



STUCK IN THE MIDDLE

CAN EUROPE STILL LEAD ON CLIMATE
CHANGE AND BENEFIT FROM GREEN GROWTH?
A PROGRESS REPORT ON 20-20-20 TARGETS

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EXECUTIVE SUMMARY

The global energy landscape is undergoing radical change, especially with regard to the paradigm which has been underpinning it since the second energy revolution, characterised by the rise of oil. The advent of unconventional hydrocarbons, such as shale gas and light tight oil in the United States, the policy of incentives for renewables and the rethinking of nuclear energy following the Japanese Fukushima disaster are redrawing a world energy map that is very different from that of the past. In the medium term, countries that were traditionally major importers of energy, such as the United States and Brazil, will radically change their situation and become net exporters, which will, understandably, have wide-ranging repercussions.

Moreover, the future global energy scenario will be influenced by a substantial increase in global energy demand, mainly driven by non-OECD Asian countries. It is estimated these countries will account for more than 65% of additional primary energy demand by 2035¹

Global greenhouse gas emissions, mainly linked to the use of fossil fuels, are, however, likely to increase. As specified in the first volume of the IPCC's Fifth Assessment Report on Climate Change (AR5), the increase in emissions will cause a global temperature increase, compared to pre-industrial levels, estimated at between 2° C and 5° C by the end of the century. This will have serious consequences for the environment and for humans.²

Given this outlook, it is only natural to ask questions about the role that the European Union will be expected to play on the international scene. The first phase of implementation of the Kyoto Protocol (2008 - 2012) has just come to an end and the second, which began in early 2013, has only a limited number of countries participating, accounting for some 15% of global emissions. Europe, in fact, is so far the only major emitting area to have a solid domestic policy to reduce greenhouse gas emissions. As evidenced, however, by the state of the international debate on the implementation of joint action in this field, the EU will continue almost alone along this road until at least 2020, when the future global

¹ International Energy Agency (IEA), 2013, *World Energy Outlook 2013*.

² IPCC - WGI, *The Physical Science Basis*, 2013

agreement to reduce emissions is expected to come into force. It is worth asking whether the decision to pursue, in any case, an ambitious climate policy, with its obvious effects on economic and energy policy and industrial competitiveness, will not penalise the EU compared to other international players.

The starting point of this analysis can only be the so-called 20-20-20 package, which sets out the EU targets to be achieved by 2020 through (i) a 20% reduction in EU greenhouse gas emissions from 1990 levels, (ii) a 20% share of energy from renewable sources (RSE) in gross final energy consumption and (iii) a 20% improvement in energy efficiency in the EU (based on normal projected levels for 2020). To support the achievement of these targets, the EU has, since 2009, adopted a set of rules relating to renewables and the reduction of greenhouse gases³.

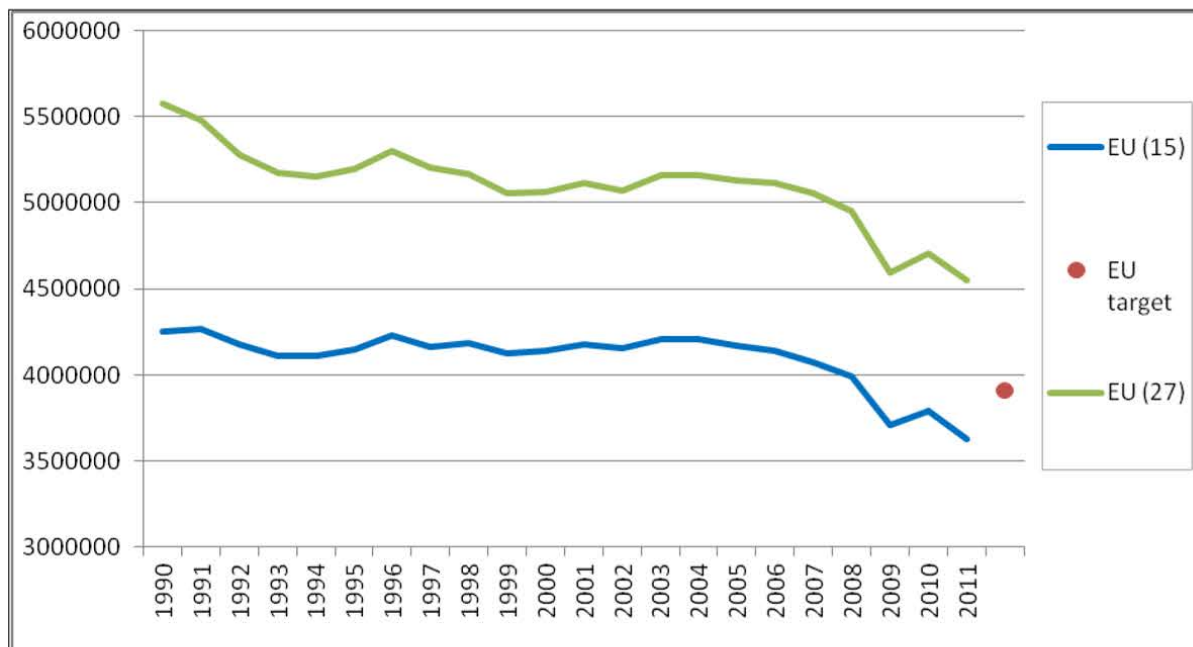
Clearly, any expressions of opinion at only four years from the start of the implementation of the package can only be a provisional exercise. However, several elements have emerged clearly enough to be able to make a few preliminary remarks on the general effect that the emissions reduction policy is having on the various parts of the EU economy. First, it is important to note that with regard to the three main 20-20-20 targets, the EU seems to be on track. Even though none of the Member States have distinguished themselves in all three areas, equally, none of them have under-performed.

Regarding the reduction of greenhouse gas emissions, recording a percentage of 18% in 2012, the EU is already very close to meeting its target eight years before the deadline. Part of the reason for this is also the recent economic crisis, which has led to a considerable decline in consumption. While continuing to benefit from the impact of current measures, it is estimated that by 2020 Member States will

³ Here we would simply refer to the most recent 20-20-20 measures: (1) Reduction of emissions and ETS : Directive 2009/29/EC - greenhouse gas emission allowance trading scheme of the Community; Decision 406/2009/EC on the effort of Member States to reduce their greenhouse gas emissions. (2) Renewables: Dir. 2009/28/EC - Promotion of the use of energy from renewable sources. (3) Carbon dioxide capture and storage: Dir. 2009/31/EC - the geological storage of carbon dioxide. (4) Energy efficiency: Dir. 2012/27/EU on energy efficiency; European Commission, COM (2011) 109 final - Energy Efficiency Plan 2011. We then have (5) Reg. 443/2009 - setting emission performance standards for new passenger cars and (6) Dir. 2009/30/EC regarding the setting of fuel quality standards, which stipulates that greenhouse gas emissions produced by the fuel cycle must be reduced by at least 6% by 2020.

have reduced their greenhouse gas emissions by 21% overall; if further policies – currently at the planning stage – are implemented, this figure could reach 24%⁴.

Figure 1. EU-15 and EU-27 emissions trends from 1990 to 2011 (UNFCCC, 2013)



The emissions trading scheme (EU ETS), which got under way in 2005, has proven to be a fundamental pillar of EU climate change policy. The sectors it covers, which account for 40% of the emissions of the entire EU, reduced their greenhouse gas emissions by 16% during the first two stages of implementation (2005 -2012). In addition, the EU ETS has helped to reduce emissions at a substantially reduced cost to the economy. In particular, according to some estimates, the cost in terms of GDP has been 0.01% per annum⁵. It is important to mention, however, that the first two phases of the trading scheme were characterised by a general over-allocation of permits through the National Allocation Plans, which, together with the reduction in emissions due to the economic crisis, has kept prices lower than expected.

As regards carbon leakage, analysis of the first two implementation phases of the EU ETS has shown that none of the sectors covered by the scheme have undergone significant relocations due to the cost of implementing the EU rules. The

⁴ EEA, *Trends and projections in Europe 2013 – Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013.

⁵ Ellerman et al. (2010) Carbon Price.

free allocation of emissions permits, and their low prices, in particular, have effectively contained the cost to companies⁶. On the other hand, it has nevertheless been acknowledged that such low carbon prices have significantly reduced the incentive for companies to invest effectively in low-carbon technologies in the long term, thereby undermining one of the main goals of the scheme. In this regard, it would appear to be necessary to adopt a set of reforms, both in the short and medium-to-long term, in order to remedy, in a structural manner, the surplus of permits and shore up their prices, to ensure that the trading scheme fulfils its potential in terms of both the economy and emissions reduction.

As regards the renewable energy target, in 2011, gross final consumption of energy from renewable sources in EU-27 had reached 12.7% of the total. With this, the EU has met and surpassed its target set for 2011 - 2012 (10.8% of the total) and is successfully moving towards achieving its target for 2020 (20%)⁷. The development of power generation from renewable sources has found fertile ground, to varying degrees, in the Member States. Sweden, Latvia, Finland and Austria, for example, have had the highest shares of renewable energy in the EU (respectively 46.8%, 33.1%, 31.8% and 30.9% of gross final consumption). Looking at medium-term objectives, Romania and Italy have been particularly virtuous and have significantly exceeded their required targets. Germany and Spain have achieved their goals, with a decent surplus, while France and Poland have failed, albeit slightly, to reach their targets.

⁶ Ecorys, Öko-Institut, Cambridge Econometrics, TNO, “Carbon Leakage Evidence Project. Factsheets for selected sectors” (2013).

⁷ EEA, Trends and projections in Europe 2013 – Tracking progress towards Europe's climate and energy targets until 2020, EEA Report No 10/2013.

Figure 2. Electricity generation by source in 2007, as a % of the total. Source: Eurostat (2013)

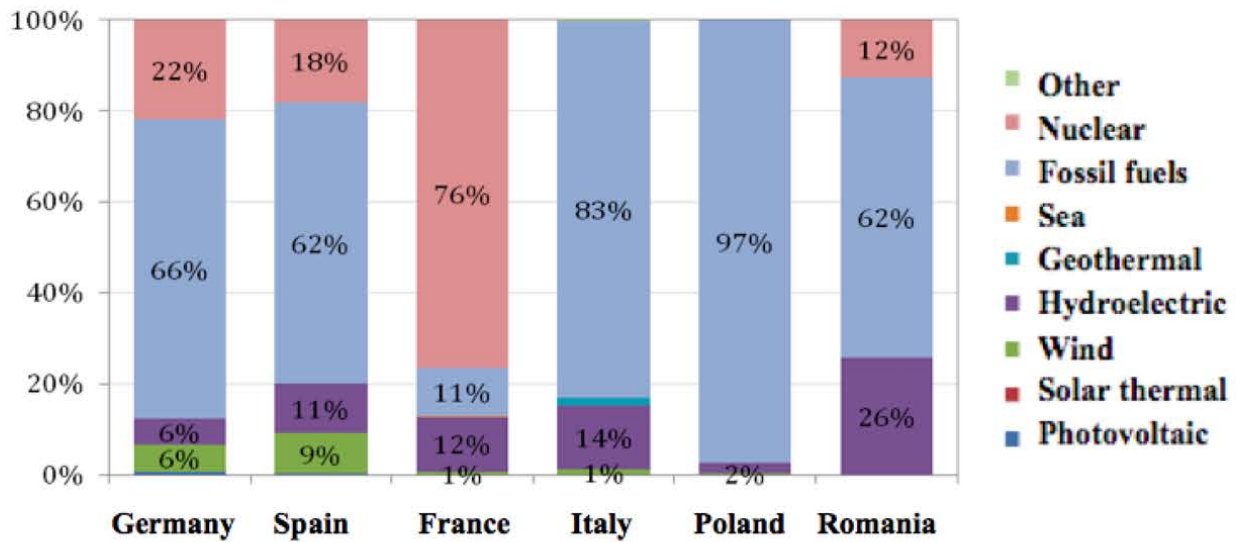
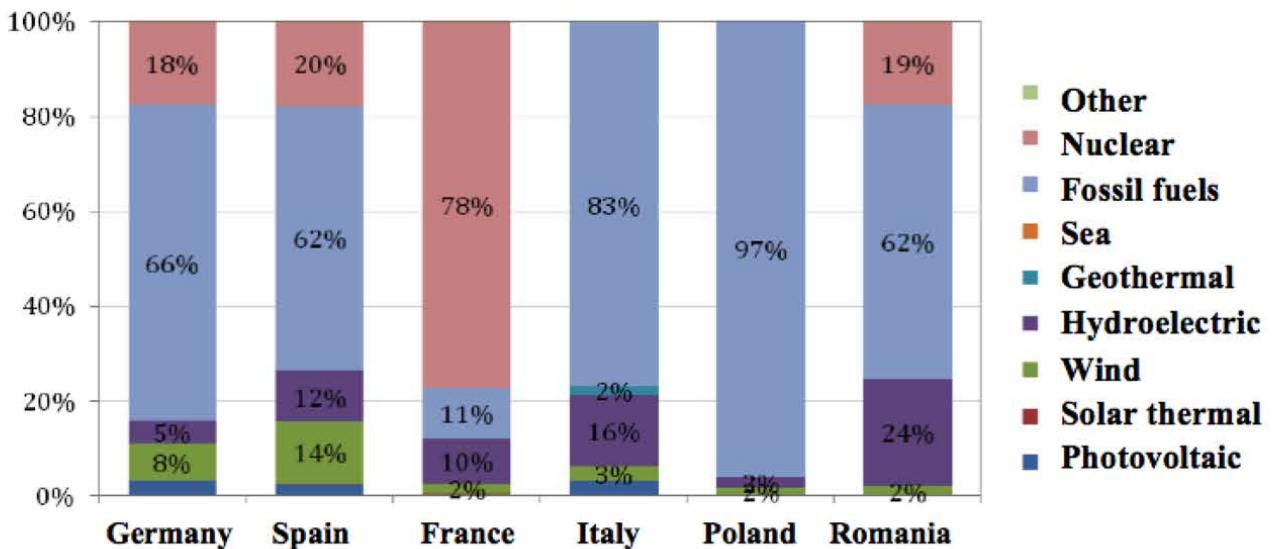


Figure 3. Electricity generation by source in 2011, as a % of the total. Source: Eurostat (2013)

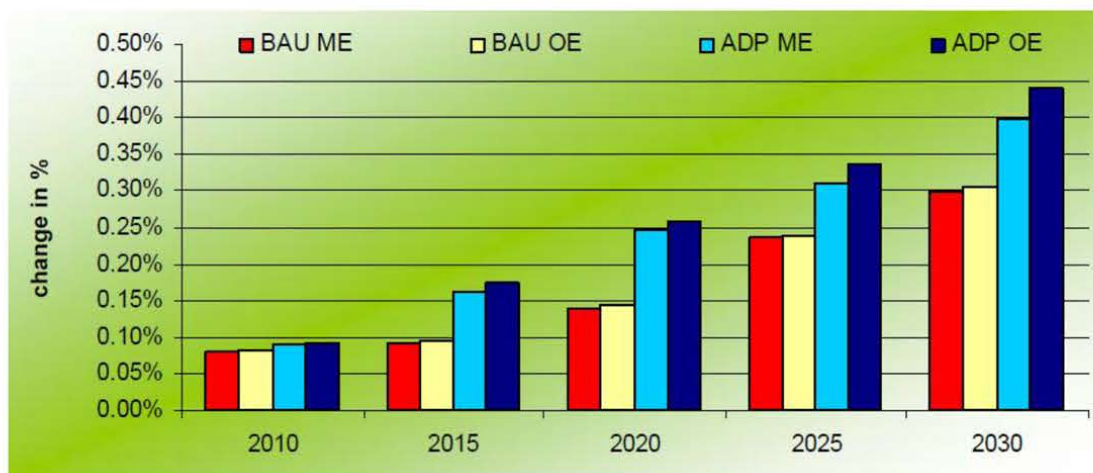


According to the Commission's findings, the growth of the sector remains constrained by the complexity of planning permission procedures for the construction of the necessary plants and the persistent inadequacy of network infrastructure to meet the needs of the new energy generation systems.

However, the development of renewables has had a positive impact on the economy of individual Member States, thus confirming the Commission's forecasts. In the midst of an economic crisis, it has generated new investment and created new jobs: the sector has been confirmed as being more capital- and labour-intensive than the fossil fuel energy sector. In 2012, the wind power industry

alone helped to create 249 000 jobs (a figure that will more than double by 2020), increasing its contribution to EU GDP by 33%⁸. In the same year, the photovoltaic sector created 265 000 new jobs.⁹ Projecting the energy scenario to 2020, it has been calculated, in a 'business as usual' scenario, that the renewable energy sector will make a 0.14% contribution to EU GDP and could make a 0.25% contribution if additional efforts were made to strengthen the green component of the economy. A possible maximum target of up to 0.45% of EU GDP could be achieved if it were decided to extend the 20-20-20 package guidelines until 2030.¹⁰

Figure 4 – GDP variations (as a percentage) in the various scenarios. Source: Fraunhofer ISI et al., 2009.



The EU agenda has, moreover, led Europe to become the leading world investor in renewables. In 2012, the sector accounted for EUR 244 billion in global investment flows. The European Union was responsible for most of these (32.7 %), followed by China (27.3 %) and the United States (14.7%).

The development of renewable energy sources has, of course, been supported by substantial public funding, at national and EU level. Between 2007 and 2013 the European Regional Development Fund and Cohesion Fund spent a total of EUR 4.7 billion to support the deployment and use of plants generating energy from renewable sources. 22% of these funds went to Italy. In addition to this funding, various kinds of incentives and subsidies have been introduced at national level,

⁸ EWEA, 2013, Wind energy facts, available on www.ewea.org

⁹ EPIA, 2012, EPIA Fact sheet: Job creation, available on: <http://www.epia.org/news/fact-sheets/>

¹⁰ Fraunhofer ISI et al., 2009, The impact of renewable energy policy on economic growth and employment in the European Union

which, especially recently, have begun to have an adverse effect on consumer bills. It should be taken into account, however, that any change in the energy mix may involve substantial initial investment and will have substantial benefits only in the medium to long term.

Confirming the importance of having different binding targets, the goal of improved energy efficiency, the only one which is just an approximate guide, will not be achieved. The range of measures taken to support energy efficiency in the EU is too piecemeal and lacks the necessary harmonisation. Only four countries – Bulgaria, Denmark, France and Germany – are making good progress in reducing primary energy consumption. In the rest of the EU there is a lack of sufficiently ambitious policies to achieve the target. With regard to energy intensity, substantial differences between the EU Member States have been highlighted. For example, while the energy intensity of Bulgaria (712 tonnes of oil equivalent needed to produce EUR 1000 of gross domestic product) may have decreased by over 30 % between 2000 and 2010, it is still just less than eight times that of Denmark (90.9) and more than five times that of Germany and Italy (respectively 129 and 121), both of the latter countries having a highly manufacturing-oriented industrial system¹¹. At the sectoral level, the reduction is dominated by the construction industry, which alone is responsible for 41 % of the energy savings achieved in Europe. Studies conducted in recent years on the ability to create jobs in the energy efficiency sector show that for every million euro of additional investment in energy efficiency measures, an average of 19.3 new jobs are created, both directly and indirectly. This figure certainly gives an idea of the potential positive impact in terms of employment that the strengthening of energy efficiency targets could have on the EU economy.

Given that the high price of energy, especially for industry, is a clear obstacle to the competitiveness of the European industrial system, if EU lawmakers impose energy efficiency constraints with a view to encouraging EU companies to invest in technologies that reduce energy intensity, this would have an indirect impact on competitiveness in the medium-to-long term. While some sectors, such as the

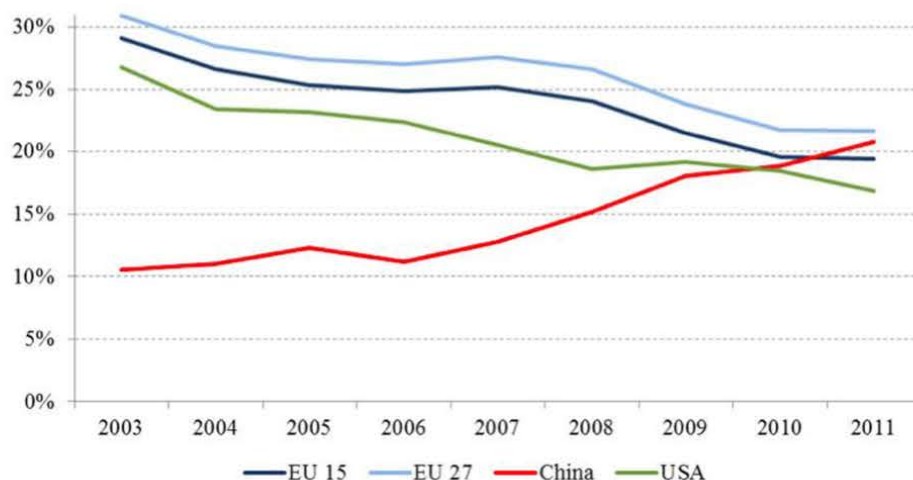
¹¹ EEA, *Trends and projections in Europe 2013 – Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013

paper industry, driven precisely by high energy prices, have independently decided to substantially reduce their consumption (for the same product), most other energy-intensive industries need special energy efficiency schemes, dedicated measures and, in all likelihood, binding targets that need to be met.

Industrial energy price trends in the EU have grown steadily in recent years, rising from an average of 6 cents per kWh in 2004 to over 13 in 2011. However, the share of that increase that is due to emissions reduction is less significant than might be expected (less than 1 cent/kWh).

Over the same time frame, the competitiveness of the EU manufacturing sector, which accounts for a significant, though declining, share of EU GDP, has decreased significantly. The share of EU manufacturing output compared to the world total, therefore, has fallen when compared to China's share, but has remained essentially unchanged compared to the US, where energy prices are known to be significantly lower.

Figure 5. – Shares of global manufacturing output¹²



Furthermore, the loss of industrial competitiveness began well before the entry into force of the policies and measures that make up the 20-20-20 package. Since the 20-20-20 package was introduced in 2009, on the contrary, the main

¹² European Commission, *Competitiveness report 2013: no growth and jobs without industry*, EU COMM, 09/2013, MEMO/13/815, 2013 .

competitiveness indices have stabilised somewhat. EU energy and climate policies cannot, therefore, be held responsible for the loss of competitiveness of European industry, as is sometimes claimed.

These policies, however, have 'forced' EU industry to move towards continuous technological innovation. Indeed, in recent years the EU has produced and filed more patent applications than in the past. More specifically, with regard to the key green growth technologies, Europe has strengthened its global dominance by filing 44% of all patents relating to electrical machinery and energy technologies, 61 % of all patents concerning transport and 51% of all those relating to engines, pumps and turbines.¹³

Whether the cause be the continuing economic crisis or EU lawmakers' lack of courage, it is important to stress that the policies introduced by the 20-20-20 package have not even fully achieved the improvement of the EU's economic conditions that was expected when they were introduced, which was an integral part of the European green growth paradigm. From a more microeconomic point of view, it should also be pointed out that our energy and climate policies have not produced any significant improvements in the fuel poverty conditions in which more and more European citizens are being forced to live, especially in Eastern Europe.

Although difficult to quantify, when assessing the impacts of the EU's climate and energy policies, it is important also to consider the relevant externalities. In particular, some studies have shown that raising the EU emissions target would help to reduce the costs related to the reduction of other air pollutants by EUR 2.6 billion compared to the current target and by EUR 3.6 billion compared to the baseline scenario, in addition to the cost reductions that would result from the improved health of EU citizens (estimated savings of between EUR 3.3 and EUR 7.6 billion by 2020)¹⁴. Furthermore, thought should clearly be given to the disastrous economic impact on GDP that would occur as a result of the worsening of climate change in the hypothetical 'no-action' scenario that the Union is striving to avoid.

¹³ European Patent Office, 2012

¹⁴ European Commission, *Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage. Background information and analysis*, COM(2010) 265 final, 2010

The most important issues that have emerged from this analysis are certainly those relating to the need for Europe to show effective leadership with regard to the global climate change agenda, and to strengthen that leadership, without foregoing that vital competitiveness of its industrial system and the benefits of green growth.

It is a given fact, borne out by the above-mentioned data, that up to now Europe has not suffered, as has sometimes been suggested, any negative economic impact from the ambitious climate and energy policies implemented.

These short- to medium-term data, however, are likely to be inexorably eroded in the medium to long term due to the great fluidity of the international energy scenario once again and the incisiveness with which the other major international players have made their own energy specialisation choices.

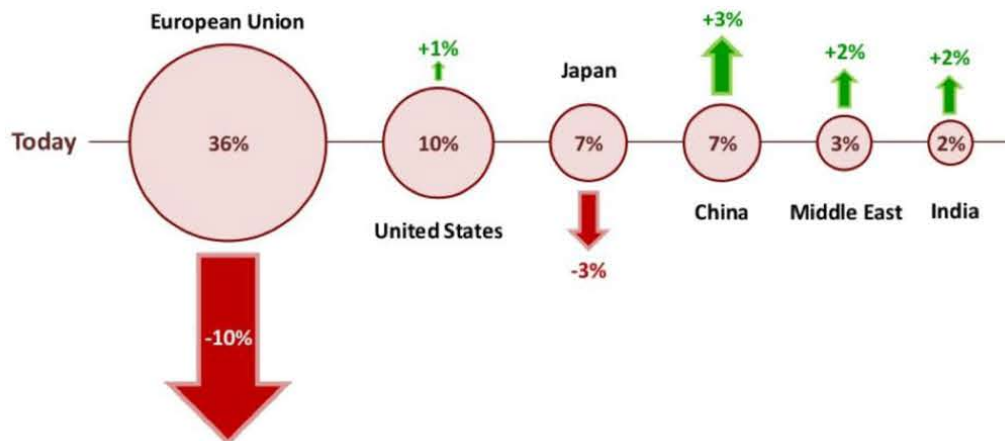
As the IEA has made clear, Europe has been and is noticeably absent from the main driving forces that are currently able to shape our global energy future. The same IEA forecasts point out that it is precisely Europe itself, not having an active role, that is likely to become the region in which the negative effects of the new international energy scene are more strongly felt.

Whether unconventional energy sources enable the US to maintain, in the long term, its status as an energy exporting country, whether the Middle East begins to dominate the international oil market once again, whether India, China and non-OECD countries decide to base their own energy paradigm on gas, coal or an increasing share of renewables, Europe will nevertheless see its economy weakened by medium- to long-term political decisions that are not implemented in full and are lacking in courage.

Particularly in energy-intensive industries such as the production of iron and steel, cement, glass, paper and oil derivatives, in which energy accounts for the largest share (between 30% and 70%) of total production costs, it is estimated that in the absence of a more effective energy (and, of course, climate) policy that is able to compete with those of other global players, Europe will, in the medium to long term, lose more than 10% of its global market share. This reduction takes on a vital importance if one considers that these sectors account for about 20 % of total industrial output and employ around 25% of the total workforce. It is a clear

example of the negative economic effects of the lack of a clear direction in EU energy policy.

Figure 6 – Variations in world shares of output of energy-intensive industries. Source: IEA, 2013¹⁵.



Similar risks of contraction are expected in the European oil-refining sector, which will be adversely affected by the increased capacity of non-OECD countries to meet their domestic needs, and for the energy utilities sector, which, in Europe, will face increasing difficulties in making sufficient profits to ensure the necessary modernisation of energy production plants.

This somewhat pessimistic medium- to long-term scenario, which puts forward the plausible theory of Europe's marginalisation as regards the shaping of the future global energy landscape, is likely to be exacerbated in terms of the EU's ability to lead the international climate change agenda and the drastic reduction of the EU's 'relative weight' in global greenhouse gas emissions. The mere quantification of such emissions in Europe, in fact, shows that they have been reduced from 19% of the world total in 1990 to 11% in 2013 – a figure that will reach 4-5 % in 2030¹⁶.

One possible remedy can only lie in the spirit with which, years ago, Europe imagined its sustainable future in the green growth paradigm, able to combine growth and economic and social development with respect for the environment and nature. Between 1990 and 2010, the 27 EU Member States were able to

¹⁵ International Energy Agency (IEA), 2013, *World Energy Outlook 2013*.

¹⁶ Business Europe, 2013, *A competitive energy and EU climate policy*

increase their GDP by 41%, decoupling it from greenhouse gas emissions which, over the same time, decreased by 17%.

Europe will be able to overcome the energy and climate challenge it is facing only if it recovers the spirit and will that drove the creation of that model of sustainable development. In contrast with the timidity with which, at times, it currently expresses fundamental choices for its future, EU policy should transform that model of sustainable growth into bold and resolute choices and decisions about its energy, environmental and industrial future.

The starting point for the launch of more vigorous action in this regard could be that very same increase in the emissions reduction target, which has long been debated within EU decision-making bodies.

Benefiting from the lower costs brought about by the economic crisis, the EU would spend only EUR 11 billion more than what it is spending to achieve the current target¹⁷.

It is precisely because of the impact of the economic crisis that the cost of achieving the current EU targets would in any case be reasonable, amounting to 0.5 % of EU GDP by 2020. The costs associated with reducing emissions by 30% instead would be 1.26 % of EU GDP. Both of these estimates would be significantly reduced if other major economies were to unite with Europe to combat climate change¹⁸. In addition, the principles and approach to the de-carbonisation of the economy described in the EU Roadmap 2050, for instance, deserve to be pursued more courageously and, after a debate with the stakeholders concerned, made an integral part of the EU regulatory framework. In this regard, the Commission's recent effort to set a more ambitious target for 2030, in keeping with the long-term goal set out in the Roadmap 2050, is of major importance. This should lead to the determination of quantitative targets, which will be set out in the first few weeks of 2014. Equally important is the Commission's effort to reform the ETS system for the trading of permits, in order to ensure an appropriate carbon price.

¹⁷ European Commission, *Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage. Background information and analysis*, COM(2010) 265 final, 2010

¹⁸ Bosello F., Campagnolo L., Carraro C., Eboli F., Parrado R., Portale E., 2013: Macroeconomic Impacts of the EU 30% GHG Mitigation Target, 2013.028, working notes.

The direct and indirect subsidies with which the EU is still supporting fossil fuels, which, in addition to being in quantitatively greater numbers than those granted to renewables, have further hidden costs relating to public health and call for a careful review.

Energy efficiency, which is virtually the only instrument available to the Union to reduce the gap in competitiveness between its industrial system and that of countries with much lower energy prices (such as the US), absolutely must be made a compulsory priority in upcoming energy and climate policies. In this regard, the introduction of binding targets and incentives specifically aimed at improving energy efficiency would be of great benefit.

The obvious discrepancies that still exist in the energy sector offer EU governance the opportunity to focus their attention on the new EU Member States in which, clearly, the positive impact of green investment would be multiplied, both in terms of its effects on the environment and climate and in economic terms.

Clearly, however, the theories discussed above require a truly common and harmonised approach to the choices that Europe is called upon to make, at least in relation to energy and climate change.

If we continue with our current discordant approach in key areas that are common to the entire EU, such as energy and climate, it will be difficult to be able to meet the future challenges of the new international scenario with the same incisiveness and strength with which other countries – such as US, Brazil, China, India or the Middle East in general – have acted.

Such harmonisation would also offer a real opportunity to put into practice initiatives that have long been discussed, such as, for example, the common European electricity network, often called the 'super-grid'.

Such common infrastructure would provide the opportunity, through the deployment of ordinary technology, which is certainly within the EU's potential, to connect the power grids of the Member States, thus taking a decisive step towards the common goals of security and affordability of supply.

The European super-grid, which is currently being thwarted by problems of a regional nature and by bureaucratic and political difficulties, would also allow for a more effective integration of energy generated from available renewable

sources throughout the Union, the benefits of which would be felt in the medium term.

For reasons related to the profile of the electricity demand curve of the various EU countries (determined by climate, customs and different time-zones) and the ability to circumvent the problem of the intermittency of renewable sources, the common European grid would be able, in the medium term, to contribute to a significant reduction in electricity prices, which is one of the main issues limiting the EU's industrial competitiveness.

The individual aspects, considerations and proposals set out in the conclusions of this paper should be interpreted only as the corollary of a more detailed and far-reaching idea of the role of Europe and its institutions in relation to the global climate change emergency and, even more generally, to decisions about our future.

On the one hand, it is clear that we have to rethink our model of production, consumption and development by further freeing them from the constant, destructive search for a compromise between environmental resource exploitation and the goal of maximum economic efficiency. On the other, we need to abandon our timidity and our essential inability to choose, by aiming at the future, which otherwise, as the international energy scenario shows, will result in the relativisation and marginalisation of the role of a Europe that is incapable of deciding and of building its own future.

