

EXECUTIVE SUMMARY

Since 2008, the EU has made a huge leap forward in promoting the transition to a low carbon economy

In recent years, the EU has set an ambitious agenda to foster the transition to low carbon economies. The Climate and Energy Package adopted in late 2008 sets an EU-wide 20% greenhouse gas emission reduction target for the 27 Member States by 2020, 20 % share of energy from renewable sources in EU gross energy consumption by 2020 and a 20% decrease in primary energy use by 2020. At the core of this strategy is an objective of achieving greenhouse gas emissions reduction while improving security of supply and promoting the emergence of new green sectors. The recent crisis has not put a brake on this level of ambition as these 20/20/20 targets are part of a broad coordinated exercise of economic and fiscal policies in the context of the European Semester.

Energy costs matter...

Recently, the cost of energy has emerged as an important dimension of international competitiveness of European industries, in particular in light of the "shale gas revolution" taking place in the US. Energy matters for the competitiveness of our economies as it affects the production costs of industries and services and the purchasing power of households. Energy costs are not only driven by the type of fuel mix used and consumed, but they have been influenced by our energy policy choices as well as by technological evolutions that can contribute to reducing our energy needs. This report provides analysis and evidence for the economic impact of energy developments in the EU and Member States over the past years. It could contribute to discussions about economic aspects of energy and climate policies and how they can best contribute to fostering the transition to low carbon economies.

...but the EU manufacturing has been successful in reducing its energy intensity

The comparison of energy costs in Europe and Member States and in the rest of the world helps assess our economies in terms of energy cost competitiveness. Chapter I.1 develops unit energy cost indicators that bring together the energy price and the energy intensity dimensions. One salient feature is that the dynamics of energy costs has been positive in the EU, but also in the rest of the world. Another salient characteristic is that, in a global context, the EU manufacturing sector exhibits a low level of energy costs relative to both output and value added. This positive outcome is mostly explained by the low energy intensity of the sector. The EU manufacturing sector has so far responded to energy price increases through sustained energy intensity improvements, thus maintaining its relatively favourable position. Although not visible over the longer period (1995-2009), the latest period analysed (2005-2009) shows that these improvements have been driven partly by restructuring towards sectors with lower energy costs as energy intensive industries have been more affected by energy cost increase pressure. In addition, Member States with high share of energy intensive industries are most exposed to unfavourable unit energy costs developments.

High energy prices should remain a concern, taking account of the increasing EU-US energy price gap.

Against this background, one cannot ignore the recent spectacular development of the production of shale gas and oil in the US which has started in 2009-2010 and is often seen as a major competitiveness threat in the near future. Chapter I.2 provides a focus on more recent developments in the US and EU. While the surge in US shale gas has led to marked changes in the US energy sector and a reduction in the US energy trade balance in GDP terms, the impact on the EU is limited at the moment as no major shift in the EU-US goods trade balance nor significant divergent trends in the overall production structure of manufacturing industry are observed and can be

ascribed to the shale gas revolution. However, this should not imply complacency on the widening EU-US energy price gap as the full impacts may become visible only after some delay. Moreover, energy efficiency improvements may slow down in the EU and speed up in US due to diminishing low cost options, and increased policy effort. Consequently, high energy prices for EU industries should remain a policy concern, even more so in case the EU-US energy price gap will continue to increase.

It is therefore strategic for the EU to see whether and how energy prices have been affected by policy developments. This report analyses three important components of energy cost – electricity and natural gas retail prices, and carbon prices. EU electricity and gas markets have been fundamentally reshaped by the significant energy and climate policy initiatives over recent years, in the areas of market opening, renewables penetration, climate change mitigation, and security of supply. The report explores the impact of these policy reforms on end-user electricity and gas prices as after all, these are what industries and households are ultimately paying. The report also looks at carbon prices as it is expected to provide the price signal to change our consumption behaviour and reduce our carbon footprint.

Market opening in electricity and natural gas has brought significant downward price effects. Renewable support has contributed to increasing electricity prices...

Analysis shows that while fossil fuels still remain key drivers of electricity and natural gas price formation, market opening and competition appear to have significant downward price effects for both household and industrial consumers. In both markets, empirical estimates confirm that EU energy policies, such as unbundling of networks and market opening lower retail prices. In addition to these positive developments, natural gas and electricity prices are also affected by specific factors. In the natural gas market, security of supply plays an important role. High import dependency and low diversification of imports can significantly contribute to increasing end-user prices for industries and households. Hence Member States which rely on one foreign source are likely to be exposed to higher prices. In the electricity market, support to less mature renewables technologies has translated in higher electricity prices for both industry and households segments. Furthermore, in some Member States, the burden has not been evenly shared across consumer segments, i.e. industries and households.

... while renewable production, among other factors have negatively affected carbon prices.

By contrast, the carbon price is not found to have any statistical significant impact on electricity retail prices. The latest data on carbon price evolution show that its level is far lower than what was expected when the Energy and Climate Package was adopted in 2008. As it is, although the carbon price is seen as one of the key pieces for the transition to low carbon economies, it fails to provide a strong price signal for consumption behaviour and for investments in clean production technologies. The empirical estimate carried out in chapter II.2 analyses the main drivers of carbon prices and shows that economic factors have played a major role in driving carbon prices in phase 2. Without any doubt, the recent economic crisis has contributed to lowering the demand of allowances, contributing to a large part to the ETS market imbalance, hence the decrease in the carbon price. However, the European carbon market is not isolated from other shaping factors such as the fuel switching behaviour of the conventional power producers and the renewable penetration among other drivers. There is evidence that the deployment of renewable production has also contributed to a lesser extent to this ETS market imbalance, therefore lowering the carbon price. Such results show the

importance of economic factors in driving carbon prices, but highlight the interplay between energy and climate policies and ultimately the trade-offs policy makers are confronted to when designing climate change and energy policies combining market instruments and support mechanisms.

Compared to the rest of the world, the EU has been successful in developing wind and solar energy

Finally, the Energy and Climate agenda provides a comprehensive regulatory and policy framework that favours the emergence of new green sectors. This means that energy markets in the context of well-designed policies, can offer many opportunities for growth and jobs ⁽¹⁾. The report scrutinises the development of new technologies and energy sources - solar and wind - and their impact on trade flows as a way to assess one dimension of competitiveness. Chapter III.1 provides an overview of what happened in the EU and other parts of the world. In Europe, the support to renewable sectors stepped up from 2007 and has represented a strong opportunity to accelerate the expansion of less mature technologies such as wind and solar. Compared to the rest of the world, the EU has been one of the frontrunner in developing wind and solar energy although other countries have been catching up since.

The EU has developed strong positions in the wind equipment sector...

The expansion of renewables provided opportunities in terms of industrial equipment and trade flows. Chapter III.2 gives a closer look at trade developments in the EU and Member States in the wind and solar sector. Evidence shows that the EU displays strong comparative advantages in the wind industry, but has not managed to develop such position in the solar industry. When analysing the drivers of trade of wind and solar equipment, one interesting result is the role of knowledge in driving trade flows, with the EU export performance being strong in technologies where the EU has a strong portfolio of patents. This suggests that innovation and R&D policies should be seen as key policies in promoting the emergence of new green sectors.

... but the fuel costs avoided by renewable developments are still too low.

Another expected benefit of developing renewable is the impact on the energy trade bill and its contribution to reducing our energy dependence. The EU dependence on fossil fuels is higher than in the US, and the EU27 trade deficit in energy products amounted to 3.2% of GDP in 2012. Chapter III.3 shows that renewables help reduce import fuel costs and contribute to improving the energy trade balance, but only to a limited extent. Nonetheless, the avoided fuel costs are expected to rise in the coming years, due to increasing production of renewable energy in the EU and projected increase in EU fossil import prices.

(1) COM(2012)663.