ePolicy

Engineering the Policy-making Life Cycle

D2.3 Means of Project Evaluation

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ABSTRACT

This deliverable provides a number of indicators for the evaluation of project results and outcomes. We identify the project components that need evaluation, provide proper means of their evaluation and possibly identify minimal success criteria.

SEVENTH FRAMEWORK PROGRAMME

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1 Introduction

This deliverable provides the means of project evaluation. The first section of the deliverable is devoted to list the outcomes of the project in terms of methodology, software tools and dissemination strategies. Then, for each of these outcomes, we have identified the indicators for evaluating their quality and ways to evaluate these indicators. Finally, the management of the project is considered, whose quality is evaluated in specific deliverables, whose content is summarised in the present document.

For each project component we either identify some success criteria or indicate the deliverable where these success criteria are defined. Finally, for each component, we indicate the deliverable where the evaluation is performed.

2 Outcomes of the ePolicy project to be evaluated

As outlined in the exploitation plan provided at Month 18, here are the outcomes of the ePolicy project that should be evaluated.

ePolicy decision support system (DSS) for the Emilia-Romagna Energy Plan An important component of the overall results of the ePolicy project will be a prototype decision support system for the policy makers of Emilia-Romagna aimed at supporting the production of alternative regional energy plans and scenarios. This will be available for use by environmental experts to calibrate the system and configure the input data for the Emilia-Romagna physical and territorial constraints. The configured system can then be utilised by regional planners who use political objectives, such as target energy to be produced by renewables for thermal and electric energy, additional restrictions on energy sources, costs and any other relevant targets. The system will then receive input from the opinion mining component, which has been trained to extract opinions from blogs and forum on the social acceptance of renewable energy sources, and produce alternative plans. The DSS will produce the environmental impact of the alternative scenarios so that these can be evaluated. After the alternative scenarios have been developed, they can be passed to an incentive design component which will be used to suggest possible policy instruments that can be simulated by the social simulator component to evaluate their effectiveness. The overall system can perform several iterations to provide a result that satisfies the policy maker.

Beside this integrated software tool, single components represent a project outcome as they could be used as stand-alone components.

Global Optimizer The global optimizer component embeds a combinatorial optimization model and solver that produces a set of Pareto optimal energy plans given a number of constraints on costs, receptors, and a number of objective functions. The component is based on constraint logic programming. It performs both regional planning and the strategic environmental assessment of the plans produced. The component also receives

as input the cost of the primary activities of the plan, the secondary activities and their respective cost and environmental impact. The global optimizer component is tailored to ER as it is fed with data from that region.

Incentive design module The incentive design component is used by the policy maker to - given a budget for the incentives and a target power output - determine the distribution of these incentives to interested parties. The resulting design aims to achieve at least the target power production while remaining within the budget. The criteria for incentivizing participants include not only the efficiency of the proposed installation in terms of power produced per Euro invested, but also the fairness of the allocation across all applicants. Additionally, it is intended to encourage an allocation process where participants reveal their private information truthfully and purposeful misrepresentation does not gain them an advantage. As notions of fairness and efficiency may be subject to policy decisions, the incentive design will not provide a single solution, but rather allow the policy maker to explore and adapt different scenarios. The result of the incentive design is passed to the social simulator that will evaluate the effectiveness of the design. Several iterations of this process are likely to be necessary to allow the policy maker to achieve a result that satisfies his or her requirements.

Social Simulator The simulator component is based on agent-based modeling, a computational method for simulating the actions and interactions of autonomous decision-making entities (so-called agents) in a network or system, with the aim of assessing the effects of their individual actions and decisions on the system as a whole. Individuals and organisations are examples of entities which are often represented as agents. Each agent individually assesses its situation and makes decisions on the basis of a set of rules. The ePolicy social simulator is tailored to data coming from the Emilia Romagna region, collected through interviews, from an on-line questionnaire and from past data. It simulates the decision making procedure of households for deciding to install or not to install a PV plant against different policy instruments. The simulator computes the global PV adoption in ER.

Opinion mining component The opinion mining component is based on sentiment analysis techniques from the area of text mining and can be used to infer the sentiment and opinion of the population on a set of topics. This inference is carried out over textual sources (e.g. blog posts or other e-participation tools). This component has two main phases: the training phase and the usage phase. The goal of the training phase is to learn models that are able to classify new text documents concerning the sentiment they express on a set of topics. These models are learned by example, i.e. using a set of texts that were pre-classified by a human expert on the domain. Using this training data set, models are learned that can be used in the second phase. The second phase consists of using the learned models to infer the sentiment on the set of selected topics for new text messages that are posted by the population. These classifications are then aggregated to

form the overall sentiment of the population concerning the selected topics. Moreover, means of visualizing the results of this process providing intuitions on the tendencies of this sentiment over time will also be provided to the user.

Visualization Modules The visualization modules developed in the ePolicy project have the objective of providing intuitive access to the analytical models of the project. Three visual interfaces will be implemented. One for the global optimizer, one for the social simulator, and one for the opinion mining component. Although the visual interfaces are based on the specific use cases of the project, adaptation to alternative situations is possible. Moreover, the visualization components will be designed with different abstraction levels, making them useful for different user groups - from modelling experts who have a deep understanding of the relevant modelling to policy makers, who clearly understand the policy area but do not have modelling expertise.

Methodology for extending the software to other domains One of the results of the ePolicy project is intended to be a methodology for extending the DSS and all its components to other policy areas. In particular, six ways have been identified to extend the system. Three of them refer to the same policy area (namely that of renewable energy) but focused on either larger (such as National and EU plans) or smaller scales (provincial and municipality) or the same scale but for other regions. The other three extensions concern other policy areas: the first is the extension of the system for coping with regional planning on different policies. The second is to cope with other parts of the regional energy plan, in particular the one on energy efficiency that is extremely important. Finally, there is another extension suggested by ENEL, the major Italian utility company (which is a member of the Advisory and Dissemination Board, ADB, of ePolicy) which is interested in applying the ePolicy methodology to some of their business models and pricing schema (similar to policy instruments) that on one hand are cost-effective for ENEL and on the other hand provide energy efficiency and peak reduction in consumption profiles.

3 Software products evaluation

3.1 Global optimizer

The global optimizer component could be used either in isolation or integrated with the other components in the overall architecture. In this section we consider the evaluation of the global optimizer as a stand-alone component.

The evaluation should consider both functional requirements, namely for checking the functionalities that the system exposes, and non functional requirements identified for the global optimizer.

During the requirement analysis, we have identified two main users for the global optimizer:

- the environmental expert who mainly configures the system, provides matrices for environmental impact assessment, imposes regional constraints on the production of energy from renewable sources due to the geographical characteristics of the region, defines costs for the activities, defines the relation between primary and secondary activities.
- the policy maker who queries the system for obtaining regional plans and their environmental assessment, by providing as input constraints further restricting the ones imposed by the environmental expert.

For each category we will test the functional and non functional requirements.

3.1.1 Functional Requirements

Concerning functional requirements, we have identified a number of functionalities of the system concerning its configuration and its usage.

We will test the functional requirements by devising two lists of requirements, one for the functionalities required by the environmental expert and one for the functionalities required by the policy maker. By analysing the code and testing it on data from the RER Energy plan 2011- 2013 plus other instances, we will check the functionalities implemented.

At the end of the test, if the number of functional requirements implemented is lower or equal to the 60% of the requirements contained in the requirement document,[1] then the component evaluation has to be considered unsatisfactory. If this number is between 60 and 80%, the evaluation has to be considered sufficient, while if the number is higher than 80% the evaluation is successful.

3.1.2 Non Functional Requirements

The nonfunctional requirements will be evaluated by running tests and by performing field tests involving users and asking them to evaluate the software through interviews and questionnaires. In particular, we will consider the following means of evaluation of non-functional requirements:

- Scalability, performance and efficiency: we plan to run a battery of tests, both on the first version of the prototype (whose evaluation is due at month 24, D3.3) and on the final version (whose evaluation is due at month 33, D3.5) by using the data from the RER regional plan of 2011, the new data of 2014 and also a set of synthetic instances generated by changing the matrix coefficients, increasing the number of objective functions, changing constraints, and increasing the number of activities. For these tests we will extract the running time, the number of explored nodes, the mean and the variance of the tests. We consider this test satisfactory if for running the system on a real plan, the system has a response time less than five minutes.

[1] The requirement document will be provided together with the Second Project Report and has been required by the reviewers during the first project meeting

- Cost of development and time of development: these figures will be extracted by the project time sheets measuring the time and the cost of MM exposed on these activities. We consider the evaluation of these parameters succesful if the numbers are in line with what expected in the project proposal. In particular, if the variation of time and cost is lower than the 5% with respect to the budgeted time and cost.
- Accuracy, precision and re-configurability: these figures will be measured by using questionnaires, directed to policy makers (that test the first two requirements) and to environmental experts (evaluating all of them). If more than the 70% of users are satisfied with these features (derived by questionnaires) the evaluation has to be considered successful.

For each category of users we will evaluate the component by providing questionnaires customized for policy makers and for environmental experts that are not devoted to assess the visual interface of the component and its friendliness, but rather to assess the correctness of the results. We plan to involve policy makers of the RER, which is a partner of the project, and, after a training period, to use the global optimizer for the Regional Energy Plan 2014-2016, therefore on a real plan. This will give us the possibility to evaluate the system on a real setting, provide alternatives that could be evaluated by the policy maker on environmental, energy and economic aspects. We will report the experience of this test both on the web site and in a summary document, deliverable D3.5, due at month 33.

We also plan to make a trial by contacting policy makers from other regions through the RER. The idea is to guide them in defining a plan by checking the functionalities they expect from a system like that. It is worth mentioning that the system requirements have been designed by looking at several plans, but they have been mainly tailored to the requirement stated by RER experts. Therefore, this test is devoted to understand how the functionalities of the system are suitable for other regions, or if new requirements arise from this analysis. Again the evaluation of these policy makers will be captured through a questionnaire and reported in the Exploitation Plan, due at month 28.

In parallel, we plan to measure the configurability of the system by asking several experts from ARPA Emilia Romagna, which is a partner of the Advisory and Dissemination Board of the project, to configure the system. During this activity, the environmental experts will also query the system for generating regional plans in order to check if the configuration is correct. Therefore the questionnaire of the environmental experts will be a superset of the one devoted to policy makers. Again this evaluation will be reported in the deliverable D3.5 due at month 33.

3.2 Incentive design component

Given the description of the incentive design component above, we derive the following requirements.

3.2.1 Functional Requirements

- The incentive design component must output incentive designs. We can determine whether this requirement has been fulfilled by inspecting the output.
- The incentive design component must optimise incentive designs. We can measure this by inspecting the output and comparing the given incentive design to other possible incentive designs.
- The incentive design component must consider goals for energy production and budget constraints. The incentive design will specify numbers for these constraints that allow us to judge whether they have been considered.
- The incentive design component must allow the user to explore different allocation scenarios. It is straightforward to judge whether this requirement has been met.
- The incentive design component must allow for an iterative process of computing and adapting the incentive design. It is straightforward to judge whether this requirement has been met.
- The incentive design component must allow to consider policy decisions. We can judge whether this requirement is met by evaluating the means for specifying policy decisions.
- The incentive design component must allow for incentive-compatible incentive designs. That is, participants must be encouraged to reveal their private information truthfully. We can determine whether this requirement has been met by inspecting the incentive design.
- The incentive design component must allow for equilibrium incentive designs. We can determine whether this requirement has been met by inspecting the incentive design.
- The incentive design component must interface with the social simulator. It is straightforward to judge whether this requirement has been met.
- The incentive design component must interface with the rest of the ePolicy system. It is straightforward to judge whether this requirement has been met.

If the number of functional requirements implemented is lower or equal to 60% of the requirements mentioned above, then the component evaluation has to be considered unsatisfactory. If this number is between 60 and 80%, the evaluation has to be considered sufficient, while if the number is higher than 80% the evaluation is successful.

3.2.2 Non Functional Requirements

- The incentive design component must be easy to use. This can be assessed by gathering user feedback.
- The incentive design component must provide solutions within a reasonable time. This can be assessed by testing the component with a number of different scenarios and noting the time it takes to find a solution.
- The incentive design component must provide information that allow the user to evaluate incentive designs. This can be assessed by gathering user feedback.
- The incentive design component must be installable with reasonable effort. This can be assessed by gathering user feedback.

- The incentive design component must not depend on third-party components that incur additional costs. It is straightforward to judge whether this requirement has been fulfilled.

If the number of non-functional requirements implemented is lower or equal to 60% of the requirements mentioned above, then the component evaluation has to be considered unsatisfactory. If this number is between 60 and 80%, the evaluation has to be considered sufficient, while if the number is higher than 80% the evaluation is successful.

3.3 Social simulator

3.3.1 Functional Requirements

The social simulator, which has the aim to capture the individual household perspective on the adoption of photovoltaic panels in the Emilia-Romagna Region, has the following main functional requirement: Given an input in form of the policy instruments (choice of policy instrument, financial spending targets on this instrument over time and max. total spending target values for the respective instrument) it will simulate the adoption of photovoltaic by the modelled households as well as the money spent over time. The above mentioned input parameters can be provided manually by a user of the social simulation or automatically be the ePolicy components interfacing the simulator.

The policy instruments it will account for are:

- feed-in-tariffs
- fiscal incentives
- interest rate support

The overall goal of the social simulator is to present likely adoptions of photovoltaic panels under different policy instrument settings chosen.

Along the lines of this minimum functional requirement, the social simulator has a number of sub-requirements. These include:

1. the user can select and specify which of the above mentioned policy instruments he wants to model, and
2. the user can choose whether he wants to view the whole Emilia-Romagna region or only sub-regions, and
3. for each selection of simulation setup of (policy instrument/region) the user will obtain output in form of
    - number of adopted PV installation over time;
    - MW of power installed over time;
    - cost of funds allocated over time;

These functional requirements were established in discussion with stakeholders of the system, including policy makers in the Emilia-Romagna region. For the realistic representation of the decision making entity behaviour that is required for realistic simulation results, we are conducting online questionnaires as well as semi-structured interviews with groups identified as important for the simulation. These groups include for example household caretakers as well as companies providing energy services and photovoltaic

panels. For the online questionnaire we aim to have a participation rate of at least 150 persons to be able to base our assumptions for the simulation on a solid empirical basis. Furthermore we rely heavily on official GIS data which will be provided by the region as well as ENEL. After the completion of the social simulator prototype, we will use historic data (e.g. take up rates of each National Energy accounts and changes in regional policy instruments) as well as feedback from policy makers in the Emilia-Romagna Region for an additional validation of the social simulator.

Besides the above mentioned functional requirements, the social simulator component needs to interface with the rest of the ePolicy system, in particular the global optimizer and the incentive design component. From the latter it will obtain its input parameters (if these are not specified manually) and it will provide output information to both of them. This is ensured with support from WP8, whose evaluations is described in Section 3.6.

3.3.2 Non Functional Requirements

In additional to the above mentioned functional requirements, several non functional requirements for the social simulator have been identified. As in the case of the functional requirements, all these non-functional requirements have been derived in discussion with stakeholders of the social simulator, including the regional policy makers, as well as photovoltaic companies interested in the reaction of households to different incentives fostering the uptake of photovoltaic panels.

- The social simulator must provide information that allow its user to evaluate the different policy instrument implementation strategies.
- It should allow to use GIS data for the setup of decision making entities and the environment they act in, to allow for more realism and better acceptance by the policy makers envisioned to use the tool.
- In order to ensure a realistic representation of the decision making entities (the households) in the social simulator, as mentioned before, its setup will be grounded on empirical data collected by interviews and an online questionnaire.
- The social simulator component must not depend on third-party components that incur additional costs and will be developed using open source tools.
- The social simulator software should be platform independent.

As the functional requirements, the non-functional requirements will be put up for testing by presenting a prototype of the simulator to its various stakeholder groups.

3.4 Opinion mining component

In accordance with the description of the opinion mining component we derive the following main requirements of this software component.

3.4.1 Functional Requirements

- The main outcome of the opinion mining component is a set of sentiment scores for a pre-defined set of topics. These scores are obtained through time, i.e. they are in

effect a time series, allowing to observe, visualize and analyse their tendency along time.
- The opinion mining component should be able to classify new documents concerning the expressed sentiment regarding a set of pre-defined topics.
- The opinion mining component must be able to aggregate the classifications of new text documents into an overall sentiment concerning the topics, on a certain time scale (e.g. weekly, daily, etc.).
- The opinion mining component should be able to accept as input a set of topics of interest for sentiment analysis, together with a set of e-participation web sites from which text messages will be crawled.

The opinion mining component has as central feature of its functionality the development of a set of models that are able to classify documents concerning the opinion on a set of predefined topics. This prediction task can be evaluated in terms of their accuracy. We will use standard evaluation methodologies for predictive models to obtain statistically significant measures of the accuracy of these models. Using the available pre-classified documents we will use cross validation to obtain reliable estimates of the accuracy of the models.

Another key part is the module that is responsible for fetching, at the given web sources, documents that are relevant to the selected topics of interest. This is a classical information retrieval task and will be evaluated using again standard methodologies and metrics, like for instance the precision and recall of the module.

Finally, the software in itself can be evaluated from the point of view of its usability in terms of being able to present the user with the correct and useful information she/he is looking for. This will be evaluated using a set of voluntary users that will put the software to test and will provide feedback on its usability.

If the number of functional requirements implemented is lower or equal to 60% of the requirements mentioned above, then the component evaluation has to be considered unsatisfactory. If this number is between 60 and 80%, the evaluation has to be considered sufficient, while if the number is higher than 80% the evaluation is successful.

3.4.2 Non Functional Requirements

- The opinion mining component should be implemented using only free software.
- The opinion mining component should be easy to adapt to new domains.
- The opinion mining component should facilitate the extension of the set of topics and/or web sites.
- The opinion mining component should provide easy ways of exploring the tendency of the sentiment scores and should also provide means to drill down these scores up to the actual messages that lead to the scores.

The non functional requirements of the opinion mining component are essentially facilities that the software should provide to the user. Once again these facilities can be

evaluated using a pool of voluntary users that can provide feedback on the usability of the system in terms of these extra functionalities.

If the number of functional requirements implemented is lower or equal to 60% of the requirements mentioned above, then the component evaluation has to be considered unsatisfactory. If this number is between 60 and 80%, the evaluation has to be considered sufficient, while if the number is higher than 80% the evaluation is successful.

3.5 Visualization component

Goal of the visualization component is to provide an intuitive access to the technical components of the ePolicy project. The three visual interfaces - one for the global optimizer, one for the social simulator, and one for the opinion mining component - will be evaluated regarding their usefulness and their usability. These evaluation criteria can be divided into functional (does the visual interface fulfill the requirements of the user?) and non-functional (is the interaction design and the visual encodings usable for the user?) requirements respectively.

3.5.1 Functional Requirements

The functional requirements of the visualization component are directly connected to the functional requirements of the three mentioned technical components. Mainly, the visual interfaces have to provide access to these technical components in two ways. Firstly, the users should be enabled to visual-interactively define input parameters for each component. Secondly, the users should be enabled to view the output data of the technical components and analyze this data. In order to evaluate these criteria first of all a requirement analysis for the visual interfaces is conducted. This is realized via a user questionnaire. Based on these requirements a task completion test is designed. In this test the users have to solve specified tasks with the implemented visual interfaces that cover the functional requirements on the visual interfaces. If these tasks are completed successfully with an average rate of over 70% the functional requirements are met.

3.5.2 Non Functional Requirements

Non-functional requirements on the visualization component concern the visual encodings and the interaction designs. In order to test these features, a questionnaire for each visual interface is designed. In these questionnaires the users are asked whether they understand the visual designs and whether they intuitively know how to use the interfaces. Moreover, the users are enabled to give informal feedback on the designs regarding a possible improvement of the visualization component. If an average rate of over 70% approve the usability of the visualization component regarding its visual encodings and interaction design, the non-functional requirements of the visualization component are met.

3.6 Software architecture

All the software components described in the previous sections will be integrated in a framework, providing the e-Policy users (i.e., policy makers and domain experts) a complete and comprehensive suite of tools supporting the decision making process. The aim of the overall software architecture is to allow the single components to interact with each other and to exchange data properly, as well as to support them with common tasks.

3.6.1 Functional Requirements

The main functional requirement of the architecture is to provide a new, comprehensive integration model where the single components will contribute to a suite of added-value services aimed at the policy maker and the domain expert. Beside a new, innovative integration model, the software architecture will provide also a framework with a number of software facilities already implemented for the easy of the integration. In particular:

- User authentication: depending on the their profile, users might be required to authenticate in order to access the software components, or part of their functionalities.
- Support an Access Control List method to users/roles and components/functionalities: depending on the played role, the users might access different components and functionalities.
- Provide a web-based access to the components.
- Support users' "work sessions" distributed over time and geographical locations: the process of defining a regional plan might require many iterations through various steps, and might require several days to complete.
- Provide data persistence facilities: users and components might need to save (and possibly retrieve later) partial/complete computation results and plans, to inspect them and possibly to reuse.

The successful implementation of these functional requirements will be evaluated primarily by two means: (a) by providing a detailed and update list of implemented functionalities at the end of the project; and (b) by extensively testing these functionalities when sharing the components with stakeholders and other involved users. To this end, test cases, questionnaires and interviews already planned for the single components will include also a part devoted to the evaluation of the support provided by the overall architecture. The design and the implementation of the software architecture will be considered as successful if the main requirement of a new integration model will be achieved, and if at least four out of the five requirements about support services will be implemented and made available to the single components.

3.6.2 Non Functional Requirements

Among the non-functional requirements envisaged for the overall architecture, we will consider the following aspects and relative evaluation means:

- Scalability, performance and efficiency: similarly to the evaluation of the single components, a number of tests is planned after the release of the overall prototype (expected at month at month 32, D8.2), and the results will be documented in the Deliverable D8.3 (Month 36). Existing data from the previous RER regional plans as

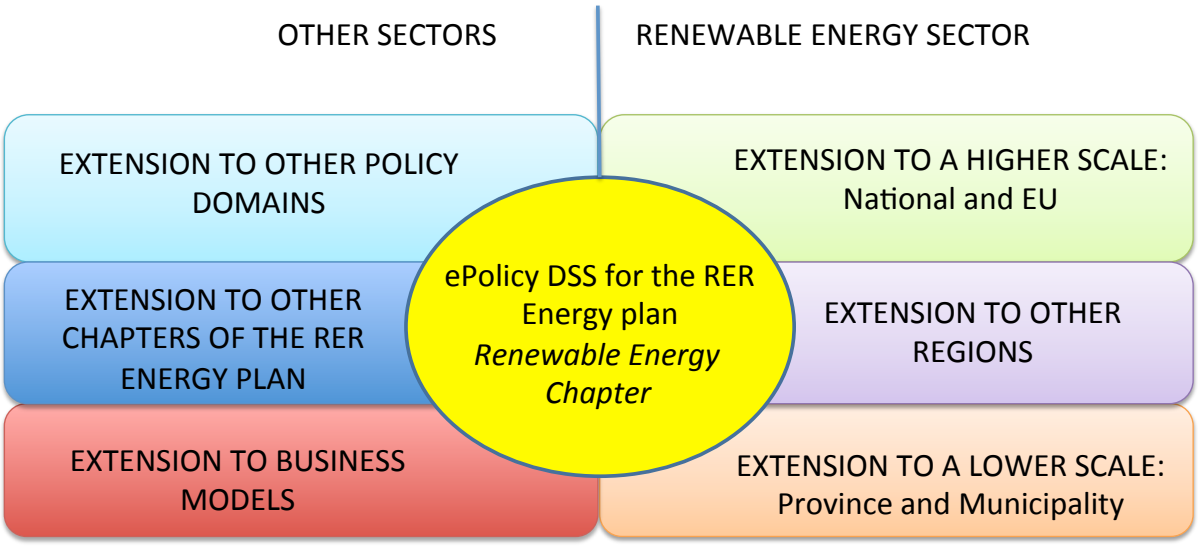

Figure 1: Possible extensions to the ePolicy DSS

well synthetic data will be used to stress the architecture running on a standard hardware.

- Accuracy, precision and reconfigurability will be evaluated by means of test cases and questionnaires provided to the policy makers and stakeholders involved in the evaluation process.
- Cost of development and time of development: these figures will be extracted by the project time sheets measuring the time and the cost exposed for these activities.

4 Evaluation of the methodology

In the Exploitation plan, six possible opportunities for extending the DSS have already been identified. Three of these are focused on the same ePolicy domain - i.e. renewable energy sources - while the other three look towards other policy areas. These are illustrated in figure 1.

For the renewable energy policy sector Figure 1 indicates the following possible areas as those into which ePolicy could be extended:

- To a higher level, i.e. national and EU
- To other regions
- To a lower level, i.e. province and municipality or similar

For other policy areas ePolicy could be extended as follows:-

- To other sections of the ER energy plan
- To regional plans covering other policy areas
- To other business models

Clearly, some extensions could be combined. For example, other chapters of the energy plan, say the part dealing with energy efficiency but at the national level. Another example could be municipal plans for transport.

For each of these extensions, we will identify one stakeholder to involve in the methodology evaluation. Basically, we will identify which parts of the system should be changed or extended for coping with the extension, and this methodology will be evaluated by the stakeholder, with an interview. We will consider the evaluation of the methodology successfull if the methodology for at least four of the six extensions is considered appropriate by the stakeholders.

This evaluation will be contained in the last Activity report of the project.

5 Dissemination and Exploitation evaluation

5.1 Dissemination

Dissemination activities include the setting up and maintenance of the project website, the activities of the Advisory and Dissemination Board, and publication activity such as articles, conference presentations and other dissemination methods. A number of indicators are being and will continue to be used to evaluate, monitor and report on these activities. These are described below:

Project Website

- Average monthly number of visits to the website over the last 12 months (i.e. the total number of visits to the website including repeated visits by the same individual)
- Average number of pages viewed per visit over the last 12 months

We would expect these numbers to increase during the three years of the project. If they decrease, the evaluation is considered not successful, if they increase, instead, the project website successfully achieves its role.

Open Workshops/Sessions in conferences/events for stakeholders

- Number held, the DOW suggests we will organize three so three is successful, 2 is medium and 1 unsatisfactory.
- Attendance numbers at each event, we expect to have 20 participants per event.

Publications A record of all publications, conference presentations, and other dissemination activities is being maintained throughout the life of the project. This can be used to report the following

- Number of journal articles published: the DOW specifies at least 4 scientific and 8 technical papers during the project lifetime as a minimum success criteria.
- Number of conference presentations made: we aim at having 25 by the end of the project.
- Number of other dissemination activities: we aim at having 10 of them in total.

5.2 Exploitation and Stakeholder involvement

Within the overall project plan it was originally intended that an exploitation plan based on the results of the work of the consortium (Plan for Using and Disseminating Foreground (PUDF)) would be produced in month 28; i.e. towards the end of the consortium's three year work programme. However in the report on the first year review of the

project the European Commission (EC) indicated that whilst they had decided that the project should be allowed to continue, there were some minor modifications required. One of these was that an exploitation plan should be provided at the end of month 18. This plan has been completed and submitted to the Commission in line with the required timetable. The project is still intended to produce the PUDF at month 28. These plans are important vehicles for taking forward the concepts, approach and software developed in ePolicy and laying the foundation for their future exploitation. In addition the methodology for extending the project results and tools to other aspects of energy policy, to other geographical areas and to different policy domains is also vital for such future exploitation. Hence the completion of the plans and the methodology for extension represent important indicators of progress in this area.

In addition to the items mentioned above, contacts with stakeholders who expressed interest in entering individual discussions with the ePolicy team regarding the application of the decision support system, one of its constituent modules, or the visualisation techniques will be monitored, and the number of such contacts used to measure progress.

In summary, a number of indicators are being and will continue to be used to evaluate, monitor and report on exploitation and stakeholder involvement. These have been mentioned above and are described below:

- Completion and submission to the European Commission of the Month 18 Exploitation Plan
- Completion and submission to the European Commission of the Month 28 Plan for Using and Disseminating Foreground (PUDF)
- Completion of the development of the methodology for extending the project results and tools to other aspects of energy policy, to other geographical areas and to different policy domains
- Number of stakeholders entering individual discussions with the ePolicy team regarding the application of the decision support system, one of its constituent modules, or the visualisation techniques used

5.2.1 Evaluation of the participatory process

Citizens direct involvement is foreseen in the ex-post evaluation phase, i.e. to evaluate the set of scenarios identified by the optimization component. Having a set of scenarios, e-participation tools will be used to retrieve the attitude of citizens toward these scenarios, indicating which solution is better perceived.

The e-participation tools used are those provided by Emilia-Romagna Region through the **Io Partecipo+** service, evolution of the former **Io Partecipo** initiative (see D9.1). **Io Partecipo+** will particularly focus on accessibility with a new interface and will integrate a single sign on option with the most widespread and popular social media such as Facebook and Twitter.

The assessment of e-participation process will occur in 3 phases.

1. Quantitative analysis. A proper set of indicators will be defined to measure *how much* the e-participation process have been successful in terms of information delivered and level of involvement and impact. Specific indicators that will be used are:
   - Number of citizens involved;
   - Number of user generated content:
     - Number of opinions expressed;
     - Number of posts in forums;
     - Number of related post in social networks;
     - Number of shared news in social networks;
     - Number of *likes* on Facebook;
   - Frequency of citizens contributions (eg. posts/contributions per day);
   - Number of users of each website section dedicated to the process;
   - Analysis of percentage of active users which operate on the website.

   Specific focus will be put on the analysis of the profiles of the citizens involved to identify both the level of expertise of citizens about the topics dealt and how many of the participating citizens can be classified as *influencer* on the base of their web activity. The level of expertise of users could be measured on the basis of the information that can be provided by the user completing the *profile section* in the IoPartecipo+ website. Instead, concerning the measure of *influence*, today several instruments are available on the web to proper measure the influence of people on social networks: as an example instruments like Klout (http://klout.com/) can provide an *influencer score*, which could be used to measure the impact on the participation process of influencer participants.
2. Qualitative analysis: questionnaire/polls. Specific survey will be delivered to a restricted number of citizens, in order to measure how the participation process has been perceived. The test will focus on four main axes:
   - Usability of the Tools /Technologies deployed;
   - Appropriateness, Appeal, Attractiveness of the participation processes;
   - Interest, Perceived Importance of topics discussed;
   - Perceived Impact on the policies addressed.
3. Self-Assessment: SWOT analysis. Once the results of qualitative and quantitative analysis will be available, a self-assessment phase will be carried out, identifying Strengths, Weaknesses, Opportunities, and Threats of the participation process implemented.

6 Management Evaluation

In the deliverable D1.4 we have identified a number of indicators that measure the quality of the project management. These indicators have been extracted from the management guidelines, and cover all aspects of the management activity. In particular, we have three indicators for the coordinator activity measuring her efficiency in communicating the administrative matters, the timely delivery of project documents and deliverables to the European Commission and the participation to project meetings. Then we have three

indicators measuring the activity of the Scientific and Management Board. In particular, the number of meetings, the promptness in informing the project coordinator about changes in the workplan and in the administrative matters are considered. In addition, we have two indicators measuring the quality of the activity of WP leaders, considering the exchange of information between WP leaders and the coordinator and WP leader and the participants to the WP.

Two indicators then measure the project meetings participation and the way dates are decided, other four indicators measure the deliverables and progress reports, their timely delivery, and the internal procedure for circulating the material.

Finally we have three indicators on the quality of the dissemination of project results.

This evaluation is contained in D1.4 for the first year, in D1.6 for the second and in D1.7 for the third year.