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**COMMISSION STAFF WORKING DOCUMENT**

**Review of European and national financing of renewable energy in accordance with  
Article 23(7) of Directive 2009/28/EC**

**Accompanying document to the**

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN  
PARLIAMENT AND THE COUNCIL**

**Renewable Energy: Progressing towards the 2020 target**

{COM(2011) 31 final}

## 1. INTRODUCTION

Renewable energy has always been a part of Europe's industrial development. For centuries, biomass (wood) provided us with heating for our homes, hydro and wind energy have provided us with power for our industry. Today, renewable energy continues to be the sole source of truly sustainable energy available to us and Europe continues to lead the world in improving the technologies and in manufacturing the equipment<sup>1</sup>.

In 2009, Europe's leaders agreed to a new European framework for promoting renewable energy, including legally binding national targets for 2020, such that the EU will reach a 20% share of renewable energy overall. This agreement and the subsequent legislation<sup>2</sup> were part of the Energy and Climate Package, showing EU leadership and commitment to tackling the climate threat. Renewable energy is a core element in the fight against climate change as it is an ideal energy source to decarbonise the generation of energy, as well as a means of improving the security of our energy supply. Instead of relying on centralised power sources run on imported fossil fuels, rising use of renewable energy allows us to draw on distributed and inexhaustible sources of energy local to the communities that use the energy, diversifying fuels and sources of energy. Such industries also create jobs, for equipment manufacturers, installers, technicians, builders and engineers. The industry currently employs over 1.5 million people and by 2020 could employ nearly 3 million more<sup>3</sup>.

Providing the stable regulatory environment necessary to encourage investment in this industry, in *all* Member States, is not easy. Changes are needed to planning and building regimes and to electricity grids. In addition, **the financing of the growth of the renewables sector needs more attention**. Striving to compete with incumbent energy companies, technologies and traditional infrastructure, with fossil fuels and nuclear power still receiving four times the level of subsidies<sup>4</sup>, renewable energy is often more expensive than traditional sources. However the traditional sources must be replaced, if we are to enjoy the net benefits of a clean and sustainable energy system.

The benefits of encouraging the renewables industry were widely acknowledged as the global financial crisis took hold in 2009, when "clean tech" stimulus packages worth billions were implemented in the United States and China, as well as in the EU<sup>5</sup>. Indeed the growth of the sector in the US, China other Asian countries shows that the sector is seen as a crucial industry for the future. As noted in the new EU Energy Strategy<sup>6</sup>, the challenge facing Europe is to stay at the forefront of this industry, to ensure it grows, at a time when governments are simultaneously faced with the need to curtail government spending. This is one of the challenges addressed in the EU 2020 Strategy for Jobs and Growth<sup>7</sup>. Much can be done to remove the non-cost barriers to the growth of renewable energy, but **more can also be done to ensure that the public funding that is spent on renewable energy is used cost effectively**.

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<sup>1</sup> See "Patents and clean energy: bridging the gap between evidence and policy", UNEP, EPO, ICTSD

<sup>2</sup> Directive 2009/28/EC

<sup>3</sup> Commission (ECOFYS) EmployRES study, gross employment effects.

<sup>4</sup> Globally, the IEA has estimated 2009 fossil fuel subsidies at \$312bn

(<http://www.worldenergyoutlook.org/subsidies.asp>), and the most recent figures for the EU (EU15) put fossil fuel subsidies at €21.7bn compared to €5.3bn for renewable energy (EEA Technical report 1/2004).

<sup>5</sup> European Economic Recover Package: [http://ec.europa.eu/energy/eepr/index\\_en.htm](http://ec.europa.eu/energy/eepr/index_en.htm)

<sup>6</sup> COM(2010)639/3 Energy 2020: a strategy for competitive sustainable and secure energy

<sup>7</sup> European Council conclusions 25/26 March 2010

For over a decade a few Member States have driven the development of renewable energy. They invested heavily, first in research and development, then in building demonstration plants, and finally in supporting wide spread deployment of renewable energy equipment. These countries, led by Germany, Denmark and Spain, now have major renewable energy companies, operating globally. However their growth was spurred by national sources of financing, chiefly from domestic energy consumers paying slightly higher energy bills to cover the extra cost of developing the renewable energy<sup>8</sup>. Now, this kind of growth and commitment must occur across *all* Member States, if they are to reach their targets. Most of this extra investment will be borne by energy companies, who pass on some of the cost to their consumers. As acknowledged above, there are costs associated with achieving our renewable energy objectives<sup>9</sup>, but these are dominated by the clear net benefits of reducing emissions, diversifying our energy supplies and generating jobs and economic growth. We cannot revert to our old ways, and every delay in modernising our energy sector adds to the costs<sup>10</sup>.

These issues and the political conclusions are contained in the Communication which this report accompanies<sup>11</sup>. This report provides the analytical background to the Communication. It reviews the instruments available for filling this investment need and the European and national support instruments used, and contains suggestions for reform and improvement. In so doing, the report complies with the requirements of Article 23(7) of Directive 2009/28/EC. It also explores actions to improve cooperation regarding national renewable energy support schemes, to ensure they are consistent with technological progress and do not hinder innovation or competitiveness.

## 2. POLICY CONTEXT

Whilst Member States have legally committed to achieving their 2020 targets, to simplifying their planning regimes and ensuring renewables are integrated into the electricity grid, the challenges remain huge. The Commission and European Council have included the target as part of the aforementioned Europe 2020 Strategy and the new Energy 2020 strategy calls for a continent-wide approach<sup>12</sup>, highlighting how important it is for Member States to work together to achieve these goals. The Commission's recent Communication on energy infrastructure<sup>13</sup> has also explored the need for infrastructure in light of the growing share of renewable energy in Europe's electricity mix. The Communication finds that the short term costs of investing in electricity grid infrastructure are far outweighed by the benefits of creating an integrated European electricity market capable of sustaining a future de-carbonised electricity sector. The urgency of the need for action has been highlighted most recently in the IEA's 2010 World Energy Outlook.

Whilst energy infrastructure has traditionally been funded by the private sector or national governments, European intervention and funding for infrastructure projects of European importance can help create a more efficient energy network and create significant cost savings

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<sup>8</sup> Today, the cost of renewable energy in Germany (which produces the greatest amount of renewable electricity) is estimated at €0.0205/kWh.

<sup>9</sup> The Commission's Renewable Energy Roadmap, which first proposed the 20% target, estimated the additional annual costs for the EU as between €10bn-€18bn (COM(2006)848).

<sup>10</sup> The IEA noted that "Every year of delay adds an extra USD 500 billion to the investment needed" (IEA press release 6 October 2009)

<sup>11</sup> COM (2011)xxx Renewable Energy: progressing towards the 2020 target.

<sup>12</sup> COM(2010)639/3 Energy 2020: a strategy for competitive sustainable and secure energy

<sup>13</sup> COM(2010) 677 Energy infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network

for Europe<sup>13</sup>. Similarly, European intervention to promote efficiency in the achievement of the renewable energy targets could save billions of Euro.

**3. RISING ENERGY INVESTMENT NEEDS**

The Commission's Communication on renewable energy<sup>11</sup> (which this report accompanies) highlights the major investment required for meeting our energy needs in the future. The analysis undertaken for the Commission in preparing this report<sup>14</sup> found that annual capital investment in renewable energy (including 62% of new power investment) would need to rapidly double to €70bn to ensure we achieve our goals. So whilst the production cost of most renewable energy technologies is declining (wind production costs have declined by 20% over the 9 years to 2006 and solar PV by 57%<sup>15</sup>), the growing scale and market share of the renewable energy sector requires additional funding to fill the gap. Moreover, whilst some forms of renewable electricity generation have already reached "grid parity" (off grid wind and PV, large hydro, biomass/waste plants, in good circumstances, can be as cheap as grid electricity), widespread grid parity (and the consequent phasing out of subsidies) will only occur after 2020.

In addition to the choice of technology, location and scale, the financing instrument used can also affect costs. Supporting *investment* can reduce capital costs; certain types of operating support can reduce project revenue risks and so reduce costs; coordinated action across Member States can help exploit resources more efficiently and so create savings. Analysis undertaken for the Commission suggests that choosing more efficient technologies and sites, mitigating risk and coordinating resource development across Europe rather than from a national perspective, could reduce costs by as much as 10%<sup>16</sup>; reducing the annual investment need from €70bn to €62bn. For this reason it is important to explore the whole toolbox of instruments available to us.

**4. THE FINANCING TOOLBOX**

For all industry, investment requires capital expenditure to generate production and revenues to cover costs. Renewable energies have much lower operating costs (no fuel costs for most technologies) but proportionately higher capital costs and the financing of renewable energy has to take this into account. To expand renewable energy deployment and meet the investment gap, efforts can be directed via direct or indirect support, to lowering the cost of capital by reducing technology, plant and construction costs, or by raising more revenues through support measures, to cover costs.

reducing capital costs	covering generating costs through revenues
<p><b>Grants:</b> taxpayer funded aid, often for innovative demonstration projects.</p> <p><b>R&amp;D grants:</b> grants, often for research into</p>	<p>(starting point: energy prices covering costs)</p> <p><b>Regulated prices:</b> feed in tariffs, giving energy producers a fixed financial payment per unit of electricity or heat produced from renewable energy</p>

<sup>14</sup> ECOFYS, Ernst & Young, Fraunhofer ISI, TU Vienna, 2010. The least cost electricity investment component of this, consistent with the analysis of COM(2010)677 ranges from €310bn-370bn.  
<sup>15</sup> EWEA "The economics of wind energy" and EPIA "Set for 2020"  
<sup>16</sup> Green X analysis of annual capital investment needs ranging from €70bn to €61.9bn see ECOFYS et al. These cost reductions occur if trade in renewable energy were to occur across the single market, rather than in protected national markets.

<p>innovative, immature technologies.</p> <p><b>Public loans:</b> offer cheaper access to capital due to public funds used to bear greater risk. Particularly useful for SMEs who are less able to access capital.</p> <p><b>Equity funds:</b> private medium risk investors, expecting relatively high returns, for later stage of projects and more mature technologies, and investment periods of 3-5 years.</p> <p><b>Venture capital:</b> private equity investment for financing technology innovation, with active involvement of the fund managers in the project.</p> <p><b>Mezzanine funds:</b> loans that take more risk than normal ("senior") debt but less risk than equity; expecting relatively short term and variable but high return.</p> <p><b>Guarantees:</b> offer of compensating payment to a lender or an investor in case of payment default by a project developer.</p> <p><b>Contingent grants or loans:</b> support that is converted into a loan when a project turns out to be successful, or treated as a grant if the project encounters financial difficulties.</p>	<p>sources. Often fixed for 10-20 years, differentiated by technology and phased out.</p> <p><b>Regulated premiums:</b> feed in premiums, giving energy producers a fixed financial payment per unit of electricity or heat produced from renewable energy sources for the green value; the producer receiving the market price for the physical energy.</p> <p><b>Quota/certificates:</b> impose a minimum share or quota of renewables in the electricity, transport fuel or heating fuel mix, which can be met either through physical production (common for biofuels) or through purchasing "green certificates", virtual, rather than physical energy. The producer of the green energy is paid for the green certificates by the supplier or other facing the obligation.</p> <p><b>Fiscal incentives:</b> tax exemptions or tax credits for investments in renewable energy projects.</p> <p><b>Tenders:</b> A government call for tender for a renewable energy project, often specifying the capacity/production/technology/site. The winner is generally granted a long term power purchasing agreement at a competitive price.</p>
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The choice of instrument to help reduce renewable energy costs depends on the state of technology and project development<sup>17</sup>. All of these instruments can play a role in the right circumstances. They alleviate different forms of project risk – technology, construction, regulatory – and depend in particular on the maturity of a project or technology. R&D funding for instance traditionally consists of grants for significant portions of project capital costs, as the cost and uncertainty surrounding the technology render them too risky for the private sector to finance alone. Once a technology is more established grants can still be useful to finance demonstration projects, and venture capital – bearing high risks – can become available when technology is nearly established.

Once a technology is capable of being deployed but not yet competitive, support tends to shift from capital to operating support and here again there is a continuum of instruments, depending on circumstances.

For some sectors and technology, where the scope of operations is quite large and the number of market participants quite small, public tenders for a given production of energy can be appropriate. For micro energy systems functioning at household level, investment grants or

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<sup>17</sup> See "Support schemes for renewable electricity in the EU" European Commission Economic Papers 408, April 2010 and "Financing Renewable energy in the European Energy market", ECOFYS et al, October 2010 for details.

tax credits (e.g. for solar water heaters) are still quite common. The most significant form of operating support for electricity, heating and transport are feed in tariffs and obligations. Reviewing the relationship between project risk and instrument choice, the empirical evidence suggests that the more reliable revenue stream provided by feed in tariffs is generally more effective in driving renewable energy growth, particularly for a broad range of technologies. Quota obligations and tradable green certificates often suffer from revenue volatility and require payment of a risk premium, which appears to make them both less effective and efficient.

## 5. NATIONAL SUPPORT FOR RENEWABLE ENERGY

### Member States' use of different instruments for electricity, heating and transport (biofuels).

		AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK	
Electricity	FIT	x	x	x	x	x	x		x	x		X	x	x	x	x	x	x	x	x			x			x	x	x	
	Premium					x		x	x	x												x					x		
	Quota obligation		x													x							x		x			x	
	Investment grants		x		x	x						x		x	x			x	x	x	x								
	Tax exemptions		x								x	x		x						x		x	x			x		x	x
	Fiscal incentives			x			x			x											x	x	x				x		
heating	Investment grants	x	x	x	x	x	x		x		x		x	x	x		x	x	x	x	x	x	x		x	x	x	x	
	Tax exemptions	x	x					x				X	x			x	x					x				x		x	
	Financial incentives			x			x		x			X											x						
	Premiums											X																	
trans- port	Quota obligation	x		x	x	x	x	x		x	x	X			x		x	x	x			x	x	x	x		x	x	x
	Tax exemptions	x	x		x	x	x	x	x	x		X	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x

What is most striking about the above table is how Member States use a range of different instruments. As discussed in Chapter 4, the use of multiple instruments can be appropriate, given the different economic status of all the different technologies, in terms of maturity, users, climatic conditions and markets.

**In the electricity market**, 21 Member States now use feed in tariffs at least for some technologies and some market segments; seven use feed in premiums and six use quotas. The use of multiple instruments or the adaptation of instruments also reflects Member States' efforts to improve the efficacy of the instrument in a gradual manner without causing too much disruption to the market. Changes in recent years have seen a blurring of the traditional

dichotomy of tradable certificates (setting quantity not price) and feed in tariff (setting price not quantity): Technology specific rules have been introduced in quota regimes, optional feed in premiums are made available in more mature markets where project risk is lower, modifying the means of financing (in particular budget/off budget choices) and creating new feed in tariffs for new technologies since the stable financial revenues from feed in tariffs appear to be more effective and efficient in promoting green electricity<sup>18</sup>). In addition, Member States make smaller annual changes – to the quotas, to the tariff or premium rates, to the lifetime of the support, and to aspects of eligibility. All of these changes improve the efficiency of the instrument. But more needs to be done. The move to market integration, in particular the evolution to feed in premiums is too slow and too fragmented. As the EU Energy Strategy notes, we need a greater convergence of national support schemes and to move to a more pan-European trade in renewable energy<sup>19</sup>.

As shown by the National Renewable Energy Action Plans, most Member States have continued to focus on *national* resources and could achieve their 2020 targets on their own. They have not sought to reduce costs by developing cheaper resources in other parts of the single market. The analysis cited above<sup>16</sup> makes clear that billions of Euro could be saved if Member States treated renewable energy as a commodity in a single European market rather than in national markets. Given the fiscal constraints Member States currently face, with combined government deficits of €368bn, every effort should be made to minimise costs. The first step to such a change is the use of the new cooperation mechanisms created by the Renewable Energy Directive.

These cooperation mechanisms are a means of allowing Member States to benefit from a form of trade of renewable energy whilst still maintaining control over their national support schemes and the achievement of their national targets.

Historically, Member States have been keen to develop their own resources (contributing to their own emissions reductions, reducing fossil fuel imports and generating jobs) rather than develop the cheapest renewable energy sources. However, as the cheaper renewable energy potentials are exploited and costs start to rise, the need to seek out cheaper renewables in other Member States will rise. For this reason, the Directive created a number of “cooperation mechanisms” that allow a cross-financing between Member States for the achievement of the EU target.

Article 6 of the Directive creates “statistical transfers”. These are agreements between Member States to transfer a quantity of renewable energy produced in one Member State to another Member State for target compliance purposes. The transfer is purely virtual; there is no accompanying energy flow.

This mechanism exists so that Member States with considerable renewable energy sources, or with effective support schemes that help develop such sources cost effectively, can offer any renewable energy production surplus to their requirements (either to their target or trajectory) to other Member States. The “other” Member States interested in purchasing such transfers would be those with limited domestic renewable energy sources or with inadequate support schemes for developing the available domestic resources. The transfers would normally be for

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<sup>18</sup> See "Financing Renewable energy in the European Energy market", ECOFYS et al, October 2010

<sup>19</sup> COM(2010)639/3 Energy 2020: a strategy for competitive sustainable and secure energy, p10

Member States wanting to comply with their targets, or until their own domestic resources can be brought into production at a later stage.

A second mechanism is the “joint project”, a broad concept covering the building or co-financing of infrastructure or even an energy purchase agreement. The intention behind the mechanism is the same as for statistical transfers: to help build new plants and infrastructure in a Member State and sharing the resulting energy towards two or more Member States’ national targets, in order to reduce the overall cost of reaching the targets.

One key difference between joint projects and statistical transfers is the proposed inclusion of “private entities” in joint projects. A private entity such as a power generator, infrastructure company, energy equipment manufacturer, a banking consortium can identify projects in any Member State. Financing such a project could occur under the normal and existing domestic arrangements, but if such arrangements are insufficient, because the support is too low or does not qualify according to domestic priorities, the project would not be built. In such a case, the project developer could broker an agreement whereby another Member State agrees to help finance the project; again, this could be through loans, grants, tenders or access to national support schemes such as feed-in tariffs or green-certificate regimes. In exchange for this co-financing, the Member State would receive credit for a share of the renewable energy that was produced as a result of the project.

In addition to the cooperation mechanisms available to Member States, the Directive also creates an instrument that would enable third countries to take part in developing renewable energy sources and contributing to the EU target. Accordingly, “joint projects” between Member States and third countries – similar in structure to the joint projects between Member States– can be established. However, whilst joint projects between Member States can be purely “virtual trade” arrangements, joint projects with third countries have strict conditions attached to them to ensure that the arrangements generate new renewable energy production of electricity that is actually consumed in the EU. In particular, as proof of importation, the Directive requires that:

- the electricity is firmly nominated to the allocated interconnection capacity by all responsible Transmission System Operators in the country of origin, the country of destination and, if relevant, each third country of transit;
- the electricity is firmly registered in the schedule of balance by the responsible Transmission System Operator on the Community side of an interconnector; and
- the nominated capacity and the production of electricity from the designated installation refer to the same period of time.

In addition, the energy that is produced and exported to the EU under the agreement may not receive operating support. This rule is applied to reduce the risk of paying double subsidies and over-compensating producers.

The third element of the cooperation mechanisms established under the Directive is called “joint support schemes”. Member States may agree to join or coordinate their national support schemes (e.g. a common feed-in tariff or green-certificate/obligation regime). In the event of the joining of schemes, the renewable energy produced under such conditions is considered “pooled” and shared out either as a “statistical transfer” or according to an agreed distribution



rule. Sweden and Norway's recent announcement of a joint green certificate support scheme to begin in 2012 is the first example of the use of this mechanism.

### 5.1. Improving the functioning of national systems for supporting renewable energy

Whilst there has been some convergence and improvement in the efficiency of some Member States' instruments in the **electricity sector**, there has not been any coordination, and past recommendations of the Commission have not often been acted upon<sup>20</sup>. The continued existence of multiple different national support regimes shows little sign of change. This means investors and other market operators must deal with a wide range of changes, small and large, occasional or regular, in 27 Member States. This exacerbates the differences and distortions between Member States' electricity markets and ignores the benefits of operating in a single European electricity market. Given the growing importance of the share of renewable energy in the European electricity mix<sup>21</sup>, this is a concern. As a consequence, there is a need for further reform of electricity market support schemes.

As investor and market confidence in the renewable energy sector depends heavily on the regulatory framework, the reform of support mechanisms must be managed carefully. Retroactive changes to support schemes in particular should be avoided given their negative effect on investor confidence. It is for this reason that Member States created the cooperation mechanisms of the new Renewable Energy Directive, allowing Member States to control how their renewable energy resources are jointly developed, co-financed, and their support schemes joined or harmonised. Thus as the level playing field of a single energy market is created, renewable energy will be able to participate and compete.

The forums and projects established by the Commission to help Member States develop the cooperation mechanisms<sup>22</sup> can also be used to steer other aspects of national support schemes such as common technology banding, annual revision dates, cost calculation methodologies/indices, conversion of feed in tariffs to feed in premiums as technologies mature and ongoing work on the creation of regional clusters for joint support schemes, such as that under development between Norway and Sweden. The mechanisms also provide scope for supporting the development of renewable energy production in third countries, such as in the Mediterranean Solar Plan and DESERTEC initiative. **Thus the framework to make real progress towards a European support scheme regime now exists.**

**In the heating sector**, the predominance of investment grants is due to Member States' focus on household installations of small solar thermal or solar photovoltaic units. Given the cost reductions that have occurred in micro units in recent years, Member States could start to consider regulatory rather than financial solutions at the household level. For example, Article 13(4) of the Renewable Energy Directive includes rules for building regulations or codes to include minimum levels of renewable energy in buildings, ensuring growth through regulatory rather than financial means. Recent regional examples of such rules (e.g. in Catalonia) suggest major savings can be achieved by such means<sup>23</sup>. Given its local nature,

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<sup>20</sup> See for instance SEC(2008)57 Chapter 4.

<sup>21</sup> The 16% share today is expected to rise to 33% in 2020.

<sup>22</sup> These include the Concerted Action on the Implementation of the Renewable Energy Directive, Member States' "International feed in cooperation group" and numerous projects under the Intelligent Energy Europe Programme.

<sup>23</sup> See SEC(2008)85-2 Annex to the Commission's impact assessment on the energy and climate package, p122

support for micro heating systems can exploit distributed forms of energy that develop a local community's biomass, solar or geothermal resources.

The scope for any large scale heating from renewable energy sources is only now beginning to be explored in most Member States, partly because it is only now included in the European regulatory framework (the 20% target). Projects could include developing combined heat and power plants and/or district heating systems based on geothermal, biogas or biomass energy sources. In this context, Member States could start developing new instruments or extending existing instruments to heat production from renewable sources. In Sweden, for example (where Stockholm's district heating system serves 80% of households and sourced 80% from renewable energy), the Local Investment Programme and Climate Investment Programme promote further household uptake. Whilst commercial heat production occurs in a very local market, it is still sensible for Member States to discuss their different experiences in developing this energy source, and again the Concerted Action under the Intelligent Energy Europe Programme provides a forum for such coordination discussions.

**In the transport sector**, a mixture of instruments is also used to support the development of renewable energy, chiefly biodiesel and bioethanol. Quota systems require the use of biofuels for a given fraction of the road transport fuel mix. The fuels themselves are freely tradable across the EU. The extra cost of the biofuel is then part of the price of petrol or diesel and passed on to consumers. In 17 Member States this quota regime is supplemented by tax credits, whereby expenditure on biofuels is tax deductible. This supplement is therefore additional support funded by taxpayers. The empirical evidence regarding this sector shows that biofuels growth is more effective in those Member States where both instruments are applied<sup>24</sup>.

In all three sectors it is important that greater efforts are made to improve the efficiency and coordination of national instruments. For this reason the Communication on renewable energy<sup>11</sup> notes that the Commission will promote a more harmonised approach on the basis of best practice, through its state aid scrutiny, review of national support schemes and through guidance with the implementation of the Renewable Energy Directive and its cooperation mechanisms. Bearing in mind the scope for reviewing cooperation mechanisms given in Article 23 of the Directive in 2014 (prior to the preparation of a post 2020 renewable energy roadmap in 2018), it is important that the Commission take an active role in their development. Containing costs, helping to develop the *European* renewable energy market, it will be important for the Commission to help share the lessons of national experiences.

Separately, producers of renewable electricity can also generate revenues in the consumer market, from the sale of "guarantees of origin". Electricity suppliers can buy and use these guarantees to demonstrate to consumers the share of renewable energy in their electricity mix.

## **6. EU SUPPORT FOR RENEWABLE ENERGY**

Current EU funding for renewable energy has been provided through equity, project grants or loans. These have been in the form of debt assistance from the European Investment Bank to help the achievement of European energy and environmental goals and from the EU Research budget addressing the European dimension of energy technology development.

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<sup>24</sup> See SEC(2009)503 Section 2.3.

Despite the strong political support, ambitious European policy and legal framework (albeit with lagged implementation in some Member States), the EU financial support given to renewables is relatively low. For the period 2007-2009, funds spent on renewable energy amounted to **roughly €9.8bn**, (€3.26bn/a), the bulk of which in the form of loans from the European Investment Bank. During this period the financial support was made up of:

- €4.4bn in loans and assistance from the European Investment Bank;
- €65m from the European Economic Recovery Plan;
- €110m for the "Intelligent Energy Europe" Programme, which co-funds analysis and policy research in renewable energy;

€499m of EU Structural and Cohesion Funds were allocated by Member States, to projects and demonstrations of renewable energy (with a total of approximately €4.8 billion planned for 2007-2013)<sup>25</sup>;

- €250m from the EU R&D Framework Programme;
- In addition, the EIP GIF budgeted €51M in venture capital or loan guarantees;
- Separately, the European Bank for Reconstruction and Development granted SEI loans of approximately €40M

A major new source of financial support for renewables at the EU level is the "NER 300 programme", established under the Emissions Trading Directive 2003/87/EC. This will support the demonstration of CCS and innovative renewables at commercial scale and aims to co-fund at least 34 innovative renewable energy projects in the EU. The programme will provide around €4.5 billion of co-funding (matching funding from industry and Member States).<sup>26</sup> The Commission has launched the first Call for Proposals comprising 200 million of the 300 million allowances under the NER300 programme in November 2010.<sup>27</sup> The European Investment Bank will support the Commission in implementing the programme.

Annual EU budgets are prepared in the context of a multi-annual financial framework, the seven year "EU financial framework" plan, currently for 2007-2013. Today's EU expenditure thus occurs on the basis of a strategic document concluded in 2005 with a mix of instruments ranging from traditional grants to loans, loan guarantees and venture capital. Discussions are now beginning on EU spending priorities in the next financial perspectives period, post-2013<sup>28</sup>.

## **6.1. Improving EU expenditure on renewable energy**

European energy policy has changed significantly over the last five years. There has been a broad acknowledgement that a more active *European* pursuit of our common policy goals is more effective on the global stage and in the global economy. For this reason, a reorientation of

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<sup>25</sup> See COM(2010)110, 31.3.2010, "Cohesion policy: Strategic Report 2010 on the implementation of the programmes 2007-2013".

<sup>26</sup> See Commission Decision 2010/670/EU of 6.11.2010, OJ L 290, p. 39.

<sup>27</sup> OJ C 302, 9.11.2010, p. 4, further information is available at: [http://ec.europa.eu/clima/funding/ner300/index\\_en.htm](http://ec.europa.eu/clima/funding/ner300/index_en.htm)

<sup>28</sup> See COM(2010)700 Final.

EU budget priorities is appropriate. This is possible both in terms of more focused use of existing instruments and in developing new European instruments.

**Structural Funds and Cohesion Funds** constitute a significant part of EU expenditure, with planned support for renewable energy activities for the period 2007-2013 of approximately €4.8 billion. As stated in the Communication "Regional Policy contributing to sustainable growth in Europe 2020"<sup>29</sup>, the deployment of renewable energy can be an important driver of local economic development, especially in rural and coastal areas, outermost regions and islands. In this framework, local and regional authorities need to see investment in renewable energy as strategic investment securing employment and regional development. To reap the full benefit of local renewable energy potential, local and regional authorities should address renewable energy in a full life-cycle, developing integrated regional supply chains according to the local renewable energy potential. Such investment has cross-sectoral benefits at local and regional level from agriculture and forestry (biomass for energy) to SMEs, industry and the construction sectors. Currently, the Commission is reflecting on the future of Cohesion Policy. **The Budget Review as well as the Conclusions of the 5<sup>th</sup> Cohesion Report<sup>30</sup> conclude that Cohesion Policy needs to concentrate on the Europe 2020 objectives and targets, including the renewable energy target.**

**The European Agricultural Fund for Rural Development (EAFRD)** also finances development programmes of the Member States and in particular the rural part. This can also include renewable energy projects, in particular support for the stimulation of biomass production through energy crops or forestry.

Another large element of European budget expenditure is on **research and technology development**. The EU R&D budget (€48bn FP7) helps to integrate national research agendas across Europe. It facilitates the creation of the European Research Area and finances research in a wide range of disciplines. R&D has a long history of public support and clear economic justification for European funding. EU budget expenditure in this area drives forward European policy priorities through research and maximises positive spill over effects from national research. The Commission has established the field of energy as a clear priority for the future. The European Strategic Energy Technology Plan (SET-Plan)<sup>31</sup> sets out a vision of how Europe can continue to lead the world in the development of a diverse portfolio of clean, efficient and low-carbon energy technologies. More recently, the Commission has presented detailed analysis of the financing needs of clean energy R&D<sup>32</sup>. It estimates that a further €50bn is needed over the next ten years and concludes that "stronger intervention at the European level could be one of the most effective ways to bring forward the desired broad portfolio of technologies". Together with the private sector the Commission has been establishing European Industrial Initiatives for key renewable energy technologies (European wind, solar and grid Initiatives) and proposing to reinforce the successful financial instruments already used at the European level.

For certain demonstration projects and for deploying technologies in near commercial, bankable projects, European funds have also been deployed using the **European Investment Bank**. The Bank has a mission to support projects that contribute to European energy and

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<sup>29</sup> COM(2011) 17 final, adopted on 26 January 2011.

<sup>30</sup> COM(2010)642, 9.11.2010, "Conclusions of the fifth report on economic, social and territorial cohesion: the future of cohesion policy".

<sup>31</sup> COM(2007)723 A European Strategic Energy Technology Plan

<sup>32</sup> COM(2009)519 Investing in the Development of Low Carbon Technologies.

environmental goals, and has contributed approximately €3bn per year for renewable energy projects for several years. The Commission's SET Plan also called for the reinforcement of financial instruments involving the Bank, such as the RSFF, the Marguerite Fund and the High Growth and Innovative SME Facility (GIF). In addition, the Commission and the Bank will assess optimal financial packages for large demonstrations and market replication projects, to develop innovative financial instruments to promote both energy efficiency and renewable energy. At the national level, the UK Government's plans to establish a Green Investment Bank highlight how Member States also see the need to address the capital access concerns of the renewable energy industry. In recent years a range of external funds for low carbon technologies have been developed, such as the Global Energy Efficiency and Renewable Energy Fund (GEEREF) to leverage private finance into renewable energy projects through equity or debt. More recently, in its European Economic Recovery Package, the Commission financed over half a billion euros of grants to speed up the implementation of key renewable energy projects of European interest.

With the wide range of European instruments used to finance renewable energy projects with a European dimension, there is scope for ensuring that in the forthcoming review of the European financial perspectives maximum use is made of these targeted and effective instruments. Indeed, in its recent budget review<sup>28</sup> the Commission emphasised the catalytic role European funds should play in leveraging public and private financial resources.

In this context, following the Commission's proposal for the next multi-annual financial framework, the Commission intends to maximise the leverage of private capital into energy projects of regional European interest. It will strive to facilitate the uptake of the Renewable Energy Directive's cooperation mechanisms, the intended use of which is disappointingly low, according to the National Renewable Energy Action Plans recently submitted to the Commission<sup>33</sup>. This would improve regional cooperation and begin the harmonisation of support schemes. It could ensure savings of as much as €10bn annually<sup>16</sup> and that **renewable energy starts to be integrated into the European market.**

## 7. CONCLUSION AND ACTIONS

Europe has established the regulatory framework for creating a low carbon economy, starting with pricing greenhouse gas emissions and a major drive to develop renewable energy technologies and deploying them in all sectors of our economy. Given the financing gap that needs to be filled to reach our targets, and the current fiscal constraints governments face, it is important that we finance renewable energy growth as efficiently as possible. As with energy infrastructure, there is a need for European action, to speed up the efficient delivery of renewable energy production.

At the national level, the reform of financing instruments occurs regularly, in a manner which generally strives to avoid creating investor uncertainty. However such reforms occur in an uncoordinated manner. The Communication on renewable energy<sup>11</sup> therefore notes that the Commission intends to lead national cooperation on financing renewables, based on the new framework for Member State cooperation contained in the Renewable Energy Directive. In this way the cost of achieving the targets whilst promoting the growth and future prosperity of the European renewable energy industry can be minimised.

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<sup>33</sup> [http://ec.europa.eu/energy/renewables/transparency\\_platform/action\\_plan\\_en.htm](http://ec.europa.eu/energy/renewables/transparency_platform/action_plan_en.htm)

With European sources of financing, the current Budget Review will aim to maximise the impact of EU funds. For renewable energy, EU funds, including those of the European Investment Bank, must facilitate cost effective renewable energy development and the lowering of the cost of capital investments in the sector.

To ensure the achievement of these objectives, reflecting the conclusions of the Communication on renewable energy<sup>11</sup>, action could include:

- Preparation of guidelines for more harmonised reform of national renewable energy support schemes, through the use of the Directive's cooperation mechanisms.
- Facilitation of the development of cooperation mechanisms both between Member States and with third countries (e.g. in the context of large scale industrial renewable energy initiatives such as the Mediterranean Solar Plan and Desertec Initiative).
- Promotion of reforms in the southern Mediterranean to facilitate the growth of renewable energy and the scope for third country cooperation post 2020
- The review of European Structural Funds and Cohesion Fund in the context of the EU Budget Review to examine the scope for an improved contribution of the funds to EU energy and climate targets in line with the Europe 2020 Strategy.
- Continued work with financial institutions to improve European support for private investment in renewable energy projects.
- Expanded use of innovative financial instruments as a device for achieving greater private sector leverage for European policy priorities and maximising the EU value added of financing in the energy sector.