 3 allocation and auctioned in 2011-12.

<sup>32</sup> Commission Decision of 6 July 2012, [http://ec.europa.eu/clima/policies/ets/cap/auctioning/docs/c\\_2012\\_4564\\_en.pdf](http://ec.europa.eu/clima/policies/ets/cap/auctioning/docs/c_2012_4564_en.pdf)

<b>Hungary</b>	9.6	9.5	10.8	12.0	14.7	14.5	18.6	22.8
<b>Iceland</b>	0.0	0.0	0.3	0.3	0.4	0.4	0.5	0.6
<b>Ireland</b>	10.7	5.9	6.7	7.5	9.2	9.0	11.6	14.2
<b>Italy</b>	99.2	61.2	69.1	77.2	94.5	93.2	119.7	146.2
<b>Latvia</b>	2.8	1.7	1.9	2.2	2.6	2.6	3.3	4.1
<b>Liechtenstein</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Lithuania</b>	5.2	2.9	3.4	3.9	5.0	5.0	6.6	8.3
<b>Luxembourg</b>	1.3	0.8	0.9	1.0	1.2	1.2	1.5	1.8
<b>Malta</b>	1.1	0.6	0.7	0.8	1.0	1.0	1.3	1.5
<b>Netherlands</b>	34.5	21.3	24.0	26.8	32.9	32.4	41.6	50.9
<b>Norway</b>	7.5	0.0	5.6	6.2	7.6	7.5	9.7	11.8
<b>Poland</b>	65.9	13.3	23.2	40.3	70.6	77.7	123.4	190.1
<b>Portugal</b>	18.5	11.2	12.6	14.1	17.2	17.0	21.8	26.7
<b>Romania</b>	<b>33.8</b>	<b>16.5</b>	<b>23.2</b>	<b>30.0</b>	<b>41.5</b>	<b>43.4</b>	<b>59.8</b>	<b>76.1</b>
<b>Slovakia</b>	15.9	9.7	11.0	12.3	15.1	14.9	19.1	23.3
<b>Slovenia</b>	4.6	2.8	3.2	3.5	4.3	4.3	5.5	6.7
<b>Spain</b>	88.9	54.8	62.0	69.2	84.7	83.5	107.3	131.1
<b>Sweden</b>	9.2	5.6	6.4	7.1	8.7	8.6	11.1	13.5
<b>United Kingdom</b>	107.4	66.2	74.8	83.6	102.3	100.8	129.6	158.3

Source: EEA ETS data viewer accessed 15 October 2014.

**For phase 4**, the European Commission has already indicated<sup>33</sup> that the redistributive mechanisms implemented in Phase 3 would continue. It estimated the **total revenues to €8 to 17 bn annually**, depending if auctions only concern the power sector or apply to all ETS sectors. Such estimate corresponds to the scenario with -40% GHG emissions and 30% renewable energy targets, with no pre-set target for energy efficiency, and no MSR. **It can thus be considered as a lower bound estimate.**

However, the **set-aside of allowances to fund dedicated projects**, for example relative to the demonstration and deployment of promising new technologies, **would reduce revenues from allowances auctioning to be perceived by Member States.**

### 3.1.3 At least 50% of auction revenues should be used for 'climate-friendly' actions

Member States have the last word regarding the use of revenues from their auctioned allowances. Nevertheless, Directive 2009/29/EC stipulates that **at least 50% of the revenues generated from allowances auctioning — 100% for allowances auctioned for intra-European redistributive purposes — should be used for funding mitigation and adaptation actions through fiscal or financial support policies in the EU or in developing countries** (see section 2.3.5), such as:

- Contributing to European or international climate funds;
- Funding mitigation and adaptation projects, in particular:
  - Avoided deforestation and increased afforestation and reforestation in developing countries committed under the international agreement on climate change;
  - Technology transfer and adaptation facilitation in these countries;

<sup>33</sup> Impact assessment of « A policy framework for climate and energy in the period from 2020 up to 2030 », 22 January 2014. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014SC0015>

- Forestry sequestration in the EU;
- Environmentally safe capture and geological storage of CO<sub>2</sub>, including in third countries.
- Developing renewable energies and other technologies to meet the European 2020 targets related to renewable energies and energy efficiency; in particular:
  - Funding R&D projects aiming at increasing mitigation and adaptation as well as energy efficiency and clean technologies in sectors covered by the EU ETS Directive;
  - Supporting measures to increase energy efficiency and insulation or providing financial support to address social aspects in lower and middle income households;
  - Encouraging low-emission and public forms of transport;
- Administrative expenses related to the management of the EU ETS.

The wording – the use of « should » instead of « must » or « shall » - leaves Member States with a **strong incentive, rather than a formal obligation**, to devote a large share of their auction revenues to climate actions. Article 17 of Regulation No 525/2013 of 21 May 2013 establishes the Member States' obligations regarding their reporting on the use of auctioning revenue and project credits<sup>34</sup>.

### 3.2. Estimates of emissions, shortfall, and price projections up to 2030

**A number of estimates for the EU carbon prices have been published over the last years, reflecting the evolution of market participants' expectations and the on-going institutional discussions regarding structural reforms in Phases 3 and 4.** Indeed, because of the inter-period banking possibility, participants to the EU ETS would modify their strategies immediately even if the change in the regulatory framework is only implemented in Phase 4. For example, a more ambitious annual reduction factor for allocation in Phase 4 would increase the incentives to buy allowances already in Phase 3, increasing the carbon price and delivering more incentives for early abatement.

Forecasts for the European carbon price at the 2020 and 2030 horizons have often experienced a downward trend, because of low economic activity prospects and the concern that other EU energy policies, in particular as regards renewable energies and energy efficiency<sup>35</sup>, might create additional incentives for emissions abatement and slacken the emissions constraint in the EU ETS where the power sector represents the bulk of allowance demand.

Finally, the European Commission's proposal to implement a **Market Stability Reserve** lead market analysts to model alternative scenarios.

#### 3.2.1. Limits to modeling results

Forecasting the price of EU allowances can be done on the short term – up to a few days - thanks to financial econometric techniques.

Longer-term estimates can be obtained, albeit with much larger uncertainties on the evolution of the market fundamentals — economic growth, relative energy prices, pace of low-carbon technologies development, costs of low-carbon technologies at different time horizons, effectiveness of energy

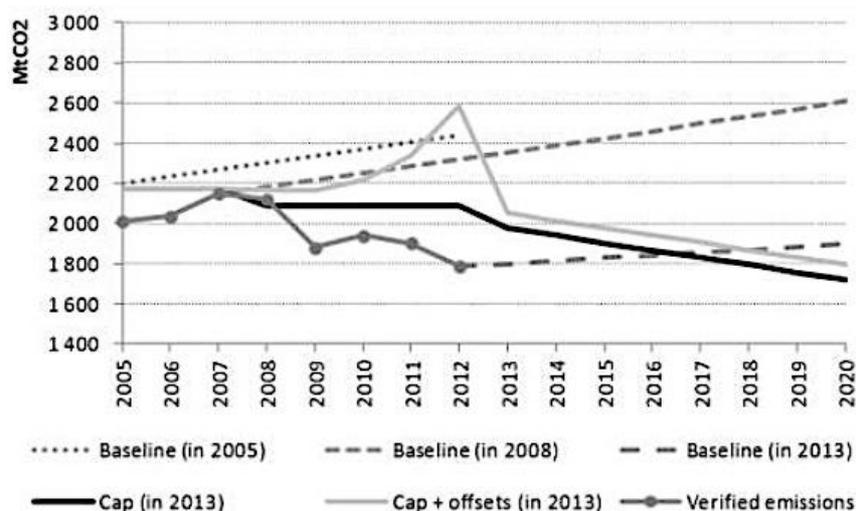
<sup>34</sup><http://eur-lex.europa.eu/legal-content/FR/ALL/?uri=OJ:L:2013:165:TOC>

<sup>35</sup> The proposal of the European Commission for an indicative energy efficiency target of -30% for 2030 was interpreted by market participants as highly likely to be implemented.

efficiency and other environmental policies, etc. In practice, long-term estimates of the carbon price are based on models using marginal abatement cost curves (MACCs) at different time horizons.

When reviewing past forecasts of the European carbon price, one can realize participants and analysts have often — if not always — overestimated the carbon constraint, as shown in Figure 4. **Thus, price forecasts on the long term should be taken with caution, keeping in mind they reflect simplified socio-economic hypotheses.**

Figure 4 - EU ETS ex ante anticipations compared to ex-post observations



Note: baselines give the ex ante expectations of the emissions level, at the beginning of each phase.

Source: Trotignon and de Perthuis (2013), from CITL/EUTL data.

### 3.2.2. Estimates of market balance by 2030<sup>36</sup>

The term “market balance” is often used to describe, over a given period, the difference between:

- The quantity of carbon assets that is available on the market — free and auctioned EU allowances not surrendered yet for compliance, unused share of CERs/ERUs ceilings;
- And verified emissions in the EU ETS perimeter.

**Because ETSs are designed so that emissions cannot surpass the cap, the market balance is always positive and is often called a surplus.** Its actual level depends on a number of factors, in particular the stringency of emissions caps vs counterfactual emissions, and also importantly the corresponding strategic behavior of market participants who can choose to reduce their emissions more or less depending on their anticipation of emissions prices and internal abatement costs over time.

The market balance and participants’ expectations of its evolution are reflected in the market price<sup>37</sup>.

Analysts scenarios try to estimate the evolution of the allowance surplus until 2030 with the Market Stability Reserve implemented. The actual effect of the MSR is highly dependent on EU ETS participants’

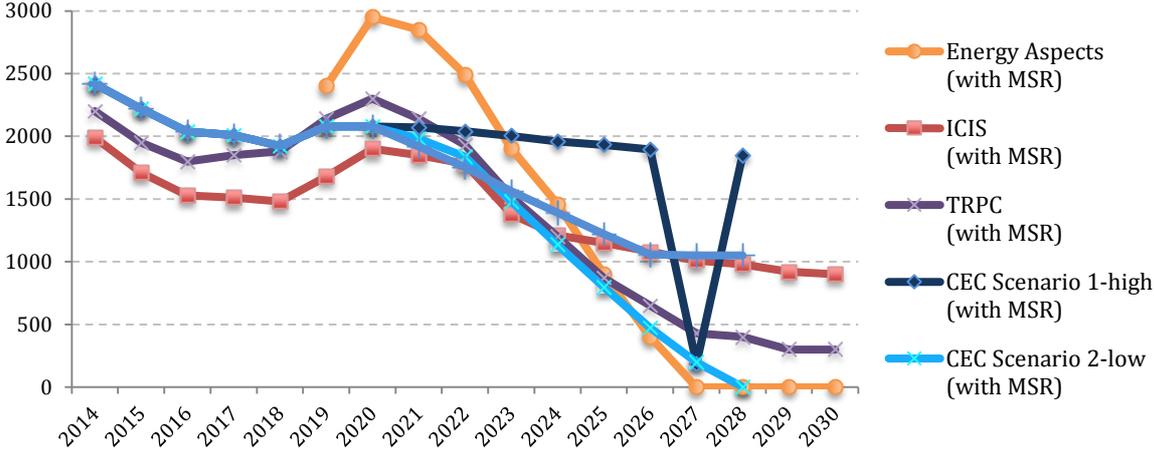
<sup>36</sup> More details on each scenario are available in a separate Excel file joined to this report.

<sup>37</sup> For a discussion on the notion of « surplus » in the EU ETS, see Trotignon R. (2013), Réforme structurelle de l’EU ETS, presentation on 15 February 2013 (French only). <http://www.chaireeconomieduclimat.org/wp-content/uploads/2013/02/13-02-15-FLM-n64-Trotignon-De-Perthuis-Reforme-EU-ETS.pdf>

behavior: if hedging or banking behaviors have been underestimated, the MSR will artificially decrease the amount of allowances available on the market, thus raising prices. In this case, more abatement will be triggered.

Overall, as shown in Figure 5, most scenarios logically predict a decreasing surplus over time, in some cases up to zero — however, it is highly unlikely the surplus will be null because of the need for market liquidity; in this case more abatement would be undertaken<sup>38</sup>. **In a nutshell, estimates of the market balance would range between a few hundreds to a little more than 1,000 million allowances<sup>39</sup>.**

**Figure 5 – Estimates of the market surplus (allocation minus emissions)**



Source: adapted from European Commission (2014), Energy Aspects and ICIS presentations of the 25 June 2014, Thomson Reuters Point Carbon (2014), Trotignon (2014).

**From a market dynamic point of view, the implementation of the MSR will reduce the surplus more quickly than in baseline scenarios, meaning the effect on market prices will be higher all over the implementation period.** The situation will be reversed when the MSR will start putting allowances back on the market.

**3.2.3. Main price projections available<sup>40</sup>**

The scenarios presented above are also used to forecast the potential allowance price levels up to 2030. The MSR is expected to increase significantly the carbon price when implemented, with estimates of the carbon price in 2030 ranging from 30€ to more than 80€ per allowance.

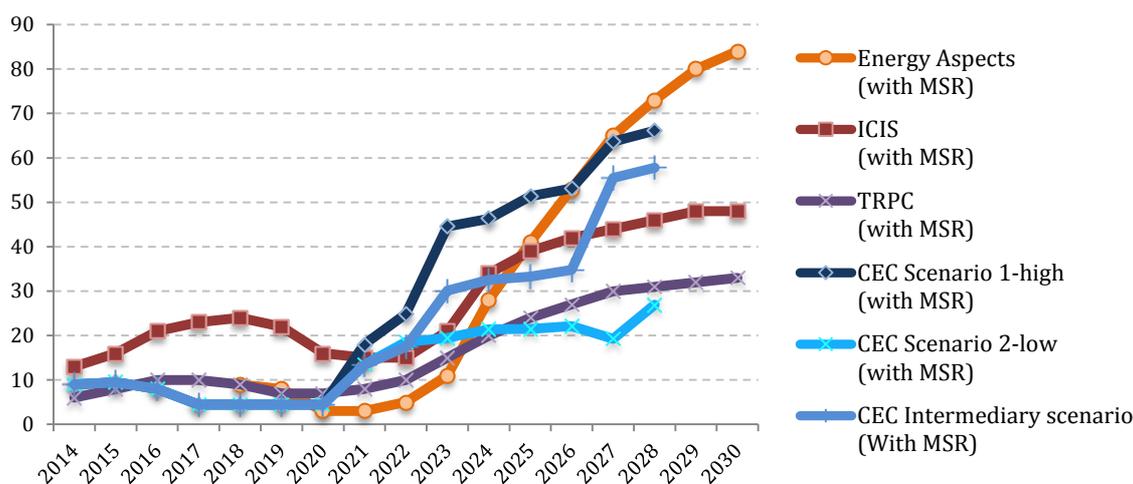
**On average, the value of 50 to 60€ can be retained** — for 2020, estimates are below 10€, even if in practice the price difference between phase 3 and 4 will be smoothened by the arbitrages of market participants.

<sup>38</sup> The only reason why the price would drop to zero would be that the EU ETS would not be continued after 2030.

<sup>39</sup> The only scenario above this amount corresponds to Scenario 1 of the Climate Economics Chair in which EU ETS participants have a very strong preference for banking allowances instead of using them. Such a scenario remains unlikely if the market surplus decreases, as allowance prices will go up.

<sup>40</sup> More details on each scenario are available in a separate Excel file joined to this report.

**Figure 6 – Price scenarios including the implementation of a MSR**



Note: the European Commission did not provide carbon price estimates in its Impact Assessment of the proposed MSR.  
 Source: adapted from Energy Aspects and ICIS presentations of the 25 June 2014, Thomson Reuters Point Carbon (2014), and Trotignon (2014).

### 3.3. Potential revenues from auctioning for Romania up to 2030

Auction revenues for Member States until 2030 depend on the volume of allowances distributed, the share of auctioning in the whole allocation process, and the expected market price. However, each of these parameters depends on a variety of regulatory and economic evolutions:

- **The volume of allowances to be distributed** is dependent on the 2030 target which will be adopted; it can be complemented by the possibility to use international offsets, although it seems unlikely by 2030 unless a higher emissions reduction target is decided by the European Union in case a satisfactory international agreement is obtained;
- **The share of auctions in the allocation** is expected to increase as derogatory provisions end (e.g., for the power sector in 8 Eastern Europe countries). Uncertainties still remain regarding the level of free allocation that should continue for trade-exposed industries, political pressure to avoid any loss in industrial competitiveness making it likely to continue even after 2020. Also, redistributive mechanisms among EU Member States might be modified in the future while it is rather likely some kind of redistribution will be preserved. Finally, the set-aside of allowances to fund dedicated projects, following the NER300 experience, would reduce the actual auction revenues for Member States.
- **The market price for allowances** will be determined by the evolution of market fundamentals, including any regulatory decision modifying the market supply — e.g. the implementation of the Market Stability Reserve, as discussed above.

**For each set of parameters, several scenarios have been tested:**

- The volume of allowances to be distributed until 2030 depends on the linear annual reduction factor that is to be reviewed at the latest in 2025. Two scenarios are tested: the factor remains at -1.74% per year until 2030 or it is increased to -2.2% from 2021 on, on the basis of the European Commission’s proposal.

- The share of each Member State in the auctioned allocation is supposed to remain the same as in Phase 3, i.e. 4% for Romania. The level of auctioning in the overall allocation is expected to increase up to 90% in 2030, on a linear basis.
- The market price for allowances is differentiated based on upper, middle and lower bounds of market analysts' forecasts.

Table 6 presents the resulting auction revenues estimates. The estimates of auction revenues have to be interpreted as an order of magnitude, taking into account that the gaps between phases 3 and 4 will be probably smoothed.

**Table 6 – Romania's estimates of auction revenues**

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Price scenarios (in €/EUA)</b>																		
<b>S1: upper bound</b>	6	6	8	10	12	10	9	8	15.7	19.4	23.1	26.8	30.5	34.2	37.9	41.6	45.3	85
<b>S2: middle bound</b>	6	6	8	10	12	10	9	8	13.2	14.9	16.6	18.3	20	21.7	23.4	25.1	26.8	60
<b>S3: lower bound</b>	6	6	8	10	12	10	9	8	10.7	11.4	11.1	11.8	11.5	12.2	12.9	12.6	13.3	35
<b>Romania's potential revenues if annual reduction factor of 1.74% (in m€)</b>																		
<b>S1</b>	203	99	186	300	498	434	538	609	1078	1348	1622	1899	2180	2462	2746	3030	3314	6241
<b>S2</b>	203	99	186	300	498	434	538	609	907	1035	1165	1297	1429	1562	1695	1828	1961	4405
<b>S3</b>	203	99	186	300	498	434	538	609	735	764	793	822	850	878	906	932	958	2570
<b>Romania's potential revenues if annual reduction factor of 2.2% (in m€)</b>																		
<b>S1</b>	203	99	186	300	498	434	538	609	1074	1336	1599	1862	2124	2390	2652	2904	3166	5914
<b>S2</b>	203	99	186	300	498	434	538	609	903	1026	1149	1273	1397	151	1637	175	187	4175
<b>S3</b>	203	99	186	300	498	434	538	609	732	757	782	807	830	853	874	895	914	2435

*Note: the modeling uses a linear price evolution and simplified hypothesis that are detailed in the Excel file joined.*

### 3.4. Review of experience with auctioning and use of revenues in other EU Member States

#### 3.4.1. Overview of allowance auctioning in phases 1 and 2

As chargeable allocation was limited to 5% and 10% of the allocation in phases 1 and 2 respectively, the actual amount of auctioned allowances remained low. **Along with auctioning, some Member States chose to sell allowances directly on the secondary market**, a solution that can be economically efficient as long as the quantities sold are limited, to avoid distorting the market.

**Table 7 – Chargeable allocation in phases 1 and 2, by Member State**

	Phase 1			Phase 2		
	Auctioning vs. Sale	% of allocation	Amount	Auctioning vs. Sale	% of allocation	Amount
<b>Austria</b>				<b>Auctions</b>	<b>1.22%</b>	<b>2,300,000</b>
				<i>More than €20 million, not earmarked.</i>		
<b>Belgium (Flanders)</b>				<b>Auctions</b>		<b>9,565,000</b>
				<i>€20 million used to feed the Flemish Climate Fund to support improvement of energy efficiency in buildings – incl. social housing - in SMEs (through grants), in the tourism sector, agriculture... as well as investment in low-carbon transport infrastructure.</i>		
<b>Bulgaria</b>				<b>Auctions</b>		<b>100,000</b>
				<i>No information on possible earmarking.</i>		
<b>Czech Rep.</b>				<b>Auctions</b>	<b>1.1%</b>	<b>2,568,500</b>
				<i>€13.35 million, dedicated to supporting energy savings in public buildings within the Green Investment Scheme</i>		
<b>Denmark</b>	<b>Sale through brokers</b>	<b>4.35%</b>	<b>4,381,000</b>	<b>Sale</b>		<b>2,775,000</b>
				<i>Allowances remaining from NER Phase 2</i>		
<b>Germany</b>				<b>Sale in 2008-09, then auctions</b>	<b>8.8%</b>	<b>212,056,000</b>
				<i>€3.005 billion, 100% earmarked for environmental projects</i>		
<b>Greece</b>				<b>Auctions</b>		<b>18,750,000</b>
				<i>€174 million, no earmarking specified</i>		
<b>Hungary</b>	<b>Auctions</b>	<b>2.56%</b>	<b>2,745,000</b>	<b>Auctions</b>	<b>2%</b>	<b>2,500,000</b>
	<i>€12 million originally earmarked for GHG mitigation, promotion of renewable energy and energy efficiency. Remainder to be returned to the state budget. €9.9 million actually collected, some covered mandatory EU and international reporting, preparation of the National Climate Change Strategy, and mitigation programs.</i>			<i>€16.15 million, no earmarking specified</i>		
<b>Ireland</b>	<b>Auctions</b>	<b>2.06%</b>	<b>1,213,000</b>	<b>Sale</b>		<b>1,000,000</b>

	Phase 1	Phase 2
	€13.1 million, to cover EU ETS administration and implementation by the State Agency. Remainder to the Treasury for non-environmental projects.	€8.2 million.
<b>Lithuania</b>	<b>Auctions 1.58% 552,000</b>	<b>Auctions 3,299,000</b>
	€33,120, used to offset the administrative costs of the scheme	€22.5 million revenues; ~ 80% for energy efficiency in residential buildings. Remainder used for school renovation, installation of renewable energy in private homes, support to cities' infrastructure for environmental-friendly vehicles.
<b>Luxembourg</b>		<b>4,000</b>
		No information on possible earmarking.
<b>Netherlands</b>		<b>Auctions 3.7% 16,000,000</b>
		€154 million; not spent on climate actions.
<b>Norway</b>		<b>Auctions 42% 35,000,000</b>
		No earmarking of revenues. NB: Norway had a derogatory status to auction up to 50% of its allocation
<b>Poland</b>		<b>Auctions 210,417</b>
		€0.9 million revenues from Phase 2 NER
<b>Romania</b>		<b>Auctions 600,000</b>
<b>UK</b>		<b>Auctions 7% 122,819,000</b>
		€1.5 billion, no earmarking

Source: Chevaleyre and Berghmans (2013), DEHst (2012), Haita (2013), Flemish Climate Policy Plan <http://www.lne.be/en/about/publications/flemish-climate-policy-plan-2013-2020-summary.pdf> Polish Ministry of Environment Kobize <http://www.kobize.pl/aktualnosci.html>.

As pointed out by Haita (2013), among the various experiences of allowance auctioning in Phases 1 and 2, **only a few Member States actually used all or part of the revenues to finance environmentally-related projects**. In general, the revenues fell in the general public budget or were earmarked to cover administrative expenses of the EU ETS.

**Such choices correspond to the economic theory of the double-dividend: the dual benefit of carbon pricing, in addition to the environmental benefit, is that revenues captured by the public authorities can be used to reduce distortionary taxes, for example on labour or capital.** The choice in the use of revenues will therefore redistribute the economic rent which was created along with the creation of the emissions allowances.

### 3.4.2. Use of auctioning revenues in Phase 3

#### 3.4.2.1. First outlook

Vase and Sunderland (2014) report that public commitments have been made by 13 EU Member States to recycle part of the proceeds from the EU ETS auctions to climate and energy efficiency programmes.

Formal earmarking — i.e. institutionalized by law — remains limited to a small number of countries, probably because governments may see it as too constraining and giving less flexibility (see Table 8).

**Table 8 – Overview of Member States’ earmarking for auction revenues**

<b>Country</b>	<b>% of EU ETS revenues to be used in climate actions</b>	<b>Description</b>
<b>Bulgaria</b>	100%	Article 35(6) of the Energy Law dedicates the monetary equivalent of 100% of the revenue received from auctions of greenhouse gas emission allowance trading to finance the obligations for purchase of electricity at preferential prices under the Energy from Renewable Sources Act. As of end of June, the balance was negative with a shortage of €154 million.
<b>Czech Republic</b>	50%	50% of ETS revenues are recycled for carbon emission reduction programmes —building energy efficiency, industrial innovation, alternative transport and flood protection.
<b>Estonia</b>	50%	50% of the revenues will be recycled for environmental purposes in particular energy saving measures in apartment buildings.
<b>France</b>	Up to 100%	EU ETS auctioning revenues are attributed to the National Agency for Housing — up to a limit of €590 million — for energy efficiency refurbishment in the housing sector, especially for low-income households.
<b>Germany</b>	Almost 100%	Funding of the Special Energy and Climate Fund for national and international (up to 2013) climate programmes. See section 3.4.2.2
<b>Hungary</b>	50%	Requirement for 50% of revenues to be spent on climate action. Housing refurbishment reported to be 2013 priority.
<b>Italy</b>	50%, tbc	Announcement in February 2012 that 50% of ETS revenues would be allocated to the "Kyoto rotation fund". As a revolving fund, it was expected to offer low interest loans for EE (incl. buildings), distributed generation and small scale RE to individuals, small and medium sized enterprises and public authorities.
<b>Lithuania</b>	100%	All ETS revenues are directed into a revolving fund, in particular targeted at improving energy efficiency in buildings.
<b>Romania</b>	More than 70%	71% of revenues (plus 100% from aviation) will go to projects for climate purposes.

Source: Bulgaria Ministry for Economy and Energy (<http://www.mi.government.bg/en/library/energy-act-256-c25-m258-1.html>), Vase and Sunderland (2014).

According to the Commission Regulation N°525/2013, **Member States had until 31 July 2014 to report to the European Commission on their use of auction revenues for 2013..**

The European Commission made a synthesis available on 28 October 2014 (European Commission, 2014), reproduced in Table 9. It shows all Member States reckon at least 50% of the 2013 auctioning proceeds were used for climate and energy purposes even if no formal earmarking was implemented — e.g. in Austria, Ireland, the Netherlands or Denmark.

**Whether the reported funding is effectively additional to previous commitments remains to be seen and one can question a 100% additionality given the current economic/fiscal constraints for a number of countries. In that regard, some guarantee, although not absolute, is provided when auction revenues are earmarked for specific purposes.**

Also, off the 2,712 M€ aimed at financing climate and energy related policies and for which the split between domestic and international actions is declared, more than 80% is dedicated to domestic policies. It shows recycling of auctioning revenues can be a decisive instrument for financing climate-friendly actions in Europe, in coherence with EU long-term objectives and Member States national strategy and priorities.

**Table 9 – Used or planned use of reported revenues from EU ETS allowance auctioning (in million euros)**

Country	Total auctioning revenues (M€)	Auctioning revenues used or planned for climate & energy related purposes				Not used for climate & energy related purposes (M€)	No split reported (M€)
		In % of total	Total amount (M€)	Of which domestically (M€) – when specified	Of which support to third countries (M€) – when specified		
<i>Austria</i>	56	66%	37	30	7	19	
<b>Belgium</b>	115	-	-	-	-	-	115
<b>Bulgaria</b>	53	97%	51	51	0	1	
<b>Croatia</b>	0		0	0	0	0	
<b>Cyprus</b>	-	-	-	-	-	-	
<b>Czech Republic</b>	81	91%	73	73	0	8	
<i>Denmark</i>	56	100%	56	28	28	0	
<b>Estonia</b>	18	50%	9	9	-	9	
<b>Finland</b>	67	50%	34	0	34	0	34*
<b>France</b>	219	100%	219	219	0	0	
<b>Germany</b>	790	100%	790	548	243	0	
<b>Greece</b>	148	100%	148	-	-	0	
<b>Hungary</b>	35	50%	17	17	0	17	
<i>Ireland</i>	42	100%	42	42	0	0	
<b>Italy</b>	386	50%	193	-	-	-	193
<b>Latvia</b>	11	100%	11	11	0	0	
<b>Lithuania</b>	20	100%	20	20	0	0	

<b>Luxembourg</b>	5	50%	3	3	0	3	
<b>Malta</b>	5	64%	3	3	0	2	
<i>Netherlands</i>	134	100%	134	134	0	0	
<b>Poland</b>	244	50%	129	129	0	115	
<b>Portugal</b>	73	100%	73	70	2	0	
<b>Romania</b>	123	74%	91	91	0	32	
<b>Slovakia</b>	62	100%	62	62	0	0	
<b>Slovenia</b>	18	50%	9	9	0	9	
<b>Spain</b>	346	100%	346	346	0	0	
<b>Sweden</b>	36	50%	18	18	0	18	
<b>UK</b>	485	100%	485	297	188	0	
<b>Total</b>	<b>3,625</b>	<b>87%</b>	<b>3,052</b>	<b>2,210</b>	<b>502</b>	<b>232</b>	<b>342</b>

*NB: Certain figures may not add up due to roundings.*

*Notes: Countries whose name is in italics reported they do not earmark revenues for specific purposes; the figures provided are only examples of climate and energy related funding. Countries in blue use all of the energy and climate related funded for domestic projects. \*Amount dedicated to international development aid.*

*Source: adapted from European Commission, 2014.*

### 3.4.2.2. The German experience

Germany is often quoted as a model when it comes to auctioning revenues recycling in favor of climate-friendly policies. As shown in the section 3.4.1, the country started selling and auctioning allowances in phase 2 and **has fully dedicated proceeds from sales and auctions to climate actions since then** — either by covering administrative costs linked to climate policies or by funding national and international climate- and energy-related initiatives.

Since 2011, the revenues are managed by the **Special Energy and Climate Fund (EKF)**. A dedicated structure allows the **effective earmarking of auctioning revenues** and enables the **bundling of climate-related expenditure**, especially when several ministers are involved as it is the case for Germany (Esch, 2013). EKF contributes to financing climate- and energy-related projects both at the national level, through the National Climate Initiative's programmes (NKI), and at the international level, through the International Climate Initiative (IKI) — see Box 4.

**Because of low-carbon prices, however, the EKF had to be complemented since 2013 by other sources of revenues to make sure it could meet its financing commitments**, in particular for international climate actions. In 2013, KfW, the German government-owned development bank, provided €311 million from its own resources. In 2014, the federal budget for programs dedicated to the international climate and environmental protection was solicited, implying a redistribution from development aid funding to climate change policies and an only partial additionality of climate finance<sup>41</sup>.

<sup>41</sup> <http://www.bmub.bund.de/presse/pressemitteilungen/pm/artikel/bundesumweltministerium-klimaschutz-und-energie-wendeprogramme-werden-weiter-gefoerdert/>. See also <http://www.germanclimatefinance.de/2013/03/15/the-german-2014-federal-budget-climate-financing-secured-development-aid-cut/>

**Table 10 – Use of allowances sales and auction revenues in Germany between 2008 and 2015**

Use	Disbursements in millions of euros							
	2008	2009	2010	2011	2012	2013	2014	2015
International Climate Initiative (IKI)	120	120	120	120	n/a	473	0	0
National Climate Initiative (NKI)/Market incentive program (MAP)	250	308	308	308	n/a	n/a	n/a	n/a
Environmental innovation program	15	15	15	15	n/a	n/a	n/a	n/a
R&D; Renewable energy investment subsidies	15	17	17	17	n/a	n/a	n/a	n/a
<b>Total</b>	<b>400</b>	<b>460</b>	<b>460</b>	<b>460</b>	<b>120</b>	<b>888.5</b>	<b>n/a</b>	<b>n/a</b>

Source: DEHSt (2012), Esch (2013), Oxfam (2014)<sup>42</sup>.

The German example illustrates the difficulty Member States will face when earmarking ex ante EU ETS revenues, given the uncertainties on the carbon price. The consequences of an overestimation of the auctioning revenues are to put at risks other policies (here development aid and potentially support to domestic policies).

#### Box 4 – German national and international climate initiatives

The German National Climate Initiative (NKI) of the Federal Environment Ministry supports various programmes and projects related to:

- climate protection in municipalities, and in social and cultural institutions
- innovative projects in industry and in the consumer, education and municipal sector
- highly-efficient small combined heat and power systems (mini CHP systems) and
- commercial cooling and air-conditioning plants.

The International Climate Initiative (IKI) is geared towards meeting the needs of the partner countries and supporting climate protection measures, in particular reducing greenhouse gases, improving adaptability to the consequences of climate change and conserving and using climate-relevant areas which merit protection. It is part of the German contribution to fast-start financing, the commitment of industrialised countries in the Copenhagen Accord to financing immediate climate protection measures in developing countries until 2012.

<sup>42</sup>Oxfam Deutschland Briefing of 10 September 2014, [http://www.deutsche Klimafinanzierung.de/wp-content/uploads/2014/09/HH2015\\_Oxfam\\_%C3%9Cberblick\\_Klimafinanzierung\\_ver11September141.pdf](http://www.deutsche Klimafinanzierung.de/wp-content/uploads/2014/09/HH2015_Oxfam_%C3%9Cberblick_Klimafinanzierung_ver11September141.pdf)

Source : German Ministry for Environment, <http://www.bmub.bund.de/en/topics/climate-energy/climate-initiative/general-information/> (accessed on 12 October 2014).

### 3.4.2.3. *The UK experience: EU ETS revenues included in the general budget with parallel support to electricity-intensive industries*

The UK has shown a traditional opposition to the hypothecation or earmarking of tax revenue, because it is alleged to reduce flexibility in spending decisions with a reduced value for money for taxpayers. However, some examples exist in the energy sector, in particular regarding the support to renewables development, as reported by Vase and Sunderland (2014). Hepburn and al. (2006) give the example of the Carbon Trust established in 2001, which relied on the earmarked revenues from the Climate Change Levy, a tax on energy delivered to non-domestic customers. The aim of the Carbon Trust was to assist businesses to reduce their emissions, multiplying the impact of the price signal provided by the tax by supporting energy efficiency investment and commercialization of low-carbon technologies by UK companies.

The association for the Conservation of Energy (2012) reports the announcement in the 2011 Autumn Statement, confirmed in the 2012 Budget, of the **recycling of energy policies' revenues towards electricity-intensive industries to reduce the impact of policy costs**. While **it does not constitute a formal recycling of the EU ETS revenues**, the government has committed to:

- compensate electricity-intensive businesses to help offset the indirect cost of the carbon price floor and the EU ETS, subject to EU state aid guidelines<sup>43</sup>;
- increase the level of relief from the Climate Change Levy on electricity from 65 to 90% for those entities who commit to Climate Change Agreement with the UK government.

### 3.4.2.4. *The Polish experience*

Poland is planning to adopt an innovative *ex post* resource allocation system, where funds are spent after one year, increasing certainty on their volume.

## 3.5. Selected references

### 3.5.1. EU legislation and public information

- Commission Regulation No 525/2013 of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC. <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32013R0525>
- Commission Regulation No 176/2014 of 25 February 2014 amending Regulation No 1031/2010 in particular to determine the volumes of greenhouse gas emission allowances to be auctioned in

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<sup>43</sup> New guidelines for energy and environmental State aids were adopted in April 2014 and implemented on 1 July 2014 for the 2014-20 period ([http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014XC0628\(01\)](http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014XC0628(01))). Specific guidelines still apply to State aid in the context of the EU ETS ([http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52012XC0605\(01\)](http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52012XC0605(01))).

2013-2020.

[http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L\\_.2014.056.01.0011.01.ENG](http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.056.01.0011.01.ENG)

- EEA, *EU ETS data viewer*, <http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer>
- European Commission (2014), *Progress towards achieving the Kyoto and EU 2020 objectives* {SWD(2014) 336 final}, Communication COM(2014) 689 final, 28 October 2014. [http://ec.europa.eu/clima/policies/g-gas/docs/com\\_2014\\_689\\_en.pdf](http://ec.europa.eu/clima/policies/g-gas/docs/com_2014_689_en.pdf).  
Annexes: [http://ec.europa.eu/clima/policies/g-gas/docs/com\\_2014\\_689\\_annex\\_en.pdf](http://ec.europa.eu/clima/policies/g-gas/docs/com_2014_689_annex_en.pdf),  
[http://ec.europa.eu/clima/policies/g-gas/docs/swd\\_2014\\_336\\_en.pdf](http://ec.europa.eu/clima/policies/g-gas/docs/swd_2014_336_en.pdf)

### 3.5.2. Emissions and price forecasts

- DECC (2013), *Updated short-term traded carbon values for UK public policy appraisal*, Sept. 2013. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/240095/short-term\\_traded\\_carbon\\_values\\_used\\_for\\_UK\\_policy\\_appraisal\\_2013\\_FINAL\\_URN.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/240095/short-term_traded_carbon_values_used_for_UK_policy_appraisal_2013_FINAL_URN.pdf)
- Orlandi I. (2014), *EU ETS Market Stability Reserve*, presentation at the European Commission Expert Meeting of 25 June 2014, Bloomberg New Energy Finance. [http://ec.europa.eu/clima/events/docs/0094/bloomberg\\_new\\_energy\\_finance\\_en.pdf](http://ec.europa.eu/clima/events/docs/0094/bloomberg_new_energy_finance_en.pdf)
- Sikorski T. (2014), *The MSR*, presentation at the European Commission Expert Meeting of 25 June 2014, Energy Aspects. [http://ec.europa.eu/clima/events/docs/0094/energy\\_aspects\\_en.pdf](http://ec.europa.eu/clima/events/docs/0094/energy_aspects_en.pdf)
- Thomson Reuters Point Carbon (2014), *Long term EUA price outlook: Abatement in sight*, Carbon Market Analyst, 21 August 2014.
- Trotignon R. (2014), *EU ETS Reform proposal - A reserve for stability or instability?*, presentation at the conference « Emissions trading in the 2030 framework » of 3 Sept. 2014, Climate Economics Chair. <https://sites.google.com/a/chaireeconomieduclimat.org/conference-emissions-trading/downloadable-files>
- Tschach I. (2014), *Expected Market Impact of the Proposed MSR*, presentation at the European Commission Expert Meeting of 25 June 2014, ICIS. [http://ec.europa.eu/clima/events/docs/0094/icis\\_tschach\\_solutions\\_en.pdf](http://ec.europa.eu/clima/events/docs/0094/icis_tschach_solutions_en.pdf)

### 3.5.3. Use of auction revenues

- Chevalyere C. and Berghmans N. (2013), *Auction revenues in EU ETS Phase 3: a new public resource*, CDC Climat, Climate Brief n°25, January 2013. <http://www.cdclimat.com/Climate-Brief-no25-Auction-revenues-in-EU-ETS-Phase-3-a-new-public.html>
- Esch A. (2013), *Using EU ETS Auctioning Revenues for Climate Action – What is the appetite for earmarking within specific EU Member States?*, GermanWatch, May 2013. <https://germanwatch.org/de/download/7749.pdf>
- Haita C. (2013), *Recycling the Auction Revenue from Phases I and II of the EU Emissions Trading Scheme*, ICCG, March 2013. [http://www.iccgov.org/FilePagineStatische/Files/Publications/Reflections/15\\_Reflection\\_March\\_2013.pdf](http://www.iccgov.org/FilePagineStatische/Files/Publications/Reflections/15_Reflection_March_2013.pdf)

- Hepburn C., Grubb M., Neuhoff K., Matthes F. and Tse M. (2006), *Auctioning of EU ETS phase II allowances: how and why?*, *Climate Policy* 6 (2006) pp. 137–160.  
<http://www.old.cambridgeprg.com/wp-content/uploads/2008/11/hepburn.pdf>
- Vase P. and Sunderland L. (2014), *The economic case for recycling carbon tax revenues into energy efficiency*, Prashant Vaze Consulting, Feb. 2014.  
[http://www.e3g.org/docs/The\\_case\\_for\\_recycling\\_carbon\\_tax\\_Feb2014\\_Final.pdf](http://www.e3g.org/docs/The_case_for_recycling_carbon_tax_Feb2014_Final.pdf)

## 4. EU ETS participation and compliance for installations in Romania

Romanian industrial and power installations entered the EU ETS in 2007 when Romania joined the European Union. Romanian aircraft operators were included in the scheme in 2012.

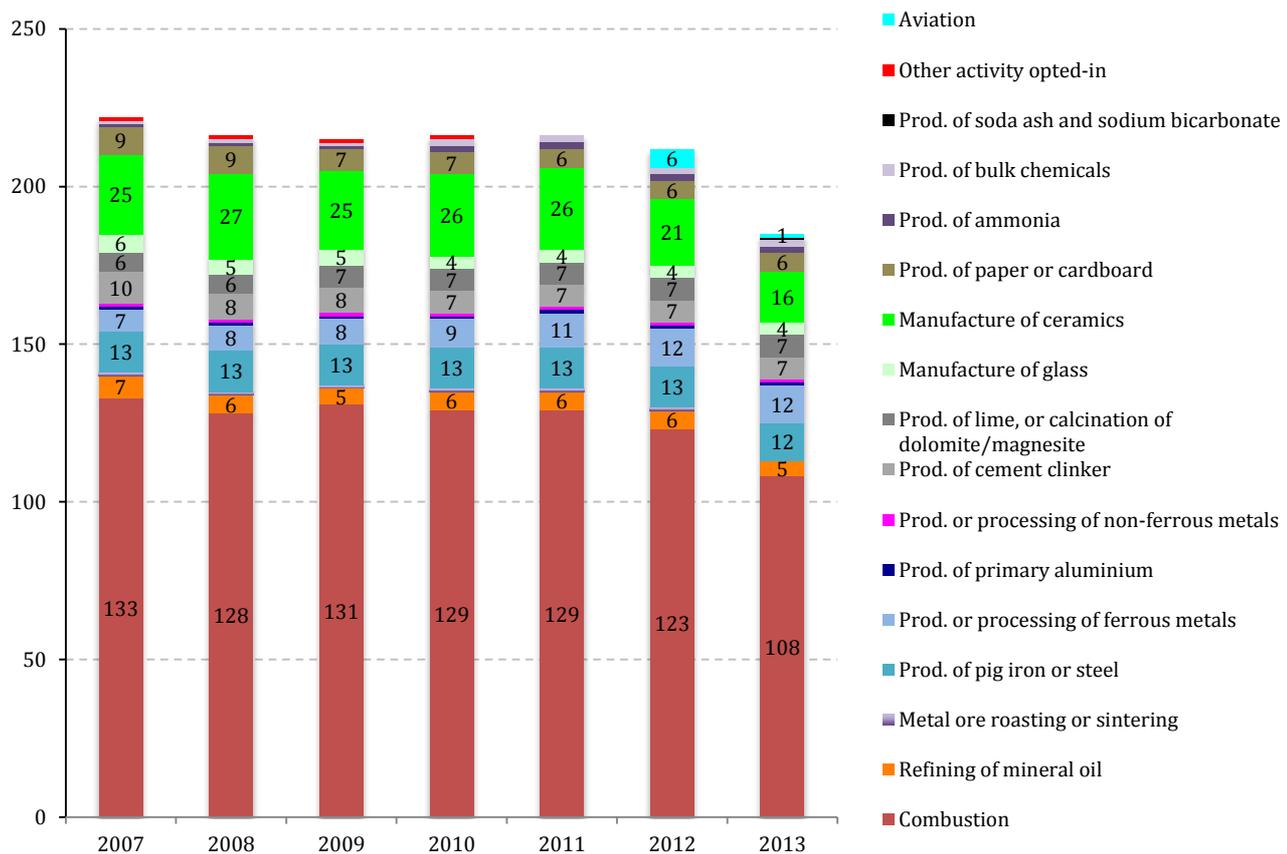
Since 2007, 289 installations and operators have been listed as participating to the EU ETS, although some are no longer included because of installations closures or change in the EU ETS scope in particular in Phase 3 from 2013 on.

### 4.1. Typology of Romanian EU ETS installations

#### 4.1.1. Number of installations covered over time by sector

In 2013, 201 installations and operators were included in the EU ETS in Romania. Among them, 185 actually emitted greenhouse gas emissions, the majority (58%) pertaining to the fuel combustion sector, which includes the production of electricity, heat and co-generation.

Figure 7 – Evolution of the number of Romanian installations and operators under the EU ETS from 2007 to 2013, by sector

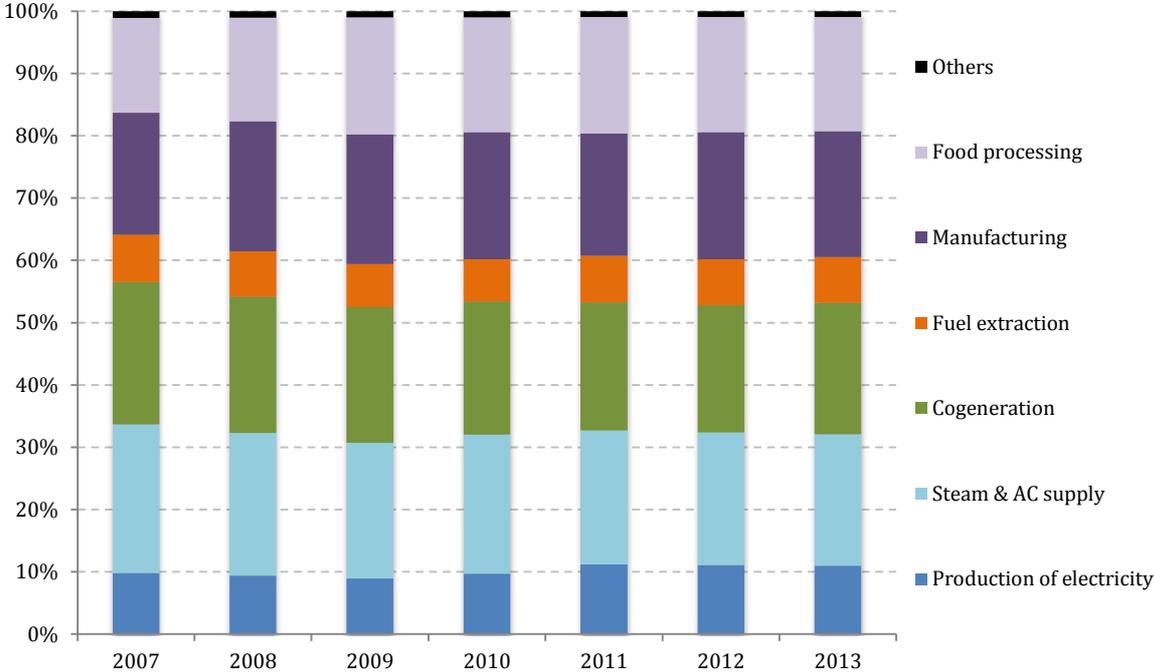


Source: EUTL.

The combustion sector is very diverse as it includes any installation burning fuels to produce power and/or heat, whether power/heat is the final product for sale or an input to produce other goods. Figure 8 shows that combustion installations operating in 2013 are in majority (66 i.e 53%) producing

power and/or heat as the final product, while 51 combustion installations pertained to other energy or manufacturing sectors.

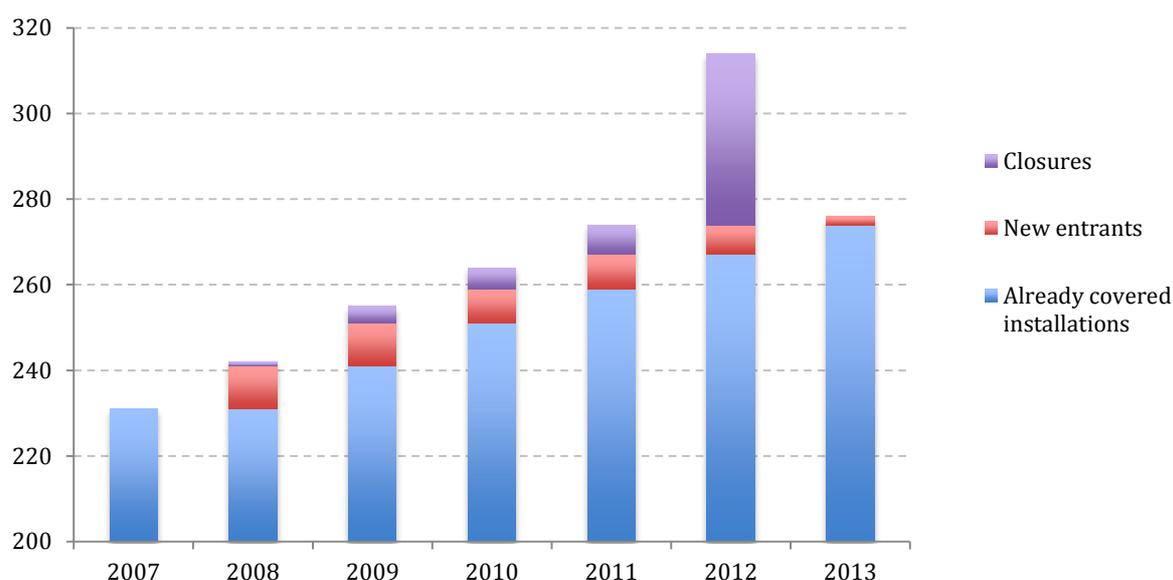
**Figure 8 – Distribution of combustion installations by sub-category (2013 scope)**



*Note: the data used in this figure corresponds to the 109 combustion installations operating in 2013 for which a sub-category was known (out of 119 combustion installations operating in 2013).  
Source: own calculations from EUTL and MECC data.*

**The modifications of the list of EU ETS incumbents in phase 3 reduced the number of installations and operators covered in Romania by 13%,** mostly because of the evolution incurred by the combustion sector. In total, 35 installations operating in 2012 were not included in the EU ETS in 2013; out of them, 18 belonged to the combustion sector. Indeed, since 2013, combustion installations emitting less than 25 ktCO<sub>2</sub>e/yr can be excluded from the EU ETS. It appears to be the case for 9 installations.

Figure 9 – Number of installations in the EU ETS, including for their first or last year of operation



Note: for each year, operating installations are distinguished whether they already operated previously ('already covered installations'), are new entrants, or operate for the last year ('closures'). Source: own calculations based on EUTL data.

Table 11 – Impact of phase 3 scope changes on the number of Romanian installations in the EU ETS

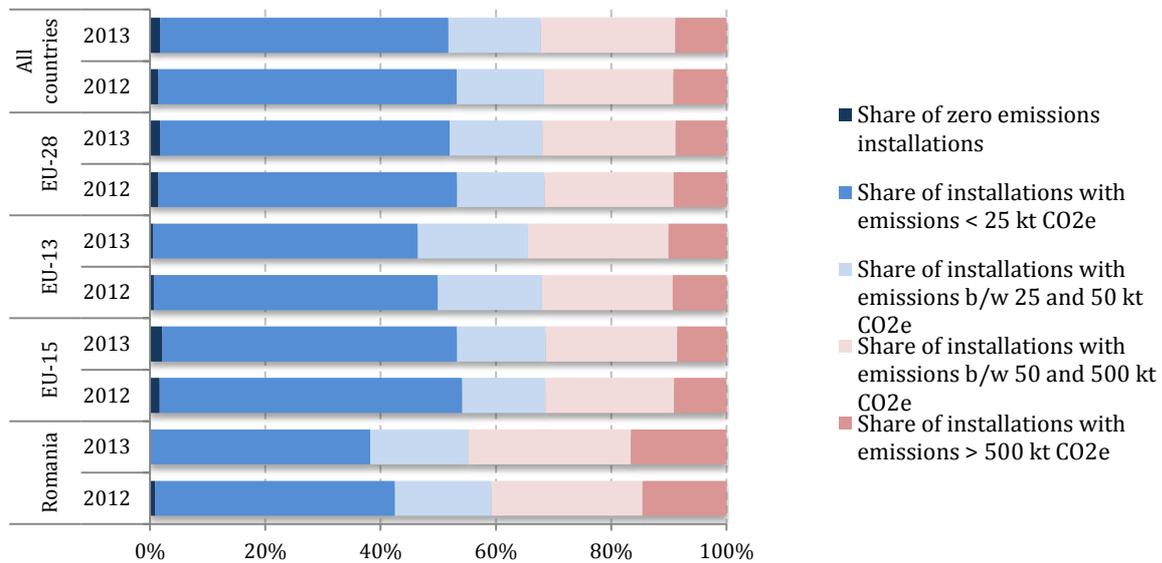
Sector	Share in number of installations and operators in 2013	Evolution of the number of installations and operators covered 2012/13
Metal ore roasting or sintering	0%	-100%
Aviation	1%	-83%
Manufacture of ceramics	9%	-24%
Refining of mineral oil	3%	-17%
Combustion	58%	-12%
Prod. of pig iron or steel	6%	-8%
Prod. or processing of ferrous metals	6%	0%
Prod. of primary aluminium	1%	0%
Prod. or processing of non-ferrous metals	1%	0%
Prod. of cement clinker	4%	0%
Prod. of lime, or calcination of dolomite/magnesite	4%	0%
Manufacture of glass	2%	0%
Prod. of paper or cardboard	3%	0%
Prod. of ammonia	1%	0%
Prod. of bulk chemicals	1%	0%
Prod. of soda ash and sodium bicarbonate	1%	0%
Other activity opted-in	0%	
<b>TOTAL</b>	<b>100%</b>	<b>-13%</b>

Source: EUTL data viewer- EEA.

#### 4.1.2. Size of Romanian installations

The Romanian installations are bigger in terms of emissions than the European average, whatever the reference group that is taken into account. Figure 10 shows that installations emitting more than 50ktCO<sub>2</sub>e/yr account for 45% of installations in Romania in 2013 while the European average is 32%, a share that does not vary much if one considers EU Western or Eastern countries.

Figure 10 – A European comparison of Romanian installations' size in 2012 and 2013



Source: EUTL data viewer-EEA.

#### 4.1.3. Estimated number of market participants by sector

The actual number of market participants does not correspond directly to the number of installations and operators as:

- Several installations can be owned by the same entity, who generally manages EU ETS compliance at the group level<sup>44</sup>;
- Financial intermediaries and other participants may be allowed to open an account in the Romanian registry and thus participate in the EU ETS market.

For example, among the 282 operators or personal accounts recorded in Phase 1, it is possible to isolate 166 distinct entities, thanks to the grouping proposed Jaraite et al. (2013).

It is also possible to analyze for each sector the type of mother company, as shown in

Table 12. Unsurprisingly, industrial companies hold the large majority of industrial accounts.

<sup>44</sup> As recalled by Trotignon (2013), “this facilitates long-term strategies, limits risks for individual installations and allows a more efficient use of the limited expertise on such a new market”.

Table 12 – Romanian EU ETS account holders in Phase 1

Type of account	Entities ultimately controlling a company (control at least 50.01% of all corporate levels below it)					Total
	Unspecified	Bank/Financial company/Private equity firm	Foundation/Research institute	Industrial company	Mutual & pension fund/Nominee/Trust/Trustee	
<b>Financial company</b>	<b>3</b>	<b>2</b>		<b>3</b>		<b>8</b>
<b>Industrial company</b>	<b>38</b>	<b>17</b>	<b>1</b>	<b>211</b>		<b>3 270</b>
Combustion Mineral oil refineries	30	7	1	131		1 170
Metal ore	1	1		7		9
Cement/clinker		2		14		16
Glass		3		13		16
Ceramic	3	1		6		7
Pulp/paper/board	3	3		30		36
Pig iron/steel	1			8		2 11
Mineral wool	1			1		1
Other activity	2			1		3
<b>Unknown</b>	<b>3</b>					<b>3</b>
<b>Total</b>	<b>44</b>	<b>19</b>	<b>1</b>	<b>214</b>		<b>3 281</b>

Source: extracted from Jaraite et al. (2013).

Table 13 – Biggest Romanian emitters in 2013 (>100 kt/yr) when grouped by ultimate owner

	Position in 2013	Emissions in 2013	Number of Installations open in phase 3	Average annual Phase 3 allocation
<b>Unknown owner</b>	-1,942,209	5,679,738	5 679 738	1,450,247
<b>SOCIETATEA COMERCIALA COMPLEXUL ENERGETIC ROVINARI SA</b>	-4,291,364	4,291,363	1	347,070
<b>SOCIETATEA COMERCIALA COMPLEXUL ENERGETIC TURCENI SA</b>	-4,169,783	4,169,782	1	353,782
<b>SOCIETATEA COMERCIALA DE PRODUCERE A ENERGIEI ELECTRICE SI TERMICE "TERMOELECTRICA" - SA</b>	-2,302,330	4,074,801	11	1,390,417
<b>ARCELOR-MITTAL</b>	-288,911	3,939,110	3	3,423,328
<b>COMPLEXUL ENERGETIC CRAIOVA SA</b>	-2,457,083	2,772,728	2	457,423
<b>OMV AKTIENGESELLSCHAFT</b>	-1,745,225	2,440,543	11	949,958

TERMOELECTRICA S.A.	-1,833,058	1,902,411	1	303,460
TRANSWORLD FERTILIZERS HOLDING SA	-666,894	1,854,955	1	1,114,242
<b>MUNICIPALITIES</b>	<b>-602,398</b>	<b>1,553,750</b>	<b>14</b>	<b>502,666</b>
SC VERMOEGENSVERWALTUNG GMBH	636,637	1,532,293	3	2,034,165
HOLCIM LTD.	282,700	1,532,223	2	1,815,730
LAFARGE SA	994,948	1,138,852	2	1,416,657
C.E.T. GOVORA SA	-815,940	1,081,365	1	220,186
ROMPETROL HOLDING SRL	-78,527	832,899	3	833,885
VIMETCO N.V.	94,115	394,130	2	457,909
DALKIA INTERNATIONAL	-190,181	328,961	1	97,930
ING GROEP NV	98,298	326,655	1	398,549
PIOCHE CONSULTANTS LTD	180,110	261,995	1	414,635
L.V.I. HOLDING NV	176,771	247,735	3	398,130
TERMICA SA	-51,098	176,551	2	59,388
COMPAGNIE DE SAINT GOBAIN SA	-19,917	132,773	2	105,843

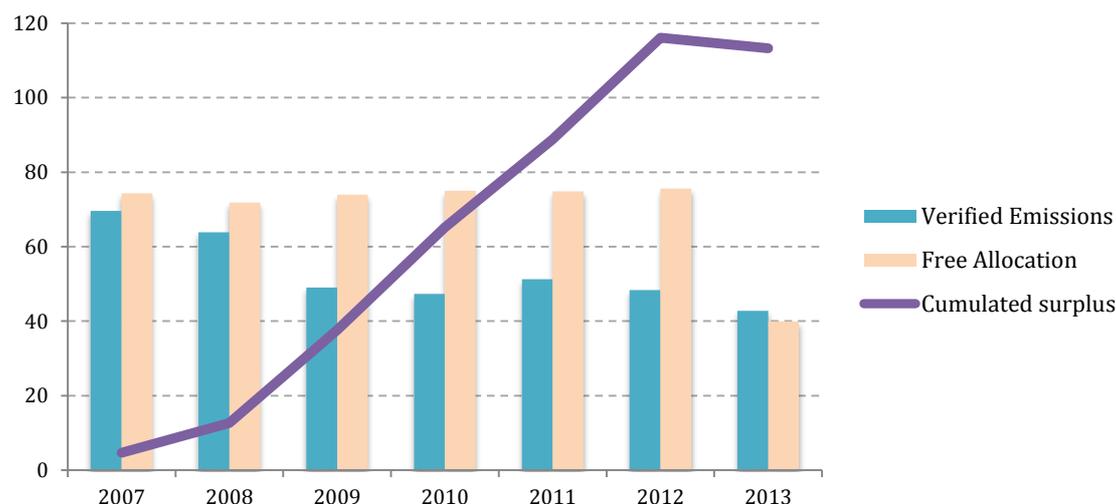
Source: own calculations based on from Jaraite et al. (2013).

#### 4.1.4. Emissions volumes over time

As many Member States, Romania experienced a sharp drop in verified emissions under the EU ETS, a combination of emissions abatement and reduction in industrial production following the economic downturn.

Between 2007 and 2013, emissions covered by the EU ETS decreased by 39%. While free allocation was also considerably reduced between phase 1 and phase 3 (-46%), the surplus in allowances reached 113 MtCO<sub>2e</sub> in 2013.

Figure 11 – EU ETS-covered Romanian emissions vs. free allocation from 2007 to 2013, in MtCO<sub>2e</sub>



Source: EUTL.

The modification of the perimeter of installations covered over time did not lead to substantial changes in emissions, including when entering phase 3, as shown in

Figure 12.

**Figure 12 – EU ETS-covered Romanian emissions by status of installations in MtCO<sub>2</sub>e**



*Note: for each year, operating installations are distinguished whether they already operated previously ('already covered installations'), are new entrants, or operate for the last year ('closures').*  
*Source: own calculations based on EUTL data.*

**4.2. Compliance since 2007**

Compliance refers to the annual process through which incumbents have to surrender as many carbon assets — European allowances and/or international Kyoto offsets under qualitative and quantitative conditions — as their previous year’s emissions.

To achieve this goal, incumbents can use a variety of strategies, in particular through the active management of allocation and carbon assets.

**4.2.1. Compliance status**

When analyzing the compliance status, **an important indicator remains the ‘position’ of each installation or sector, i.e. the difference between the allocation received freely and the emissions for a given year.** Installations or sectors receiving more (respectively less) allowances than their needs are said “long” (resp. “short”). Even if in theory the position does not influence the compliance strategy — installations are supposed to only compare their abatement costs to the market price — in practice it is widely recognized that ‘long’ installations may not use market mechanisms as much as they might do, while ‘short’ installations have a more intense use of the market since they are obliged to buy carbon assets. Hence an asymmetry in the market behavior between ‘long’ and ‘short’ installations or sectors.

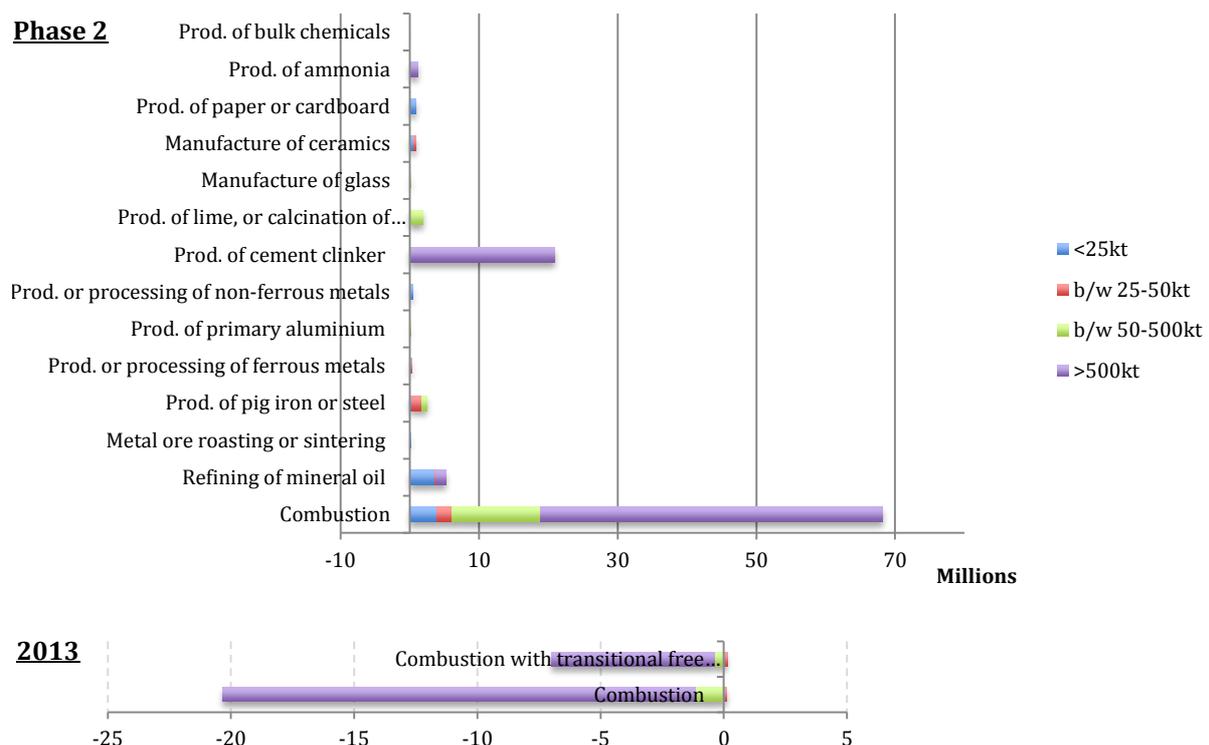
#### 4.2.1.1. Compliance by size of installation

Figure 13 presents the position of Romanian installations in Phase 2 and in 2013, by sector. The first result is that **all categories of size showed a surplus in allowances in phase 2, whatever the sector considered**. In the combustion sector, where all size categories are represented, the majority of the surplus came from the largest installations.

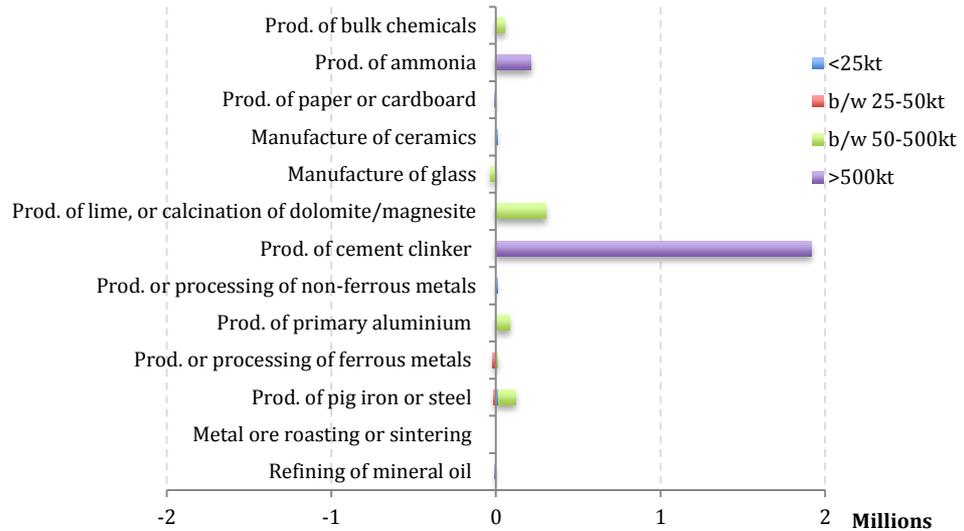
The picture for phase 3 is more contrasted. Now several sectors show a deficit, for one or all size categories. **The combustion sector remains the more impacted by the change in the allocation process** and the end of free allocation for the power sector. However, the transitional free allocation provision diminishes the deficit in allowances of the combustion sector by 66%.

For other industrial sectors, the situation differs substantially among sectors. Some still experience a rather large surplus in allowances, reflecting either a good level of efficiency compared to the EU average which is possible for a few installations, or a weak production<sup>45</sup>, or a combination of both; others are already in deficit, although not by much, meaning their production is either close to the European carbon-efficiency benchmark or their production is still below pre-downturn levels.

**Figure 13 – Compliance status by size of installation in MtCO<sub>2</sub>e in phase 2 and 2013**



<sup>45</sup> Benchmarks that were used to determine the free allocation are calculated using historical outputs. The baseline period is chosen by the operator between the 2005-08 period or the 2009-10. It means that all operators who chose as the reference period the one preceding the economic downturn will receive more allowances in proportion ; if their output has not reached pre-downturn levels, the allocation may be higher than their actual emissions.



Note: the classification of installations by size is the same as for phase 2.

Source: own calculations based on EUTL data.

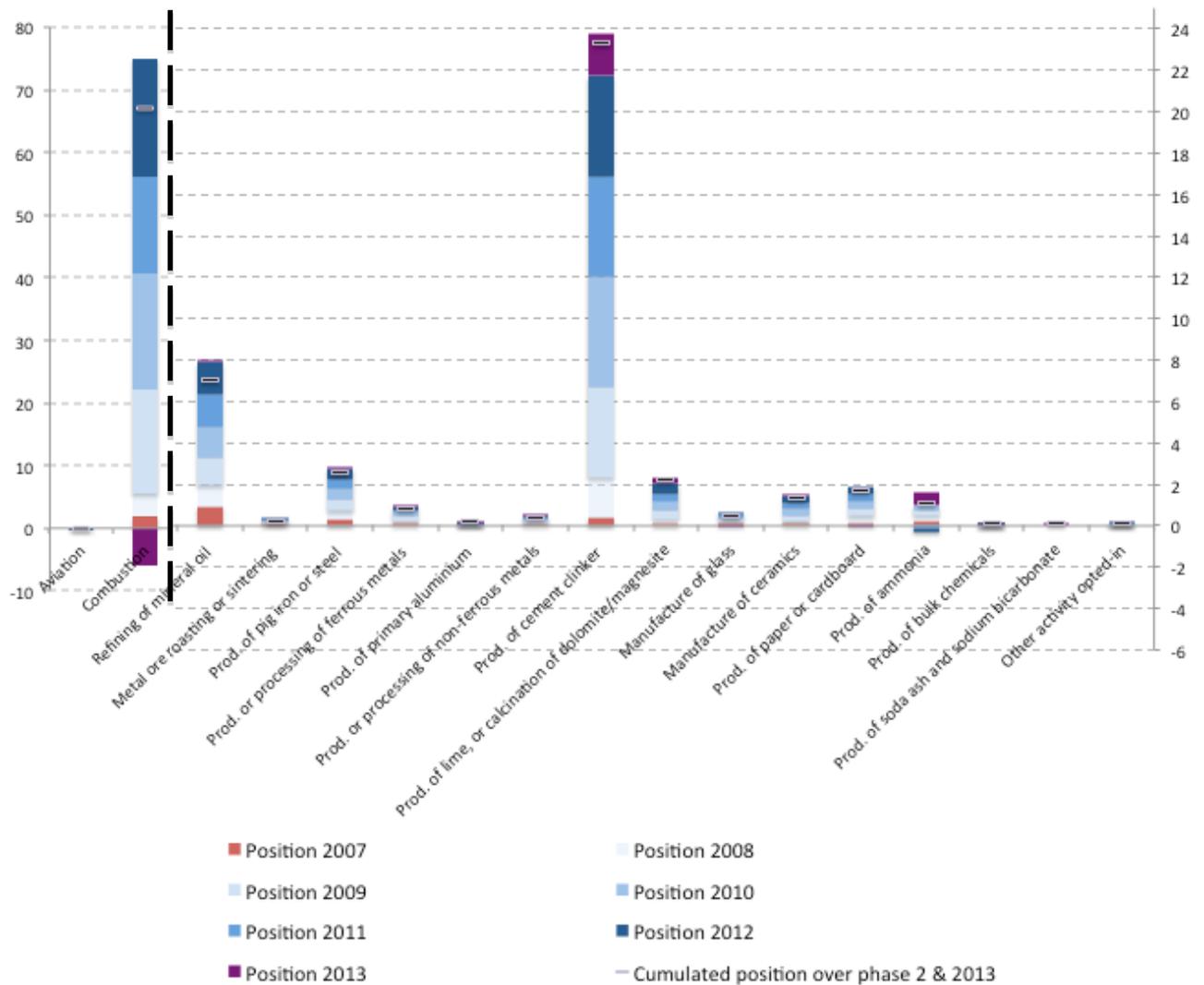
#### 4.2.1.2. Sectoral compliance

In many EU Member States, the combustion sector has been the only sector “short” in allowances since the beginning of the EU ETS. Indeed, because of its lower exposure to international competition, Member States often chose to put a higher burden on this sector. With the programmed ending of free allocation for the whole sector by 2020, the power sector will be obliged to buy all the allowances it needs, less banked allowances from phase 2.

In Romania, the combustion sector received more allowances than its needs in phase 2, and experience the first deficit in freely allocated allowances only in 2013, as shown in

Figure 14.

Figure 14 – EU ETS sectors' position (free allocation-emissions) from 2007 to 2013, in MtCO<sub>2</sub>e



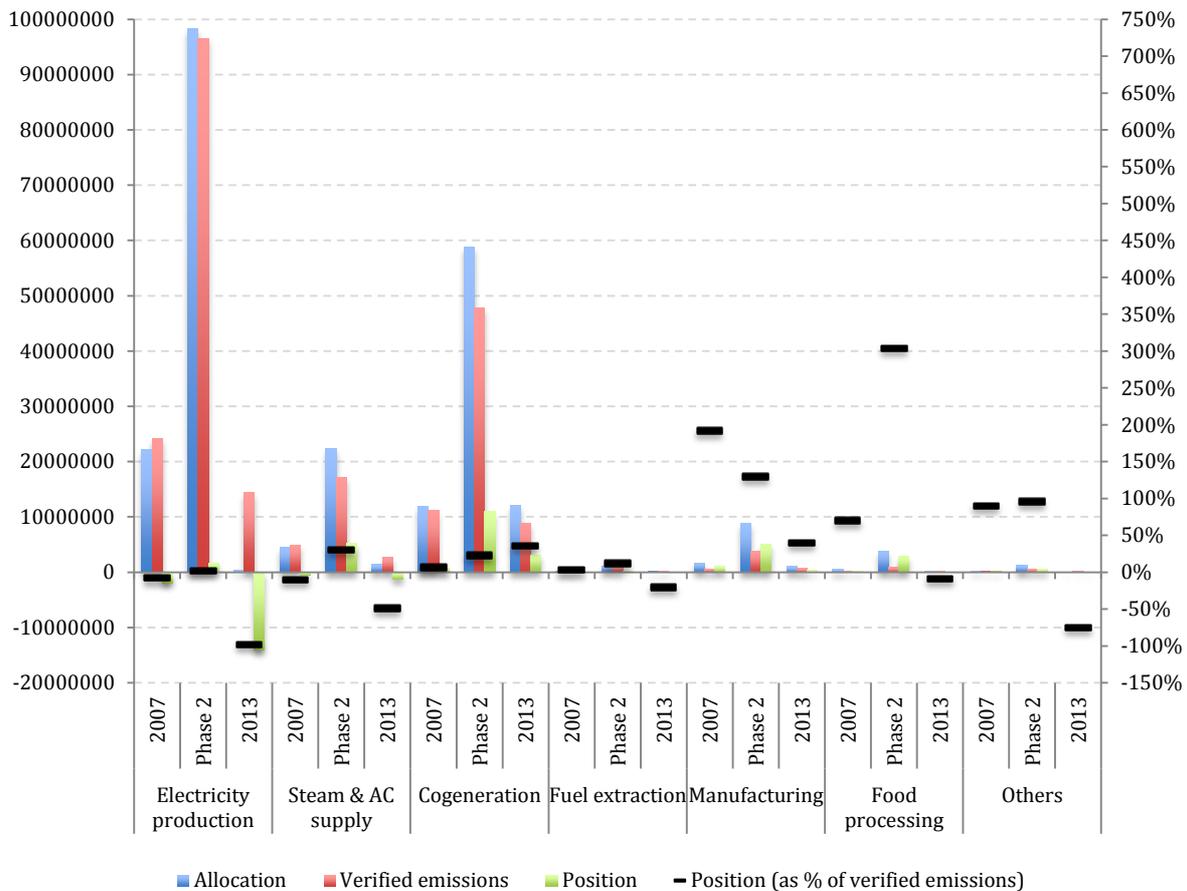
Note: the left and right axis are not at the same scale.

Source: own calculation from EUTL.

Within the combustion sector, only installations producing or transforming energy for sale show an aggregated allowance deficit to the exception of cogeneration facilities, as shown in

Figure 15. The sub-category with the highest deficit is the production of electricity, followed by the transportation of electricity (the sole installation included in the “others” sub-category), the supply of steam and air conditioning and fuel extraction.

**Figure 15 – Combustion installations' position (free allocation - emissions), by sub-category (in tCO<sub>2</sub>e and as a percentage of verified emissions)**



Source: own calculation from EUTL.

#### 4.2.2. Use of international credits<sup>46</sup>

International credits issued from the Kyoto Clean Development Mechanism (CDM) and Joint Implementation (JI) mechanism are accepted under conditions in the EU ETS since the adoption of the so-called 'Linking Directive' (Directive 2004/101/EC) in 2004. As the credits — respectively called Certified Emission Reductions or CERs and Emission Reductions Units or ERUs — have been available at cheaper costs, there is a **high incentive for EU ETS installations to use them to the maximum allowed by law**. Spared European allowances can then be banked or sold on the market to cash in the price difference with international credits.

Figure 16 shows Romanian installations used this strategy of surrendering international credits while they received more allowances than their compliance needs. **All sectors surrendered at least one international credit**<sup>47</sup>.

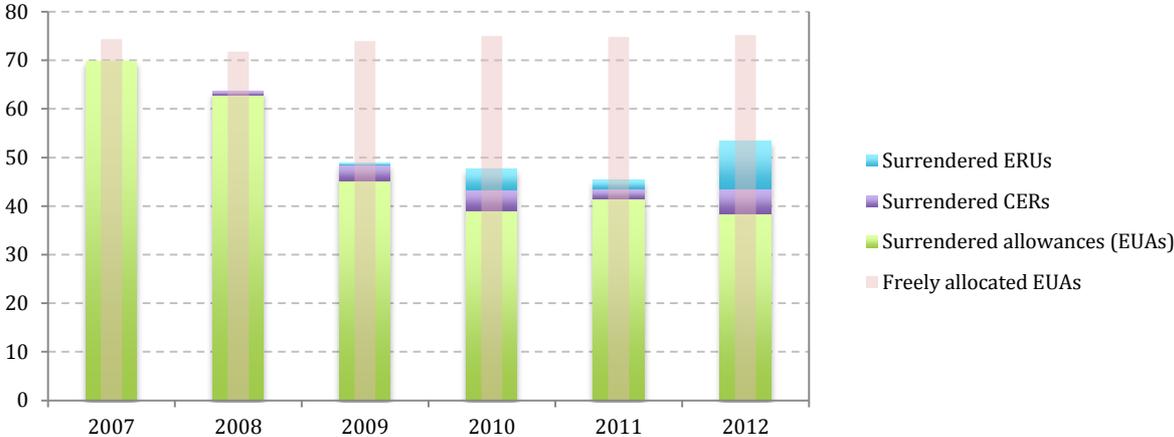
Figure 17 illustrates the use of international credits on average by sector. Because of the over-allocation and because the entitlement of using international credits refers to the equivalent of a share

<sup>46</sup> The analysis is limited to 2007 and Phase 2 as it is impossible from 2013 on to differentiate EUAs from international credits converted into EUAs.

<sup>47</sup> To the exception of the production of soda ash and sodium bicarbonate which includes only one installation which did not emit during Phase 2.

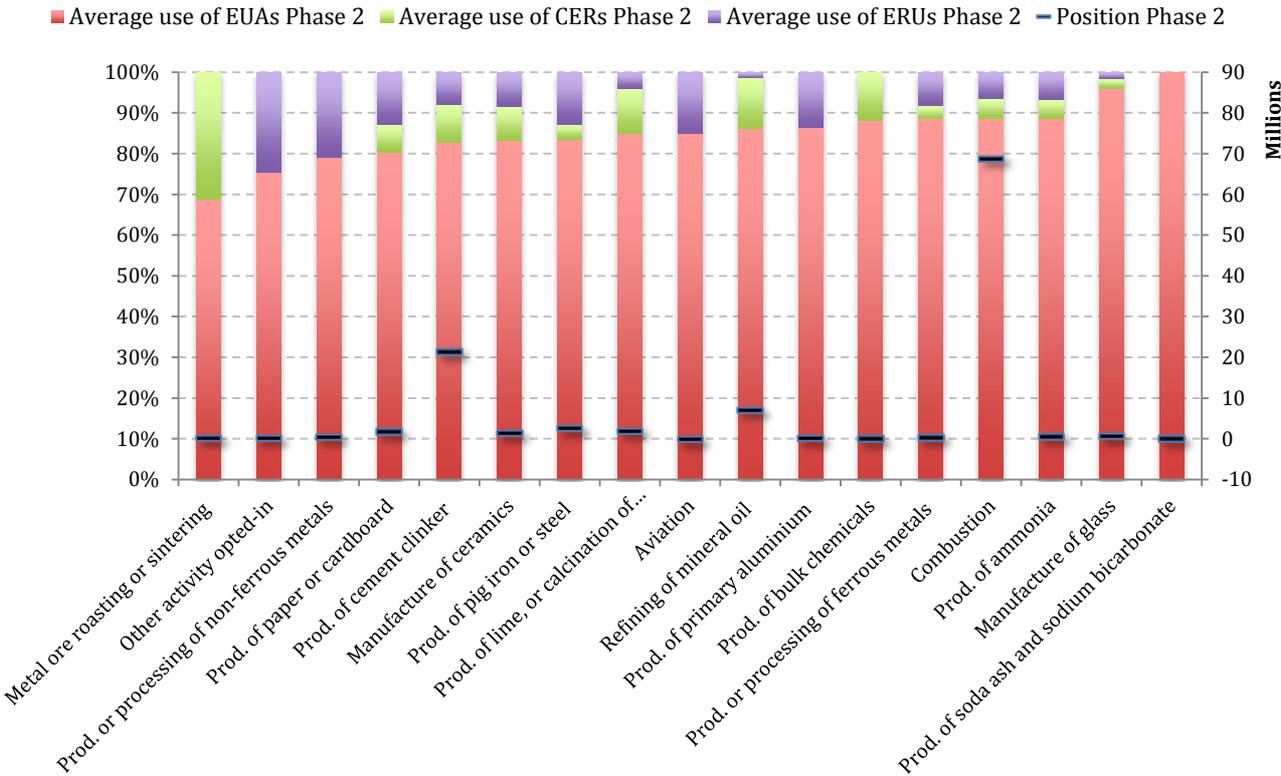
of allowance allocation (10% in Romania), **some sectors could cover a large share of their emissions thanks to international offsets.** The level of international offsets' use does not appear to be correlated to each sector compliance position.

**Figure 16 – Carbon units used for compliance by Romanian EU ETS installations (in millions)**



Source: own calculations based on EUTL data.

**Figure 17 – Carbon units used by Romanian EU ETS sectors in phase 2, in % of verified emissions**

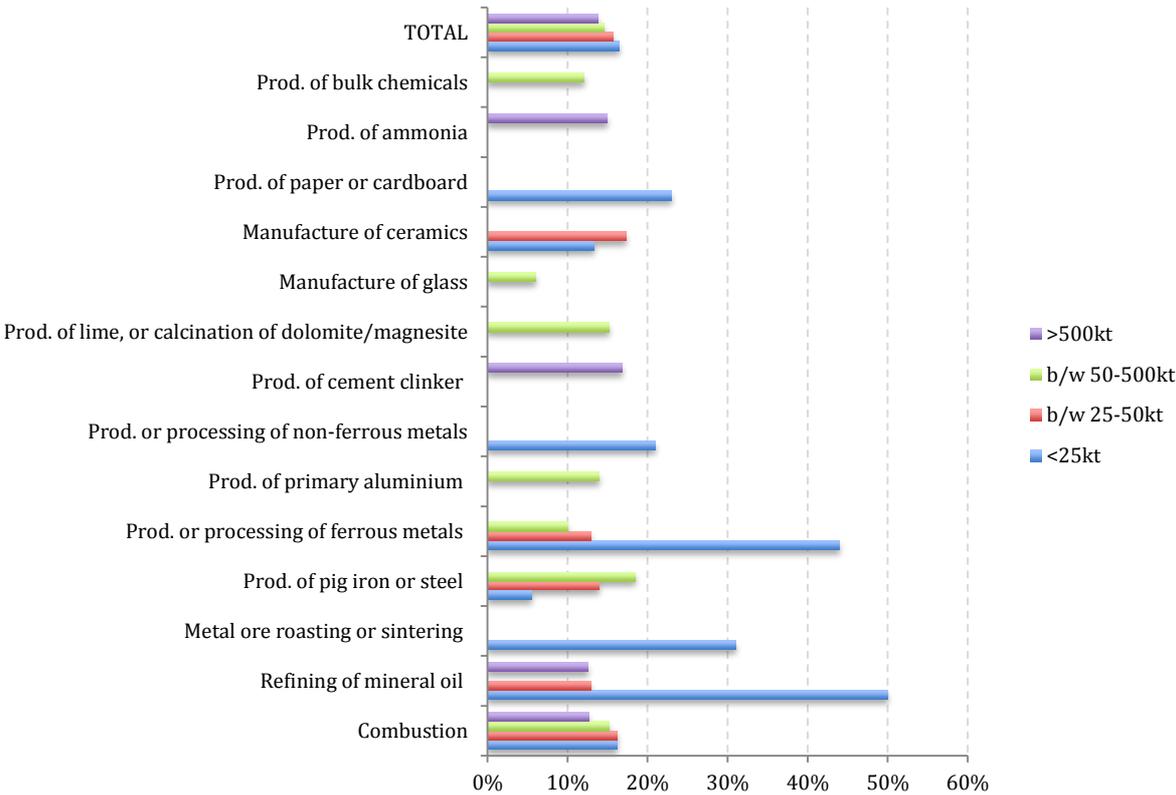


Note: the right axis corresponds to sectors' positions — i.e. the difference between allowances received for free and verified emissions, in MtCO<sub>2</sub>e. Source: own calculations based on EUTL data.

EUTL data also reveals that Romanian installations used proportionately a high number of ERUs within international offsets. They rank 6<sup>th</sup> among EU ETS participating countries in terms of the share of ERUs in surrendered units (at 6%).

Finally, Figure 18 shows that contrary to what could be expected, **smaller installations have also accessed the CDM and JI markets**. A first explanation is that they benefitted from a pooled management of compliance needs, at their holding group level. A second explanation is that specific arbitrage products have been proposed by specialized brokers, aiming at maximizing the use of CERs and ERUs to benefit from the price difference with allowances.

**Figure 18 – Use of international offsets by size category of installations**



Source: own calculations based on EUTL data.

**4.2.3. Banking, borrowing and use of trading**

EU ETS incumbents can use other flexibility provisions than the use of international offsets, in particular banking of allowances. Given the surplus observed over phase 2, borrowing strategies were probably limited. As details regarding transactions recorded in the EUTL are only disclosed after 5 years, only scarce information is available to analyze phase 2 strategies, let alone phase 3 strategies.

However, Martino and Trotignon (2013) offer a partial picture of banking, borrowing and trading strategies through the analysis of phase 1 EUTL data. Their conclusions are that:

- **Borrowing was used by at least 25% of operators** and involved large amounts of allowances.
- For the year 2007, because no banking was allowed towards phase 2, it was estimated that half of the surplus expired worthless.
- **Participation to trading was much higher for large installations**, especially in the energy sectors where installations were more frequently missing allowances to cover their emissions and had also a larger exposure to commodity markets given the nature of their activity. On the contrary, a gross

25% of installations did not participate in any trading, reflecting a possible lack of an optimization strategy for installations with enough allowances to cover their needs. Financial intermediaries and utilities trading desks seem to be very active in intermediating trades: only 12% of the volumes traded took place directly between two operators.

### 4.3. Concluding remarks

The choices in the allocation process made by European Member States since the inception of the EU ETS in 2005 have modified the way the “carbon rent” created through allocation is distributed among economic players — industries, utilities, but also governments and indirectly citizens and tax payers.

**The development of auctioning is the opportunity to raise public money but also questions the use governments will make of auction revenues.** Economists have long favored the recycling of such proceeds, under the so-called theory of “double dividend”: by increasing public spending or relieving distortive taxes, on labour for example, the use of auction revenues is expected to boost economic growth. In the present times of strong public budget constraints, they are often viewed as a good opportunity to alleviate public debt or to fund strategic projects, even if they have no link to environment and climate change.

In parallel, **European governments have committed to report on their use of auction revenues and to dedicate at least half of them to climate-related policies.** Analysis has shown some countries like Germany will go beyond and dedicate 100% of auction proceeds to national and international climate actions. However, the issue of the additionality of the funding remains. The German hand in case shows that **political arbitrage** is needed among the range of public policies.

In particular, **the changes in the allocation process raise questions regarding their impact on European competitiveness.** Because European industries are already fighting to keep market shares on the international market, it is often feared that an additional constraint, through carbon pricing, would make their playing field even less leveled. As recalled by Vivid Economics and Ecofys (2013), various policy options remain available for mitigating carbon leakage, including thanks to the auction revenues, but each one with its drawbacks:

- **Provision of financial compensation to firms;** it does not effectively mitigate carbon leakage and would have to follow European state-aid guidance to avoid creating distortions among EU industrials. Nevertheless, carbon revenues might be used to finance R&D projects to prepare EU industries to the decreasing cap on emissions, as suggested by the European Commission on the model of NER300.
- Exemption of economic sectors from the trading scheme; it does not achieve the original policy goal of reducing carbon emissions. The exclusion of small installations from the EU ETS seeks to reserve the participation to the EU ETS to the cases where it is the most cost-efficient regulatory instrument. On the contrary, **other sectors might join the EU ETS in the future** if such cost-advantage analysis proves positive.
- **Provision of free allowances to firms;** it controls carbon leakage only indirectly and its performance has not been demonstrated in empirical studies. Nevertheless, it remains the easiest political solution to be implemented after the failure of the unilateral inclusion of international air flights. As such, it is not likely to be reconsidered on the short to medium terms.

**Member States thus have to consider a number of parameters in their use of auction revenues.** One of them in particular is that policies funded by auction revenues face a quantitative risk linked to the difficulty to foresee the actual amount of money raised. It pledges rather for an ex-post earmarking.

#### 4.4. Selected references

##### 4.4.1. Analysis of EUTL data

- Jaraitė J., Jong T., Kažukauskas A., Zaklan A., and Zeitlberger A (2013). *Ownership Links and Enhanced EUTL Dataset*. European University Institute, Florence, 2013. <http://fsr.eui.eu/CPRU/EUTLTransactionData.aspx>
- Martino V. and Trotignon R. (2013), *Back to the Future: A comprehensive analysis of carbon transactions in Phase 1 of the EU ETS*, Climate Economics Chair, Sept. 2013. <http://www.chaireconomieduclimat.org/wp-content/uploads/2013/10/13-10-09-Cahier-ID27-Martino-Trotignon.pdf>

##### 4.4.2. Useful websites

- EEA EU Emissions Trading System (ETS) data viewer, <http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer>
- European Commission, *Union Registry reports for phase 3*, [http://ec.europa.eu/clima/policies/ets/registry/documentation\\_en.htm](http://ec.europa.eu/clima/policies/ets/registry/documentation_en.htm)

## Contacts in other Member States

Here are some contacts in other EU Member States who can be useful for organizing a dedicated workshop on the use of auction revenues:

- Czech Republic: Mr Michal Danhelka, member of the EU Climate Change Committee ([Michal.Danhelka@mzp.cz](mailto:Michal.Danhelka@mzp.cz))
- Lithuania:
  - Mr Romualdas Brazauskas, member of the EU Climate Change Committee ([r.brazauskas@am.lt](mailto:r.brazauskas@am.lt))
  - Ms Dalia Streimikiene, Lithuanian Energy Institute ([dalia@isag.lei.lt](mailto:dalia@isag.lei.lt)): contacted, pending reply.
- France:
  - Ms Cécile Goubet, member of the EU Climate Change Committee (+33 1 40 81 79 99; [cecile.goubet@developpement-durable.gouv.fr](mailto:cecile.goubet@developpement-durable.gouv.fr))
  - Mr Maxime Durande, Head of Carbon Markets Unit ([maxime.durande@developpement-durable.gouv.fr](mailto:maxime.durande@developpement-durable.gouv.fr))
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- Poland:
  - Mr Tomasz Karpinski, member of the EU Climate Change Committee ([tomasz.karpinski@kobize.pl](mailto:tomasz.karpinski@kobize.pl))
  - Mr Przemyslaw Sikora ([przemyslaw.sikora@kobize.pl](mailto:przemyslaw.sikora@kobize.pl)), contacted, not directly in charge of EU ETS auction revenues, pending reply on the good contact person.
- UK:
  - Mr Paul Van Heyningen, member of the EU Climate Change Committee ([paul.vanheyningen@decc.gsi.gov.uk](mailto:paul.vanheyningen@decc.gsi.gov.uk))
  - Mr Hugh Salway, International Climate Change-EU Institutions and Policy at HM Treasury, +44 (0) 207 270 1432 ([Hugh.Salway@hmtreasury.gsi.gov.uk](mailto:Hugh.Salway@hmtreasury.gsi.gov.uk))
  - Ms Inga Staples-Moon, Department of Energy and Climate Change ([inga.staplesmoon@decc.gsi.gov.uk](mailto:inga.staplesmoon@decc.gsi.gov.uk))