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Political Economy of the Emission Reduction Measures[1]

Abstract: The objective of the article is the critical analysis of measures undertaken by the European Union in order to reduce CO_2 emissions. The analysis covers also some alternative methods of addressing the emissions problem as well as applicable reforms of the current ETS scheme. The arguments, of political and economic nature, are contextualized in the broader scope of the EU's climate and energy policies.

Key words: ETS, political economy, EU, emissions.

Introduction

The European Union's Emission Trading Scheme (ETS) is the first and – by so far – the largest international trading system for greenhouse gas (GHG) emission allowances in the world. Established in 2005, it is a key instrument of the EU climate-energy package which goals are, among others, to achieve the GHG reduction targets. It is based on a cap and trade principle. By issueing a specific amount of allowances according to the cap, the EU can directly target emission levels and thus link them to the climate policy commitments. Because the cap is reduced over time, overall emissions will fall. By putting a price on carbon and making it marketable, the goal is to incentivize companies to invest in cleaner technologies. The scheme includes 31 participating countries from the EU and the EEA, currently covering over 11,000 installations, which together account for 45% of the countries' total GHG emissions. So far, the ETS has been focusing on the major emitting sectors, such as energy, minerals, ferrous metals, pulps, cement and aviation (EC, 2015). Energy as well as electricity and heat production sum up to the largest share, making up almost one

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third of the participating countries’ total GHG emissions (European Environment Agency, 2011).

Currently however, this policy suffers under a massive oversupply of allowances, resulting – among others – from the economic crisis, implemented climate policies and the possibility to offset emissions by purchasing carbon credits (Koch et al., 2014). Consequently, the price for emission allowances collapsed to historically low levels, threatening the achievement of the EU climate targets. Thus, policymakers face the challenge to reform the ETS. While the range of options is abundant, political and economic feasibility remains a challenge.

This paper aims to look at the policy from a critical perspectives in order to evaluate its performance and current reform ideas. First, the paper provides an overview of the historical effectiveness of widely used emission reduction policies, it explains the mechnics of emission allowances, making a short comparison to its main alternative, the carbon tax. In this section also the economic foundations behind abatement policies as well as the basics of measuring their cost efficiency are covered. This part also gives an overview on the three phases of the EU ETS, providing an insight into the progress made and the challenges that remain. It also analyses the reasons for the price collapse. Finally, the last part critically discusses possible solutions to fix the EU ETS and gives a brief outlook on the future of greenhouse gas emissions reductions.

Policy Options and the Mechanism of Emissions Trading

Reducing the GHG emissions is an element of a wider package of interconnected climate and energy policies. Once agreed on the EU level, they diffuse into the member states where the authorities are free to choose the instruments to be implemented in order to achieve their individual targets. As a result, many different countries implement many different instruments with varying success. One such instrument that has been implemented by the European Union on the supranational level, is the introduction of a pollution permit market, where the right to produce emissions can be traded between the polluting companies.

There are many various ways in which the governments can intervene in the case of negative external effects (externalities such as pollution). In general, these are divided into two groups; quantity policies and pricing policies. While quantity policies impose absolute measures equally on all firms, pricing policies represent relative instruments such as taxes or subsidies.

In principle, a simple per-unit tax on the producers of the polluting good in question would be sufficient to achieve the pollution reduction target and it would do so at the lowest possible cost (Tresch, 2008). A per-unit tax increases the private marginal costs of the producers by the amount of the tax. After paying the tax, the firms have only some resources left left per unit to cover their production costs, which is why they shift their production to low emitting technologies. The government would only have to set the tax accordingly and the market would automatically move to the social optimum (Tresch, 2008). Because the tax only affects the marginal costs of production, one tax for all companies is applicable. However, the firms producing polluting goods are free in their choice of production technologies and thus also in the allocation of different input factors. Hence, one firm might create more pollution than any competitor, producing the very same amount of goods. Therefore, this type of tax should be applied as closely to the source of the pollution as possible. Taxing the source of pollution directly provides a direct incentive for the firms to produce their output in a less polluting manner.

Another potential policy instrument for emission reduction is regulation. The so-called command and control (CAC) approach appears in situations in which the government (or any other regulator supra-national, national or sub-national) requires all firms equally to reduce their pollution using a certain instrument, e.g., a certain technology that reduces emissions. However, this approach could also be followed by mandating every firm to reduce its emissions by the same (relative) amount, leaving it to the firms how this reduction might be achieved. CAC might be a viable approach in the case that all companies have the same production function. However, this is almost certainly not the case for most industries. In the realistic case that different firms face different functions of production, an one-size-fits-all CAC approach might lead to severe distortions in the marketplace.

Among all the overviewed policy options, the initial approaches to the regulation of carbon emissions were predominantly in the “command and control” category of policies. These policies attempt to force emitters to adhere to specific regulatory requirements such as emission standards or mandatory technological requirements; they may also place a limit on the amount of CO_2 that can be output, impose information disclosure requirements, require emitters to obtain special permits in complicated and lengthy procedures or any combination of the above (*NCEE EPA*, 2010). There are many issues with command and control regulations which explain why they are generally not sufficiently effective in achieving abatement:

– The first challenge is the huge diversity in the operational structure and the technological capabilities and solutions of greenhouse gas emitters. This makes it essentially impossible to create "one size fits it all" regulations that are effective in case of the vast majority of producers in multiple sectors and in turn tends to result in overly complex, industry and sector-specific regulations, which increase the cost of both the compliance and the auditing and enforcement of the regulations.
– The second problem with command and control regulations is their high propensity to create market distortions by favoring or requiring specific kinds of technologies or processes and increasing the barriers of entry for new players as a result of larger compliance and administration costs (Harrington et al., 2004). Empirical evidence is ambiguous on whether smaller players are at a larger disadvantage; for instance Becker et al. (Becker et al., 2013, p. 535) found that "spending on pollution abatement operating costs per unit of output increases with establishment size;" this, however, does not invalidate the fact that market distortions exist because of command and control regulations.
– The third problem arises from the tendency of command and control measures to include strict technological restrictions, which in turn removes the incentive of emitters to innovate (Harrington et al., 2004, p. 15–16). In extreme cases where compliance is costlier than non-compliance, emitters may decide that it is worth it to pay the fines instead of abating, resulting in a no-win situation for everyone.

An alternative to command and control regulations are incentive-based approaches. These policies aim to either provide incentives to emitters to reduce their emissions or provide disincentives for them to emit; a mechanism which the Productivity Commission (Productivity Commission, 2011) calls "carrot vs. stick" approach. The ultimate goal of incentive-based policies is to levy taxes on emissions or provide subsidies for abatement, for example by subsidizing the use of low-emissions technologies, thus making the relative cost of low-emissions technologies more attractive than that of high-emissions ones. From a purely economic point of view, the taxation of certain technologies means an implicit subsidy on others and vice versa (Productivity Commission, 2011, p. 49). If the goal of eliminating the relative cost difference is reached, profit-maximizing market players will voluntarily opt to invest in low-emissions technologies. Additionally, if emissions are penalized to the point that high-emissions facilities is only possible at a loss (that is, the marginal cost of operation exceeds the marginal revenue), then existing facilities will also switch technologies; although I have not come across a single policy that caused such drastic changes, most likely due to the fact that it would have hurt the respective economy too much. Changing the relative cost of technologies is done either by explicitly placing a price on carbon emissions (which is what cap and trade and carbon tax schemes do) or by indirectly affecting the price of emissions through subsidies and taxes on technologies or products (feed-in tariffs, tax rebates, capital subsidies, preferential loans, fuel taxes and so on). Generally the explicit pricing approach is deemed to be more efficient (OECD, 2013).

Instead of implementing new taxes, the governmental authorities could also introduce per-unit subsidies for pollution reduction, which would theoretically have the same effect as taxes do, at least in the short run. That is because a subsidy on every unit of pollution that has been avoided raises the marginal cost of every additional unit of pollution just as a tax does. In the long run, however, the effects are quite distinct. Subsidies on pollution reduction increase the marginal cost per unit produced, but opposed to taxation, it lowers the average cost of production, thus attracting new firms to enter the market. Following this mechanism, subsidies on pollution reduction could result in a higher number of firms offering a larger amount of goods at a smaller price. Because aggregate production would now be above the level before the subsidy, aggregate pollution could rise accordingly, given the fact that pollution is related to output. Not to mention the political feasibility – the governments prefer collecting taxes to subsidizing.

In addition, it is also important to distinguish between policies that mainly affect the supply side versus those that affect the demand side, their consequences and the relations between them. Supply-side policies are directly aimed at the producers of CO_2 in order to discourage them from emitting for example using a carbon tax. On the contrary, demand-side policies aim to incentivize consumers to use less electricity and products created using emission-intensive processes and more of those goods that are produced using more environmentally friendly processes (OECD, 2013). Whether a policy results in substantial abatement is also in part affected by the elasticity of supply and demand as well as the market position of producers and consumers: if the competition among producers is low and the demand is inelastic, a tax on emissions would only lead to higher prices but not lower emissions.

It is also appropriate to mention certain additional considerations and possible difficulties and side effects that may arise from the implementation of emissions reduction policies. First and foremost, the key notion to understand is that the market will always optimize for the highest attainable profit under the present regulatory environment, which may or may not be the path that results in the largest abatement. The protection of the environment and the prevention of global warming are not exclusively about reducing CO_2 emissions; should policies overwhelmingly focus on this objective alone, it might lead to adverse side effects such as market players substituting high-emissions technologies with lower-emissions ones that damage the environment in a different way that could be even worse than emitting those extra tons of CO_2. The issues around the disposal of nuclear waste and hazardous batteries used in solar systems are two examples for such controversial topics. Additional side effects may arise from the idea of "grandfathering", that is, applying more stringent regulations to new market players than to existing producers. The idea behind grandfathering is to avoid the adverse effects of hitting the existing economy too hard with the new regulations. However, this incentivizes the industry to keep operating longer than they would otherwise have the high-emissions facilities which fall under the grandfathering rules (NCEE EPA, 2010). Adverse side effects can also result in an effect which is called "carbon leakage", a special case of which is the relocation of production facilities by domestic players to foreign countries where regulations are less stringent (Cala, 2014). In this regard, lower or non-existent requirements have become a de-facto selling point for less responsible developing countries.

Another option for government intervention is to create an artificial market of tradable pollution permits. The government (or any other legitimate authority) issues permits for pollution production where each permit equals a given quantity of pollution. The permits can then be traded freely among the polluting firms, allowing each firm to hold the right amount of permits in order to achieve the desired level of production. The main advantage of emission trading schemes as environmental policy is that the government can simply adjust the number of issued permits to meet the emission reduction target and thereby guarantee that emission will not exceed the target.

The permits themselves can be allocated in many different ways. They can be distributed by auction or they can be allocated freely, based either on production volume or on historic emissions output. The method of distribution plays an important role regarding the effectiveness of the instrument. If permits are allocated freely based on historic output of emissions (grandfathering), this might provide an incentive not to reduce emissions because reduced emission would imply that fewer emission permits will be allocated to the corresponding firms. Therefore, firms might want to keep their emissions high in order to be granted the same amount of permits in the following period. If permits are allocated based on actual levels of production, on the other hand, those firms that pollute less at a given level of production might experience additional competitive advantage over their competitors. Hence, it seems that auctioning the permits for every period seems to be the most promising approach. In the present, the EU implemented a combined system where part of the allowances are distributed freely whereas some other part needs to be purchased. In the beginning of the annual trading period, companies are either given emission allowances for free through the grandfathering procedure (according to their past emissions) or they have to bid for them in auctions. During the period, they have the opportunity to trade excess allowances on a platform, e.g. the European Energy Exchange (EEX), or to purchase if they need more allowances. At the end of the trading period, total emissions must not exceed the amount of allowances. In case of violation, a 100 € per ton of emitted CO_2 equivalent penalty applies and the shortfall has to be compensated. On the other hand, if the company has allowances left, it is possible to keep them for the next period (EC, 2015).

In theory, there are arguments for both certificates and taxation. The advantage of certificates is that the emission goal can be directly targeted. Given the commitment of the EU to decrease GHG emissions by 20% by 2020 compared to 1990 levels, they can reach that goal by providing the corresponding amount of certificates. Furthermore, the reduction goal can be reached at minimum cost, given that firms with different abatement costs can trade certificates.

On the other hand, there are reasons why to prefer taxation over an ETS. First, a certificate system does not provide dynamic incentives to reduce emissions, unless further measures such as a regular cap reduction are taken. Second, the allocation of certificates based on past emissions tends to punish companies that invested in clean technologies before the ETS and benefits firms that did not, leading to considerable distributional effects. Third, it is difficult to evaluate the amount of certificates needed. Given that allowances are usually allocated based on historic emissions, there is an incentive to over-report emission levels, which can lead to oversupply. A possible countermeasure could be a one-year moderate carbon tax before introducing the ETS in order to obtain accurate data on company emissions. By imposing a tax, the incentive to over-report could be eliminated, and given the subsequent introduction of the ETS, under-reporting could be prevented, too.

According to Weitzman (1974), whether it is more efficient to set the carbon price with a tax or to set total emission levels using an ETS depends on the degree of uncertainty about the climate benefit and abatement costs. For instance, an ETS is more appropriate if the marginal abatement cost curve is relatively flat and the marginal climate benefit curve relatively steep. In other words, if it is more difficult to target the "right" level of emissions and a bad targeting of emissions would lead to higher deadweight losses than a bad targeting of the carbon price, it is more appropriate to fix the emission level with an ETS, and *vice versa* (Venmans, 2012).

The obvious advantage of tradable pollution permits over taxes is that the government can simply issue a number of permits equal to the respective pollution target and let the market establish the price for the permits that leads to the least-cost properties of this pricing strategy. Also, the market price of the permits would adjust automatically, whereas taxes would have to be adjusted periodically if the economy is experiencing general inflation. There are also some disadvantages compared to the tax, however. For instance, firms could use the permits as a market entry barrier, buying more permits than they need and hoarding them, thereby increasing market entry costs for potential new firms. Another potential drawback is the regional scope of the permit markets. While emission trading schemes are mostly national in scope, damages caused by pollution are of regional, if not global nature.

Considering the balance of advantages and disadvantages of both taxes and pollution permits, it is still unclear which instrument is the better option for any given scenario. A final issue in determining the appropriate policy is the uncertainty regarding the measurement of costs and benefits of pollution reduction. While the potential damages of air pollution are still being intensely debated about among scholars, the marginal costs of reducing pollution are not known with certainty either. In general, permits are better at controlling the amount of pollution, whereas taxes focus on controlling the increase in the increase in the costs to firms of reducing pollution (Tresch, 2008).

The reason why policies for reducing greenhouse gas emissions are needed in the first place is that such emissions and the resulting climate change are considered as externalities or market failures, that is, a cost incurred by individual players that affects the society at large. In fact, it is argued that “climate change presents a unique challenge for economics: it is the greatest example of market failure we have ever seen” (Stern, 2006). Generally, because of this, government intervention is required in order to internalize this externality by making the abatement of emissions be in the best interest of emitters. Another important consideration is the cost difference between high- and low-emissions technologies: especially in electricity generation (one of the main sources of CO_2 emission), environmentally friendly technologies have either higher capital requirements or higher operating costs, or both – which means that without policy intervention new investments would favor the lower-cost alternative (Productivity Commission, 2011).

The practice of governmental decision-making shows that emission trading schemes and taxes have proven to be superior to subsidies and regulatory command and control approaches. The decision whether to impose a tax or to introduce a market for tradable pollution permits is highly dependent on the given situation, also the political insentives. It has to be noted, however, that in case a tax would be preferred, taxation should be as close to the actual source of the pollution as possible in order to achieve optimal outcomes. The emission trading schemes can be a good way of internalising the external effects of industrial air pollution.

With the emission trading scheme introduced by the European Union, a first example for international cooperation with regard to pollution reduction has been set. By linking ETS to the clean development mechanism (CDM) by the UNFCC, the European Union might have established what appears to be in a position to serve as a starting point for both integration with other emerging national and regional emissions trading systems or for a future global emissions trading system (Bärwaldt, Leimbach, Müller, 2009). Therefore the ETS in its current form does not need to remain a local solution but could present a global opportunity.

ETS – Performance, Failures, Reforms

In the beginning of the 1990s, the plan of the European Commission to introduce a pan-European carbon tax was blocked by the member states, as they feared that supranational taxation would impair national sovereignty. During the negotiations on the Kyoto Protocol, the US urged for flexible, market-driven mechanisms – these two developments have paved the way for the ETS as we know it today (Convery, 2009).

The first phase of its implementation (Pilot Phase – 2005–2007) was characterized as “learning by doing” (EC, 2015). Given that reliable emission data prior to 2005 were not available, the initial cap and the amount of issued European Emission Allowances (EUA) had to be based on historical emission data (Georgiev et al., 2011). Because of the low precision of these data, it was necessary to initiate the mechanism in a pilot phase in order to build up a comprehensive EU-wide database, with recordings of GHG emissions from all participating installations (Bel et al., 2015). Thus, each participating country had to establish a National Allocation Plan (NAP), according to which the number of EUAs each industrial plant obtained would be determined. After the first trading year, the actual emissions turned out to be 4% less than allowances allocated to companies, which led to an immediate price crash in April 2006 (Venmans, 2012). The over-estimation of actual emission levels ex ante resulted in an oversupply. Fortunately, the first phase was designed as a trial period, which meant that excess allowances could not be transferred into the second phase, thus the EUA price fell to zero by the end of the pilot phase (Griffin, 2009). Although the verified emission level within the EU actually increased by 1.9% during these three years, this outcome was rather the result of strong economic growth than caused by the surplus of allowances (Koch et al., 2014). Compared to estimated business-as-usual scenarios, however, the EU ETS was found to have actually decreased GHG emissions by 2.5–5%, despite the price collapse (Brown et al., 2012). Ultimately, the main lesson learned was to apply stricter caps in the next phase.

In the next phase (2008–2012), in order to counter another price deterioration, the cap was tightened by the European Commission by 6.5% compared to the 2005 level. Moreover, around 10% of all allowances had to be purchased through auctions, while the others continued to be freely allocated via grandfathering. Because this phase coincided with the first commitment period of the Kyoto Protocol, companies were also enabled to obtain EUAs by purchasing carbon credits, which were used to fund projects aimed at reducing GHG emissions in developing countries (EC, 2015). The aviation sector has been integrated into the EU ETS in 2012,[2]

[2] However, the unilateral integration of international aviation led to protests, which resulted in the postponement of the introduction of overseas flights.

initially for both intra-European and overseas flights. It should have accounted for 11% of all emissions covered, with two thirds stemming from overseas flights (Leggett et al., 2012). Despite the good start, the EUA price dropped again as soon as the EU was hit by the economic crisis in late 2008. Because industrial output declined during recession, demand for emission allowances remained low and the price could not recover. As a consequence, a cumulative surplus of 1776 Mt CO_2eq allowances accumulated until the end of phase II, of which 41.5% were the result of low demand for EUAs and 58.5% due to the carbon credits (Hu et al., 2015).

Now we are under the third phase (2013–2020) in which an annual reduction of allowance allocations by –1.74% was introduced, both in order to create dynamic incentives for companies to invest in cleaner technologies and to reach the EU emission targets (Bel et al., 2015). Second, the free EUAs are not allocated through grandfathering any more, but based on a Best Available Technology (BAT) benchmark.[3] Third, the share of allowances auctioned rises progressively, from 40% in 2013 to 100% until 2027. Energy companies have to purchase all certificates in auctions, while industries exposed to carbon leakage continue to receive 100% of the benchmarked allocation for free (Venmans, 2012). Forth, a single, EU-wide cap on emissions replaced the previous system of national caps, leading to the activation of the EU ETS single registry (EC, 2015). Unfortunately, it seems that these adjustments proved not far-reaching enough to solve the problem of oversupply. The price has so far remained below 10 € (EEX, 2015). As a result, the EU ETS as an instrument to decrease emission levels is currently ineffective. The allowance surplus is expected to continue to build up incrementally until 2016 due to the combined impact of the oversupply from phases II and III and the usage of carbon credits. After the peak in 2016, the surplus should begin to be absorbed by the rising gap between baseline emissions and the cap becoming tighter (Hu et al., 2015). However, it has to be emphasised that the total expected surplus of 2622 Mt CO_2eq, which appears enormous compared to e.g. the annual GHG emissions of around 887 Mt CO_2eq in Germany (WRI, 2015), will only be fully absorbed by 2025, if no further measures are taken. In other words, the EU ETS will only be able to impact emissions after 2025 because before that, emission levels above the cap remain possible if com-

[3] Which is calculated from the average of the 10% most carbon efficient installations in the industry.

panies surrender their stored allowances. This in turn will seriously compromise the 2020 emissions reduction target of the EU (Hu et al., 2015).

There is no one single reason for the failure of the ETS system so far. One is the oversupply, which keeps the price below a level deemed necessary for the functioning of the policy. Behind this is the unforeseen decline in industrial activity since the 2008 recession, which was further exacerbated by the sovereign debt crisis in the EU. Given the structural problems, the future prospects for recovery are still perceived as unfavourable. This in turn puts a downward pressure on demand expectations for emission allowances, which keeps their price low (De Perthuis, 2014). A second reason is the missing link between the EU ETS and other energy and climate policies, mainly for energy efficiency and renewable energies. Because the mechanism fails to take into account that these policies decrease emissions independently from the EUA price, this generates a growing surplus of allowances over time (De Perthuis, 2014). For instance, renewable energy support in Germany alone accounts for a reduction of 10–16% of the electricity sector’s emissions. Similarly, efficiency policies decrease the electricity demand of the companies subject to the EU ETS, implying further indirect reductions in demand for allowances (Weigt et al., 2012).

Another reason why the price remains depressed is the uncertainty about the stringency of the EU ETS in the future. In other words, if there was absolute certainty that the scheme is going to be continued into the next decades, including the planned tightening measures, the price would be higher because it is not only a function of current demand, but also reflects future demand expectations. However, given that the long-term commitments towards the EU ETS as well as the emission reduction targets are not certain, but subject to economic and political developments, the EUA price remains low. Koch et al. (Koch et al., 2014) show that the EUA price development depends more on abrupt changes in expectations than demand-driven, abatement-related fundamentals, such as GDP and energy commodity prices. In fact, less than 10% of the variations of EUA price changes are explained by fundamentals. Although these factors are found to be statistically significant, their relationship with the EUA price is nonlinear. Specifically, the relationship weakens considerably during periods of high volatility, i.e. when prices usually experience landslide changes. According to the researchers, these are exactly the times when uncertainty is highest regarding both the future demand for certificates and the future stringency of the policy. Thus, given the limited impact of abatement-related fundaments on price dynamics, reform options that only focus on adjusting supply to changes in demand drivers might not solve the problem. In contrast, measures that improve certainty in price development and establish credibility in the long-term functioning of the system would be more appropriate to put the EU ETS on a more solid footing.

What are the possibilities to improve the performance of the ETS mechanisms? Acting in a temporary way, the European Commission has approved to backload, the scheduled auctioning of 900 Mt CO_2eq allowances until 2019–2020 (EU Commission, 2015). Even though this measure can alleviate the oversupply problem in the short term, it will not have a decisive impact on the EUA price (Hu et al., 2015). Another measure currently under discussion is the acceleration of the absorption of the surplus allowances, which in practical terms means to increase the annual rate by which the amount of provided allowances are reduced. Specifically, the European Commission proposes to decrease the cap by –2.2% instead of the current –1.74% per year. On the one hand, this is needed to reach the target of 40% lower GHG emissions until 2030 compared to 1990 (EU Commission, 2015). According to Hu et. al (Hu et al., 2015), increasing the downward slope of the cap could contribute to an additional abatement of 524 CO_2eq in the EU. At the same time, however, it is important to notice that the researchers come to the conclusion that a reduction factor of at least –2.55% would be needed if EU wants to reach its long-term target of decreasing emissions by 80–95% until 2050.

The European Commission considers also a rule-based mechanism to adjust auctions in an automatic manner. Specifically, if an upper threshold of EUAs in circulation is reached, the amount of new allowances auctioned will be reduced and stored. If a lower threshold is reached, the stored allowances will be released again. As such, the MSR implies a soft target corridor for the auctioning of EUAs (ICAP, 2015). Although such a mechanism can substantially reduce the surplus after 2020, thereby somewhat lifting the price level, the stored allowances will also have to be released again. To sum up, the MSR might offer a solution against future demand shocks, but would have a zero net impact on GHG abatement in the long term. It would be another artificial component to the already artificial market.

There is also a more progressive proposal delivered by scholars which is to draw lessons from monetary policy and to establish an Independent Carbon Market Authority. Similar to a central bank, it would be responsible for the dynamic management of the supply of allowances, thereby ensuring the linkage between different time horizons, climate policies and the emission reduction targets (De Perthuis, 2004). In order to guarantee its independence and to insulate the institution from short-term political interests, the ICMA would have to act according to a precise mandate. Furthermore, adjustments in supply would have to be conducted according to clear and transparent criteria. Finally, with respect to forward guidance, indexes upon which interventions are based would have to be published in advance (Clò et al., 2013). In the short term, the ICMA could ensure the proper functioning in the trading market, e.g. by monitoring liquidity, and it would also be able to react in case of demand shocks. In the long term, it could dynamically adjust the annual cap to the reduction targets and incorporate other climate policies into the scheme, thereby avoiding oversupply and price collapses (De Perthuis, 2004).

Conclusions

The proper evaluation of possible policies aiming to reduce GHG emissions is of huge importance during the decision making processes of governments attempting to implement such measures, as there are lots of possible policies to choose from, each with different benefits, disadvantages and costs. These attributes may also change with time: policies or technologies which were an optimal choice in the past may not continue to retain their competitive advantage in the future, and similarly, policies and technologies that used to be too costly or unsuitable in the past, may become promising in the future. A suitable example would be solar power which used to be very expensive compared to standard high-emissions methods of electricity generation, but whose technology costs are decreasing more rapidly than those of other technologies (Fraunhofer, 2015).

In order to measure the effectiveness of a regulatory policy aiming to reduce carbon emissions it is not sufficient to compare the amount of abatement it achieves: certain other factors, most notably the cost of the abatement, should also be quantified. That is why the majority of policy efficiency studies use the unit cost of abatement as a standard measure which is calculated by dividing the total cost attributable to the policy with the amount of abatement that can be attributed to it (Productivity Commission, 2011). While this is a really simple formula, considerable difficulties are involved in the determination of both the total cost and the total abatement. There is also no single widely accepted methodology for this measurement: although the basic principles of the majority of methods are similar, studies differ quite considerably in the details of their methodologies (Kuik et al., 2008). But even under the assumption of the existence of a common, widely accepted and used measurement methodology, it would not be trivial to compare and draw conclusions from the resulting figures, as the coverage of the policies, the characteristics of the relevant industries and the available abatement opportunities also vary significantly across countries (Criqui, 1999, p. 586; OECD, 2013).

Poland happened to be one of the accidental winners of the current situation – namely the failure of the ETS system. Any prognosis of the national costs of application of the emissions reduction measures were calculated based on the assumption that the ETS allowance costs 15 euros or more. This would be painful for the Polish economy due to the high carbon-dependence. However the collapse of the allowances prices made this problem invalid, at least so far.

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Ekonomia polityczna środków redukcji emisji

Streszczenie

Celem niniejszego tekstu jest krytyczna analiza środków podejmowanych przez Unię Europejską na rzecz zmniejszenia emisji dwutlenku węgla. Analiza obejmuje również inne, alternatywne metody walki z emisjami, jak również możliwe do zaaplikowania reformy aktualnego system ETS. Przywoływane argumenty dotyczą perspektywy politycznej i ekonomicznej walki z emisjami, jako jednego z elementów polityki klimatycznej i energetycznej podejmowanej w Europie.

Słowa kluczowe: ETS, ekonomia polityczna, EU, emisje