

Environmental Protection and Sustainable Development in the European Union: Evolution, Governance and Implications for Competitiveness*

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ABSTRACT:

This article considers how the EU governance set-up evolved with respect to environmental protection and sustainable development. It aims at evaluating the EU's progress towards creating the basis for a competitive, low-carbon European economy (a kind of EU industrial strategy) and sustainable production and consumption patterns. The article concludes that environmental and energy policies have become increasingly Europeanized and come under the single market and competitiveness rationale. It puts forward that the shift to a low-carbon economy is associated with important economic benefits, whereas economic costs appear overrated. However, shortcomings in EU governance sit uneasily with a more coherent approach to sustainable development.

KEYWORDS:

EU governance, environmental policy, sustainable development, single market, competitiveness

Introduction

This article considers how the EU governance set-up evolved with respect to environmental protection and sustainable development. It aims at evaluating the EU's progress towards creating the basis for a competitive, low-carbon European economy (a kind of EU industrial strategy) and for sustainable production and consumption patterns.

For the European Union (EU), a high level of environmental protection and sustainable development are treaty-based objectives. On the international stage, the EU has come to assume a leadership role in combating climate change. The Europe 2020 Strategy (2011-2020), which sets the EU's economic agenda, enshrined green growth as one of its three growth-enhancing priorities for the coming decade. The EU committed to implementing a high and rising level of environmental protection and to ambitious climate targets independently of the stance adopted by third countries. That fact makes the EU well placed to lead the modification of consumer preferences and production patterns towards sustainability provided of course that the EU governance set-up is conducive to those longer-term goals. At the same time, the EU's commitment might expose EU industry in the global marketplace (potential loss of competitiveness). For economic viability a EU low-carbon economy and green growth strategy requires that economic benefits be larger than associated costs.

The evolution of environmental policy and governance in the EU

The evolution in the governance (assignment of competencies and the nature of the decision-making process) and regulation of environmental policy in the EU reflects the influence of international agreements but above all the growing association with the efficiency rationale in the internal market context.

The founding Rome Treaty (1957) had made no reference to environmental policy. In the post-war setting, the environmental side effects of economic activity were not high on the agenda of the European Economic Community. The European Community entered the new policy area in 1973, after its 1972 Paris summit, without any need for treaty revision.¹ In doing so, it responded to international developments² and to the need to safeguard the good functioning of the common market. The result was the creation of a Community environment policy and legislation (Sbragia 2000). Successive environmental Action Programmes (up to

the present there have been six EAPs) came to define Community objectives and priorities and to guide environmental policy. In the beginning the emergence and rise of Community legislation was motivated by the concern that national environmental legislation and policies might come to constitute non-tariff (frictional) barriers to intra-Community trade and thereby segment the common market along member state lines. The focus on the governance of environmental policy emerges with the first reform of the founding treaties, the Single European Act (1986). The Single European Act, together with the Treaties of Maastricht (1992) and Amsterdam (1997), created the legal basis for environmental policy as a Community policy.

The governance of environmental policy became characterized by increasing Europeanization and by the environment becoming ever more associated with the internal market logic. The Single European Act had made environmental legislation subject to qualified-majority voting in the Council and to the co-operation procedure in the European Parliament, provided that the protection of the environment was linked to the single market. For all other cases, it maintained the unanimity-voting requirement in the Council. The Treaties of Maastricht and Amsterdam established the co-decision procedure (co-decision I and II, respectively) as the standard decision-making procedure for common and co-ordinated measures, with qualified-majority voting in the Council and the European Parliament as a co-legislator beside the Council.³ More specifically, under the Maastricht Treaty the co-decision procedure (I) became applicable to the areas of environmental policy linked to single market harmonisation measures matters, whereas the cooperation procedure applied to all other matters. The Amsterdam Treaty extended co-decision (II) to most environmental matters. Yet, it maintained the same exceptions as under the Maastricht Treaty (among others, fiscal measures and energy), which require unanimity voting in the Council. The Treaties also gave environmental policy a special status by establishing the principle of environmental policy integration. It means that environmental concerns cut across policy areas and need to be taken care of right from the start in other EU policies areas. The Commission is held to conduct cost-benefit analyses on (the selection of) environmental policies. The Amsterdam Treaty made sustainable development a Treaty objective of the Union, compared with sustainable growth respecting the environment under the Maastricht Treaty. However, as Lenschow (2010) points out, the meaning of the sustainable development was not further specified and meant to refer to the definition provided by the Brundtland report.⁴

The Treaty of Lisbon (2007) confirmed sustainable development as a treaty-based objective of the EU and furthermore called for a high level of environmental protection and the improvement of environmental quality in the EU. Environmental policy remained in the European domain as a shared competence of the Union and its member states, but was broadened to include climate change. Moreover, energy, formerly a national competence, became a shared competence, too. The unanimity requirement was nevertheless maintained in important areas, notably with respect to the above-mentioned fiscal measures and energy sources. The Lisbon Treaty associates sustainable development with competitiveness and growth. So does the Europe 2020 Strategy, which sets the EU's economic agenda.

Competences for environmental regulation are located in the EU sphere. The EU has become the major source of environmental legislation for its member states. It has added new environmental governance regimes to the existing ones, in layers that are more or less intertwined (von Homeyer 2007). The change of environmental regulation over time evidences the growing efficiency and competitiveness concerns in the single market and the sustainable development objective. Von Homeyer (2007) characterized the evolution of regulation according to the following stages: starting in 1972 with the regulation of acute problems, as of 1987 the chief issue became the harmonization of regulation to assure a level playing field in the internal market. From 1992 onwards, market integration and implementation cost concerns gave rise to the use of framework regulations on efficiency and policy effectiveness grounds. Since 1998, regulation to implement sustainable development has focused on networks and policy learning.

As pointed out by Sbragia (2000), in the 1980s the influence of the “green countries” (West Germany, the Netherlands, Denmark) had raised the level of environmental protection in the Community. Yet, their approach had tended to be based on traditional non-market “command and control” type of regulation, that is, on instruments that tend to be more costly in terms of implementation than economic instruments. In the 1980s and 1990s the command-and-control approach to regulation and the more output and cost-benefit oriented regulatory approach to policies competed with a view to single market wide regulatory harmonisation. The latter new approach, which is characterized by new instruments and by access to information and involvement by the public, prevailed. The 1990s became characterized by new instruments and Community legislative activity but also by international agreements, in which the EU emerged as a key actor in international environmental policy matters. The EAPs reflect the EU's change of approach

from the 5th EAP (1993-2000) onwards towards ecological modernisation of the economy and the switch from a top-down to a bottom-up approach and to new instruments. The 5th EAP established sustainable development as the overriding objective, targeted climate change (among others) and put emphasis on the role of market instruments. Sbragia (2000) concludes that the EU acquired a good record in new instruments and became more successful than the US or Japan at implementing new instruments. The 6th EAP (2002-2012) focuses on enhancing the cost effectiveness of reaching environmental targets and commitments. Climate change is one of its four priorities. The 6th EAP called for an intensified use of market-based instruments.

It is noteworthy that there is some scope for regulatory competition in the EU. EU legislation establishes a framework of minimum requirements to be applied in all member states that allows for different country preferences. Minimum requirements may allay fears as to any race to the bottom in terms of environmental standards and limit systems shopping / regulatory arbitrage in the single market. Member states are free to go beyond minimum standards and set stricter national requirements, provided that those do not constitute invisible barriers to trade in the internal market.

The EU Emissions Trading Scheme (ETS), an economic instrument, became the EU's single most important environmental policy. It goes back to the Kyoto Protocol (1995), negotiated under the umbrella of the United Nations, which came to be based on the instrument of carbon trading, modelled on US practice. The Commission's proposal of a carbon tax instrument, made in 1992 in the run-up to the preparatory Rio conference, had encountered resistance from member states. Tax matters were and remain subject to unanimity voting. The Kyoto Protocol resulted in a change of regulatory system in the Community, with an instrument that was new to both the EU and its member states. The adaptation and internalisation process of the carbon trading system resulted in 2005 in the set up of the ETS as the world's first regional cap-and-trade carbon pricing scheme.⁵ Over time, governance of the ETS has become more centralised at the EU level. This fact contrasts with the EU's general approach to sustainable development that relies on networked governance. The EU's ultimate goal is to export its carbon cap-and-trade scheme to the global level. A global market for carbon emission licences would attenuate concerns about competitiveness distortions (so-called carbon leakage). Next to its Kyoto commitments (of an eight per cent reduction in carbon emissions compared to 1990, above the five per cent target for other

industrialized countries), and with a view to the negotiation of a global and comprehensive Kyoto successor agreement, the EU has made the commitment to abate 20 per cent (extendable to 30 per cent if other countries make adequate efforts) of greenhouse gases until 2020 (transposed into EU legislation as part of the so-called Climate Action and Renewable Energy Package of 2008).⁶ As put by Schaik and Egenhofer (2005), the EU's governance set-up with regard to external representation favours up-front goal fixing in international negotiations.⁷

Progress in the energy field has been slow in comparison with environmental policy.⁸ This is despite the fact that energy had been at the heart of two of the three European Communities (Coal and Steel, Euratom), that the two oil crises (in 1973 and 1979) came to highlight the importance of energy, of energy supply security and the link with economic growth, and notwithstanding liberalisation efforts within the internal market context to create a European energy market. Energy became a shared competence under the Lisbon Treaty (2009), but unanimity was maintained notably for measures that significantly affect a member state's choice between different energy sources and the general structure of energy supply.

The 2008 EU Climate Action and Renewable Energy package consisted of five legislative pieces, which translated the EU's 2007 greenhouse gas reduction commitments into EU legislation. The legislative package led to an increase in policy coordination at the EU level.⁹ The ETS, the EU's chief instrument to combat climate change and increase efficiency, became more centralized at the EU level. Member state policies in sectors of national competence and beyond the reach of the ETS became subject to national commitments. The unanimity requirements regarding member states' energy mix did not impede a directive on renewable energies. A framework directive on carbon sequestration and storage, a transition technology, allowed for some harmonisation but also flexibility (given different national energy mixes) in implementation at the member state level. The Commission decision on new guidelines on state aid for environmental purposes, adopted in April 2008, reflects the centralisation of competition policy on state aids at the EU level and the concerns with guaranteeing a level playing-field and efficiency in the internal market.

The EU Climate Action and Renewable Energy package illustrates that environmental and energy policies have become more linked up at the Community level. Developments in energy reflect the causal link between greenhouse gas emissions from fossil energy sources and climate change, but also rising energy security

concerns that have highlighted the importance of renewables. Environment and energy have also become priorities in terms of internal market results (Lisbon Strategy, Europe 2020 Strategy).

Sustainable development had become one of the Lisbon Strategy's objectives in 2001, upgraded in 2011 by the Europe 2020 Strategy to the promotion of growth through a more resource efficient, greener and more competitive European economy (European Commission 2010a).¹⁰ Green growth denotes growth that is efficient in terms of natural resource use, minimizes pollution and environmental impacts, and is resilient in that it accounts for natural hazards (Hallegatte et al. 2011).

The success of such a strategy will be conditioned by the EU's governance set-up. Although the EU has competences in environmental, climate and energy policy, policy-making is conditioned by the unanimity requirement in important matters, i.e. environmental and energy taxes. In addition, matters relevant for environmental sustainability fall under both the single market and the Lisbon process and their respective instruments. The implementation of green growth is coordinated through both single market and Lisbon / Europe 2020 Strategy instruments that overlap. Yet, those instruments differ markedly in terms of governance methods and implementation. The comparison between the economic governance of the single market and of the Lisbon strategy evidences the weaker governance and enforcement mechanisms of the latter, which is based on soft coordination and the Open Method of Coordination (OMC) rather than on the Community Method (Sapir et al. 2005). Soft coordination under the OMC (Hodson and Maher 2001, Radaelli 2003) has encountered implementation problems in the absence of sanctions within the Lisbon framework. Tilford and Whyte (2010) point to the EU's failure to integrate sustainable development targets in the growth and employment focused revised Lisbon Strategy. The governance weaknesses of the Lisbon Strategy in essence continue under the Europe 2020 Strategy (Bongardt and Torres 2010 and 2012). For a coherent industrial strategy, green growth requires measures under both the single market and the Europe 2020 Strategy (European Commission, 2010b). For that the transmission mechanism (complementarity) between the single market and Europe 2020 measures would need to function well, which is however doubtful in the light of the governance set-up (Schaeffer and Baumann 2011).

On the efficiency properties of the single market and of economic instruments

The EU objective of sustainable development and green growth is based on the idea that a well-functioning internal market, promoting competition, efficiency and innovation and thereby the delivery of tangible results to European citizens, can be made to work in favour of the environment. The provision of the right incentives and of a quality regulatory framework is addressed under the Europe 2020 Strategy.

Green growth calls for an adequate institutional framework (institutions, environmental and other policies) to best modify non-sustainable production and consumption patterns and for adopting those policies and instruments that best break the link between growth in the production of goods and services – desirable – and pollution and environmental damage (bads) – undesirable – and promote dynamic efficiency. In a competitive global market environment the EU needs to select adequate policies and instruments in order to minimise implementation costs and capitalize on productivity and growth-enhancing features of environmental protection.

Market incentives, regulation and the pricing of environmental costs are critical for minimising short-run trade-offs between output and environmental protection and, taking a longer perspective, for innovation and sustainable growth. Rather than constituting a mere cost-aggravating factor, adequate policies and instruments for environmental protection may create the basis for sustainable EU specialisation patterns and an opportunity for EU firms to create a competitive advantage based on eco-efficiency and environmentally friendly innovation (new products and processes, technologies or even sectors). There is a rising recognition and endorsement of the benefits of market-based instruments for environment and energy-related policy purposes and for EU competitiveness on a global scale (European Commission, 2007a). Market-based instruments (such as taxes¹¹ and charges, levies, tradable emission quotas) correct economic agents' incentives in the market and tend to better promote efficiency (least-cost solutions and innovation) than command-and-control type instruments, (i.e. emission quotas, technical fixes, prohibitions) and hence EU competitiveness and growth.

Negative environmental external effects are a market failure and need to be corrected for economic efficiency reasons. The market mechanism can be made to internalise negative externalities. The polluter pays principle implies that environmental costs (an inefficiency) are (made to be) borne by polluters through the pricing of environmental damage. The maximisation of total social benefits

from pollution (that is, production) requires implementing the optimal (efficient) level of pollution, that is, pollution should take place up to the point at which the marginal (social) costs of pollution become just equal to the marginal (private) benefits from production. On efficiency grounds the EU would therefore want to induce economic agents – through competition in the market, adequate policies and policy instruments and a quality regulatory framework – to behave in a way as to achieve the socially-optimal pollution level (Pareto optimum). Should the efficient level of pollution not be known or that information be very costly to obtain, a selected pollution level should be implemented at least cost for society (cost-effective solution, adopting the least-cost alternative).

In the short-run, policy makers might face a trade-off between production and less pollution (environmental protection may not be a win-win situation). Choosing those environmental policies that minimize output loss calls for conducting cost-benefit analyses to determine the optimal level of pollution or, otherwise, to select cost-effective instruments for implementing the chosen pollution level. Of course, the existence of and access to relevant environmental information is a pre-condition for enabling governments to select the best or least-cost environmental protection programme, but also for firms to choose the most adequate pollution abatement solutions (and for consumers to make an informed choice in line with their preferences). The challenge to attribute a monetary value to environmental damage (necessary to determine the efficient level of pollution) is often not negligible for governments or firms, a fact that might come to bias cost-benefit analyses as a result. The benefits from pollution (production) tend to be better quantifiable, whereas the damage costs to society are often inherently uncertain, accrue over long time horizons and are difficult and costly to calculate. The debate on the cost of (the man-made contribution to and even existence of) climate change is illustrative in that regard.

The state can essentially employ three types of instruments to implement environmental goals: communication instruments (to remedy market failure rooted in informational problems), market instruments (with efficiency properties and with a dynamic impact) and command-and-control type regulation (direct regulation, which is often more costly to implement and has a static, one-off impact).¹² The properties of market instruments of pollution control, as opposed to command-and-control type instruments, tend to make them more adequate for implementing least-cost solutions and for creating first-mover advantages and green growth.¹³ They price environmental damage costs and can often be implemented at a low

administrative cost through the tax system. The polluter pays principle leads to the internalisation of negative externalities, which raises polluters' production costs compared to less polluting rivals and the price that the consumers of a polluting product have to pay in the market. It also induces incumbents and potential entrants to invest in less-polluting products and technologies. Command-and-control type instruments comprise quantitative limits, mandatory technologies or prohibitions. Since the state, for lack of information or information cost reasons, may not be able to impose the least-cost pollution control solutions on polluting firms, abatement becomes more expensive from the point of view of society. Those instruments also have only a one-off, static impact. However, in given situations of dysfunctional markets (concentrated market structures, homogeneous cost structures) direct regulation is the preferred solution.

The pricing of environmental damage leads to least-cost pollution abatement from a social point of view since firms know better than the state – due to asymmetric information or prohibitive costs of data collection – what their least-cost solution to reduce environmental impacts is and whoever can easily and more cheaply abate pollution will do more of it. It penalises polluting firms in the market for their inefficiency since their costs will be higher in comparison with more efficient, less-polluting rivals (loss of competitiveness). Market instruments promote continuous improvements and innovation since firms will keep up their efforts to lower pollution levels in order to reduce payments of a tax or to avoid buying emission rights in the market or to be able to sell their permits in the market with a margin (note that the system also works in case permits are provided for free). They hence have a dynamic impact as inefficient firms risk being priced out of the market in a competitive environment. They are also associated with a double dividend (environmental improvement plus receipt for the state).

Pricing environmental damage provides economic agents with an incentive to change behaviour (i.e., consumption patterns or to continuously improve products and production processes). It thereby promotes the shift towards cleaner alternatives and substitute products. The extent to which producers manage to pass on cost increases to consumers and the speed at which consumption patterns change depend on the price elasticity of demand, that is, the readiness with which substitute products are available. The existence of substitute products results in more rapidly changing consumption and production patterns, whereas their non-availability requires firms to invest in new technological solutions that might take longer to develop and to adopt.

Various Commission studies have emphasized the need for environmental taxation to make better use of the efficiency potential of market-based instruments and for better coordination between EU and member state policies to transform environmental and climate challenges into economic opportunities. In its mid-term review of the 6th EAP the Commission indicates the need to step up efforts in priority areas (among which climate change) and the scope for efficiency gains and synergies associated with the improvement of market-based instruments and of environmental policy integration and of international cooperation. According to the Commission, the use of market instruments needs to be strengthened, in particular of environmental taxes (European Commission 2007b). However, the governance of environmental taxes, i.e. the maintenance of the unanimity requirement in tax matters, is a serious obstacle to the reinforcement of environmental taxes (European Commission 2007a). The ill fate to date of a EU carbon tax to combat climate change is a case in point. This is despite the fact that such a EU-wide tax would have efficiency properties, come with a double dividend and foster the possibility, advocated by the Commission, of changing taxation away from labour towards pollution (an inefficiency). However, with tax competition in the EU, member states face cost (competitiveness) implications for their domestic firms in the internal market if they go it alone. The same applies to energy taxes. Energy costs are a competitiveness factor for industry.

The European Commission (2007a) has repeatedly called the attention for the fact that environmental legislation by itself was not sufficient as a driver of innovation and that policy coordination was needed for the transition towards a low-carbon and resource efficient economy and to better exploit synergies between environmental protection, energy supply security and industrial competitiveness. That need for collective action regards in particular two sectors (the environmental goods and services industry and the high energy-intensive industry) but also eco-industries, despite evidence on their strong growth in the EU and of European companies as world leaders in several environmental markets. The implementation of a coherent industrial strategy however relies to an important degree on the Europe 2020 Strategy and on effective implementation through Europe 2020 soft coordination instruments (European Commission 2010b). In addition, the economics of carbon trading have cross-policy implications that need to be taken into due account. Carbon pricing works via the price signal and depends on its good functioning. To the extent that other policies distort the price signal they need to be adapted. Also, firms and sectors not subject to the ETS need to subject to equivalent taxation (European Commission 2010b).

Costs and benefits associated with a EU low-carbon economy strategy and green growth

Greenhouse gas emissions give rise to climate change, a global negative externality. International coordination to combat climate change therefore appears to face a paradox. It is at the first glance akin to a prisoner's dilemma (Nash 1951), that is, a situation where cooperation is globally beneficial whereas it is in the best interest of any individual player (country) to defect. The reason is that a country, which invests in curbing its emissions while others do not, risks higher costs and hence competitiveness disadvantages in the global economy. However, a non-cooperative outcome (Nash equilibrium) would be detrimental to the world since global greenhouse gas emissions were not be capped at a sustainable level.

The EU endorsed the objective a competitive, low-carbon economy and of green growth, and hence of more sustainable production and consumption patterns, in apparent contradiction with the non-cooperative prisoner's dilemma outcome. It amounts to a EU industrial strategy meant to create both sustainable and competitive production patterns. The aim is to transform environmental and climate constraints into business and economic opportunities and into the very basis for competitiveness, employment and growth. The economic viability of such an industrial strategy depends on whether economic benefits are larger than costs. It is in the EU's interest to modify unsustainable consumption and production patterns and its specialisation profile if there is a net positive pay-off.

What are the principal benefits and costs from a low-carbon and green growth industrial strategy? There are two main benefits. First and foremost, EU firms can gain a dynamic first-mover advantage from more restrictive EU climate targets in environmentally friendly goods, technologies (for instance, alternative energy technologies becoming available and cheaper with respect to fossil fuels) and new emerging sectors (European Commission 2010a).¹⁴ Much will depend on the good functioning of the ETS, the EU's chief instrument to implement carbon emission reductions and promote dynamic advantage. The EU is a front-runner with regard to establishing the world's first international carbon pricing scheme and in moving to auctioning. It is however questionable whether present carbon price levels, depressed by the recent crises, provide a sufficient stimulus for green investments.

Secondly, long-term environmental commitments can also lead to reputation spillovers into other policy domains, triggering wider economic benefits through

a positive impact on a country's investment and trade flows (Rose and Spiegel 2008). Joining an international environmental agreement (like the Kyoto Protocol) or, one may add, by committing credibly up-front (e.g., the EU Climate Action and Renewable Energy package), a country (for instance the EU) signals creditworthiness by means of environmental investments that have a low discount rate of the future. At times of crisis, the resulting rise in a country's creditworthiness and impact on international trade and investment might not be negligible for any (European) country.

The costs from EU environmental leadership are related to the potential negative impact on the European industry's carbon competitiveness (carbon leakage). However, these costs appear often overrated. First, one should recall that the very idea behind carbon pricing is to aggravate polluters' costs as to penalise polluters in the market and thus exert pressure towards less carbon-intensive and more competitive EU specialisation patterns. Impaired competitiveness of carbon emitters is therefore a desired effect aimed at making industry more competitive in the longer run. Still, in a globalised world economy the EU has to take into account the likely impact of a European carbon-pricing scheme on the international competitiveness of European industry. According to Delgado (2007), the EU is more vulnerable than other economies to carbon pricing because it features a specialisation pattern in international trade that is characterised by a relatively carbon-intensive export mix.¹⁵ Due to this EU carbon uncompetitive specialisation pattern there might be a risk of firms' relocating to places beyond the EU in function of "systems shopping" or regulatory arbitrage when carbon-pricing schemes are unequal on a global scale (for instance introduced in the EU but not in third countries). Bleischwitz et al. (2007) however caution that impaired competitiveness and possible relocation in an ever more open and global marketplace is only an issue in those industries with little market power (or openness and tradability), which thus cannot pass on the entire cost increase to consumers. In any event, in the first and second stages of the ETS (2005-7 and 2008-12, respectively) emission rights in the EU have mostly been distributed for free to major polluters from energy-intensive sectors. It is only in the third stage that the ETS will move, mostly gradually with the notable exception of (most of) the energy sector, to auctioning off emission rights.

The international competitiveness impact on EU industry is also conditioned by the geographical spread and implementation of carbon pricing. International competitiveness distortions can be expected to be the smaller the more wide

spread is the application of the carbon trading instrument on a world scale. In the absence of a comprehensive global post-Kyoto agreement, the international competitiveness loss should thus be larger, to the extent that carbon pricing in the EU increases costs for local firms but not for their foreign competitors. That might then translate into an international competitiveness disadvantage (at least in the shorter run), not for all firms but for those firms in carbon-intensive sectors and exposed to international trade. Even if carbon-pricing schemes were applied equally in the world, the EU's non-carbon competitive specialisation pattern (i.e. in industries such as minerals and chemicals rather than in high-tech industries and services) means that there would be a real competitiveness effect on EU industry (Delgado 2007). A shift towards less carbon-intensive and hence more competitive and sustainable EU specialisation patterns hence brings about economic benefits for the EU irrespective of global agreements on climate change. In conclusion, it is in the EU's interest to assume leadership and modify its uncompetitive specialisation pattern in international trade and, to do so, select those policies and instruments that minimize implementation costs.

In the absence of a global agreement post-Kyoto and given the EU share in global greenhouse gas emissions, EU carbon reductions look insufficient for reducing global emissions to a sustainable level. A global carbon market could effectively cap global emissions at sustainable levels. An emissions trading scheme that includes (major) customer countries (a global monopsony) could force the desired amounts of supply on resource exporters, which would in turn ensure a global cap on greenhouse gas emissions (Sinn, 2007). Otherwise, EU reduced demand could just reduce world market prices (the EU being a large consumer of fossil fuels), which could induce increased consumption and pollution by other countries. EU efforts would thus fail to result in any net reduction of global emissions.

It is therefore in the interest of the EU that the ETS gain as broad a coverage as possible and that a global carbon market and price become established. If the EU managed to export its carbon-pricing regulatory regime to the global level, EU firms could benefit from reduced competitive distortions and less danger of a race to the bottom in global environmental standards. The issue of potential carbon leakage triggered a discussion about EU trade policy responses. Authors have discussed how a go it alone scenario becomes manageable in international trade.¹⁶ The Commission has limited itself to studying options in case no international agreement on climate change is concluded for the post-Kyoto period (from 2013 onwards).

Conclusion

The EU's objectives of sustainable development, a high and rising level of environmental protection and green growth imply the need for less resource intensive and environmentally sustainable growth and for modifying unsustainable production and consumption patterns and technologies. The performance of the EU's model of sustainable development is conditioned by the adequacy in the provision of incentives for economic agents (internal market, competition policy, regulation) and of specific public policies (environment, energy) and instruments.

In the EU environmental policy and governance have increasingly been brought under the internal market and competitiveness rationale. Environmental and energy policies are increasingly becoming linked up with a view to combating climate change. The EU has gained competences in environmental policy over time. Environmental policy is a shared competence, which has been extended also to climate policy and to energy policy. While co-decision is the norm in decision-making, the maintenance of the unanimity requirement in some important matters – amongst which notably fiscal matters, but as well energy sources, constitutes a major obstacle for addressing non-sustainable production and consumption patterns through EU instruments. Of course, national governments could make use of taxation at the domestic level. However, they might be reluctant to do so to the extent that environmental and energy taxes imply cost disadvantages for domestic firms in the internal market. EU environmental policy has come to rely to a large degree on the ETS carbon-trading scheme, a (non-tax) market instrument. The governance of that economic instrument has been increasingly centralized at the EU level to enhance policy effectiveness. From the point of view of a EU strategy of shifting to sustainable development, a low-carbon economy and green growth strategy faces limits in terms of coherence. Those limits derive from the overlap and need for complementarity of single market instruments (Community method) and Europe 2020 (soft coordination) instruments with regard to the implementation of sustainable growth objectives.

The international negative externality properties of greenhouse gases on the one hand and the uncertainty surrounding a potential post-Kyoto global and comprehensive climate agreement on the other raise the question as to the economic viability of a European low-carbon and green growth strategy. An evaluation of the costs and benefits of such an industrial strategy indicated that benefits are substantial. The benefits derive from the creation of a first-mover advantage in

green goods, technologies and new sectors and increased EU carbon competitiveness. In addition, there are wider economic benefits (reputation spillovers into trade and investment) associated with long-term green investment. As for costs, potential competitiveness losses seem overrated. The ETS prices environmental damage, which penalizes (given) polluters in order to improve medium to long-term competitiveness of the European economy. However, at present European major polluters still receive valuable pollution licences for free (a transfer from taxpayers to polluters), as the ETS will only move gradually to full auctioning during its third phase (2013-2020). European specialisation patterns being carbon-uncompetitive, they need to be modified in any case. Those firms, which are energy-intensive (in their use of fossil energy) and did not improve on emissions (e.g., by shifting to renewable energy) and are exposed to international competition, may experience competitive distortions. If a global carbon market came into existence it could be expected to attenuate competitive distortions. However, EU industry would still have to modify carbon-uncompetitive specialization patterns.

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¹ The European Council launched environmental policy as a new area of common need (article 235 of the Rome Treaty). It implied unanimity voting in the Council and a minor role for the European Parliament in environmental policy.

² The Club of Rome report on the *Limits to Growth* called attention for the limits of natural resources and of the Earth's capacity to absorb waste and pollution (Meadows et al. 1972). In 1972, the United Nations Stockholm conference on human development had taken up concerns about the sustainability of consumption and production patterns in the face of limited natural resources at a multilateral level, which led to the establishment of the United Nations Environment Programme (UNEP).

- ³ See Torres (2003) for an analysis of the workings of the co-decision procedure in environmental matters, in particular with respect to the influence of national parliaments on raising standards.
- ⁴ The Brundtland report defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development 1987: 8).
- ⁵ Baldwin (2008) refers to carbon trading as light regulation. The Kyoto Protocol illustrates the importance of international commitments also with respect to feedback into EU and national policies and into regulation and pollution control instruments (i.e. the ETS, the Climate Action and Renewable Energy package).
- ⁶ The meet the climate challenge the EU is committed to substantially lowering carbon emissions in absolute terms. With a view to its objective to contain the rise in the earth's temperature below two degrees centigrade until 2050, the EU will have to step up its committed short to medium run EU carbon emissions cuts (from eight per cent in line with its Kyoto target between 2008-2012 to between 20 and 30 per cent in line with 2020 commitments) significantly in the longer run (according to the European Council by 80 to 95 per cent until 2050).
- ⁷ According to Schaik and Egenhofer (2005), in multilateral climate negotiations the EC and its member states operate with a common negotiating position, whose formulation is more inter-governmentally organised. The institutional set-up implies difficulties for the conduct of international climate negotiations, which can be overcome by EU up-front goal fixing, making use of European Council's political and strategic agenda-setting capacity for the Union.
- ⁸ For an in-depth analysis see Andoura et al. 2010.
- ⁹ The ETS directive broadens the scope and improves the functioning of carbon trading in its third phase starting in 2013 (European Commission 2008). It features a shift towards auctioning and reaping a double dividend, implementing the polluter pays principle, with receipts from environmental protection for the EU and for its member states. The ETS is to cover more than 40 per cent of total EU carbon emissions, aiming at a 21 per cent reduction in overall emissions by 2020 (compared with the reference year 2005). The abolition of national allocation plans and the establishment of a EU-wide cap imply centralisation at the EU level of this market instrument and are efficiency-enhancing. The second directive in the package makes policies of member state responsibility subject to coordination at the EU level, in sectors that are not covered by the ETS (such as buildings, transport, agriculture, waste). It aims at a 20 per cent increase in energy efficiency as compared with projections. The directive on renewable energy aims at a change in the EU (and member states') energy mix, notably a 20 per cent share of renewable energy in energy consumption by 2020. A framework directive to establish a legal framework for safe and environmentally friendly carbon sequestration and storage responds to the perceived need for a transition technology. The new guidelines on state aid for environmental purposes are to safeguard the good functioning of the internal market.
- ¹⁰ The Europe 2020 Strategy enshrines the Climate Action and Renewable Energy package targets, but does not go beyond. Targets are therefore hardly ambitious, even less so if one takes into account that EU emission levels and abatement costs have been depressed by the effects of the crisis (Egenhofer 2010).
- ¹¹ A tax that internalizes an underlying market failure by correcting the price signal accordingly is called a Pigouvian tax.
- ¹² At times voluntary agreements (between firms, between firms and the state) are added as a separate type of instrument.

- ¹³ Firms will conduct an analysis at the margin (producing until marginal cost becomes equal to marginal benefit at the last unit produced) to minimize taxes or maximize their margin with a view to the price of emission rights. The state/government could theoretically also achieve the same result but typically will lack the information to do so or the cost to procure it would be prohibitive. The EU has taken a variety of measures that contribute to overcoming informational problems in the market, ranging from the establishment of the European Environmental Agency to environmental labels and certification (Environmental Management and Accounting System – EMAS).
- ¹⁴ Note that the economic costs of environmental damage/ the benefits of environmental protection are becoming ever more apparent for countries around the world.
- ¹⁵ Delgado (2007) defines the carbon intensity of exports as determined by a combination of export mix, electricity mix and technology mix.
- ¹⁶ See for instance Gros and Egenhofer (2010). It is however difficult to calculate the carbon price distortion. Kolev and Riess (2008) caution that the carbon price signal be an imperfect indicator for carbon leakage in a world where carbon pricing via emission trading is not the only public policy option.