



Co-funded by the Intelligent Energy Europe
Programme of the European Union



Project title: RES Heating and Cooling – Strategic Actions Development
Acronym: RES H/C SPREAD
Project No. IEE/13/599/SI2.675533

The lessons learned from the development of six RES H/C action plans

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Version: October 2016



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1 Executive Summary

The IEE-project RES Heating and Cooling – Strategic Actions Development (“**RES H/C SPREAD**”) is aimed at developing six pilot regional plans for heating and cooling from renewable energy that could further support the planning efforts of other European regions. Regional and local public administrators require targeted support to improve their planning and governance capabilities. Consequently, special attention has been devoted to improving participatory governance, enabling the cooperation of local, regional as well as national stakeholders. To this end, each region has established its own country governance committee (CGC) to support the development and implementation of the plans. The plans have been used as the case studies for the production of harmonized guidelines to support local authorities and planners to find the best solution among different technical choices to develop a heating and cooling local strategy.

The main objective of this report on lessons learned from the development of six RES H/C action plans is therefore to provide suggestions and indications on **what to do, what to improve and what to avoid** when public administrations or regional agencies intend to develop such a plan. Therefore the consistency, practicability and expected effectiveness of selected outputs of RES H/C SPREAD have been examined in order to provide comprehensive guidance for stakeholders interested in regional planning. The text is divided in general description of the applied RES H/C planning methodologies and evaluation procedures. Chapter three describes the plans’ content (which are written in national language, respectively) more in detail in order to highlight the regional differences as well as strengths and weak points. In total, 19 financial, 23 informative, 13 regulatory as well as 2 other concrete measures have been proposed. Finally, the **general lessons learned** and **main hurdles** of RES heating and cooling planning are summarized in chapter four.

As an overview, the following table briefly describes the main recommendations for regional planners/stakeholders that want to develop plans for RES heating / cooling under the use of participatory governance, as performed in the project RES H/C SPREAD.

Process step	Possible barrier	What to do?	Corresponding lessons learned
pre-project phase	relevant stakeholders are unknown	conduct stakeholder-analysis (see RES H/C SPREAD Recommendations for CGC-establishment), develop a comprehensive stakeholder map	The stakeholder assessment should be done well in advance: who can influence the planning directly/indirectly, what is their motivation etc. Are there special groups that require special attention? In any case, the composition of stakeholders should be balanced and appropriate. The interests and competency of each group can complement a RES H/C plan in order to make it relevant and usable. It is beneficial to include high level representatives with decision making power already at the beginning of a planning process. For methodological / procedural approaches for the organization and implementation of CGC-workshops see RES H/C guidelines .
	lack of interest among stakeholders	information activities	It is important to disseminate also beneficial effects apart from the fulfillment of energy/environmental commitments, e.g. value added for the region, cost-effectiveness etc.; It is advisable to focus also on region-specific conditions. Don't underestimate administrative issues. An adequate venue for the workshops carries the message that the intended project values the stakeholders' inputs. Furthermore information exchange (between various levels) is a key-success factor for RES technologies' implementation.
Step 1: Analysis of Status Quo in the region (inter alia evaluation of existing planning documents)	stakeholder's needs and priorities are unknown / unclear	carefully assess needs and priorities in workshops	A "One-Size-Fits-All" approach is often not appropriate for RES H/C planning; The needs and priorities are essential in order to facilitate the design of efficient policies and their smooth implementation. Especially municipalities are often highly motivated and therefore crucial for the overall promotion of RES heating and cooling. Clarify the specific roles of the parties involved in the stakeholder dialogue.

Process step	Possible barrier	What to do?	Corresponding lessons learned
Step 2: Data collection & potential analysis	Data availability and diversity of end users	Estimation and mapping of supply and demand data; buy additional data sources, cooperation with energy suppliers	Data availability should be discussed at the beginning of every planning project. Cost-benefit analyses for the purpose of Article 14(3) EED shall include an economic analysis covering both social-economic and environmental factors. Data collection includes at least technical and economic data (for details, see Handbook on CBA and RES H/C guidelines)
	Unclear system boundary	Follow the suggestions of the RES H/C SPREAD Handbook on CBA	It is important to match demand and supply as much efficiently as possible. In a first step, heat maps are very useful to identify the most interesting areas.
Step 3: Cost-Benefit-Analyses	uncertainties regarding future developments (e.g. energy carrier shifts)	implement different scenario-analyses	Stakeholder interaction is essential in order to create robust scenarios. It is effective to integrate key stakeholders like local energy suppliers, political decision makers, municipalities, etc. in this step.
	inadequate tools	search for alternatives; in some cases (e.g. language barriers) it is advisable to develop an own tool (e.g. Excel®)	The stakeholders / CGC members need to really understand the tools and methodologies they get recommended. The main requirement is the simplicity of the selected CBA-tool.
	lack of understanding regarding CBA-mechanisms	provide easy-to-understand information, "tailored" for target groups	Information should always be circulated among CGC members in advance, so that everybody can prepare properly for the workshops. The message should be meaningful and easy to understand.

Process step	Possible barrier	What to do?	Corresponding lessons learned
Step 4: Intervention strategies and accompanying policy measures	participation processes may result in high workloads, especially in bigger regions with a high number of stakeholders	define different working groups, adapt composition of stakeholders	Apply moderation techniques, count on experienced staff. It is advisable to motivate participants to solve problems immediately and to record the outcomes. For details concerning procedural approaches see also RES H/C guidelines .
	certain stakeholders are not interested in certain issues	chance composition of stakeholders according to the workshops' agenda; feedback should be taken seriously and should be considered accordingly	In order to increase the effectiveness of the stakeholder participation process, it is advisable to prioritize and act strategically. Therefore, consistency and transparency of the process are essential. Public administrations are often (mainly) interested in the RES H/C planning process because they have to fulfill certain obligations. It is furthermore important to understand the stakeholder interaction as dynamic process. What are the specific problems, who is addressed and what can precisely be done?
	lack of acceptance for the RES H/C planning	raise awareness, expansion of stakeholder involvement	Successful regional planning also requires involvement and awareness raising of end-users. It is advisable to take into account any potential best practices and lessons learned from your country (see. Best-Practices)
	uncertainties regarding the proposed measures	quantify the concrete impact of measures, exploit synergy effects between different measures	A good (targeted) mix of measures, e.g. the combination of regulatory and informative measures, seems to be beneficial. Support systems create trust in technologies. This is very important for the acceptance of "new, innovative" technical applications.

	stakeholder participation is not focused enough	formulate the right questions	It is often not trivial to formulate the right questions, although this is a prerequisite for the effective elicitation of the stakeholder's contributions. It tends to be very important to present the progress of the work between consecutive meetings in order to create a sense of professionalism and to incentivize the involved stakeholders for more effective contributions.
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Process step	Possible barrier	What to do?	Corresponding lessons learned
Step 5: Initializing the plans implementation	lack of clarity regarding the implementation of the developed plan	Implement a profound, continuous improvement process, monitoring	Define responsibilities for monitoring processes well in advance; an effective monitoring procedure is a prerequisite for successful and efficient implementation. Generally, quality standards are also important on technology level, especially if the technology is "new" in a region (e.g. training courses for plumbers etc.)
	lack of commitment of relating stakeholders	setting up a memorandum of understanding (MoU)	The MoU should be planned well in advance, necessary negotiations often take time. The impact can be increased enormously, if the plan is embedded into an existing energy- and/or climate strategy. If so, the instruments can support each other and existing synergies can be utilized. Furthermore, it is essential to understand and to agree on success for all parties involved in the stakeholder dialogue.
	uncertainties regarding the implementation process	intensify the involvement of the country governance committee members	Good planning and successful implementation requires the establishment and maintaining of good long term relationships among all relevant stakeholders.

2 Methodology

2.1 General planning methodology

Within RES H/C SPREAD, six regional plans in six different regions have been produced. These involved regions – Castilla y Leon (Spain), Emilia Romagna (Italy), Riga (Latvia), Rhodope (Bulgaria) Western Macedonia (Greece) and Salzburg (Austria) – represent the main EU climatic zones. In order to address the related stakeholders, these plans are written in national language. Each project partner was responsible for the development of the RES H/C plan in the relating region taking into account a general planning methodology developed within the project. Of course the country-specific situation has been taken into account in each case.

The addressed **methodology for the plans' development** consists of five main steps.

Firstly, the regional situation and existing planning documents and strategies – like Sustainable Energy Action Plans (“SEAPS”) – have been analyzed. Special attention has been paid to local targets and policies.

In a next step, the energy-demand and supply data has been collected in order to evaluate the energy potentials in each region. If necessary, required data has been additionally collected or rather estimated. The data has also been acquired through the support of the country governance committees (CGC). Data might not be generally available or even confidential; subsequently the close collaboration with stakeholders via the CGCs has been essential.

After that, cost benefit analyses of selected RES and excess heat recovery technologies have been calculated. This has been done to integrate the (new) energy supply resources with the demand of energy. Each country team has been calculating the costs and benefits of selected interventions to exploit the particular, regional RES H/C potential. The interventions have been discussed with the CGC in order to achieve policy consensus and those with better cost-effectiveness, lowest environmental impact and highest energy benefit have been included in the RES H/C plans respectively.

The plans development has been finalized by discussing the adequate intervention strategies and accompanying policy measures for the plan roll out with the CGC. Important points like the setting of priorities and time scheduling of the interventions have been examined. Since the overall goal of the project is to initialize the implementation phase of the corresponding RES H/C plans, the planned policy measures for the plans roll out have been debated intensively with the CGCs. In order to ensure the plans effectiveness, concrete monitoring procedures have been developed in each regional RES H/C plan.

The last methodological step is initializing the plans implementation. For this purpose, a corresponding memorandum of understanding (MoU) will be signed by relating key-decision makers).

2.2 Applied evaluation procedures

The six RES H/C plans have been evaluated on the basis of different elements. Because of the fact that the plans are written in national language, a self-evaluation questionnaire in English has been developed by AEA and circulated among the project partners. This questionnaire includes questions in three thematic fields, namely:

- the consistency, practicability and expected effectiveness of the plans that have been developed within the project,
- the transferability of these plans and the process of preparing them to other EU regions or countries,
- as well as the degree of usefulness of the accompanying country governance committees and how their effectiveness could be improved.

The questionnaire has been filled in by the partners and has been send back to AEA for further evaluation.

Moreover the evaluation has been carried out on the basis of an appraisal of achieved performance indicators of the project (especially what concerns the plans development) and the views expressed by the country governance committee members during the various workshops (4 per region). In addition to that, both the synthesis reports on regional planning as well as stakeholder involvement developed within the project have been taken into account.

3 Regional Planning, Challenges & Stakeholder Involvement

3.1 Six regional RES H/C Plans

3.1.1 Introduction in RES H/C planning

Despite the fact that each region has developed its own plan according to its specific situation, each plan addresses some content-related “key issues”. After a foreword and summary (in English) a short introduction describes the current regional role in energy planning. An important part is the statement of needs including the analysis of the existing situation in the regions. This includes data collection issues and data mapping, structured by supply and demand. Thereafter, every plan defines its own objectives, of course depending on regional differences. Important elements such as relating national climate and energy targets have been taken into account accordingly. It is important to notice that objectives should be realistic and measurable (e.g. the improvement of share of RES by a certain amount of percent etc.). After that, every plan describes alternatives for its region, which have intensively been discussed during the CGC meetings. Good practice examples which have been collected in the beginning of the project have of course been discussed and integrated (see best practices, annex and fact-sheets of [RES H/C SPREAD](#)). Another common aspect of all RES H/C plans developed in the project is that the alternatives have been evaluated by means of profound cost benefit analyses, at least partly performed with the software tool “[EnergyPLAN](#)”. Based on that, a general strategy and action plan have been formulated for each of the regions. These action plans include a defined timeline, the resources required for implementation as well as mechanisms and accompanying measures to be taken. For observing the progress of proposed measures, every plan contains a monitoring procedure.

3.1.2 General differences and regional needs

It is obvious that the wealth of information shared during the country governance committee workshop as well as the different needs and objectives per region lead to different RES H/C plans. As it is not the

objective of this report to compare the differences in detail but rather to focus on the lessons learned, we only mention the key issues of relevance for the further evaluation at this point.

The first main difference concerning the parameter “consistency” of the plan is the referring time frame of the documents. Most of the plans developed refer to a planning horizon up to the year 2030 (e.g. Rhodope plan in Bulgaria, Riga plan in Latvia, Western Macedonia plan in Greece, Castilla y Leon in Spain and Emilia Romagna in Italy). In contrast, the Austrian plan contributes to an existing, long-term strategy and therefore has a time frame up to 2050.

Obviously, also the data availability for the plans development has been different in the regions. Nevertheless, in all of the regions energy supply and demand side data have been used for the analysis to some extent.

Main differences are to be seen in the concrete needs of the regions when it comes to regional planning. This indicates that local/regional/national stakeholder interaction is a fundamental prerequisite for successful planning. As an example, basic needs of the regions are described below:

Some regions’ main needs relate to **biomass use**, especially in the Rhodope region (Bulgaria) where the sustainable utilization of the vast biomass potentials has been ranked as the most important need of the region. Another high priority need is to stimulate the usage of firewood stoves in buildings with limited heating demand and wood chips heating systems in multi-family buildings. Also in Western Macedonia (Greece) the combination of lignite with biomass for the coverage of the heating demand has been seen as a very important issue. In Spain, a main aim is to increase the share of RES in thermal uses in order to decarbonize the economy according to EU commitments, e.g. via by substitution of fossil boilers by renewable systems. In Emilia Romagna, Italy, the general energy strategy focusses mainly on gas power plants, but also on the diffuse presence of more than 1300 small biomass and photovoltaic plants. Also in Austria biomass use is – although it is already very popular – expected to increase. According to the existing planning strategies, oil boilers shall be banned in the Salzburg region in future and it is foreseen to replace them by pellet boilers.

Another crucial topic is the **efficiency** of heating systems and grids. In the Rhodope region the replacement of old and inefficient heating systems

(e.g. biomass chips) has been ranked as second most important need. Also in Western Macedonia the more efficient exploitation of the biomass for heating purposes has been listed as main need. In the Riga planning region, energy efficiency on energy end-user side is ranked highest – there is a special need for deep renovation of buildings. Energy efficiency is also an important need in Castillia y Leon, Spain, together with diversification and increased flexibility of energy sources.

District heating is another topic many regions focused on. As an example, the maintaining of district heating as the main fuel for the coverage of the heating demand in buildings have been ranked as top priority in the Western Macedonia region, Greece. Also the extension of the existing district heating grid is essential. In the Riga planning region in Latvia, the development of new energy services and a strategy for the district heating companies when energy demand and revenues are decreasing, has been ranked as second most important issue. Moreover, new pilot projects and real examples for transition to 4th generation district heating have been considered as important, together with energy management in municipalities and cities.

Another important topic is **energy poverty**, especially in Greece. Also the higher penetration of solar thermal energy has been mentioned in the Western Macedonia region. Also in the Spanish region, a main need in the region is to decrease the energy cost for consumers (households, but also companies as well as public administration).

In all the regions under study, the developed RES H/C plans more or less **contribute to already existing plans:**

In Austria, the main need in the region can be seen to provide a valuable contribute to the existing “climate and energy strategy 2050” and corresponding “Masterplan ... 2020” in Salzburg. Additional measures have been defined in order to reach the targets of these documents, especially in new fields such as industrial excess heat supply, use of energy from waste water and cooling of server rooms. All of these issues haven’t been taken into account in the existing planning documents yet. Moreover, the existing “Masterplan ... 2020” has only a planning horizon until 2020 and does not cover the whole period of the strategy until 2050. Furthermore, RES H/C plan estimates the costs of the technologies while the existing plan focuses on CO₂ reduction only.

In Latvia, the important objectives of the plan reflect the targets in already existing SEAPs, e.g. the reduction of energy consumption in building, the fuel switch from fossil fuels to biomass, improving the biomass supply logistics etc.

In Western Macedonia, no central energy plan has been developed yet, while only a few SEAPs have been compiled. The aim of the RES H/C plan is to homogenize all the proposed policies into one common framework.

In contrast to that, the Rhodope plan in Bulgaria supports existing SEAPs and other obligatory plans through its activities. On the territory covered by the plan are two municipalities signatories to CoM and with SEAPs, five more are in process of developing their plans (inter alia in the framework of the project 50 000&1 SEAP, co-funded by Intelligent Energy Europe Programme). Additionally, all municipalities have to (according to legal obligation) regularly develop RES programs and report on their implementation. The RES H/C plan supports the existing plans e.g. through collection and analysis of heating data, mapping demand and potentials, various cost benefit analyses as well as through the proposed policies for the promotion of RES.

In Castillia y Leon, Spain, the plan is in line with the targets of the Bioenergy Castillia y Leon Plan launched in 2011. It is foreseen that it will also be integrated into the Energy Efficiency Strategy that the region is developing 2016.

Also in Emilia Romagna, Italy, the RES H/C plan and its measures have been fully endorsed by the regional administrations and are in line with the regional strategies.

It was already mentioned above that the RES H/C plans contain a **memorandum of understanding (MoU)** signed by regional authorities (or similar) in order to bring them up and support them at policy level. In the Rhodope Region, the MoU has been signed by the general assembly of the association of Rhodope Municipalities, a board including all Mayors and municipal council representatives. In contrast, the Austrian MoU has been signed by the Federal state of Salzburg, Department of Energy Industry. Also in Greece, a relevant regional authority has signed the document, namely the Governor of Western Macedonia. In Latvia the developed plan will be used and approved as action program "Energy" under the Riga planning region development programme 2014-2020. In Spain, the MoU

has been signed by the General Director of Energy and Mines of the Castilla y Leon regional government. In Italy, the regional Council of Emilia Romagna has signed the Memorandum.

3.1.3 Assessed technologies and proposed measures

What regards the technologies assessed with cost benefit analysis there haven't been major differences between the regions. All major RES heating technologies have been taken into account:

Assessed technologies within cost-benefit scenarios in RES H/C SPREAD in alphabetical order	Region					
	BG	AT	LV	GR	ES	IT
Adding heat pumps and heat storage capacity to CHP plants			x			
Adding solar thermal in individual houses			x			
Adding solar thermal to the district heating system			x			
Aero thermal heat pumps		x		x	x	
Ambient heat		x				
Biomass boilers (various types and applications)	x	x	x	x	x	x
Biomass co-firing / lignite boiler				x		
Biomass CHP				x		
Biogas CHP				x		
Coal	x	x				
District cooling / heating		x	x	x		x
Diesel	x					
Energy carrier shifts / change of electricity mix		x				
Energy conservation in buildings		x	x			
Electricity (air-conditioning systems)	x	x				
Electricity (radiators)	x					
Exchange of old boilers by more efficient ones		x				
Free Cooling		x				

Gas power plants						x
Geothermal district heating		x			x	
Geothermal heat pumps (horizontal heat exchanger)				x		
Geothermal heat pumps (vertical heat exchanger)				x		
Geothermal infrastructure (high enthalpy)						x
High-efficient individual biomass boilers		x		x		
Higher efficiency for cooling in non-domestic buildings		x				
Hot water supply (electricity, various combinations, e.g. solar thermal)	x	x	x	x	x	x
Hydropower		x				x
Increasing efficiency of electric devices		x				
LPG	x					
Natural gas	x	x				
Oil boilers		x				
Photovoltaic		x			x	
Replacement of district heating natural gas boilers with wood chips boilers		x	x			
Replacement of natural gas, coal, electrical and diesel boilers in individual houses with solar thermal, heat pumps, pellet boilers		x	x			
Robust networks						x
Solar thermal systems for heating, hot water	x	x	x	x	x	
Solar thermal systems for heating, hot water & cooling				x		
Switching from natural gas CHP to biofuel CHP			x			
Thermal insulation of buildings		x				
Wind power		x				
Wood chips	x		x		x	
Wood in efficient stoves with radiators	x					
Wood in primitive stoves	x					

Wood in primitive stoves with radiators	x					
Wood pellets	x	x			x	

Moreover, a large number of measures have been proposed in the RES H/C plans. Even though the measures and alternatives proposed in the different regions reflect their specific situation, many of these measures can surely be promoted in other EU regions as well. The list of measures described above highlights the findings of the six regions participating in the project RES H/C SPREAD. The measures can be classified by type (financial, regulatory, and informative):

Region	Type and number of proposed measures			
	financial	informative	regulatory	other
Rhodope	3	2		2
Salzburg	2	10	4	
Riga	2	5	4	
Western Macedonia	6			
Castillia y Leon	3	4	2	
Emilia Romagna	3	2	3	
No. of measures (total)	19	23	13	2

Financial measures proposed:

Rhodope region, Bulgaria

Financial measures proposed:

- Establishment of Local programme/fund for stimulating multi-family buildings owners to use wood chips heating systems;
- Tax deduction if certain level of energy efficiency (i.e. RES) in a residential building is reached.
- Application for funds (mainly EU SIF) to implement RES-H projects in public buildings

Salzburg region, Austria

Financial measures proposed:

- Incentives for sewage plants and establishment of contracting models for low temperature excess-heat
- Incentives for the industry and establishment of contracting models for low temperature excess-heat

Riga planning region, Latvia

Financial measures proposed:

- Attract private additional investments needed to energy efficiency projects in buildings using energy performance constricting (EPC). Using EPC in public building renovation, Re-financing of projects selling future cash flow (receivables) through a forfaiting transaction;
- Development of new energy services (DH ESCO services)

Western Macedonia region, Greece

Financial measures proposed:

- Installation of co-firing biomass and lignite boilers in the existing district heating network
- Installation of biomass boilers in the existing district heating network
- Promotion of autonomous high-efficient biomass boilers in households
- Installation of a biogas CHP plant
- Installation of a biomass CHP plant
- Promotion of solar thermal system for domestic hot water production

Castillia y Leon, Spain

Financial measures proposed:

- Subsidies for RES installations with an innovative added value / sector interest
- Investment in demonstration plants / projects

- Support of RES equipment manufactured in the Castilla y Leon region

Emilia Romagna, Italy

Financial measures proposed:

- Regional rotatory funds
- Guaranties for bank loans to both private and public organizations
- Regional loans

Informative measures proposed:

Rhodope region, Bulgaria

Informative measures proposed:

- organization of annual events for promotion of RES heating solutions;
- organisation of meetings with Owners Associations for promotion of financial instruments for energy efficiency (i.e. RES) improvements;

Salzburg region, Austria

Informative measures proposed:

- Preparing an implementation concept for the use of energy from waste water in the sewage plants Siggerwiesen/St. Georgen/Mattsee/Neuhaus/Seekirchen
- Implementation concepts for the use of energy from waste water in the areas of Maxglan/Kendlersiedlung/Gneis/Rott/Liefering
- Feasibility studies on building level (...)
- Capacity building addressing companies and municipalities
- Negotiations with industrial facilities selected in the project RES H/C SPREAD
- Capacity building addressing companies, especially in the existing energy consultancy (e.g. via the Land Salzburg and regional Agencies)
- Capacity building addressing municipalities

- Information campaign for companies with large server rooms
- Adjustment of the existing energy consulting of regional agencies and the Land Salzburg
- Dissemination of best practices examples addressing companies

Riga planning region, Latvia

Informative measures proposed:

- Prepare information campaign for the reorganization of the heating in the private sector
- Create a region statistics on decentralized heat sources
- Plan regular boiler operator training
- Develop long-term strategies for building renovation
- New pilot projects and real examples for transition to 4th Generation district heating

Castilla y Leon, Spain

Informative measures proposed:

- Information to support SEAPs for municipalities
- Information on solar energy installation
- Information addressing companies (commercial strategies)
- Support training for professionals (installers, administrators, engineers, architects)

Emilia Romagna, Italy

Informative measures proposed:

- Participative processes to raise awareness amongst energy stakeholders and public
- Communication using social media channels

Regulatory measures proposed:

Salzburg region, Austria

Regulatory measures proposed:

- Revision of the land use plans for certain areas
- Create a framework to use industrial excess heat at relevant facilities with low temperature heat grids and geothermal energy storage as well as in areas with constant heating & cooling demand
- Create a framework to use excess heat from server rooms that are property of the Land Salzburg or its regional agencies
- Promotion of low temperature heat grids in certain areas (...)

Riga planning region, Latvia

Regulatory measures proposed:

- Introduce regular energy audits whose frequency depends on the age of the boiler: the older the boiler as energy audit must be carried out more often (above 10 years - energy audit must be done every year), the less than 3 years boiler - energy audit must be done every 4 years
- Biomass certification and fuel control
- Implementation of energy management (ISO 50001) in municipalities and cities
- Ban diesel and coal heating till 2020. Encourage new consumers to use efficient district heating systems, limiting use of fossil heating system where district heating is available

Castillia y Leon, Spain

Regulatory measures proposed:

- Include the outcomes of RES H/C SPREAD in the urban planning normative
- Improvement of related bureaucratic processes

Emilia Romagna, Italy

Regulatory measures proposed:

- Clear rules for authorizing procedures
- Regional energy laws
- Distribution of competences amongst regional and local administration (according to national constitutional laws)

Additional measures proposed:

Rhodope region, Bulgaria

Proposed measures regarding logistical and technical support and collaboration

- establishment of Logistic biomass centres for improvement of regional market conditions through PPP or technical support
- establishment of fruitful cooperation with neighbouring municipalities for best practices exchange

It can be seen in the lists above, that the measures cover a wide range of applications. Regarding financial aspects, local funds, incentives and guaranties for bank loans, but also tax reduction as well as private investments have been addressed. In addition to that, informative measures include feasibility studies, pilot projects, trainings, meetings & events, information campaigns, dissemination of good practices, the use of social media channels for communication and awareness raising activities via participatory processes. Regulatory aspects include audits, certifications, implementation of energy management, the banning of fossil heating systems, regional energy laws, the distribution of competences between different administrative levels, promotion of various RES technologies as well as the revision of land use plans.

Furthermore also accompanying policy measures aiming at the plans' roll-out are foreseen. As an example, cooperation with a local energy agency is foreseen in Latvia. In Spain the regional government will undertake efforts to favor the installation of RES in their own buildings. Other accompanying policy measures have been defined in Bulgaria, where the local and

regional authorities will commit to the plan integration in their policy (planning) documents.

This diversity reflects the fact that the regions involved do require targeted support to improve their governance capabilities and planning exercises. Furthermore the wealth of information shows that the discussions with the country governance committees have been very intense and fruitful, the cooperation therefore worked very well. A good mix of measures, e.g. the combination of regulatory and informative measures, is beneficial in order to achieve the overall objectives of the plans.

3.2 General hurdles in RES H/C planning

It became apparent during the project that there are some main hurdles nearly every project team came across when performing the regional planning exercise. It is likely that these hurdles will also occur in regional planning elsewhere.

Obviously **missing or unsuitable data** has been identified as one very important barrier for regional planning. Data collection takes time and costs money, especially when data accuracy is important or georeferenced information is needed. When it comes to heating and cooling with renewables, especially a lack of data about different excess-heat sources, adequate technology costs but also energy demand data have been identified as barrier. In some cases data is available, but property of e.g. the local heat supplier and not for public use. Another aspect is the level of data aggregation and related estimations.

Another main hurdle in RES H/C planning can be the **commitment of the relating local/regional/national stakeholders**. The interaction with all relevant, regional stakeholders is essential, not so much for the plan development itself, but crucial for the endorsement of the work carried out.

Moreover, **uncertainties regarding future developments** (e.g. energy carrier shifts) or uncertainties regarding future energy and technology costs have been identified as important hurdle for RES H/C planning.

Referring to the practicability of the tools used in the project RES H/C SPREAD, it can be concluded that the **EnergyPLAN-tool for cost benefit analysis** is generally seen as a suitable tool for overall energy planning. Beside EnergyPLAN contains information on investment and operation costs for a large variety of energy technologies, other tools are considered to be

more useful for concrete (feasibility) studies where detailed, sectorial analysis are foreseen. Therefore the regions in RES H/C SPREAD, for example Castillia y Leon in Spain, Salzburg in Austria, Western Macedonia in Greece and Rhodope region in Bulgaria developed and used also other tools for their calculations. For instance, in Spain additional parameters have been added in order to better adopt the calculation on the status quo in the region. For regional planners, EnergyPLAN seems to be too complicated; especially what concerns input parameters and data transparency. But it can definitely be recommended for experts and scientific approaches. Another interesting option would be to use EnergyPLAN in a first step to get an overview and to develop an own regional planning tool on that basis. Another critical point is the possible language barrier – as the partner BSERC stated, EnergyPLAN can therefore not be used by the Bulgarian public authorities. In Greece, EnergyPLAN has not been used at all due to the complexity to collect and introduce all the necessary input data and to stimulate the current energy system in the region. Moreover, the lack of transparency during the calculations and the preparation of the plan as well as the inability to conduct cost-benefit analysis constitute another reason for the abandonment of EnergyPLAN in the Western Macedonia region. Therefore, the cost benefit analysis has been implemented according to the JRC's guidelines for the conduction of the comprehensive assessment within the framework of the Article 14 EED.

Referring to the proposed **methodology from the STRATEGO** project, it can be said that a better special resolution would be beneficial for regional planning. The resolution of 1 square kilometer seems often not to be sufficient for regional or even local planning issues. Nevertheless, it gives some information on where to concentrate further assessments.

3.3 Evaluation of stakeholder interaction

Within the project RES H/C SPREAD stakeholder interaction has been identified by the project partners as general success factor for regional planning. Particularly, the establishment of country-governance-committees (CGCs) has turned out to be essential. **General success factors** for stakeholder interaction within this format are to integrate a **wide range of different stakeholders** (e.g. from national and regional policy makers, regional development planners, municipal development planning specialists, energy specialists, heating companies, end user etc.) because the interests and competency of each of the groups can

complement the plan in order to make it relevant and also usable. Nevertheless, the **composition of stakeholders should be balanced and appropriate**. A comprehensive stakeholder map should be developed in advance. Of course it is important to have high level representatives on board, which really have decision making power. Moreover the most appropriate experts from each participating organization should be invited. The incorporation of all crucial aspects strengthens also the transparency regarding the selection of the policy measures reducing simultaneously the possibility for disagreement and disputes. In order to perform the workshops, profound moderation techniques are helpful. Another success factor can be to **adapt the stakeholder composition** according to the agenda of the meetings. In some cases it can be useful to divide the CGC in different working groups, e.g. according to certain technologies. This turned out to be an interesting option to increase the effectiveness of the workshops. It is an advantage to understand the stakeholder interaction as a dynamic process where different groups are involved at different stages etc.

Moreover, **formulating the right questions** is a prerequisite for the effective elicitation of the stakeholders' contributions.

Regarding **administrative issues**, a short travel time for the participants is beneficial, just as to send the invitations in time. The venue should be adequate.

It turned out to be appropriate to really **emphasis on the interest** of all participants during the workshop sessions. Feedback should be taken seriously and should be considered. It is also very important to present the progress of the work between the consecutive meetings in order to create a sense of professionalism and to incentivize the involved stakeholders for more effective contributions. Related comments and recommendations of the CGC members have been incorporated into the RES H/C plans in every involved region. Generally all of the CGC members were equally interested in the RES H/C planning, but e.g. in the case of Bulgaria it has been noticed that public administrations, especially municipalities, are more interested in regional heating planning because their obligation to plan (every 2 years) and report (annually) the RES developments and related measures.

Generally the **CGC meetings have been evaluated positively** by the participants. More information on the concrete outputs of the stakeholder

process carried out in RES H/C SPREAD can be found in the corresponding [homepage-section](#) of the project. Furthermore the methods and procedures developed within the project RES H/C SPREAD, e.g. for cost-benefit analysis, have been considered as valuable support by the CGC members.

3.4 Effectiveness of the plans

The quantification of the cost benefit scenarios show a **significant GHG-emission saving potential** in all of the developed RES H/C plans. Most of this potential is due to fuel switch from fossil fuels to RES, but energy efficiency aspects have also been incorporated in the planning. The quantitative outcomes of the RES H/C plans are analyzed in detail in the working packages "capacity building and cost-benefit analysis" and "development of regional RES H/C plans" (see reports on http://www.res-hc-spread.eu/en_GB/resources/reports/, accordingly). The following table gives an overview on the modeled share of RES in the different regions and related CO₂-saving potentials. The comparison clearly shows the differences between the regions: Some already start from a quite high baseline (e.g. 63% RES share in total energy consumption in Rhodope, Bulgaria; or rather 56% in Salzburg, Austria) other regions still have to catch up in this regard. This reflects the necessity of the RES H/C planning exercise especially in those regions.

Region	Modeled share of RES in total energy consumption (Baseline to max.) [Ref.Year]	Related, theoretical maximum of CO ₂ savings [%]
Rhodope, Bulgaria	63% - 100% [until 2030]	70%
Salzburg, Austria	56% - 100% [until 2050]	99%*
Riga, Latvia	52% - 64% [until 2030]	32%
Western Macedonia, Greece	21% - 34% [until 2030]	38%**
Castillia y Leon, Spain	31% - 44% [until 2030]	38%
Emilia Romagna, Italy	0% - 89%***[until 2030]	8%

* based on the vision of the existing climate and energy strategy of the Federal State Salzburg to become "CO₂-neutral", timeframe 2050

** based on RES target of 34% in 2030

*** all scenarios, values only for electricity

Despite the effects on GHG-reduction and related costs, other expected benefits (**externalities**) have been discussed but not quantified. As an example, in the Western Macedonia region, Greece, it has been decided by the members of the relating CGC to organize an initiative for the quantification of externalities. It is foreseen to update the existing regional plan according to the obtained findings. Also in Austria externalities like regional added value and employment effects have been included in the plan, but not in a quantitative but qualitative way. Also in Latvia no additional benefits have been included in the cost benefit analyses. In contrast to that, in Castillia y Leon, Spain, additionally SO₂-emission avoidance has been made a subject of discussion, too. In Bulgaria, increased biomass utilization, i.e. logistic centres for biomass, will create new jobs in the region. Also in Emilia Romagna employment effects have been examined.

An effective **monitoring procedure** is seen as prerequisite for successful and efficient implementation of the RES H/C plans.

In Greece, the degree of implementation of the plan will therefore be evaluated on annual basis and will be adjusted if significant delays will be identified during the realization of the foreseen policies. In this case additional policies should be adopted, which have to be viable in terms of cost and benefits, in order to achieve the established targets. The proposed monitoring indicators in Greece consist of

- The number of the installed RES units and systems
- The capacity of the installed RES units and systems
- The produced heating and cooling energy (MWh)
- The required investments
- The number of beneficial energy poor households

For each proposed measure an implementation schedule including the required investments has been described.

In the Rhodope Region, Bulgaria, the monitoring will be performed by the Council on Energy Efficiency, consisted of municipal experts from the municipalities, members of the Association of Rhodope municipalities. It is planned to have two types of monitoring reports – short and detailed. The short one will be performed after two years and every four years after that, and the detailed will be developed after four years and every four years after (until 2030). The short one will monitor the overall performance, i.e.

share of RES, measures implemented and their impact, etc. The detailed one will collect much more detailed data, specified comprehensively as annex to the Plan.

In Spain, the monitoring will be made annually by a special sub-group of the CGC. They will have one meeting per year, but additional meetings can also be called.

In Austria a monitoring procedure is currently (as of September 2016) developed for the existing "masterplan climate and energy 2020". As the RES H/C plan is a contribution to this, it will also be integrated into the monitoring procedures accordingly. As part of the monitoring, the following parameters will be measure until 2020:

- Energy savings of the measures foreseen in the RES H/C plan
- Development of the energy mix as a consequence of the implemented measures
- Calculation of GHG-savings of the different measures

Also in Latvia there are monitoring procedures foreseen. The plan will be checked according to the revision of Riga planning region "Development Programme 2014-2020".

In Italy, a concrete list of energy and environmental indicators has been produced in order to monitor the region's achievement of objectives.

The **evaluation of the plans ambitiousness** by the project partners results in a differentiated picture. In Greece, the plan is not considered as really ambitious, because the fulfillment of the specified RES targets (from 21% in 2012 to 34% in 2030) is feasible according to the national imposed targets under RES directive. Nevertheless, the economic recession can hamper potentially the implementation of the regional plan, as the available funds may not be adequate for the realization of the proposed measures.

In contrast to that, the regional plan is considered to be ambitious in other regions. Nevertheless, in Bulgaria higher targets are hindered by the region itself that does not have a central body, solely responsible for the plan's implementation. Furthermore the district and municipal authorities have very limited budget that can be dedicated to the plans implementation.

Also in Austria, the plan is considered as ambitious. This is due to the fact that the already existing strategies and plan in the region are ambitious and the new RES H/C plan further complements these documents.

In Spain, the RES H/C plan is reflected to be quite ambitious as it is a medium and long term strategy. It has to be linked or integrated into other existing on-track strategies (e.g. energy efficiency, bioenergy, solar strategies) in the region.

In the long run the RES H/C plan in the Riga planning region, Latvia, is seen as ambitious as it foresees attracting private capital for energy efficiency processes in buildings and transition to 4th generation district heating systems. However it lays in the responsibility of each municipality to implement their own energy and climate targets.

The **responsible organizations and / or institutions** for the plans implementation are the following:

- ANKO in Western Macedonia region, Greece
- District authorities, municipal authorities and the Association of Rhodope Municipalities in Bulgaria
- General Directorate of Energy and Mines and Regional Energy Entity of Castillia y Leon of the Leon Regional Government in Spain
- Land Salzburg, Department of Energy Industry in Austria
- In Latvia the planning regions are responsible within their scope of competence and ensure the implementation of the plan, cooperation regarding regional development and interaction with local municipalities.
- Regional administration as well as local municipalities in Emilia Romagna, Italy.

3.5 The transferability of regional plans

An important aim of the lessons learned compiled in RES H/C SPREAD is the transferability of the experience gained during the process.

Generally, it can be said that the recommended methodologies, cost-benefit conclusions and recommended policy measures are highly transferable, especially to other regions in each of the countries. Also the plans are highly replicable to other regions with "similar" preconditions (climate, biomass availability, buildings characteristics etc.) per country.

Additionally, there are certain issues that can also easily be transferred even to other EU member states not participating to the project: It can be said, that the overall methodology of the RES H/C planning described in the project is definitely highly replicable. General policies and planning measures indicated can be transferred easily to other regions as general problems tend to be very similar in all planning regions. Of course region-specific values and conditions have to be taken into account. The lessons learned aiming at stakeholder involvement can surely be applied in every European Member state.

4 Summary of Lessons Learned

4.1 Stakeholder process - general lessons learned

- Stakeholder processes – like the Country-Governance-Committee Format performed in RES H/C SPREAD – should generally be clear and understandable to the participants. Therefore, the goals as well as non-targets have to be defined right at the beginning. It should be agreed on what makes the process successful for all parties involved.
- It is advisable to agree on the necessity for the planning exercise and the responsibilities of the stakeholders involved in an early step.
- Stakeholder processes are “living” processes, mutual learning / making adaptations is essential.
- Trust between all parties involved is a precondition for an effective working relationship.
- It shall strictly be avoided to raise expectations that can't be met.
- Main advantages of stakeholder involvement are increased transparency and “better” decision making. It identifies possible disputes at an early stage. The participants bring in their expert knowledge and boost the process if they are motivated. Moreover, stakeholder involvement builds trust and leads to better implementation.
- An active dialogue helps to anticipate new issues during the process that have not been clear at the beginning.
- Recognize possible barriers to stakeholder participation in advance (e.g. inadequate and not-targeted information in workshops, lack of time, overwhelming workloads etc.)

4.2 RES H/C lessons learned transposable to other contexts

The main lessons learned with regard to RES heating and cooling planning that can be transposed to other contexts are the following:

- It is essential to identify, analyze and define the most important (key) stakeholders for a regional RES heating and cooling planning process well in advance. Therefore an assessment should be made in order to analyze who can influence the plan directly or indirectly, what is their motivation etc. A promising approach is to follow the methodology of the stakeholder survey performed in RES H/C

SPREAD, including expert-interviews. It is wise to analyze if there are any groups or issues with regard to RES heating and cooling that require special attention.

- A detailed identification, assessment and integration of all the relevant heating and cooling stakeholders' needs and priorities into the regional plan are utmost important. That will facilitate the design of efficient policies and their smooth implementation. A "one-size-fits-all" approach is not appropriate for regional and local RES heating and cooling planning.
- The recommended planning methodology and country governance committee (CGC) interactions developed within the project RES H/C SPREAD are in general highly transferable to other regions and countries.
- It is beneficial to choose a "representative" venue for a CGC workshop where the invited people feel also comfortable. This carries the message that the project also values their input.
- Communication among all relevant stakeholders is the key to success and prevents possible future barriers. Active involvement of key decision makers is utmost important for a successful regional planning. Feedback from key stakeholders has to be incorporated accordingly in order to make clear that the stakeholders' involvement influences the decisions. It should therefore precisely be explained what input is needed from the stakeholders and how it might/will be used.
- The composition of stakeholders might change during the phases of a RES H/C planning process. That means it is not necessary to involve all participants with the same level of intensity all of the time. It is therefore important to prioritize and to act strategically. This is considered to be an option in order to increase the effectiveness of the stakeholder participation process.
- Public administrations are very interested in regional heating planning because they often have to fulfill certain obligations (e.g. concerning planning and reporting the RES developments and related measures)
- The development and implementation of the plan requires establishing and maintaining of good long term relationships among all the relevant RES H/C planning decision makers. The CGC format is considered to lay the basis for this work. It is also a good way to

further support planning efforts of other European regions via dissemination activities on best practices.

- Generally to increase the share of RES for heating and cooling is not only seen as fulfillment of energy and environment (i.e. decarbonization) commitments, but also to generate added value in the regions. It is important to disseminate these beneficial effects also outside of a RES heating and cooling planning project.
- Cost benefit analysis is an appropriate way to promote cost efficient RES technologies as well as to convince responsible public authorities.
- The successful regional planning requires involvement and awareness raising of end users.
- When it comes to regional RES H/C planning, meaningful and easy-to-understand information should be provided, especially regarding cost-benefit analysis and energy scenario development. Information should always be circulated to CGC members in advance, so that everybody can prepare properly for the meetings and workshops.
- The diversity of proposed RES H/C measures reflects the fact that the regions involved do really require targeted support to improve their governance capabilities and planning exercises.
- A good mix of measures, e.g. the combination of regulatory and informative measures, is beneficial in order to achieve the overall objectives of a RES heating and cooling plan.
- The developed regional RES heating and cooling plans should always be linked to existing plans (or plans under development), strategies and policies.

4.3 Main hurdles in RES H/C planning

The main hurdles in RES heating and cooling planning are the following:

- Data availability and diversity of users. Missing, unsuitable or confidential data will result in time consuming data collection procedures. Data availability should be analyzed right at the beginning of every planning project.
- To implement a profound continuous improvement process of the plans is seen as a main bottleneck for success. Therefore, responsibilities for monitoring processes have to be defined in order to assess and update the regional plan continuously.

- The commitment of relating local/regional/national stakeholders is a precondition for successful RES heating and cooling planning as well as for the endorsement of the work carried out. Setting up a memorandum of understanding (MoU) for the plans implementation by relevant public authorities is expedient and should be planned well in advance.
- Uncertainties regarding future developments e.g. energy carrier shifts but also political circumstances are also seen as important hurdle for RES H/C planning.
- Inadequate tools (e.g. for cost-benefit analysis, spatial resolution of heat demand etc.). Regional planners need to really understand the tools and methodologies they get recommended. Sometimes, also language barriers occur.
- Participation of stakeholders into the planning activities may result in high workloads, especially in bigger regions and / or cities.