

**THE EU'S EMISSIONS TRADING SCHEME:
ACHIEVEMENTS, KEY LESSONS, AND FUTURE PROSPECTS**

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Clémentine D'OULTREMONT



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INTRODUCTION

Launched in 2005, the European Union Emissions Trading Scheme (EU ETS) is the first and largest cap-and-trade system of allowances for emitting greenhouse gases in the world. As such it represents a valuable policy experiment from which lessons can be drawn.

The European Union has developed the ETS as the cornerstone of its climate policy. The objective of emissions trading is to provide incentives for businesses to reduce carbon emissions at the least possible cost. Over time, the ETS drives investments in low-carbon technologies, leading to further emissions reductions.

Initially the EU ETS was split into two trading phases: a pilot phase from 2005 to 2007 (Phase I), and a mandatory phase from 2008 to 2012 (Phase II), coinciding with the commitment period of the Kyoto Protocol. In 2008, a third phase post-Kyoto was mandated to operate from 2013 to 2020. The objective is to help the EU to reduce its emissions by at least 20% by 2020 compared to 1990 levels and to increase this target to 30% in the context of an ambitious and comprehensive international agreement.¹

Despite the diverse achievements of the EU ETS so far, the scheme is still far from having fulfilled its theoretical potential. Although it has been proven that the scheme led to abatement during the first phase, carbon prices have remained too low to promote investments in the development, diffusion and deployment of low-carbon technologies. Yet, if the EU wants to achieve the long-term challenge of ‘decarbonising’ its economy, a credible and long-term carbon price is needed to insure green investments. The lack of reliable and verified data for emission projections and the fear of industry and Member States for the economic costs of the scheme led to a first phase with many design shortcomings. Some of these shortcomings were solved in the second phase but most of them have remained. In order to address the scheme’s design flaws and, thereby, improve the credibility of the scheme in its future Phase III, the ETS Directive was thoroughly revised in 2008.² The analysis of the revised directive shows that most of the lessons from the earlier experience have been learned. However, since this revision, the economic crisis occurred and has greatly undermined the efficiency of the ETS, changing the political and economic landscape in which the EU’s climate policy was projected. By reducing industrial production, the

1. What ‘ambitious’ means is still unclear but the EU documents state that an ambitious and comprehensive international agreement should contain comparable reductions to the EU by other developed countries and appropriate actions by the economically more advanced developing countries based on their responsibilities and capabilities.

2. Directive 2009/29/EC amending Directive 2003/87/EC, OJ 2009, L 140, pp. 63-87.

economic recession has certainly reduced emissions but has also ensured that carbon prices stay low in the forthcoming years, delaying the necessary shift towards a low-carbon economy.

In order to prevent Phase III from being rendered ineffective before its start and in order to ensure the EU ETS' credibility as an effective means of reducing emissions, the ETS cap must be unilaterally revised towards an objective of 30% emission reduction by 2020. This would not only correct the negative consequences of the economic recession on the scheme but would also boost investment in the development of green technologies.

Besides, the future of the scheme will very much depend on the international context, which is far from clear. While the negotiations for a global climate agreement are progressing painfully, the ambition of the EU to link up its ETS with other trading systems in order to progressively build up an international global carbon market is very uncertain due to the wavering will of external actors. Developments at the international level have created further uncertainties, hindering investment in green technologies.

Against this background, this paper will analyse the lessons learnt so far from the EU ETS in order to have a better perspective of its future. After a general outline of the EU ETS (§ 1) its main achievements will be considered (§ 2). Next, the various shortcomings of the scheme in its first phase and ongoing second phase will be analysed (§ 3), followed by a description of the new design features of the revised scheme post-2012 (§ 4). Then, it will be assessed how the shortcomings of the first years' experience have been taken into account in the revised ETS scheme as well as how the recession has since then undermined these improvements, thereby reducing the efficiency of the future scheme (§ 5). Finally, the lessons learnt from the EU ETS so far and what they tell us on the future prospects of the scheme will be summarised in a conclusion.

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1. The ETS general outline

The EU ETS was established by Directive 2003/87³ and entered into force on 1st January 2005. It covers 11,500 installations in the power and heat generation sector and in other energy-intensive industrial sectors⁴, accounting for about 40% of EU's total greenhouse gas (GHG) emissions.

It is a 'cap and trade' system. The idea is to impose a cap or limit on the total amount of emissions of sectors covered in order to help the EU Member States to achieve their reduction commitments under the Kyoto Protocol. Theoretically, the cap creates the scarcity required for firms to trade their pollution allowances, thereby putting a price on carbon and giving an incentive to economically efficient reductions. An allowance represents the right to emit a tonne of greenhouse gas.⁵ For each trading period, Member States are required to establish a National Allocation Plan (NAP) which determines the national cap on the total amount of allowances and how these allowances will be allocated each year to the installations covered by the scheme. Each NAP must be approved by the European Commission.

If an installation emits more than the amount of allowances it received, it has three main options: purchasing extra allowances from those who pollute less than their allocated allowances, investing in emissions reductions and selling freed-up allowances, reducing production and selling freed-up allowances. Installations will sell their allowances as long as the carbon price exceeds their marginal abatement costs and inversely.

To fulfil a proportion of their commitments under the ETS, installations also have the possibility to use two other Kyoto Protocol mechanisms which were linked to the EU ETS by Directive 2004/01⁶: the Clean Development Mechanism (CDM) and Joint Implementation (JI). These mechanisms allow installations to invest in projects to reduce emissions in third countries and use emission credits generated from these for compliance purposes. The CDM applies to projects in developing countries whereas JI covers projects in countries that have committed to emission reductions under the Kyoto Protocol, mainly countries with economies in transition. The idea behind these mechanisms is to enable

3. OJ 2003, L 275, pp. 32-46.

4. Combustion plants, oil refineries, coke ovens, iron and steel plants and factories producing cement, glass, lime, pottery, bricks, pulp and paper. These activities are listed in Annex I of Directive 2003/87.

5. CO₂ is the only greenhouse gas concerned for Phase I. In Phase II, emissions of nitrous oxide from the production of nitric acid were also included.

6. OJ 2004, L 338, pp. 18-23.

emissions reductions at the lowest cost while encouraging the transfer of low-carbon technologies in the host countries.

On the basis of lessons learnt during the first years of experience, the ETS was heavily revised in 2008 by Directive 2009/29 in order to improve the credibility of the scheme in its Phase III. In the following sections the achievements and shortcomings of the ETS so far will be analysed in order to better assess the revision of the future scheme, considerably undermined by the economic recession, discussed later.

2. Achievements of the ETS so far

Considering the lack of experience of the EU with emissions trading before 2005, the huge complexity of the scheme and the time constraint to implement it⁷, the achievements of the EU ETS are not negligible. These successes are very important for the EU to efficiently promote its model as the basis of a potential future global carbon market.

2.1. Proper functioning of the allowance market

The biggest achievement of the EU ETS is the creation of a functioning allowance market. On a global scale, the EU represented about 73% of the global turnover in carbon allowances and credits, making it the dominant force in the global carbon market.⁸ Since the market has been in operation, it has extended significantly: 362 million allowances traded in 2005 amounting for € 7.2 billion, increasing to 1 billion allowances in 2006, 3.1 billion allowances in 2008⁹ and over 6.3 billion allowances in 2009.¹⁰ The amount of allowances traded doubled between 2008 and 2009. Due to this significant increase in the volume of transactions over 2008 and despite a decrease of the average allowances prices by 42%¹¹, the total value of allowances increased by 18% in 2009, amounting to around € 88.7 billion.¹² This is to a large extent due to the economic and financial crisis which led many businesses to sell their surplus of allowances to generate cash.

As a market mechanism, the EU ETS has matured quickly. The carbon prices have responded logically to essential factors like economic growth, energy prices and weather patterns. This proves that the market is both rational and efficient, reflecting macro-economic trends.

Ironically though, the reflection of the carbon price volatility on macro-economic fundamentals can also endanger the efficiency of the scheme. The global economic downturn has affected the carbon prices in such a way that it signifi-

7. C. EGENHOFER and N. FUJIWARA, *Shaping the Global Arena, Preparing the EU Emissions Trading Scheme*, CEPS Task Force Report, No. 61, March 2007.

8. European Commission, *EU action against climate change – The Emissions Trading Scheme*, Brussels, 2009.

9. *Ibidem*.

10. A. KOSSOY and P. AMBROSI, *State and Trends of the Carbon Market*, Carbon Finance at the World Bank, Washington DC, May 2010, p. 8.

11. € 22.1 in 2008 and € 14 in 2009.

12. A. KOSSOY and P. AMBROSI, *op. cit.*

cantly modified the EU climate policy projections for the forthcoming years, as it will be analysed later.

2.2. Impact on corporate behaviour

There is strong evidence that the ETS has had a significant effect on corporate behaviour. EU businesses in the covered sectors are aware that the ETS is here to stay. They have accepted that there is a price to pay for emitting carbon and increasingly take this reality into account in their long-term business strategies.¹³

2.3. Creation of business opportunities

As a new factor in industries' decision-making, the scheme has created a lot of related new business opportunities such as carbon trading, carbon finance, carbon management, carbon consulting and carbon auditing.

2.4. Reduction of emissions in a cost-effective manner

The crucial question when assessing the EU ETS is whether it has so far been able to reduce GHG emissions in a cost-effective manner. The lack of robust and consistent methodologies and assumptions to evaluate the EU ETS effect on emissions prevents from giving an accurate answer to this question. Nevertheless, according to several important studies¹⁴, there has been abatement of somewhere between 2 and 5% during the first period 2005-2007 of the EU ETS despite an over-allocation of allowances from Member States. This emissions abatement is central for the political recognition of the scheme.

Besides, the EU ETS should help the EU to comply with its emissions reduction target under the Kyoto Protocol given that the ETS sectors represent about 40% of EU total emissions. According to the last progress reports of the European Environment Agency (EEA), the EU is on track to achieve and even over-achieve

13. N. B. BEKKHUS and K. VAN HECKE, "The European Union Emission Trading Scheme" in *The Climate Change Challenge: International, European and Belgian Aspects*, Studia Diplomatica, Vol. LXI, 2008, N°1, p. 146.

14. A. KOSSOY and P. AMBROSI, *op. cit.*, p. 6; A.D. ELLERMAN and B. BUCHNER, "Over-Allocation or Abatement? A Preliminary Analysis of the EU ETS based on the 2005-06 Emissions Data", *Environmental and Resource Economics*, Vol. 41, n°2, pp. 267-287; A.D. ELLERMAN, F. CONVERY and C. DE PERTHUIS, *Pricing Carbon: The European Union Emissions trading Scheme*, Cambridge University Press, 2010.

its Kyoto Protocol commitment. When the Kyoto Protocol was agreed upon, the aggregate objective of the then existing 15 EU Member States was to deliver an 8% reduction of GHG emissions below 1990 levels between 2008 and 2012. In a report of the EEA published in 2009¹⁵, emissions in the EU-15 were indicated to be 6.2% below 1990 levels in 2008, i.e. before the consequences of the financial crisis on the real economy. It was therefore estimated that the further implementation of additional policies and measures would be necessary in order to achieve the EU-15 Kyoto target. However, in a report published in October 2010¹⁶, the EEA indicated that EU-15 emissions in 2009 had decreased by 6.9% compared to 2008, mainly as a consequence of the economic recession. As a result of this significant fall in emissions, the EU-15 had already over-achieved its Kyoto target level in 2009 by a gap equivalent to 2.2% of 1990 levels. Moreover, this overachievement increases to 5.9% when the planned use of CDM and JI by EU governments and expected carbon sinks removals (i.e. forestry activities) are taken into account.

It is important to note that being set up as a market mechanism, the EU ETS should help the EU to achieve its emissions reduction target under the Kyoto Protocol at a cost accounting for less than 0,1% of EU's Gross Domestic Product.¹⁷

The EEA report¹⁸ also points out that the significant emissions reductions resulting from the economic crisis have a limited impact on the Kyoto target achievement. Since emission caps in the EU ETS were decided before the recession occurred, only emissions under the caps count towards the achievement of the Kyoto targets, not actual verified ETS emissions. Therefore, emissions from non-ETS sectors “take on a special importance as they are the only ones that matter for the achievement of Kyoto targets by governments.”¹⁹ Accordingly, abatement efforts in the EU are expected to remain limited during Phase II both in the non-ETS sectors and in the ETS sectors where allowances have been allocated too generously relative to the emissions reductions resulting from the crisis.

Among the 12 other EU Member States, the 10 which have Kyoto commitments should also meet or even exceed their targets. According to the EEA, the EU-27

15. European Environment Agency, *Greenhouse Gas Emissions Trends and Projections in Europe 2009*, EEA Report, No 9/2009, 2009, p. 9.

16. European Environment Agency, *Tracking Progress towards Kyoto and 2020 targets in Europe*, EEA Report No 7/2010, 12 October 2010, p. 6.

17. European Commission, *EU against climate change – The Emissions Trading Scheme*, Brussels, 2009, p. 5.

18. European Environment Agency (2010), *op. cit.*, p. 7

19. *Ibidem*, p. 7.

emissions in 2009 decreased by 6.9% as compared to 2008, leaving the EU-27 with already more than 17% of emission reductions below its 1990 levels.²⁰ This makes the achievement of the 20% target by 2020 much easier and cheaper than initially expected.

20. *Ibidem*, p. 6.

3. The shortcomings of the ETS so far

The EU ETS is still a relatively recent policy which has been adopted rapidly. The lack of reliable and verified data for emission projections and the fear of industry and Member States regarding the economic costs of the scheme led to the adoption of a scheme with significant shortcomings. Currently in its fifth year of existence, the scheme is still far from its theoretical potential. The shortcomings analysed below concern aspects of the scheme which will have a significant impact on its future, namely the cap-setting, the allocation method, the use of offset credits, the linking-up with other ETs and the price volatility and uncertainty undermining the development and diffusion of new green technologies. The lessons learnt from these shortcomings will therefore be of particular interest when assessing the changes brought by the revised directive for phase 3 and the future of the scheme in general.

3.1. Problems posed by decentralised cap-setting

The fact that Member States can determine their cap on allowances for each trading period is the result of a concession by the Commission to Member States to get the ETS adopted. Afraid of the impact of this new scheme on their industry's competitiveness, Member States sought to retain sovereignty on the amount of GHG emissions liable for reduction (i.e. the cap), constituting the major determinant of the environmental effectiveness of an ETS.

When Member States established their caps in their national allocation plans (NAPs) during the first phase, they had no certified data of GHG emissions from the sectors covered by the ETS. Therefore, they developed "business as usual" baselines on the basis of their projected growth in emissions. Given the lack of available data on both historical and projected emissions, and intense lobbying from national industries, most Member States allowed emissions to rise by overestimating their economic growth rates.²¹

Yet, the price is to a large extent determined by the cap. In 2005, the allowances prices stayed quite high, but suddenly crashed in April 2006 after the release of the verified emissions data in 2005. This data showed that emissions allocations to installations covered for the first period were higher than actual 2005 emissions. Consequently, the lack of demand for allowances provoked a fall in carbon prices. Although it was largely argued that this result was due to a signifi-

21. D. ELLERMAN and B. BUCHNER, "The European Union emissions trading scheme: origins, allocation, and early results", *Review of Environmental Economics and Policy*, 2007.

cant over-allocation of allowances from Member States, it is nevertheless unclear to what extent it is also attributed to actual emission reductions by the covered sectors.²² In the previous section, it has been seen that emissions reductions had been achieved during Phase I.

Moreover, the restrictions on banking unused allowances for future use into the second phase did not offer a possibility to create scarcity on the over-supplied market. Only Poland and France introduced limited banking in Phase I. These restrictions can be explained by the fear that too many allowances left to be carried over to Phase II could have undermined the achievement of the reduction targets. Nevertheless, the absence of the banking opportunity led to a fall in carbon prices close to zero during the last months of phase I.

The tight schedule between the first and second periods did not allow for a full revision of the system in light of Phase I's shortcomings. As Member States were again too generous in their allocations, the European Commission took an active role by rejecting most of the Member States NAPs 2 for inconsistency with their Kyoto targets. On the basis of an EU-wide methodology of projections based on 2005 verified emissions and an assessment to ensure that the allocations were consistent with the Member States Kyoto targets, the Commission reassessed the caps of each country and thereby opened the path towards harmonisation. This reassessment reduced aggregate allocations in the EU by 10% compared to the initial NAPs 2.²³ Some Member States brought an action for annulment against the Commission's decisions and the European Court of Justice ruled in their favour. However in their new NAPs, Member States finally agreed on the cap previously determined by the Commission. Besides, the possibility of banking allowances into Phase III was allowed in Phase II in order to create scarcity and reduce price volatility.

In its first year, Phase II sustained a substantial carbon price from around € 20 to a peak of just under € 30 in July 2008. However, the price dropped sharply to € 8 in February 2009 as a consequence of the biggest economic crisis since the Great Depression of the 1930s. Although Phase II had more or less dealt with the problem of over-allocation in Phase I, it was without taking into account this major external factor. The impact of the crisis has exerted downward pressures on energy prices and reduced production. Correspondingly, carbon emissions decreased, leading to an unexpected increase in the supply of allowances. In addition, the supply of offset credits from the Clean Development Mechanism (CDM) depressed the carbon price as well. After the worst of the

22. *Ibidem*; D. ELLERMAN and B. BUCHNER, 2008, *op. cit.*

23. Carbon trust, *EU ETS Phase II allocation: implications and lessons*, 21 May 2007, p. 4-6.

crisis in the beginning of 2009, the carbon market started to recover. From May 2009 to present, the allowance prices have stabilised within a narrow range of € 13 to € 16 and no increase is expected for a while.

3.2. Allocation issues

Once the cap is set, each country has to determine how the amount of allowances will be allocated to the covered installations. The chosen allocation method influences significantly the distribution of costs and benefits in the scheme.²⁴ The choice of allocating allowances mainly for free and the inconsistencies between the different allocation methods developed by each Member State have undermined the efficiency and fairness of the scheme.

3.2.1. *Administrative burden for authorities and operators*

The high degree of discretion for Member States in Phase I induced heavy administrative burdens, disparities, complexity and a lack of transparency. This complexity created uncertainty for installations and other market actors, and thereby increased transaction costs. In order to make Phase II simpler and more transparent, the Commission established some standardised tables containing the main information in the NAP.

3.2.2. *Inefficiency of new entrant and closure rules*

In the course of a trading period, most NAPs offer free allowances to new entrants, and withdraw allowances from plants upon closure. These rules have created perverse incentives which discourage investment in low carbon technologies and keep old and inefficient plants in operation.

Regarding the new entrant rules, each Member State establishes a New Entrant Reserve which allocates allowances to new installations covered by the ETS. As new carbon intensive plants receive more free allowances than low carbon plants, the new entrants have no incentive to invest in clean technologies. Such a system amounts to implicit subsidies to construct high polluting plants while the logic of the ETS is to reflect the social cost of carbon emissions and to encourage investments in low carbon technologies. Furthermore, the new entrant allocation rules vary largely from one Member State to another. Like-

24. H. VAN HASSELT, *The EU ETS in the European climate policy mix: past, present and future*, Vrije Universiteit Amsterdam, 2009, p. 39.

wise, there is no harmonisation with regards to the distribution of allowances and the replenishment of the reserve. According to a study, for the setting-up of a same combined-cycle power plant in two countries applying different new entrant allocation rules under Phase II, the value of the plant's annual allocation would range from € 0 in Sweden (no free allocation) to € 15 million in Germany.²⁵ Such a difference runs the risk of creating distortions of competition in the EU market.²⁶ This protection of new investments from the carbon price remained unchanged in most Member States under Phase II.

As for the closure rules, the withdrawal of allocations from installations upon closure creates an incentive to keep inefficient installations in operation so they can retain their allowances. Conversely, an incentive to close inefficient plants is created when a plant can retain its allowances after closure and invest the revenues in a new replacement plant. This kind of "transfer rule" was already applied by some Member States in Phase I and the number increased in Phase II. However, it has also increased the complexity of the system.²⁷

3.2.3. *Limits of grandfathering relative to other allocation methodologies*

Under Phase I and Phase II, allowances were mainly allocated to installations for free on the basis of their past emissions (i.e. grandfathering). Basically, this amounts to reward installations that have traditionally polluted more with more allowances, discouraging abatement efforts. As already illustrated by the issues related to new entrant and closure rules, free allocation resulted in largely inconsistent NAPs, leading to competitive distortions within the EU.

Free allocation has generated huge windfall profits, allowing all the covered sectors to benefit from the scheme.²⁸ However, undue distributional effects are not the same among the covered installations. It depends on the ability of sectors to pass through the costs of their allowances into the product prices while benefiting from their allowances for free.

25. Assuming 2400 GWh annual electricity generation, an allowance price of € 10 and an electricity price of € 31/Mwh in M. AHMAN and K. HOLMGREN, "New entrant allocation in the Nordic energy sectors: incentives and options in the EU ETS", Swedish Environmental Research Institute, January 2007, p. 12.

26. C. EGENHOFER, N. FUJIWARA, M. AHMAN, L. ZETTERBERG, *The EU Emissions Trading Scheme: Taking Stock and Looking Ahead*, CEPS and CLIPORE, July 2006, p. 4.

27. *Ibidem*.

28. M. GRUBB, T. L. BREWER, M. SATO, R. HEILMAYR, D. FAZEKAS, *Climate Policy and Industrial Competitiveness: Ten insights from Europe on the EU Emissions Trading System*, The German Marshall Fund of the United States (GMF), Washington, 2009, p. 4.

The sector that has benefited the most from windfall profits so far is the power sector. The reason being is that on the power market, prices are set by marginal production costs which include the costs of carbon emissions. If the marginal producer is a coal power plant, as it is often the case, the increase of the power price is significant as coal requires many allowances. Low carbon producers such as hydro or nuclear will then enjoy large profits without incurring the costs. Besides, all power companies benefit also from their free allowances. This double rent has generated huge windfall profits. According to a study of Point Carbon, the windfall profits of power companies in Germany, Italy, Poland, Spain and the UK could amount to € 23 billion over the second period.²⁹ Most Member States have recognized the undue distributional effects of free allocation for Phase II, but they have mainly addressed them by allocating fewer free allowances within the power sector.

Energy-intensive industries have also gained important windfall profits. In a study of de Bruyn *et al.*, it has been calculated that the windfall profits obtained by the refineries and iron and steel sectors between 2005 and 2008 amounted to € 14 billion.³⁰ Regarding Phase II, a recent study of Sandbag (a campaigning organisation focused on the issue of emissions trading) estimates that about one billion of superfluous allowances will have been allocated to the industry sector, amounting to € 14 billion of windfall profits.³¹

As a fairer method than grandfathering, benchmarking has been widely considered but not much used. Under this approach, allowances are still distributed for free but the allocation is based on a best performance standard, rewarding carbon efficiency. The limited use of benchmarking can be explained by the difficulty to agree on appropriate benchmarks given the heterogeneity of production processes, as well as the lack of data.³² In Phase II, benchmarking was slightly more used by some Member States but it was limited to the power sector as a means to reduce windfall profits. The differences of standards between Member States have led to inconsistencies and risks of distortions in the EU market.³³ Here-under, it will be shown that this method has been harmonised under Phase III.

29. This figure is based on a carbon price of € 21 and some other assumptions in Point Carbon, *EU ETS Phase II – The potential and scale of windfall profits in the power sector*, March 2008, p. 2.

30. S. DE BRUYN, A. MARKOWSKA, F. DE JONG and M. BLES, *Does the energy intensive industry obtain windfall profits through the EU ETS? An econometric analysis for products from the refineries, iron and steel and chemical sectors*, CE Delft, April 2010, p. 8.

31. This figure is based on a carbon price of € 14 in D. MORRIS and B. WORTHINGTON, *Cap or trap? How the EU ETS risks locking-in carbon emissions*, Sandbag, September 2010, p. 7.

32. H. VAN HASSELT, *op. cit.*, p. 41.

33. C. EGENHOFER, *The Making of the EU Emissions Trading Scheme: Status, Prospects and Implications for Business*, European Management Journal, Vol. 25, Issue 6, December 2007, p. 458.

The best way to avoid windfall profits is auctioning. By selling allowances, the revenues do no longer go to businesses but to governments' budgets. Although there is an economic rationale for optimising the use of auctioning, it has been allowed up to a limited extent due to the strong opposition of industries: 5% of allocations for Phase I and 10% for Phase II. Only 4 out of 25 Member States used this method at all in Phase I, and only Denmark used it up to its 5% limit. In Phase II, auctioning was used by only 11 countries, especially to address the windfall profits in the power sector.

3.2.4. Concerns about competitiveness and carbon leakage

Even before the EU ETS came into force, the scheme was heavily criticised by EU industries. They feared for their competitiveness with foreign industries which would not have to bear the same carbon constraint. They were also concerned that the increase in production costs due to the carbon constrain, would encourage European businesses to relocate their activities in third countries where climate policies are less stringent than in the EU. This phenomenon called "carbon leakage" would not only undermine the economic activity of the EU, it would also reduce the environmental benefits of the scheme.

The impact of the EU ETS on competitiveness varies widely according to the sectors covered under the cap. Contrary to the power sectors, some energy-intensive industries have features which make them vulnerable to competitiveness concerns, and eventually carbon leakage. The literature distinguishes these concerns according to the direct or indirect effects of the ETS. The direct effects regard the ability of energy intensive industries to pass through the carbon costs onto prices paid by consumers as well as their exposure to international competitiveness.³⁴ The indirect effects are due to the increase in power prices in the EU, resulting from the ETS. As the carbon costs are expected to rise, there is a fear that power companies raise their prices excessively, in order to pass through their additional costs, at the expense of big industrial power consumers. These indirect costs could have impacts for both industries covered and industries not covered by the ETS.³⁵

So far, the carbon prices have been too low to impact on the competitiveness of EU energy-intensive industries. Many studies have argued that the risk of carbon leakage has been largely over-estimated and, though the impacts are difficult to

34. *Reviewing the EU emissions trading scheme – priorities for short-term implementation of the second round of allocation*, CEPS Task Force Report, No. 56, 2005; J. REINAUD, *Industrial competitiveness under the European Union Emissions Trading Scheme*, IEA Information Paper, 2005.

35. C. EGENHOFER and N. FUJIWARA, 2005, *op. cit.*

estimate, it is actually limited to a small number of energy intensive sectors.³⁶ This is not surprising since the cost for carbon induced by the ETS is very small compared to other costs that determine industrial production and location such as volatile exchange rates and energy costs.

The fear regarding competitiveness has nevertheless allowed energy intensive industries to secure generous allocations of allowances during the two first phases. These large amounts of freely obtained allowances led to the windfall profits described earlier.

3.3. Controversial issues on the use of offset credits

Besides cap setting and allocation methods, the use of credits generated from CDM and JI also suffers from a lack of harmonisation. Between and within Member States the use of offset credits is very controversial and has raised both quantitative arguments, i.e. on the amount of credits that should be allowed, and qualitative arguments, i.e. on the type of projects that should be accepted.

Regarding the quantity of credits, the development of the use of CDM and JI credits in the EU ETS has advantages and drawbacks. The main reason of the use of offset credits is that they provide cheaper options to reduce emissions and thereby act as a safety valve against price spikes. Besides, they contribute to sustainable development in developing countries. However, the use of CDM and JI credits reduces the incentives for domestic abatement and technological innovation within the EU. Moreover, a significant supply of offset credits combined with a low demand exerts a downward pressure on the price signal.

During pilot Phase I, the use of credits generated from CDM and JI was very limited. Given the over-allocation of allowances and the impossibility of banking credits, there was no incentive for EU operators to use such mechanisms. Moreover, the capacities to implement them were not yet fully adequate.

With respect to Phase II, the Commission decided that the use of CDM/JI credits by installations under the EU ETS might not be lower than 10% of the allowances allocated to each installation. This limit must be consistent with Member States' commitment to complementarity under the Kyoto Protocol which

36. European Commission, McKinsey and Ecofys, *EU ETS Review – Report on international competitiveness*, Brussels, December 2006; U. OBERNDORFER and K. RENNINGS, “Costs and Competitiveness of the European Emissions Trading Scheme”, Centre for European Economic Research, *Eur. Env.*, Vol. 17, No. 1, 2007; J.C. HOURCADE, D. DEMAILLY, K. NEUHOFF, M. SATO, *Differentiation and dynamics of EU ETS industrial competitiveness impacts*, Climate Strategies, 2007.

requires that the use of CDM and JI credits is supplemental to domestic abatement efforts in each developed country. In the absence of a definition of this 'supplementarity principle' in European and public international law, the Commission interpreted this requirement as a ceiling of 50% with regard to the aggregate use of CDM/JI credits within the EU.³⁷

The Commission justified its decision by arguing that it reflects a "reasonable balance" between domestic reductions and incentives for operators to invest in projects in developing countries. This statement is however problematic in light of the figures. Given that the overall cap in Phase II is only 6% lower than comparable 2005 emissions, while the offset budget within the EU ETS amounts to approximately 13% of the overall cap, it is clear that the limit on the use of CDM/JI is far too generous.³⁸ Consequently, the whole offset budget not only substitutes from the overall reduction effort but, it also allows the EU to increase its emissions by a quantity equivalent to the overall reduction effort required by the scheme.

On the basis of the Commission's decisions with regard to NAPs for Phase II, credits from CDM and JI have been allowed to enter the scheme up to the generous limit of 1.4 billion offset credits during 2008-2012.³⁹ With the impact of the global economic recession, only 132 million tons of CDM credits were issued in 2009, 10% less than in 2008.⁴⁰ Globally only 400 million tons of CDM credits had been issued in May 2010.⁴¹

According to a study of Sandbag⁴², approximately 81 million of offset credits were used for compliance in 2008 and 2009. This study estimates that some 611 million offset credits will be used during Phase II. It is thus already clear that offset credits will have been used much less than the limit allowed for Phase II. This should allow an amount of about 789 unused offset credits⁴³ to be carried over from Phase II to Phase III. The consequences of this transfer will be analysed in the section 5.3.

Still according to Sandbag estimates, the EU ETS should achieve a tiny reduction

37. Communication from the Commission to the Council and to the European Parliament on the assessment of national allocation plans for the allocation of greenhouse gas emission allowances in the second period of the EU Emissions trading Scheme, COM (2006) 725, Brussels, 29 November 2006.

38. J. DE SEPibus, "Linking the EU Emissions Trading Scheme to JI, CDM and post-2012 International Offsets", nccr trade regulation, October 2008, p. 10.

39. A. KOSOY and P. AMBROSI, *op. cit.*, p. 18.

40. *Ibidem*, p. 15.

41. *Ibidem*.

42. D. MORRIS and B. WORTHINGTON, *op. cit.*, p. 19.

43. The difference between the 1.4 billion offset credits available for use in Phase II and the 611 million offset credits which will have been used in Phase II.

of 32 million tonnes of carbon emissions during Phase II.⁴⁴ However, the addition of the use of offset credits (611 MtCO₂) will bring the EU to increase its domestic emissions by some 579 million tonnes.

The quality of the project mechanisms also proved very controversial, especially in the case of CDM. First of all, the development of the CDM has shown a real tension between its two-fold objectives: contributing to sustainable development in developing countries and reducing emissions in a cost-effective way in developed countries. Indeed, the most cost-effective and successful projects are also those which contribute the least to sustainable development (the most criticised are the HFC and N₂O projects), whereas the projects linked to significant sectors of sustainable development are almost unsupported by the CDM. To date, the EU has not imposed qualitative restrictions, except for forestry, nuclear and large hydroelectric projects. Moreover, some regions are overrepresented. China, India and Brazil account for 75% of carbon revenues whereas low-income countries in greater need of the revenues CDM can receive only 3%.⁴⁵ Finally, the environmental integrity of the CDM itself is disputed.⁴⁶ In order to reduce emissions, CDM projects must carry emission reductions additional to what would have occurred otherwise. However, this claim of additionality is difficult to prove and the risk of validating 'business as usual' projects is actual.

More generally, the fact that the rules governing the use of offset credits from 2013 are still unclear – depending on the result of the global climate negotiations – creates a lot of uncertainties around the future developments of CDM and JI.

3.4. Issues relevant to linking up with other ETSs

When looking back in history, the adoption of a cap and trade system was promoted by the United-States to the EU in order to reduce their GHG emissions. The EU accepted this instrument in return for a tougher emissions reduction commitment from the US and with the idea of linking both their systems in the future. However, the US has finally never ratified the Kyoto Protocol, nor adopted the ETS it advocated. The EU became then the supporter of a system that it would not have originally defended.

44. *Ibidem*.

45. World Bank, "Generating the Funding Needed for Mitigation and Adaptation", in *World Development Report 2010: Development and Climate Change*, 9 November 2009, p. 265.

46. Commission Staff Working Document, accompanying document to the Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system, Impact assessment, SEC(2008) 52, Brussels, 23 January 2008, p. 138.

One of the main ambitions of the EU ETS remains to be linked with other cap and trade schemes in third countries. When the EU ETS Directive was adopted in 2003, it provided therefore the possibility of linking the EU ETS with other developed countries having ratified the Kyoto Protocol through agreements on the mutual recognition of allowances. To date, apart from the incorporation of the ETS Directive into the European Economic Area in 2008⁴⁷, there has been no linking up of the EU ETS with other cap and trade schemes. This absence of linkages between schemes will be further analysed below.

The ambition of the EU ETS to move towards a world-wide carbon market is driven by several reasons. Not only would it ensure that environmental objectives are met globally, but it would also allow a wider geographical scope to identify least cost abatement options. The emergence of a global carbon price would also avoid risks of carbon leakage, while ensuring a certain degree of fairness in terms of sharing the burden between all emitters.⁴⁸

However, linking also raises a number of concerns due to the heterogeneity of domestic and regional schemes regarding their targets and design features prior to linking. Poorly-designed linking of ETSs can undermine the environmental effectiveness of the overall system. Some significant issues include the differences of caps leading to an uneven distribution of gains across countries/regions; the existence of a price control mechanism in one system increasing the emissions throughout the linked system; and the different criteria used for the eligibility of credits from offsetting projects leading to different environmental guarantees. It is therefore central to reach an agreement on the harmonisation of essential key features before linking. Besides an agreement on the mutual recognition of allowances, the Directive does not contain any other criteria before linking the EU ETS with other schemes. The decision on whether or not linking the EU ETS with another scheme has to be made on a case-by-case basis. It is nevertheless foreseen that the Commission shall draw up any necessary provisions relating to the schemes linkage under the agreement relating to the recognition of allowances.

3.5. Price volatility and uncertainty

The fact that the market functions does not mean that it has provided a stable and effective carbon price. On the contrary, carbon prices have remained far too low and volatile to stimulate any substantial investments in the research, devel-

47. This incorporation has led to the extension of the scheme to Iceland, Liechtenstein and Norway.

48. Commission Staff Working Document, *op. cit.*, p. 131.

opment and deployment of new and low-carbon technologies within the EU. Yet, this is an essential element of the fight against climate change in the long-run.

The reasons of the failure to provide sufficient incentives to invest in new and low-carbon technologies can be found in the lack of certainty within and outside the EU ETS' regulatory framework.

Within the scheme's regulatory framework, price volatility and uncertainty stem from many elements. In Phase I, the data limitations, the lack of ambition of Member States' caps and the inability to carry over unused allowances into Phase II created significant price fluctuations. Although these issues were more or less addressed in Phase II, the uncertainty stemming from the short allocation periods relative to investment cycles and the perverse effects from free allocation, including the new entrant and closure rules, remained.

Many other macro-economic fundamentals affect price volatility outside the EU ETS' regulatory framework. Although this is inherent to a market mechanism, it creates further uncertainty. In the case of the ETS, it stems especially from the indecision of international climate negotiations, energy prices, weather conditions, technological progresses and last but not least unexpected changes in economic growth. In Phase II, the carbon prices remained relatively high and stable until the 2008-2009 economic recession. But by reducing the industrial production, the crisis brought about a fall in emissions and an over-supply of allowances, leading to decreased carbon price, which have led companies to cancel or delay their investments in emission reduction projects.

While the factors affecting the price signal within the EU ETS' regulatory framework can be addressed, the macro-economic factors are much more unpredictable. It must be remembered that, as a cap and trade scheme, the EU ETS can guarantee the reduction of a quantity of emissions but not a fixed price. The price of carbon is seen as a function of supply and demand over the short and long terms. This is the reason why the European Commission rejected the possibility of *ex post* adjustments⁴⁹, allowing the reduction of the supply of allowances in case of rapidly falling demand. Such *ex post* adjustments would have disruptive effects on the allowances market, increasing uncertainty rather than reducing it.

49. Communication from the Commission to the Council and to the European Parliament on the assessment of the national allocation plans for allocation of greenhouse gas emission allowances in the second period of the EU Emissions trading Scheme, COM(2006) 725 final, 29 November 2006, p. 8.

Therefore, the key long-term challenge of the ETS is to set up a scheme that responds to new economic and environmental impacts, but in a credible and predictable way in order to maintain R&D and technology adoption incentives.⁵⁰

50. OECD, *The Economics of Climate Change Mitigation – Policies and Options for Global Action Beyond 2012*, 2009, p.67.

4. Description of the revised ETS post-2012

On the basis of the lessons learned from the first phases, the Commission released a proposal for a revised ETS Directive in January 2008. This proposal was part of a wider package composed of several legislative proposals aiming to achieve the EU's 2020 targets of a 20% reduction of GHG emissions, a 20% improvement in energy efficiency and a 20% share in the production of renewable energy. This climate and energy package was finally adopted in December 2008, giving birth to the revised ETS Directive 2009/29.⁵¹ In the following sections, the main elements of this revised Directive are analysed.

4.1. Wider scope of application

From 2013, the scope of the EU ETS will be extended to cover new sectors. This includes: GHG emissions from petrochemicals, ammonia and aluminium sectors, as well as N₂O emissions from the production of nitric, adipic and glyoxylic acid, and perfluorocarbon emissions from the aluminium sector. Installations undertaking the capture, transport and geological storage of greenhouse gases will also be included. The addition of these sectors is expected to extend the coverage of the scheme from around 40% to 43% of total EU greenhouse gas emissions.

At the same time, Member States will be able to remove small installations from the scheme on the condition that alternative measures are in place that will achieve an equivalent reduction in their emissions. This opportunity is justified by the recognition that small installations, emitting relatively low amounts of emissions, have to bear participation costs superior to the environmental benefits of the scheme.

From 2012, GHG emissions from civil aviation will also be included in the EU ETS.⁵² Emissions from shipping should be included at a later stage. According to the revised Directive⁵³, in case no international agreement is approved on maritime emissions, or such an agreement is unsatisfactory to the EU by 31 December 2011, the Commission should make a proposal to include international maritime emissions with the aim of adopting such legislation by 2013. Other sectors like road transport and forestry were also considered but called for further investigation due to their many uncertainties.

51. OJ 2009, L 140, 63-87.

52. Article 3c of Directive 2008/101/EC.

53. Recital 3

4.2. EU-wide cap

One of the main changes of the revised directive is the replacement of the current decentralised system of 27 national caps on emissions by an EU wide cap proposed by the Commission and agreed by the European Council.

In order to establish this harmonised cap-setting, it is initially required to establish an overall reduction objective for the EU ETS. This EU ETS objective is part of the EU commitment endorsed by the European Council in 2007 to reduce 20% of total GHG emissions by 2020 compared to 1990 levels, which is equivalent to a 14% reduction compared to 2005. This 20% reduction effort has been divided between the ETS sectors and all other sectors not covered by the ETS. As it is considered more cost-effective to reduce emission in the ETS sectors, the latter will have to reduce 21% of their GHG emissions by 2020 compared to 2005 whereas the non-ETS sectors will have to achieve a 10% reduction by 2020 compared to 2005. Moreover, these objectives could change if, as pledged, the EU decides to increase its 20% overall target to 30% in case of comparable commitments by other developed countries. In the long-term, it has already been agreed that the EU will have to reduce 80 to 95% of its GHG emissions by 2050 compared to 1990 levels.

To achieve this ETS target, the quantity of allowances or the cap will be reduced by 1.74% annually starting in 2013 until 2020 and beyond. This will lead to a 21% reduction of the number of allowances available in 2005 by 2020. The initial quantity of allowances, on which this linear reduction will be based, will correspond to the average total quantity of allowances issued by Member States in accordance with the Commission Decisions on their national allocation plans for the 2008 to 2012 period. This quantity of allowances will be adjusted however to take into account the broadened scope of the scheme. The revised Directive indicates that the Commission will publish adjusted quantities by 30 September 2010.⁵⁴ In July 2010 though, the cap for 2013 has been fixed by the Commission at 1.926.876.368 allowances.⁵⁵

54. Article 9a, § 2 and 3 of the revised Directive 2003/87/EC.

55. Commission Decision of 9 July 2010 on the Community-wide quantity of allowances to be issued under the EU Emission Trading Scheme for 2013, C(2010) 4658 final.

4.3. Auctioning becomes the rule and free allocation a slowly dying exception

Auctioning will progressively become the main allocation method, instead of the current method whereby allowances are principally allocated for free. More than simply reflecting the ‘polluter pays’ principle, auctioning avoids giving windfall profits to certain sectors, reduces price volatility, maximises the price-signal, triggers investments in the development and research of low carbon technologies and provides significant revenues.

Since experience has showed the ability of the power sector to pass on the carbon costs to their consumers, it will in principle have to purchase all its allowances from 2013 onwards. However, under certain conditions some Member States will have the option to temporarily deviate from this rule with respect to existing power plants.⁵⁶ The auctioning rate of these plants will be at least 30% relative to emissions in the first period and will have to increase progressively to 100% in 2020. Full auctioning will also apply to installations involved in the capture, transport and storage of carbon from 2013 but allowances for the emissions stored will not have to be surrendered.

For other manufacturing sectors covered by the ETS, there will be a progressive phase-out of free allocation on an annual basis, starting with an 80% share of free allowances in 2013, and decreasing to 30% in 2020 with a view to reaching full auctioning in 2027. However, some energy intensive industries deemed to be exposed to a significant risk of carbon leakage will be able to receive free allowances in the long-term. This exception will be analysed in the following section 4.4.

The amount of free allowances allocated to the installations will be determined by EU-wide *ex ante* benchmarks so as “to ensure that allocation takes place in a manner that provides incentives for reductions in GHG emissions and energy efficient techniques”.⁵⁷ In line with the revised Directive, the Commission, in October 2010, released its draft Decision on free allocation rules⁵⁸ which was adopted by the Climate Change Committee on 15 December and has been submitted to the European Parliament and the Council for a three-month scrutiny before formal adoption by the Commission. The starting point for the bench-

56. Article 10c of the revised Directive 2003/87/EC.

57. Article 10a 1 of the revised Directive 2003/87/EC.

58. European Commission, *Draft Commission Decision determining transitional Union-wide rules for the harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC*, Brussels, 25 October 2010, available on http://ec.europa.eu/clima/policies/ets/docs/decision_free_allocation_22_oct_en.pdf

marks is the average of the 10% most carbon-efficient installations in sectors or sub-sectors, calculated for each product falling under the definition of a product benchmark.⁵⁹ The amount of allowances for an installation will be calculated by multiplying a benchmark value with the historical production data for the period 2005-2008, i.e. just before the crisis. According to the draft Decision of the Commission, if an installation also produces products not covered by a product benchmark, additional allowances will be provided on the basis of three fallback approaches: fuel benchmark, heat benchmark, and process emissions. The amount of free allowances to be allocated per installation will be calculated by the Member States competent authorities on the basis of the harmonised rules and under the scrutiny of the Commission.

88% of the total quantity of allowances to be auctioned will be distributed among Member States on the basis of their relative share of verified emissions from the EU ETS in 2005 or the average of the period 2005-2007, depending on the highest one. In order to help the poorest Member States to invest in reducing their emissions and adapt to the effects of climate change, 10% will be distributed to them on the basis of solidarity. The remaining 2% of the total quantity of allowances will be distributed as a 'Kyoto bonus' to the most virtuous Member States which in 2005 had cut their GHG emissions by at least 20% below their emission levels in their base year under the Kyoto Protocol. These countries are mainly Eastern and Central Europe countries which have benefited from 'easy reductions' thanks to their situation before 1990.⁶⁰

National governments will hold auctions of allowances and any person in the EU will be able to buy them according to the rules of the internal market. In July 2010, Member States unanimously voted in support of a Commission's draft Regulation on the timing, administration and other aspects of auctioning⁶¹ "to ensure that it is conducted in an open, transparent, harmonised and non-discriminatory manner".⁶² The draft Regulation was submitted to the European Parliament and the Council for a three-month scrutiny and was adopted by the Commission in November 2010.

59. Article 10a 2 of the revised Directive 2003/87/EC. For comprehensive studies on the issue, see: C. EGENHOFER and A. GEORGIEV, *Benchmarking in the EU: Lessons from the EU Emissions Trading System for the Global Climate Change Agenda*, CEPS, 11 June 2010; Ecofys, Fraunhofer Institute for Systems and Innovation Research and Öko-Institut, *Methodology for the free allocation of emission allowances in the EU ETS post 2012*, November 2009.

60. Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland Romania, Slovakia.

61. European Commission, Draft Commission Regulation on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances pursuant to Directive 2003/87/EC of the European Parliament and the Council establishing a scheme for greenhouse gas emission allowances trading within the Community, 2010, available on: http://ec.europa.eu/environment/climat/emission/pdf/draft_auct_reg_14072010.pdf

62. Article 10 § 4 of the revised Directive 2003/87/EC.

Auction revenue will accrue to national Governments. It is estimated that auctioning could raise about € 50 billion of revenues annually by 2020. On the basis of a Member States' non-binding agreement, the revised Directive recommends that at least 50% of auction revenue should be used to combat and adapt to climate change, in both the EU and developing countries.

Regarding the new entrant rules, 5% of the total quantity of allowances will be assigned to a New Entrant Reserve dedicated to the allocation of allowances to new entrants according to the method used for installations already covered by the scheme. For instance, new entrants in the power sector will have to buy their allowances. As for closures, no free allocation will be given to an installation that shuts down, unless the operator demonstrates that its installation will resume production within a specified and reasonable time.⁶³ Such a rule harmonises the old “transfer rule”. However, the move towards full auctioning will make it die out anyway.

4.4. Preventing carbon leakage

An important exception to the auctioning of emission allowances has been made for some energy-intensive sectors that are exposed to a significant risk of carbon leakage due to laxer emission constraints in other regions of the world. These sectors will continue to receive 100% of their allowances for free in the long term and will be regularly subjected to a situational assessment. However, their share of free allowances will decrease with the annually declining cap.

In its decision 2010/2/EU, the Commission identified the energy-intensive sectors and sub-sectors that are expected to be subject to carbon leakage.⁶⁴ To do so, it followed a methodology in three phases.⁶⁵

In Phase I, a quantitative analysis is performed through the assessment of two main criteria. The first criterion calculates the carbon intensity, i.e. the extent to which the ETS increases the costs of a covered sector due to the direct and indi-

63. Article 10a 19 of the revised Directive 2003/87/EC.

64. Commission Decision of 24 December 2009 determining pursuant to Directive 2003/87/EC of the European Parliament and of the Council, a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage, 2010/2/EU, OJ 2010, L 1/10-18. It gives a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage adopted under the comitology procedure by the Commission, available on <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32010D0002:EN:NOT>

65. Article 10a § 14-18; European Commission, *Commission services paper on Energy Intensive Industries exposed to significant risk of carbon leakage*, October 2008, p. 6-7, available on: http://www.euractiv.com/29/images/Comm%20paper%20carbon%20leakage%20180908_tcm29-175576.doc

rect effects. The second criterion assesses the trade exposure as a (sub-)sector which is exposed to international competition can hardly pass through carbon costs by increasing its market price without losing market share. Therefore, it has been considered that an ETS sector is at risk of carbon leakage either when its carbon intensity or its trade exposure exceeds a threshold of 30%, or when its carbon intensity exceeds 5% and its trade exposure exceeds 10%.

In Phase II, a qualitative analysis takes into account other market factors such as the potential for emissions abatement through innovation, market concentration and profit margins. This analysis could lead to an addition of sectors and sub-sectors relative to Phase I.

Finally, Phase III re-assesses the results of the two first phases in light of mitigation efforts in other countries. The imbalance in carbon constraints between the EU and third countries is indeed the source of carbon leakage. For instance, the Organisation for Economic Co-operation and Development (OECD) estimated that if the EU acts alone by reducing its emissions by 50% in 2050, 11.5% of this abatement effort would be offset by emission increases in third countries. Inversely, if all developed countries take similar commitments, carbon leakage would be reduced to less than 2%.⁶⁶ According to the revised Directive, the Commission was supposed to assess the risk of carbon leakage in the light of the outcome of the international negotiations in a report by June 2010. However, in a Communication of May 2010, the Commission rightly states that a definitive assessment is difficult considering the fact that the UNFCCC negotiations are continuing.⁶⁷ Therefore, the rules on carbon leakage remain uncertain as dependent on the international context.

Carbon costs passed on in electricity prices could also expose some electro-intensive sectors to the risk of carbon leakage. In order to avoid such risk, the revised Directive provides for the possibility of national state aids to compensate these so-called indirect emitters. Consequently, the Commission has undertaken to adapt the Environmental State Aid Guidelines by 31 December 2010.

66. OECD, *The Economics of Climate Change Mitigation: Policies and Options for Global Action Beyond 2012*, September 2009, p. 84.

67. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage, COM (2010) 265 final, 26 May 2010.

4.5. Use of offset credits

The Directive extends the possibility for operators to use offset credits generated by emission-saving projects in the third period. However, the quantitative and qualitative restrictions on the access to these credits will depend on the conclusion of a satisfactory international climate agreement.

With regard to quantitative restrictions, in the current scenario of a 20% emissions reduction target with no international climate agreement, the revised Directive allows a limited additional quantity of credits to be used during Phase III in addition to the generous quantity allowed in Phase II. However, this use is limited to 50% of the EU-wide emission reductions below the 2005 levels over the period 2008-2020. In addition to the limit of 1400 MtCO₂ during Phase II, about 300 MtCO₂ of additional credits will be made available in Phase III (150 MtCO₂ for existing installations and 150 MtCO₂ for new sectors and installations).⁶⁸ Accordingly, the total limit for offset credits during 2008-2020 should amount to 1700 MtCO₂.

At the installations level, all of them will be able to use credits up to either the amount allowed to them during Phase II, or a minimum amount of 11% of their allocation during the period 2008-2012.⁶⁹ All installations with a higher limit than 11% under Phase II will thus keep it under Phase III (e.g. Germany, Spain, Italy), while all installations with a lower limit will benefit from a limited increase of up to 11% (e.g. UK, Poland, Belgium). Furthermore, a credit limit beyond 11% will be given to the installations with the lowest sum of free allocation and allowed use of credits in Phase II. For the new sectors and new entrants, the minimum access to credits will be 4.5% of their verified emissions during Phase III. For the aviation sector, the access will be limited to at least 1.5%.

In the case of a move towards a 30% emissions reduction target by 2020, the Commission may propose to allow additional access to credits. In line with the initial proposal from the Commission, an indicative offset budget of 2570 MtCO₂ can be given.⁷⁰

With respect to qualitative restrictions, in the situation where no international agreement is reached, offset credits will not be used directly for compliance but will need to be exchanged against Phase III allowances. The revised Directive

68. A. KOSSOY and P. AMBROSI, *op. cit.*, p. 18.

69. Article 11a § 8 of the revised Directive 2003/87/EC.

70. Point Carbon, "The EU ETS review: Implications for credit import", CEPS, 14 January 2009.

makes a difference between three kinds of credits. Firstly, credits issued during Phase II will have to be exchanged with allowances by 31 March 2015. Secondly, credits issued after 2012, but generated from projects registered during Phase II, will be exchangeable until the end of Phase III in 2020. Thirdly, credits from projects registered during Phase III will only be exchanged throughout Phase III if they come from projects in least developed countries or projects established on the basis of a bilateral agreement with third countries from 2013 onwards. The use of this additional quantity of credits relative to the credits from projects registered during Phase II should not increase the overall credit import limit beyond 50% of the required reductions. Besides, the revised Directive foresees that “measures may be applied to restrict the use of specific credits from project types”⁷¹ from 2013 onwards.

In the event of a stricter emissions reduction in the context of a global agreement, only credits from third countries which have ratified the new agreement will be eligible for use in the EU scheme. These credits will not have to be exchanged but will be used straight for compliance, while respecting the overall credit import limit.

4.6. Criteria for linking up with other ETSs

The revised Directive offers the possibility to conclude agreements for the recognition of allowances between the EU ETS and any other compatible ETSs in the world, provided that these schemes are mandatory and that they have absolute emissions caps. Moreover, it also provides the possibility to conclude non-binding arrangements between the EU ETS and any other countries or sub-federal or regional entities to provide for administrative and technical coordination.⁷²

4.7. Price volatility control

The extension of the banking system, the longer trading period of eight years, along with the predictable linear reduction of the cap and the increasing use of auctioning by 2020 should improve price stability in the third trading period.

In order to further address price volatility the revised Directive introduced two other mechanisms. The first mechanism requires the Commission to present

71. Article 11a § 9 of the revised Directive 2003/87/EC.

72. Article 25 1a and 1b of the revised Directive 2003/87/EC.

proposals, where appropriate, to ensure the protection of the market for emissions allowances in case it is not sufficiently protected from insider dealing or market manipulation.⁷³ The second mechanism only applies in case of excessive price fluctuations in the market. If, for more than six months, the allowance price is more than three times the average price during the two preceding years and the price evolution is not based on market fundamentals, one of two measures may be adopted. The first measure would allow Member States to bring forward the auctioning of a part of their allowances to be auctioned. The second measure would allow Member States to auction up to 25% of the remaining allowances in the new entrant reserve.⁷⁴

73. Article 12a of the revised Directive 2003/87/EC.

74. Article 29a of the revised Directive 2003/87/EC.

5. Assessment of the revised ETS post-2012 in light of shortcomings of previous periods

The many problems experienced during the first years of the EU ETS have brought important lessons. The changes introduced in the revised EU ETS Directive show that most of these lessons have been learned. However, since the review in 2008, the global economic recession has significantly changed the assumptions made by then, undermining the future climate policy. To save the integrity of the scheme, the policy-makers should therefore review the EU ETS in light of the new economic and political context.

5.1. An EU-wide cap predictable but no longer stringent

The abolition of the decentralised system allowing Member States to determine the total quantity of allowances and the method to allocate these allowances is one of the main achievements of the revised ETS. It will simplify the EU ETS by establishing a clear distinction between the cap setting and the allocation process which was pretty blurred under the NAPs. It will also abolish the incentive for each Member State to favour its own industry, creating inequalities between industries of different countries. Moreover, it will put an end to discussions between Member States and the Commission on the establishment of NAPs that had led to legal actions by some countries in Phase II.

The EU-wide cap approach holds two main positive aspects. On the one hand, the cap is entirely set at the EU level. However, Member States are still supportive of the ambition level as they agreed on the reduction targets. On the other hand, the linear reduction of the cap is expected not only to create further certainty and predictability for industries, but also to improve the carbon price by creating an increasing scarcity of allowances in the market.

In a Decision in July 2010, the Commission determined the cap for 2013 at just under 1.927 billion allowances.⁷⁵ This cap has been set with a view to reach the EU ETS sectors' target to reduce 21% of their emissions by 2020 compared to 2005. However, the consequences of the economic recession have made the EU ETS target inappropriate and ineffective. The decrease in industrial output has led to a fall in demand and an over-supply of allowances. Consequently, an

75. Commission Decision, C(2010) 4658 final, *op. cit.*

amount of approximately 1.368 billion of unused allowances and credits during Phase II could be carried over into Phase III.⁷⁶ In addition, it has been seen that around 300 million offset credits will be made available in Phase III. Consequently, approximately 1668 million of allowances and credits are expected to inflate the total Phase III cap. Such a volume of carbon should allow emissions to grow with no need for domestic abatement until at least 2016.⁷⁷

As foreseen in the revised directive, the Commission decision on the cap for 2013 is based on Member States' allocations in Phase II but also takes into account the increased scope of the scheme and the new entrants from 2008 to 31 August 2010. However, since the economic crisis has created an over-allocation of allowances in Phase II, the establishment of Phase III EU-wide cap on the basis of allocations in Phase II is likely to be undermined by a baseline which is no longer effective.

In order to preserve the integrity of the scheme, the EU should address the instability brought by the economic recession by tightening the cap. This would deliver a higher carbon price and thereby encourage green investments. The most efficient solution to do so would be the EU to move unilaterally towards a 30% reduction of its GHG emissions by 2020 from 1990 levels, without waiting for an international agreement. In May 2010, the Commission released a Communication in which it analysed the options for a possible shift to a 30% target.⁷⁸ In the case such a move occurs, the cap would need to be revised. The Commission proposes to increase the ETS objective to 34% below 2005 levels by reducing allowances planned for auction by 15% by 2020. This would set aside some 1.4 billion allowances in Phase III which represents what is needed to compensate the 1.368 billion of unused allowances and credits in Phase II carried over into Phase III. As the efforts required for the 20% target set in 2008 amount more or less to what is required today to reach the 30% target, the move towards 30% emissions reductions by 2020 can be considered as a compensatory measure of the consequences of the crisis.

76. This amount consists of some 387 million of unused allowances in Phase II, some 192 million unused allowances from the New Entrants Reserve (NER) and some 789 million unused offset credits. The two first figures are taken from the study of D. MORRIS and B. WORTHINGTON from Sandbag, *op. cit.* p. 19, and the last figure is explained p. 14 of this paper; In the Communication from the Commission, COM (2010) 265 final, *op. cit.*, the amount of allowances carried over from Phase II into Phase III is estimated to 5%-8% of the total Phase II cap, or some 500-800 million of unused allowances. This equates more or less to the sub-mentioned 387 million of unused allowances plus the 192 million unused allowances from the NER, i.e. a total of 579 million unused allowances.

77. This assumption is derived from Sandbag, *Rescuing the EU ETS from redundancy*, 2010, p. 4.

78. Communication from the Commission, COM (2010) 265 final, *op. cit.*

5.2. Allocation methods not perfectly tailored

While analysing the allocation issues of the first phases, it has been shown that the impact of the carbon constraint from the scheme differs from one sector to another. This depends mainly on each sector's ability to pass on direct and indirect carbon costs onto prices, its exposure to international competitiveness and its potential for emissions abatement through new technologies, market concentration and profit margins. In order to alleviate distributional effects and competitiveness concerns, it is thus important to tailor the allocation methods according to each sector's features. That is what the revised EU ETS tried to establish for its third trading period with full auctioning for the power sector, a progressive phase-out of free allocation based on *ex ante* benchmarks for other sectors and a 100% free allocation for some energy-intensive sectors deemed to be exposed to a risk of carbon leakage. However, we will see that the criteria used to determine the impact of the scheme on the sectors' competitiveness are not perfectly tailored. Many sectors eligible for receiving free allowances are actually not at risk of closure or carbon leakage as a result of the expected more stringent carbon pricing under Phase III. Therefore, despite the choice of benchmarking as a tailored allocation method, some energy-intensive industries will still be able to benefit from windfall profits.

The move towards an increasing use of auctioning over time was supported by the need to address many of the issues linked to free allocation, such as windfall profits and distortions of competition due to over-allocation. Therefore, windfall profits for the power sector will disappear in the third period. In 2013, around 50% of the total volume of allowances is expected to be auctioned while the rest of allowances will be allocated for free.

The quantity of free allowances allocated to the installations will be determined by *ex ante* benchmarks, providing a tailored solution for each sector or sub-sector. The excellent technical work made by the Commission for establishing these benchmarks has to be recognised and promoted outside the EU. Given that the benchmarks are quite stringent, only around 10% of the installations, the most efficient ones, will have any chance of receiving all their allowances for free. The others will have to buy all allowances above the benchmarks. Thereby, operators that have taken early action to reduce greenhouse gases will be rewarded. As allocations will no longer depend on historical emissions, this allocation methodology will give stronger incentives to reduce emissions for both new entrants and existing installations. It also better reflects the polluter pays principle, and thereby has the potential to ensure a non-distorted carbon price and considerably reduce windfall profits.⁷⁹

79. C. EGENHOFER and A. GEORGIEV, *Benchmarking in the EU: Lessons from the EU Emissions Trading System for the Global Climate Change Agenda*, CEPS, 11 June 2010.

However, contrary to the benchmarks, the methodology designed to identify the industries that will receive free emission allowances in the third phase is more the result of a political arrangement than an economically-based approach. Many recent studies have shown that the criteria chosen to identify these industries are not restrictive enough.⁸⁰ Under these criteria, the Commission identified 164 out of all 258 manufacturing sectors as being at risk of carbon leakage.⁸¹ Yet, according to *Climate Strategies*, out of these 164 sectors, only 13 would be likely to relocate outside the EU, including steel, cement, aluminium, paper and pulp, some chemical sub-sectors and refineries.⁸² As described above, the quantitative analysis is established according to two criteria (i.e. trade exposure and carbon intensity) based on thresholds defining three groups of sectors at risk of carbon leakage. While the first group of sectors identified on the basis of the single carbon intensive threshold (i.e. 30% or higher carbon intensity) can be considered at risk of carbon leakage, the two other groups were identified on the basis of ill-adapted thresholds. The single trade exposure threshold (i.e. 30% or higher trade exposure) is the most problematic. It led to the inclusion of a group of 118 sectors in the list.⁸³ Yet, high trade exposure is not necessarily indicative of a risk of carbon leakage, especially when carbon intensity is low and products from a sector are highly differentiated. Therefore, some of these sectors will be able to pass through the costs of allowances on international markets, generating windfall profits. The last group composed of 27 sectors was listed as “at risk” on the basis of carbon intensity combined with trade exposure thresholds (i.e. more than 5% and 10% respectively). However, these thresholds are not high enough to justify a risk of carbon leakage. Other specific factors such as market concentration, abatement potential, institutional factors and profit margins can also determine vulnerability to carbon leakage. Therefore, it is not sure that these sectors are actually at risk or that other sectors at the margin of the thresholds will not contribute to carbon leakage.⁸⁴

A qualitative analysis would have been key for taking into account the differences between sectors and analysing the exact nature of the risk. However, the qualitative analysis foreseen in the revised Directive does not aim to remove from the list certain sectors whose characteristics would have revealed that they

80. S. CLO, “Grandfathering, auctioning and Carbon Leakage: Assessing the inconsistencies of the new ETS Directive”, *Energy Policy*, n°38, 2010; S. DRÖGE and S. COOPER, “Tackling leakage in a world of unequal carbon prices – A study for the Greens/EFA Group”, *Climate Strategies*, May 2010; R. MARTIN, M. MUÜLS AND U. J. WAGNER, *Policy Brief: Still time to reclaim the European Union Emissions Trading System for the European tax payer*, LSE, Imperial College London, Universidad Carlos III de Madrid, 2010.

81. Commission Decision 2010/2/EU, *op. cit.*

82. S. DRÖGE and S. COOPER, *op. cit.*

83. S. CLO, “Grandfathering, auctioning and Carbon Leakage: Assessing the inconsistencies of the new ETS Directive”, *Energy Policy*, n°38, 2010, p. 2426.

84. S. DRÖGE and S. COOPER, *op. cit.*, p. 4.

were not at risk. Instead, it is used to determine whether other sectors should be added on the list.

In a nutshell, it is likely that free allocation of allowances will cause trouble. Many sectors will receive free emission allowances while not facing an actual risk of relocation outside the EU. Consequently, some sectors could face higher constraints than others relative to their responsibility for emissions, creating new distortions of competition. Moreover, despite the fact that the benchmarks will force most of the installations eligible for free allocation to buy some of their allowances, some of these installations which are able to pass-through the allowance price will still benefit from important windfall profits. According to Martin *et al.*, industries deemed to be at risk of carbon leakage will be able to receive about € 7 billion of windfall profits annually.⁸⁵

It is essential to note that this analysis does not reflect the consequences of the recent economic and political situation. In its Communication of May 2010, the Commission has recognised that the financial crisis has had important consequences for the carbon leakage debate.⁸⁶ On the one hand, the fact that the carbon price has been inferior to what had been initially expected has significantly decreased the EU ETS impact on sectors' competitiveness. In the Commission's assessments to draw up the list of sectors deemed to be at risk, a price of € 30/tonne of greenhouse gas was used which is about twice today's price. This overstated the risk of carbon leakage for many sectors. On the other hand, it has been seen that energy-intensive sectors will carry forward a significant amount of unused allowances into the third period, easing their future carbon costs. For instance, the surpluses of the steel and cement sectors for the second period have been estimated to about 127 million tonnes for steel, which is 35% more than its 2009 emissions, and 164 million tonnes for cement, which is 8% more than its 2009 emissions (without taking into account offset credits).⁸⁷

Accordingly, in the same Communication, the Commission estimated the risk of carbon leakage of the EU's 20% target to be less than 1%, with the chemicals and fertiliser sectors "hardest hit". Moreover, in case of a move towards a 30% target, the impact would remain limited. The Commission estimated that ferrous and non-ferrous metals, chemical products and other energy intensive industries would entail extra production losses of around 1% compared to the 20% target.⁸⁸

85. R. MARTIN, M. MUÛLS AND U. J. WAGNER, *op. cit.*, p. 1.

86. Communication from the Commission, COM (2010) 265 final, *op. cit.*

87. D. MORRIS AND B. WORTHINGTON, *Cap or trap? How the EU ETS risks locking-in carbon emissions*, Sandbag, September 2010, p. 47.

88. Communication from the Commission, COM (2010) 265 final, *op. cit.*

Despite these arguments, the Commission has considered that the measures to prevent carbon leakage “remain justified at present” given that the conclusion of a comprehensive global climate agreement is still uncertain.⁸⁹ Such an agreement would be the best solution against carbon leakage as it would create a level playing field between countries.

5.3. Uncertainty of the rules regarding the use of offset credits

Although several changes have been introduced in the revised directive, uncertainties regarding key issues on the use of offset credits remain.

Quantitatively, the new restrictions on the use of credits are actually not so different from Phase II. The limit of 50% of mitigation effort over 2008-2020 echoes the ceiling established by the Commission for Phase II and removes the legal uncertainty created by the reference to the ‘supplementarity’ principle. Although this time the cap is more stringent, this limit remains generous. With respect to the level of credits for installations, they will be able to use credits up to either the amount allowed in Phase II or an amount of at least 11% of their allocation in Phase II. This will reduce to some extent the differences between Member States’ NAPs in phase II.

While the recourse to offset credits for Phase III was already significant after the revision of the directive, it has become an important impediment to the efficiency of the future scheme with the consequences of the global recession. It has been estimated that some 1.2 billion of unused offset credits from Phase II could remain available for use in Phase III.⁹⁰ Such a surplus of credits is expected not only to largely substitute domestic abatement, but also to reduce the carbon price. This prolonged use of such low-cost reductions in the scheme will also slow down innovation and affect the compliance with the EU’s 2020 targets for renewable and energy efficiency. The move towards a 30% reduction target could already greatly address these issues by reducing the supply of allowances by 1.4 billion as proposed by the Commission.

In the event the EU decides to move towards a 30% reduction target, the import limit on credits would change. The initial Commission proposal for a revised

89. *Ibidem*.

90. D. MORRIS and B. WORTHINGTON, *op. cit.*, p. 19. This amount consists of some 820 million unused offset credits from Phase II and a further 380 million offset credits which are expected to be made available in Phase III.

directive planned to increase the use of credits up to 50% of the additional efforts. However, this generous scenario is only indicative. Since then, the impact of the global recession has greatly changed the situation. The move towards a 30% reduction scenario would be thus a good opportunity to revise the limits on the number of offset credits available for use in order to encourage more domestic reduction efforts.

On the quality side, in the absence of a global agreement, credits will have to be swapped with allowances. This measure allows operators of installations to be certain that they may use CDM and JI credits after the end of the Kyoto Protocol period in 2012 and reduces the downward pressure of the credit prices on the allowance prices.

Although the majority of credits used in the third period will be credits registered before 2013, the revised directive allows a limited additional quantity of credits from projects started after 2013 in Least Developed Countries (LDCs) and from countries that have entered into bilateral agreements with the EU. Considering that the EU occupies most of the global credits market, this measure should help to correct the uneven distribution of projects in the world in the absence of a global agreement. The EU's strategy is two-fold. On the one hand, it wants to focus the CDM on LDCs so as to favour financial transfers to countries most vulnerable to the effects of climate change and responsible for a very low level of GHG emissions. On the other hand, the possibility of concluding bilateral agreements with third countries should also allow the EU to substitute part of the demand for CDM credits with credits from the new sectoral carbon market mechanism. This sectoral mechanism credits emissions reductions from a whole sector on the basis of an ambitious threshold. This should scale-up investments in green technologies in advanced developing countries.

Regarding the environmental and economic integrity of future CDM project types, the revised directive does not foresee any qualitative restrictions. However, it states that measures may be applied from 2013 onwards. The absence of any new restrictions has created uncertainty on what credits the EU ETS will accept in Phase III. Nevertheless, in November 2010, the Commission released a proposal to introduce further quality restrictions on the use of CDM credits from industrial gas projects in Phase III.⁹¹ Specifically, the proposal provides that the use of CDM/JI credits from projects involving the destruction of HFC and N₂O is prohibited from 2013 onwards in the EU ETS. These restrictions

91. European Commission, *Draft Commission Regulation of determining, pursuant to Directive 2003/87/EC of the European Parliament and of the Council, certain restrictions applicable to the use of international credits from projects involving industrial gases*. Available on: http://ec.europa.eu/clima/news/docs/proposal_restrictions_final.pdf

seem essential to reduce the entry into the EU ETS of credits from projects entailing unacceptable environment and social impacts. Yet, there is a risk of *ex-post* adjustment of eligibility criteria for existing credits that could undermine the efficiency of the market.

5.4. Opportunity of linking up with other ETSs

The revision of the ETS Directive reflects the EU's will to move towards a global carbon market. In this context, the European Commission's objective is to develop a carbon market among Member States of the Organisation for Economic Cooperation and Development (OECD) by 2015 and to extend this to the big emerging countries from around 2020.⁹²

The revised Directive offers the possibility of linking up the EU ETS with any other ETS in the world and no longer only with developed countries having ratified the Kyoto Protocol. Moreover, the amendments include two new conditions in order to insure a minimum harmonisation between the schemes linked. Firstly, linking may only be considered with *mandatory* systems in order to preserve the environmental integrity of the scheme and to avoid a risk of competitive distortions. Secondly, linking must take place with schemes that have *absolute emissions caps*. Thereby, a certain stringency of the caps is required so as to impose a binding constraint on emissions⁹³ and avoid significant distributional issues regarding the gains between countries or regions. Furthermore, the Directive states that schemes linked together must be *compatible*. The examination of this compatibility criterion takes into account the level of environmental ambition and the establishment of a robust and comparable emissions monitoring, reporting and verification mechanism and compliance system. This should be done on a case-by-case basis by the Commission in consultation with Council committees when deciding whether or not to link with another ETS.

So far, the likelihood of the achievement of the rapid linking ambitions of the EU is highly uncertain. In the US – the first candidate for linking with the EU ETS – the adoption of the Waxman Bill regulating the implementation of a federal cap and trade system seems unlikely to occur anytime soon. To make the situation worse, the negotiations on the adoption of a national scheme in Australia are also stalled. Nevertheless, systems have been recently implemented in

92. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, International climate policy post-Copenhagen: Acting now to reinvigorate global action on climate change, COM (2010) 86 final, 9 March 2010.

93. Commission Staff Working Document, *op. cit.*, p. 134-135.

two sub-federal entities. In the North-East of the United States⁹⁴, the Regional Greenhouse Gas Initiative (RGGI) has been operating since September 2008. In Japan, the Kyoto Metropolitan Government has just started a cap and trade system in April 2010 and a national system is being envisaged.

Regarding developing countries, it has been seen that the Commission's strategy is two-fold⁹⁵: to propose a substantial reform of the CDM, which should mainly focus on Least Developed Countries (LDCs); and, to promote the development of sectoral carbon market mechanisms in economically more advanced countries, whose credits could be recognised for use in the EU ETS and the emerging OECD-wide carbon market. In order to do so, the revised Directive provides the possibility to conclude non-binding arrangements with third countries to provide for administrative and technical coordination in relation to allowances in the EU ETS. These sectoral crediting mechanisms are considered to be the last significant stepping stone before the adoption of a cap-and-trade system. Currently, developing countries such as China, India and the Republic of Korea are seriously considering such market mechanisms.

The International Carbon Action Partnership (ICAP) will help the EU to develop its ambitions.⁹⁶ Created in 2007, ICAP is a partnership between the European Commission, several EU Member States, US States, Canadian provinces, Australia, New Zealand, Norway and the Tokyo Metropolitan Government. Its objective is to contribute to the creation of a well-functioning global carbon market. It will do this by allowing governments and public authorities that are engaged in the process of designing or implementing ETSs to share best practice, build partnerships and discuss design compatibility issues before making possible future linking of carbon markets.

In the future, it would be good that the potential international climate agreement provides for key ETS features as well as for the mutual recognition of allowances across ETSs in order to establish the basic design on which the global carbon market could be built.

94. Maine, Maryland, Massachusetts, New Jersey and New York.

95. Communication from the Commission, COM (2010) 86 final, *op. cit.*

96. See: <http://www.icapcarbonaction.com/>

5.5. Remaining uncertainties and lack of price incentive for green investments

The revised Directive addressed most of the design's shortcomings inducing uncertainty and price volatility within the EU ETS by making the regulatory framework as stable and predictable as possible. Important improvements in this respect are: the linear reduction of the cap known long in advance and set at the EU level, the remaining possibility of banking allowances, the longer trading period of 8 years more adapted to investment cycles and the increasing use of auctioning.

However, some important and inevitable uncertainties remain outside the regulatory framework of the scheme, undermining the development and diffusion of new technologies. A major part of uncertainty stems from the remaining absence of an international climate agreement upon which would depend some important aspects of the revised Directive (e.g. the move towards a 30% reduction target, the extent of the measures to address carbon leakage or the quantitative and qualitative restrictions on the use of credits from CDM and JI). Moreover, it has been seen that the ambition of linking the EU ETS with other trading schemes is highly uncertain, depending on evolutions outside the EU. Finally, future economic growth prospects remain uncertain due to the global recession. This should keep affecting investment decisions and the demand of allowances.

The recession has significantly undermined the improvements brought by the revised Directive. In its Communication of May 2010, the Commission acknowledged that the carbon price is likely to remain low after 2012 because of the huge surplus of allowances banked forward into the future.⁹⁷ Whereas the impact assessment of 2008 foresaw a carbon price of around € 32 in case of full implementation of the climate package, new estimates project a carbon price of € 16 in 2020.⁹⁸ Yet, such a price does not provide enough incentive for businesses to invest in new green technologies. Thereby, the achievement of the EU's 2020 targets for renewables and energy efficiency is highly uncertain. Investing in renewables is expensive. In order to make investment in renewables profitable, the carbon price should reach \$38 for onshore wind energy, \$136 for offshore and \$196 for solar cells.⁹⁹ Therefore, in the short and medium term it is not the EU ETS but more public financial support which will efficiently contribute to the achievement of the 20% target of renewable energy.

97. Communication from the Commission, COM (2010) 265 final, *op. cit.*

98. *Ibidem.*

99. Equivalent to respectively € 28,5, € 102, € 147 in the New Energy Finance website: <http://www.new-energyfinance.com/>

The impact of the recession on the carbon price is also expected to halve government revenue from auctioning.¹⁰⁰ With the pressure on public finances, it is therefore very likely that Member States will not comply with their non-binding agreement of spending at least half of auction revenue to tackle climate change

The revised directive introduced two new mechanisms in order to address volatility when the price evolution does not reflect market fundamentals. The first mechanism foresees the intervention of the Commission to ensure protection in the event of speculation and manipulation. The EU ETS experience has shown that important variables such as oil and natural gas price changes can greatly influence carbon prices, raising opportunities of market manipulation. The second mechanism is presented by the Commission as a mechanism to respond to excessive price fluctuations. However, it only prevents the price from rising too high by bringing forward the auctioning of future allowances or by auctioning a part of the new entrant reserve in order to increase allowance supply without influencing the emission cap. Nothing has been foreseen for preventing the carbon price from falling too low, which has been the main problem so far. Therefore, although the efficiency of these mechanisms is yet to be tested, it is likely they will not be sufficient to protect the EU ETS against new external factors enhancing uncertainty and volatility.

To reduce the risk of large price fluctuations, several scholars¹⁰¹ developed the idea of control mechanisms through a price floor and/or a price cap (or “safety valve”). Like a tax, this would reduce the short-term cost uncertainty while maintaining the long-term perspective of an ETS. Such a hybrid system has however not been very successful with the Commission which considers that limits on prices could unduly interfere with the market. Moreover, in absence of price harmonisation, these control mechanisms could be problematic in the case of linking with other schemes if one of the other schemes has not foreseen such measures.

Though little experienced so far, the possibility of linking up ETSs also reduces price volatility. The impact of shocks in a region or country is mitigated through the extension of the area covered which offers more abatement options. On the other hand, the shocks could also become more frequent as the scheme is no more protected against developments in other regions.¹⁰²

100. Communication from the Commission, COM (2010) 265 final, *op. cit.*

101. K. NEUHOFF, M. GRUBB, J.-C. HOURCADE, and F. MATTHES, *EU ETS Post 2012: Submission to the EU Review*, Climate Strategies, University of Cambridge, CIRED, Öko-Institute e.V., 6 July 2007; Price Waterhouse Coopers, “Carbon Taxes vs Carbon Trading. Pros, cons and the case for a hybrid approach”, march 2009.

102. OECD, *op. cit.*, p. 68.

In the shorter term, the main measure the EU could take to have a direct impact on the carbon price is to move towards a 30% reduction target. If the EU wants to drive the economy towards a low-carbon path, the current target of a 20% reduction is clearly insufficient. In its Communication of May 2010, the Commission acknowledged that a 30% target would not only be “technically feasible but also economically affordable.” As a result of the economic crisis, making the additional effort to reach 30% would now cost € 81 billion. This represents a figure just € 11 billion higher than what the EU had originally agreed upon to reach its 20% target in 2008.¹⁰³ Moreover, it is without counting the price tag that would involve the delayed action of a 20% target. According to the International Energy Agency, every year of delayed investment in low-carbon technologies has a global cost ranging from € 300 to 400 billion.¹⁰⁴

Although the Commission supports a unilateral move to a 30% objective, it also recognises in its analysis that the current political conditions are not favourable. At the international level, the shift depends on progress in international negotiations towards a new global climate agreement. At the EU level, it was agreed by the Council of Ministers¹⁰⁵ that the Commission should further analyse the economic consequences for each Member State before taking such action. Nevertheless, in July 2010, a joint statement by the British, French and German environment ministers called for a unilateral move towards a 30% target.¹⁰⁶ Although the new Eastern Member States are deeply resistant to further action on climate, the EU's climate commissioner, Denmark, Ireland and a group of leading European businesses have now all backed the call for a stronger target. They claim this would not be difficult and would prevent Europe from lagging behind in the global race for green technology.

At a time when competing economies like China, Japan, and the US are rapidly embracing the race to compete in new green technologies, it is paramount for the EU to boost its incentives to research, develop and deploy new technologies if it wants to remain at the forefront of the fight against climate change. Recent research from Bloomberg New Energy Finance showed that China has overtaken the EU in green technology investment. From mid-2009 to mid-2010, China has attracted \$ 40.3 billion in asset financing for new clean energy capacity, compared with \$ 29.3 billion in the EU.¹⁰⁷

103. Communication from the Commission, COM (2010) 265 final, *op. cit.*

104. N. TANAKA, *The IEA contribution: A blueprint to deliver on ambitious climate change goals*, IEA, 14 December 2009, p. 6.

105. Council of Ministers of 11 June 2010

106. F. HARVEY, “Ministers toughen stance on emissions”, *Financial Times*, 14 July 2010.

107. S. FEINBERG, *Powered by China, Clean Energy Investment holds steady in Q2 2010*, Bloomberg New Energy Finance, 13 July 2010, available on: <http://bnef.com/Download/pressreleases/121/pdf/file/>

While the long-term success of the EU ETS in developing more stable and higher carbon prices in order to provide incentives for innovation and development of clean technologies is uncertain, it is central that the EU continues to develop a complementary mix of policy instruments, including subsidies for the research and development of new technologies, taxation of non-ETS sectors, voluntary agreements, performance standards, as well as information instruments to encourage changes in behaviour and green public procurement.

6. Conclusion: Looking forward on the basis of lessons learnt

Theoretically, an ETS enables the achievement of any environmental goal in an economically efficient manner by reducing carbon emissions at least costs. Moreover, it is supposed to provide incentives for investments in green technologies and penalises high-carbon options, leading to further reductions of emissions and an increasing carbon price over time. However, the EU ETS has not yet been able to realise its theoretical potential. As a matter of fact, the first phase is considered as a ‘learning by doing’ period and the second phase has turned out to be a period of global economic recession. It seems thus too soon to actually determine the efficiency of the instrument.

Nevertheless, the EU ETS’ achievements are not negligible. It has created a functioning carbon market which has grown considerably over time, both in terms of volume and value of transactions. Businesses in the covered sectors have increasingly taken into account the carbon price in their corporate behaviour. New business opportunities linked to the scheme have been created. And last but not least, many studies recognise that the EU ETS achieved emissions abatement during the first phase. Moreover, it is already clear that the EU will more than comply with its Kyoto target at a cost of less than 0,1% of its GDP. As the EU ETS covers about 40% of total GHG emissions in the EU, the share of the scheme in the Kyoto target achievement is not negligible. However, it is likely that the significant emissions reductions resulting from the economic crisis will have left very little room for abatement efforts in the EU.

Although the EU ETS has managed to create a functioning carbon market, it did not succeed in providing a stable and effective carbon price so far. This is to a large extent due to the fact that the scheme has been undermined by some serious design shortcomings which can be largely attributed to the fear of negative macroeconomic impacts from Member States. Firstly, the decentralised character of the scheme has allowed Member States to retain sovereignty on the amount of allowances and the way they are allocated. This has not only caused over-allocation and low carbon prices but has also created inequalities between industries in different countries. Furthermore, while there is an economic rationale to auction allowances, free allocation was heavily favoured. Experience has shown that this allocation methodology has caused undue distributional effects, especially huge windfall profits for the power sector and some industrial sectors. Finally, generous access to credits from offsetting projects was also granted to satisfy some Member States despite many strong arguments to restrain their use.

Some of these concerns have been addressed in Phase II through marginal improvements and the Commission's revision of national allocation plans.

When analysing the revised Directive 2009/29/EC, it is clear that the lessons from the first years of experience have been taken into account as most of the design concerns have been addressed. The linear reduction of the cap established at EU level and the longer trading period will increase the long-term predictability of the scheme. The increased use of auctioning as the rule and the slow phasing out of free allocation based on benchmarks will tackle many of the design shortcomings of the first periods, including the windfall profits, the inequalities between industries of different countries, and the treatment of new entrants and closures in the scheme.

Still, the revised Directive does not remove all design concerns. Although it tried to adjust the allocation methodologies according to each sector's features, free allocation will keep creating unfair competitive advantages for some industries in Phase III. The criteria chosen to identify the industries that will receive free allocation in the third phase are not restrictive enough. This will allow many industries to receive 100% of allowances free of charge up to 2020, while not facing an actual risk of carbon leakage. It is even truer in the aftermath of the economic crisis. Energy-intensive industries will carry over a significant amount of unused allowances and credits to Phase III, easing their future carbon costs. Moreover, some energy-intensive industries, able to pass on carbon costs, will continue to benefit from windfall profits. However, benchmarking will significantly reduce these profits as all emissions above the level of the benchmark will not be compensated for free of charge.

The revised Directive has restrained the use of offset credits but not enough. Quantitatively, the limit on the use of offset credits has been set quite generously. With the recession though, the surpluses of credits from Phase II carried over into Phase III could discourage domestic reductions for the years to come. Qualitatively, the restrictions introduced in the Directive could promote sustainable development through CDM projects in least developed countries, while encouraging abatement in emerging countries through sectoral trading schemes linked to the EU ETS. Besides, the Commission has recently submitted a proposal to introduce further quality restrictions on the use of some CDM credits. Such restrictions should reduce the entry into the EU ETS of credits from projects environmentally and socially damaging. However, there is a risk of *ex-post* adjustment of eligibility criteria for existing credits that could undermine the efficiency of the market.

The recession has greatly undermined the EU ETS with a risk of long-term damaging effects. The large surpluses of credits and allowances from Phase II will inflate the Phase III cap, threatening the very purpose of the scheme, which is to create scarcity on the quantity of emission allowances in order to force emission reductions. It has been estimated that emissions in the EU could grow with no need for domestic abatement until 2017.¹⁰⁸ Moreover, these surpluses of allowances and credits are expected to maintain a low carbon price in Phase III. This low carbon price will not be sufficient to drive innovation and investments in green technologies. Although, the EU needs a credible carbon price if it wants to keep its front-runner position and ensure the transition towards a low-carbon society.

In order to correct the harmful effects of the recession, it is necessary that the EU moves quickly towards a 30% reduction target by 2020, without waiting for an international climate agreement. Not only would it not be expensive but it would also direct the EU economy onto a low-carbon path, with a huge potential for growth creation largely compensating the costs.

As the first experience of carbon trading in the world, the EU ETS has drawn many important lessons for its future and for the future of other potential ETS designs in third countries. However, due to the global economic recession and the remaining uncertainties at the international level, the actual future potential of the EU ETS is still unclear. Therefore, it appears a wise approach to continue developing a mix of different tailored instruments to tackle climate change in conjunction with the EU ETS.

108. D. MORRIS and B. WORTHINGTON, *op. cit.*