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Securing Energy Efficiency to Secure the Energy Union

How Energy Efficiency meets the EU Climate and Energy Goals

Executive Summary

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''It is necessary to fundamentally rethink energy efficiency and treat it as an energy source in its own right, representing the value of energy saved. As part of the market design review, the Commission will ensure that energy efficiency and demand side response can compete on equal terms with generation capacity.''

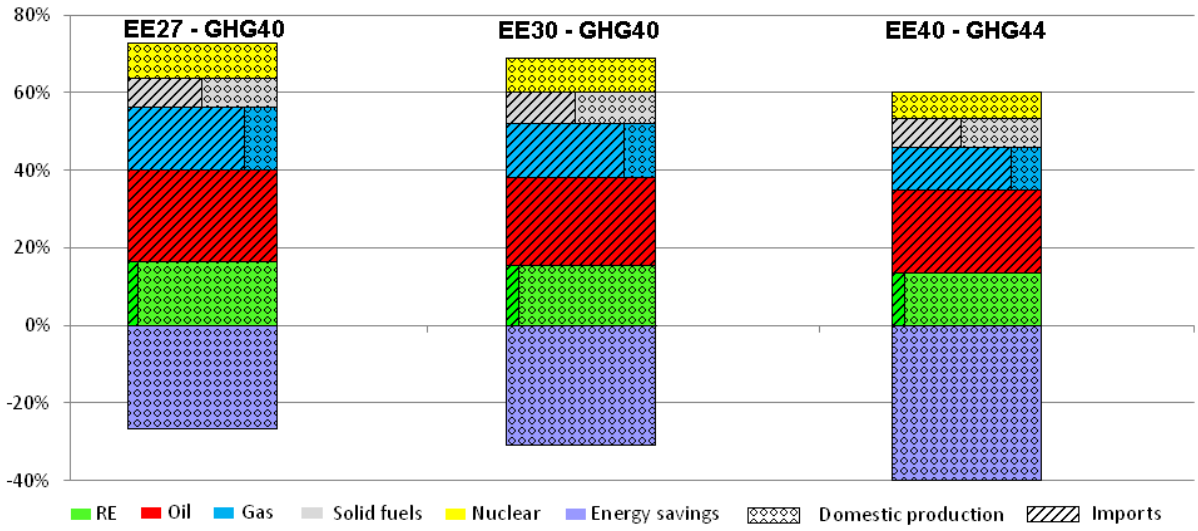
A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy
Energy Union Package, COM(2015) 80 final

Executive summary

Energy saving will overtake oil as Europe's first fuel in 2030

In line with the Energy Union strategy, the EU climate and energy framework sees energy saving as the EU first fuel in 2030. In the 40% energy saving scenario, EE40, the sum of domestic production of energy saving and renewables will overtake the sum of imported fossil fuels (oil, gas and solid fuels) (Figure ES.1). Making energy efficiency the mechanism for delivering moderation of demand will enable the EU to meet its objectives in terms of security of supply, climate change and competitiveness. Under the EE27, EE30 and EE40 scenarios, the EU energy import dependency would not rise from its current level. The EE27 and EE30 scenarios would allow Europe to meet its 2030 climate objective by reducing greenhouse gas (GHG) emissions by 40 % as compared with the 1990 level and the EE40 scenario would lead to greater reductions (44 %). In the longer run, the decarbonisation scenarios should give EU industry a competitive advantage and end-use consumers would benefit from energy and cost savings.

Figure ES.1 EU primary energy mix in 2030 in the EE27, EE30, EE40 decarbonisation scenarios



Key point: With 40% energy saving target, domestic production of energy saving and renewable energies will overtake the sum of imported fossil fuels all together (oil, gas solid fuels) in 2030.

Source: PRIMES 2014

A strong policy signal is required from the 2015 Paris Climate Summit (COP21) to value the carbon saved globally by pricing GHG emissions and making energy saving the niche fuel for investors, especially when energy prices are low

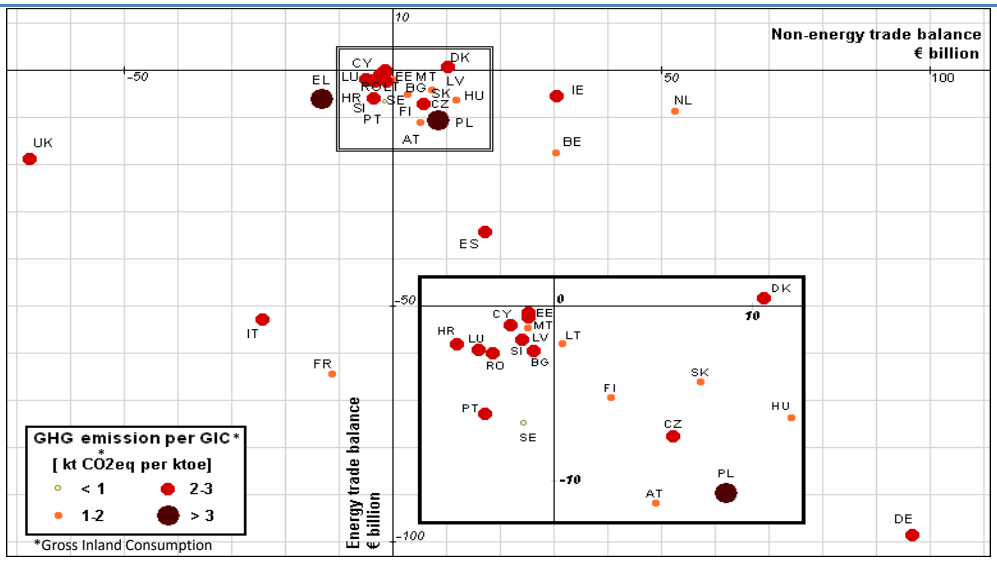
Decarbonisation of the EU energy system requires significant investment. The EU Emissions Trading Scheme (ETS) is one policy instrument that provides financing opportunities, but in the absence of a binding and transparent global climate deal, carbon pricing is not practised worldwide and the ETS has been blamed for the partial relocation of energy-intensive industries to regions without climate regulations. COP21 is therefore an important step towards creating a global carbon market in which a monetary value is given to the carbon saved by pricing GHG emissions. The ETS carbon prices

considered in the decarbonisation scenarios for the EU 2030 climate and energy framework vary from €39/t CO_2 eq. in the EE27 scenario to €6/t CO_2 eq. in the EE40 scenario. Such low carbon prices make the decarbonisation more challenging from a financing perspective, especially if the societal perspective is not privileged when estimating the capital cost of the decarbonised energy system.

If maintained over a period of decades, low energy prices will reduce the EU fossil fuel import bills (2.8 % of EU GDP in 2013, when fossil fuels accounted for 72 % of the EU primary energy mix) and consequently the "energy purchases" cost of total energy system. This will free up resources that could be used for investments in energy efficiency. Current energy prices are almost half those used to estimate energy purchases cost in the decarbonisation scenarios. A price signal on GHG emissions would make energy saving the niche fuel for investors, especially in a period of low energy prices.

Fossil fuel import bills have a significant impact on individual Member States' trade balances. The trade deficits of Austria, Finland, Lithuania, Poland and Spain were entirely due to energy in 2013 (Figure ES.2). With the exception of Denmark, the only EU country with an energy trade surplus, all Member States have experienced increased energy trade deficits in the past five years. In the case of Sweden, the EU country with the lowest GHG emissions per unit of energy consumed as a result of the low proportion of fossil fuels in its primary energy mix, over 80 % of the deficit is due to energy; this is equivalent to 1.5 % of the country's 2013 GDP. The highest relative expenditure on fossil fuel imports in 2013 was in Malta (9.4 % of GDP), followed by Bulgaria, Cyprus, Hungary and Lithuania (all over 6 % of their national GDP).

Figure ES.2 Net energy trade balance, non-energy trade balance and energy-related GHG emissions by Member State (2013)



Key point: Fossil fuel imports exacerbate most Member States' trade deficits and increase their contribution to global warming.

Source: Eurostat: EU trade since 1988 by SITC [DS-018995] and EEA: greenhouse gas emissions [env_air_gge]

A framework for De-risking Energy Efficiency Investments (DEEI) is needed to ensure that energy saving compete on equal terms with generation capacity

Energy efficiency investments suffer from investors' perceived risk, which increases financial cost and consequently the capital-cost of the total energy system. A guarantee fund for such investments

would reduce financial cost by providing a guarantee for energy efficiency loans, thus lowering the interest rate and consequently the capital cost. Furthermore, lowering the interest rate for such investments would help energy saving to compete on equal terms with generation capacity. As regards prevailing capital costs (the most important financial parameter), connected risk and basic rate components can be separated by using the "Levelised Cost of Conserved Energy (LCCE)" as the financial metric for costs/benefits analysis. The DEEI framework could mitigate the perceived risk by providing a guarantee to lower interest rates. As a result, investors would estimate the Weighted Average Cost of Capital (WACC) on the basis of a lower risk premium and the capital cost would be reduced.

Investing in the development and deployment of low-carbon technologies should enhance the competitiveness of EU industry.

The decarbonisation of the EU energy system will lead to jobs and growth if the necessary investments are made in the development and deployment of low-carbon technologies. Innovation is needed at each stage of the transition to a low-carbon economy, from designing policy instruments to developing technologies as well as new business models, understanding impact of policies on individual choices and monitoring progress towards climate and energy targets. Major coordinated efforts to reshape skills and institutional arrangements will be required at EU, national and regional levels to ensure effective implementation of the EU climate and energy policies.

The EU is on track to meet its 2020 GHG emissions reduction target but not its energy efficiency target.

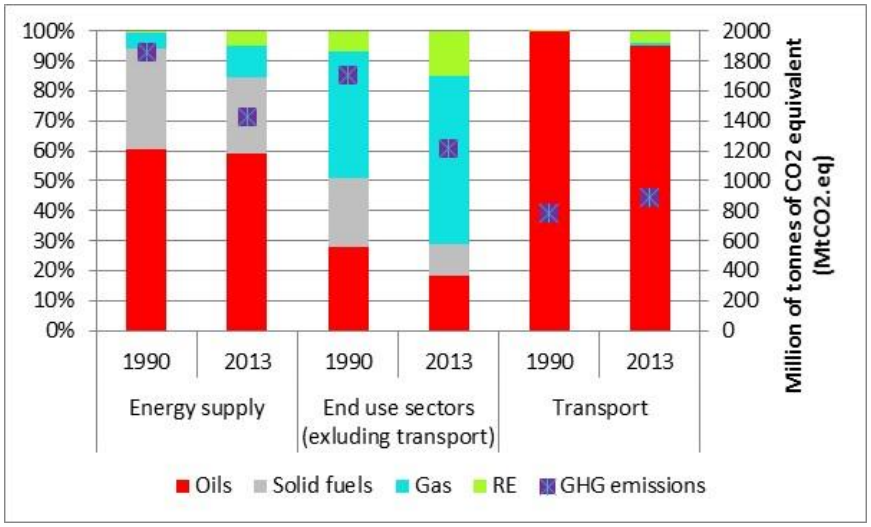
Decarbonisation of the EU energy system is well under way. The EU energy-related GHG emissions, which represented 79% of total GHG emissions in 2013, fell by 19% between 1990 and 2013. While total GHG emissions decreased by 21% over the same period. On the contrary, the EU energy efficiency target is unlikely to be met without additional measures. The sum of national indicative targets submitted by Member States to the European Commission corresponds to 17.6% primary energy saving compared to projections to 2020.

The restructuring of the EU economy (especially in eastern Member States), the recent economic crisis and the implementation of energy efficiency measures in end-use sectors resulted in total energy demand dropping back to 1990 levels. Combined with an increase in the proportion of renewables in the EU primary energy mix (almost three times more than in 1990) and the implementation of energy efficiency measures in energy supply, this accelerated the decarbonisation of power and heat generation. As a result, the EU economy improved its energy and carbon intensities while growth was decoupled from energy consumption and carbon emissions.

The power generation and energy-intensive industries covered by the ETS are responsible for 45 % of total EU GHG emissions and for 23 % of emissions reduction between 2005 and 2013 (Figure ES.3). Emissions reduction from power generation are projected to reach 58 %, 55% and 60% in the EE27, EE30 and EE40 decarbonisation scenarios as compared with the 2005 level, as a result of the implementation of renewable energy targets and energy efficiency measures. The scenarios project lower reductions from the energy-intensive industries: 32 % (EE27), 29 % (EE30) and 30 % (EE40).

The transport sector -aviation included- is characterised by an increase in GHG emissions (+12.8 %) between 1990 and 2013 (Figure ES.3). It is also the sector with the lowest emissions reduction in the decarbonisation scenarios (around 17 %). As a result, it will be the highest emitting sector in 2030 and will remain as dependent as it is today on imported oil.

Figure ES.3 Changes in primary energy mix and energy-related GHG emissions per sector



Key point: The transport sector is the only sector with almost no changes in the use of fossil fuels. It is also the sector with increased GHG emissions over the period 1990-2013.

Source: Eurostat for energy for energy and EEA for GHG emissions

Sectors covered by the Effort-Sharing Decision (ESD), which include buildings, transport, agriculture and waste, contributed 9.3 % of GHG emissions reduction between 2005 and 2013. Austria, Belgium, Ireland and Luxembourg are at risk of not meeting their national ESD targets by 2020. The buildings sector is projected to be the least emitting sector in 2030 as a result of more renovation of existing buildings and the zero-energy approach to new ones. Consequently, space heating will consume less energy and gas imports will be reduced. Emissions reduction are projected to be higher in the non-residential sub-sector than in the residential sub-sector (up to -73 % against 63 %, as compared with the 2005 level; EE40 scenario).

The EU climate and energy policy package will be streamlined to ensure better monitoring of progress towards 2020 and 2030 climate and energy policy goals.

The EU 2020 climate and energy policy package has been put together step by step, sector by sector over the past four decades. It is made up of various regulations, decisions and directives (Table ES.1). Gauging progress towards climate and energy goals is challenging, given the range of indicators used to assess implementation of individual policy measures and the inconsistency of reporting across Member States. For the post-2020 targets, the Energy Union intends to develop a more reliable and transparent governance system. Reporting on progress will be streamlined through integrated national energy and climate plans for 2021-2030. Consistent indicators need to be agreed and used to avoid duplication, ensure better interaction between policy measures and allow for progress to be monitored across Member States.

Table ES.1 The EU 2020 climate and energy policy instruments

2020 EU climate and energy targets (base year 1990, annual reporting)									
Emission Trading Scheme target (EU level) *Directives 2003/87/EC and 29/2009/EC and decision 2015/1814* (base year 2005, annual reporting since 2006, covers 45% of total emissions)					*Effort Sharing Decision targets (national level)* *Decision 406/2009/EC* (base year 2005, annual reporting since 2013, covers 55% of total emissions)				
DG in charge	***Framework***	***Policy measure***	***Sectors***	***Reporting***	***DG***	***Framework***	***Policy measure***	***Sectors***	***Reporting***
Climate Action	*Directive 2009/29/EC*	*Maximum CO_2 emissions*	*Power generation*	*Every year*	*Climate Action*	*Decision 406/2009/EC*	*Maximum CO_2 emissions*	*Buildings*	*Every year*
			Energy intensive industries	*Every year*				*Transport*	*Every year*
						Directive 1999/94/EC	*Label for new passengers cars*	*Transport*	*NA*
						Regulation 443/2009 and 333/2014	*Maximum CO_2 emissions for new passengers cars (average fleet)*		*Every year*
						Regulation 510/2011 and 253/2014	*Maximum CO_2 emissions for new light commercial vehicles (average fleet)*		*Every year*
						Directive 2009/30/EC	*Target to reduce life cycle of GHG emissions from fuels*		*Every three years*
						Directive 2009/33/EC	*Public Procurement for clean Vehicles*		*Every two years*
						Directive 2010/75/EU	*Target for Maximum Industrial emissions*	*Industry*	*Every three years*
Energy	*Directive 2009/28/EC*	*Minimum share of renewables*	*Power and heat generation*	*Every two years*	*Energy*	*Directive 2009/28/EC*	*Minimum share of renewables*	*Transport*	*Every two years*
								Buildings	
	Directive 2009/125/EC	*Minimum energy performance standard*	*Industry (energy related products)*	*NA*		*Directive 2009/125/EC*	*Minimum energy performance standard*	*Buildings and industry (energy related products)*	*NA*
	Directive 2010/30/EU	*Label*				*Directive 2010/30/EU*	*Label*		*NA*
	Directive 2012/27/EU	*Energy saving obligation*	*Energy providers*	*Every year*		*Directive 2012/27/EU*	*3% yearly renovation rates*	*Buildings (public only)*	*Every year*
		Mandatory audits	*Industry*	*NA*			*Indicative maximum primary and/or final national energy consumption*	*All sectors together*	*Every year*
						Directive 2014/24/EC	*Public procurement*	*All sectors*	*Every three years*

Key point: The EC developed a comprehensive set of policy instruments to ensure the EU 2020 climate and energy targets will be met.

Source: Compiled by the authors from various EC sources

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