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**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE
COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE
COMMITTEE OF THE REGIONS**

Renewable energy progress report

{SWD(2013) 102 final}

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Renewable energy progress report

1. INTRODUCTION

The Renewable Energy Directive 2009/28/EC ("the Directive") established a European framework for the promotion of renewable energy, setting mandatory national renewable energy targets for achieving a 20% share of renewable energy in the final energy consumption and a 10% share of energy from renewable sources in transport by 2020. These goals are headline targets of the European 2020 strategy for growth, since they contribute to Europe's industrial innovation and technological leadership as well as reducing emissions, improving the security of our energy supply and reducing our energy import dependence. The Directive also requires the simplification of the administrative regimes faced by renewable energy, together with improvements to the electricity grid, to improve access for electricity from renewable energy. It established a comprehensive sustainability scheme for biofuels and bioliquids with compulsory monitoring and reporting requirements. All biofuels used for compliance with the 10% target and that benefit from national support are required to comply with the scheme.

The purpose of this Report is to assess Member States' progress in the promotion and use of renewable energy along the trajectory towards the 2020 targets and to report on the sustainability of biofuels and bioliquids consumed in the EU and the impacts of this consumption in accordance with the Directive¹. The assessment covers recent developments and is based on the latest Eurostat data on renewable energy (for 2009 and 2010), Member State renewable energy progress reports submitted to the Commission in 2011², the Commission's own research, as well as research carried out for the Commission³.

As outlined in detail below, an impression is gained of a generally solid initial start at EU level but with slower than expected removal of key barriers to renewable energy growth, with additional efforts by particular Member States being necessary. Deviations from national plans increase the regulatory risk faced by investors and barriers that should, but have not yet been addressed through the implementation of the renewable energy Directive remain to be overcome. At EU and Member States level, further efforts are needed in terms of administrative simplification and clarity of planning and permitting procedures and for infrastructure development and operation. And further efforts are needed regarding the treatment and inclusion of renewable energy production within the electricity system. The general economic conditions in the EU today together with disruptive changes to support schemes for renewable energy (again, raising regulatory risk), add to the conclusion that further measures will be needed at Member State level in order to stay on the trajectory and for the targets to be achieved. Addressing such barriers will contribute significantly to the cost effective deployment of renewable energy and the achievement of the EU's targets. Technology development and cost reductions are also critical, and these will be explored in the Commission's forthcoming Communication on energy technology and innovation.

¹ Specifically, Articles 17 (7), 18 (2), 18 (9) and 23 (1-6).

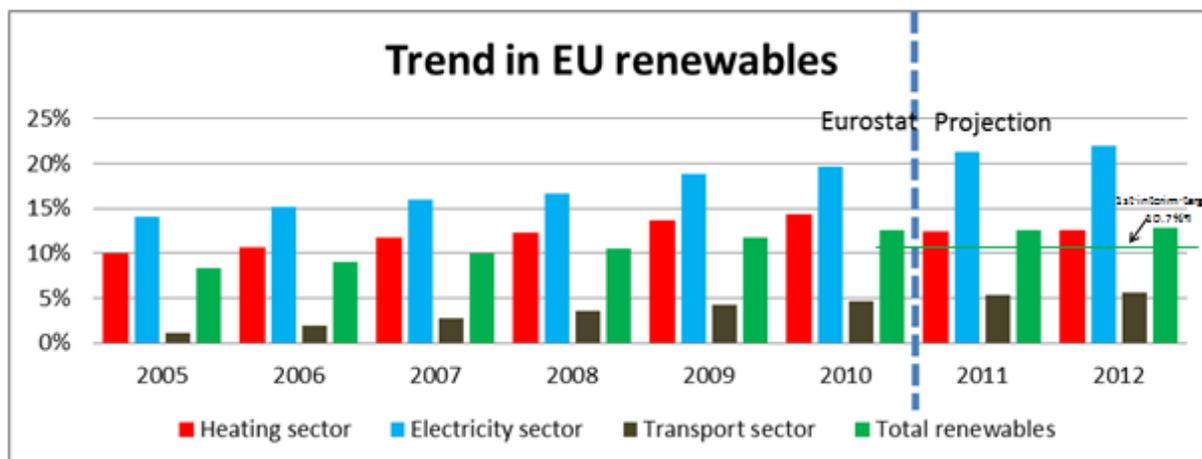
² Member State biennial renewable energy progress reports (2011): http://ec.europa.eu/energy/renewables/reports/2011_en.htm

³ *Renewable energy progress and biofuel sustainability, ECOFYS et al, 2012* http://ec.europa.eu/energy/renewables/reports/xxxxx_en.htm^{*}

2. PROGRESS IN RENEWABLE ENERGY DEVELOPMENT

With the implementation of the Renewable Energy Directive and national policies set out in National Renewable Energy Action plans ("plans"), most Member States experienced significant growth in renewable energy since the Commission's last progress report⁴.

Sectoral and overall growth of renewable energy in the EU (Eurostat)



In fact, the 2010 renewable energy shares of 20 Member States and the EU as a whole were at the level of or above 2010 commitments set out in their national plans and above the first interim target for 2011/2012⁵.

However a further analysis undertaken for the Commission modelling current policy initiatives and various barriers to renewable energy development⁶ (See Staff Working Document and associated report for further details⁷) reveals a less optimistic outlook for 2020. The analysis, which provides a conservative estimate of renewables growth compared to other sources, limits policies to those already in place, and reflects the economic crisis, ongoing administrative and infrastructure barriers and policy and support schemes disruption. This suggests future investment may decline or be delayed unless further measures are taken by Member States to achieve their targets. Given investment lead times of eight to ten years, any major disruption of investment today will have significant impact on renewable energy production over the coming years and has become cause for concern. Hence, many Member States will need further measures to ensure the achievement of their targets.

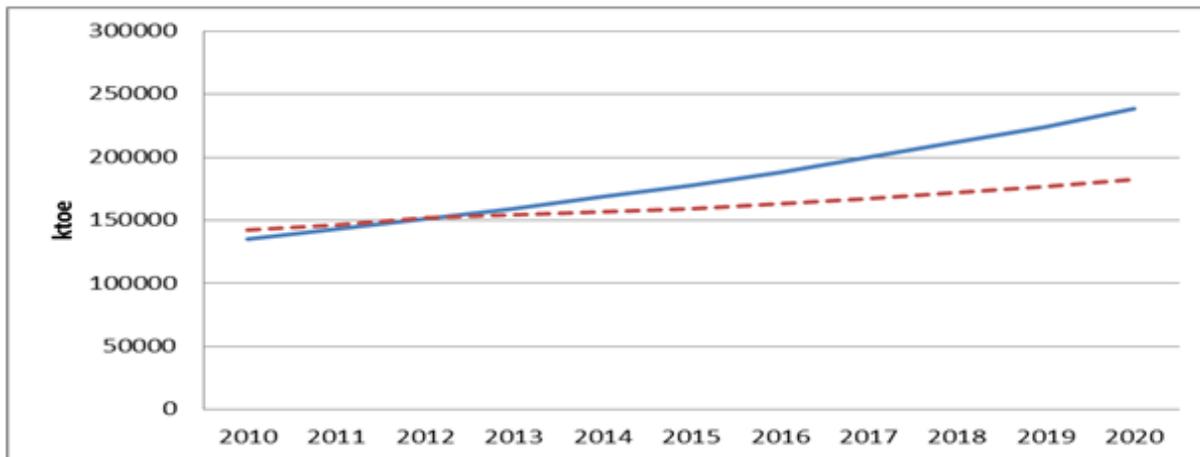
Planned (blue) versus estimated (red/dotted) trend in EU renewable energy

⁴ Renewable Energy: progressing towards the 2020 target (COM (2011) 31 and SEC (2011) 130)

⁵ Interim targets are set out in the indicative trajectory established in Part B of Annex I of Directive 2009/28/EC. The EU interim target for 2011/2012 was 10.7%. National results are given in Annex I of this Communication.

⁶ Green-X model was used to perform a detailed quantitative assessment of the future deployment of renewable energy on country, sector and technology level. The model drew on assessments of national policies and plans up to mid- 2012. Details are contained in the report noted in footnote ³.

⁷ Renewable energy progress and biofuel sustainability, ECOFYS et al, 2012 http://ec.europa.eu/energy/renewables/reports/xxxxx_en.htm

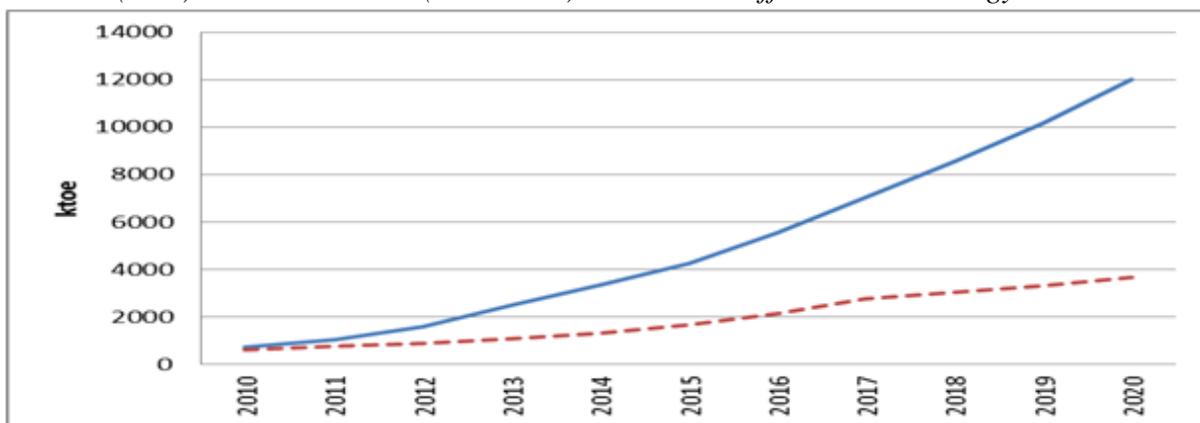


This conclusion is underpinned by the sectoral developments in electricity, heating and cooling and transport. 15 Member States failed to reach their indicative 2010 targets⁸ for the share of renewable energy in the electricity mix. In the transport sector, 22 Member States failed to achieve their indicative 2010 target of 5.75%⁹.

The heating and cooling sector has not had any, even indicative targets, and has experienced slow growth since 2005. Moreover the analysis undertaken for the Commission suggests that the share of renewable energy in the heating and cooling sector may actually *decline* in the coming years.

The failure to comply with national plans is most evident in the **wind** sector. According to Member State plans, wind capacity is expected to reach 213 GW in 2020 (169 GW onshore and 44 GW offshore). Electricity *generation* from offshore capacity is planned to reach 140 TWh (roughly 12 Mtoe). However, according to the Commission's analysis, it may only reach 43 TWh (3.7 Mtoe) due to reduced national efforts and infrastructure difficulties.

Planned (blue) versus estimated (red/dotted) trend in EU offshore wind energy

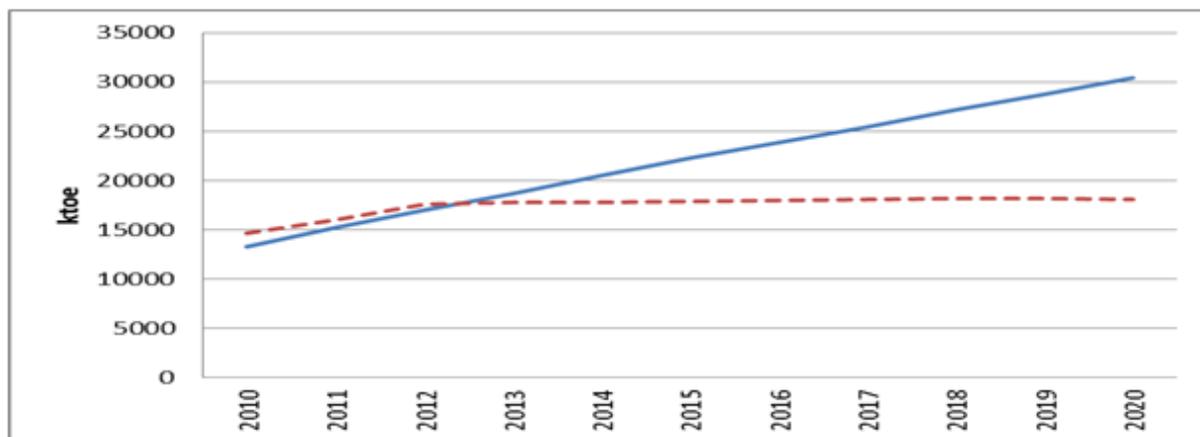


Despite the recent strong growth in the onshore wind industry of recent years, Member States' plans for onshore wind production 354 TWh may fall short. Further efforts will be needed to reinforce measures and improve infrastructure, or only an estimated 210 TWh might be achieved.

⁸ Agreed under Directive 2001/77/EC. Austria, Cyprus, Czech Republic, Greece, Finland, France, Italy, Luxembourg, Malta, Poland, Romania, Sweden, Slovenia, Slovakia, UK.

⁹ Established under Directive 2003/30/EC. Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Greece, Spain, Finland, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, Netherlands, Portugal, Romania, Slovenia, UK.

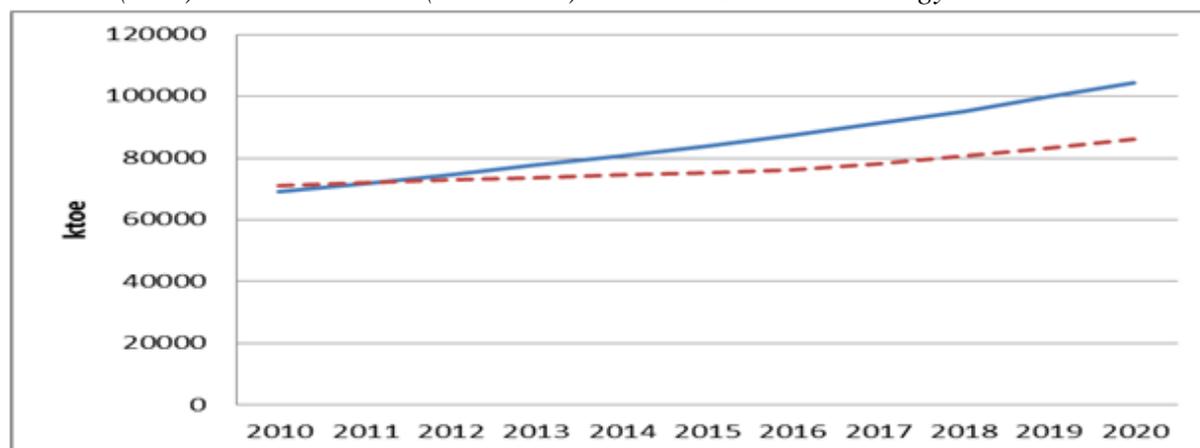
Planned (blue) versus estimated (red/dotted) trend in EU onshore wind energy



Total wind generation may therefore fall short of expectations. Whereas Member State plans foresee wind generation of almost 500 TWh, current trends point to the risk of achieving only half of it, i.e. 253 TWh.

For all **biomass**, the trend is also negative but not as extreme as for wind:

Planned (blue) versus estimated (red/dotted) trend in EU biomass energy

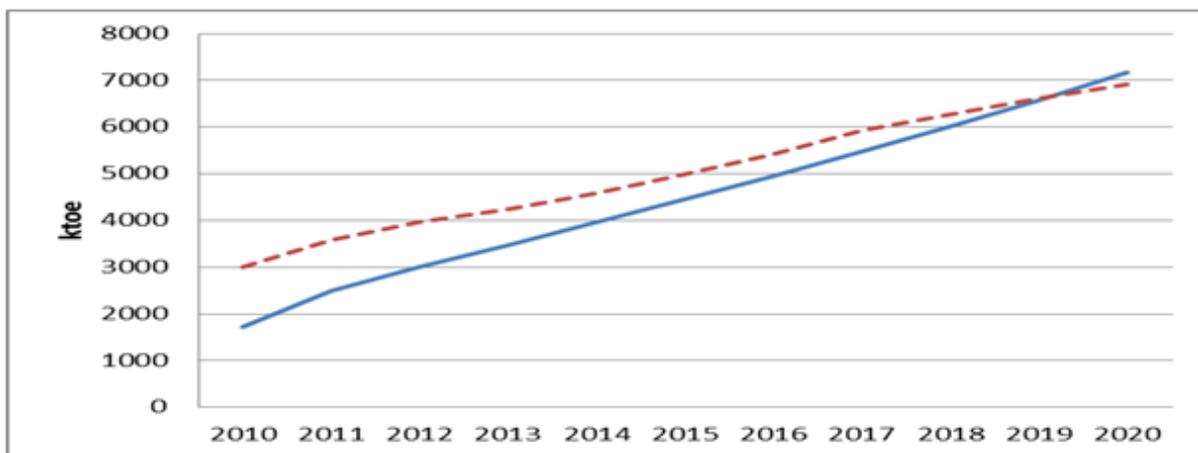


Here, however, the scale of production in the sector is far greater than for wind or solar power. Planned production is intended to reach 104 mtoe by 2020 (for both the electricity (232 TWh or 19 mtoe) and heating sectors (around 85 mtoe), compared however, to *expected* production for 2020 of 86 mtoe. This deviation could be linked to the production cycles of the wood, pulp and paper industries, whose wastes and residues constitute a significant part of biomass feedstock. The Commission's intended report on biomass and sustainability will explore this matter in greater depth¹⁰.

For **photovoltaics**, the story and expectations are different. The strong growth of the last few years has seen a surplus created that will continue for some time:

Planned (blue) versus estimated (red/dotted) trend in EU PV energy

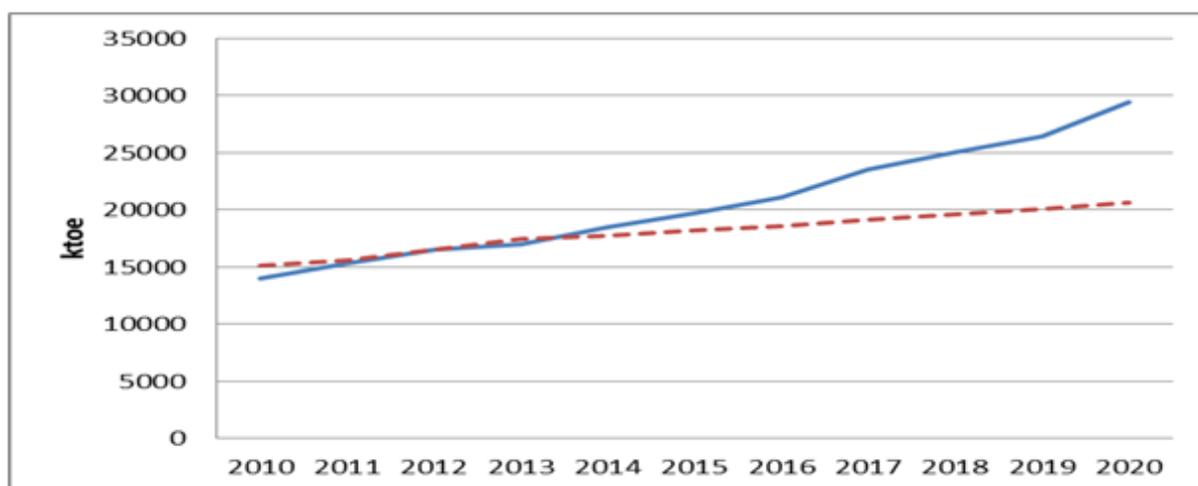
¹⁰ In COM(2010)11 the Commission committed to reporting on the impacts of biomass sustainability regimes.



An optimistic and secure EU market helped lead to a build-up of global PV production capacity, as China, India and the US entered into a new, EU-triggered global PV market. The resulting overcapacity has brought production costs down significantly. However rigid national support schemes were generally unable to adapt rapidly enough to such falling costs, raising profits and creating a rate and scale of installations in some countries almost excessive in a time of general economic crisis. The result has been sudden and unpredictable changes to a number of national support schemes, which will, again, curtail investment such that there remains a risk that the current surplus of PV over planned levels (46TWh rather than 35TWh) will disappear and become a deficit by 2020 (see section below for further discussion of support schemes.)

For biofuels (biomass consumed in the transport sector), the prognosis is more like that of biomass in general: a slight surplus over the planned trajectory will decline and, unless further measures are taken, will result in a deficit. In addition, the Commission has proposed an amendment to the 10% target for renewable energy in the transport sector, requiring greater use of non-food feedstock to contribute towards the target. Greater reliance on advanced feedstock (which produces higher greenhouse gas savings than food-related feedstock) clearly requires additional measures for the target to be reached.

Planned (blue) versus estimated (red/dotted) trend in EU biofuels



From all of the above data it can be concluded that overall, by sector and across technology, there has been a strong initial start in EU renewables growth under the new regime of the Renewable Energy Directive. However, as we look at their future evolution, it seems that the economic crisis is now affecting the renewable energy sector, particularly its cost of capital, as it has all other sectors of the economy. This, combined with ongoing administrative

barriers, delayed investment in infrastructure and disruptive changes to support schemes, means **further efforts are needed to achieve the 2020 targets**.

When assessing national results for the initial, interim targets, it must be recalled that the 2010 plans and 2011/2012 interim targets are just the starting point of the trajectory that gets steeper towards 2020. In fact, if the growth rates achieved in 2009/2010 were maintained to 2020, eleven Member States would still fail to reach their target. In many Member States currently implemented policies (chiefly sub optimal support schemes and addressing administrative barriers) risk being insufficient to trigger the required renewable energy deployment to reach the 2020 targets. The financial crisis also affects these developments, since the cost of capital has risen in several Member States. Thus low cost measures that reduce administrative burdens and that increase energy efficiency (lowering total energy demand and therefore raising the share of renewable energy) are even more important policies for achieving the targets.

A summary of current national performance is contained in Annex 1.

3. POLICY MEASURES

Until such time as Europe has achieved an open and competitive single energy market, with market failures corrected and external costs internalised, policy measures, be they financial, regulatory or administrative, are needed to boost the growth of renewable energy. Europe is still striving to make the energy market work. Market failures include fragmented markets, low levels of competition, and significant external costs related to climate change, environmental pollution, security of supply, and technological innovation (spill over effects and first move advantages). To compensate for the market failures, Europe has a range of policy measures in place including support schemes, standards, and administrative rules to promote renewable energy development.

Direct EU measures to support renewable energy include EU R&D expenditure and the allocation of revenues from the sale of ETS allowances (the "NER300" programme). The scope to promote innovative technologies in the future will be explored in the Commission's forthcoming Communication on energy technologies and innovation. In addition, the key European instrument for internalising the external costs of climate change, the EU ETS, is entering its third phase. To date, however, the (low) carbon price has not provided investors with sufficient incentive and has not succeeded in being a major driver towards long term low carbon investments.

Administrative procedures

Authorisation and planning procedures and the slow pace of electricity infrastructure development were identified as important challenges to the renewable energy growth in the last progress report¹¹. Article 13(1) of the Renewable Energy Directive requires Member States to ensure that permitting procedures for renewable energy are transparent, proportionate, coordinated and limited in time, and are facilitated for smaller or decentralized projects. The Directive also requires Member States to report on progress achieved in addressing these barriers.

The Commission's analysis of Member States' 2011 progress reports¹² indicates that **progress in removing the administrative barriers is still limited and slow**. Many Member States do not even address in their reports the administrative reforms specifically listed in Article 22 (3)

¹¹ Renewable Energy: progressing towards the 2020 target (COM (2011) 31 and SEC (2011) 130)

¹² Member State biennial renewable energy progress reports (2011): http://ec.europa.eu/energy/renewables/reports/2011_en.htm

of the Directive. The Commission will continue to investigate Member States' removal of these barriers and will launch infringement proceedings where Member States fail to act.

There are concerns about slow progress regarding online applications, administrative time limits for planning and permitting decisions, and transparent approval processes. The availability of a single administrative body for dealing with renewable energy project authorizations and assistance to applicants is still limited. Only Greece and Portugal reported newly introduced "one-stop-shop-agencies" since the plans were published; a few Member States had them in place before for some technologies (e.g. wind) or in some parts of the country (e.g. in Germany or in Sweden). Only Denmark, Italy and the Netherlands have a single permit system for all projects. These concerns are particularly acute in the heating and cooling sector, where the disparate nature of the different possible technologies hinders the development of uniform administrative approaches.

Sub optimal administrative arrangements clearly raise the costs of renewable energy and their removal normally has low fiscal implications: simplifying and speeding up administrative procedures does not need to cost public administrations more, and the reduction in uncertainty and regulatory risk for investors can significantly reduce the cost of capital. For energy transmission infrastructure, such measures have been addressed at European level through the regulation on guidelines for trans-European infrastructure which defines responsibilities for coordinating and overseeing the permit granting process, sets minimum standards for transparency and public participation and fixes the maximum allowed duration of the permit granting process. Such measures are urgently needed under Article 13 of the Renewable Energy Directive for energy installations.

The Electricity Grid

Renewable energy for generating electricity must be integrated into the market. However some of the major future renewable energy sources – mainly wind and solar power – have inherently different characteristics from conventional sources in terms of cost structure, dispatch ability and size, and cannot simply "fit" into existing market structures without any adaptation. Infrastructure investments are clearly and urgently needed and electricity grid operations also need to be updated.

Article 16 of the Directive requires reforms of electricity infrastructure, operation and development and the rules for grid access and cost sharing, with a view to increasing the contribution of electricity from renewable energy sources. Member States are also required to report on these reforms. Analysis of Member State progress in ensuring the transmission and distribution of electricity from renewable sources and the improvement of the renewable energy integration rules indicates that most Member States have made some progress in tackling their grid barriers. However, further progress improving the transparency and consistency of network rules is still needed.

Given the longer term expectations of the growing share of EU electricity coming from renewable energy sources, full implementation of Article 16 of the Directive is important. The current failure to modernise the grid as the energy mix is changing is causing problems for the development of the internal market, technical problems related to loop flows, grid stability and growing power curtailment, and investment bottlenecks resulting from delayed connection of new power producers. Adaptation of the electricity grid and system operation, including by improving storage capacity, better system controls and forecasting will improve the efficiency with which current infrastructure is used. And more efficient use and management of the grid can also avoid transport losses. Together with rapid progress in implementing the Member States' Ten Year Network Development Plan and in determining and starting the Projects of Common Interest established under the regulation on guidelines

for trans-European energy infrastructure, such improvements are necessary for the equal treatment of renewable energy and the proper integration of renewable energy producers into the electricity market.

Arrangements and cost sharing rules for *using* the grid also need modernising to reflect the changing nature of the electricity generation mix and progressively increase the balancing responsibility of renewable energy producers as dispatchable electricity producers. The final aim should be that renewable energy is fully competitive and that producers act and are treated as equal market players. The increase of transparency and equitable grid connection and the development of cost sharing rules will provide the incentives on all producers to improve system-wide efficiency and not to make production decisions or location decisions in isolation.

It should also be recalled that infrastructure concerns for clean energy are not limited to the electricity sector. The need to reduce fossil fuel dependence in the transport sector also requires new infrastructure investments. So to foster the deployment of alternative fuels infrastructure in transport, the Commission has published the 'Clean Power for Transport' package¹³ proposing a Directive on the deployment of alternative fuels infrastructure including binding targets for infrastructure uptake.

Support schemes

There has been a discussion about the effectiveness and the efficiency of different types of renewable energy support schemes for at least a decade. Multiple schemes exist, with good and bad features and impacts. In 2011 the Commission suggested guidance would be useful to help Member States identify best practice⁴. Following discussions with Member States, the Commission's 2012 report "Renewable Energy: a major player in the European energy market"¹⁴ announced plans to produce such guidance. Given the prominent role that financial support schemes play in developing renewable energy today, and given the growing prominence (and cost) of renewable energy use in the electricity sector, urgent efforts are needed to reform support schemes to ensure that they are designed in *a cost effective, market-oriented manner*. The Commission's guidance is necessary to ensure that support schemes are adjusted regularly and quickly enough to take account of falling technology costs and to ensure reforms make renewable energy producers part of the energy market (such as by moving from feed in tariffs to feed in premiums or quotas, and using tendering to avoid over compensation etc.); to ensure such market interventions are correcting market failures and not adding or maintaining market distortions. The Commission's forthcoming revision of state aid guidelines will also take this into account. Regarding the uncertainty of support schemes for biofuels in particular, the lack of progress on the adoption by the Council of a new legal framework for taxation of energy products¹⁵ is a concern, since the scope to use tax incentives would expire by 2020 under the current legal framework.

Many national reforms have had a negative impact on the investment climate. Most critical have been changes that reduce the return on investments *already made*. Such changes alter the legitimate expectations of business and clearly discourage investment, at a time when significantly more investment is needed. Thus there is a need for guidance on the reform process itself, to ensure support schemes are cost effective but not disruptive. The Commission also feels more action is needed to ensure convergence and the Europeanisation of energy: in addition to developing common approaches to supporting renewable energy,

¹³ (COM(2013) 18 final) http://ec.europa.eu/transport/themes/urban/cpt/index_en.htm

¹⁴ COM(2012)271

¹⁵ Commission proposal for revision the Energy Taxation Directive COM(2011) 169 final.

growing cross-border cooperation must occur. The current legal framework for such cooperation is the Renewable Energy Directive's cooperation mechanism framework. This includes joint projects, where common approaches can be developed based on specific renewable energy projects, technologies or regions as well as joint support schemes such as the Swedish-Norwegian scheme, feasible within well connected regional markets where consumers will also physically profit from renewable energy capacity installed in a neighbouring country. Such instruments provide the pathway to the *European* development of renewable energy, where resource development in a single energy market occurs on a common and cost effective basis. To this end, in addition to the forthcoming guidance on cooperation mechanisms, the Commission will promote the emergence of regional (and possibly sectoral) joint support schemes between Member States based on cooperation mechanism, such as a common, *European* approach to offshore wind development in the northern seas).

All four elements of renewables reform and integration (strong growth, cost control, market integration and Europeanisation) will be explicitly addressed in the Commission's forthcoming Guidance. This will contribute to policy coherence and making sure that any market interventions are correcting market failures without adding or maintain existing market distortions.

4. SUSTAINABILITY OF BIOFUELS

Not all Member States have developed their biofuels markets and the bulk of EU biofuels production and consumption is dominated by five Member States (France, Germany, Italy, Spain and UK). In 2010, Eurostat reported that 1.4% (177 ktoe) of all EU consumed biofuels was produced from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (although other, unofficial statistics indicate approximately 9%, including recycled cooking oil). Articles 17, 18 and 23 of the Directive require the Commission to monitor a range of issues surrounding biofuels and bioliquids, including their impact on sustainability, biomass markets, commodity and food prices, and the need for measures on soil, water and air protection. This is fully addressed in the staff working document accompanying this Report. The Commission is also studying the sustainability of biofuels from a consumer perspective as a part of a broader study on the functioning of the fuels market¹⁶.

A key element in such monitoring is information regarding the origin of the fuels. 60% of EU consumed biodiesel feedstock in 2010 was produced within the EU. Argentina was the largest biodiesel exporter to the EU. Most – about 80% - of the EU consumed ethanol feedstock for transport was produced in the EU, while the largest share of imports came from Brazil and the U.S., although imports from Brazil almost halved in comparison to 2008.

¹⁶ The study (to be published by the end of 2013) explores whether consumers are able to make informed choices, by looking into consumer understanding and the transparency of information. It is expected to generate recommendations on improving and harmonising fuel labelling at the pump across EU Member States. The study also tackles the issue of the availability of different fuels and retailers, and retail prices.

Origin of final biofuels consumed in the EU in 2010¹⁷

	Biodiesel		Bioethanol		
	Volume (ktoe)	Share		Volume (ktoe)	Share
EU	8,270	83.2%	EU	2,243	80.1%
Argentina	1,003	10.1%	Brazil	234	8.4%
Indonesia	285	2.9%	U.S.	121	4.3%
Malaysia	123	1.2%	Peru	26	0.9%
China	67	0.7%	Kazakhstan	24	0.8%
U.S.	61	0.6%	Bolivia	20	0.7%
Other countries	129	1.3%	Egypt	15	0.5%
			S.Korea	16	0.6%
			Other countries	101	3.6%
Total	9938			2800	

Source: EUROSTAT, COMTRADE.

Origin of all biofuel feedstock consumed in the EU in 2010

EU	Argentina	Indonesia	Brazil	U.S.	Canada	Ukraine	Malaysia	Paraguay	Other
63.9%	9.7%	6.6%	5.3%	3.0%	2.4%	2.3%	1.7%	1.5%	1.3%
Russia	China	Switzerland	Peru	Bolivia	Peru	Egypt	Guatemala		
1.0%	0.5%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%		

The Commission's scrutiny of Member States' **transposition** of the biofuel sustainability criteria shows that there are some gaps, and legal proceedings have begun to ensure that effective sustainability regimes are in place in all Member States. At the same time, 13 "voluntary schemes" for certifying the sustainability of biofuels have been approved by the Commission, enabling biofuel producers around the world to comply with high EU standards. In addition, key export countries (Argentina, Brazil, Indonesia, and Malaysia) have adopted new regulatory measures to improve their environmental practices in biofuels related areas.

The Commission and Member States' monitoring of the need for specific measures for **air, soil and water protection** generally find that all current EU agricultural practices obligatory under EU Common Agricultural Policy and environmental legislation apply to biofuel feedstock production (since the bulk of biofuels are produced from agricultural crops) and as such, separate biofuels-specific measures are not necessary. In fact, the current sustainability regimes and voluntary schemes often include requirements of good agricultural practice and so best agricultural practice for air, soil and water protection is encouraged by the schemes. However, as pressure on agricultural resources increases, it will be important to ensure protection measures in place continue to be adequate.

Global net land use for biofuels consumed in the EU is less than 3Mha. Within the EU, and whilst not all Member States have reported on areas planted with biofuel feedstock, estimates range from 2% (Poland) to 6% (France) of national cropland, within the EU.

Regarding the "social sustainability" of biofuels, the Commission is also required to report on **land use rights**, since EU demand for biofuels adds to existing international demand for food and non-food agricultural exports and so to the pressure in developing countries to convert more land for such cash crops. Given the time lags between land acquisition and biofuels production and flaws on the ILC Land Matrix database, it is not yet clear if EU biofuels demand contributes any abuse of land use rights. The Commission and Member States'

¹⁷ Trade of biodiesel and of bioethanol is analysed on basis of Eurostat trade statistics by CN8 (dataset DS_016890: code HS 3824.90.91 for biodiesel, codes HS 2207.20.00, HS 2207.10.00, HS 220890.91, HS 2208.90.99 and HS 2909.19.10 for ethanol) and Comtrade (code 382490 for biodiesel, codes 2207, 2208 and 2909 for ethanol).

monitoring of this issue must, however, continue. Given the significant **food price** increases and impact on food affordability that occurred in 2008 and 2011 and the poor U.S. 2012 harvest, it is important to assess whether EU biofuels consumption has contributed in any way or whether other factors such as bad weather, bad harvests, rising global demand, increased oil prices, etc. are more important. Commission analysis has found that grain use for bioethanol production constituted 3% of total cereal use in 2010/2011 and is estimated to have minor (1%-2%) price effect on the global cereals market. EU biodiesel consumption is greater, and the estimated price effect on food oil crops (rapeseed, soybean, palm oil) for 2008 and 2010 was 4%¹⁸. It also appears that biofuel demand is more price sensitive than the food market and so demand declines more in response to rising prices. That said, the Commission will continue to monitor and improve its analysis of EU biofuel demand in the global agricultural market, food prices and food price volatility. Moreover the interactions between biofuels and other sectors of the bio-economy are also still evolving and the impacts on traditional users of biomass, such as the oleo chemical industry continue to need to be explored.

The Directive also requires the Commission to report on the compliance with a wide range of **international conventions** (such as on labour conditions and biodiversity) of all countries providing feedstock for EU biofuels consumption. Whilst most non EU countries have ratified the fundamental conventions, enforcement is lower than in the EU or in the US which has not ratified many such conventions. Thus efforts across the board must continue to encourage countries to fully apply these conventions. Turning to the social *benefits* of EU biofuels consumption, is estimated to have generated 220,000 jobs in the EU and 1.4m jobs globally, in 2010.

Finally, it is important to consider the **greenhouse gas emissions saving** resulting from switching to biofuels. Whilst imported mineral oil still constitutes the vast bulk of fuel used in the transport sector, the 4.7% share of biofuels is estimated to have generated 25.5 Mt CO₂eq savings, based on national reporting (22.6 Mt CO₂eq based on the application of global default values). This estimate does not include indirect agricultural intensification effects or indirect land use change effects which reduce the CO₂ savings available from biofuels. When these emissions are included, estimated savings are significantly reduced, reflecting the dominance of "1st generation", often food crop-based biofuels which have lower or no estimated greenhouse gas emissions savings. For this reason the Commission has proposed amendments to the Fuel Quality and Renewable Energy Directives, to more firmly take account of indirect land use change effects resulting from EU biofuel consumption¹⁹. The proposal includes limiting the contribution that food-based biofuels can make towards the 10% target to 5%, enhanced incentives to encourage the development of second generation biofuels from non-food feedstock, like waste or straw are proposed. This proposal is now with Parliament and the Council of Ministers, and will clarify EU biofuels policy up to 2020.

5. CONCLUSION

Spurred on by the adoption of the 2009 Renewable Energy Directive and the legally binding renewable energy targets, renewable energy grew strongly. The data and analysis for the renewable energy progress report shows that while the EU as a whole is on its trajectory towards the 2020 targets, some Member States need to undertake additional efforts (see annex). In addition, the analysis suggests there are reasons for concern about future progress.

¹⁸ Renewable energy progress and biofuel sustainability, ECOFYS et al, 2012 http://ec.europa.eu/energy/renewables/reports/xxxxx_en.htm

¹⁹ COM(2012) 595 final http://ec.europa.eu/energy/renewables/biofuels/land_use_change_en.htm

The transposition of the Directive has been slower than desirable and the trajectory grows steeper in coming years so that in reality most of Member States' effort is needed towards the end. Whilst Member States have had seven years to achieve the first 20% of their target for 2012, thereafter they have only two years to achieve the next 10% for 2014, 15% for 2016 20% for 2018 and 35% for 2020. In addition, the significant change in economic circumstances in Europe will result, according to analysis undertaken for the Commission, in *current* policies being insufficient to trigger the required renewable energy deployment in a majority of Member States.

Member States deviations from their own national renewable energy action plans reflect policy changes which reduce clarity and certainty for investors, increasing their exposure to regulatory risk. The deviation from the plans' expectations regarding sectoral and technology trends also indicate where further efforts may be needed. Other reasons for concern include **the failure to address barriers to the uptake of renewable energy: administrative burdens and delays** still cause problems and raise project risk for renewable energy projects; **slow infrastructure development, delays in connection, and grid operational rules** that disadvantage renewable energy producers all continue and all need to be addressed by Member States in the implementation of the renewable energy Directive.

The changed economic climate has also clearly had an impact on the development of new renewable energy projects. One aspect is the increased cost of capital in general. Another aspect is the increase in risk resulting from Member States changes to support schemes. The Commission's planned guidance on support schemes and reform is intended to ensure that such support is cost effective and helps integrate renewable energy production into the energy market.

The results of the current debate on the 2030 framework for energy and climate to which this progress report contributes and the Commission's proposal to amend the renewable energy and fuel quality Directives to improve the incentives for advanced biofuels rather than for first generation biofuels are also elements that will play a role in the years to come up to 2020 and are elements that need to be taken into account when looking at the 2011/2012 compliance with the trajectory. The Commission will also continue to examine Member States' implementation of the Directive and take legal measures wherever necessary. The Commission has already launched a number of infringement cases for Member States' non transposition of the Directive²⁰; further infringements will follow if implementation is incomplete. Complying with obligations under the Renewable Energy Directive, the Commission has also assessed the implementation, effectiveness and impacts of the EU's biofuel sustainability regime and biofuels policy. Whilst Member States' implementation of the biofuels sustainability regime is too slow, the possible negative impacts of EU biofuels consumption do not appear to warrant further or specific policy intervention beyond proposals already made. In addition, the greenhouse gas savings as reported by member States (and not yet including indirect effects) appear positive.

In its Communication of June 2012²¹, the Commission committed itself to driving forward the integration of renewable energy in the internal market and address incentives for electricity generation investment. It also intends to prepare guidance on best practice for cost effective and consistent renewable energy support schemes, to provide further guidance for the use of cooperation mechanisms to achieve renewable energy targets at lower cost and to work on

²⁰ Cases are open and Reasoned Opinions have been sent to Austria, Bulgaria, Cyprus, Czech Republic, Finland, Hungary, Ireland, Latvia, Luxembourg, the Netherlands, Poland and Slovenia.

²¹ Renewable Energy: a major player in the European energy market COM(2012)271

improved regulatory framework for energy cooperation with third countries. These actions all require the rigorous and complete implementation of Renewable Energy Directive and commitments made in the National Renewable Energy Action Plans. Progress on these elements must be maintained. In addition, support in the new EU multi-annual budget framework for new energy technologies and energy infrastructure should help ensure continued growth for the renewable energy sector in Europe. With such progress, the EU can expect the renewable energy industry to be a thriving, mature and globally competitive one in the lead up to 2020 and beyond.

Annex I. Overview of Member States' progress

Member State	2005 RES share	2010 RES share	1 st interim target	2020 RES target
Austria	23.3%	30.1%	25.4%	34%
Belgium	2.2%	5.4%	4.4%	13%
Bulgaria	9.4%	13.8%	10.7%	16%
Cyprus	2.9%	5.7%	4.9%	13%
Czech Republic	6.1%	9.4%	7.5%	13%
Germany	5.8%	11.0%	8.2%	18%
Denmark	17%	22.2%	19.6%	30%
Estonia	18%	24.3%	19.4%	25%
Greece	6.9%	9.7%	9.1%	18%
Spain	8.7%	13.8%	10.9%	20%
Finland	28.5%	33%	30.4%	38%
France	10.3%	13.5%	12.8%	23%
Hungary	4.3%	8.8%	6.0%	13%
Ireland	3.1%	5.8%	5.7%	16%
Italy	5.2%	10.4%	7.6%	17%
Lithuania	15%	19.7%	16.6%	23%
Luxembourg	0.9%	3%	2.9%	11%
Latvia	32.6%	32.6%	34.0%	40%
Malta	0%	0.4%	2.0%	10%
Netherlands	2.4%	3.8%	4.7%	14%
Poland	7.2%	9.5%	8.8%	15%
Portugal	20.5%	24.6%	22.6%	31%
Romania	17.8%	23.6%	19.0%	24%
Sweden	39.8%	49.1%	41.6%	49%
Slovenia	16.0%	19.9%	17.8%	25%
Slovakia	6.7%	9.8%	8.2%	14%
UK	1.3%	3.3%	4.0%	15%
EU	8.5%	12.7%	10.7%	20%

The most objective measure is to judge Member States against their first interim target, calculated as the average of their 2011/2012 shares. Whilst on average such progress to 2010 is good, this does not reflect the policy and economic uncertainties that renewable energy producers appear to face currently.

Progress towards the first interim target:

>2% above interim target

<1% from or <2% above interim target

>1% below interim target