Supported by

GreenNet-Incentives

Intelligent Energy Europe

EIE/06/217/SI2.445571

GreenNet-Incentives

Promoting grid-related incentives for large-scale RES-E integration into the different European electricity systems

Deliverable D13

Stakeholder Consultation on RES-E barriers

Evaluation Report

Jaroslav Jakubes, Luděk Pur
Enviros, CZ

Wolfgang Orasch, Hans Taus
Wien Energie Stromnetz GmbH, AT

Hans Auer, Lukas Weißensteiner
Energy Economics Group (EEG), Vienna University of Technology, AT

Katerina Sardi, Tasos Krommydas
Regulatory Authority for Energy of the Hellenic Republic, RAE, GR

Bernhard Heyder
EnBW Energie Baden-Württemberg AG, DE

Anselm Kroeger-Vodde
IT Power Limited, UK

Wolfgang Ove
SINTEF Energiforskning AS, NO

Katarina Vertin
ApE – Energy Restructuring Agency Ltd., SI

Botond Weöres
EnergoBanking Kft, HU

Bernhard Hasche
Universität Stuttgart, DE

Date of preparation: November 2008

Acknowledgements:

The authors would like to thank all Stakeholders involved in the Stakeholder consultation for their valuable responses to questionnaires and comments.

Co-ordination of the project **GreenNet-Incentives**:

Lukas Weissensteiner
Scientific co-ordinator of **GreenNet-Incentives**
Vienna University of Technology
Energy Economics Group (EEG)
Gusshausstrasse 25-29/373-2
A – 1040 Vienna
Austria
Tel. 0043-1-58801-37368
Fax. 0043-1-58801-37397
Email. weissensteiner@eeg.tuwien.ac.at

Dr. Hans Auer
Project co-ordinator of **GreenNet-Incentives**
Vienna University of Technology
Energy Economics Group (EEG)
Gusshausstrasse 25-29/373-2
A – 1040 Vienna
Austria
Tel. 0043-1-58801-37357
Fax. 0043-1-58801-37397
Email. auer@eeg.tuwien.ac.at

Table of Contents

1. Introduction

1.1 Objectives of Stakeholder consultation

The core objective of the project **GreenNet-Incentives** is to promote grid-related incentives for large-scale RES-E integration into different European electricity systems, to identify existing non-technical barriers for RES-E grid integration, and to actively involve key European market actors (grid companies, RES-E generators, regulators, decision makers) in the discussion process towards "green" electricity grids.

The major products of this project will comprise tailor-made recommendations and actions plans for several key market actors to establish a common European vision on the implementation of grid-related policies favouring "green" electricity networks. This report summarizes the results of a stakeholder consultation on different non-technological barriers and information deficits on large-scale RES-E grid integration conducted within Work package 5 (WP5) of the project **GreenNet-Incentives**.

Based on the results of the stakeholder consultations, conclusions are drawn concerning national and common shortcomings in RES-E system integration practice and recommendations are derived from best practice observed.

Due to limited number of countries and stakeholders involved, the ambition of the authors is not to elaborate exhaustive and detailed statistical analysis. The aim of this stakeholder consultation process and this concluding report is rather to:

- indicate trends and views of stakeholders and give detailed first-hand evidence of shortcomings in the practice of RES-E system integration and

- derive corresponding potentials for improvement from the viewpoint of the key market actors.

The results will also be used in the training / education and dissemination activities within the **GreenNet-Incentives** project

1.2 Definition of target groups

Two main groups of stakeholders have been addressed in this consultation - **Energy Regulatory Authorities** and **Distribution Grid Operators**. Additionally, other market actors as RES-E developers and operators, professional associations, etc. have been approached. This group if for simplification referenced to as **RES-E Developers**. Therefore three types of questionnaires have been elaborated and three stakeholder groups contacted.

The priorities of the three key stakeholder groups related to grid connection and operation of distributed sources of electricity based on RES significantly differ and are sometimes exactly opposite.

The motivation and priorities of the three stakeholder groups could be summarized as below:

- **Energy Regulatory Authorities:** Protect the final consumer, regulate costs of grid operation and development, support RES development (in some countries).

- **Distribution Grid operators:** Operate the grid safely, economically, without technical complications and additional costs for themselves

- **RES-E Developers:** Get the RES-E source connected to the grid – quickly, without administrative and technical barriers, without additional costs and fees for grid connection and benefit from available system of support for RES-E

1.3 Applied methodology

The Stakeholder consultation within WP5 of the **GreenNet-Incentives** project was conducted in the form of personal interviews and telephone/email communication using specific questionnaires that were developed in order to reflect priorities and issues relevant to each stakeholder group involved in the Stakeholder consultation

The aim was to identify several existing non-technological barriers and information deficits on large-scale RES-E grid integration, issues related to grid connection of RES, priorities of the relevant stakeholder group, evaluation of current grid connection practices and system of support of RES, etc.

The questionnaires were structured in order to collect quantitative as well as qualitative responses from the stakeholders and contained approx. 20-30 questions. Some of the questions were further structured and the answers were provided using a scale in order to provide basis for quantitative evaluation of the responses.

The content of the questionnaires was prepared and was structured into the following sections:

- **Stakeholder group 1: Regulatory authorities:**
  - System of support of RES-Electricity - in general (7 questions)
  - Administrative procedures related to RES-E installations development - in general (1 question)
  - Issues specific to Regulatory authorities (20 questions)
- **Stakeholder group 2: Distribution grid operators;**
  - System of support of RES-Electricity - in general (7 questions)
  - Administrative procedures related to RES-E installations development - in general (1 question)
  - Issues specific to Distribution system operators (16 questions)

- **Stakeholder group 3: RES-E Developers**
  - System of support of RES-Electricity - in general (5 questions)
  - Other factors (1 question)
  - Issues specific to project developers – administrative procedures(6 questions)
  - Issues specific to RES Project Developers / Others (8 questions)

The respondents were identified in advance in preceding Task 5.2. of the **GreenNet-Incentives** project and included relevant national Energy regulatory Authority or other authorities/institutions, Distribution grid operators and investors, developers, professional association and other stakeholders involved in development of RES-E projects.

Responses were collected partly during personal interviews and partly through telephone / e-mail communication with representative of relevant partner organisation involved in **GreenNet-Incentives project.**

2. Evaluation of results of stakeholder consultation

In total 72 questionnaires were collected by 10 partners from 10 Greennet-Incentives project consortium countries covering old EU member countries (Austria, Germany, Greece, Italy, United Kingdom), new EU members (Czech Republic, Hungary, Romania, Slovenia) as well as one EEA country outside the EU (Norway).

Besides 9 regular **GreenNet-Incentives** project partners who contacted all three stakeholder groups, 1 extra response to the questionnaire for energy regulator was provided by Regulatory Authority for Energy of the Hellenic Republic.

Besides the regulatory authorities responsible for energy market regulation, in some countries (NO, AT, RO), also other authorities and agencies were contacted using the questionnaire for regulatory authorities.

In total 13 questionnaires were collected from Regulatory authorities from 10 countries, 25 questionnaires from DSOs from 9 countries and 34 questionnaires from RES-E developers from 9 countries.

Out of 72 questionnaires collected, 19 were based on face-to-face interviews, the remaining were collected by e-mail or telephone conversation with relevant stakeholders.

2.1 Context for RES electricity production in respondent countries

The basic information related to the currently applied s RES-Electricity support scheme (according to the requirements of 2001/77/EC Directive on Electricity Production from Renewable Energy Sources), information on perception of the potential and importance of individual types of RES, on current status of development of utilisation of RES and efficiency of support system for RES-Electricity was collected in the introductory part of the questionnaires and was common for all three stakeholder groups.

The responses on selected questions were analysed and presented individually by stakeholder group because the views and opinions of the stakeholders from the different groups also differed.

2.1.1 Type of support system for RES-E

Question:

What is system of support for RES-Electricity in your country?

The question was answered by Regulators and DSOs in order to confirm and where necessary also update and comment information about currently applied RES-Electricity support scheme. All EU member countries included in the Stakeholder consultation apply RES-Electricity support scheme according to the requirements of Directive 2001/77/EC on Electricity Production from Renewable Energy Sources.

The types of RES-E support schemes in analysed countries are summarised in the following table.

Feed-in tariff systems are the most common type of RES-E support schemes applied. Feed-in tariff are used in 6 out of 10 respondent countries. In two countries (United Kingdom, Romania) quota/green certificate systems are currently used. In Italy, the system of support is mixed and depends on type and capacity of RES-E source. Only in Norway, which is not EU member country, other way of support of RES-Electricity sources is used (investment subsidies, tax benefits).

Table 1: Types of RES-electricity support systems in analysed countries

Country	RES-E support scheme	Notes / comments
Austria	Feed-in Tariff	▪ RES-E production promoted through a feed-in tariff - technology specific, over a period of 10 years + additional 2 years at reduced tariffs (75%, 50%) - laid down in the Green Electricity Act and the corresponding regulations. ▪ Since 2009 renewable grants for hydro power up to 20 MW and small photovoltaic equipment available.
Czech Republic	Feed-in Tariff	▪ Feed-in tariff scheme with option of fixed feed-in tariff or green premium (“green bonus”) on top of market price of electricity. Technology specific, with long-term guarantee of support (20 years, 30 years for small hydro). ▪ Furthermore, renewable energy is promoted through several subsidy programmes financed from EU funds and an exemption from income tax for revenues of selling RES-Electricity.
Germany	Feed-in Tariff	▪ Support of RES-E production is regulated by the Act on Granting Priority to Renewable Energy Sources (EEG) setting fixed compensation for RES-Electricity fed into the grid to be paid by the grid operator.
Greece	Feed-in Tariff	▪ RES-E production promoted through a guaranteed feed-in tariff, whose amount depends on the energy source. ▪ Furthermore, the construction of systems generating electricity from renewable energy sources is subsidised by an investment grants or tax reduction.
Hungary	Feed-in Tariff	▪ Mandatory takeover for a given period and price adjusted by inflation. ▪ Grid operators are obliged to purchase renewable-energy-sourced electricity and pay a guaranteed price (§ 13 (1) Act Nr. LXXXVI of 2007). ▪ Furthermore, companies and public bodies are eligible for EU funds supported by EEOP 2007-2013 subsidy programme, while private individuals are eligible for the NEP-2008 subsidy programme.
Italy	Quota/Green Certificate + Feed-in Tariff	▪ Feed-in tariff - only for RES plants up to 1 MW and for wind power plants smaller than 200 kW. Solar PV and thermal plants can accede to a fixed price scheme for all the produced electricity; the fixed price does not include the sale price of the energy market. ▪ Green Certificates - All RES plants except Solar PV and thermal plants
Norway	Other	▪ Investment subsidy (electricity: only for wind). Micro-power plant <100 MW do not pay consumer tax (“forbruksavgift”) (10.5 øre/kWh ≈ 1.3 €cent kWh).

Table 1 (continued): Types of support systems for RES-E in analysed countries

Country	RES-E support scheme	Notes / comments
Romania	Quota/Green Certificate	▪ The promotion system consists of obligatory quota combined to the green certificates' transaction. The promotion system for RES-E has been recently improved by the Law 220/2008 which introduces technology specific support: o 1 GC/1 MWh - new small hydro < 10 MW; o 1 GC/2 MWh - existing hydro small 1 - 10 MW; o 2 GC/1 MWh - existing small hydro < 1 MW; o 2 GC/1MWh - wind power plants up to 2015; and 1 GC/1MWh - in wind power plants after 2016; o 3 GC/1 MWh - biomass, biogas, bioliquid, geothermal and combustion associated gases. o 4 GC/ 1MWh - solar plants.
Slovenia	Feed-in Tariff	▪ Premium + purchase obligation. For small scale fixed price, for larger sort of premium, that will be annually defined according to market situation and reference costs of power plants.
United Kingdom	Quota/Green Certificate	▪ Renewable Obligation - In UK the generation company that wants to construct a RES-E plant applies for renewable energy certificates. The certificate is an incentive. Special prices are paid for the electricity generated. ▪ Introduction of feed-in tariff system in 2009 is under preparation.

Source: Responses to questionnaires, http://res-legal.eu/

2.1.2 Priority access to the grid for RES-E

Question (answered by Regulators):

Is the priority access to the grid / transmission / distribution guaranteed for RES-E sources?

Legislative guarantee of priority access to the grid for RES-E sources and to transmission/distribution of electricity generated from renewables is one of support measures for increase of competitiveness of distributed electricity sources utilising renewable energy.

The question was answered by Regulators and DSOs in order to confirm/update and comment information about applied conditions related to the priority access to the grid for RES-E installations and priority transmission/distribution of RES- electricity.

Priority access to the grid for RES-E sources is guaranteed in 5 out of 10 consulted countries, in the remaining countries it is subject to the general provisions of relevant energy legislation. Priority transmission and distribution of electricity from RES is guaranteed in all consulted countries except Slovenia, UK and Norway.

According to the results of stakeholder consultations, legislative guarantee of access to the grid and transmission and distribution is not considered as

barrier in countries where it is not applied. Its introduction, however, may be an additional motivating factor for RES-E grid integration.

The current situation related to guaranteed access to the grid for RES-E sources in analysed countries are summarised in the following table.

Table 2: Priority access to the grid in analysed countries

Country	Priority access to the grid for RES-E	Priority transmission / distribution for RES-E	Notes / comments
Austria	No	Yes	▪ Grid access for RES-E granted according to the general provisions of energy law and according to non-discriminatory principles. ▪ In the autonomous systems of the non-interconnected islands, the DSO has the ability to curtail RES generation for grid stability issues in case of low loads.
Czech Republic	Yes	Yes	▪ Priority access to the grid upon meeting specific (technical) conditions. ▪ Basic technical conditions for parallel operation of the source with the grid have to be met (line capacity, voltage, frequency, harmonic frequencies, flicker etc.)
Germany	Yes	Yes	▪ Without conditions.
Greece	Yes	Yes	▪ Priority access to the grid upon meeting specific (technical) conditions. ▪ In the autonomous systems of the non-interconnected islands, the DSO has the ability to curtail RES generation for grid stability issues in case of low loads
Hungary	Yes	Yes	▪ The Act on Electric Energy (Act No. LXXXVI of 2007) gives priority in grid connection and usage to electricity generated from RES. Furthermore, it establishes certain restrictions on electricity imports to the benefit of renewable energy.
Italy	No	Yes	▪ Grid access for RES-E granted is subject to the general provisions of energy law. For RES-E sources, some of the fees are reduced
Norway	No	No	▪ RES-E sources as all other power generators are guaranteed market access, i.e. grid connection if there is available capacity.
Romania	Yes	Yes	▪ According to the new Law no. 220/ 2008 on RES-E promotion, the TSOs and DSOs are obliged to guarantee the renewable energy transport and distribution by ensuring the liability and security of the grid.
Slovenia	No	No	▪ Grid access for RES-E is subject to the general provisions of energy law. ▪ Usage of the grid is also subject to the general provisions of energy law and shall be granted without discriminating against certain parties.
United Kingdom	No	No	▪ Grid access for RES-E is subject to the general provisions of energy law.

Source: Responses to questionnaires, http://res-legal.eu/

2.1.3 Potential for RES-Electricity generation and current situation in RES-Electricity generation

Question:

What type of RES-E installations has the highest potential in your country?

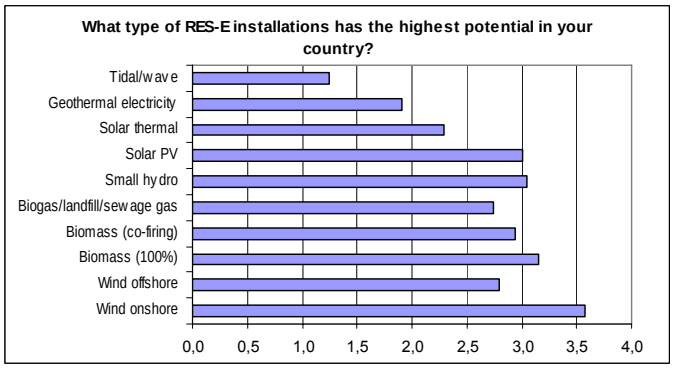
This question was answered by all three stakeholder groups. The aim was to clearly identify the type of RES-Electricity source which is considered by the Stakeholders to have the highest potential (and also resulting current and future issues related to grid integration). The focus was also to distinguish between different views and opinions of different stakeholder groups reflecting their technological and other priorities.

Potential of different RES-Electricity sources was evaluated per country using a relative scale (1-lowest to 5-highest). The results (overall and per stakeholder group) are presented in Graphs below.

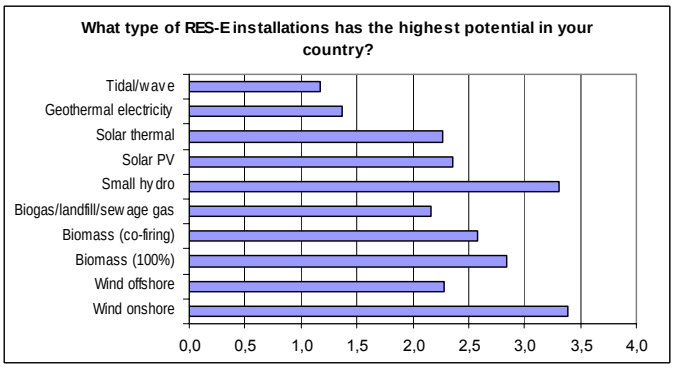
The detailed results per country are presented in the Annex 1 of this report.

Figure 1: Evaluation of potential of different types of RES-E sources by different stakeholder groups

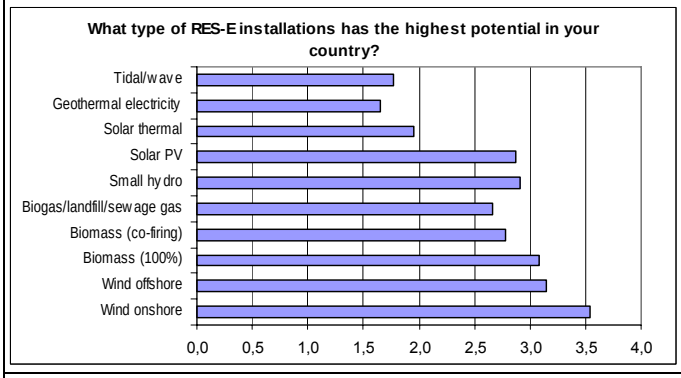
All countries, all stakeholders; 72 respondents



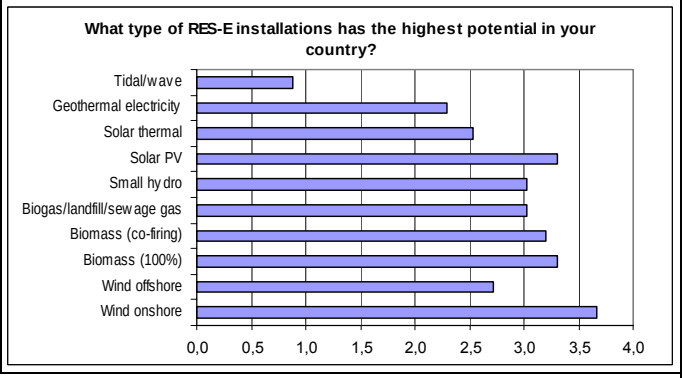
All countries, Regulators; 13 respondents



All countries, DSOs; 25 respondents



All countries, RES-E Developers; 34 respondents



Scale: 0-lowest, 5 highest

In average for all stakeholders and all countries, onshore wind energy is clearly perceived and evaluated as RES-E source with highest and most important potential, followed by a group of RES-E sources with very small difference with regards to perception of their potential - biomass, small hydro and solar PV.

Tidal/wave (where relevant), geothermal electricity and solar thermal electricity generation were evaluated as RES-E sources with the least significant potential by all stakeholder groups. This corresponds well with the current share and status of technological development of these technologies.

The Regulators are significantly more conservative as regards evaluation of potential of RES-E sources. From their responses to the questionnaire it appears that onshore wind is the RES-E source with the highest potential, however, importance of small hydro, as regards its potential is evaluated by them at almost the same level as onshore wind. Biomass electricity potential was also considered important while there was not a significant difference between other RES-E sources (solar PV, solar thermal, biogas, offshore wind).

The point of view of DSOs is more balanced and except onshore wind, which is considered as most promising RES-E source, there is no significant difference between other RES-E sources. Also, DSOs have evaluated offshore wind in the highest range from all stakeholder groups.

RES-E Developers evaluate the RES-E potential in most optimistic way - onshore wind is considered as most promising RES-E source while there is no significant difference between biomass and solar PV.

Question:

What type of RES-E installations currently develops in the most dynamic way?

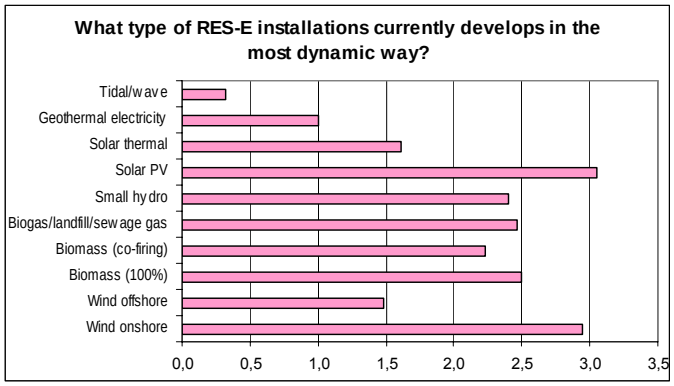
The question was answered by all three Stakeholder groups. The aim was to clearly identify the type of RES or market segment with most significant dynamics of development (and resulting current and future issues related to grid integration) and to distinguish between views and opinions of different Stakeholder groups.

The current situation in electricity generation and in development of new installations was evaluated in a relative way per country using scale (1-lowest to 5-highest). The results (overall and per Stakeholder group) are presented in Graphs below.

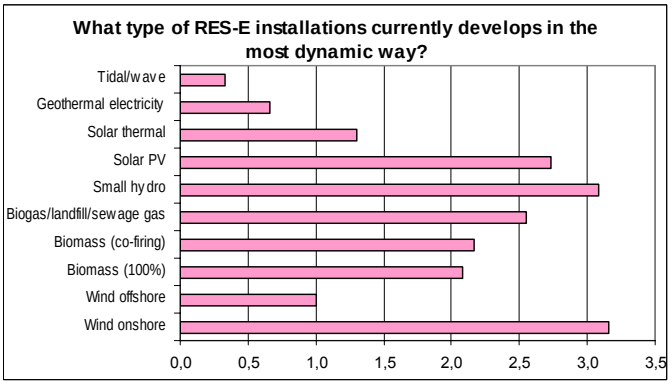
The detailed results per country are presented in the Annex 1 of this report.

Figure 2: Evaluation of current dynamics of development of different types of RES-E sources by different stakeholder groups

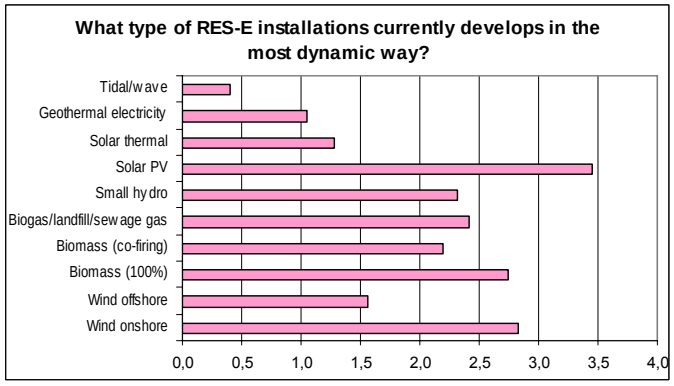
All countries, all stakeholders; 72 respondents



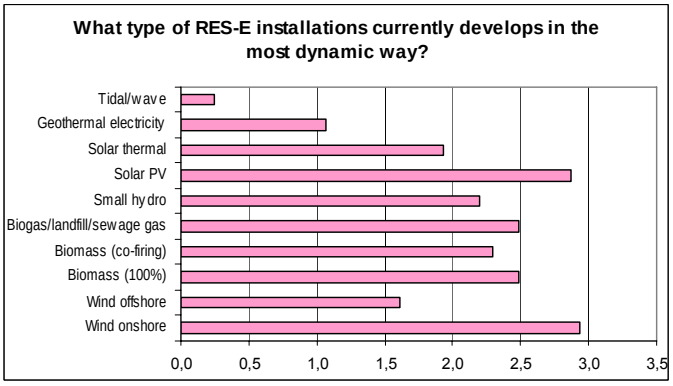
All countries, Regulators; 13 respondents



All countries, DSOs; 25 respondents



All countries, RES-E Developers; 34 respondents



Scale: 0-lowest, 5 highest

According to the responses to questionnaires for all stakeholders and all countries, solar PV and onshore wind energy are considered as the most dynamically developing RES-E sources. Biomass, biogas and small hydro are slightly behind with similar level of development, however, the difference is not too significant.

Geothermal electricity, solar thermal electricity, tidal/wave electricity (where relevant) and also offshore wind were evaluated as RES-E sources with significantly slower dynamics of development by all stakeholder groups. This corresponds well with the current share and status of technological development of these technologies. In the case of offshore wind, which is considered to be an economically viable option with significant potential of development, the results indicate that its dynamics of development does not correspond to current expectations of stakeholders.

The similarly structured response was received also from DSOs and RES-E developers, while Regulators consider small hydro as most dynamically developing RES-E source together with onshore wind.

2.1.4 Level of motivation provided by currently applied RES-E support scheme

Question:

How would you evaluate level of support / motivation provided by your country's RES-Electricity support scheme?

The question was answered by all three stakeholder groups. The aim was to evaluate the level of motivation (or demotivation) for development of RES-E projects and electricity production by individual types of renewable electricity sources provided by currently applied RES-E support scheme. The aim was also to clearly identify the type of RES or market segment with most consistent and conflicting opinions of the involved stakeholders and to evaluate the strong and weak points and barriers in currently used RES-E support systems.

The level of motivation (or demotivation) for RES-E production by individual types of RES-E sources provided by currently applied RES-E support system was evaluated using a scale in range -5 (highest demotivation) through 0 (neutral) to +5 (highest motivation). The results (overall and per Stakeholder group) are presented in the graphs below.

The detailed results per country are presented in Annex 1 of this report.

The results of evaluation of level of motivation by currently applied RES-E support system are very subjective and country specific and differ also significantly across the three stakeholder groups.

All stakeholder groups have evaluated very similarly the level of support provided to solar PV, which is the only renewable source where there were no significant differences.

In general, the Regulators see the existing RES-E support systems as more motivating compared to other stakeholder groups. The existing RES-E support systems are the most motivating for onshore wind, small hydro and biogas according to Regulators.

The most significant differences concern evaluation of level of support/motivation to onshore and offshore wind energy. The Regulators evaluate level of support for onshore wind energy as the highest from all Stakeholders while RES-E Developers evaluate the support/motivation for onshore wind energy as very low, although still positive.

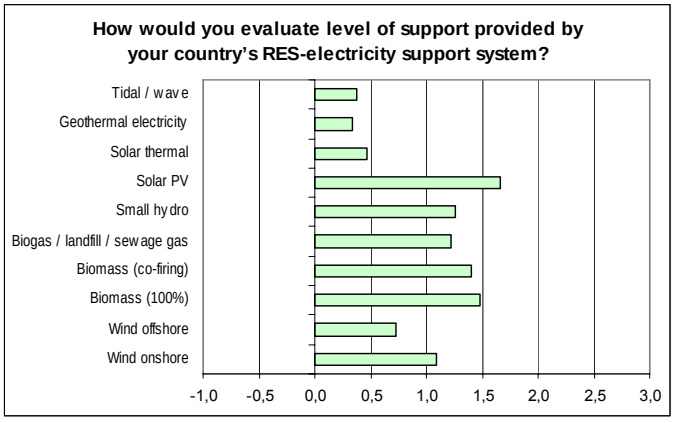
On the other hand, from the Regulators' point of view, support for offshore wind energy does not create sufficient motivation while the opinion of RES-E Developers is opposite - the level of motivation for offshore wind energy was evaluated as several times higher than for onshore wind energy.

From the point of view of RES-E Developers, the RES-E support systems are the most motivating for solar PV and biomass and slightly less motivating for onshore wind, small hydro and biogas.

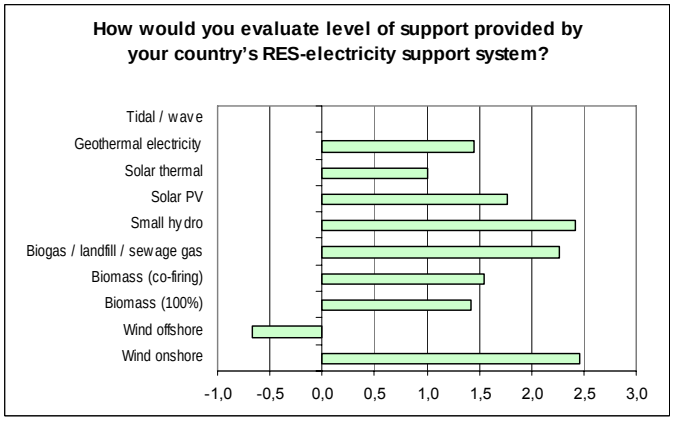
The point of view of DSOs is more or less balanced, compared to Regulators and RES-E Developers - they do not have extreme opinions. From the point of view of DSOs, the support systems are the most motivating for solar PV and slightly less motivating for biomass and onshore wind.

Figure 3: Evaluation of current level of support/motivation for RES-E production provided by your country's RES-Electricity support system by different stakeholder groups

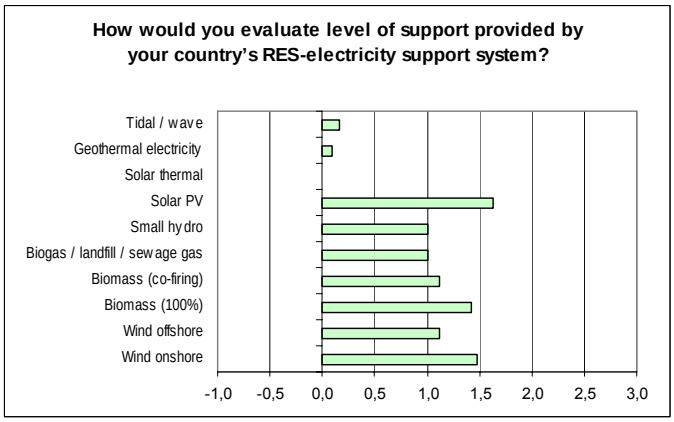
All countries, all stakeholders;
72 respondents



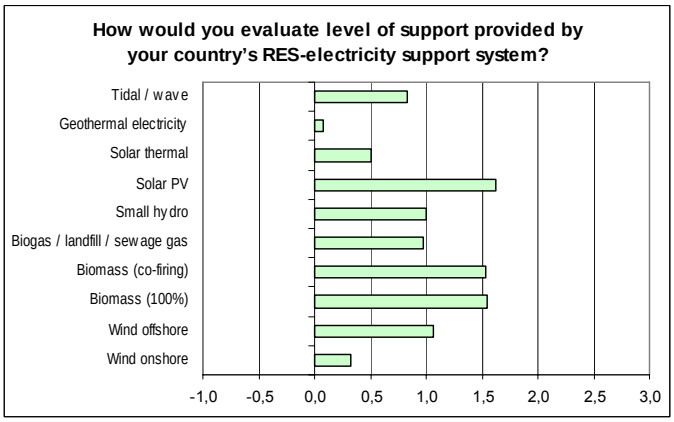
All countries, Regulators;
13 respondents



All countries, DSOs;
25 respondents



All countries, RES-E Developers;
34 respondents



Scale: 0-lowest, 5 highest

Question:

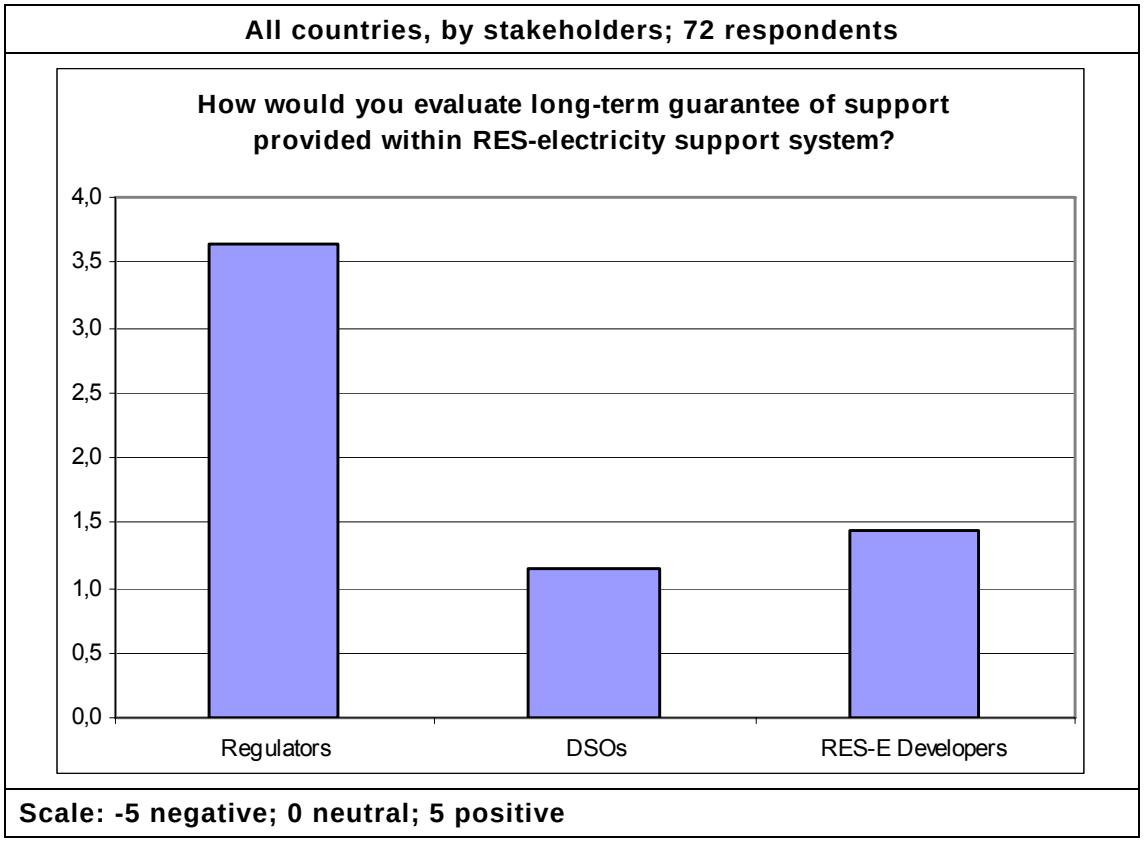
How would you evaluate long-term guarantee of support provided by existing RES-Electricity support system?

In particular in feed-in tariff RES-E support systems, the long-term guarantee of stability of support (in a form of feed-in tariff or premium to feed-in price of electricity) is very important motivating factor, sometimes with even higher importance than actual level of feed-in tariffs / premiums.

The question was answered by all three stakeholder groups. The aim was to evaluate the level of motivation (or demotivation) for RES-E production and investments into RES-E installations provided by currently applied RES-E support/promotion scheme, in particular from the point of view of long term guarantee and stability of support.

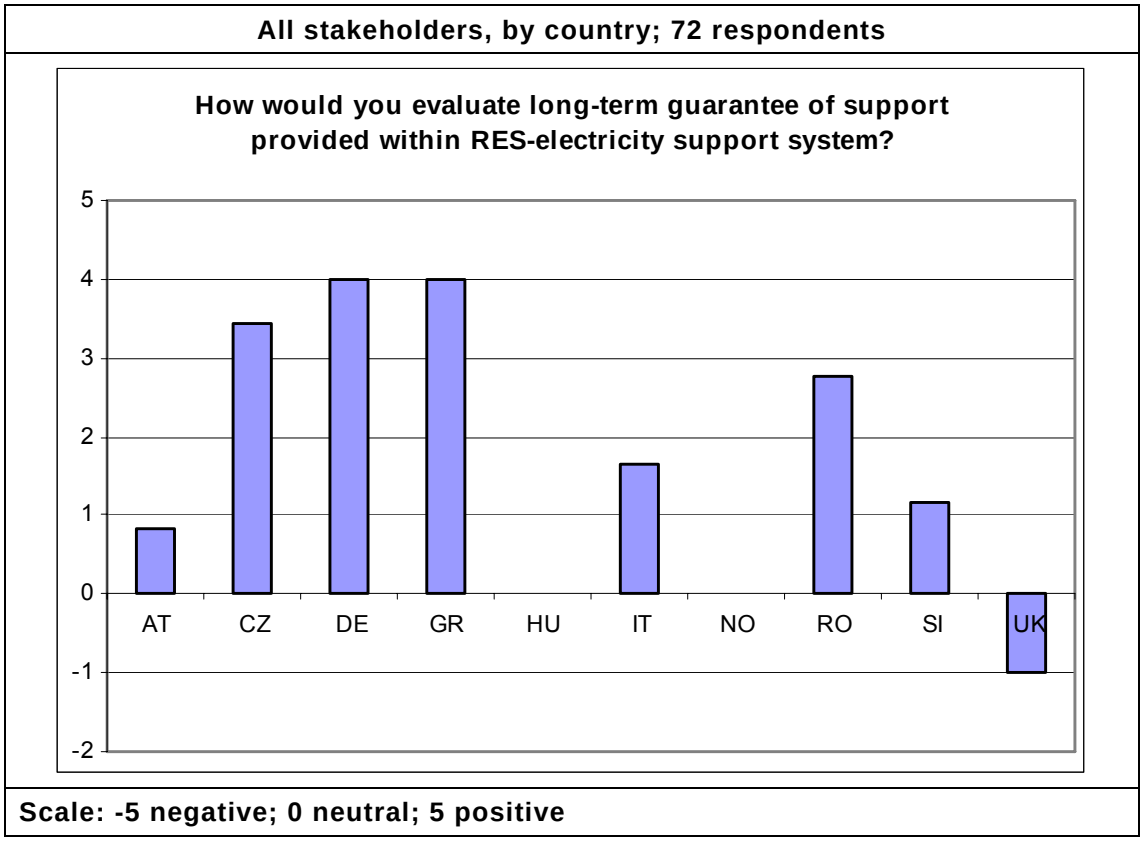
The level of motivation (or demotivation) for RES-E projects development and RES-Electricity production based on long-term guarantee of support provided by existing RES-Electricity support system was evaluated using a scale of range -5 (highest demotivation) through 0 (neutral) to +5 (highest motivation). The results (by Stakeholder group and by country) are presented in the graphs below.

Figure 4: Evaluation of long-term guarantee of support provided within RES-Electricity support system – by stakeholder group



The level of long-term guarantee of support to RES-E production is evaluated significantly more positively by the Regulators, while DSOs and RES-E developers with experience from real life projects are less positive and optimistic.

Figure 5: Evaluation of long-term guarantee of support provided within RES-Electricity support system – by country



The long-term guarantee of support is very positively evaluated in Germany, Greece and the Czech Republic. All three mentioned countries apply transparent RES-E support systems with long-term guaranteed feed-in tariffs (for instance in the Czech Republic, guarantee of support is 30 years for small hydro and 20 years for other RES-E sources). In Hungary and Norway, however, the evaluation is neutral in average and even negative in the UK. This means that absence of long-term guarantee of support or uncertainty about its development is a significant risk factor for RES-E Developers into RES-E installations as well as for financing institutions.

According to the responses to the questionnaires, some of the countries would need improvement of the currently applied feed-in tariff system (Hungary, Austria, Slovenia) as regards long-term guarantee of conditions of support, improvement of current quota-based system (UK) or introduction of new system at all (Norway). In Austria, project developers' perception of the support system from an overall perspective is negative due to the fact, that the respective legal framework has been changed several times in the recent past, the latest amendment was pending at the time of consultation and the effective support level (laid down in the legislation subject to amendment) was not sufficient to develop new projects (as easily can be seen in stagnating deployment statistics).

Question:

How would you evaluate administrative burden / complexity of RES-Electricity support scheme in general?

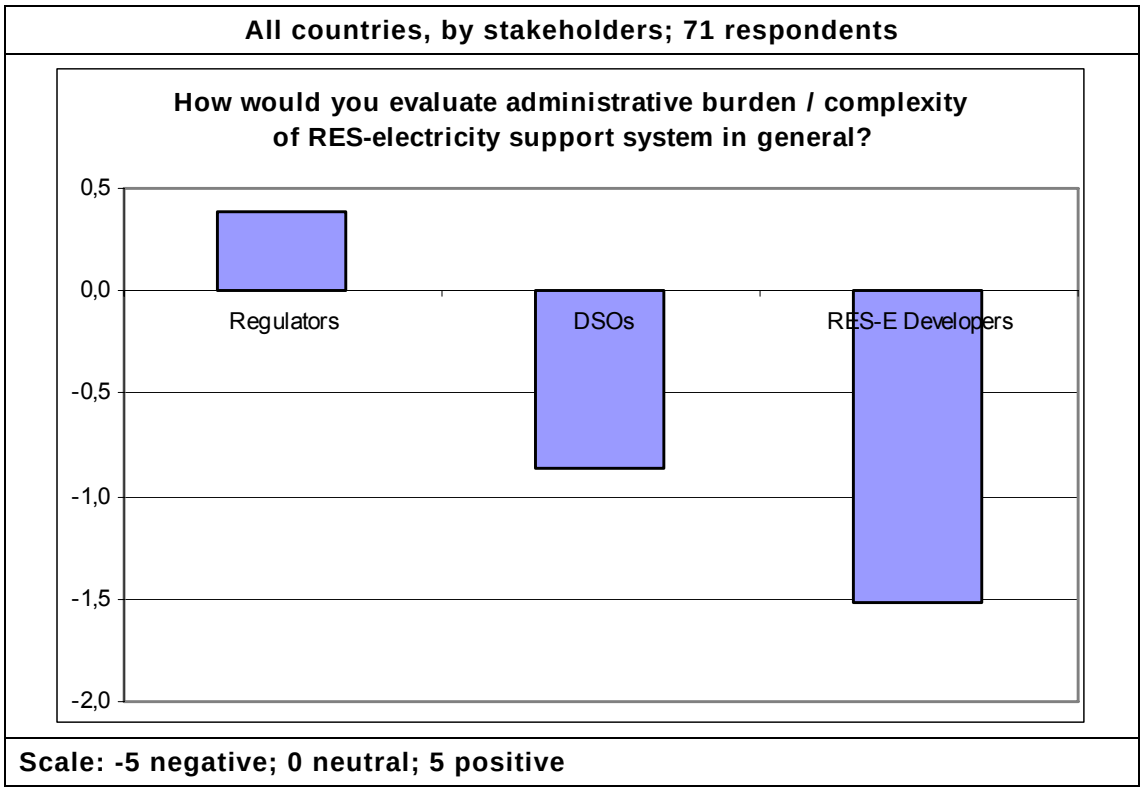
The applied RES-E scheme puts certain administrative and other requirements to RES-Electricity producers. Sometimes this administrative load and complexity of support system may even have a de-motivating effect or complicate the process of development of new RES-E projects and operation of existing projects.

The question was answered by all three stakeholder groups. The aim was to evaluate the administrative burden or complexity of RES-Electricity support system in general.

The level of motivation (or demotivation) for RES-E production provided by currently applied RES-E support system (from the point of view of its complexity and related administrative burden) was evaluated using scale of range -5 (highest demotivation) through 0 (neutral) to +5 (highest motivation).

The results (by stakeholder group and by country) are presented in the graphs below.

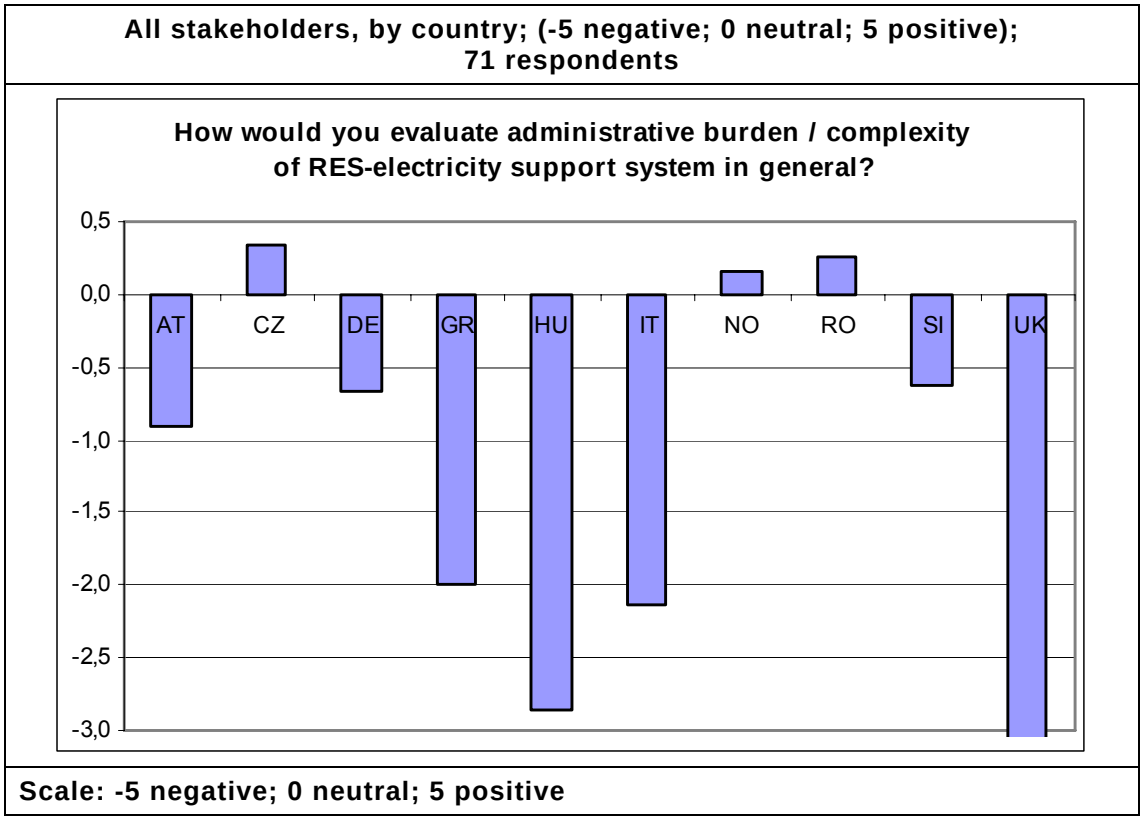
Figure 6: Evaluation of administrative burden / complexity of RES-Electricity support system in general – by stakeholder



The complexity of the RES-E support schemes and related administrative requirements are significantly more positively evaluated by Regulators, while DSOs and RES-E Developers with experience from real life projects are significantly more critical.

The reason why the evaluation of Regulators is significantly more positive is the fact that Regulators have been in many countries involved in development, evaluation or even implementation of the RES-E support scheme.

Figure 7: Evaluation of administrative burden / complexity of RES-Electricity support system in general – by country



In particular in Hungary, Italy, Greece as well as in the UK, the complexity and related administrative requirements of existing RES-E support scheme have been evaluated as problematic and strongly de-motivating. This response shows that it is not only important to implement working RES-E support scheme, but it is also important to keep it as simple and transparent as possible for the involved stakeholders.

2.2 Administrative procedures related to RES-E project development

During the development of questionnaires and the Stakeholder consultation itself, key focus was given to non-technological barriers such as various administrative procedures necessary for development, grid connection and operation of renewable electricity projects. The following key administrative procedures were evaluated during Stakeholder Consultation:

- Land use / construction permit procedures
- Environmental Impact Assessment (EIA) procedures
- Grid connection procedures
- Licensing procedures
- Coordination between relevant administrative authorities

These administrative procedures were evaluated briefly by Regulators and DSOs.

The RES-E Developers who have first-hand practical experience with administrative procedures and potential barriers in development of their RES-E projects have provided more detailed feedback and evaluate the administrative procedures in higher level of detail.

The results by stakeholder group are presented in the following chapters.

2.2.1 Administrative procedures related to RES-E project development – point of view of DSOs and Regulators

Question: How would you evaluate administrative procedures related to RES-E installations development (in terms of administrative burden / complexity of system, lead time, level of experience of RES-E developers / administrative authorities with RES-E projects)?

The question was answered by DSOs and Regulators. The aim was to evaluate the administrative procedures related to RES-E installations development from the point of view of stakeholders who are not directly or only partly involved in these administrative procedures. The focus was primarily on administrative burden and complexity of system, lead time, level of experience of RES-E Developers with the administrative procedures and level of experience of administrative authorities with RES-E projects.

The level of motivation (or demotivation) for development of RES-E installations resulting from currently applied administrative procedures and their requirements was evaluated using scale of range -5 (highest demotivation) through 0 (neutral) to +5 (highest motivation).

The results of evaluation of responses of relevant stakeholders are presented in the graphs below.

Figure 8: Evaluation of administrative procedures related to RES-E installations development by Regulators

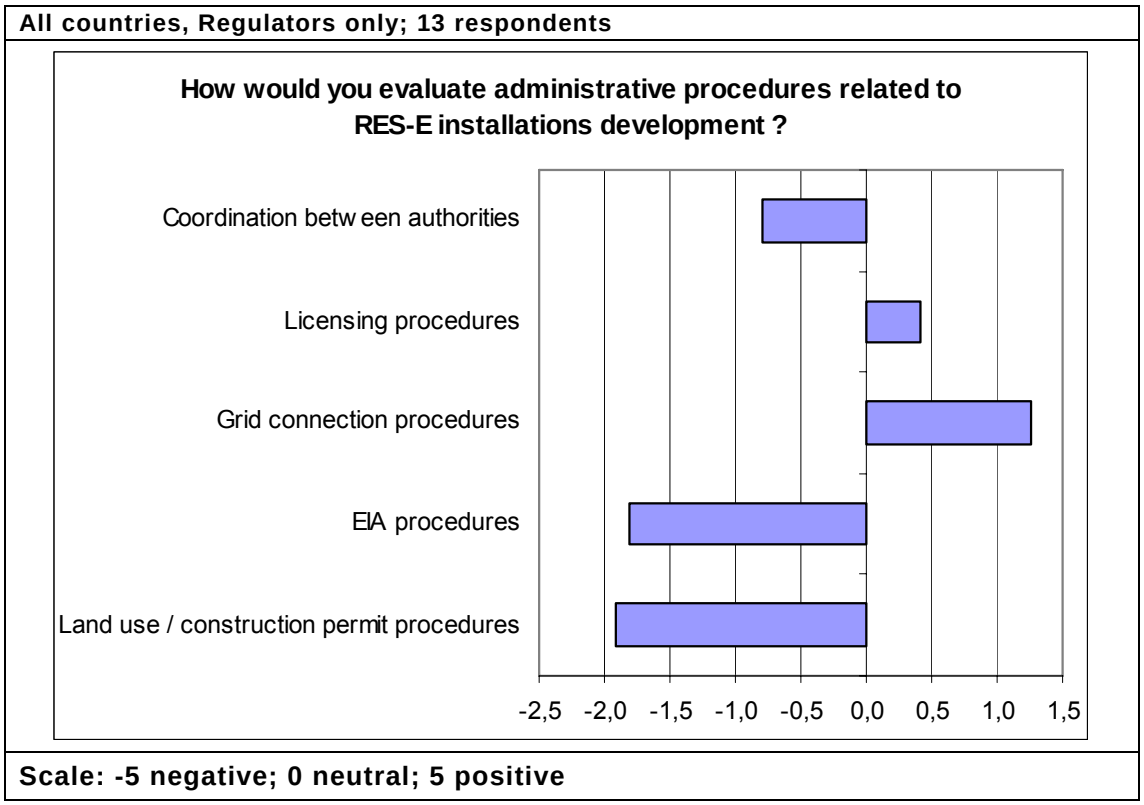
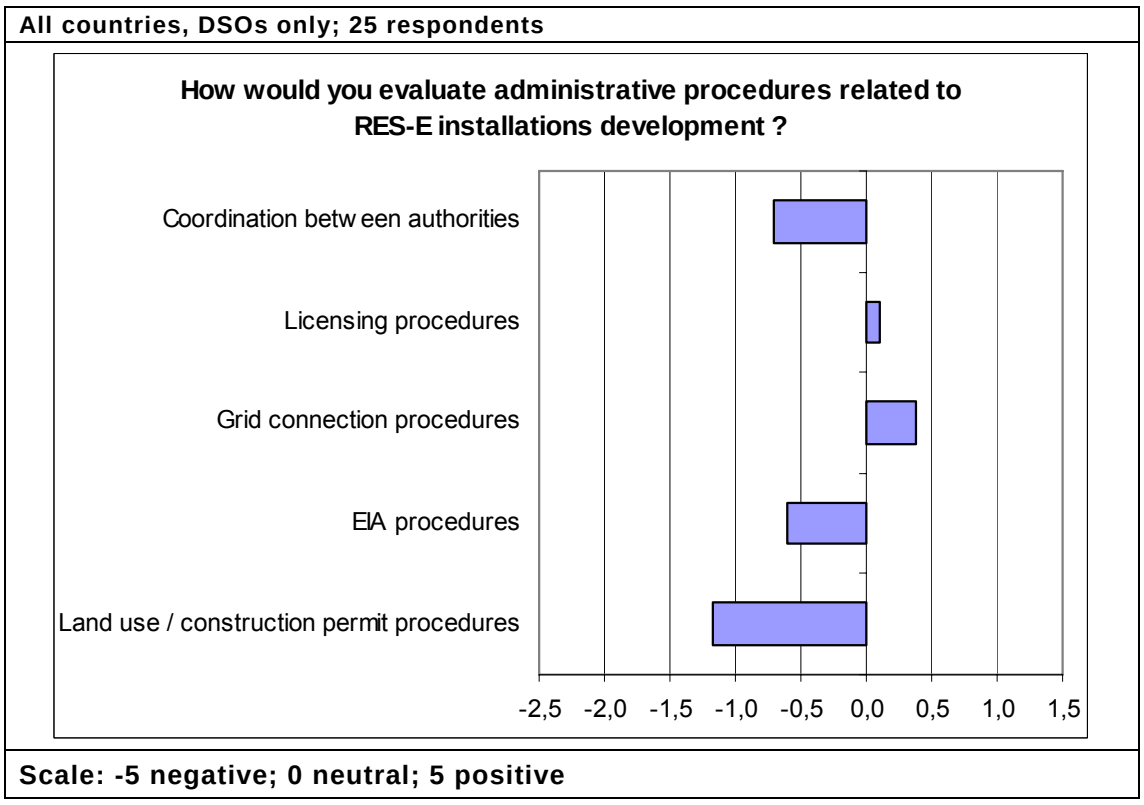


Figure 9: Evaluation of administrative procedures related to RES-E installations development by DSOs



Lengthy, unclear, non-transparent and complicated spatial planning (land use), construction permit and EIA procedures and lack of coordination between authorities involved in administrative proceedings related to RES-E projects are mentioned as the key barriers for development of new RES-Electricity projects almost unanimously by both Regulatory authorities and DSOs. On the other hand, licensing and grid connection procedures are not considered as a barrier. The DSOs have similar view on administrative procedures related to RES-E projects development but are not as critical as Regulators.

As regards the responses from all three Stakeholder groups, the Regulators and DSOs still tend to evaluate administrative obstacles in less critical way than RES-E Developers who have the most critical point of view (as could be seen from more detailed responses to the following questions).

The evaluation of administrative procedures by country is presented in the Annex 1.

The administrative procedures related to development of RES-E projects are evaluated as negative factor (or barrier) in all countries participating in Stakeholder consultation except Austria and partly Czech Republic, Germany and Slovenia. In particular in Italy, Hungary, Norway and UK, at least four of five evaluated administrative procedures have been identified and evaluated as a serious barrier for RES-E project development.

2.2.2 Administrative procedures related to RES-E project development – point of view of RES-E project developers

The administrative procedures related to development of RES-E projects were evaluated in more detailed way in the case of RES-E developers who have first-hand practical experience with administrative procedures and potential barriers in development of their projects. The questions in the questionnaires were more specific and structured in more detailed manner in order to evaluate each of the key factors influencing development of RES-E projects:

- Land use / construction permit procedures
  - administrative burden / complexity of system
  - time required to obtain permit
  - level of experience of investors
  - level of experience of administrative authorities with RES-E projects
- EIA procedures
  - strict requirements for nature/landscape protection
  - administrative burden / complexity of system
  - time requirements to obtain permit
  - level of experience of investors

- level of experience of administrative authorities with RES-E projects

- Grid connection procedures
  - administrative burden / complexity of system
  - technical requirements
  - costs / cost share model applied for grid connection
  - time requirements to get connected
  - level of experience of investors
  - level of experience of grid operators with RES-E projects
  - motivation of grid operators to connect RES-E projects, cooperation with project developers

The level of motivation (or demotivation) for development of RES-E installations resulting from above mentioned administrative procedures or other factors was evaluated using scale of range -5 (highest demotivation) through 0 (neutral) to +5 (highest motivation).

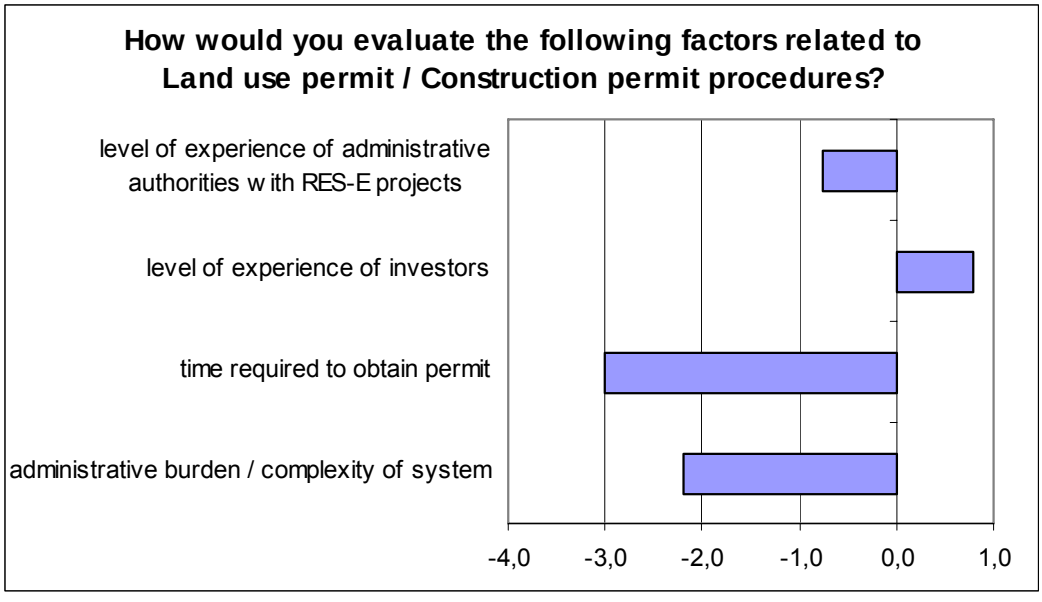
The results for all involved countries are presented and commented on below. The results per country are presented in Annex 1.

Question:

How would you evaluate the following factors related to land use permit / Construction permit procedures?

Figure 10: Evaluation of land use / construction permit procedures related to RES-E installations development by RES-E Developers

All countries, RES-E Developers: 34 respondents



Scale: -5 negative; 0 neutral; 5 positive

As regards planning / construction permit procedures, in particular time required to obtain permit(s) and complexity of the system resulting in administrative burden to RES-E Developers were considered as most serious barriers to RES-E project development. In addition, the level of experience of relevant administrative authorities with RES-E projects was evaluated in a negative way as well. On the other hand, the RES-E Developers consider their level of experience with planning permit / construction permit procedures as sufficient, so this factor is not considered as barrier.

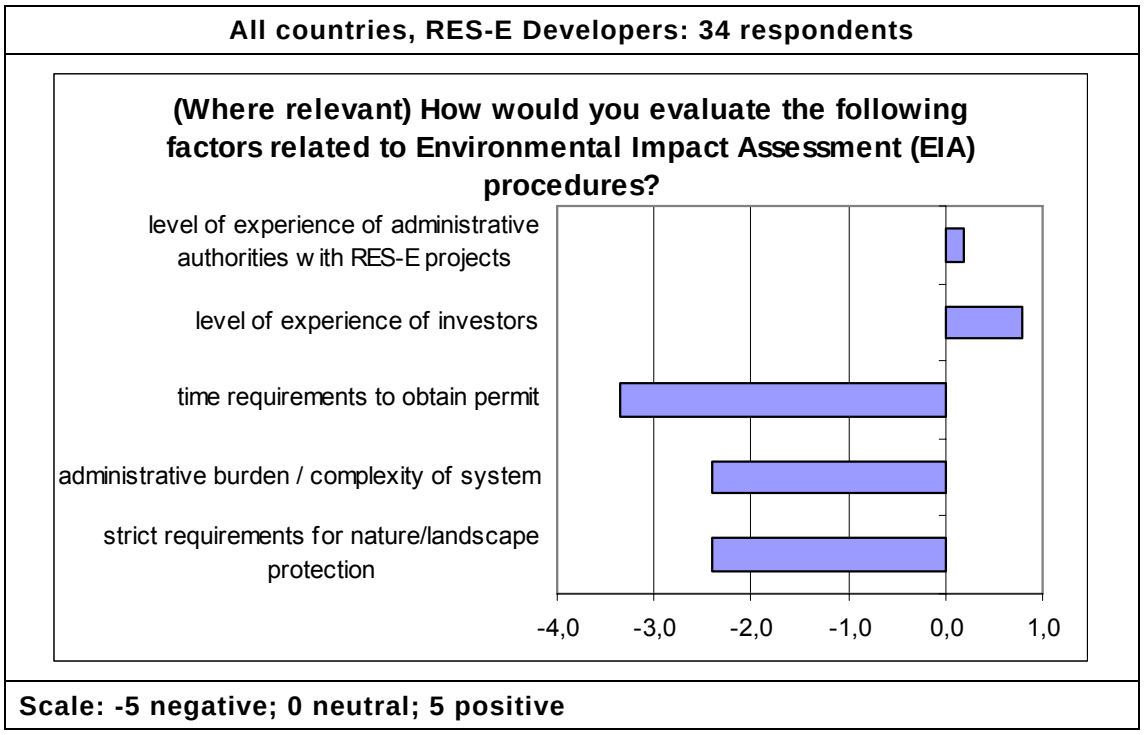
The detailed evaluation of land use / construction permit procedures by country is presented in Annex 1.

The land use / construction permit procedures were evaluated as negatively influencing RES-E project development in particular in the Czech Republic, Slovenia, Romania, Italy, Hungary and the UK. On the other hand, in Germany, besides slightly negative evaluation of administrative burden / complexity of system, the land use / construction permit procedures are not considered to be a barrier in development of RES-E projects.

Question:

How would you evaluate the following factors related to Environmental Impact Assessment (EIA) procedures (where relevant)?

Figure 11: Evaluation of Environmental Impact Assessment (EIA) procedures related to RES-E installations development by RES-E Developers



Larger RES-E investments such as wind farms, small hydropower plants, biogas installations, biomass based electricity sources are subject to Environmental Impact Assessment procedures.

According to overall results of stakeholder consultation, the experience of administrative authorities as well as experience of RES-E Developers with the administrative and legal requirements and resulting administrative procedures are not considered as barrier at all.

On the other hand, in particular time required passing through the EIA process, complexity of the system (resulting in administrative burden to RES-E Developers) and strict requirements for nature / landscape protection are considered as serious barriers to RES-E project development.

The detailed evaluation of Environmental Impact Assessment (EIA) procedures by country is presented in Annex 1.

The EIA procedures were evaluated with overall negative results in Slovenia and Romania, also in other countries, time required passing through the EIA process, complexity of the system and strict requirements for nature / landscape protection are evaluated as a barrier. The only exception is Germany, where the evaluation of EIA procedures is more or less neutral.

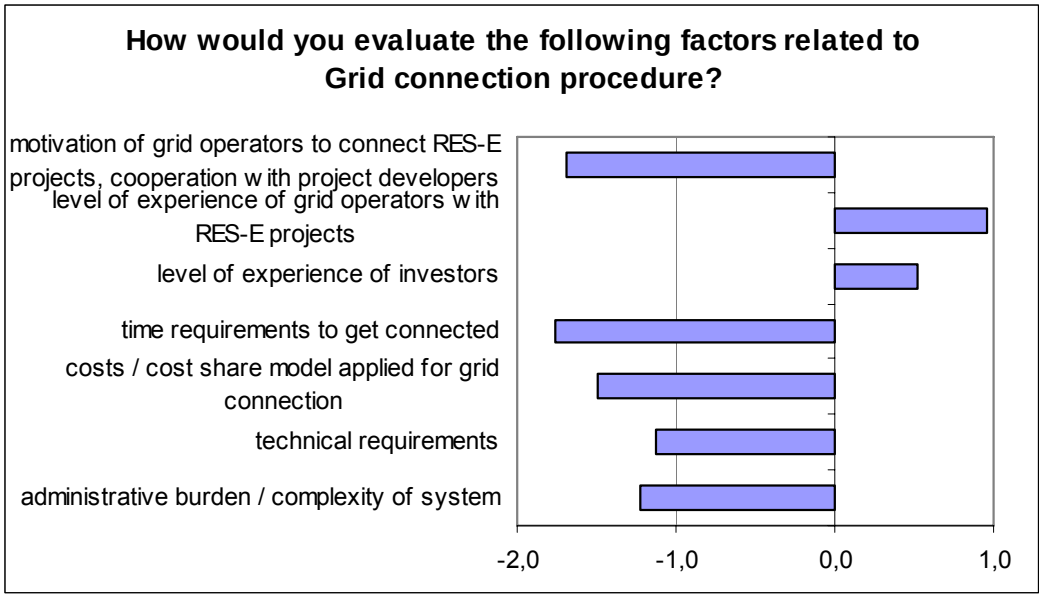
The neutral results in the case of the Czech Republic and the UK mean that no valid answers were obtained.

Question:

How would you evaluate the following factors related to Grid connection procedures?

Figure 12: Evaluation of Grid connection procedures related to RES-E installations development by RES-E developers

All countries, RES-E Developers: 34 respondents



Scale: -5 negative; 0 neutral; 5 positive

As the grid connection procedures regards, experiences of DSOs as well as RES-E developers are not considered as a problem and a barrier.

Similarly as in case of other administrative procedures, time requirements to get connected to the grid and, complexity of the system (resulting in administrative burden to RES-E developers) are considered as serious barrier.

The barrier that was evaluated as the second most serious (after time requirements) is also low willingness of DSOs to connect RES-E projects and to cooperate with project developers. In addition, model of coverage of costs of connection and strict technical requirements for grid connection create an environment which would not be supportive to quick and simple connection of RES-E projects to the grid.

The evaluation of grid connection procedures by country is presented in the Annex 1.

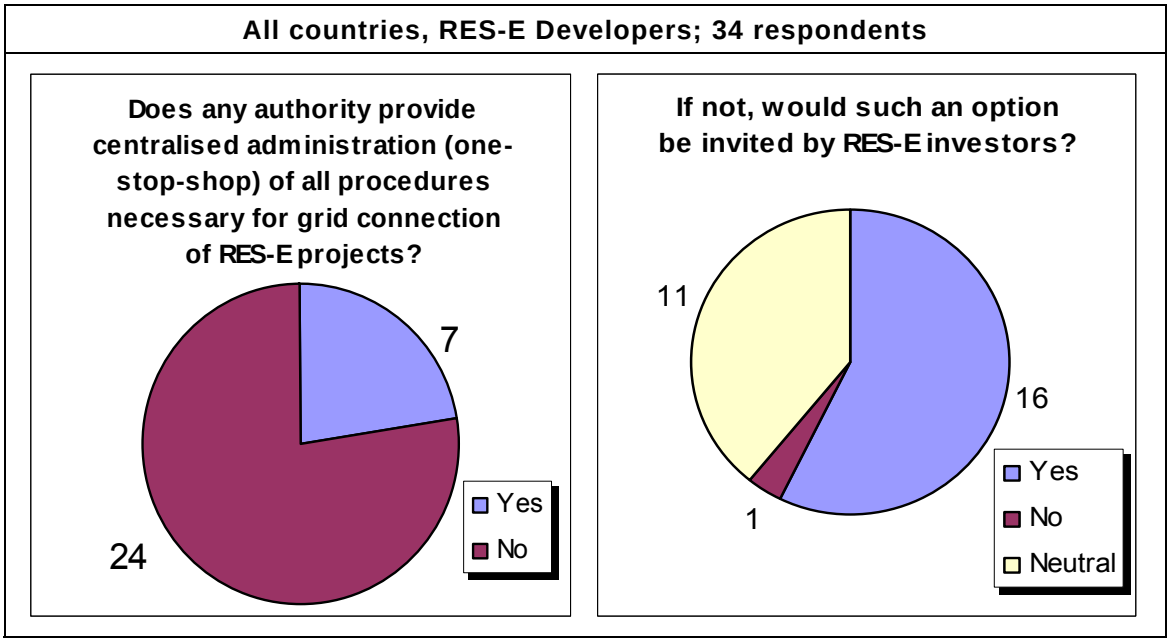
Question:

Does any authority provide centralised administration (one-stop-shop) of all procedures necessary for grid connection of RES-E projects?

If not, would such an option be invited by RES-E Developers?

The additional question was focused at coordination between authorities and availability of centralised administration (one-stop-shop) of all procedures necessary for grid connection of RES-E projects.

Figure 13: Evaluation of centralised administration (one-stop-shop) of all procedures necessary for grid connection of RES-E projects by RES-E Developers



From the answers of the RES-E Developers it is clear that the level of coordination between authorities is not sufficient and supportive to development and grid connection of RES-E projects.

Only six of 30 respondents who provided valid answers indicated that a kind of centralised administration (one-stop-shop) for RES-E Developers developing RES-E projects exists in their countries, however, the answers were consistent only in Italy. Almost 2/3 of RES-E developers would invite such an option while approx. 1/3 is more or less neutral.

The results, together with negative evaluation of coordination between authorities show clearly the need for improvement of coordination between involved authorities, simplification of administrative procedures related to development, grid connection and operation of RES-E plants.

Improvement or introduction of centralised administration of all procedures necessary for development, grid connection and operation of RES-E projects could be one of the measures that could significantly improve the situation and would be very positively accepted by major part of RES-E developers as well as other stakeholders.

Question:

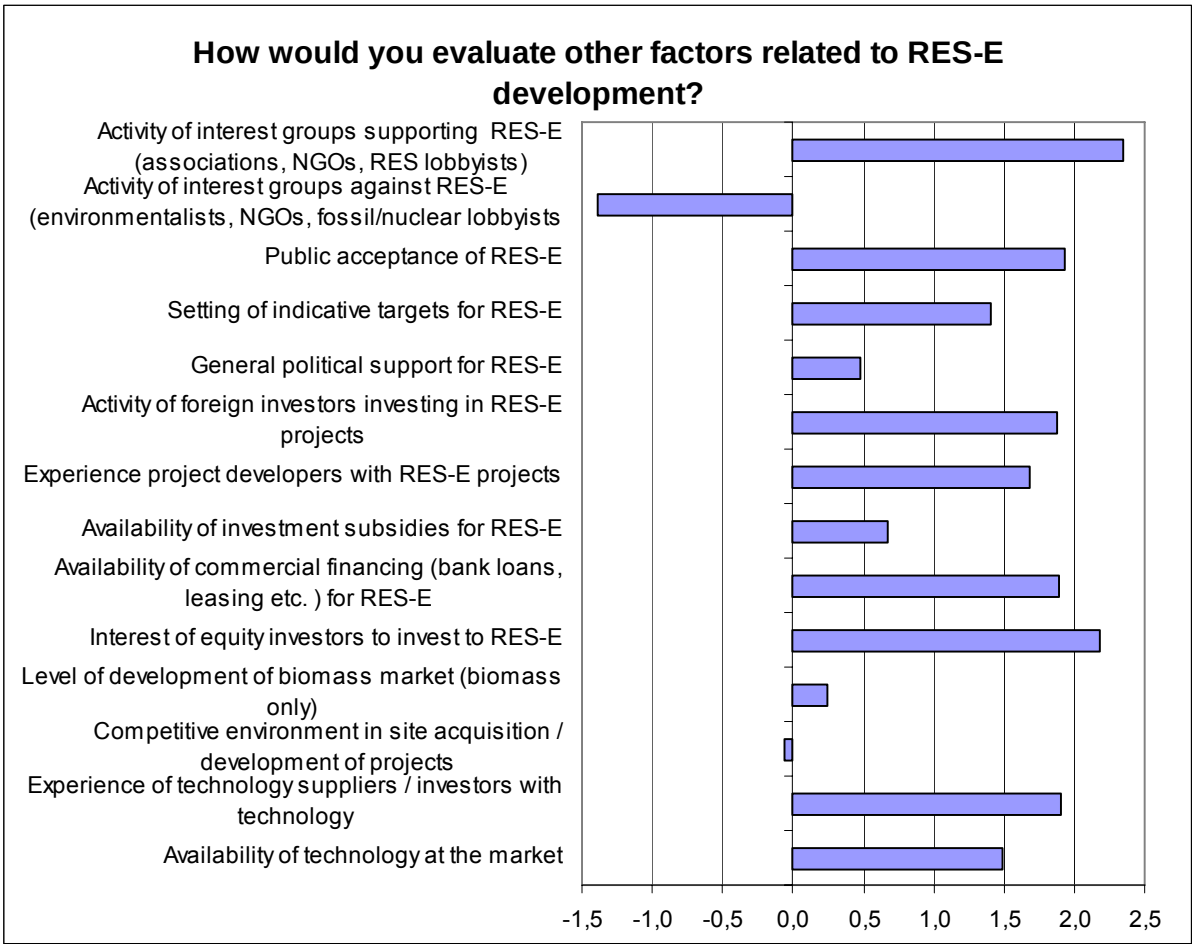
How would you evaluate other factors related to RES-E development?

The RES-E developers have also evaluated the other factors related to RES-E projects development. These include technical, social and economical factors such as:

- Availability of technology on the market
- Experience of technology suppliers / investors with technology
- Competitive environment in site acquisition / development of projects
- Level of development of biomass market (biomass only)
- Interest of equity investors
- Availability of commercial financing (bank loans, leasing etc.)
- Availability of investment subsidies for RES-E
- Experience of project developers with RES-E projects
- Activity of foreign investors investing in RES-E projects
- General political support for RES-E
- Setting of indicative targets for RES-E
- Public acceptance of RES-E
- Activity of interest groups against RES-E (environmentalists, NGOs, fossil/nuclear lobbyists etc.)
- Activity of interest groups supporting RES-E (associations, NGOs, RES lobbyists)

Figure 14: Evaluation other factors related to RES-E development by RES-E developers

All countries, RES-E developers; 34 respondents



Scale: -5 negative; 0 neutral; 5 positive

Most of the factors influencing the development of RES-E projects have positive influence on development of the projects. The key ones are:

- Activity of interest groups supporting RES-E (associations, NGOs, RES lobbyists);
- Interest of equity investors and banks to invest into or finance to RES-E projects;
- Public acceptance of RES-E installations.

Setting of indicative targets for RES-E appears to be also a positive motivation factor.

There are also factors that are considered to be neutral or slightly hampering the process of development of RES-E projects – namely competition in acquisition of suitable sites, which could delay project development. The other factor is the level of development of biomass markets which is not considered sufficient in order to motivate development of biomass in electricity projects.

One of the factors was clearly indicated as negative, creating barrier to development of RES-E projects – it is the activity of various interest groups working against RES-E development. These groups could be environmentalists, activists and NGOs (NIMBYists), fossil/nuclear lobbyists etc.

Surprisingly, public acceptance of RES-E sources was evaluated as rather high, although direct decisions of local/regional self governments, (which often interpret the opinions and will of their electorate – the citizens) or indirect influence on administrative procedures are in many cases the opposite and rather slow down the process of RES-E project development.

The evaluation of other factors related to RES-E development is presented in Annex 1.

The evaluation of other factors differs country by country and results from the country specific situation.

While for example in Austria, the public acceptance of RES is considered to be positive and corresponding with overall deployment of RES-E sources, in the Czech Republic the public acceptance is considered as one of the main barriers for further development of RES-E installations. On the other hand, the setting of indicative targets and general political support are considered as positive motivating factors in the Czech Republic while the Austrian stakeholders are significantly more critical and evaluate these factors in a negative way.

The key other barriers identified are:

- Activities of interest groups against RES E in Norway, Czech Republic, Slovenia and the UK
- General political support for RES-E in Norway, UK and partly in Austria.
- Availability of RES-E technologies at the market in Romania and (surprisingly) in Norway and the UK.

2.3 Grid connection regulation for RES-E

2.3.1 Applied grid connection cost allocation model

Question:

What is current system of grid connection cost allocation?

The question was answered by regulators and DSOs only in order to confirm / update and comment information about currently applied system of grid connection cost allocation.

The stakeholders also presented and commented on grid connection cost allocation which they would prefer from their own point of view.

Table 3: System of grid connection cost allocation by country – current and preferred by different stakeholder groups

Country	Grid connection cost allocation system - present		Grid connection cost allocation system – preferred system		
	Present	Notes / comments	Regulators	DSOs	RES-E Developers
Austria	**Deep/Shallow (technology dependent)**	Based on Connection (+ for wind: Grid Extension, Grid Reinforcement Costs)	**Shallow**	**Deep**	**Super shallow (3)** Shallow (2)
Czech Republic	**Other**	Semi-deep – connection + grid extension / reinforcement costs (based on country-wide average costs) shared between DSO (TSO) and plant operator in ratio approx 50:50.	**Deep**	**Shallow (2)** Deep (1)	**Shallow (4)** Other (1)
Germany	**Shallow / super shallow**	Super-shallow for wind off-shore	**Shallow**	**Shallow**	**Shallow (3)** Super shallow (1)
Greece	**Shallow**	RES investor pays for the connection costs. A state subsidy of up to 50% is available. Grid Extensions and Reinforcements are envisaged in the 5-year System Development Plans published biannually by the TSO. Costs are incorporated in Use of System tariffs	**Shallow**	n/a	n/a
Hungary	**Shallow**		**Shallow**	**Super-Shallow**	**Shallow (2)** Deep (2)
Italy	**Shallow**	A shallow allocation is in use for HV and MV connections. LV connection costs are partially covered by a flat contribution related to power and distance.	**Shallow**	Super shallow (1) Deep (1)	Super shallow (2) Deep (2) Shallow (1)

Table 3 (continued): System of grid connection cost allocation by country – current and preferred by different stakeholder groups

Country	Grid connection cost allocation system - present		Grid connection cost allocation system – preferred system		
	Present	**Notes / comments**	**Regulators**	**DSOs**	**RES-E Developers**
Norway	**Deep**		Shallow (1) Deep (1)	**Shallow (2)** Deep (1)	**Other**
Romania	**Shallow**	on basis of ANRE methodology	**Shallow**	**Deep**	**Shallow**
Slovenia	**Shallow**		**Shallow**	Shallow (1) Deep (1) Other 1) Super-shallow (1)	**Super shallow**
United Kingdom	**Shallow**		n/a	Shallow (2) Other (2)	n/a

Note:
***Deep connection costs** - electricity producer pays costs for connection to the nearest power grid plus costs for reinforcing the existing grid*
***Shallow connection costs** – electricity producer pays only costs for connection to the nearest power grid*
***Super shallow connection costs** - electricity producer does not pay for connection – the costs of connection plus costs for reinforcing the existing grid are covered by the grid operator*

In most countries, shallow systems of grid connection costs allocation or their modifications are in place. Only in Norway and Austria, deep systems of grid connection costs allocation are applied (In Austria, technology dependent deep charging resulted from contractual agreements rather than explicit legislation. Transparency is therefore seen as non sufficient - see below).

The different stakeholder groups differ in their views on preferred system of grid connection costs allocation and their opinions are often not uniform even within the stakeholder group in given country. Nevertheless, it could be concluded that:

- The RES-E Developers tend to support shallow or super-shallow systems;
- DSOs tend to support shallow systems but are often not consistent in their opinions;
- Regulators mostly support shallow systems.
- In general, all stakeholders prefer rather shallow systems of grid connection costs allocation.

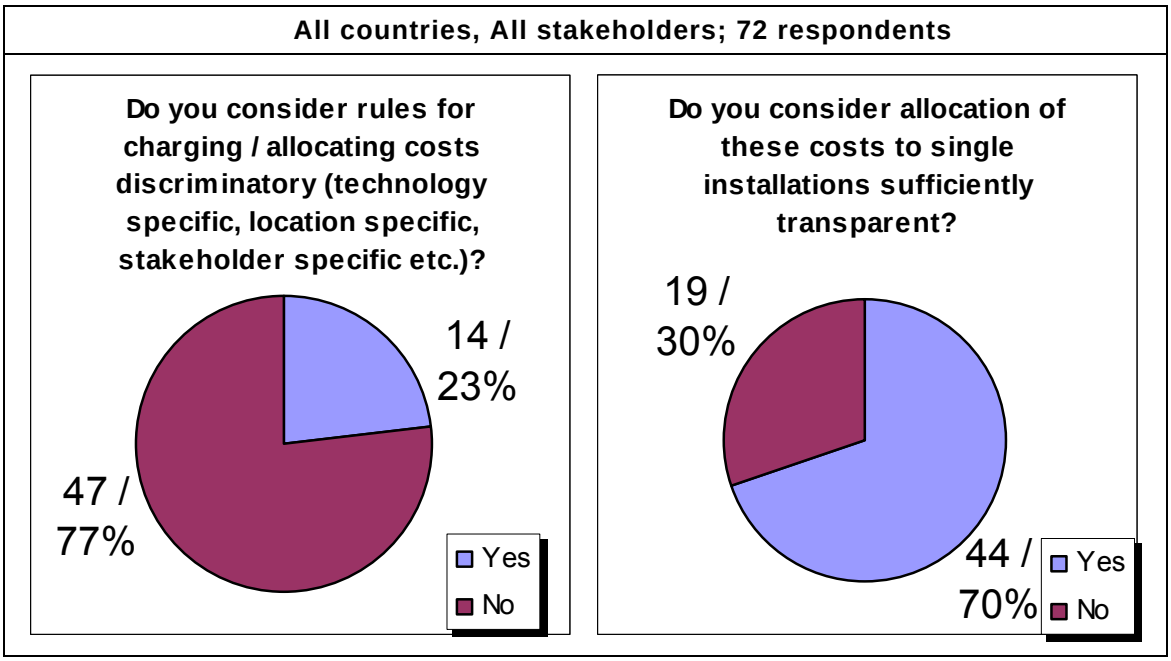
2.3.2 Transparency and other issues related to system of grid connection cost allocation

Question:

Do you consider rules for charging/allocating grid connection costs discriminatory (technology specific, location specific, stakeholder specific etc.)?

Do you consider allocation of these costs to single installations sufficiently transparent?

Figure 15: Evaluation of transparency and other issues related to system of grid connection cost allocation



The transparency of allocation of costs of grid connection to single installations was evaluated as sufficient by 70% of respondents. Also, 77% of respondents do not think that the rules for charging / allocating costs are discriminatory from the point of view of location, stakeholder, technology etc.

The transparency is considered insufficient mainly by RES-E Developers, in particular in Austria (all 5 RES-E Developers included in Stakeholder Consultation!), the Czech Republic (3 of 5) and Italy (2). Also, 2 of Norwegian DSOs do not consider rules transparent as well as do Regulators in Hungary and Romania.

The rules for charging / allocating costs are considered discriminatory in some way also by RES-E Developers, in particular in Austria (3 of 5), the Czech Republic (2), Romania (2) and Italy (2).

The data related to grid connection costs provided by the DSO were confirmed to be verifiable by Regulators in all consulted countries except Hungary and Greece.

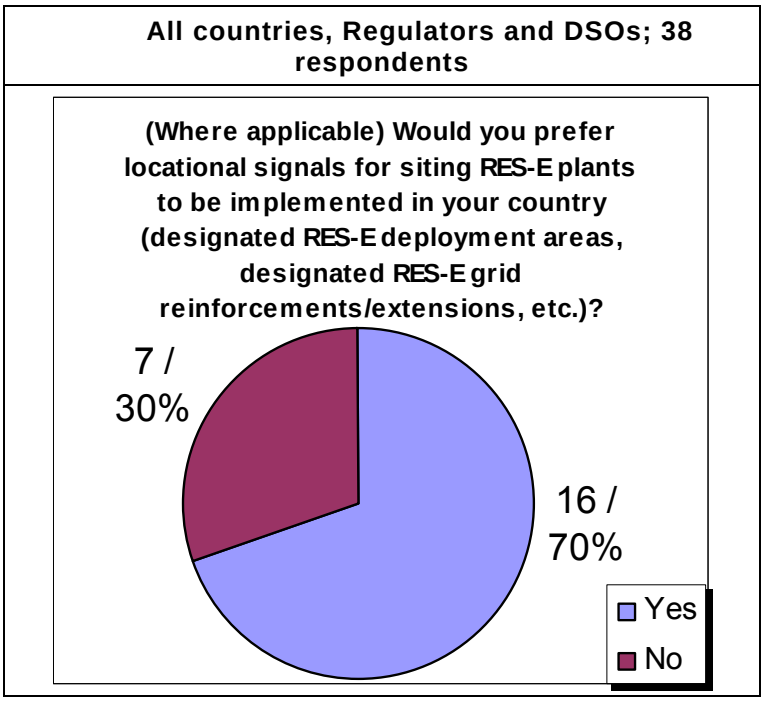
2.3.3 Locational signals

Question:

Would you prefer locational signals for siting RES-E plants to be implemented in your country (designated RES-E deployment areas, designated RES-E grid reinforcements / extensions, etc.)?

The question was answered by Regulators and DSOs in order to confirm / update and comment information about application of locational signals for siting RES-E plants and their desirability.

Figure 16: Evaluation of desirability of Locational signals for RES-E deployment



According to responses to questionnaires, locational signals for siting RES-E plants are implemented in some way in Austria, Norway, Slovenia and Greece.

Locational signals would be preferred by 70% of DSOs included in the Stakeholder Consultation. In particular DSOs in Germany and the UK have provided unambiguous answers that the locational signals are desirable.

2.3.4 Information about grid infrastructure

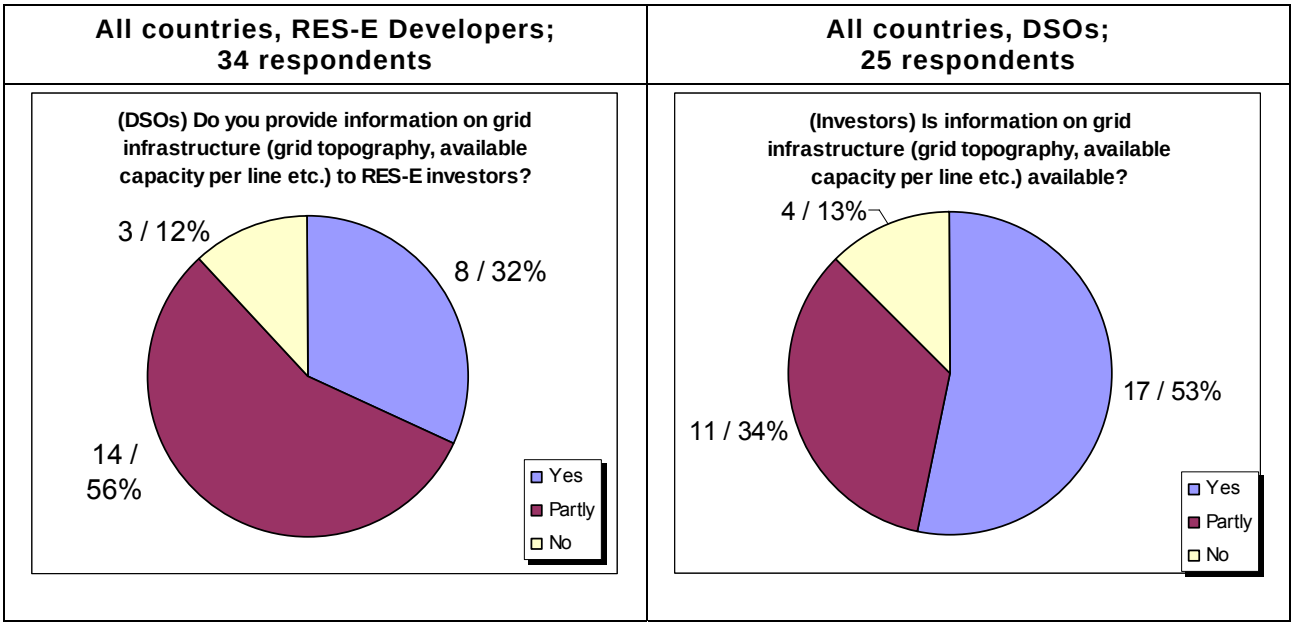
Questions:

(Answered by DSOs) Do you provide information on grid infrastructure (grid topography, available capacity per line etc.) to RES-E investors?

(Answered by Developers) Is information on grid infrastructure (grid topography, available capacity per line etc.) available?

Question was answered by RES-E Developers and DSOs. Availability of information about grid infrastructure is important for RES-E Developers for planning of their investments into RES-E generating plants.

Figure 17: Evaluation of availability of Information about grid infrastructure



According to results of Stakeholder consultation, almost 90% of DSOs as well as RES-E Developers confirmed that information about grid infrastructure is available fully or partly. There were only individual negative responses that are not uniform with replies of other stakeholders from the same country and stakeholder group, however, the negative responses may indicate some problems with availability of information about grid infrastructure in Italy and Romania.

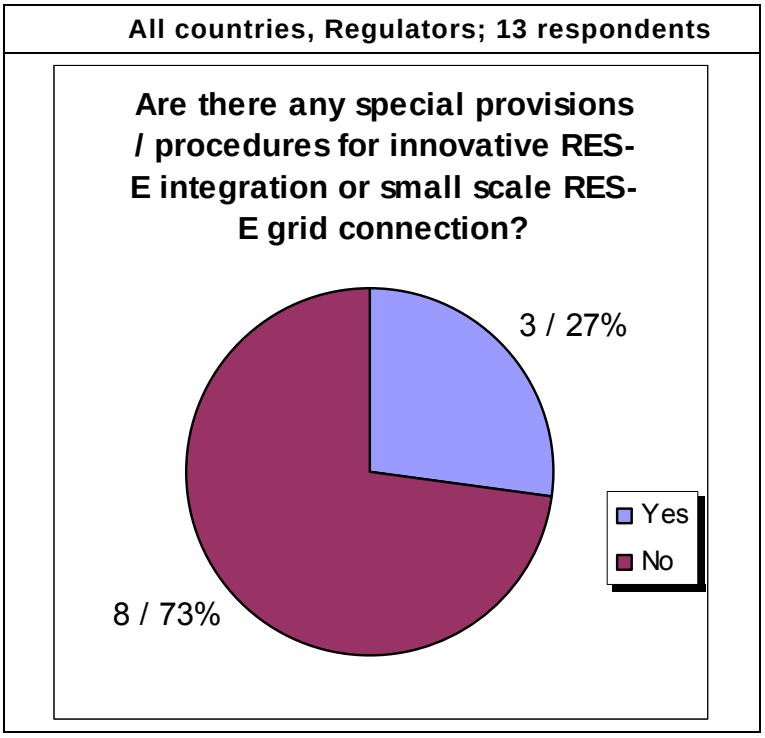
2.3.5 Innovative / small scale RES-E grid integration

Question:

Are there any special provisions / procedures for innovative RES-E integration or small scale RES-E grid connection?

Question was answered by Regulators in order to confirm / update and comment information about application of special provisions / procedures for innovative RES-E integration or small scale RES-E grid connection.

Figure 18: Evaluation of availability of special provisions and/or procedures for innovative RES-E integration or small scale RES-E grid connection



In most consulted countries, there exist no special provisions and/or procedures related to innovative RES-E integration or related to small scale RES-E grid connection. The only exceptions are the Czech Republic (simpler licensing requirements and procedures for small scale sources, simpler grid connection procedures for sources connected to low voltage grid), Italy and Norway.

2.3.6 Other issues related to grid connection (determination of connection point, grid connection study, refusal of connection, tendering etc.)

Other questions focused to issues related to grid connection such as determination of connection point, necessity to elaborate grid connection study, rules for refusal of connection and tendering of connection work were included in the questionnaires as well. As the answers did not differ

significantly or the questions were formulated in a way that not many valid answers were received, the conclusions are summarized only briefly.

Determination of grid connection point:

- In most consulted countries, the grid connection point is determined as the closest technically suitable connection point. In most countries, connection study is required either for all or only for large RES-E sources or complicated situations.

Refusal of connection:

- As regards refusal of connection, in most countries, Regulatory authorities are involved while in Germany and Greece, connection could be refused by DSO.

Publication of grid access contracts:

- The individual grid access contracts are not public but the model grid access contracts are published in most consulted countries.

Tendering for construction of grid connection:

- Tendering for construction of grid connection (in case it is provided by DSO) is applied in most consulted countries except Germany, Hungary and UK.

2.4 Other issues and comments by stakeholders and country

During the Stakeholder consultation, many other comments were collected from the consulted stakeholders. The selected comments by consulted stakeholders which were not included in the quantitative evaluation of responses to questionnaires are presented below per consulted country.

2.4.1 Austria

- RES support - feed in tariff system is simple but investment support system is very complicated.
- Further development of “Smart grids” is desirable and necessary.
- Unbundling - Unbundled grid operators with the exemption of Tirol where generation facilities of the regional supplier are preferred.
- Problems / barriers related to RES-E grid connection from the point of view of project developers - larger projects causing problems with balancing of the grid.
- Increasing costs due to increasing integration of DG can not be additionally recovered. Signals for reinforcement costs are necessary.
- Necessary further development of EU legislation – enabling full recovering of costs for grid connections for network operator (by RES-E operator or network tariff), grid reinforcement, simplification of administrative procedures.

- Technology supporting stable integration of RES-E (preventing negative circuit feedback) shall be demanded. This would resolve potential conflicts in the field of system integration from the start.
- Serious issues - Existing network capacity is spent to RES-E without cost recovering. There is no compensation for grid integration costs for network operators. There exist no incentives for all over system optimization.
- Problems / barriers from the point of view of project developers - administrative procedures, grid connection costs, construction permit procedures, long-term stability of feed-in tariffs. For small solar PV projects the administrative burden should be lower. Insufficient grid capacity in certain points.
- There is conflict between grid tariff regulation scheme and increased distributed energy sources. These increased network costs have to be included in the grid tariff regulation scheme.
- Technology specific differentiations shall be implemented to incentivise favourable technology from grid stability point of view (3 phase PV connection vs. 1 phase).
- At present allocation of reinforcement costs to consumers may discriminate this group rather than generators.

2.4.2 Czech Republic

- Technical issues - Lack of distribution/ transmission capacity, necessity to provide system services (backup, balancing).
- Energy policy should be clear, binding and transparent first.
- RES-E Developers – administrative procedures, developers could have problems with construction of connecting lines from RES-E installation to connection point.
- The massive development of RES-E sources would require significant improvements of distribution network which was designed for distribution of electricity towards end users, not for distribution of electricity from decentralized sources.
- The centralized sources are much easier to handle with from the point of view of DSOs.

2.4.3 Germany

- Barriers - Legislative timeframe, negative perception of new sources (even RES-E) among population, expenses for administration (grid reinforcement), risk (finance & grid-wise / electrical equipment). administrative procedures (RES-E Developers).
- Additional administrational expenses for DSOs due to fast increasing number of applicants for grid connection.
- System management at EU level necessary, synchronising the rules within the EU-27.

- Unbundling has raised complexity of the process.

2.4.4 Greece

- Barriers - long and comparatively complex licensing procedure, long times for construction and/or grid reinforcement, limited public acceptance, areas of high wind potential are usually isolated and far from the existing grid infrastructure.
- Locational signals - RES installations in non-interconnected islands receive higher levels of feed-in tariffs. The Special Land Use Framework for RES differentiates between “Wind Priority Areas” and “Wind Suitability Areas”.

2.4.5 Hungary

- Too many administrative points for interference and government taking a monopoly over key regulatory issues favouring selected groups not on technical grounds .
- Project development takes close to 2 years (double that of Western European countries - Construction permit 8-10 months, Environmental permit 6 months). Permits not consistent with one and other (Government, Environmental, Construction).
- There are range of practical problems with taxation associated with the transfer of ownership from project developer to grid operator (VAT, title fees) having an effect on transparency.
- Differentiation by technology and size is in process. In the past discrimination was done on nonprofessional basis favouring selected investor groups.
- In Hungary there has been no major power plant constructed over the past 20 years despite shortage of supply partially due to demotivating factors. This has led to electricity prices higher than in Western Europe.
- Longer guarantee of feed-in and differentiation between technologies is desirable.

2.4.6 Italy

- Locational signals would be advisable for network planning. DSOs always suggested it to Italian Regulator, but never succeeded.
- Unstable and unclear regulatory framework, uncertainties about authorization processes, bad understanding on grid related issues, no link between localization of energy consumption and distributed generation plants (distribution grid acting as a transmission infrastructure), need of new grid infrastructure, high connection costs (for small generation plants).

2.4.7 Norway

- DSOs are careful to invest in the grid before licensing because of uncertainty.
- Cost burden is often put on the first investor. With investors that follow being on a “free-ride”. This is considered unfair. It can also be a barrier and it gives a short-sighted planning approach.
- Income frame model for DSO do not give incentives for investments in the grid.
- Rules for charging / allocating costs discriminatory between locations on basis of the availability to the grid at different sites. There is also different practice for different DSOs.
- Technical issues - stability during grid disturbance, balancing issues, grid capacity
- One should look into the possibility that the state could subsidize grid investments for RES-E. Or maybe the government could finance investments in the grid for RES-E and investors could pay back an appropriate share at the time of connection.

2.4.8 Romania

- It’s necessary to develop promotion mechanism also for heat production from renewables
- Barrier - Time of answer from distribution/transport system operator, Approvals from local administration authorities, Land use / construction permit procedures, Authorisation from the state

2.4.9 Slovenia

- Barriers are seen only with location and environmental procedures. The new Energy Law well defines and removes other barriers when connecting to the grid.
- Coordination between authorities: Environmental ministry has its own procedures, and the Directorate for Energy can not interfere with their decisions.
- Environmental problems, dislocation of power plants, far form the main grid.
- Developers barriers - Unreasonably high grid costs, higher than the investment into the power plant itself (e.g. a plant built in a national park will never be connected to the grid due to very high connection costs).
- It should be government responsibility to create environment and conditions favourable for investors to invest into RES-E, DSO should charge everything. Now since DSO became private, soon this will not be their interest to pay for grid reinforcement.

- Necessary further development of EU legislation - Simplifying technical requirements for RES-E grid connection, European sources (subsidies or loans for connection)
- DSOs - Problem of integration of larger producers on small area with the inappropriate grid infrastructure, standards
- Developers - insufficient data about technical characteristics of the grid, lack of knowledge and experience of technicians and project developers.

2.4.10 UK

- Locational signals - in a very few circumstances, no more than one or two per DSO, specific strategic separately-funded reinforcement can be justified to open up areas, particularly for onshore wind development
- Feed-in tariffs could dramatically change deployment, particularly of small scale generation
- Planning permission is indeed an administrative burden for project developers and DSO (grid enforcement)
- Problems DSO - Access to the transmission system, network is heavily physically constrained, mainly due to increased power flows from onshore wind in Scotland to the population centres of the Midlands and the South. Further, no satisfactory commercial arrangements exist for distribution-connected generation to acquire transmission access rights. Difficulties in forecasting RES-E activities.
- Reinforcement - time to reinforce the system, degree of reinforcement, resources and availability, staff and material. Planning, planning and planning.
- Problems Developers - Planning permission, , Certificates only guaranteed for 5-10 years. Uncertainty for period afterwards. Shortage of wind turbine availability. Planning, planning and planning
- DSO's main interest is "keeping the lights on". DSO is in favour of more renewable up to a certain limit, where they could cause problems in the grid.
- Technical issues – connection of large amount of RES-E and related disturbance in network, balancing issues. This is currently no concern resp. no actions are currently undertaken as preparation for this case.
- Regulatory issues – RES-E development should not put additional costs should be put on the DSO, no impact on quality and security of supply
- Currently enough staff at DSO for processing grid connection requests. Dramatic increase in volume of requests could cause delays.

3. Conclusions

The three consulted Stakeholder groups have very different views on issues covered by questionnaires – the difference in their opinions is obvious as they have different interests and issues to solve:

- RES-E Developers – their main interest is to develop renewable energy projects and get connected to the grid - quickly, simply, without excessive costs.
- DSOs – they are rather neutral on the condition that they do not have to solve too many technical / administrative issues and their costs related to connections / grid extension are covered / recovered through system services fees or end user prices.
- Regulators – their main task is to protect end users – they therefore regulate costs of DSOs and in most countries involved in design / implementation of RES-E support system

3.1 Key non-technological barriers for grid connection of RES-E sources

The support schemes for RES-E in some countries are not sufficient and sometimes create additional barriers. Such barriers which could become important risk factors for RES E Developers and project financiers are:

- **Low level of support for some technologies in technology specific RES-E support systems**, and;
- **Absence of long-term guarantee of stability of support**.

The key non technological barriers related to RES-E project development are:

- **Administrative procedures related to development of RES-E projects**, and;
- **Lack of coordination between authorities** involved in administrative proceedings related to RES-E projects.

Other important barriers that were identified are of socio-economic nature, namely:

- **Little public acceptance of RES-E installations** in some countries, and;
- **Activities of various interest groups directed against RES-E development**. These groups could be environmentalists, and local NGOs (NIMBYists), fossil/nuclear lobbyists etc..

The further conclusions by individual topic covered by Stakeholder Consultation are summarized in the following sections.

3.2 Potential and current situation in RES-E generation

- In general, considering responses from all stakeholders and all countries, onshore wind energy is perceived and evaluated as RES-E source with highest and most important potential, followed by group of RES-E sources with very small difference - biomass, small hydro and solar PV. Tidal/Wave (where relevant), geothermal electricity and solar thermal electricity generation were evaluated as RES-E sources as the least significant potential by all stakeholder groups – this corresponds with current share and status of technological development of these technologies.
- Regulators are significantly more sceptical regarding their expectations. From not very clear reasons. Regulators see small hydro as the source with the best potential.
- DSOs provided highest ranking for offshore wind.
- According to RES-E Developers onshore wind is considered as most promising RES-E source.

3.3 Current dynamics of development of RES-E

- In general, considering responses from all stakeholders and all countries, solar PV and onshore wind are considered as the most dynamically developing RES-E sources. Biomass, biogas and small hydro are slightly behind with similar level of development.

3.4 Motivation provided by RES-E support system

- All countries that were subject to Stakeholder Consultation apply in some form support system for RES-E production. The most common system of support is feed-in tariffs. The exception is Norway, where investment subsidies and tax benefits for support of RES are used.
- During the interviews and in the questionnaires, there were no significant issues mentioned that would relate to RES-E support that would create or contribute to non-technological barriers to access of RES-E sources to the grid.

The perception of support schemes and whether it motivates or not differ per type of stakeholder and per country:

- Regulators see support systems as more motivating compared to other stakeholder groups. The support systems are the most motivating for onshore wind, small hydro and biogas according to Regulators. On the other hand, from the Regulators' point of view, support for offshore wind energy does not create sufficient motivation.
- The point of view of DSOs is more or less balanced, compared to Regulators and RES-E developers, they do not have extreme opinions. From their point of view, the support systems are the most motivating for solar PV and slightly less motivating for biomass and onshore wind.

- From the point of view of RES-E Developers, the support systems are the most motivating for solar PV and biomass and slightly less motivating for onshore wind, small hydro and biogas. RES-E Developers evaluate the support/motivation for onshore wind energy as low, although still positive.
- In particular long-term guarantee of support (for feed-in tariff or premiums) is a very important motivating factor, sometimes with even higher importance than actual level of feed-in tariffs / premiums.
- The level of long-term guarantee of support is significantly more positively evaluated by Regulators, while DSOs and RES-E Developers with experience from real life projects are less positive and optimistic.
- The long-term guarantee of support is very positively evaluated in Germany, Greece and the Czech Republic. All three countries apply transparent RES-E support systems with long-term guaranteed feed-in tariffs.
- According to several responses, Hungary, Austria and Slovenia would need improvement of the currently applied feed-in tariff system as regards long-term guarantee of conditions of support. An improvement of the current quota-based system would be needed in the UK (according to latest information introduction of feed-in tariff system is being prepared) and introduction of a new support system at all would is recommended for Norway.

3.5 Priority grid access

- According to the results of stakeholder consultations, the legislative guarantee of access to the grid for RES-E sources and priority transmission and distribution is not considered as a key barrier in countries where this guarantee is not applied .
- Introduction of positive discrimination of RES-E as regards the guarantee of grid access or transmission and distribution of RES-electricity, however, may become an additional motivating factor for RES-E grid integration.

3.6 Administrative barriers

- **Lengthy, unclear and complicated (spatial planning / construction and EIA) procedures and lack of coordination between authorities involved in administrative proceedings related to RES-E projects are mentioned as the key barriers for development of new RES-electricity projects almost unanimously by all stakeholders.**
- Regulatory authorities, as well as DSOs have very similar view on these administrative permit procedures. Regulators are slightly more critical than DSOs.
- The key problem according to Regulators and DSOs are spatial planning, construction permit and EIA procedures and lack of

coordination between authorities. On the other hand, licensing and grid connection procedures are not considered as a barrier.

- Regulators and DSOs tend to evaluate administrative obstacles in less critical way than RES-E Developers who have the most critical point of view.
- The administrative procedures related to development of RES-E projects have been evaluated by Regulators and DSOs as strongly negative factor (or barrier) in all respondent countries except UK, Czech Republic, Norway and Romania, where the results of evaluation neutral or slightly positive. Especially in Greece, Hungary and Italy, complexity of support system and the related administrative burden is evaluated as very serious barrier.
- As regards planning / construction permit procedures evaluated by RES-E Developers:
    - In particular time required to obtain permit(s) and complexity of the system resulting in administrative burden were considered as most serious barriers to RES-E project development. In addition, the level of experience of relevant administrative authorities with RES-E projects was evaluated negatively as well.
    - On the other hand, the RES-E Developers consider their level of experience with planning permit / construction permit procedures as sufficient, so this factor is not considered as barrier.
- As regards EIA procedures evaluated by RES-E Developers:
    - The experience of administrative authorities as well as RES-E Developers with the procedures are not considered as barrier.
    - On the other hand, time required passing through EIA procedures, complexity of the system (resulting in administrative burden to RES-E Developers) and strict requirements for nature / landscape protection are considered as serious barriers to RES-E project development.
- As regards grid connection procedures evaluated by RES-E Developers:
    - Experience of DSOs as well as RES-E Developers are not considered as a problem and are not a barrier.
    - Similarly as in case of other administrative procedures, time requirements to get connected to the grid and, complexity of the system (resulting in administrative burden to RES-E Developers) are considered as serious barrier.
    - The barrier that was evaluated as the second most serious (after time requirements) is also low willingness of DSOs to connect RES-E projects and to cooperate with project developers.
    - In addition, the way of cost coverage of connection and strict technical requirements for grid connection create an

environment which is not supportive to quick and simple connection of RES-E projects to the grid.

- Lack of coordination between authorities as viewed by the stakeholders show clearly the need for improvement. This means simplification of administrative procedures related to development, grid connection and operation of RES-E plants.
- Centralised administration of all procedures necessary for development, grid connection and operation of RES-E projects is an option that could improve the situation and would be accepted by major part of RES-E Developers.
- Most of the other factors influencing the development of RES-E projects that were evaluated have positive influence on development of projects. The key ones are:
  - Activity of interest groups supporting RES-E (associations, NGOs, RES lobbyists);
  - Interest of equity investors and banks to invest into or finance to RES-E projects;
  - Public acceptance of RES-E installations.
  - Setting of indicative targets for RES-E.
- There are also factors that are considered to be neutral or slightly hampering the process of development of RES-E projects – namely competition in acquisition of suitable sites.
- One of the factors was clearly indicated as a barrier to development of RES-E projects is the activity of various interest groups directed against RES-E development. These groups could be environmentalists, NGOs (NIMBYists), fossil/nuclear lobbyists etc.
- Surprisingly, public acceptance of RES-E sources was evaluated as rather high, although direct decisions of local/regional authorities, (which often interpret the opinions and will of their electorate – the citizens) or indirect influence on administrative procedures are in many cases the opposite and slow down the process of RES-E projects development in some of the countries involved.
- In some countries, negative public acceptance of RES-E could be a key problem projecting also to other barriers like administrative complications, negative approach of authorities etc.

3.7 Grid connection regulation for RES-E

In most consulted countries, systems with shallow allocation of grid connection costs or their modifications are in place. Only in Norway and Austria, systems with deep allocation of grid connection costs are in place.

The three stakeholder groups also differ in their views on preferred system of grid connection costs allocation and their opinion is often not uniform even within the stakeholder group in given country. Nevertheless, it could be concluded that:

- Most of RES-E Developers support shallow or super-shallow systems;
- DSOs tend to support shallow systems but are often not consistent in their opinions;
- Regulators mostly support shallow systems.
- In general, all stakeholders prefer shallow systems of grid connection costs allocation.

The transparency of allocation of costs of grid connection to single installations was evaluated as sufficient and non-discriminatory by approx. ¾ of respondents.

The transparency is not considered sufficient mainly by RES-E Developers, in particular in Austria, the Czech Republic and Italy. The rules for charging / allocating costs are considered discriminatory in some way mainly by RES-E Developers, in particular in Austria, the Czech Republic, Romania and Italy.

According to results of questionnaires, locational signals for siting RES-E plants are implemented in some way in Austria, Norway, Slovenia and Greece.

Implementation of locational signals would be preferred by 70% of DSOs included in the Stakeholder Consultation as it would improve planning of grid extension/strengthening.

According to results of Stakeholder consultation, almost 90% of DSOs as well as RES-E Developers confirmed that information about grid infrastructure is available fully or partly. There were only individual negative responses that are not uniform with replies of other stakeholders from the same country and stakeholder group. These negative responses may, however, indicate some problems with availability of information about grid infrastructure in Italy and Romania.

4. REFERENCES

[1] Auer H., C. Obersteiner, W. Prüggler, L. Weissensteiner, T. Faber, G. Resch: „Guiding a Least Cost Grid Integration of RES-Electricity in an extended Europe“, Action Plan, Project GreenNet-Europe, 2007b.

[2] Legal sources on renewable energy: http://res-legal.eu/

[3] Electricity production from RES Directive 2001/77/EC of the European Parliament and the Council on the promotion of the electricity produced from renewable energy sources in the international electricity market

5. ANNEX 1 – Selected country specific results of Stakeholder Consultation

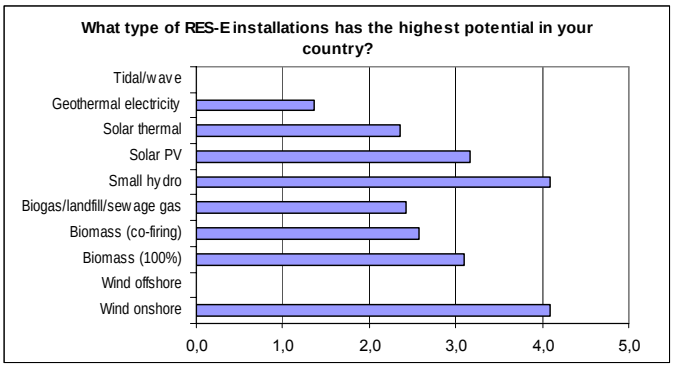
5.1 Potential for RES-Electricity generation and current situation in RES-Electricity generation

Question:

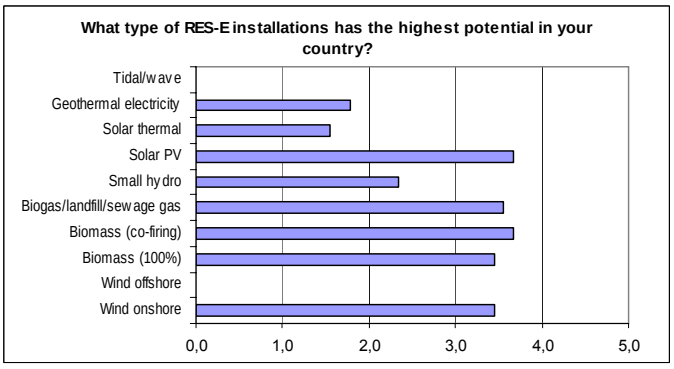
What type of RES-E installations has the highest potential in your country?

Figure 19: Evaluation of potential of different types of RES-E sources by country

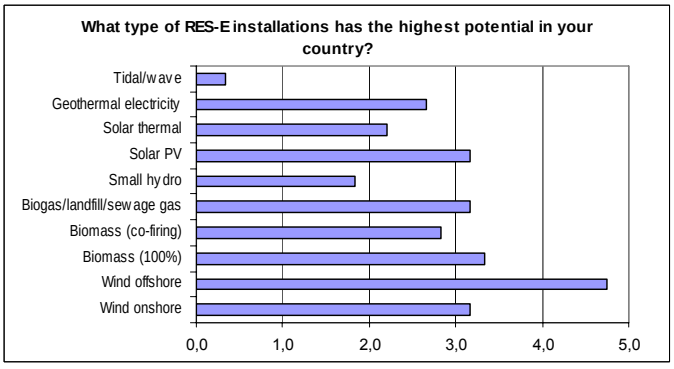
Austria, All stakeholders: 9 respondents



Czech Republic, All stakeholders: 12 respondents



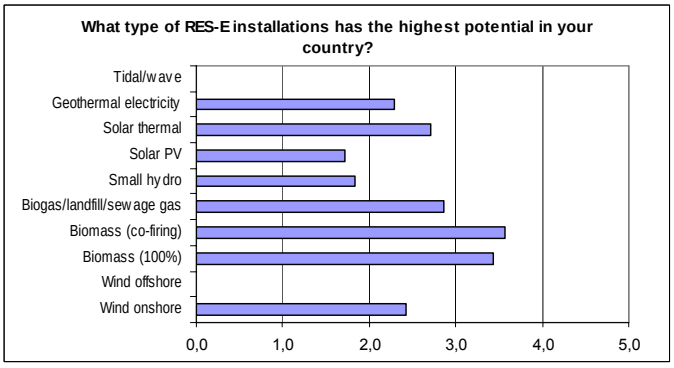
Germany, All stakeholders: 6 respondents



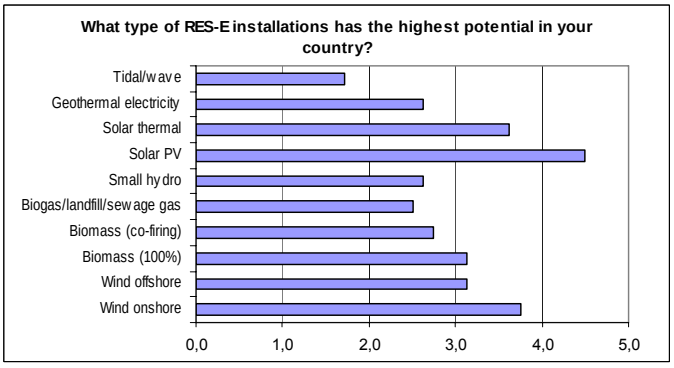
Greece
n/a

n/a

Hungary, All stakeholders: 7 respondents



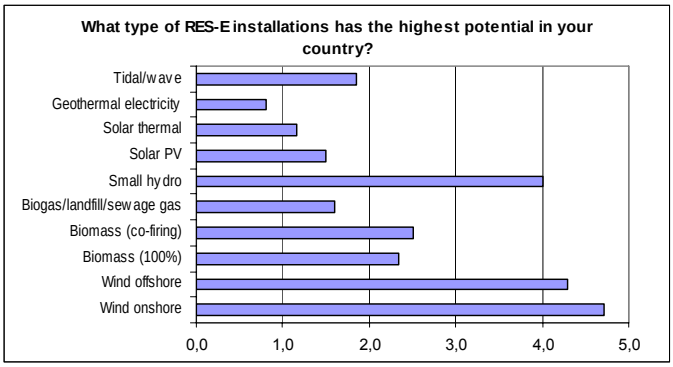
Italy, Investors: 8 respondents



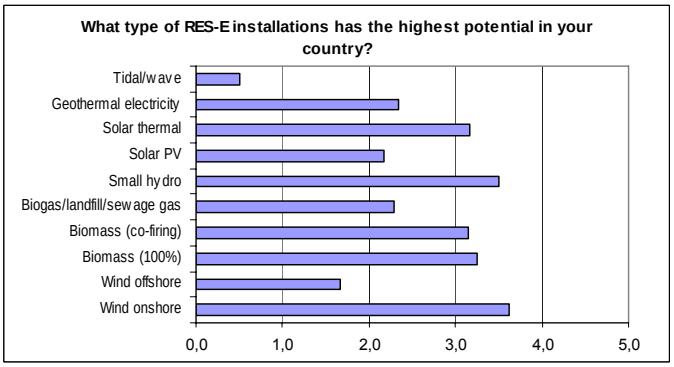
Scale: 0-lowest, 5 highest

Figure 19 (continued): Evaluation of potential of different types of RES-E sources by country

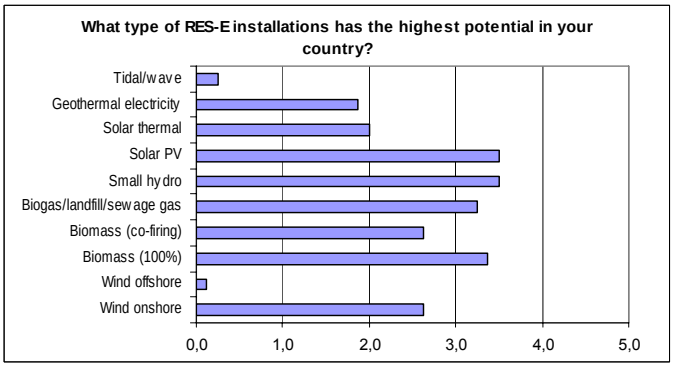
Norway, All stakeholders: 7 respondents



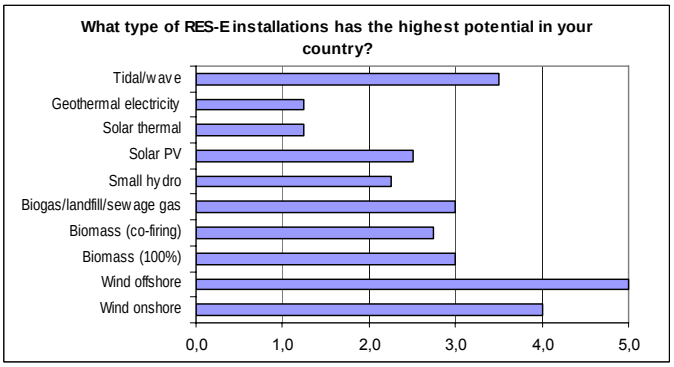
Romania, All stakeholders: 8 respondents



Slovenia, All stakeholders: 8 respondents



UK, All stakeholders: 6 respondents



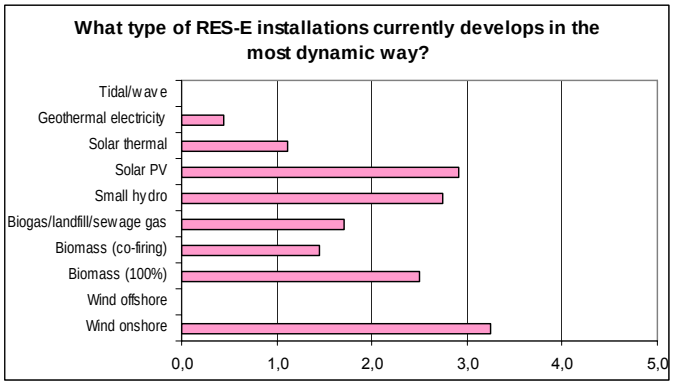
Scale: 0-lowest, 5 highest

Question:

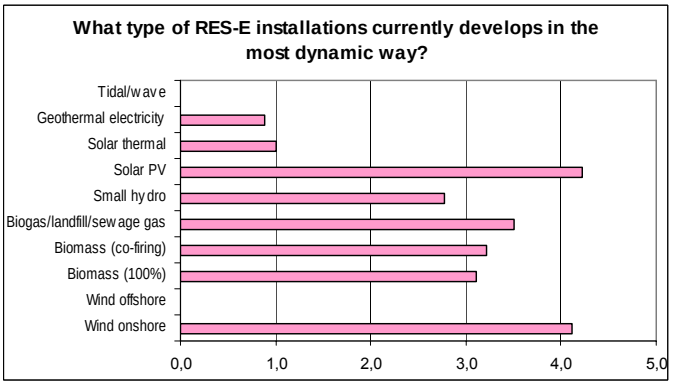
What type of RES-E installations currently develops in the most dynamic way?

Figure 20: Evaluation of potential of different types of RES-E sources by country

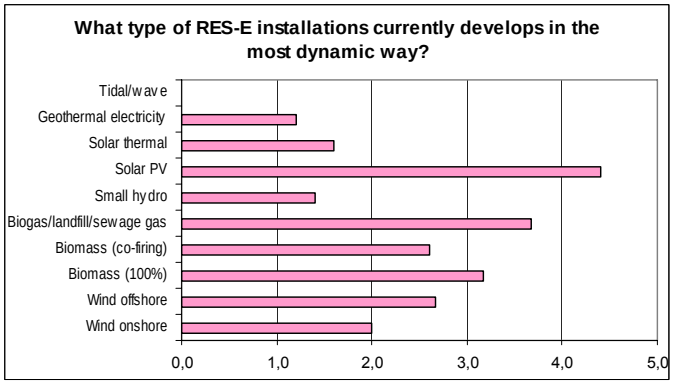
Austria, All stakeholders: 9 respondents



Czech Republic, All stakeholders: 12 respondents

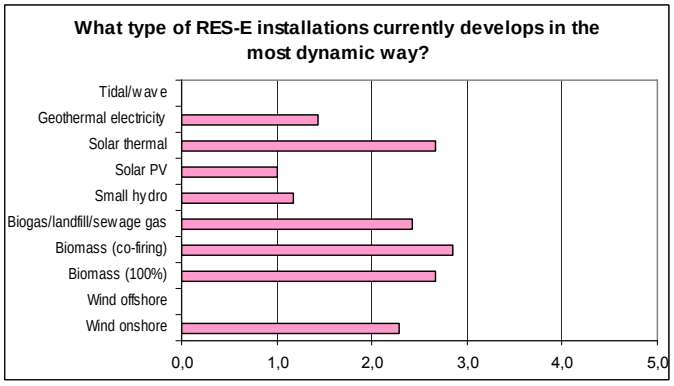


Germany, All stakeholders: 6 respondents

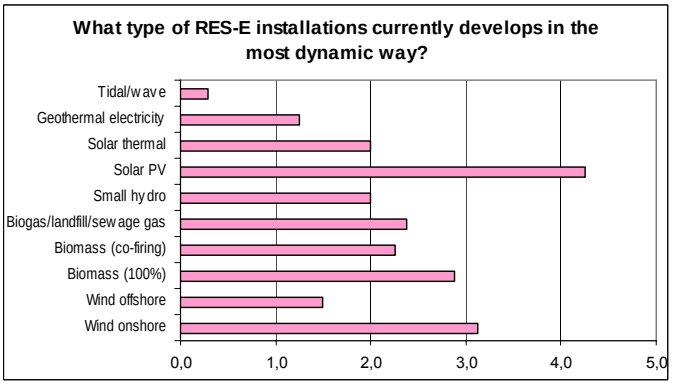


Greece
n/a

Hungary, All stakeholders: 7 respondents



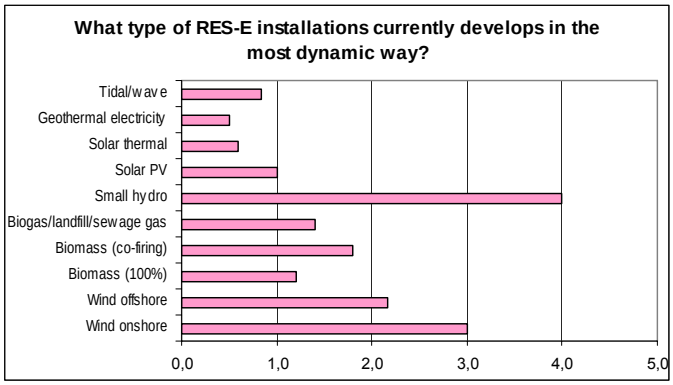
Italy, All stakeholders: 8 respondents



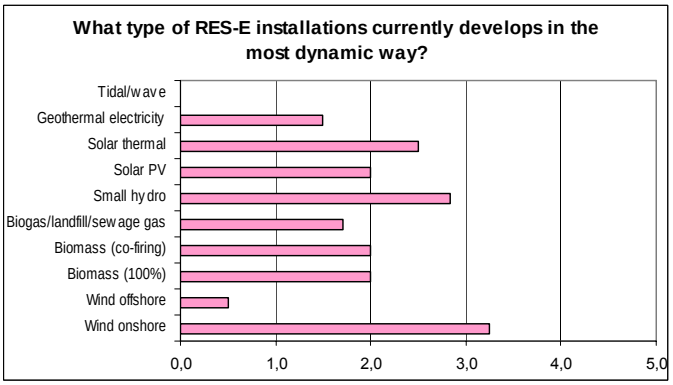
Scale: 0-lowest, 5 highest

Figure 20 (continued): Evaluation of potential of different types of RES-E sources by country

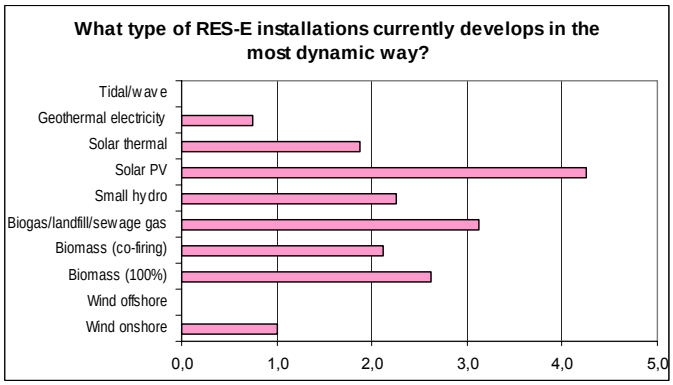
Norway, All stakeholders: 7 respondents



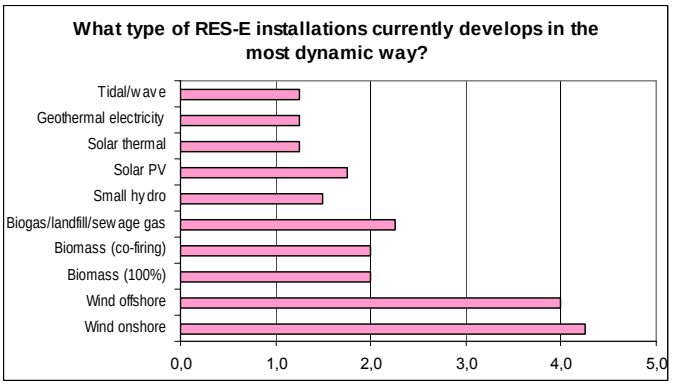
Romania, All stakeholders: 8 respondents



Slovenia, All stakeholders: 8 respondents



UK, All stakeholders: 6 respondents



Scale: 0-lowest, 5 highest

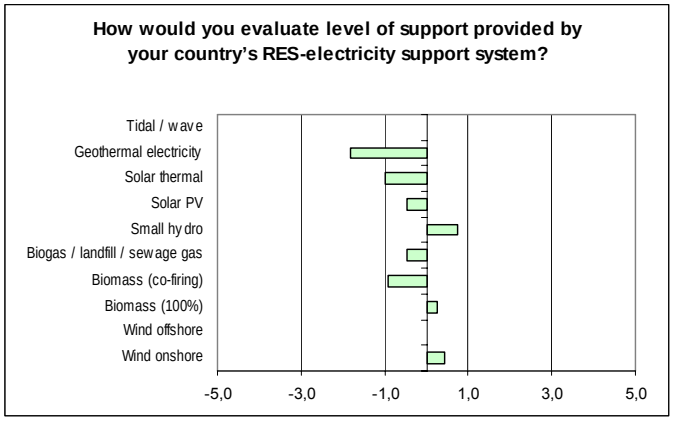
5.2 Level of motivation by currently applied RES-E support system

Question:

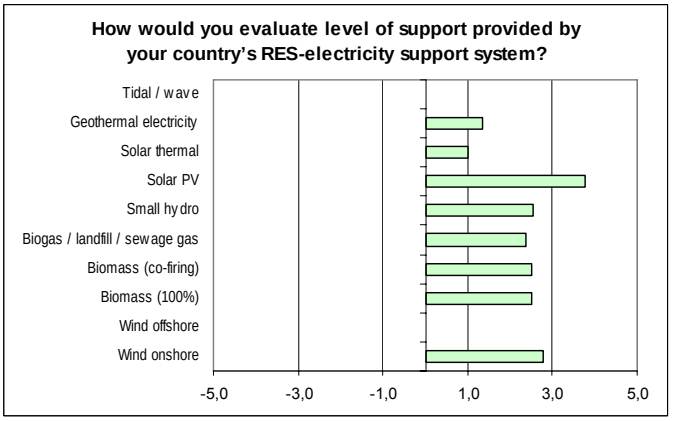
How would you evaluate level of support/motivation provided by your country's RES-Electricity support system?

Figure 21: Evaluation of current level of support/motivation for RES-E production provided by your country's RES-Electricity support system by country

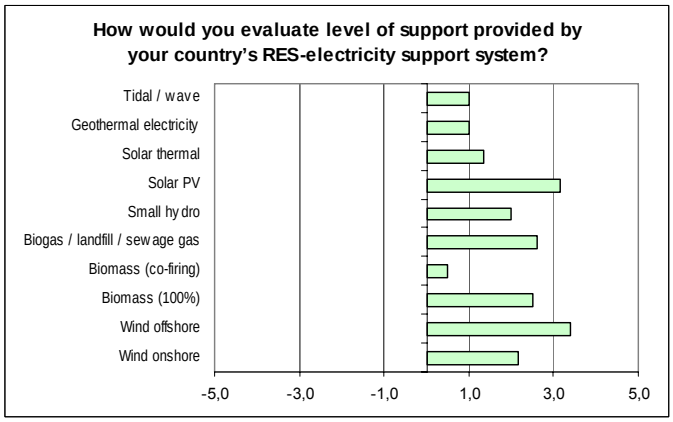
Austria, all stakeholders: 12 respondents



Czech Republic, all stakeholders: 9 respondents



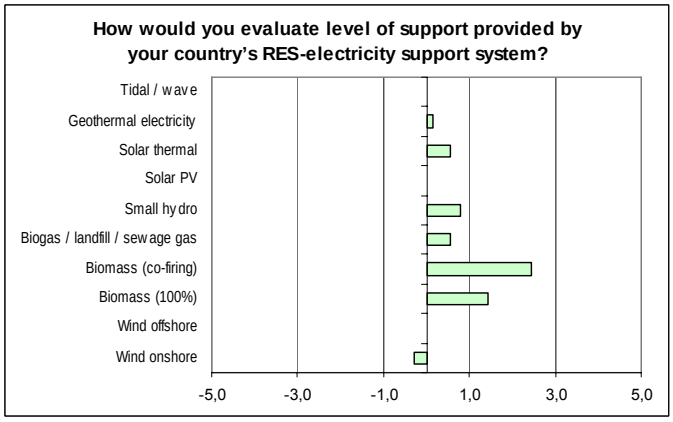
Germany, all stakeholders: 6 respondents



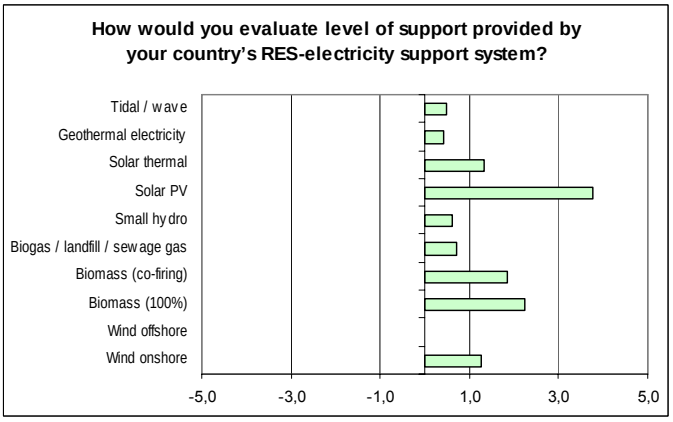
Greece:
n/a

n/a

Hungary, all stakeholders: 7 respondents

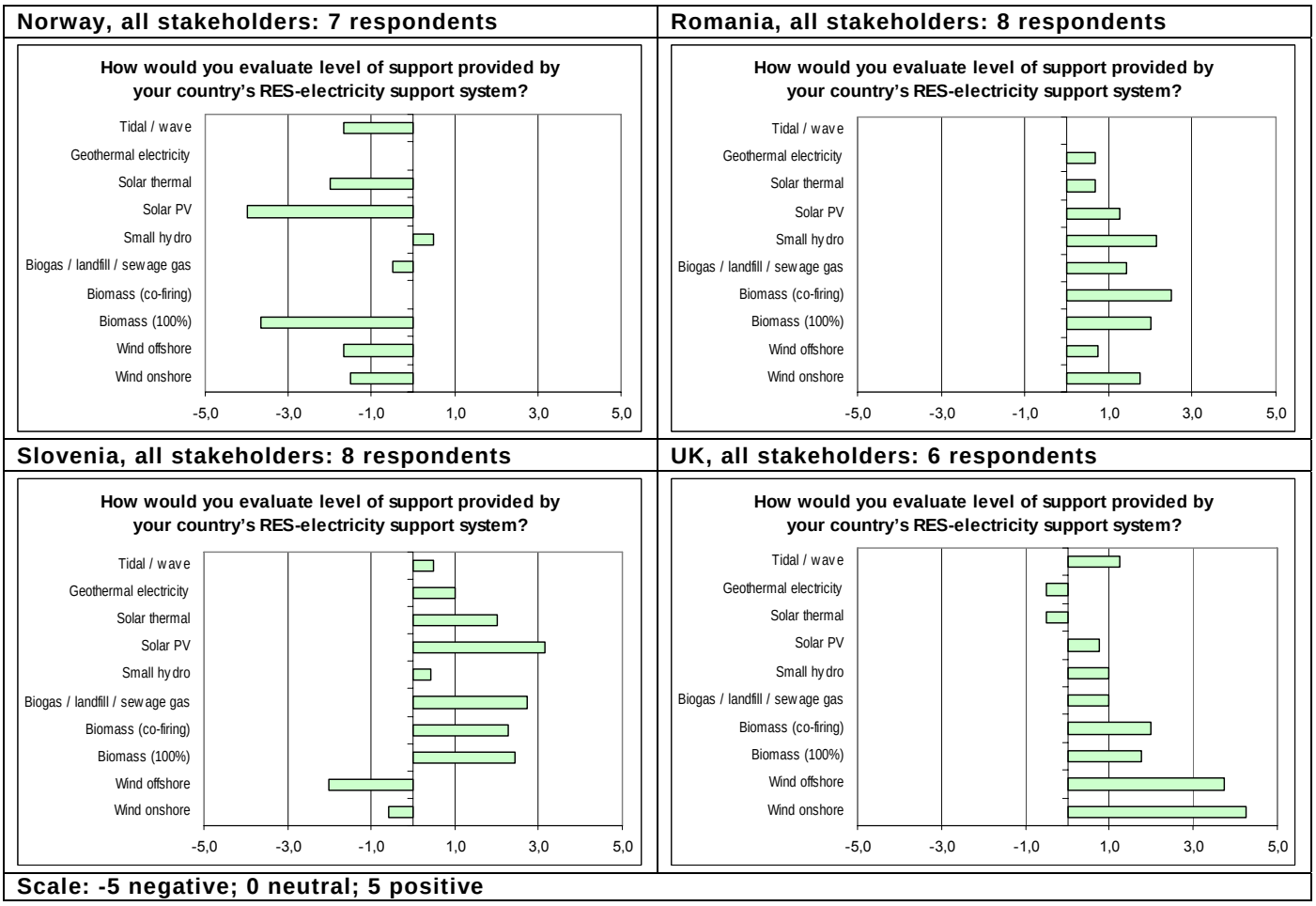


Italy, all stakeholders: 8 respondents



Scale: -5 negative; 0 neutral; 5 positive

Figure 21 (continued): Evaluation of current level of support/motivation for RES-E production provided by your country's RES-Electricity support system by country



The evaluation of level of support provided by each country's RES-E support system depends on the applied system, level of support as well as other factors.

There is no distinguishable difference between countries applying feed-in tariff systems and quota/certificate systems.

Surprisingly in Austria, the level of motivation given by current feed-in tariff system is presented as quite low and slightly motivating only in case of small hydro, biomass and wind. This is given by the fact,that the respective legal framework has been changed several times in the recent past, the latest amendment was pending at the time of consultation and the effective support level (laid down in the legislation subject to amendment) was not sufficient to develop new projects.

In Norway, where RES-E installations are supported only through grants, the RES-E support system is evaluated as rather demotivating and shows clearly

that either type of support systems applied in EU countries would be desirable.

In Norway, where RES-E installations are supported only through grants, the RES-E support system is evaluated as rather demotivating and shows clearly that either type of support systems applied in EU countries would be desirable.

The situation in Romania has changed in the meantime since the collection of the questionnaires - new Law 220 dated 6 November 2008 on RES-E promotion introduced updated Greeen Certificate system which now includes technology specific support.

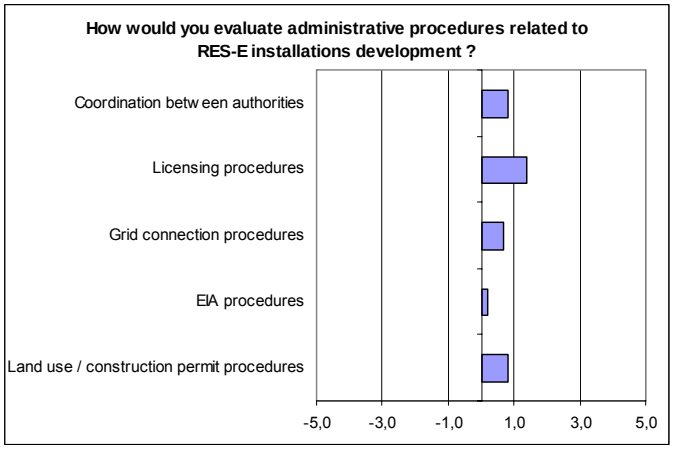
5.3 Administrative procedures related to RES-E project development

Question (specific to DSOs and Regulators):

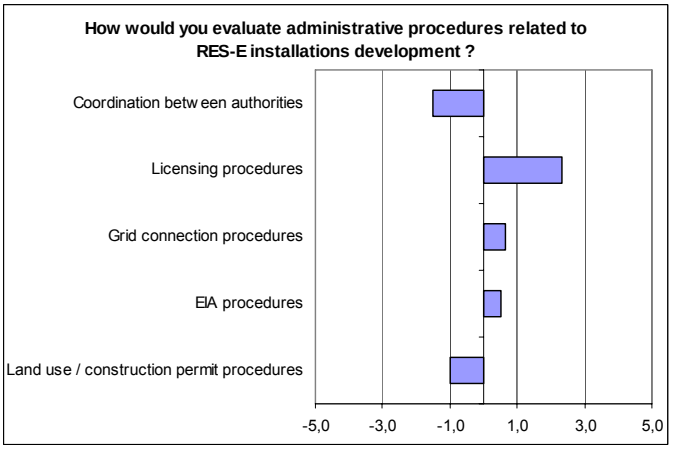
How would you evaluate administrative procedures related to RES-E installations development (in terms of administrative burden / complexity of system, lead time, level of experience of RES-E Developers / administrative authorities with RES-E projects)?

Figure 22: Evaluation of administrative procedures related to RES-E installations development by country

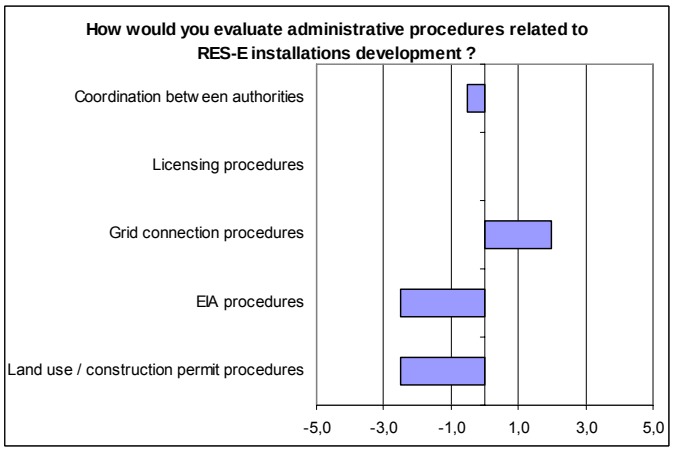
Austria, Regulators + DSOs: 7 respondents



Czech Republic, Regulators + DSOs: 4 respondents



Germany, Regulators + DSOs: 3 respondents



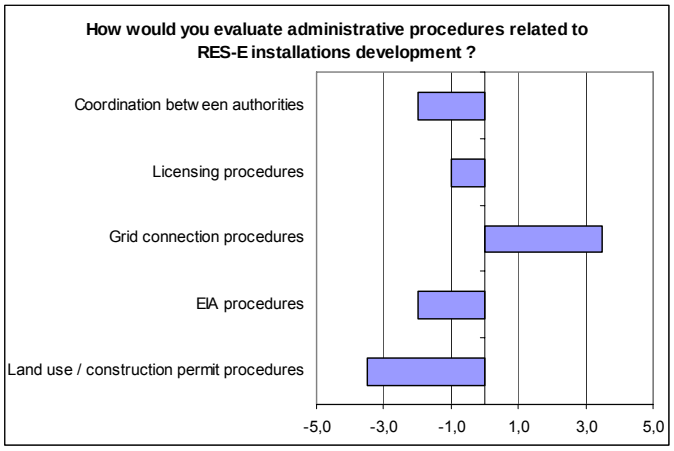
Greece:
n/a

n/a

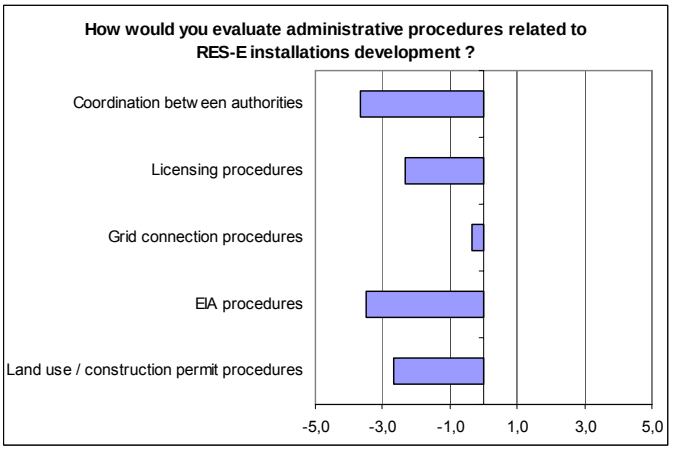
Scale: -5 negative; 0 neutral; 5 positive

Figure 22 (continued): Evaluation of administrative procedures related to RES-E installations development by country

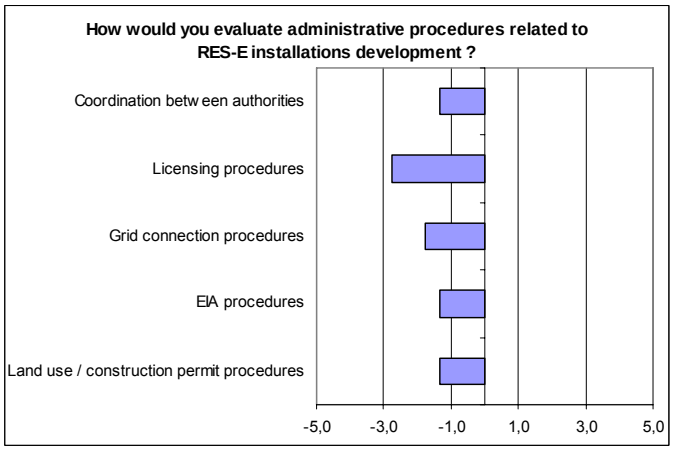
Hungary, Regulators + DSOs: 2 respondents



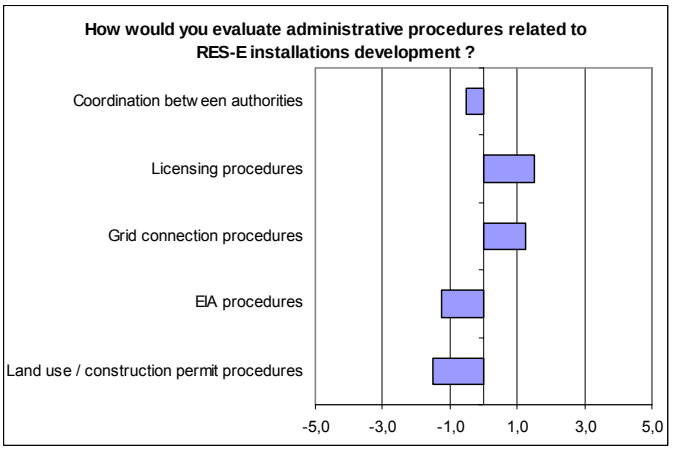
Italy, Regulators + DSOs: 3 respondents



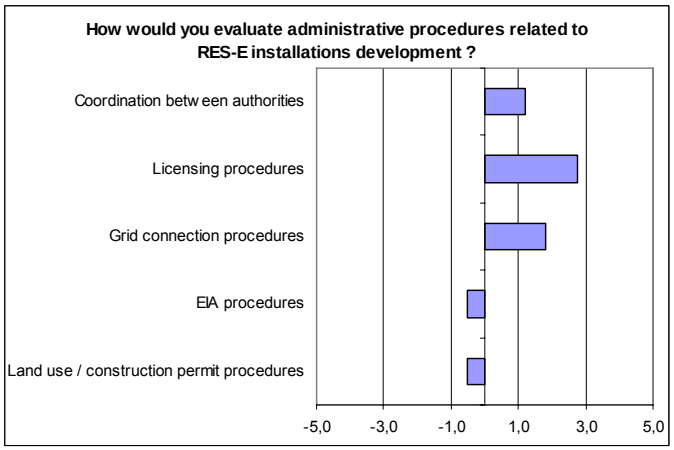
Norway, Regulators + DSOs: 5 respondents



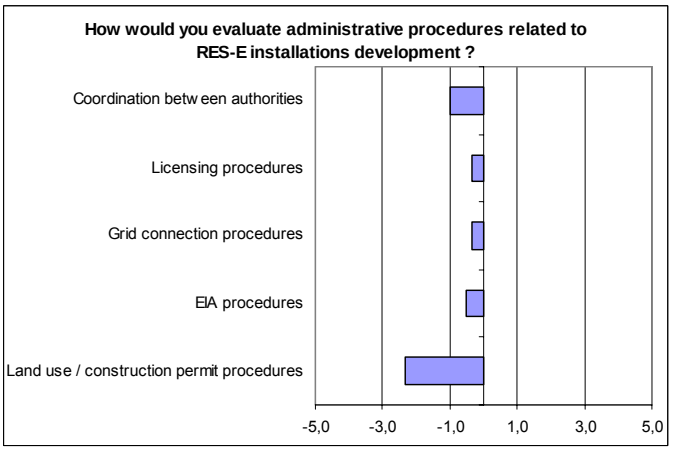
Romania, Regulators + DSOs: 4 respondents



Slovenia, Regulators + DSOs: 5 respondents



UK, Regulators + DSOs: 4 respondents



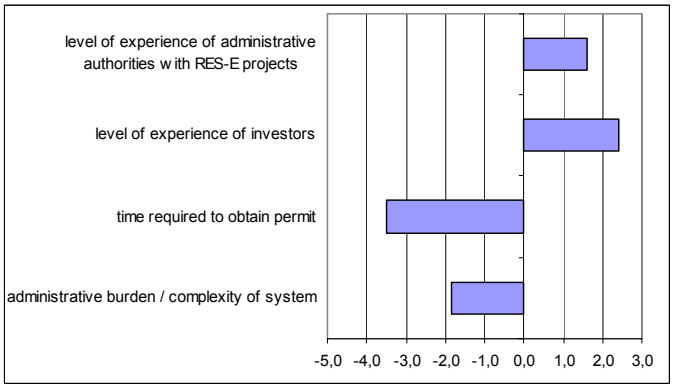
Scale: -5 negative; 0 neutral; 5 positive

Question (specific to project RES-E Developers)

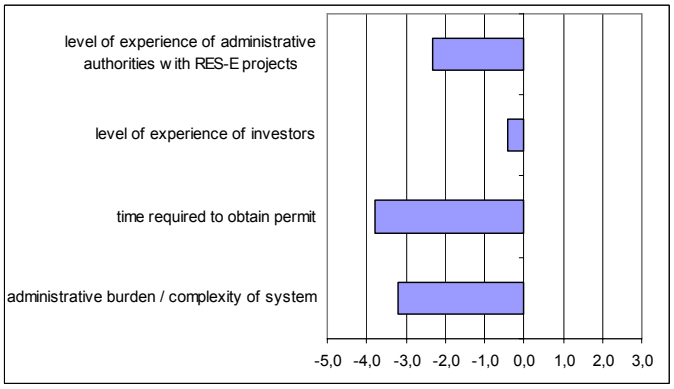
How would you evaluate the following factors related to Land use permit / Construction permit procedures?

Figure 23: Evaluation of Land use permit / Construction permit procedures related to RES-E installations development by country

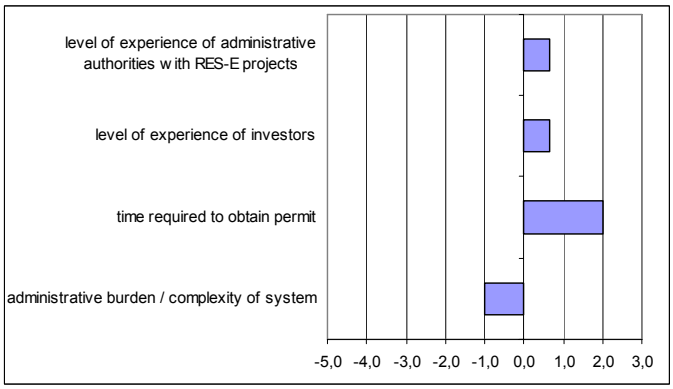
Austria, RES-E Developers; 5 respondents



Czech Republic, RES-E Developers; 5 respondents



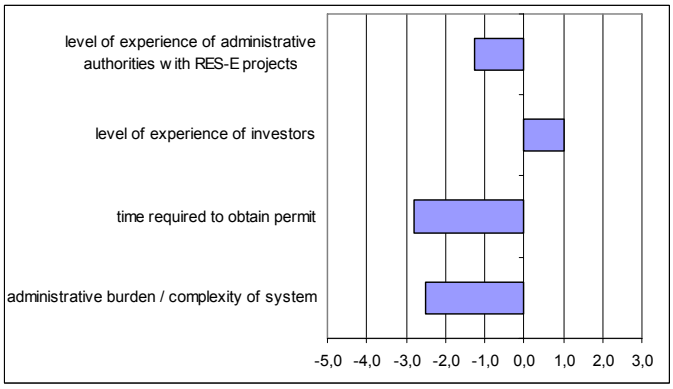
Germany, RES-E Developers; 3 respondents



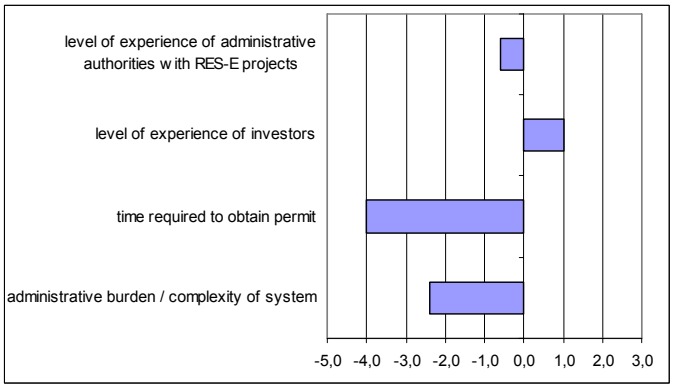
Greece;
n/a

n/a

Hungary, RES-E Developers; 5 respondents

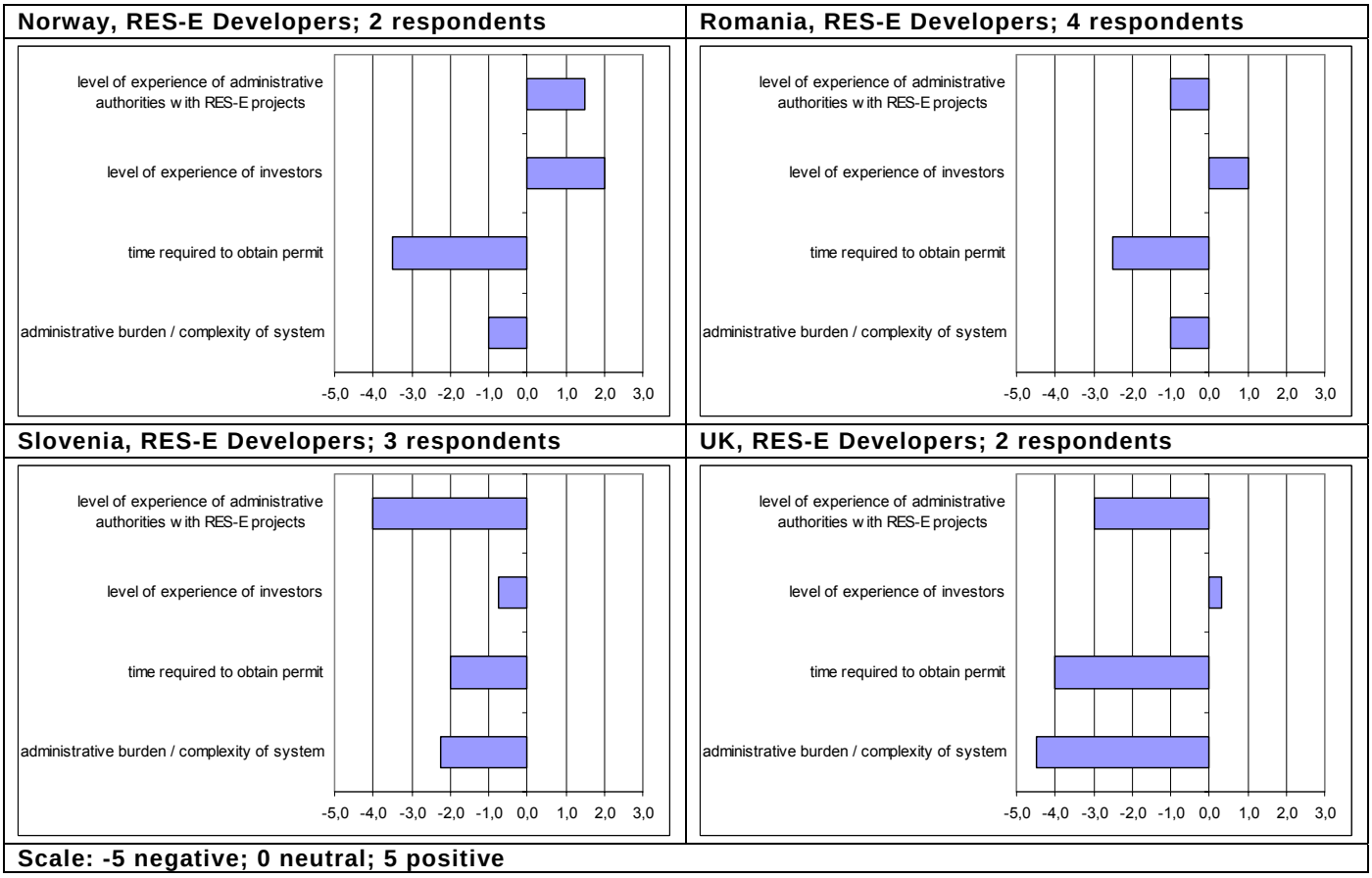


Italy, RES-E Developers; 5 respondents



Scale: -5 negative; 0 neutral; 5 positive

Figure 23 (continued): Evaluation of Land use permit / Construction permit procedures related to RES-E installations development by country



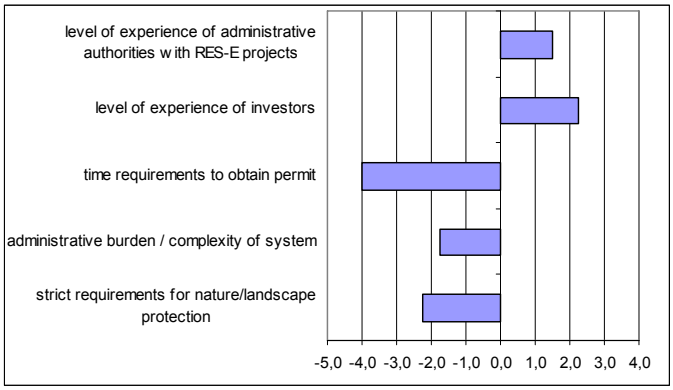
The land use / construction permit procedures were evaluated as negatively influencing RES-E project development in particular in the Czech Republic, Slovenia, Romania, Italy, Hungary and the UK. On the other hand, in Germany, besides slightly negative evaluation of administrative burden / complexity of system, the Land use / construction permit procedures are not considered to be a barrier in development of RES-E projects.

Question:

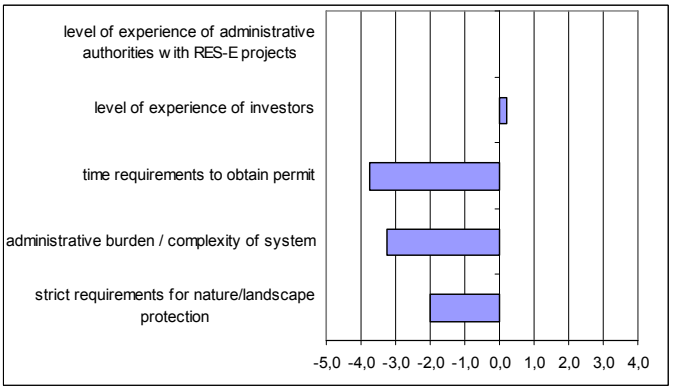
How would you evaluate the following factors related to Environmental Impact Assessment (EIA) procedures (where relevant)?

Figure 24: Evaluation of Environmental Impact Assessment (EIA) procedures related to RES-E installations development by country

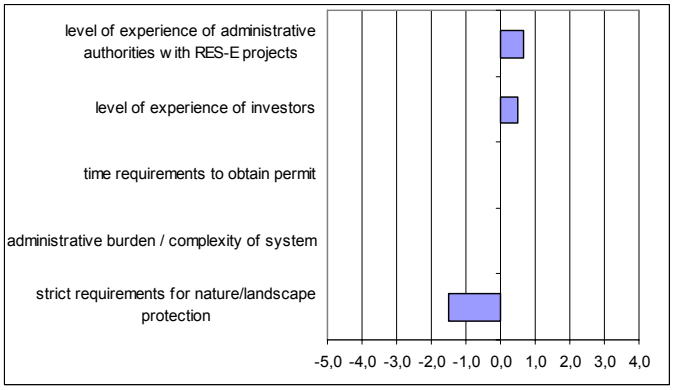
Austria, RES-E Developers; 5 respondents



Czech Republic, RES-E Developers; 5 respondents



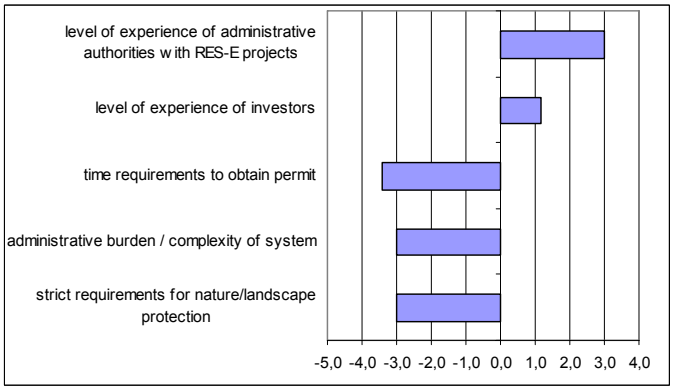
Germany, RES-E Developers; 3 respondents



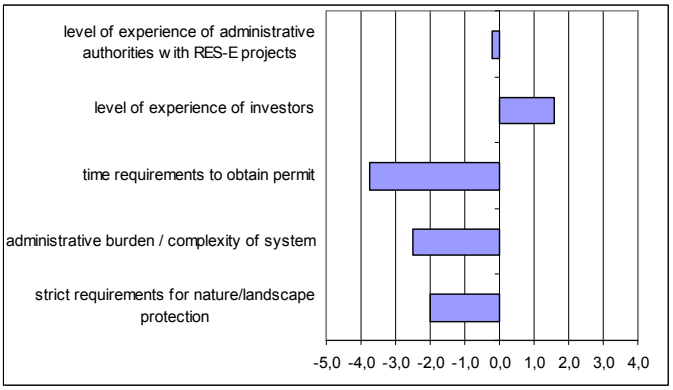
Greece; n/a

n/a

Hungary, RES-E Developers; 5 respondents

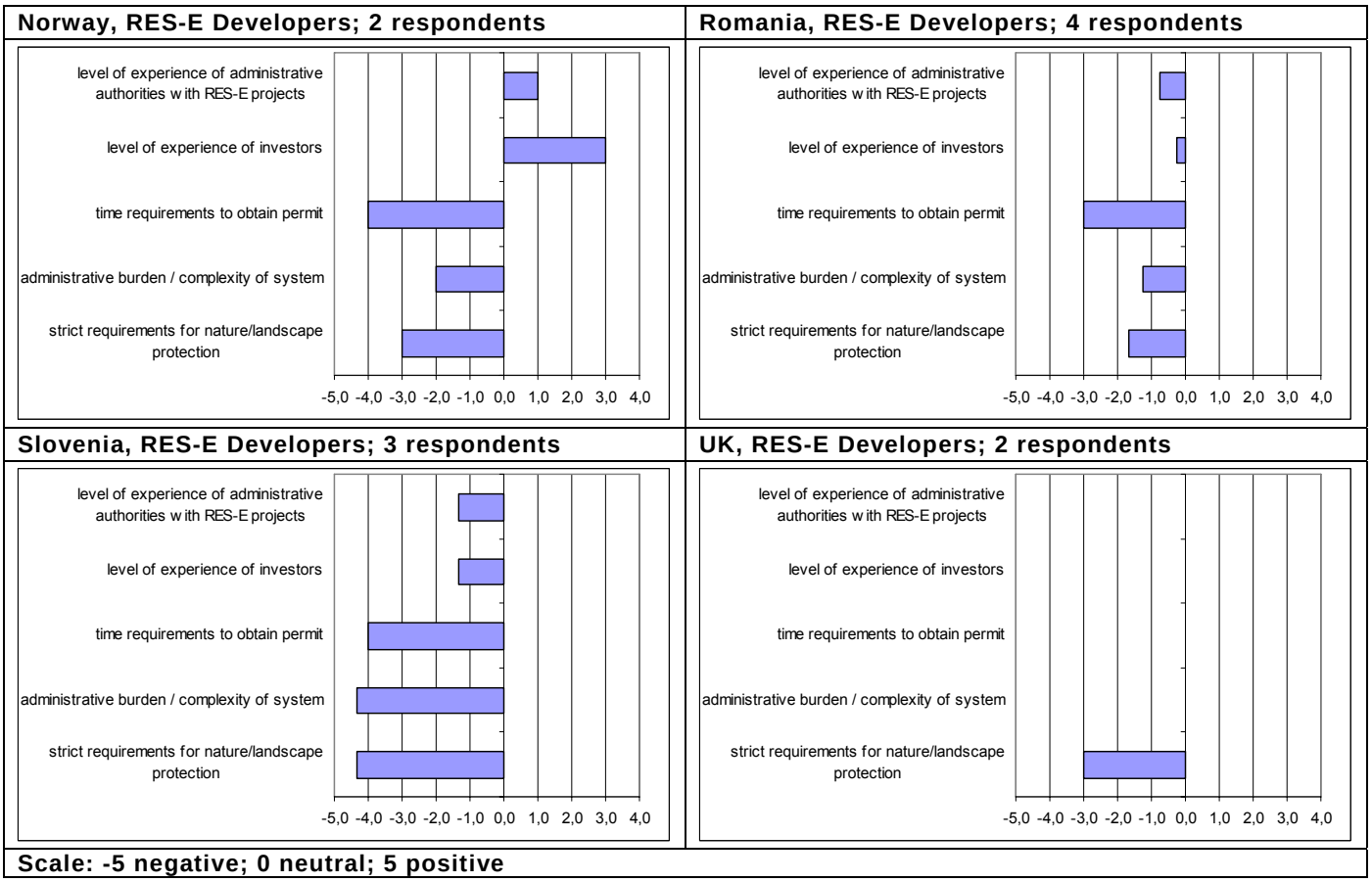


Italy, RES-E Developers; 5 respondents



Scale: -5 negative; 0 neutral; 5 positive

Figure 24 (continued): Evaluation of Environmental Impact Assessment (EIA) procedures related to RES-E installations development by country



The EIA procedures were evaluated with overall negative results in Slovenia and Romania, also in other countries, time required to pass through EIA process, complexity of the system and strict requirements for nature / landscape protection are evaluated as a barrier. The only exception is Germany, where the evaluation of EIA procedures is more or less neutral.

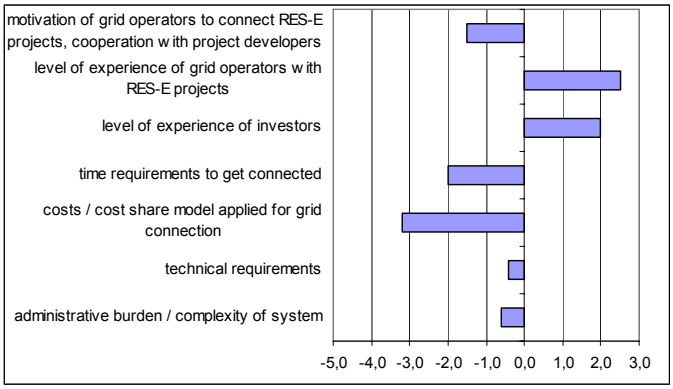
The neutral results in the case of the Czech Republic and the UK mean that no valid answers were obtained.

Question:

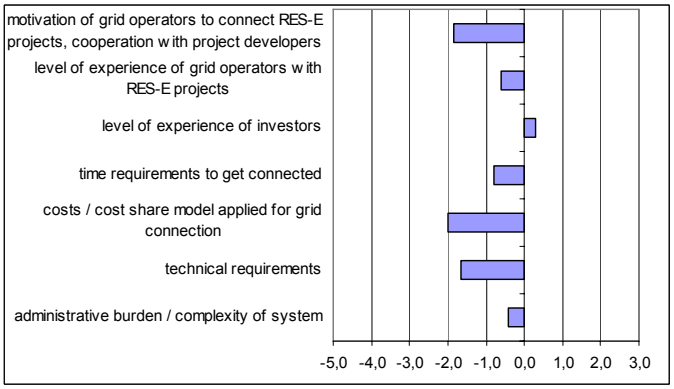
How would you evaluate the following factors related to Grid connection procedures?

Figure 25: Evaluation of Grid connection procedures related to RES-E installations development by RES-E Developers by country

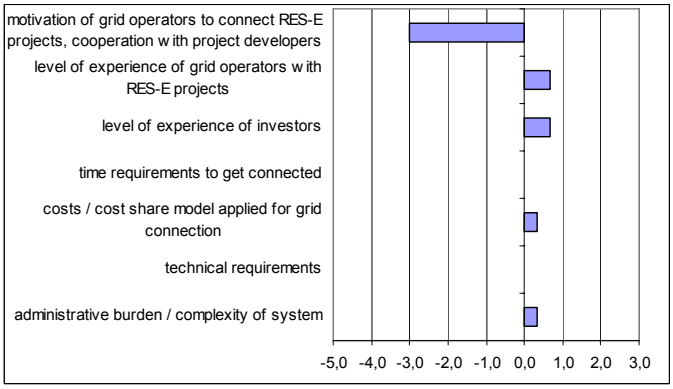
Austria, RES-E Developers; 5 respondents



Czech Republic, RES-E Developers; 5 respondents



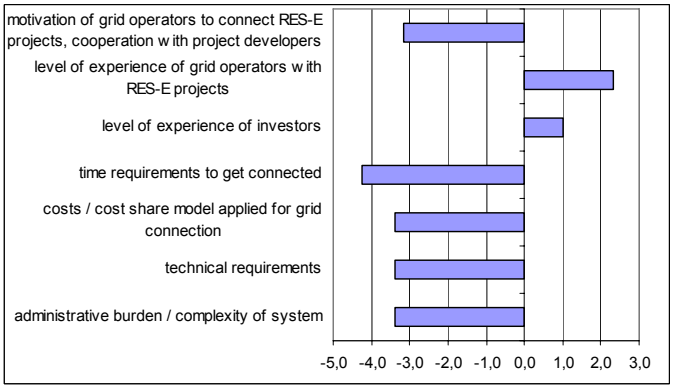
Germany, RES-E Developers; 3 respondents



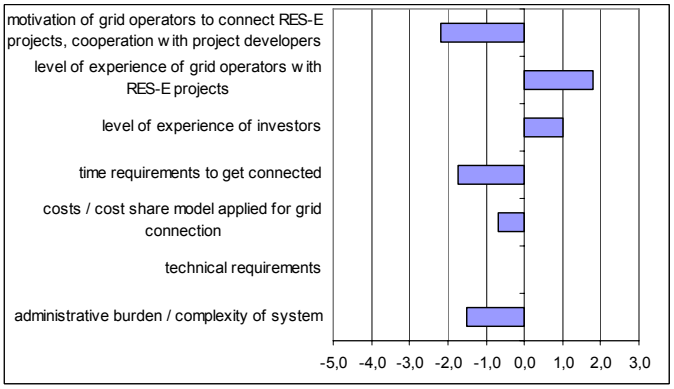
Greece;
n/a

n/a

Hungary, RES-E Developers; 5 respondents



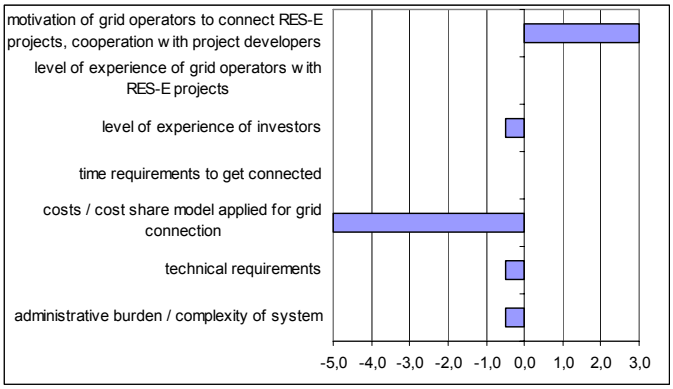
Italy, RES-E Developers; 5 respondents



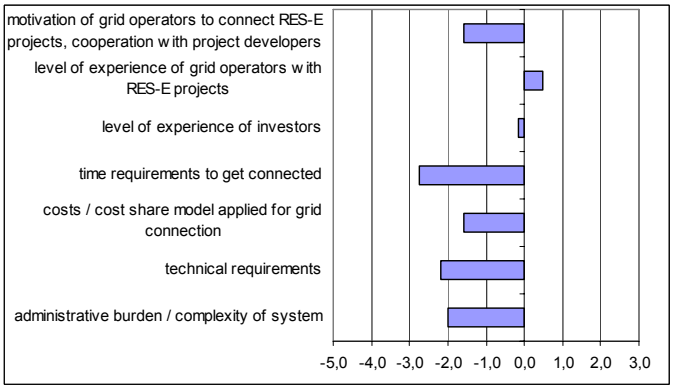
Scale: -5 negative; 0 neutral; 5 positive

Figure 25 (continued): Evaluation of Grid connection procedures related to RES-E installations development by RES-E Developers by country

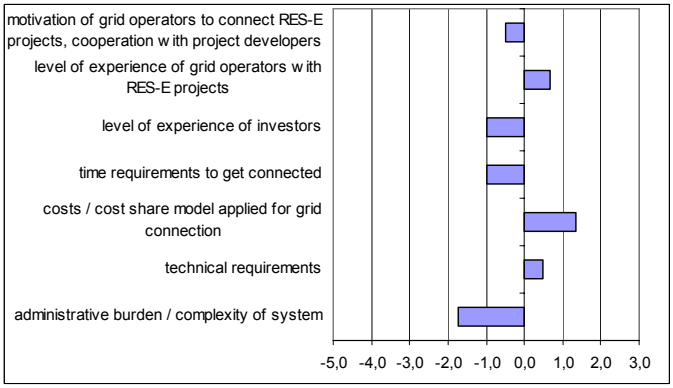
Norway, RES-E Developers; 2 respondents



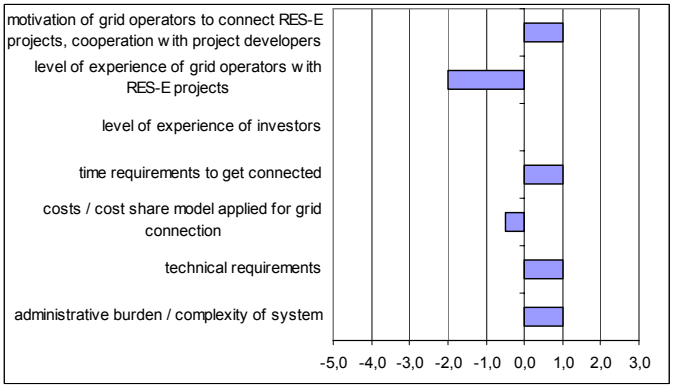
Romania, RES-E Developers; 4 respondents



Slovenia, RES-E Developers; 3 respondents



UK, RES-E Developers; 2 respondents



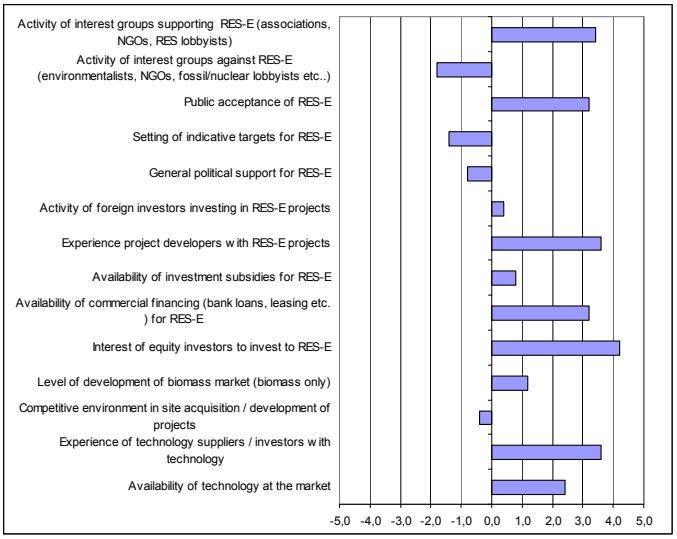
Scale: -5 negative; 0 neutral; 5 positive

Question:

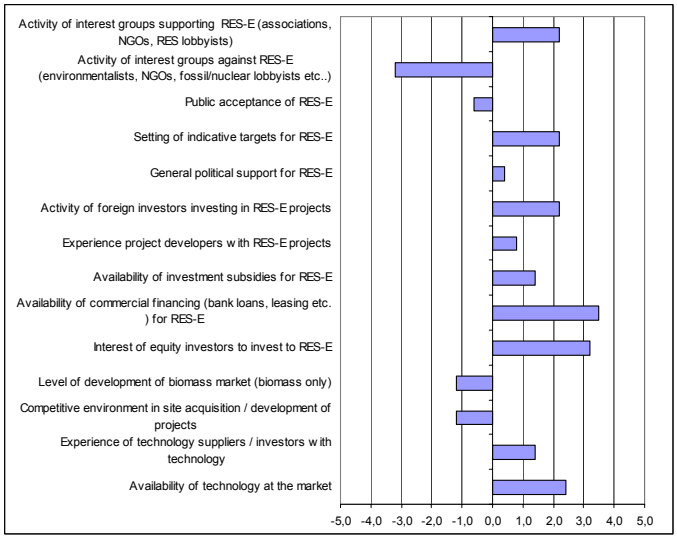
How would you evaluate other factors related to RES-E development?

Figure 26: Evaluation of other factors related to RES-E development by RES-E Developers by country

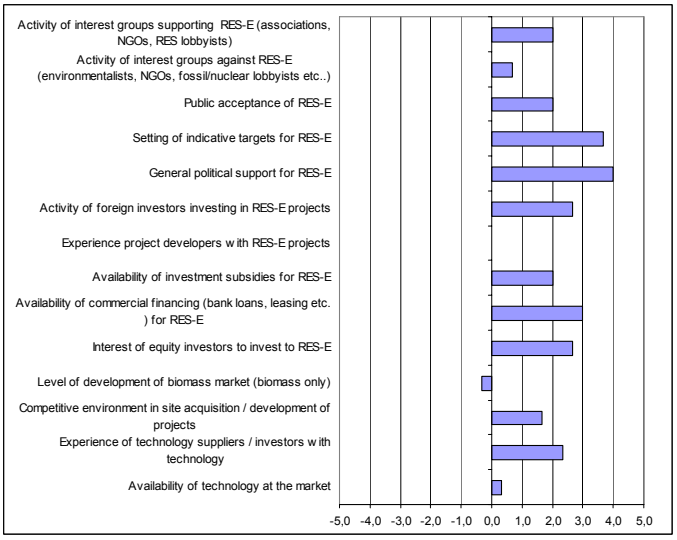
Austria, RES-E Developers; 5 respondents



Czech Republic, RES-E Developers; 5 respondents



Germany, RES-E Developers; 3 respondents



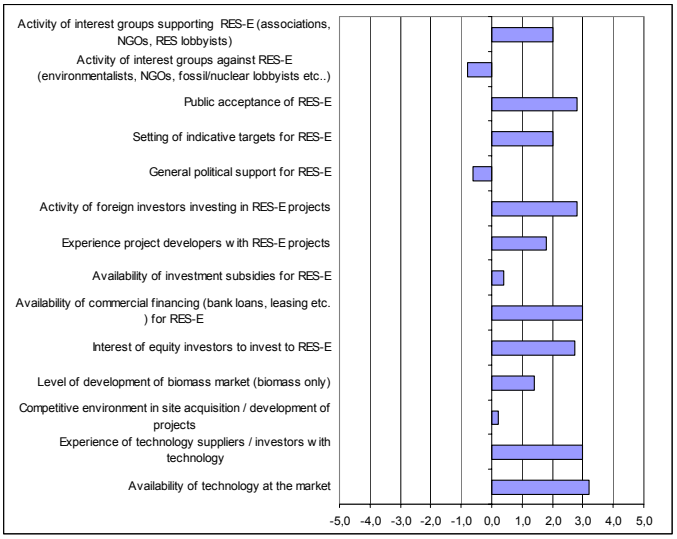
Greece;
n/a

n/a

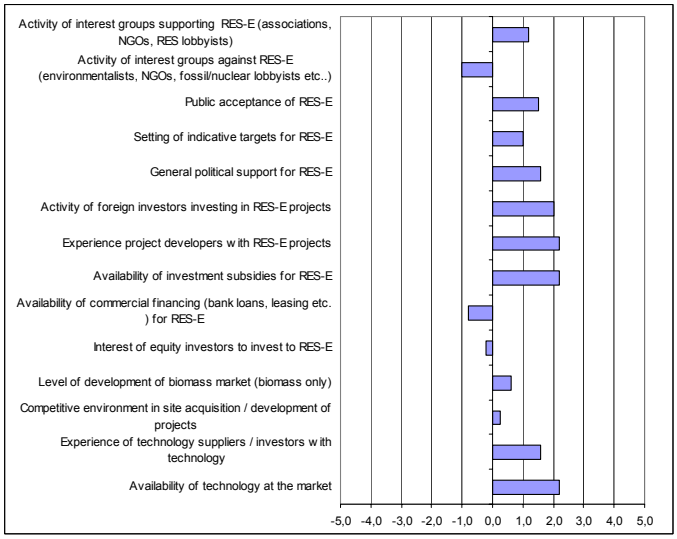
Scale: -5 negative; 0 neutral; 5 positive

Figure 26 (continued): Evaluation of other factors related to RES-E development by RES-E Developers by country

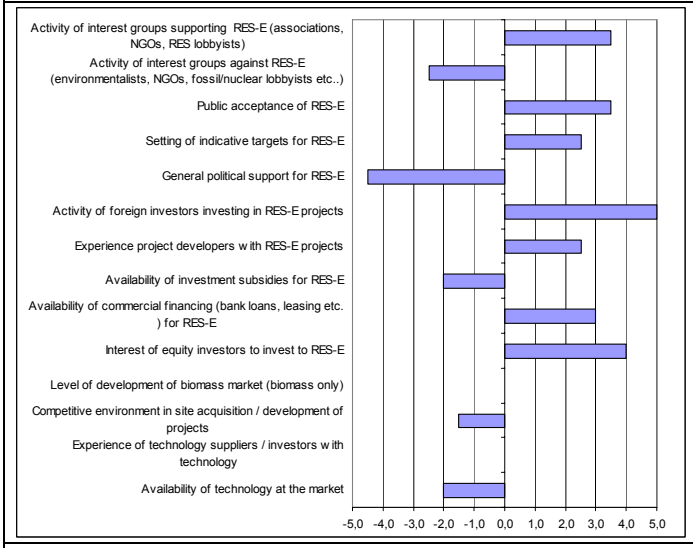
Hungary, RES-E Developers; 5 respondents



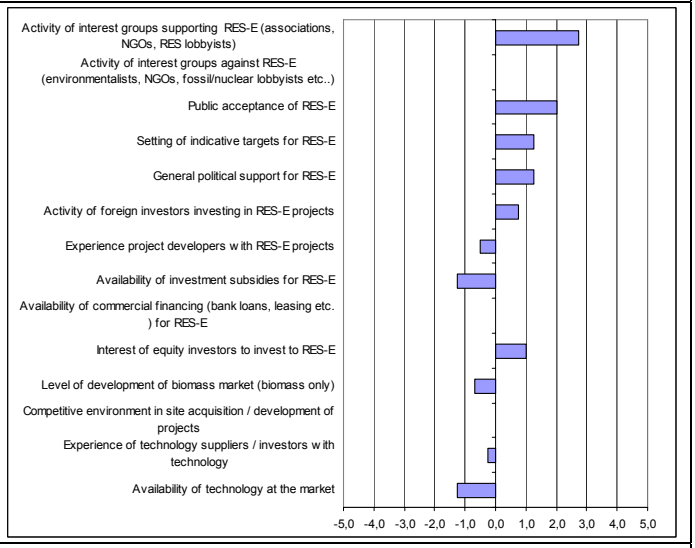
Italy, RES-E Developers; 5 respondents



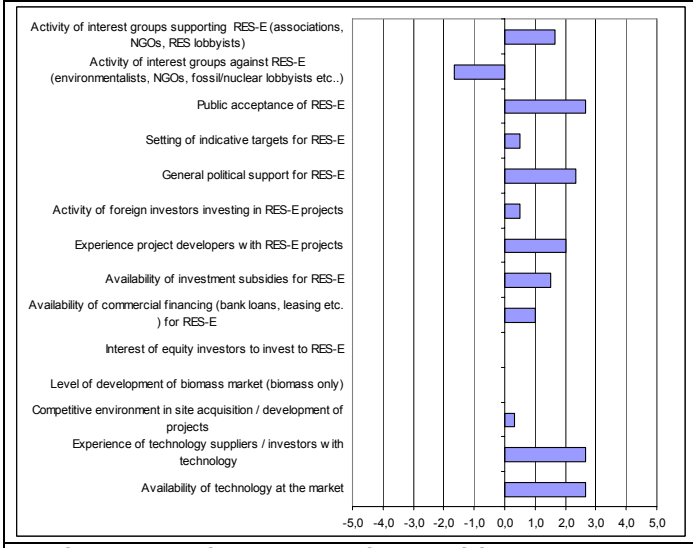
Norway, RES-E Developers; 2 respondents



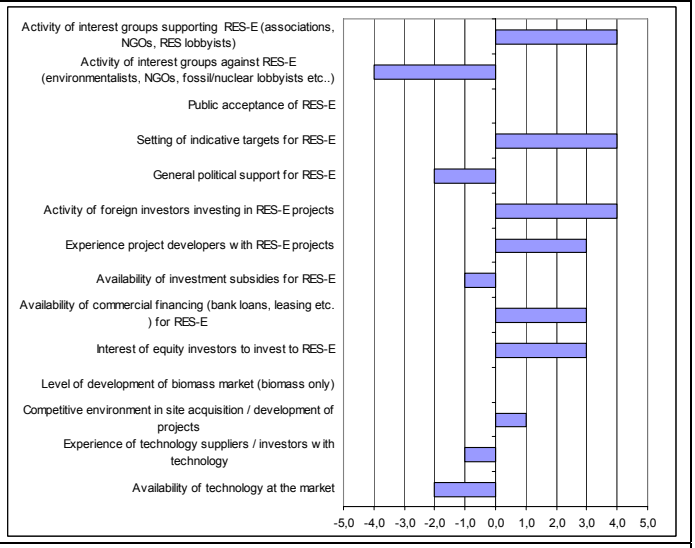
Romania, RES-E Developers; 4 respondents



Slovenia, RES-E Developers; 3 respondents



UK, RES-E Developers; 2 respondents



Scale: -5 negative; 0 neutral; 5 positive