



## Stepping up but back: How EU policy reform fails to meet the needs of renewable energy actors



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### ABSTRACT

The European Commission (EC) has been active in setting European policy and driving forward penetration of renewable energy (RE) across Member States (MS). Recent challenging economic conditions, increases in electricity price for most European consumers, an entrenched company oligopoly and the lightening of RE subsidies have all shifted the EC to a new realism for energy and climate policy. The 2014 EC Communication on climate and energy 2020–2030 removes MS-level RE targets in favour of a single EU-wide target (27% RE supply) and phasing out of subsidies for mature RE by 2020–2030. The purpose of this research is to determine if the recent policy moves by the EC are concomitant with what RE actors need in terms of EU policy reform. A questionnaire was implemented with expert professional energy actors across all MS of the EU in order to determine priority factors limiting RE penetration, key issues for RE in the EU and the specific policy areas which needed reform by the EC. The questionnaire was implemented just before production of the aforementioned 2014 Communication and included 108 respondents. Respondents replied to questions related to the significance RE implementation issues, impact of the economic crisis on RE implementation, need for further EU/national policy on RE. The main areas to target EC reform were identified, as well as the policy areas the most wanted by RE actors. Conclusions include (i) the lack of engagement of the sample of RE actors with EU-level policy with more of a focus on national and global agendas, (ii) a relatively coherent view in actors of the differential role of EC and MS governments and (iii) a failure in recent EC policy to deal with the most important perceived policy challenges in the RE sector, clarity and stability of subsidies and financial instruments.

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*Abbreviations:* CO<sub>2</sub>, Carbon Dioxide; EU, European Union; EC, European Commission; ETS, Emissions Trading Scheme; GHG, Greenhouse Gas Emissions; MS, Member State; NREAP, National Renewable Energy Action Plan; PPC, Power Public Corporation; PV, Photovoltaics; R&D, Research & Development; RE, Renewable Energy

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## 1. Introduction

### 1.1. Introduction to the European energy policy landscape

In 2009, in order to deal with energy dependency and Kyoto targets, the European Commission (EC) proposed Directive 2009/28/EC [1]. This Directive, for the first time, set mandatory Member State (MS) targets for the supply of energy from renewable sources into the gross final consumption of energy. Targets to be achieved by 2020 included greenhouse gas (GHG) emission reductions by 20%, increase of the share of renewable energy by 20% and improvements in energy efficiency by 20%; this why it is often referred to as the 20-20-20 Directive. The main purpose of mandatory national targets was to provide certainty for investors and to encourage technological development to promote energy production from all types of renewable sources. Furthermore, the 20-20-20 Directive strove to encourage energy efficiency, the improvement of EU energy supply and the economic stimulation of a dynamic sector in which the EC wishes Europe to represent a global exemplar.

According to an EU Communication [2], the EU praises itself for having done a good job so far regarding achieving the 20-20-20 targets. EU energy and climate policies have ended in: a) decreasing GHG emissions by 2012 by 18% relative to emissions in 1990, b) increasing the share of renewable energy to 13% of final energy consumed by 2012, c) installing in Europe 44% of the world's renewable electricity (excluding hydro) by the end of 2012, d) reducing the energy intensity of the EU economy by 24% between 1995 and 2011, and e) reducing the carbon intensity of the EU economy by 28% between 1995 and 2010.

In parallel, the EU has put in place a regulatory framework with the aim to drive the creation of an open, integrated and competitive single market for energy which would promote the security of energy supplies. At a national level some MS have succeeded in achieving their national target. For example, under the legislation enforced in 2005 and implemented in 2011, Romania was able to meet its target of covering 24% of its final energy consumption from renewable sources much in advance (2013) of the 2020 deadline. Romania became an investor's "paradise", placed by an international consulting firm at number 13 on a list of 40 nations ranked by their attractiveness for investment in renewables (February 2013) [3].

### 1.2. Systemic European energy sector challenges

Further renewable energy penetration is becoming increasingly challenging in the EU due to global economic conditions. Since 2008, the impacts of economics have dominated the whole EU system as the economic and financial crisis has affected MS capacity and confidence to invest and risks are threatening the EU energy market as a whole. Fossil fuel prices, whilst reducing in 2015–2016, still affect the EU's trade balance; in 2012, the EU's oil

and gas import bill amounted to more than €400 billion or approximately 3.1% of the Union's GDP.

Since setting the policy landscape in 2009 renewable energy technologies have matured and costs have fallen substantially. However, the EU policy landscape has favoured mature technologies which present the lowest investment risk; this has been at the expense of emerging options which may present greater efficiency and emissions reduction gains. The lack of support for emerging technologies delays their effective demonstration and upscaling, the accumulation of highly skilled human capital in the medium-to long-term [4] and slows down achievement of energy futures. This focus on mature technologies has helped support the rapid trajectory of RE penetration in the EU. However, this rapid roll-out coupled with EU policy reform cycles poses multiple social, economic and technical challenges for the renewable energy system [5,6].

In terms of social challenges for example, consumers feel vulnerable because they are required to pay for the high cost of RE construction and the subsidies that governments have promised to investors; despite the fact that the optimal available mix of assets and suppliers was supposed to be used to deliver the most cost-efficient energy to consumers [7]. Indeed, looking at the period between 2010 and 2012, nearly every EU MS has seen an increase in electricity prices. For example, household electricity prices have increased an average of 4% per annum across the EU (from 2008 to 2012), while some MS have seen average annual increases of 9–10% (e.g. Latvia, Spain, Cyprus) [7]. Based on a model simulation with the scenario as close as possible to the EU institutional setup, the excess cost of the 20% RE target is 6% compared to a situation with no RE target [8].

Furthermore, in terms of social challenges, some EU electricity consumers feel deceived as shifts in current conditions lead governments to change ways of leading the national energy landscapes. German consumers for example, who have chosen green energy solutions, like photovoltaics for their own consumption or as an investment and who have based their decision on subsidies and financial motivation, now "get punished". Germany has imposed a new toll/tax for households that use photovoltaics for PV electricity self-consumption bigger than 10 KW installed after August 2013 [9]. In Greece, RE implementation has been inflated due to over-subsidisation, a situation that cannot be continued on a long-term basis, and concerns especially photovoltaics, as noted by the EC [10]. These differences in implementation between MS leave a fragmented EU-wide situation with the need for cohesive and supportive national policies embedded into an integrated EC RE planning system, a need apparent since before 2012 [11].

Part of the cause of the multiple challenges to further RE penetration is the failure of creation of a functioning energy market. The stated role and aspiration of EC regulatory reform laid out in the 20-20-20 Directive of 2009 was towards market liberalisation, the decrease of electricity prices and the protection of the consumer from monopolistic behaviours. In fact, this liberalisation

reform had two main effects. Firstly, it pushed MS to transfer the electricity sector from public monopolies into competitive private companies in liberalised markets [7]. Secondly, it entrenched the pre-existing oligopoly of energy sector companies with high returns-on-investments especially for early market entrants and/or those with established procedures with public licencing authorities. An example of this from Greece is the rapid licencing of a small hydroelectric plant due to be built by dominant companies (TERNA and Public Power Cooperation, PPC) of an installed capacity of 10 MW [12]. Small developers found it subsequently hard to enter the market; this is not a desirable feature of liberalised markets [13]. In 2014, the EC noted that energy markets are not working properly and concluded that competition is weak and so market forces are less effective at leveraging costs down [7]. The ongoing global economic crisis since 2008 coupled to this ongoing weakness in energy markets suggest that a paradigm shift is overdue.

The need for such a paradigm shift has been noted, for example in April 2014, in the Lech Energy Forum, a new EU energy realism was discussed [14]. This realism reflected three big challenges: (i) the EU shale gas has changed the energy trading terms and, thus, there is little need now for new energy investment in Europe, (ii) even with EU policy, the renewables will not be competitive against solid fuels for a long time to come, and (iii) geopolitical concerns have raised the energy security issue more strongly and perhaps to the detriment of environmental priorities [19], although until recently security has tended to be a MS, rather than a European concern [15]. However, other work does not paint such a bleak picture for RE and the promotion of RE installations in the periphery of the EU could act as an economic stimulus, decrease trade deficits, and possibly have positive employment effects [16].

### 1.3. The EC moves forward in energy reform

The EC, noting the difficulties with the 20-20-20 Directive of 2009 has been undertaking a reform process, leading to the production of an EC Communication on climate and energy to 2020–030 [2]. The EC emphasises the need to continue to drive progress towards a low-carbon economy which ensures competitive and affordable energy for all consumers, create new opportunities for growth and jobs, provide a greater security of energy supplies and reduce the EU import dependence. In fact, the European Commission insists that the 2030 policy framework should be based on full implementation of the 20/20/20 targets and the following themes [2]:

- A commitment to reduce greenhouse gas emissions following a cost-efficient approach which responds to the challenges of affordability, competitiveness, security of supply and sustainability, and which takes account of current economic and political circumstances.
- Simplification of the European policy framework while improving complementarity and coherence between objectives and instruments.
- Providing flexibility for Member States to define a low carbon transition appropriate to their specific circumstances, preferred energy mix and needs in terms of energy security and allowing them to keep costs to a minimum.
- Strengthening regional cooperation between Member States to help them meet common energy and climate challenges more cost-effectively while furthering market integration and preventing market distortion.
- Enhancing investor certainty by providing clear signals now on how the policy framework will change after 2020 and by

ensuring that substantial changes to existing objectives and instruments do not take effect before this date.

- Fair sharing of efforts between Member States which reflects their specific circumstances and capacities.

The EC has set a new RE target which states that by 2030, 27% of the EU electricity should come from RE. The significant difference from the older 20-20-20 policy is that the target now will be mandatory only for the EU as a whole and not for each Member States (MS) separately. The 2014 EC Communication will be followed by a public consultation and then this will end in a Directive which will become compulsory for Member States. The EC sets this higher RE target, but has reduced the support it provides for MS to deliver it. Previously the NREAP (National Renewable Energy Action Plans) was the required government response to the 20-20-20 policy, allowing the EC to assess progression in each MS. Now with no MS targets, the benchmark for top-level assessment of subsidiarity of RE policy in MS has been removed.

### 1.4. Research aims

EU energy policy is at a juncture and a paradigm shift is needed to ensure a cost-efficient and low carbon energy future. A move is being made away from the 20-20-20 policy endeavours outlined in 2009 towards a path outlined in the 2014 Communication of a pan-European target coupled to increased competitiveness and energy security. With this intended shift in policy it is timely to determine to what extent the policy reform process is aligned to the perceived needs and desires of stakeholders in the EU in terms of ways to improve on the outgoing 20-20-20 policy. Whilst many stakeholder groups could be identified in the renewable energy sector, a focus was made on an informed and professional cadre who were closely linked to enabling activities and implementation of RE in the EU as these proponents are likely to be those whose engagement will lead to the success or failure of the reformed energy policy.

The authors aimed to assess the newly laid out 2014 policy landscape for the 2020–2030 energy future to determine if it met the needs and perceptions of actors who have been affected by the policy and regulatory demands. The target actor group were European-based energy professionals, from government/agencies and market operatives and from all the 27 European MS (at the time of the study).

A window of opportunity was used to interrogate energy actors, just before the 2014 Communication was released, in order to determine what areas of policy they would want to see reformed in the new EU landscape. These actor results could then be compared with the actual 2014 Communication once it was released. More specifically the aims were:

1. To assess whether the main issues constraining RE penetration across the EU are aligned with the beliefs of the European Commission.
2. To identify the most significant challenges to the energy sector in Europe.
3. To identify and assess the priority policy areas for RE energy reform and the differential policy responsibilities of the EC and MS.
4. To determine to what extent the priority areas for reform of EU policy identified by expert energy actors are met by the 2014 Communication?

## 2. Methodology

### 2.1. Questionnaire design

A questionnaire was designed to provide information on the respondent him/herself and on perspectives on a range of questions related to RE designed to provide information to deliver the research aims. The questions mainly used a Likert scale to allow statistical analysis of the data. Some of the questions involved assigning significance to RE implementation issues. With such a range of possible RE issues it would be confounding to analyse the results robustly; thus, a predetermined constrained list of RE implementation issues was provided in the questionnaire. This list was drawn from a recent literature meta-analysis of European RE implementation which identified 54 issues and ranked them by the frequency of inclusion in the sampled literature [5]. The 17 most frequently cited RE implementation issues, of the list of 54, were used in the questionnaire (Table 1).

The questionnaire started with a short introduction to the aims of the survey as well as an indication of the time involved to fill it in (10 min), a statement that the results will be “used exclusively for research purposes and will not be used in any commercial way” and a confirmation of anonymity. The following questions on renewable energy were used (with actual questions in italics) and answer options:

- Respondents were asked to score the importance of each of the 17 RE implementation issues (Table 1) on a Likert scale from “0” (non-significant) to “6” (highly significant). The issues were randomised in the questionnaire presented to respondents.
- For each of the 17 RE issues (Table 1), respondents were asked if there was a need for new policy. Categorical answers were “New policy at European level”, “New policy at national level”, “No new policy”.
- *Do you consider that the economic crisis can affect renewable energy implementation/process/opinion?* Categorical answers of “No”, “Yes” and “Not sure”.
- *Which one of the here below challenges are more critical to you?* With a list provided of key challenges from EC policy [12]. Respondent could select one or more key challenges.
- *Do you think that EU design of RE policy is necessary?* Categorical answers “Yes”, “No”, “Not sure”, “Only for urban centres”, “Only for rural areas”, “Only for remote areas” (no respondents selected any of the last 3 answers and these were dropped from the subsequent analysis).

- *It is 1 of January of 2021, you are the President of the EC and your targets for a sustainable energy EU future have not been met. Meanwhile, energy and environmental challenges are still there and you are determined to continue to fight against them. Which is your main priority for developing the so-wished EU sustainable energy future to come?* Respondents could select one issue from a provided list as those were presented among key priorities for EU according to the Green Paper of the European Commission [18].

The questionnaire was set-up on the SurveyMonkey platform so could be e-mailed as a link to respondents and allowed automatic data collation of results. A pilot was run with two expert energy actors to ensure seamless operation and question clarity and small revisions were made; this actor data was discarded.

### 2.2. Questionnaire implementation

The target sample of respondents was expert energy actors from across Europe. LinkedIn was used as a tool to engage actors as it for professionals with clear descriptions of their job and role. Existing energy experts already in the LinkedIn connections of the lead author were added to by searching and contacting the contacts on LinkedIn. Initially, this LinkedIn searching covered all European MS but more latterly specific EU country experts were selected to fill-in certain gaps in coverage. MS with greater RE generation, as a proportion of the total EU generation, were targeted, so MS with high levels of RE production would have more actors.

Once the LinkedIn contact was established they were asked if they would undertake a questionnaire, if they were agreeable then the questionnaire was supplied through an online link. The survey was implemented during a 4 month period from January 2013 to May 2013. In statistical terms the sample of LinkedIn contacts would be random within the sample frame of European professional expert energy actors who have a presence on LinkedIn. The response rate of connected LinkedIn contacts was 32%.

### 2.3. Representativeness and validity of the actor sample

A total of 108 contacts completed the questionnaire and these form the data set analysed in the work presented here. The initial part of the questionnaire about the respondent provided information to assess the coverage and organisational representativeness of the survey.

**Table 1**

The 17 most frequently cited RE implementation issues from a meta-analysis of European literature which were used in the questionnaire (from [5]).

| Code | European RE implementation issue  |
|------|---|
| SS5  | Local strategies are required to meet with RE industry but need to be based on knowledge, training on REP development and academic monitoring.  |
| GG2  | EU policy drives national-level renewable energy penetration and European competitiveness, but lacks clarity.   |
| EE2  | Investment in RE and relevant infrastructures is costly (very high initial costs and long payback periods).   |
| TT2  | Energy saving is needed but will restrict the need for investing in renewable energy.   |
| SS3  | Local opposition and conflict against REP implementation varies across actors due to many reasons.  |
| EE6  | Subsidies, incentives and funding must be appropriate and carefully designed to support REP implementation.   |
| EE8  | RE competitiveness depends on conventional fuels prices volatility and internalisation of externalities.  |
| GG12 | Institutional changes and market-based mechanisms lead to sustainable energy systems.   |
| SS7  | Companies experiment in a range of ways where REP implementation is concerned.  |
| VV7  | Among the important criteria for the assessment of REP implementation are environmental criteria (i.e. reduction of CO <sub>2</sub> emissions).   |
| GG6  | Long-term renewable energy system monitoring is necessary.  |
| GG7  | Dispersed RE decision making at multiple levels is difficult to manage.   |
| SS4  | Social systems, networks and partnerships are important for RE diffusion and REP implementation, encompassing a wide range of actors. Quality criteria for the implementation of participatory exercises are still under development. |
| TT4  | There is a need for wide range of RE demonstration projects.  |
| GG3  | Landscape management is important for REP implementation and requires coordination of many sectors.   |
| GG5  | Although economic performance and environmental protection are co-joined goals, environmental performance lacking in discussions (unbalanced linkage between economic and environmental performance).                                 |
| EE5  | RE market and RE market management require facilitating characteristics such as segmentation and liquidity.   |

In terms of EU geographical coverage, respondents noted their country of work or if they worked for an international agency or business covering the EU as a whole then they could note that. Croatia was excluded from the survey as it joined the EU after the survey was implemented. Of the 27 Member States in the EU at the time of the survey, respondents were from 24 (see Table 2). The countries with no replies, although LinkedIn contacts were made, were Austria, Hungary and Latvia; these three countries represent 7.2% of the primary production of renewables in the EU in 2013 (with Croatia excluded; [17]).

Apart from the geographical location of their work, the questionnaire allowed respondents to identify the type of organisation they worked for. In terms of the type of institution that the respondents worked for, the largest category was the private sector (39%) followed by research (31%) and then international/European institutions (19%) (Table 3).

From this preliminary assessment of the respondent samples the authors note a weakness in the absolute number of respondents ( $n=108$ ) and also in the lack of geographical coverage of 3 MS. However, the non-representation of the three countries in the survey is only “theoretical” as 23% of survey respondents work in institutions which cover the entire EU (for example they are working in the EC), therefore their views can be considered as representing the entire EU. The sample size means that the number of respondents from any particular MS is not large enough to do MS-level analysis and thus any MS-level analysis is not attempted. However, the sample is large enough for statistical analysis to be used for the data as whole to represent RE perceptions across the EU. In addition, with these limitations in sample size, the conclusions from these analyses are based on the main differences between the survey answers rather than smaller differences which may not be robust due to sample size. The organisational coverage covers the range of private sector, research, agency and government in an adequate balance for representative conclusions to be drawn.

**Table 2**

The number of respondents from each Member State covered by the survey, or in work across the whole of the EU.

| Member State   | Number of respondents | Member State   | Number of respondents |
|----------------|-----------------------|----------------|-----------------------|
| Belgium        | 3                     | Luxembourg     | 2                     |
| Cyprus         | 3                     | Malta          | 2                     |
| Czech Republic | 2                     | Netherlands    | 3                     |
| Denmark        | 2                     | Poland         | 2                     |
| Estonia        | 3                     | Portugal       | 3                     |
| Finland        | 1                     | Romania        | 2                     |
| France         | 9                     | Slovakia       | 1                     |
| Germany        | 4                     | Slovenia       | 2                     |
| Greece         | 11                    | Spain          | 4                     |
| Ireland        | 7                     | Sweden         | 1                     |
| Italy          | 8                     | United Kingdom | 6                     |
| Lithuania      | 2                     | The whole EU   | 25                    |

**Table 3**

The distribution of the sample actors in relation to type of institution.

| Respondent Institution  | Number of respondents |
|---|-----------------------|
| Government level (national and sub-national governmental organisations) | 10                    |
| International/European institutions                                     | 20                    |
| Local Society (Associations, NGOs, CBOs, Think Tanks)                   | 2                     |
| Private energy sector (Developers, Financial Institutions...)           | 42                    |
| Research  | 34                    |

### 3. Results

#### 3.1. Identification of the issues affecting renewable energy implementation

##### 3.1.1. Significance of renewable energy issues

The significance of the seventeen pre-determined RE implementation issues, based on the 108 respondents questionnaire scoring, was assessed to determine which RE issues were considered to be of highest significance for respondents (Fig. 1). The highest significance score was related to the need for careful design of subsidies and financial instruments (EE6), suggesting that from the sample of expert actors this is the most significant issue in RE implementation. However, these data also show that there are a range of other factors which are significant; the second-highest scoring issue (SS5) was related to the need for local strategies and capacity, then EE9 was related to the belief that the interchange between RE and conventional fuels can lead to economic benefits), VV7 (assessment of RE implementation through environmental criteria), GG6 (RE monitoring is necessary), GG3 (landscape management is important and needs coordination) and SS3 (local opposition and conflict varies across actors).

Above graph indicates that beyond the need for appropriate financial instruments, respondents consider as most significant the broader contextual factors, related to local energy strategies, the interplay between conventional fuel and renewables. The lower significance issues tended to be related to the technical aspects of the RE market (e.g. demonstration projects, energy saving requirements). This suggests that the sample of expert actors are aware of current realism of energy landscape in which financial instruments, conventional fuels, internal energy independence and economics are key.<sup>1</sup> It is broadly perceived that the RE market does not act by itself, but through a high degree of manipulation from regulatory practices, financial instruments and policies.

##### 3.1.2. Impacts of the economic crisis on renewable energy

With subsidies and financial incentives being identified as the most significant RE issue in the previous section, the global financial crisis which commenced in 2008 could be a major factor affecting RE penetration. Respondents were asked if the financial crisis can affect RE penetration and it was confirmed that the financial crisis affected RE implementation by a majority of the respondents (Fig. 2). This is concomitant with the above result that the financial platform on which RE operates is the overriding key issue to ensure RE penetration.

#### 3.2. The role and focus for EU policy reform

##### 3.2.1. Key EU-wide challenges according to RE actors

The European Commission [20] identified a range of critical challenges to be dealt until 2030 which have emerged since the original EC framework (agreed in 2008/9) and touch all levels (level, national and global):

- The consequences of the on-going economic crisis; the budgetary problems of Member States and businesses who have difficulty mobilising funds for long term investments;
- The developments on EU and global energy markets, including in relation to renewables, unconventional gas and oil, and nuclear;
- The concerns of households about the affordability of energy and of businesses with respect to competitiveness;
- The varying levels of commitment and ambition of international partners in reducing GHG emissions.

<sup>1</sup> See also interview of Mr Atle Leikvoll [18].

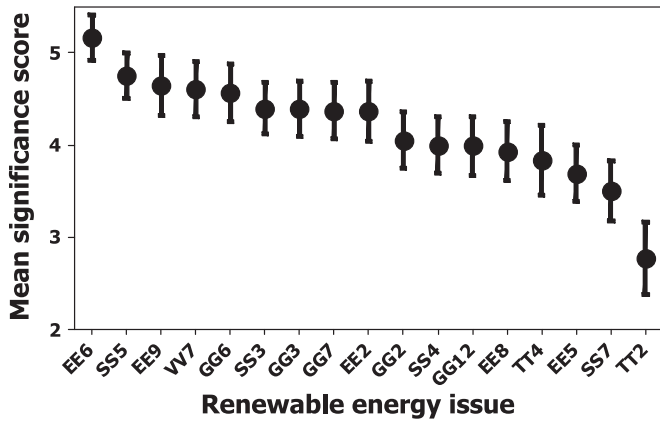


Fig. 1. The mean significance attributed to each of the 17 pre-specified Renewable Energy implementation issues (error bars shown are 95% confidence limits from the mean, n=108).

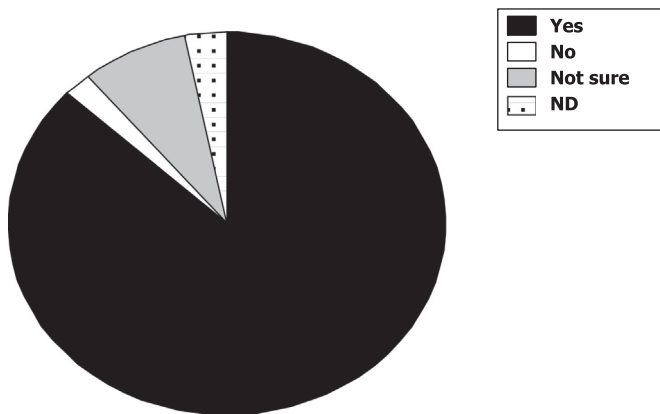


Fig. 2. A majority of the respondents noted that the financial crisis can have an effect on RE implementation (the “yes” category). A minority of respondents considered that the financial crisis had no effect (“no”), were not sure (“not sure”) or did not make a selection -no data- (“ND”).

These stated challenges were formed into a range of options for respondents to select what they perceived as the one key challenge (Fig. 3).

Whilst most respondents noted the effect of the financial crisis on RE implementation as outlined in the previous section, marginally more respondents actually rated the increase in GHG emissions as a more critical factor than the financial crisis. However, the differences between GHG emissions and financial crisis are small (< 4% respondents, Fig. 3), but it is notable that there is a significance difference in the perception of motivation for RE between the two majority answers. Identification of GHG emissions as the most critical factor suggests that RE is now positioned within a much broader mitigation and climate change agenda of global importance and responsibility. Whereas, identification of the financial crisis as the key challenge suggests that the threat is to the continuous RE support through investment and financial instruments; this is a narrow and RE sector-focussed perception. Drawing inference from these data could suggest that there is a somewhat polarised and differing perception on the role of the EU through RE; either as an approach to reduce GHG emissions and support global mitigation or to address the fiscal challenges.

The top two categories of challenges make up nearly 50% of the respondents; however, there are also a range of other answers related to various scales, from global energy demand, to regional energy security, to ensuring EU competitiveness to more local energy prices. The loss of EU competitiveness is only identified by 14% of respondents as the key energy challenge, whereas the EC

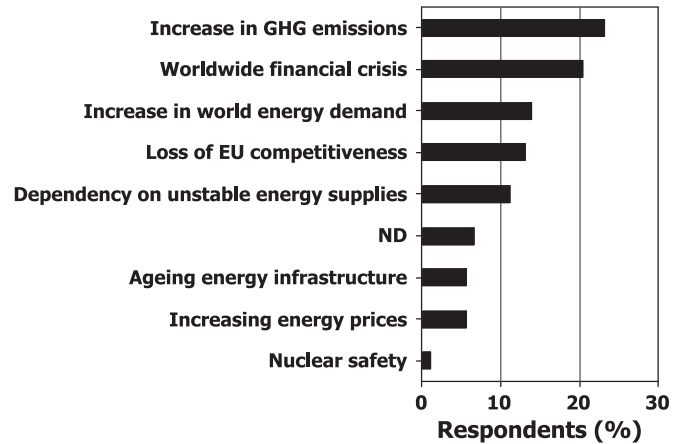


Fig. 3. The percentage of respondents selecting each critical challenge as outlined in the EC Green Paper on energy and climate policy to 2030 (ND=no data, where respondents did not supply a selection; n=108).

Green Paper of 2013 notes that “one of the fundamental objectives of EU energy policy is to ensure that the energy system contributes to the competitiveness of the EU economy” (Section 3.3 of [20]). The connection between EU energy policy and EU competitiveness is not frequently selected by the sample of expert actors as the most critical issue. The reasons for this can only be surmised, but the consequence is that global climate change concerns or sectoral fiscal stability issues are more paramount to the sampled expert actors than EU competitiveness.

### 3.2.2. Assessing the need for EU policy intervention

The respondents were questioned if the EU should intervene and design new, or revise existing, RE policy. The overwhelming majority (> 75%) responded that the EU does need to amend RE policy, with only a small number suggesting that no further EU policy was needed or not sure (< 18%) (Fig. 4). In this respect, the ongoing involvement of the EC and revision of the EC RE policy since this survey has been effectuated, was a step desired by our sample actors.

More detailed analysis is required however to determine if the policy revision has been in the specific areas perceived as important by the RE actors.

### 3.2.3. Priority challenges beyond EU 2020 targets

Going down into a strictly EU level the questionnaire tried to determine the key EU policy issues for treatment in the policy

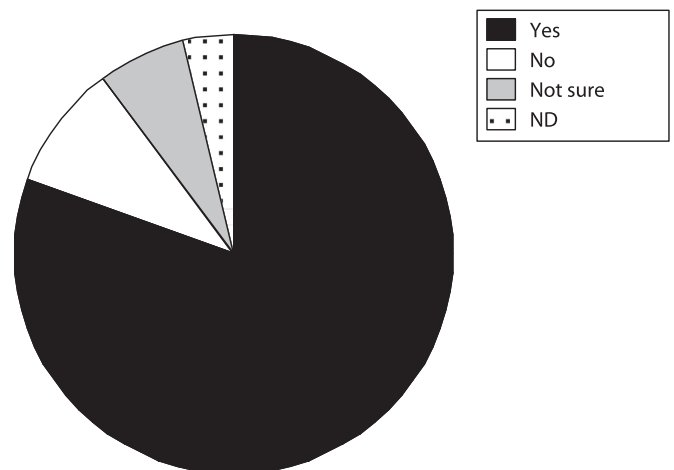


Fig. 4. The responses for the need for new or revised EU policy illustrating a majority respondents suggesting that new EU policy is required (ND=no data, respondents who have not provided a response to particular question; n=108).

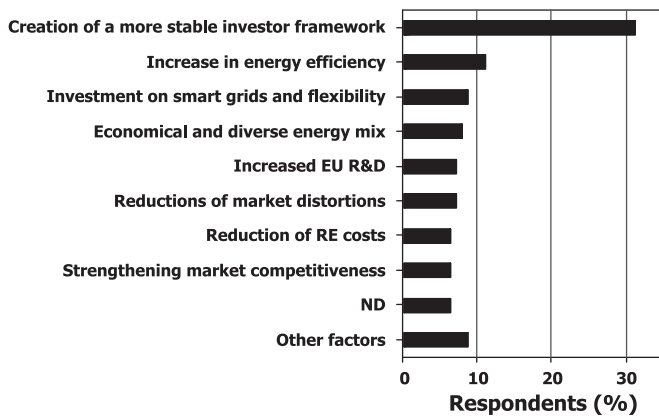


Fig. 5. The key policy areas for the EC President to develop in 2021 to lead to a sustainable energy future assuming the 20-20-20 energy targets had not been met (ND=no data, where no response was provided; n=108).

reform. Respondents were asked that “if they were President of the EC in 2021, when the 20-20-20 targets for a sustainable energy EU future had not been achieved, what would their main priority be for developing the EU sustainable energy future”.

The results show again that the creation of a more stable investor framework was the most frequently selected consideration for new EU policy (and not solely designed at a national level) (Fig. 5). Other contextual factors were then selected including energy efficiency, smart grids and diverse energy mixes.

These results concur with the conclusion from the previous assessment for the significance of different RE issues (Fig. 3). In combination, these results suggest that a stable investment framework and associated subsidies and tariffs are the most important factor for RE implementation and in which the EC needs to take a lead. However, there is also a diversity of other factors which are important which are related to broader contextual issues such as energy efficiency, grids and the energy mix. Both these analyses suggest that experts consider that the sector has matured and moved beyond technical and demonstration level needs and is now seeking a mature and balanced policy and fiscal landscape in which RE is embedded in the sustainable and diverse energy mix.

#### 3.2.4. Determining the RE focus areas for new EU or/and national policy

The previous section identified the need for a stable platform for investments in the RE sector as the most significant issue for RE implementation and for new EU policy. This section looks the extent to which the expert respondents consider that new EU policy is required in a range of issues associated with RE implementation. The RE implementation issues were the 10 most significant RE issues identified by the respondents (see Fig. 1) and for each issue respondents could answer if there was a requirement for: new EU policy, new Member State (national) policy or no new policy or leave the answer blank (ND, no data). These results were illustrated using a suite of pie charts (Fig. 6).

The most frequently identified issues to need *new EU RE policy* (> 40% responses in each case) were EU policy lacking clarity (GG2), high RE investment cost (EE2) and careful design of subsidies and incentives (EE6). These factors link to the previous conclusions of the expert actor perception for the need for the EU to provide a stable investor platform and manage subsidies and investment to promote RE penetration.

Of the 10 most significant RE implementation factors, those that were indicated most frequently (> 40% responses) to require *Member State (MS) new policy* were local strategies and capacity (SS5), to deal with RE landscape management (GG3), variation of

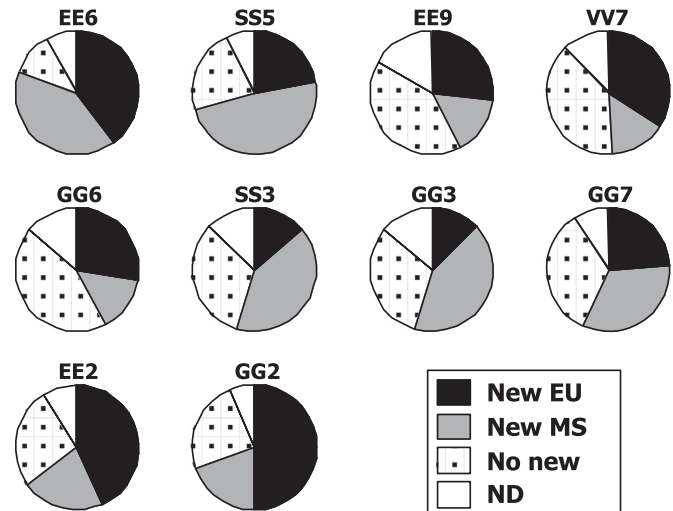


Fig. 6. Pie charts showing the frequency of responses for types of policy development for a range of renewable energy implementation issues (“New EU”=new EU policy required, “New MS”=new Member State policy required, “No new”=no need for new policy, “ND”=no data; n=108).

local opposition across RE actors (SS3) and careful design of subsidies and incentives (EE6).

These results suggest an inherent policy hierarchy from the EU to the MS level focussing on differential aspects of RE implementation, meaning a clear division of policy needs for EU and MS. Of note, is that the most significant issue (EE6, subsidies and incentives) where respondents are divided on whether needs an EU or MS new policy (> 40% in both cases), with less than 20% of respondents suggesting that no new policy is required (or not responding) for this RE issue.

Certain RE issues have relatively low frequencies of response for new policy (EU or MS) such as the need for long-term energy monitoring (GG6), the beneficial interplay between RE and conventional fuels (EE9) and assessment of RE through environmental criteria (VV7) which all have less than 50% of respondents suggesting new RE policy (Fig. 6). We notice that those aspects tend to link into other domains such as the wider energy sector and associated GHG inventories and MRV (Monitoring, Reporting and Verification) and environmental aspects and thus were not considered as core aspects of new RE policies.

These results demonstrate that within the sampled actors there is a differential role for the EU and MS policy with the EU policy being asked to focus on the creation of a stable fiscal platform whereas the MS policy being asked to focus on local strategies and conflict resolution.

## 4. Discussion

### 4.1. The stable but shifting agenda in EU energy policy

In 2009, through Directive 2009/28/EC and the setting of mandatory targets at member state (MS)-level, the EC demonstrated a strong commitment to increase the penetration of renewable energy to at least 20% by 2020. The creation of the EU internal market through regulatory intervention was considered as a pre-condition for the increase of EU competitiveness in the RE sector and the supply of low carbon clean and cost-efficient energy supply for EU citizens. Through NREAPs, the EC tried to implement a monitoring system to support MS to achieve the RE generation targets and to lead the developing RE economy. Yet, such high-level support translated into only piecemeal local RE deployment.

In fact, this study has shown that although European targets on GHG and energy intensity are getting achieved, many RE actors do not fully understand EU policy and further perceive that the 20-20-20 EU RE policy needs to be reformed in a number of dimensions.

More specifically, whereas some MS have achieved the 20% RE target and, on the supply side, many investors and big companies have generated significant profits, on the demand-side, electricity consumers have experienced a rise in retail prices from which they do not feel protected. In addition, many RE investors are struggling around subsidy uncertainty. The proposed EU Emissions Trading System (ETS) remains non-functional and not broadly understood by RE actors [20]. The ETS may be a way forward, as presently subsidies for RE distort the trading mechanism's price signal (e.g. [20]) thereby rendering the ETS non-functional as a policy setting tool, however setting the cap and price mean that "the really hard ETS negotiations are still to come" and may need a long-time horizon to become relevant to the EU context [21].

A regulatory framework has been in place since 1996, but the internal EU electricity market has not been fully liberalised and the supplier oligopoly has been largely maintained. The EC has consistently maintained this regulatory dialogue in terms of "the need of regulatory certainty" and the need to reduce "regulatory risk" [2]. Partly influenced by the lack of delivery in EU-led regulatory reform, energy prices have risen significantly. The findings presented in this work suggest that EU RE policy is relatively sidelined by actors as the analysis demonstrated that individuals think in either a local or globalised way, but not in an EU one (see Fig. 6). Whether this is due to these previously noted weaknesses in delivery at the EU-level, or a stronger alliance to the local and global RE agenda, is not clear. However, there are suggestions that in order to minimise RE-associated costs, further improvement and coordination of existing policy frameworks "seems more promising than drastic system changes", as the latter would create additional uncertainties and potentially negative effects on RET growth and project costs [22].

The 2013 EU Green Paper [20] continues to set as a first priority the achievement of targets and then "other policy instruments". In particular, the Green Paper suggests that "There is a need, to assess which targets can best, and most simply and cost effectively, drive energy and climate policies up to 2030, and whether the current approach can be streamlined particularly with reference to the need for various sub-targets." [20]. Furthermore, the EC has decided to change this goal-setting RE driver, based on the assumption that setting goals at a EU level (rather at an individual MS level) will accelerate RE in the most coherent and cost-efficient way. This new EU approach ignores national differences and directs the control of sustainable energy futures to the most competent European MS. The importance of targets to drive policy and the continued push for an improved regulatory framework have been constant in the EC rhetoric for 20 years; to what extent the single overall EU target will help further drive RE penetration is not presently clear. With the limited actor engagement with EU-level energy policy uncovered in the work presented here, the setting of a single target at exactly this level may gain weak traction among the actors.

#### 4.2. The linkage of EC policy reform to actors needs

The EC laid out its future policy intentions for both climate and energy jointly in a 2014 Communication looking towards the period 2020–2030 [23]. This Communication outlines the main building blocks that the EC will endeavour to use to act effectively on climate and energy. The stalwarts of targets (GHG and RE) and regulatory reform (titled "ensuring competition in integrated markets") are present and accompanied by energy efficiency,

energy security and reform of ETS. However, to what extent this forward looking stance of the EC matches the expectation and perspectives of energy actors is not clear. To clarify actors views in relation to the EU policy stance, the results from the actor survey presented in this work (Fig. 6) were tracked onto the policy intentions of the EC to determine the degree to which the policy reform was in the areas and directions targeted by our expert energy actor sample. The issues constraining RE penetration were ranked, based on the frequency of selection as an area for new EU policy by the actors, and linked to the various components of the EC Communication. Finally, an assessment was made to the extent to which the EC Communication has a proposed intent to deliver in the policy area of the RE issue, based on the text of the Communication (Table 4).

The assessment by the authors uses the following scale to summarise the analysis in the right-hand column:

- **Non-existent:** the EC Communication does not address this topic.
- **Negligible:** the topic is mentioned by in a synthetic way
- **Limited:** the topic is addressed and certain ways forward are noted although the treatment does not provide a comprehensive progression.
- **Substantial:** the topic is significantly covered and key areas for progression are identified.

The most significant aspect of the linkage between EU policy and RE actors is the lack of policy in the areas most frequently identified by actors to be in need of EU policy action. In the top three areas identified for EU policy action by actors (GG2 – policy clarity; EE6 – subsidies design and EE2 – high RE investment costs) the EU policy covers them in a negligible or limited (EE2) way. The need to focus on the European wide coordination of financial instruments has been identified as one of the key components of an EU energy transition to recover from the financial crisis [16]. From an EU review of support instruments for RE, Del Rio & Mir-Artiges (2015) note that the most common are subsidies for generation (such as Feed-In-Tariffs) and investment subsidies / tax incentives; these are the two areas identified as important by the actors but covered with negligible intent by the EC Communication [24].

On the other hand, the EU Communication does provide substantive inputs into the 4th (SS5 - RE R&D), 5th (VV7 - significance of environment) and 6th (GG6 - RE monitoring) ranked policy areas as identified by the sampled actors and then provides less policy intent in the remaining areas identified as not important for EU policy reform by the actors. The most compelling outcome from this comparative analysis was the policy vacuum in the policy areas most sought after by the sampled expert energy actors.

The key policy reform gaps which are identified in this comparison are policy clarity and subsidy / investment stability; those are key drivers for RE penetration by the market sector. The move to policy clarity in EU energy policy seems to be limited, both in terms of the lack of MS RE targets and also in terms of policy framing around a focus on competitiveness. With the EC continuously taking a leadership role in energy policy, on the one hand this translates in setting defined GHG and RE targets but, on the other hand, this choice demands greater flexibility" in delivering them. It is presumed that this "greater flexibility" means a reduction in the regulatory and imposed market manipulations of previous EC energy interventions and more uptake of the so-far failed ETS system.

While political dimensions cannot operate alone to drive forward RE [25], the EC seems to also avoid the subsidy and investment issues by (i) assuming maturity will lead to the predominant withdrawal of subsidies, and associated mergence to grid-parity, in



**Table 4**  
Renewable energy issues ranked by the frequency of the need for new EC policy by expert actors, the associated treatment of the issues in the EC Communication on climate and energy 2020–2030 (2014) and an assessment by authors on the degree to which the EC Communication deals with the issue.

| Frequency Rank | Renewable energy issue (code and description)  | Treatment in EC Communication (sub-section and description)   | Authors Assessment (summary strength of EC response <sup>1</sup> and comments)   |
|----------------|--|---|--|
| 1              | GG2: EU policy drives national-level renewable energy penetration and European competitiveness, but lacks clarity.                                   | 2.2 The EU RE energy target of 27% “will drive continued investment in renewable energy...”<br>2.2 No MS RE targets leaves “greater flexibility for MS to meet their GHG reduction targets in the most cost-effective manner in accordance with their specific circumstances, energy mixes and capacities to produce renewable energy”.   | <b>Negligible:</b> the EC suggests that the EU-level will drive RE penetration but the lack of MS-level targets will probably reduce the clarity in energy actors.   |
| 2              | EE6: Subsidies, incentives and funding must be appropriate and carefully designed to support REP implementation.                                     | 2.5 The EC promotes a structured drawdown in subsidies; “subsidies for mature energy technologies, including those for renewable energy, should be phased out entirely in the 2020-2030 timeframe. Subsidies for new and immature technologies with significant potential to contribute cost-effectively to renewable energy volumes would still be allowed”.<br>2.2 MS need “...an increased emphasis on the need to complete the internal market in energy. Different national support schemes need to be rationalised to become more coherent with the internal market, more cost-effective and provide greater legal certainty for investors”.<br>2.4 The EC accepts the structural surplus in ETS and notes that it is “expected to continue to erode its role as a technology neutral, cost-effective and EU-wide driver for low-carbon investment” at least into 2020. But that the ETS should “remain the central instrument to bring about the transition to a low carbon economy” by establishing “a market stability reserve at the start of phase 4 trading in 2021”.   | <b>Negligible:</b> The EC notes the increasing maturity of some energy technologies and the move to removal of subsidies in the 2020 – 2030 period whilst still allowing subsidies for new and immature technologies. This creates significant challenges to long-term RE investment as grid-parity is still some-way off, even in mature RE technologies. The proposed drawdown of subsidies may undermine investment in mature RE technologies.<br><br>The ETS will be most likely non-functional until at least 2020 and thus unlikely to provide an alternative fiscal system for RE support in the short- to medium-term. |
| 3              | EE2: Investment in RE and relevant infra-structures is costly (very high initial costs and long payback periods).                                    | 2.2 “Different national support schemes need to be rationalised to become more coherent with the internal market, more cost-effective and provide greater legal certainty for investors”<br>3.1 Member States’ national plans for competitive, secure and sustainable energy which would... [include]...certainty to investors after 2020”.   | <b>Limited:</b> Investment stability is noted and addressed through MS-level plans. However, investment stability is presently closely linked to subsidy stability over (see row above)  |
| 4              | SS5: Local strategies are required to meet with RE industry but need to be based on knowledge, training on REP development and academic monitoring.  | 4.4 The EC is “ramping up investment in energy and climate related research and development” but it also notes that “the EU will have to step up its efforts on research and innovation policy to support the post-2020 climate and energy framework”   | <b>Substantial:</b> the EC is aware of the importance of research, technological; development and capacity and is making a substantial increase in financial support through a range of instruments.   |
| 5              | VV7: Among the important criteria for the assessment of REP implementation are environmental criteria (i.e. reduction of CO <sub>2</sub> emissions). | 2.1 GHG emissions target – domestic EU wide emissions of 40% by 2030 compared to 1990 levels, delivered through ETS and MS.   | <b>Substantial:</b> the EC sets a stringent and clear GHG emissions targets and notes the value of RE in delivering it. The weakness in ETS until at least 2020 means that obligations fall primarily on MS in the shorter term which is clear but challenging.  |
| 6              | GG6: Long-term renewable energy system monitoring is necessary.  | 3.1 The EC identifies the need for rationalisation of monitoring and “considers that there is a need to simplify and streamline the current separate processes for reporting on renewable energy, energy efficiency and greenhouse gas reduction for the period after 2020, and to have a consolidated governance process with Member States”.<br>2.7 Energy security is of concern to the EC, “security of energy supply means ensuring continuous and adequate supplies of energy from all sources to all users”. RE has its role to play based on an integrated market, “contributions may come from renewable energy sources, domestic reserves of conventional and unconventional fossil fuels (primarily natural gas) and nuclear according to Member State preferences over their energy mix and within the framework of an integrated market with undistorted competition”.<br>3.2 The EC states that “systematic monitoring with key indicators is needed to assess progress over time and to inform any future policy intervention” which includes energy prices, energy security, smart grids and market liberalisation / competition. | <b>Substantial:</b> the EC notes the need for improved coherence in energy monitoring and links it strongly to energy security, competitiveness and removal of market distortions. Though for the RE sector the removal of “market distortions” may create challenges for competition with fossil fuels until ETS is fully functional in structuring the market.   |

Table 4 (continued)

| Frequency Rank | Renewable energy issue (code and description)  | Treatment in EC Communication (sub-section and description)  | Authors Assessment (summary strength of EC response <sup>1</sup> and comments)  |
|----------------|--|--|---|
| 7              | EE9: The interchange between RE and conventional fuels can lead to economic opportunities and benefits.  | 2.2 The EC notes that "the EU and Member States will need to develop further their policy frameworks to facilitate the transformation of energy infrastructure with more cross-border inter-connections, storage potential and smart grids to manage demand to ensure a secure energy supply in a system with higher shares of variable renewable energy".<br>2.5 The EC notes the importance of the internal energy market as it "provides the necessary environment and cost signals for the achievement of energy policy objectives in a cost-efficient manner" and provided prior guidance to "minimise distortive impacts". | <b>Limited:</b> The EC shows an awareness of the role of RE in the energy mix and the need to remove market distortions, but fails to identify how RE can play its role in such a competitive mix, especially in light of subsidy drawdown.   |
| 8              | GG7: Dispersed RE decision making at multiple levels is difficult to manage.                             | 3.1 The EC notes that there is a need for improved EC-MS governance through "a clear governance structure with an iterative process led by the Commission to assess the Member States' plans regarding these common issues and to make recommendations as appropriate"   | <b>Limited:</b> the focus of the EC is on EC-MS governance and it does not identify or appreciate the MS to sub-MS (regional, provincial, local) governance structure.  |
| 9              | SS3: Local opposition and conflict against REP implementation varies across actors due to many reasons.  | The EC Communication does not address this issue.  | <b>Non-existent:</b> local level conflict is a major factor constraining RE roll-out. Whilst this issue may not be in the direct remit of the EC, the responsibility it defers to MS to deal with local conflicts with no EU help means that it becomes an issue affecting RE penetration and meeting targets. An opportunity to include such MS constraints in the proposed MS-plans has not been taken. |
| 10             | GG3: Landscape management is important for REP implementation and requires coordination of many sectors. | 2.2 Biomass for GHG savings should "encompass the sustainable use of land, the sustainable management of forests...and address indirect land use effects as with biofuels".  | <b>Limited:</b> the EC considers that only biomass needs European regulation when it comes to landscape and does not recognise or address in this policy frame land-competition and planning weaknesses for other RE technologies, nor land and sea environmental impacts or loss of amenity / aesthetic value.   |

the policy time horizon, (ii) assuming that after 2020 ETS will provide an alternative fiscal system for RE support and (iii) assuming that MS will produce the enabling conditions for cost-effective and competitive energy.

These assumptions may be challenging for the EC but when it comes to energy-consuming citizens the assumptions underlie a weakness in the policy reform process which substantively fails to deal with the policy areas most needed by actors. In spite of that, the EC has proposed an Energy Union Package in a Communication in which it has the intention of "Becoming the number one in renewables...becoming the world leader in renewable energy, the global hub for developing the next generation of technically advanced and competitive renewable energies" [23]. This Communication, with a focus on security and integration, may have been induced by recent near-Europe geopolitical tension. However, it still requires cross-sector uptake and effective delivery on many of the regulatory, fiscal and policy dimensions already targeted by the EC in the design of the energy-mix, energy efficiency, climate response as well as RE. The EC may be building up layers of regulation, fiscal systems, targets and high-level intentions, but as the work presented here has shown, in the RE sector at least, the EC policy reform process has failed to provide reform in the main constraining issues in the sector as perceived by the sampled actors.

#### 4.3. Conclusions for EC energy policy reform

The work presented here has identified a number of key conclusions which can be directed at strengthening EC RE policy:

- The sample of renewable energy actors did not feel engaged

with EU-level energy policy and they tended to focus on local or international (global issues) suggesting that EC policy penetration into the sector, although spanning over 20 years, has been weak. The focus on European competitiveness in the recent energy Communication further degrades this engagement as it includes issues of lower priority.

- The actors had a relatively coherent view of what aspects of EC and MS policy needed to be upgraded; with a clear differentiation between EC and MS responsibilities. Key areas which the RE actors were keen to see delivered by the EC reform process were related to clarity of RE policy and effective treatment of subsidies and financial instruments. However, the EC energy Communication of 2014 fails to deliver anything more than limited intent on these key areas identified by the actors; suggesting a further disengagement of actors with EC energy policy.
- The EC seems to also avoid the subsidy and investment issues by assuming that (i) maturity will lead to the predominant withdrawal of subsidies, (ii) after 2020 ETS will provide an alternative fiscal system (iii) MS will produce the enabling conditions for cost-effective and competitive energy. With the stated desire for "becoming the number one in renewables" the EC must, at the very least, ensure that these assumptions hold.

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