

2012

PUBLIC FUNDING FOR GREEN ENERGY IN A CONTEXT OF CRISIS

Conclusions and key messages (Executive summary)

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Preliminary report: conclusions and key messages

- The European Union promotes the change of energy model through its Directive 2009/28/CE on the promotion of the use of energy from renewable sources which sets three compulsory goals for all Member States for 2020: a 20% reduction of greenhouse gas emissions, a 20% reduction of primary energy consumption through energy efficiency and a total share of 20% of renewable energy in final gross energy consumption, as well as a 10% share of renewable energies in transport.
- According to Eurostat figures, the primary production of renewable energy in the EU-27 in 2009 was 148.4 million tonnes of oil equivalent (toe) – an 18.3 % share of total primary energy production. The volume of renewable energy produced in the EU-27 had an overall increase of 60.2 % between 1999 and 2009, equivalent to an average increase of 4.8 % per annum.
- Renewable energy share of gross final energy consumption in the EU-27 was 12.4% in 2010 (11.5% in 2009). The countries with highest share of renewables are Sweden, Latvia, Finland, Austria and Portugal –see figure below-. Renewable energy share in total electricity consumption was 19.8% in 2010 (18.2% in 2009) and the RE share of gross inland energy consumption was 9.9% in 2010 (9.1% in 2009)¹.
- The economic activity of the 27 European Union Member States for 2010 stemming from renewable energies is valued in more than 127 billion euros – a 15% improvement on the 2009 figure of 120 billion euros. The photovoltaic sector shows an excellent performance with sales of 45,564 million euros in Europe's markets, which ranks it as top earner outperforming wind power. Photovoltaic is followed by the wind power and solid biomass sectors.
- Germany leads Europe in sales (36,860 million €). Italy (16,164 million €), France (12,602 million €) and Sweden (10,158 million €) follow Germany in turnover.
- The recent report *"The State of Renewable Energies in Europe"*, published by EurObserv'ER in the beginning of 2012, found that the renewable energy sectors have more than 1,114,000 employees in the 27 European Union Member States. This is a 25% increase on the 2009 figure (912,220).
- The major employer is solid biomass with more than 273,000 jobs (direct and indirect full time jobs), followed by photovoltaic and wind power with respectively 268,110 and 253,145 jobs estimated for 2010. Business in the photovoltaic sector surged in 2010, which led to a 50% increase in job numbers and in countries as Germany, France and Italy jobs expanded by 70% or even more.
- Germany (361,360 workers) still holds an undisputable lead over its nearest rivals in the jobs league with more than twice as many jobs as in France (174,735 workers) and over three times as many as in Italy (108,150 workers). Spain ranks fourth (98,300), followed by Sweden (54,780 workers) -see annex-.
- According to a Commission's study² in 2009, reaching the 2020 renewable energy targets is expected to lead to around 2.8 million jobs in the renewable energy sector and generate a total value added of around 1.1% of GDP and 3.4 million employees by 2030.
- In the *"A 100% Renewable Energy Vision for the European Union"* report, the European Renewable Energy Council estimate that a target of 45% renewable

¹ These figures were published by Eurostat, the statistical office of the European Union in connection with the EU Sustainable Energy Week in 2012, which promotes energy efficiency and renewable energy.

² Ragwitz, M. et al (2009).

energy in final energy consumption in 2030 is met, this would provide gross employment of about 4.4 million in the renewable energy sector – an annual average growth rate of about 6% on 2020 (2.7 million employees). If a target of 100% renewable energy by 2050 was followed, employment in the renewable energy sector would bring 6.1 million people into work.

- Most experience with supporting RES is available in the electricity sector, where the EU Directive 2001/77/EC required Member States to increase the share of renewable energy sources in electricity using national support instruments.
- Support for renewable heating and cooling is mainly based on investment grants and partly tax exemptions. In the transport sector most MS use a combination of an obligation with tax exemptions. In Europe, main support schemes are feed-in tariffs, feed-in premium and quota obligation.
- According to Ecofys, in absolute terms only a few countries hold a major part of the current overall net support expenditures (electricity, heating and transport) as arising at EU level. Thereby Germany takes the “lead” with almost 11 billion €, followed by Italy and Spain with about 5 billion €. Somewhat further distant are France with about 3 billion €, followed by Sweden and the UK with both slightly more or less than 2 billion € net expenditures. Of interest, at EU level overall net support expenditures for RES in 2009 amounted to about 35 billion €.
- The support expenditures for electricity are dominant, while heating sector with exception of Austria, Denmark, Finland and Sweden, and biofuels with exception of France and Germany account only for a minor share of the total expenditures. It must be remarked that support expenditures for renewable electricity (RES-E) is mostly paid directly by final consumer through FIT.
- At electricity sector numbers given by Council of European Energy Regulators (CEER) have some differences with those from Ecofys. The total RES-electricity support expenditure (M Euros) is 19.106 billion of Euros.
- The European funding for the period 2007-2009, funds spent on renewable energy amounted to roughly €9.8 bn, (€3.26 bn/a), mostly in the form of loans from the European Investment Bank. The European Regional Development Funds (ERDF) and the Cohesion Fund (CF) are the most important funds on renewable energy. The expenditure planned by these funds on renewable energy for the 2007-2013 period amounts 4,760 M€. This represents a total of 680 M€ per year.
- Today’s critical environmental challenges and prolonged global recession have resulted in calls for a new “green” economy that could simultaneously promote sustainability, generate economic growth and create jobs. A race is on among countries and localities to become the leader in green technology.
- Some observers question whether renewables will continue growing in Europe given the ongoing financial issues and a number of governments reducing renewable incentives. Some experts’ conclusions raised the idea that a period of low government spending could favour continued growth of renewables. With limits on spending, governments are reluctant to support big-ticket capital investments in generation whether by government utilities or the private sector. This works against investments in nuclear, coal with carbon capture and even gas units.
- However, it is necessary to take into account that some 80% of the total energy subsidies in the EU-15 are paid to fossil fuels and nuclear energy according to the European Environment Agency, while just 19% goes to renewables.
- The NER300 is a European programme to finance - provide 50% of relevant costs- demonstration projects for renewable energies in the climate change policy framework (established by the EU Emissions Trading Directive). It covers 300 million

allowances from the new entrants reserve of the third phase of the EU Emissions Trading System for the co-financing of innovative renewable energy technologies -as well as commercial demonstration projects of environmentally safe carbon capture and geological storage (CCS) - in the territory of the EU. The allowances will be sold on the carbon market and the money raised -which could be 4.5 bn EUR if each allowance is sold for 15 EUR- will be made available to projects as they operate. The NER 300 is a useful tool, but it is not and cannot be able to replace stable framework conditions and markets adapted to the needs of a renewable energies based energy system.

- Financial new investment in renewable energy was significantly lower in 2010 in both Europe and North America, although this setback was more than out-weighed by growing investment in China and other emerging economies, and in small-scale photovoltaic (PV) projects in the developed world.
- Particularly in Europe, the growth of financial new investment in 2009-2010 was -22%, whilst compounded annual growth rate during 2004-2010 was 25%. In 2011, the biggest reductions in terms of absolute dollars came in US wind and European solar.
- The Japanese earthquake and the ensuing crisis at the reactors at Fukushima initially led to a sharp rise in the share prices of renewable energy companies. But it could be that gas-fired generation will be the prime, short term beneficiary of nuclear's problems, not renewables.
- In 2010 and in the beginning of 2011, a number of countries adapted photovoltaic feed in tariff schemes, with the Czech Republic, Spain, France, Italy, UK and Germany revising policies and tariff rates given unexpected rapid growth that resulted in escalating policy cost.
- The EU had already reached its first interim target for 2011/2012 (10.7) in 2010³; the RES in consumption was 12.5% and the RES in transport was 4.7% in the same year. All the Member states have reached or rose above their renewable energy interim targets for 2011/2012, except Ireland, Cyprus, Latvia, Luxembourg, Malta, Netherlands and United Kingdom.
- By 2020, the EU member states will collectively exceed the binding target of 20%; according to the National Renewable Energy Action Plans (NREAPs) around 20.7%. Sectorally, the share of renewable energies in electricity is predicted to increase to 34-34.3% with the highest contributions of wind energy, hydroelectric and biomass. Renewable heating and cooling is planned to reach 21.4-22.2% with biomass mainly. And the share of renewable energies in transport is forecast to be 11.27-11.7% mostly from biodiesel.
- However, there are more pessimistic experts⁴ that expect that the majority of EU countries will fail to trigger the required investments in new RES technologies needed for the 2020 RES target fulfilment. According to these experts, the renewable energy share would be 14.8% (instead of 20%) in the business as usual scenario. If non-economic barriers are mitigated, with yearly expenditures of 82bn Euros (only 4bn more the in BAU scenario) the gap will be closed.
- With regard to the European debate about the renewable energy financial support post-2020. A majority considered that support should be available for selected technologies whereas few people favoured phasing out all support for renewables post-2020. Operative support could be provided for those relatively close to the

³ European Commission (2012). Communication "Renewable Energy: a major player in the European energy market".

⁴ Ragwitz et al, 2011. "Shaping an effective and efficient European renewable energy market". Fraunhofer Institute for Systems and Innovation Research (ISI), coordinator. "RE-shaping" study

market whereas at the very initial stage of development R&D support might be more appropriate.

- As for the conditions under which support for renewables continued to be justified, the absence of full internalisation of external costs, including through a robust carbon price, as well as removal of all subsidies for conventional generation were most often mentioned.
- There is no consensus whether the level of support to renewable energies should remain under exclusive national control or in favour of EU-level benchmarks. more than two thirds of public authorities responded that support should remain under exclusive national control.
- In general there was wide support for making support schemes more market-oriented and the importance of exposing renewables to market price signals in order to reduce distortions

National cases: conclusions and key messages

Employment

In Germany a substantial renewable energy industry emerged in the past years. Currently more than 380,000 employees are working in the renewables sector (direct and indirect). Furthermore the sector is expected to continue its positive development.

In Italy, the creation of green jobs linked to the renewables sector in a period of low economic growth and recession (about 120,000 in 2011 - MED data).

The renewable industry in United Kingdom supported 110,000 jobs (direct and indirect jobs).

In Spain, there are 148,394 workers in the RES sector, 88,209 of them are direct jobs.

In Bulgaria, there are 5,470 workers in the RES sector (direct and indirect). The employment in RES in Bulgaria is still limited and the employed are not unionised.

In Sweden, according to Euroobserver report (2011), there are 54,780 jobs (direct and indirect). In general the renewable energy workers have rather good level of affiliation and the quality of jobs is sufficient so as there have not been collective bargains.

Target 2020: current situation and perspectives

Germany

Renewables now make up 12.5% of total final energy consumption (BMU 2012a).

Renewables represents 20% on TPES and 12.5% of total final energy consumption in 2011.

Therefore it defined a target to increase the share of renewable energies in the total electricity supply to at least 12.5% by the year 2010 and to at least 20% by the year 2020 in line with the EU directive 2001/77/EC.

The German 2020-target is to reach 10% of renewables in the transport sector. This quota does not have to be entirely covered by biofuels. The growing electric mobility sector also supports the share of renewables in the transport sector.

Italy

In particular, the consumption of electricity from RES represents the greatest share in comparison with the other sectors, reaching 20.1% of final energy consumption in 2010 (26.4 by 2020). The heat and transport sectors are those in which the consumption of renewable energy is lower, reaching respectively in 2010: 9.5% for energy from heat (17.1% by 2020) and 4.8% for transport (10.1% by 2020). In 2010 the overall share of RES in final energy consumption was 10.1%. By 2020 the overall share of RES in final energy consumption will be 17%.

United Kingdom

In 2011, 3.8% of final energy consumption was from renewable sources, renewables generated 9.4% of the total electricity and around 14% of renewable sources were used to produce heat in the United Kingdom. With regard to the transport sector, biodiesel accounted for 3.6% of diesel, and bioethanol 3.3% of motor spirit.

There is uncertainty about the prospects of the UK meeting its 2020 targets. In its roadmap document the government also states that despite uncertainty about the contribution from individual technologies, the UK can deliver 234 TWh of renewable energy overall in 2020 – equivalent to the necessary 15% of projected energy consumption.

Spain

In 2010, 20.8% share of renewable energy at final energy consumption.

Renewable energy share in “electricity” is expected to be 38.1% by 2020. This was a realistic target at electricity sector as support schemes were working well at this sector.

There are no official estimates on job losses since the beginning of the crisis, however employers’ organizations estimate some 20,000 jobs lost out of 150,000 jobs in 2010 and this figure is expected to increase in the next future due to the moratorium on premiums in the electricity sector that implies shutting down new renewable power facilities at least until 2015.

Regarding the goals for 2020 assumed by Spain, the administration considers that they can be met, although the rest of stakeholders assure that they are hardly achievable unless the moratorium on the electricity sector is lifted. To this regard the European Commission warned in one of its communications that Spain will not be able to comply with its 2020 goals if the moratorium remains in force.

Bulgaria

The goal of Bulgaria’s National Programme on Renewable Energy Sources (2005 - 2015) is to significantly increase the share of non-hydroelectric RES in the energy mix in order to attain 16 % in 2020 (the mandatory targets set by the Directive on the Promotion of the use of energy from renewable sources 16 % share of RES on the final consumption of energy in 2020 and at least 10% share of renewable energy in final consumption of energy in transport by 2020).

In general the renewable energy targets for the country seems to be realistic, both concerning 2010 and 2020 targets, according to the interviewed representative of MIET (see more in part 6). The Energy Strategy of Republic of Bulgaria (from 2011⁵) examines two scenarios for the progress towards meeting the RE targets. The first scenario is called Basic, according to it the 16% share of RES in the FEC will not be fulfilled and this share will reach only 13 % in 2020. The second scenario, called the Goal oriented, implies the reach of the target with more than 18% share in 2020.

The share of RES in the gross consumption is complying with the EU targets – for example in 2010 the RES contributed to 15% of the electricity generation exceeding largely the 10.6% EU target.

⁵ http://www.mi.government.bg/files/useruploads/files/epsp/22_energy_strategy2020_.pdf

Sweden

Sweden's target for the share of renewable energy in the year 2020 is 49 % according to EU's Directive on the promotion of the use of energy from renewable sources 2009/28/EC. Furthermore, Sweden has a national target for the share of renewable energy in the year 2020 of 50 %.

Speaking about the future of the renewable energy sector by 2020 in Sweden, the level of ambition of the 49% renewable energy target is relatively low splitting into 62.9% RES-Energy, 62.2% RES-Heating&Cooling, and 13.8% RES-Transport. The Swedish Energy Agency has made a prediction based on existing incentives and arrived at 50.2% RES by 2020, which is not a goal that needs any kind of effort to be met. On the contrary, the 2020 target is even below the trend of RES since 1996.

In fact, the share of RES was already 48% in 2009, according to the Swedish Energy Agency. The Swedish Energy Agency's forecast for 2020, has calculated an increase to 50.2%, with the current support policies, but no strengthened support schemes. They also calculate with a 15.5% higher energy use than 2009, which is a very unlikely development, considering the EU targets of energy use reductions by 2020.

Support mechanism for renewable energies

Electricity:

Germany: Feed-in tariff (EEG feed-in tariff), Loan (KfW Renewable Energy Programme – Standard), Premium tariff (a market premium for direct selling and a flexibility premium)

Italy: Feed-in tariff, Net-Metering, Premium tariff, Quota system, Tax regulation mechanisms (Reduction in value-added tax and in real estate tax) and tenders.

United Kingdom: Feed-in tariff, Quota system, Tax regulation mechanism (Climate Change Levy).

Bulgaria: Feed-in tariff, Loan (Bulgarian Energy Efficiency and Renewable Energy Credit Line - BEERECL), Subsidy (Operation Programme Competitiveness and other EU structural funds).

Spain: Feed-in tariff, Premium tariff, Tax regulation mechanisms (Business Tax Reduction).

Sweden: Quota system in terms of quota obligations and a certificate trading system, Subsidy for the photovoltaic installations, Tax reductions for wind energy (of real estate and energy taxes).

Heating:

Germany: Loan (KfW Low-interest loan) KfW provides low-interest loans with grant payback support for the development and expansion of heat installations/plants. Subsidy (Investment Support).

Italy: A tax regulation system is currently in place.

UK: Price-based mechanisms (RHI). The Renewable Heat Incentive (RHI) is the main instrument to support RES-H non-domestic installations with a fixed amount per kWh produced. It is likely to be extended to domestic installations. Subsidy (Renewable Heat Premium Payment) (RHPP) for domestic installations, which provides a once-only subsidy to households that apply for the scheme for installing RES-H generators.

Spain: Tax regulation mechanism. At a national level, a tax reduction mechanism is in place for solar thermal installation, subject to specific conditions. The Spanish National Renewable Action Plan indicated also that a price-based mechanism for RES-H is to be established ("ICAREN"), however up to now no further information is available.

Sweden: Tax regulation mechanism: Tax reductions for households works and energy exemption.

Bulgaria: Loan (Bulgarian Energy Efficiency and Renewable Energy Credit Line, Bulgarian Energy Efficiency Fund and Residential Energy Efficiency Credit Line), Subsidy (The Operational Programme Competitiveness), Tax incentives for buildings owners.

Transport

In the transport sector, the two unique instruments used to promote renewable energy sources are the biofuel quota and/or the tax exemption for biofuels (Italy and UK used only the quota obligation, Sweden applied tax reduction mechanism and the rest of the analyzed countries used both mechanism).

Effects during economic crisis

Germany

In Germany, renewable energy technologies continued to growth even during the economic crisis. Renewables increased its share in energy supply and the employment was able to record further growth. Both domestic demand and foreign markets contributed to this stable development in the German industry.

The decision about nuclear phase-out by the end of 2022 secured the situation of the German renewables sector.

Currently the main support scheme of renewable electricity (EEG) is under revision. The amendment 2009 of EEG decreased considerably the feed-in tariffs for solar photovoltaic (PV) for all capacity sizes, but these corrections were taken because market prices for solar PV constructions dropped significantly, following the International Energy Agency recommendations. These changes had not direct connection to the financial crisis.

The costs of the German feed-in tariffs are mainly covered by the electricity bills of household consumers. In the future a new kind of conflict around redistribution might emerge. The main decision points will be the amount of money that the society is prepared to pay for the support of RE and the alleviation of the energy intensive industry.

Italy:

In Italy, the main support instruments for renewable energies appeared between 2008 and 2010 and because of that the creation of jobs continued even in the low economic growth period. However, the scenario of crisis and recession was not irrelevant.

The rapid increase of this sector, combined with the reduction in technology costs which is leading towards a grid parity scenario in PV, triggered in 2010 a debate on the abandoning of the system of incentives established and how to achieve this.

Afterwards, in 2011, there was a redefinition of support schemes with the aim of reducing financial spending on incentives and provide more support to the heat sector. In 2012 the new Energy strategy (approved by the Ministerial Decree 06/07/2012) set

the need to balance the mix of sources, times and costs of upgrading the network and a redefinition of the new target of electricity from renewable sources by 2020 -which may be equal to 32-35% of total electricity consumption.

So far this moment, the social debate is focused on the issue of whether or not to place a ceiling on the incentives and the number of installations to incentivise. The question about shifting the system of economic incentives from users towards general taxation has been suspended.

United Kingdom

The renewable sector in the UK has clearly progressed in recent years albeit from a very low base. At a time of recession the sector is one of growth.

The key challenge facing the renewable sector in the United Kingdom is the current uncertainty it faces regarding future funding.

The new Electricity Market Reform (EMR) - that will replace the Renewables Obligation mechanism- in its current form will not attract investors and will also enforce a spending cap to protect consumers' energy bills.

The lack of government support for renewables is deterring crucial investment in the sector to ensuring the future viability of many technologies. Although offshore wind subsidies are now set until 2017, those for onshore wind are to go to another consultation. On the other hand, the sudden announcement to cut the subsidy rate for solar installations caused outrage in the industry. As a result the number of homes installing solar has reduced drastically since the start of August even though the solar industry maintains that installing panels still makes good financial sense.

The lack of certainty surrounding the future funding in support schemes (Renewable Obligation and the Feed in Tariff) and the cap on funds keep investor confidence low and lack of investment now will inevitably have long-term repercussions and may well make it impossible to meet the 2020 targets.

The new chair of the Committee on Climate Change has warned that the government is in danger of breaching its own commitments on climate change by supporting the new gas-fired power stations.

Spain

Cutbacks in support mechanisms to renewable started just before the outbreak financial crisis, due largely to deficient planning that that did not take into account cost reductions in some technologies.

The financial and economic turmoil fully affected the Spanish economy in 2008 and the energy sector was affected in the initial years of the crisis due to its high reaction to variations in demands and to serious imbalance in the electric tariff system.

Cutback in support schemes started in 2010 and affected primarily photovoltaic energy although it quickly extended to the all the other technologies.

In 2012 it was adopted a moratorium to FIT in the electricity sector for all renewable technologies. This measure resulted in a major blow for the sector. Some planned subsidies for the thermal sector were also restricted and eventually were never implemented.

Bulgaria

Due to the previous attractive regulatory framework and lucrative feed-in tariffs a flood of investments was seen in 2008. The government response to unexpected interest from investors was a new rather restrictive Renewable Energy Act passed in April

2011. The new RES Act now abolishes the priority access to the grid for RES producers completely. The law places renewable energy behind all other kinds of energy. The law envisages to stop the application of the support mechanism after the indicative target for Bulgaria is achieved. This measure is in direct violation of EU directives. Another serious barrier is the fact that RES investors will find out the price at which they will be selling their energy only after the construction of their power generating facilities is completed

In 2012 the feed-in tariff (FIT) rates for the obligatory purchase of solar generated electricity have been cut by over 50 percent in Bulgaria. The cuts concerned also the wind sector (with 22 percent).

In this way, during 2011 and 2012 the new changes of the RES legislation and regulation led to a significant decrease of the support for RES. These developments, some of them retroactive, provoked a strong protest from investors complaining about changing rules, lack of transparency and problems for their investment. The newest legal changes seem to contribute to slow down the investors' interest in the sector but it is too early for definitive conclusions.

The Bulgarian regulator also raised prices for consumers, increasing them by 13 percent from the 1st of July 2012. It said that a large part of the increase was because of the growing proportion of more expensive green energy.

Sweden

The share of renewable energy in Sweden is the largest in the EU and the projections foresee to fulfil these targets even earlier than 2020. This has plausible been due to supporting politics in the field of renewable energy.

In recent years the number of mechanism has been increased, largely to fulfil the targets in renewable energy field. The indirect reason has also been supporting green companies and stimulating the export. This has also seen as one of the methods getting out from the crisis.

Some instruments or measures have ceased during couple of recent years since the Action Plan, but these have mostly been due to restructuring, not restricted resources due to economic decrease.

Final remarks

- The six countries analyzed in this report have support schemes to promote renewable energies. Support schemes are generally stronger for the electricity sector and less effective for renewable heating projects. In the electricity sector feed in tariff (FiT) is the most common instrument. FiT are expenditures that in most of the cases (all countries studied) are paid by final consumers.
- Although there is a perceived reduction of investment in renewables in Europe - compared with previous years and with other regions-, the sector has generally grown during the crisis. This factor reflects on the growing share of renewables in the energy supply, on new installed power and even on job creation. In this perspective renewables might have endured the economic crisis in better circumstances than other sectors. However, there are some exceptions like the case of Spain, where thousands of jobs were lost.
- The clearest effect of the crisis on the renewable energy sector is the cutback of retributions to solar photovoltaic energy. This can be partly explained by the reduction of costs for this technology. Wind energy was also affected by significant cutbacks (e.g. in UK and Spain), but the consequences of such reductions could be less devastating since wind energy has a more mature technology than the solar energy sector. European photovoltaic industry is also suffering because of Chinese competence with less expensive solar panels.
- Support schemes to renewables have changed in most countries although not always as a consequence of the economic crisis. Reasons for these changes include: the global reduction of costs for renewable technologies, the will to improve the efficiency of economic incentives, the determination to avoid the excessive profits for investors -as it occurs in Bulgaria or Spain- and the competence and tensions with traditional energy sources to obtain the highest energy mix share.
- It is important to note that renewables are part of a highly competitive market in which traditional energies (fossil or nuclear) are important players. Any decision on nuclear energy (like the early closure of nuclear plants in Germany, the referendum on nuclear energy in Italy) will have a clear impact on the development of renewable energies. The future perspective of gas plants in the UK and Spain will also have a significant effect on the future growth of renewables.
- One of the most common government arguments to modify and reduce economic incentives to renewable energies is their impact on the price of electricity. However, there is an open debate about this controversial issue.
- The primary threat to renewables comes from regulatory uncertainty, a situation that has especially affected the UK, Italy and Spain. A stable policy and regulatory framework is essential to assure long term investments. To this respect the post-2020 EU energy strategy turned out too weak to overcome national difficulties.
- One of the main obstacles found by researchers of this project is the lack of information, difficult access to data and the wide variety of statistics, especially regarding investments and national/regional support mechanisms expenditures. In many cases data on public and private investment are not disaggregated which complicated the drawing of any conclusions on public policies/ expenditures to support renewables.
- Even though the renewable energy sector had a significant growth in terms of energy supply, business volume and jobs during the last decade, renewables remain an emerging activity that requires government support to reach its full development, especially in the case of less developed technologies.

- Further investment is required in infrastructure, smart grids and storage for the sector of renewables to continue growing (as it is expressed in the cases of Italy and Germany). In Spain, regulation on net-metering becomes essential for the growth of renewables, even in the context of the moratorium on such facilities.
- Governments are convinced of their capability to meet national renewable energy goals for 2020; however, recent regulatory changes might have a negative effect on the achievement of these objectives. To this respect, of all the countries analyzed in this report, Bulgaria has implemented the toughest regulatory restrictions on renewables. Among the measures implemented was the elimination of priority access for renewables in a direct violation of the EU Directive on renewable energy.
- There is a consensus among stakeholders for the need to continue expanding the sector of renewable energies. Worker representatives and trade union organizations regard the development of the renewable sector as an economic improvement in the context of the current crisis and as a source of jobs. There are however differences in union position across the EU, between countries where the renewable sector is an emerging activity with worse working conditions than traditional energy producers (e.g. Bulgaria), and those countries that have achieved certain level of development and job quality (e.g. Sweden).
- The debate on the future of public support to renewables is very active at the moment. New changes in the support schemes were announced in 2012 in the UK and Spain which still need to be defined and developed. It becomes essential to analyze the social and economic impact of new regulatory changes, particularly their effect on jobs. These circumstances made even more complicated the position of central government officials in the interviews carried out for this study.