ePolicy

Engineering the Policy–making Life Cycle

Evaluation of the integrated decision support system on the regional energy plan

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ABSTRACT

The purpose of this document is to evaluate the ePolicy Decision Support System (DSS) platform developed as part of the ePolicy project. The DSS is currently focussed on the project's case study which covers aspects of the regional energy plan of the Emilia-Romagna region. The software is evaluated both through comparison with the functional requirements listed and described in Deliverable D8.2, and through various external user testing activities.

As well as evaluation of the DSS itself, this document includes evaluation of other areas of the ePolicy project including the eParticipation process that was used to support and facilitate stakeholder consultation and collaboration. Additionally, this document evaluates the plans and activities that have so far been developed or undertaken regarding the exploitation of the results of the project.

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Executive Summary

The purpose of this document is to evaluate the ePolicy Decision Support System (DSS) platform developed as part of the ePolicy project. The DSS is currently focussed on the project's case study which covers aspects of the regional energy plan of the Emilia-Romagna region. The software is evaluated both through comparison with the functional requirements listed and described in Deliverable D8.2, and through various external user testing activities.

As well as evaluation of the DSS itself, this document includes evaluation of other areas of the ePolicy project including the eParticipation process that was used to support and facilitate stakeholder consultation and collaboration. Additionally, this document evaluates the plans and activities that have so far been developed or undertaken regarding the exploitation of the results of the project including the software and tools themselves as well as the associated knowledge and capabilities that have been built up within.

Evaluation of the eParticipation Process

Concerning eParticipation, two consultation paths have been followed. The first of these is the joint design by the Emilia-Romagna region and relevant stakeholders of the ioPartecipo+ portal, which is the online portal developed for the purpose of public and stakeholder consultation. The second consultation path is in regard to the Emilia-Romagna Regional operational program on the Green Economy. These two consultation paths represent two actual examples of ex-ante policy evaluation.

These two paths represented the first application of stakeholder engagement to public policy in the region using a mix of offline and online tools. Generally this has been given a positive response by stakeholders and participants involved.

The evaluation of the two paths was performed through two activities: online surveys (available on the web portal ioPartecipo+) and interviews.

The online evaluation of the eParticipation consultation processes was performed via a dedicated online questionnaire, available on the web portal ioPartecipo+. The questionnaire was designed to provide feedback on 12 quality criteria (see page 17).

In general, the feedback received about each of these criteria were very positive. Best feedbacks were received for the accessibility of the tool and its usability with 86% and 80% of users assigning a rating of "good" or "fair". In addition, the participation process was followed by an offline element, which further explored the two themes with the stakeholder. Also the "Offline follow-up" was very much appreciated with a 81% of "good" answers.

The offline consultation path involved interviews with a selected group of stakeholders from different sectors. Generally, the feedback from this path was positive, in terms of utility, method and structure although some issues were identified: in particular, it was noted that the following information could have been provided by the platform:

- The way in which the stakeholder comments were used

- The content of the resulting policy
- A measure of the results compared to the objectives

In general all participants confirmed the value of a mixture of online and off-line instruments for consultation. Online participation allowed the consultation process to reach the widest number of participants, while offline participation provided more focused and deeper insights.

Evaluation of the ePolicy Software Platform
For the evaluation of the ePolicy software platform, several steps have been performed.

During the project life-time, the system components, their beta versions and subsequent developments have been intensively tested both by developers (during ePolicy system design) and at a later stage by the Emilia-Romagna region (RER) and the Advisory and Dissemination board members.

When all components of the ePolicy Decision Support System were complete it was evaluated using two different test procedures - namely **Deep Testing** and **High Level Testing**, each procedure being undertaken in two test sessions. Deep Testing consisted of a task completion test followed by a usability questionnaire to allow participants to give qualitative feedback. The task completion test was conducted in a generally unsupervised environment in order to enable the participants to perform the tests without being influenced, therefore giving credible feedback. Where support was given, in order to allow the user to be able to complete the test, they were asked to note this on their feedback form. The High Level Testing consisted of a demonstration of the ePolicy software carried out by a project partner, followed by a short questionnaire completed by the user.

All test sessions were successful and the evaluation results were very positive. During Deep Testing around 83% of the participants were able to solve the tasks without any help and nearly all participants stated that the system would be useful to support decision making. In the High Level Testing 89% of the testers considered the ePolicy system useful for policy makers and 64% considered the interface easy to use.

Several comments and suggestions for improvements to the ePolicy system were also collected during high level testing, such as the importance of promoting the use of the system to public administrators and policy makers, to both encourage and enable them to make good use of it. Another suggestion was to extend the ePolicy system to lower scales (such as provinces and municipalities) or to other domains (health, mobility, urban refurbishment and green policies). It is worth mentioning that these latter suggestions have already been addressed and considered as possible exploitation of the ePolicy system. In addition to these comments, the users were requested to identify systems similar to the ePolicy platform which are already available as products or as project results.

The evaluation of the software platform is concluded with the reporting of measurement of the indicators specified in D9.2 (see tables at page 32).

Evaluation of the Exploitation Strategy

The exploitation of the tools and knowledge built up within the ePolicy project is considered a key part of the outcomes. One of the results of the ePolicy project is a methodology for extending the DSS and all its components to other policy areas. In particular, six possibilities have been identified to extend the system. Three of these possible areas for extension refer to the same policy area (namely that of renewable energy) but focused on either larger (such as National and EU plans) or smaller (provincial and municipality) scales or the same scale but for other regions. The other three extensions concern other policy areas: i.e. planning on different policies (transportation, agricultural, or for distributing Structural Funds through the operative plan); planning on other parts of the regional energy plan (e.g. Energy efficiency); and finally to the private sector, for example for product design, manufacturing and marketing decisions, business models and practices and pricing strategies.

Exploitation strategies have been explored both for the whole system and for each component, specifying in particular for each component the specific strategies related to the six area listed above and an evaluation of the effort needed.

In order to support exploitation, a wide variety of dissemination activities were undertaken by the team. The aim was partly to reach out to potential partners and clients who may be interested in the results of the project.

A number of activities have been undertaken to explore potential exploitation areas, and this is set to continue beyond the end of the project. These include:

- Exploitation within Emilia-Romagna Region
- Exploitation within Piemonte Region
- Potential modelling of UK household adoption of PV solar panels
- Potential application of the System for Business Models
- Emilia-Romagna Regional Operational Programme (POR)
- Discussions about potential applications within the Scottish Government
- Application of the system with ARPA on the allocation of structural funds
- Application of the Environmental Assessment aspects of the ePolicy tool to production processes

1 Introduction

The purpose of this document is to evaluate the ePolicy Decision Support System (DSS) platform developed as part of the ePolicy project. The DSS is currently focussed on the project's case study which covers aspects of the regional energy plan of the Emilia-Romagna region.

This document is split into three further parts:

- **Section** 2 describes two eparticipation activities carried out by Emilia-Romagna Region, specifying strategies for user engagement, instruments used. An evaluation of the activities is also included.
- **Sections** 3 **and** 4 describe the methodology and process followed for testing the different components and in order to gain the engagement of testers. The results together with an analysis of the results are reported in **Section** 5. This includes the reporting of measurement of the indicators specified in D9.2 (given in Section 5.3).
- Finally, **Section** 6 describes the strategy used for exploitation of the tool, and the associated knowledge and capability that has been built up. This describes in detail the potential for extension to different applications, and indicates the estimated effort needed to adapt each software component.

2 eParticipation - Test Methodology and Results

2.1 Background

The use of stakeholder involvement and engagement practices as part of the ePolicy project has been undertaken by two sets of consultation activities and the facilitation of joint design work, started by the Emilia-Romagna Region, between 2013 and 2014.

The first set of activities consisted of the joint design of a dedicated online consultation portal, named "ioPartecipo+". This was aimed at providing a permanent consultation tool to support decision-making processes related to sector policies and formed an aspect of the application of the Regional Law of Participation 3/2010.

The second set of activities involved consultation concerning the planning and definition of the future regional operational programs (ROP) funded by European Regional Development Funds (ERDF) – focused on growth and employment in the 2014 to 2020 period, and in particular on the Green Economy.

Figures 1 and 2 are diagrams which outline the design of the consultation methods used for "ioPartecipo+" and the allocation of the ROP funds respectively.

2.2 Methods for Stakeholder Input

ioPartecipo+ portal participatory process

During the early stages of the development of the ioPartecipo+ web portal, various stakeholders were involved through a joint design approach called "Let's create together ioPartecipo+". This supported the development of the tool from initial concept, through the identification of the characteristics of the structure that was needed for user-friendly accessibility, to the implementation and evaluation of the first few months of use.

The consultation period was the first half of 2013, with a preparatory phase of internal work from October to December 2012 and an evaluation phase at the beginning of 2014.

To carry out the consultation and joint design work, two different levels of participatory interaction were used. Firstly listening/dialogue, and then proposal and joint design work. These included the following activities:

- Focus groups – undertaking joint design work with targeted stakeholders
- Informal meetings
- On-line comments through the Beta Portal
- Other participation channels – including other functions of the Portal, and other RER projects
- Social Networks

Green economy participatory process

The green economy is one of the cornerstones of the program of the European Fund for Regional Development 2014-2020.

Emilia-Romagna has shared with the regional community, priorities and opportunities related to it, particularly regarding the role of public policy. For the new planning process, a process of public consultation has been carried out, which ran from 17th September to 15th December 2013.

The participatory process involved various multi-stakeholder public debate events, including both live and on-line events, with different dedicated tools:

- Multi-stakeholder focus groups
- Creative workshop with World Café method[1]
- Online discussion using ioPartecipo+ Portal, which was used both during the process and after for assessment

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[1] the World Café methodology is a simple, effective, and flexible format for hosting large group dialogue. Details available at http://www.theworldcafe.com/method.html
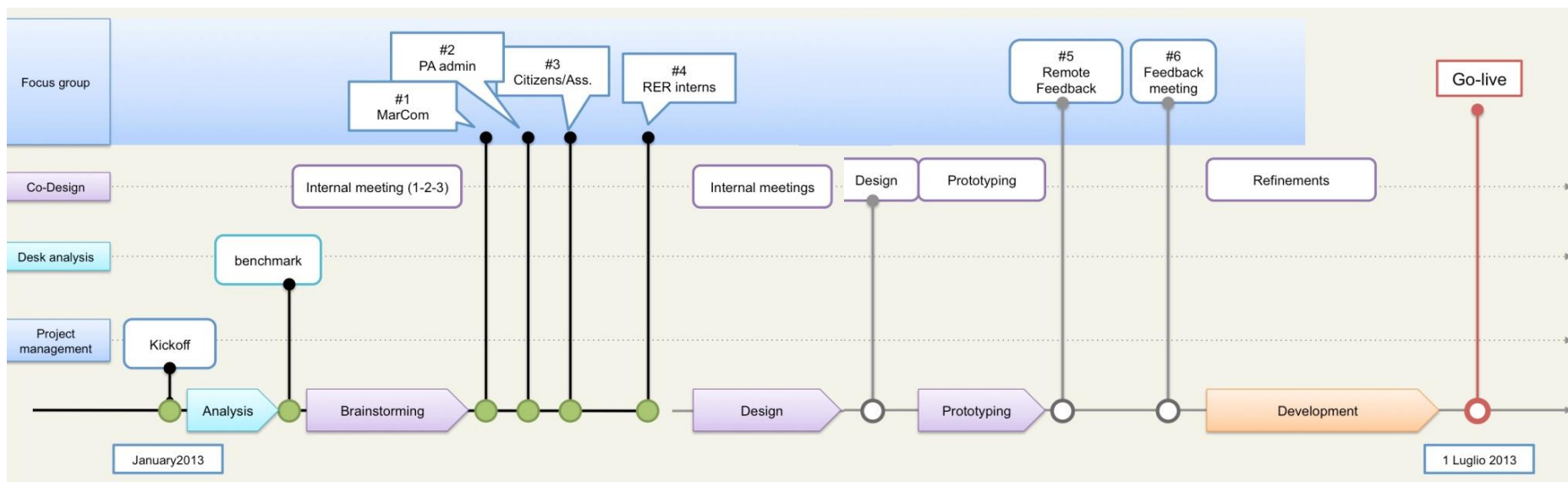
Figure 1 - Structure of the participation process used for the "ioPartecipo+" website co-designed with stakeholders
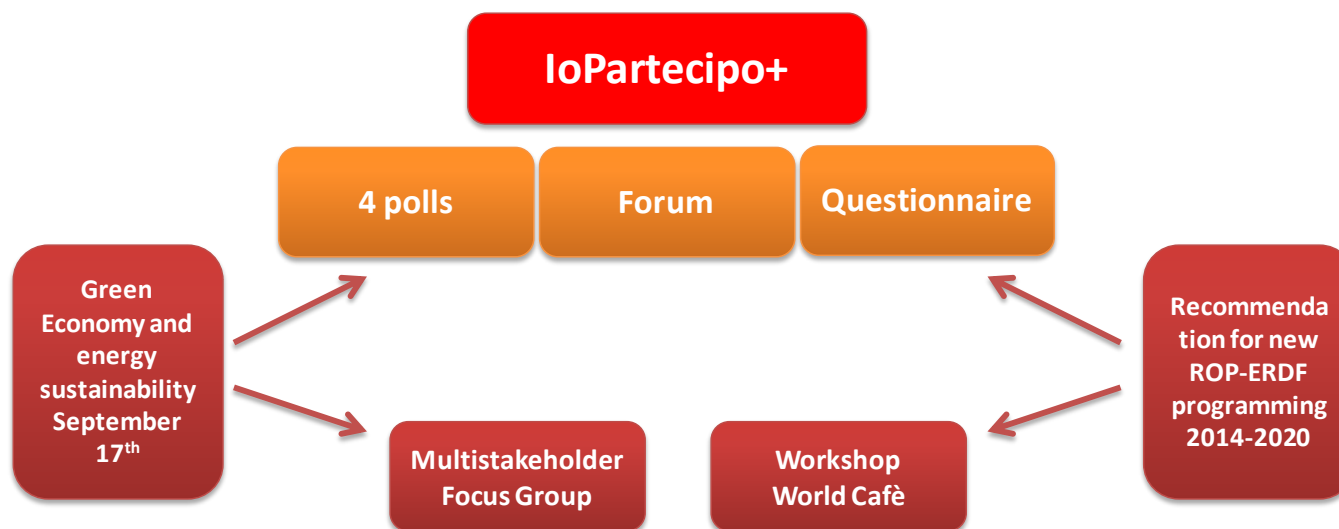
Figure 2 - Structure of the on-line and off-line participation process used for Green economy

2.3 Tools to Support Consultation

In order to plan the consultation and involvement of various stakeholders within the two participatory processes described above, the Communications Service of the Emilia-Romagna Region has produced the following on-line channels:

- Website: RER partecipazione: http://partecipazione.regione.emilia-romagna.it/
- Online newsletter and e-mail:
  - http://partecipazione.regione.emilia-romagna.it/newsletter/archivio-newsletter;
  - http://partecipazione.regione.emilia-romagna.it/newsletter
- Twitter: https://twitter.com/ioPartecipoPlus
- Facebook: https://it-it.facebook.com/iopartecipo
- Slideshare: http://www.slideshare.net/iopartecipo

Specifically to promote "Green Economy Consultation", a communication plan has been developed, managed by an external company, with numerous channels of promotion and information including in addition to those mentioned above:

- Promotion on national and regional newspapers
- Campaign spot on the radio
- ROP's dedicated website and various channels
- Online banner
- Leaflet
- Reports

2.3.1 Offline Consultation Tools

The off-line consultation tools used in the two participatory processes described above are listed in the table below.

ioPartecipo+ web portal participatory process	ROP-ERDF Green Economy participatory process
Four multi- stakeholder focus group meetings	One multi–stakeholder information forum
	One multi–stakeholder focus group meeting
	One multi–stakeholder creative workshop managed using the world café method

ioPartecipo+ portal participatory process

For the participatory and joint design process of the ioPartecipo+ portal, four focus groups were organised, each one involving a specific category of stakeholders. In total 35 stakeholders were involved, representing:

- Communicators in various sectors,
- Directors of public entities on a regional scale;

- Voluntary associations / non-profits and citizens' committees
- Regional officials working in various departments of RER

The consultation period was held from February to May 2013.

During the focus groups, the discussion was focussed on different issues to gather suggestions and proposals from the point of view of the "users", in order to jointly design or, in other words, co-design a user-friendly portal.

The topics of discussion were the following:

- Expectation levels regarding online participation for public policies,
- Accessibility of online services
- Structure of the content
- Online levels of participation from the point of view of the user
- Levels of required information
- Consultation times
- Feedback levels and models
- Mix of tools to use

Following the feedback gathered at the focus groups, several tests were carried out involving some of the participants, in order to refine the functionality of the portal.

Green economy participatory process
The off-line consultation events for the Green Economy and Sustainable Energy Axis have included many different activities, various information channels and multi-stakeholder consultation:

- Opening Conference - "A Green deal to boost Emilia-Romagna", on the September 17th 2013 with 230 participants;
- Multi-stakeholder technical focus group, held on the October 22nd 2013, with eight representatives from various sectors and industries.
- World cafe at Ecomondo Exhibition - a public discussion meeting held on November 8th 2013, to gather improvements suggestions such as an informal "discussion circle" on green issues, aimed at a wider audience of stakeholders, which was attended by thirty participants from the following organisations - AESS Modena, Building Local Community, Labservice Analytica, ASQ, INBAR, Anima Mundi Cooperative, Self Employed worker, Bologna Province, Emilia-Romagna Region, Antonioli Ltd., CNA Modena, Emilia-Romagna Cittadinanzattiva, SECI Real Estate, Serint Group Italy Srl, MEC SYSTEM Srl, Rimini City Centre, Antarctica, Fin Project srl, Geetit Ltd.

2.3.2 Online Consultation Tools

The online consultation tools used in the two participatory processes described above are listed in the table below.

ioPartecipo+ web portal participatory process	ROP-ERDF Green economy participatory process
Virtual square[2] for the development and the improvement of the services web site • Online forums and blogs • Online pools Social Networks: • Facebook • Twitter	Virtual squares for the discussion about the Green Economy • Online forums • Dedicated questionnaires • Online pools. Social Networks: • Facebook • Twitter

ioPartecipo+ portal participatory process

For the consultation for the development of the web portal, the off-line participatory events described above were used in conjunction with a range of online collaboration channels.

These channels were used also during the development of the portal, in order to continuously evaluate and monitor requirements relating to accessibility, usability, structure and graphics.

The invitation to use the prototype was sent to approximately 100 users. In total, more than 150 feed-back/comments have been received, with 30 unique comments and 25 completed questionnaires. Overall, more than 80% of comments were positive.

The co-design activity to create a web site with shared services for participation is still on-going , and is now a continuous consultation with users.

As well as this co-design activity, the collection of feedback and the ongoing dialogue with stakeholders took place offline (particularly with the regional group and the internal users of the platform) and online on the dedicated virtual square "Let's create together ioPartecipo+" (http://partecipazione.regione.emilia-romagna.it/iopartecipo/politiche-partecipate-in-emilia-romagna/creiamo-insieme-iopartecipo)

The square "Let's create together ioPartecipo+" was hosted on the web service platform, between July and December 2013. It has had 1237 views, of which 863 were unique.

The levels of participation to date on the activated online channels are shown below.

Instrument	Nr. of Activities Launched	Participation Level
Blog	6 posts	0 comments
Forum	2 discussions	10 completed questionnaires
Pools	1 pool	37 people voting

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[2] A virtual square is one of the discussion topics on the ioPartecipo+ portal, which can make available a set of instruments (e.g. poll, forum, survey, questionnaire, etc…) and documents (texts and multimedia contents)

The question aimed at the pool was very simple and direct: "Do you like ioPartecipo+?" In response, 49% of participants were very satisfied with the new web site and 42% were fairly satisfied.

Green economy participatory process

The green economy square, hosted by ioPartecipo+, had 5649 views, of which 3913 were unique views within the active period.

The levels of participation to date on the activated online channels are shown below.

Instrument	Nr. of Activities Launched	Participation Level
Forums	8 discussions	12 comments
Questionnaire	1 questionnaire	73 completed questionnaires
Pools	4 pools	183 people voting

The stakeholders who participated through online tools included individuals from local authorities, associations, and financial institutions, as well as also entrepreneurs, professionals and citizens.

Respondents to the questionnaire were mostly professionals (39%), but also public institutions were well represented (19%) and businesses (16%) too. Only one participant from a trade association responded, and there was no response from credit institutions.

The number of people who responded to the available surveys gives an indication about the interest in the main topics.

- Green economy and Regional Development (136 votes, 72 people)
- Green economy and business competitiveness (87 votes, 48 people)
- Internationalisation of green companies and supply chains (42 votes, 23 people)
- Green economy and ICT (74 votes, 40 people)

Figure 3 below shows the proportions of each source of incoming users to the Green Economy virtual square.
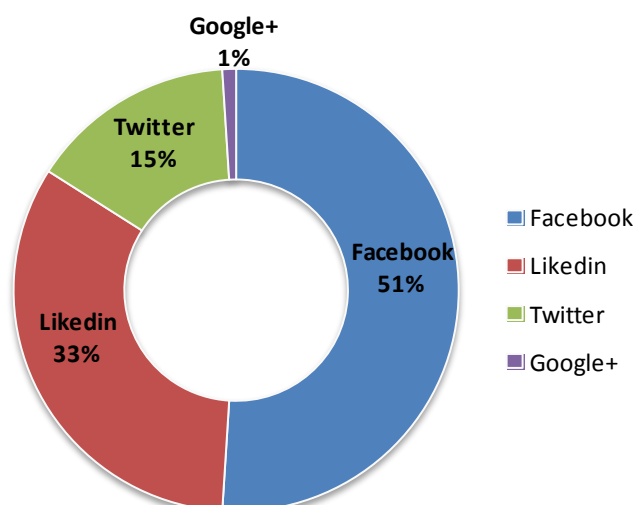
Figure 3 - Sources of incoming users to Green Economy virtual square

2.4 Evaluation of the Consultation Paths

For the two participatory processes described, the consultation process has enabled opinions to be collected in respect of not only the joint or co-designing process and ongoing collaboration, but also on the process of evaluation itself.

It should be highlighted that the sample of respondents was limited (15 participants for the online survey and 5 for live interviews). The process involved participants from various districts, and not all of respondents involved took part in both consultation paths.

The consultation for the evaluation was carried out from March to April 2014, through two activities; online surveys and interviews, which are described below.

2.4.1 Online survey evaluation (online survey and off line follow-up)

The online evaluation was performed via a dedicated online questionnaire available on the web portal ioPartecipo+. The invitation to evaluate was sent by email to the individuals involved in the previous consultation. There were 15 participants involved in the online evaluation, mainly experts in communication, project managers, and representatives of public agencies.

The on-line assessment questionnaire was structured on 12 quality criteria:

1. Type of participation instruments offered
2. Accessibility
3. Usability
4. Quality of online tools
5. Quality of offline tools
6. Online discussion content,
7. Offline discussion content,
8. Online follow-up,
9. Offline follow-up,
10. Opening support information,
11. Final feedback information
12. Favourite tools

In general, the opinions of the online participants about the various criteria were positive. A summary of the results can be seen in the table and chart below, and more detailed results are also discussed below.

Quality Criteria	Good	Fair	Sufficient	Poor
Type of participation instruments offered	63%	19%	13%	6%
Accessibility	53%	33%	7%	7%
Usability	47%	33%	13%	7%
Quality of online tools	67%	13%	13%	7%
Quality of offline tools	56%	25%	13%	6%
Online discussion content,	25%	31%	38%	6%
Offline discussion content,	44%	44%	6%	6%
Online follow-up,	57%	14%	21%	7%
Offline follow-up,	31%	50%	6%	13%
Opening support information,	56%	13%	19%	13%
Final feedback information	36%	29%	29%	7%

Table 1 - Opinions collected with the on line survey
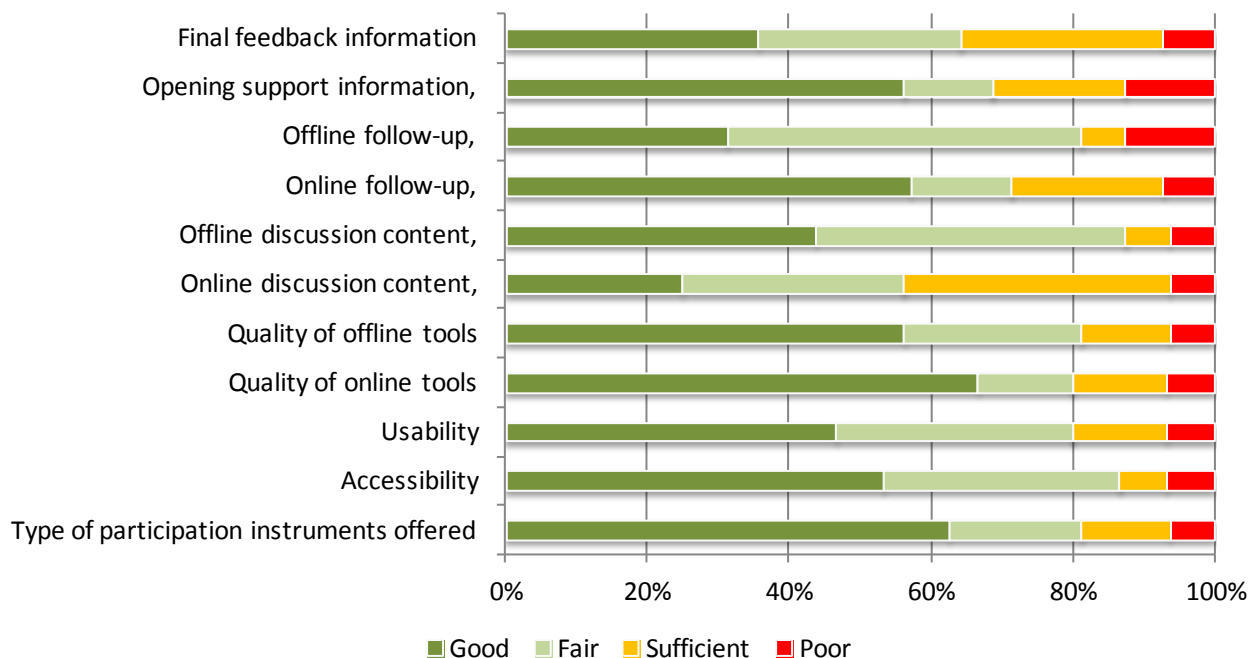
Figure 4 - Chart of the opinions collected with the on line survey

70% of the respondents preferred a mix of both online and off-line approaches. Offline interviews revealed that many suggestions have been incorporated in the final construction of the portal. Some respondents indicated that they feel that the portal is generally good and well-built, but point out some problems of "bounces", i.e. the lack of smoothness in accessing different parts of the site. According to one respondent, documents are not always available for download and this can create confusion; it becomes difficult to know whether the document is provided in pdf format or if it is contained on a page, or even that you are being sent to another link. The suggestion is to always use the same format to publish all documents.

2.4.2 Offline interview evaluation

Face-to-face focused interviews of a selected group of stakeholders from different sectors (technical, business, not-for-profit, and government control) were held, for evaluation purposes. The following cross-cutting elements featured in the results from these interviews:

- Generally, the offline path was seen as positive, in terms of utility, method and structure
- There was some concern in relation to how the feedback effectively reaches policy makers
- A final summary was missing in which information is given about contributions that have been received and the ones that have not.

Other suggestions included:

- More information in the starting phase
- Online questionnaires should be quicker for the users to answer
- Creation of a eParticipation professionals' database for the Region
- Increased visibility on the regional website homepage
- Upload videos of all offline meetings
- More offline meetings
- Organise consultations in the area outside Bologna, to give the opportunity to participate
- Make the online communication more attractive

In conclusion it should be noted that in general all participants confirmed the value of a mixture of online and off-line instruments for consultation. Online participation allowed the consultation process to reach the widest number of participants, while offline participation provided more focused and deeper insights.

2.5 Summary of eParticipation Activity Evaluation

To summarise these two paths represent the first application of stakeholder engagement to public policy in the region using a mix of offline and online tools. Generally this has been given a positive response by stakeholders and participants involved.

Several responses from participants have provided valuable support for the continuous improvement of a new generation of tools to foster greater participation, both quantitative and qualitative, from both citizens and various other stakeholders.

However, it appears that certain aspects require further technical, theoretical and targeted comparison. This can be carried out internally within the Region, as a promoter and manager of policy and engagement tools, and externally with various other stakeholders and other similar experiences, with respect to various dimensions. These aspects include:

- Management issues for offline and online tools during various stages of the life-cycle of regional policy (who, what, when, how much to use);
- Evidence of technical content and political feedback regarding the management of all stages of the policy life-cycle, in relation to the multi-stakeholder consultation (what to say, in which time, to where, use of correct terms based on the context, response times);

- Internal and external communication of the implementation of sector policies subject to consultation and its achievements against objectives;

From the two processes that have been carried out, there emerges various elements that can be summarised as strengths, weakness, opportunities and threats (see Swot Analysis on next page).

2.5.1 SWOT Analysis of the consultation tools for the on-line and off-line support to sector policies of the Region of Emilia-Romagna

Strengths	Weakness
1. Practical application of methods for offline and online participation to support regional public policies. 2. Range of stakeholders involved varied and various sectors were represented. 3. Use of new forms of consultation with dedicated technical facilitation and structured pathways: integrated pathways of focus groups, workshops, World Café, Forum combined with social networks. 4. Offline and online tools during different phases of design: design, ongoing collaboration and ex-post evaluation of the consultation events. 5. Positive feedback from participants involved when mixed consultation tools were used (offline and online). 6. Offline tools provide greater benefits and opportunities for in-depth technical and quality standards. 7. Online tools allow increased reach, and to gather answers and information in real time.	1. Lack of regional technical feedback on the comments of the participants – for example, details of the proposals that emerged from the various off-line and on-line events 2. Poor political commitment to the promotion of tools for consultation and their effective routine application 3. Poor coordination between the political-institutional consultation tools and the negotiation and consolidation of the plans. 4. Difficulties in having the right mix between the business world and private citizens in the consultation process 5. Level of information technology in the process of qualitative and quantitative feedback was lower than in the initial phase of support to the consultation. 6. For complex themes, which require specific technical competences, there are difficulties in involving the right stakeholders or citizens who have these specific competencies

Opportunities	Threat
1. Opportunities to develop management skills among the members of the services and sectors of the Region, through the process of implementing new approaches to inclusive decision-making	1. Possibility of having more consultation tools available than is actually required
2. Development of knowledge and skills in indirect participants/stakeholders with respect to the contents of regional policies	2. Lack of legitimacy of the epartecipation process unless there is feedback on the actual use of material produced during consultation
3. Greater cross-sector comparison	3. Imbalance between content and tools available
4. More suggestions for improvement from the population with respect to the policies of the Region	4. Diversity of approaches, sensitivity and commitments for new forms of participation among policy-makers and officials of the Region
5. More ideas and discussion between the stakeholders involved through the elements of exploitation	5. Conflict between existing and less innovative consultation tools with more innovative ones which are potential less relevant to policy makers
6. Concrete experimentation of the role of e-democracy tools and social networking in the definition of public policies	6. Unrealistically high expectations of the advantages of new stakeholder engagement methods and new channels of information and dialogue, when compared with the actual impact on the decision process.
7. Greater representation of stakeholders and greater inclusion of contributions from the area	7. Inconsistency between the results of the consultation processes, and the decision made by policy makers.
8. Possibility of combining participation with online and off-line access to open data sources in the region.	

3 Users Involved in Software Testing

3.1 Internal Testing on Intermediate Versions

During the project lifetime, the system components, their beta versions and subsequent developments have been tested extensively by the RER partner. In addition, other members of the Advisory and Dissemination board have been involved in testing - in particular ARPA environmental experts have provided a very important support. During this "internal" testing, valuable feedback has been received, which can be used during subsequent tests. As the testing personnel themselves are not IT experts, they were provided with support to enable them to use the system.

In addition, as the testers were involved in the project to at least some degree, it was possible to perform the testing in several steps, with several iterations, with many different component features, in order to develop an acceptable version. The testing has been a fundamental activity of ePolicy system design, and this sort of testing cannot be performed to any extent with external communities of stakeholders.

From the internal testing, the system requirements contained in D8.3 have been devised and refined, and the visual interface described in deliverable D7.1 has been structured and its evolution described in D7.3. Therefore, these tests are not reported here but have been part of the project development and contained in previous deliverables.

Within this document, the final version of the ePolicy Decision support system (containing all the ePolicy components, namely the Global Optimiser, the Social Simulator and Incentive design component and the Opinion mining tool along with the eParticipation tools presented in section 2) is evaluated.

3.2 Strategy of the Testing of the Final Version

The testing of the ePolicy DSS has been organised using the following two strategies: "**Deep Testing**" and "**High level testing**".

Deep Testing consisted of a task completion test followed by a usability questionnaire to allow participants to give qualitative feedback. The task completion test was conducted in a generally unsupervised environment in order to enable the participants to perform the tests without being influenced, therefore giving credible feedback. The participants were provided with support if they would be otherwise unable to complete the test, and asked to note within their feedback what support was given and why.

The High level testing consisted of a demonstration of the ePolicy software carried out by a project partner to a user, followed by a short questionnaire compiled by the user in order to collect feedback and opinions on the ePolicy DSS.

3.3 Deep Test User Involvement

Two testing rounds have been conducted. The first took place during the eGov Summer School at Samos in Greece on July 2014. 12 participants were involved, with an age range of 19 to 50+, and from a range of sectors. 8 participants were students in information systems-related fields, 1 was a data integration researcher, 1 civil servant, 1 IT expert and 1 person did not provide their background. 3 were female and 9 were male.

The second testing round took place with experts from PPA Energy (one of the consortium partners). The 11 participants were between 24 and 67 years old, with an average of 39. All participants had an academic background (2 BSc, 9 MSc) and all of them had a background in the energy domain. 4 females and 7 males participated.

The result of both rounds were evaluated together in order to achieve higher statistical significance. This resulted in an average age of participants of 30, all with an academic degree. 16 males and 7 females participated.

3.4 High Level Test user involvement

Two high level tests were carried out in Bologna in October 2014. The first one was performed at the end of the Bologna Workshop (Final ePolicy Conference), and the second was carried out during the 3-day Bologna Smart City Exhibition (http://www.smartcityexhibition.it/en), where a booth was devoted to the ePolicy project and a demo area was set up.

Altogether, 91 users were involved in the testing, of which 49% were policy makers or environmental experts. The remaining 51% was composed mostly by students/researchers (14%), IT engineers (10%), project managers (6%), entrepreneur/CEOs (4%) and freelance professionals (4%). 99% of participants had an average or better computer skills, of which 30% above average and 15% excellent. The age of participants ranged from 18 to 65+, with a peak in the range 35-44 (see Figure 8). In regard to the gender of participants 34% were female and 66% male.
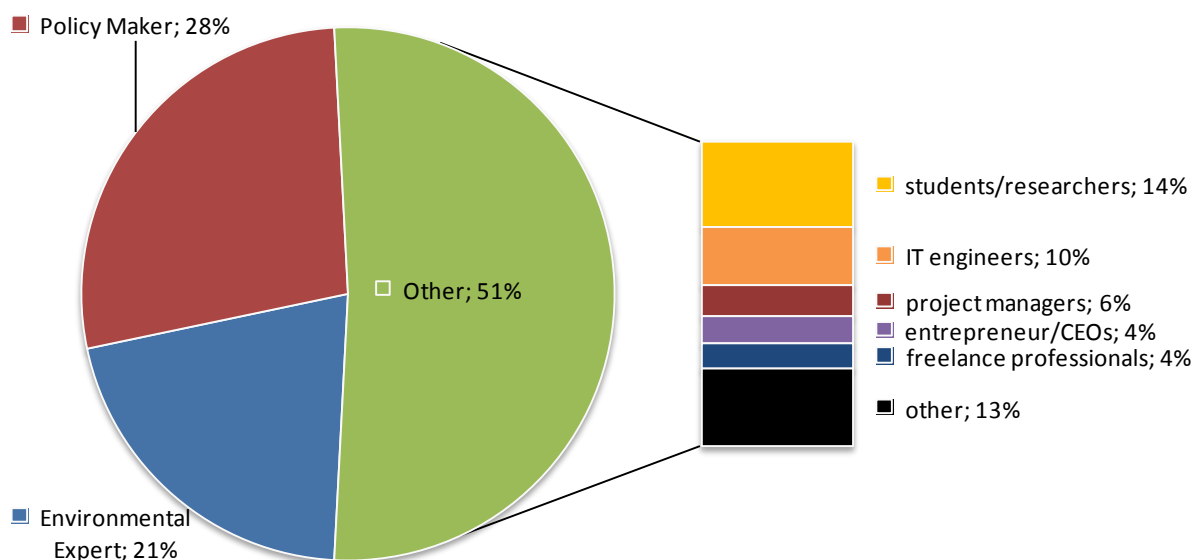
Figure 5 - Tester Demographics – Profession

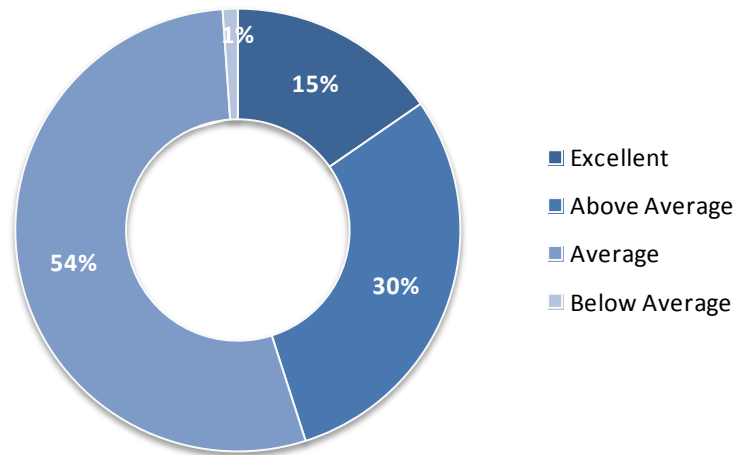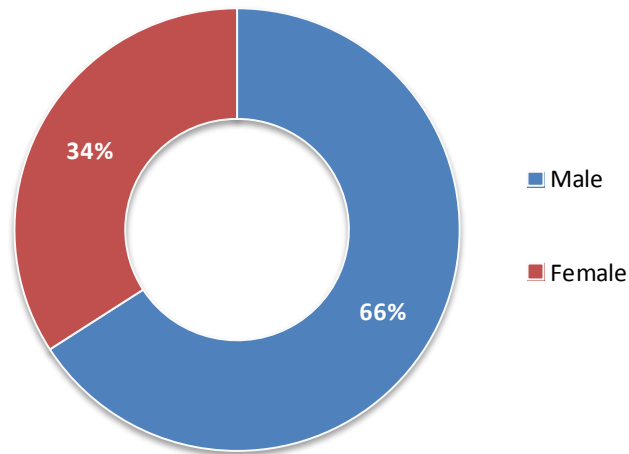**Figure 6 - Tester Demographics – Computer Skills**

- Excellent 15%
- Above Average 30%
- Average 54%
- Below Average 1%

Figure 7 - Tester Demographics –Gender
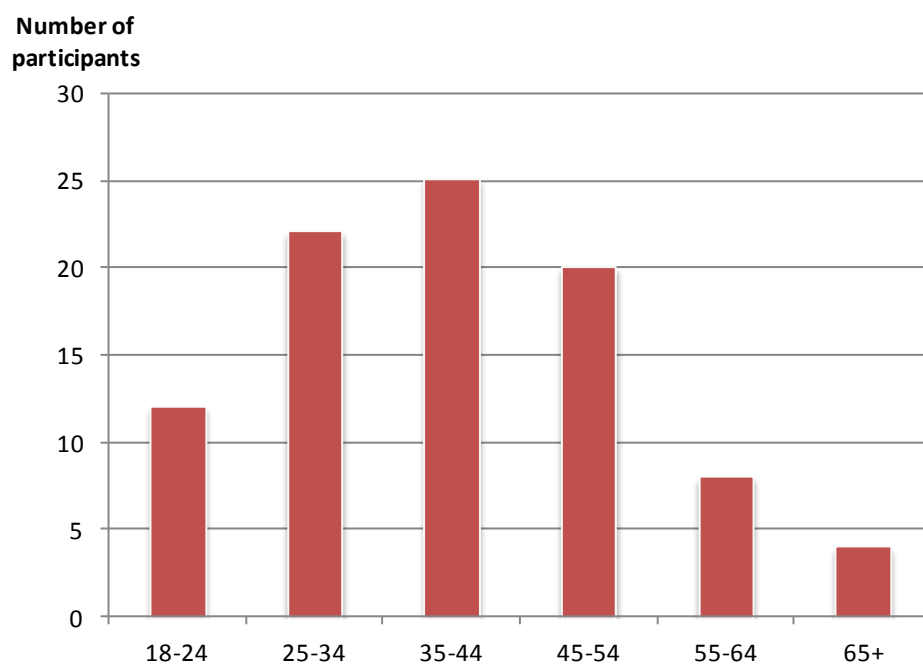
- Male 66%
- Female 34%

Figure 8 - Tester Demographics –Age Distribution

4 Methodology and Process Used for Testing Software Components

4.1 Functional Requirements Test

ePolicy requirements have been analysed and discussed as part of the software development process. In particular, in Work Package 8 (devoted to the development of the integrated framework) part of the activity has been focused on collecting requirements from policy makers, domain experts and stakeholders. The identified requirements have been discussed in Deliverable D8.2, and have been grouped into functional, non-functional and technical requirements.

In order to assess the implementation of the requirements, two different types of testing have been conducted, one at the high level of requirements, and one at the lower level of software. At a high level, the implementation of the requirements were cross-checked by the software developers involved in the project. In particular, developers involved in the integration framework checked all the requirements of the single components (including the visualisation interface), and the developers of the visualisation interface checked the achievement of the requirements of the integrated framework.

At a lower level, usual software engineering practices have been adopted to ensure the correct implementation of the components: test cases, JUnit and similar techniques have been extensively used whenever possible, and across all the components.

Functional requirements have been tested during the task completion test, included within the "Deep Testing" sessions. Specifically for each component:

- **Global optimiser**: The reasoning engine of the Global Optimiser is implemented in the ECLiPSe dialect of Prolog, and it is able to provide Pareto optimal plans with respect to one or more objective functions. The input and output parameters have been agreed upon in strict collaboration with an environmental expert, and submitted for evaluation to a policy maker in the energy field. The input data consists of the environmental matrices, minimum and maximum values for each energy source, primary/secondary activity matrices, costs per each activity, objective functions, and total energy produced (divided into electrical and thermal energy). The unit testing of ECLiPSe was extensively used to either validate results or provide updated values. The functional requirements of the Global Optimiser are listed in the requirement document, and in this document in Section 5.3.1. The functionalities required by the policy maker are listed separately to those required by the environmental expert.

- **Social Simulator and incentive design**: The social simulator has three functional requirements: (1) to realistically present the likely adoption of photovoltaic panels under chosen policy instrument settings, (2) to enable users to select and specify which of the above mentioned policy instruments they wish to model, and (3) to enable users need to choose whether they wish to view the whole Emilia-Romagna region or only sub-regions. The first requirement was met by validating the model against PV adoption estimates provided by the region. Section 5.2 of Deliverable 4.3 discusses this effort in detail. The second and third

requirements have been met; the tool is implemented in such a way that users can choose which policies and which region to simulate.

- **Opinion Mining**: Functional requirements of the Opinion Mining component have been tested within INESC, using several students within the field of Data Mining as well as junior researchers. As the outcome of the prototype was integrated within the decision support system of ePolicy, it was also involved in the several tests that were carried out of the whole. The system was also extensively tested during the many experiments that were carried out to estimate the predictive performance of the models used in the opinion mining prototype. The results of this are described in the WP6 deliverables

- **Visualisation**: the functional requirements of the visualisation component are directly connected to the functional requirements of the three technical components described above. In particular, the visual interfaces have to provide access to these technical components in two ways. Firstly, the users should be able to define input parameters for each component. Secondly, the users should be enabled to view and analyse the output data of the technical components. These criteria have been evaluated in both "Deep Testing" and "High level testing" sessions.

4.2 Deep Test methodology

As mentioned above, Deep Testing has been organised in two phases:

1. Task completion test, which aimed to validate whether the functional requirements on the visual interfaces are met.
2. Usability questionnaire to the test participants in order to verify the usability of the system.

The tasks of the task-completion test were chosen to cover each functional requirement of each component. 6 tasks were developed:

1. Social Simulation: to identify a simulated scenario with the maximum capacity that can be installed with costs not exceeding €700 million
2. Social Simulation: identify the overall cost spent on "Grants" in the former scenario
3. Social Simulation: identify which income group received the largest amount of "Grant" support in the former scenario
4. Global Optimiser: calculate the costs of an energy plan which maximises the installed power and minimises the costs, with a maximum amount of photovoltaic energy set to 4000MW.
5. Global Optimiser: identify the most positive environmental impact in the former plan
6. Opinion Mining: identify the most positive interval and its related most positive opinion in "economic aspect of photovoltaic energy"

In addition to the task-completion tests, a questionnaire that enabled the participants to give qualitative feedback was provided. It targeted the usability of the system. The following views within the DSS have been evaluated:

1. Simulation: Overview
2. Simulation: Time View

3. Simulation: Demographics View
4. Global Optimiser: Specify Plan View
5. Global Optimiser: Compare View
6. Global Optimiser: Energy Plan View
7. Opinion Mining View

For each view the following questions have been asked:

1. Looking at the visual interface – do you intuitively know how to use the interface?
2. Is the organisation and display of the interface useful for your understanding?
3. Is any information missing in the interface?
4. Is any unnecessary information provided that should be removed from the interface?
5. Do you have any suggestions for improving the interface?

Full results and analysis of this testing session have been reported in D7.4.

4.3   High Level Test methodology

At the Bologna Workshop a limited evaluation in the demonstration session was performed. This took the form of a demonstration area with four computers displaying the DSS. Project members from UNIBO, INESC, UNIFE, FRAUNHOFER, PPA Energy and SURREY introduced delegates at the workshop to the main features of the system and received oral feedback and completed questionnaires.

During the 3-day exhibition SCE 2014, Aster organised a demonstration area in a dedicated ePolicy booth. The format of the test was the same of the Bologna workshop, i.e. a demonstration of the software carried out by a project partner (Aster in this case), who explained to delegates the main features of the system, and asking them to fill in an evaluation questionnaire. Thanks to the favourable environment of the exhibition more than 80 delegates were involved in testing.

This process used a shortened questionnaire, with the structure shown below:

- a first part on personal details of the tester: name, age, gender
- a second part on their competencies: computer skills, profession, area of expertise
- a third part with the following questions:
    1. Do you think the ePolicy system could help policy makers in the decision making process? (Strongly disagree/mildly disagree/neutral/mildly agree/strongly agree)
    2. Do you think the visual interface is easy to use? (strongly disagree/mildly disagree neutral/mildly agree/strongly agree)
    3. Do you know similar tools like the one presented here used for decision making? Which?
    4. Which further model(s) (simulation, optimisation, etc.) could be included?
    5. Do you have any suggestions for improving the tool?

5 Results of the testing

5.1 Deep Test Results

Full details of deeper test are available in D7.4. Generally, the evaluation results have been very positive. All tasks of the task completion test have been completed by 83% of the participants. Around 90% of the participants could solve the tasks with the help of the test supervisor. The users rated all but one task as 'easy'.

The answers of the usability questionnaire can be summarised in a similar way. Most of the participants provided positive feedback to the questions that have been asked about the seven presented views (three simulation views, three optimisation views and one opinion mining view). On average 74% of the participants responded positively to the usability and usefulness of ePolicy software.

In addition to the quantitative feedback, qualitative feedback, e.g. suggestions for improvements, have been provided by the participants. These were summarised and analysed, and requirements have been extracted for the final improvements of the visual interfaces (see chapter 6 of D7.4).

Finally, the overall impression of the system was good. Nearly all participants stated that the system would be useful for decision making. With the help of the test participants minor issues that occurred with respect to the usability of the system could be extracted, and these can be addressed before the end of the project.

5.2 High Level Test Results

Figure 9 shows the responses to the first two questions of the main part of the short questionnaire;

1. Do you think the ePolicy system could help policy makers in the decision making process? (Strongly disagree/mildly disagree/neutral/mildly agree/strongly agree)
2. Do you think the visual interface is easy to use? (strongly disagree/mildly disagree neutral/mildly agree/strongly agree)

Looking to the graph on the left, 89% of the testers considered the ePolicy system useful for policy makers. In particular 25% strongly agree with that statement and none of the interviewed users disagree with it.

The right graph in Figure 9 reports opinions about the ease of use of the interface. Most participants considered the interface to be very complete, with multiple views and capabilities available. 64% of the testers considered the interface easy to use and only 12% considered it difficult to use. The 22% of users who selected "neutral" mostly agree that the interface seems complex but usable with proper training and/or user guidance.

ePolicy system can help policy makers in the decision making process

Strongly Agree · Mildly agree · Neutral · Mildly disagree · no answer

25% · 64% · 7% · 4%
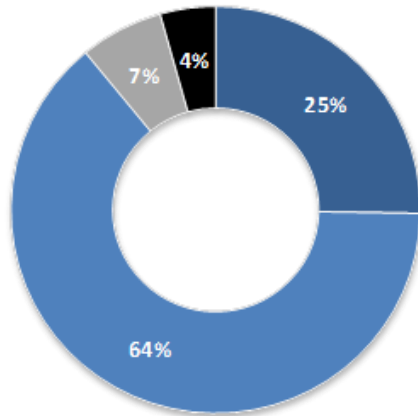
ePolicy interface is easy to use

Strongly Agree · Mildly agree · Neutral · Mildly disagree · no answer

13% · 51% · 22% · 12% · 2%
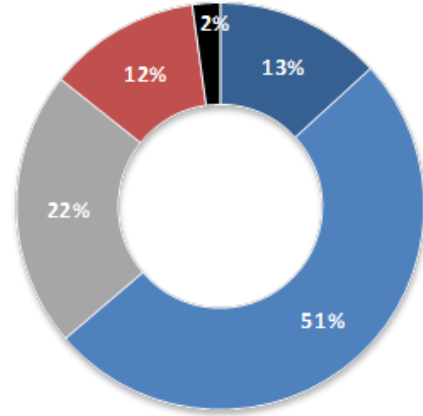
Figure 9 - Answers of ePolicy questionnaires

The users were asked to list any similar tools that they know of that are also used for decision making. The similar instruments indicated by testers include:

- **City performance tool** (by Siemens): a tool devoted to urban decision makers to select bespoke technologies that offer cities maximum environmental and economic benefits
- **Decision Theatre:** a software under development in a project funded by Italian Ministry of University and Research. It is a decision support system which aims to support policy makers in social and urban problems.
- **CO2MPARE:** a model to assess the impacts on CO_2 emissions that the investments under various Operational Programmes can have. Commissioned by the European Commission, Directorate-General for Regional and Urban Policy under the supervision of Mikel Landabaso - Head of Unit, assisted by Maud Skäringer - Policy Analyst on energy and Mathieu Fichter - Team Leader on sustainable growth
- **DESYCO:** an open source GIS-based Decision Support System (DSS) aimed at the integrated assessment of multiple climate change impacts on vulnerable coastal systems (e.g. beaches, river deltas, estuaries and lagoons, wetlands, agricultural and urban areas). Developed by the Euro-Mediterranean Centre on Climate Change (Italy)
- **EnergyPLAN:** a simulation of the operation of national energy systems on an hourly basis, including the electricity, heating, cooling, industry, and transport sectors. It is developed and maintained by the Sustainable Energy Planning Research Group at Aalborg University, Denmark.

These tools are either facing similar problems to the ePolicy tool at larger (national) or smaller (urban) scales are therefore good candidates for integration with it. CO2MPARE is focused on Operational Programmes, which is another policy field with which the ePolicy project has had involvement. Operational Programmes also plan energy (as a subpart of the programme), and are

concerned with distributing Structural Funds for implementing actions. The ePolicy project has studied Co2MPARE and has integrated part of the results regarding CO_2 emissions in the global optimizer. DESYCO is also about the environment, with specific emphasis on coastal systems.

The last two questions of the short questionnaire were as follows;

1. Which further model(s) (simulation, optimisation, etc.) could be included?
2. Do you have any suggestions for improving the tool?

More than 70 suggestion have been collected, and for analysis purpose they can be grouped in 8 categories:

1. **Extension of ePolicy to lower scale (province/municipality) (6 comments)**. This need emerged several times during the demonstrations, probably due to the high number of municipality policy maker present in the exhibition. Although only 6 such comments were recorded on the questionnaires, many other testers verbally mentioned it during informal discussions
2. **Extension of ePolicy to other sectors (10 comments)**. Specific suggestions were towards the health sector, followed by mobility, urban refurbishment and green policies.
3. **Interface (22 comments)**. Regarding the interface most comments was oriented to simplify the interface, to increase the interaction, to make it scalable to mobile devices, and to the possibility of creating synthetic reports and data analysis.
4. **Need for legend and/or contextual information (8 comments)**. The users commented that the interface can appear very complex as much information is displayed. This is expected as the domain is complex and all that information is indeed needed. However, without guidance the user can have some difficulties in understanding all aspects.
5. **Need of clarification about the parameters used (3 comments)**. Specifically, it emerged that some testers were curious about how the secondary activities are measured.
6. **Italian translation (4 comments)**. Several testers were not confident with the English language and for them the translation into Italian is a primary requirement.
7. **Need of promotion through the public administrations and policy makers (7 comments)**. The 7 comments were quite similar, each addressing the matter of real use of the ePolicy system and the need to increase the commitment of the policy makers.
8. **Other functions (17 comments)**. Some of these other functions requested were: geo localisation; data export in open data format; automatic update from sources (eg. ARPA data); personalised settings; insert opinion mining in the optimisation; insert a corrective factor in the opinion mining (as the on line expressed opinions tend to be negative).

5.3 Indicator tables

This section presents the indicators tables introduced in D9.2, and reports the results of testing for each indicator.

The analysis has been divided into two groups: the functional and non-functional indicators specific for each component, and the indicators common for each component; ease of use, problems occurred while using the component, adequacy of the service.

5.3.1 Component specific indicators

The tests of each of these indicators happened internally within the developers' tester group, and during high level and deep testing sessions with external testers for those indicators where the user involvement was appropriate. Where a specific activities have been carried out, the link to the relevant deliverable is reported.

It is noted that as the incentive design component has been completely merged with social simulator, the incentive design component is no longer accessible to the users. Therefore all functional indicators have been tested and verified by developers, and non-functional indicators which were devoted to user experience have been removed.

Global Optimiser

Indicator	Indicator Type	Test procedure	Testers group	Means of Evaluation	Results	Fulfilment
List of functionality required by the environmental expert: - Set regional max energy per source - Change environmental matrices - Change primary/secondary activity matrix - Define constant per activity - Min and max energy - State objective functions - Set total energy - Run system - Obtain results	Functional	Analysis/test of the code/software	Developers	Number of functional requirements fulfilled. If: N<60%: unsatisfactory; 60%<N<80%: sufficient; N>80%: satisfactory	100% Satisfactory	Yes

List of functionality required by the policy maker: - Min and max energy - State objective functions - Set total energy - Run system - Obtain results	Functional	Analysis/test of the code/software	Developers	Number of functional requirements fulfilled. If: N<60%: unsatisfactory; 60%<N<80%: sufficient; N>80%: satisfactory	100% Satisfactory	Yes
Scalability, performance and efficiency	Non Functional	Analysis/test of the code/software	Developers	Response time less than five minutes	With 10 objective functions and 10 intermediate points the response time is less than 30 seconds [D3.5]	Yes
Development costs and time	Non Functional	Analysis of output parameters	Developers	Variation of time and cost is lower than the 5% with respect to the budgeted time and cost.	Cost in line with budget. Time is 114% due to the hiring of less experienced developers; however all deadlines are met [D3.5]	Yes
Accuracy, precision and re-configurability	Non Functional	Questionnaire	Policy Maker Env. Expert	Success: more than the 60% of users are satisfied	Verified with experts from ARPA, Emilia-Romagna Region and Piedmont Region, although they have identified some potential improvements and some weaknesses.	Yes

Incentive design

Indicator	Indicator Type	Test procedure	Testers group	Means of Evaluation	Results	Fulfilment
Incentive design component must output incentive designs	Functional	Analysis of output parameters	Developers	Straightforward	Verified	Yes
Incentive design component must optimise incentive designs	Functional	Analysis of output parameters	Developers	Straightforward	Verified	Yes
Incentive design component must consider goals for energy production and budget constraints.	Functional	Analysis/test of the code/software	Developers	The incentive design will specify figures for those constraints that will allow a judgment to be made as to whether they have been fully considered	Verified	Yes
Incentive design component must allow users to explore different allocation scenarios	Functional	Analysis/test of the code/software	Developers	Straightforward	Verified	Yes
Incentive design component must allow the consideration of policy decisions (through specific input boxes/elements in the user interface that allows the input of items such as a budget restriction)	Functional	Analysis of output parameters	Developers	Straightforward	Verified	Yes
Incentive design component must interface with the social simulator	Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes
Incentive design component must interface with the ePolicy system	Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes

Social simulator

Indicator	Indicator Type	Test procedure	Testers group	Means of Evaluation	Results	Fulfilment
Realistically presents likely adoption of photovoltaic panels under different policy instrument settings chosen	Functional	Analysis of output parameters	Developers	Comparison with past data and other beliefs about adoption patterns	Met by validating the model against PV adoption estimates provided by the region. See Section 5.2 of Deliverable 4.3	Yes
The users need to be able to select and specify which of the above mentioned policy instruments they wish to model	Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes
The users need to be able to choose whether they wish to view the whole Emilia-Romagna region or only sub-regions	Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes
The social simulator must provide information that allows its users to evaluate the different policy instrument implementation strategies	Non Functional	Analysis of output parameters	Developers	Meeting previous input of users (from questionnaire outlined in D4.1))	Implemented	Yes
The social simulator should allow the use of GIS data for the setup of decision making entities and the environment they act in	Non Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented (available only for expert users)	Yes
The social simulator setup is grounded on empirical data collected by interviews and an online questionnaire	Non Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes
The social simulator component must be developed using open source tools	Non Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes
The social simulator software should be platform independent	Non Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes

Opinion mining

Indicator	Indicator Type	Test procedure	Testers group	Means of Evaluation	Results	Fulfilment
The opinion mining component has to give a set of sentiment scores for a pre-defined set of topics.	Functional	Analysis of output parameters	Developers	Straightforward	Implemented	Yes
The opinion mining component should be able to classify new documents regarding the expressed sentiment on a set of pre-defined topic	Functional	Analysis of output parameters	Developers	Straightforward	Implemented	Yes
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.).	Functional	Analysis of output parameters	Developers	Straightforward	Implemented	Yes
The opinion mining component should be able to accept as input a set of topics of interest for sentiment analysis,	Functional	Analysis of output parameters	Developers	Straightforward	Implemented	Yes
Development of a set of models that are able to classify documents concerning opinions on a set of predefined topics	Functional	Analysis of output parameters	Developers	Standard evaluation methodologies for predictive models to obtain statistically significant measures of the accuracy of these models in terms of their classification tasks.	Implemented	Yes
Ability to fetch, from the given web sources, documents that are relevant for the selected topics of interest	Functional	Analysis of output parameters	Developers	Straightforward	Implemented	Yes

Software usability, in terms of being able to present the user with the correct and useful information that they are looking for	Functional	Questionnaire	Policy Maker Env. Expert	Success if more than the 60% of users are satisfied	Usability rated with 61% (see section 5.7 of D7.4)	Yes
The opinion mining component should be implemented using only free software	Non Functional	Analysis/test of the code/software	Developers	Straightforward	Implemented	Yes
The opinion mining component should be easy to adapt to new domains	Non Functional	Questionnaire	Developers	Success if more than the 60% of users are satisfied	Verified by INESC	Yes
The opinion mining component should facilitate extensions to the set of topics and/or web sites.	Non Functional	Questionnaire	Developers	Success if more than the 60% of users are satisfied	Verified by INESC	Yes
The opinion mining component should provide easy ways of exploring the trends of the sentiment scores	Non Functional	Questionnaire	Policy Maker Env. Expert	Success if more than the 60% of users are satisfied	Usability rated with 61% (see section 5.7 of D7.4)	Yes
The opinion mining component should provide means to drill down the scores to the actual messages that lead to the scores	Non Functional	Questionnaire	Developers	Straightforward	Implemented	Yes

Visualisation

Indicator	Indicator Type	Test procedure	Testers group	Means of Evaluation	Results	Fulfilment
The visual interfaces have to provide access to the components (global optimiser, social simulator, opinion mining)	Functional	Laboratory Experiment	Policy Maker Env. Expert Public user	Measure success rate and time needed to solve predefined tasks derived from requirement analysis. Success if more than 60% of tasks successfully completed	Task completion test: - 83% of task completed	Yes

The users should be able to visual-interactively define input parameters for each component	Functional	Laboratory Experiment	Policy Maker Env. Expert Public user	Measure success rate and time needed to solve predefined tasks derived from requirement analysis. Success if more than 60% of tasks successfully completed	- 90% of successfully completed tasks - of which 70% considered easy	
The users should be enabled to view the output data of the technical components and analyse this data	Functional	Laboratory Experiment	Policy Maker Env. Expert Public user	Measure success rate and time needed to solve predefined tasks derived from requirement analysis. Success if more than 60% of tasks successfully completed	(average values of the 6 tasks tested - see chapter 4 of D7.4)	
Visual display	Non Functional	Questionnaire	Policy Maker Env. Expert Public user	In these questionnaires the users are asked whether they understand the visual designs and whether they intuitively know how to use the interfaces. Success if more than an average rate of over 60% approves the usability of the visualisation component	74% of satisfaction (average value of the usability questionnaire on the different components - see chapter 5 of D7.4)	Yes
Interaction designs	Non Functional	Questionnaire	Policy Maker Env. Expert Public user	In these questionnaires the users are asked whether they understand the visual designs and whether they intuitively know how to use the interfaces. Success if more than an average rate of over 60% approves the usability of the visualisation component	79% of satisfaction (average value of the usability questionnaire on the different components - see chapter 5 of D7.4)	Yes

Software architecture

Indicator	Indicator Type	Test procedure	Testers group	Means of Evaluation	Results	Fulfilment
User authentication: secure mechanisms to identify user interactions, based on the username/password model	Functional	Analysis/test of the code/software	Developers	Success if at least four out of the five requirements are implemented and made available to the single components.	Supported (see FR1, D8.3)	Yes
Support an Access Control List method for users/roles and components/functionalities	Functional	Analysis/test of the code/software	Developers		Supported (see FR2—FR6, D8.3)	Yes
Provide a web-based access to the components	Functional	Analysis/test of the code/software	Developers		Supported (see TR9, D8.2)	Yes
Support users' "work sessions" distributed over time and geographical locations	Functional	Analysis/test of the code/software	Developers		Supported (see TR9, D8.2)	Yes
Provide data persistence facilities: users and components might need to save partial/complete computation results and plans	Functional	Analysis/test of the code/software	Developers		Supported by FR9—FR13 (D8.3)	Yes
Scalability, performance and efficiency:	Non Functional	Analysis/test of the code/software	Developers	Architecture added time overhead less than 10% of the mean time for using each single component.	The means of evaluation (10% of mean time) do not fully apply to the implemented architecture, since some results are computed off-line. On the basis of the measurement discussed in D8.3, we consider this point as achieved.	Yes

Re-configurability	Non Functional	Questionnaire	Policy Maker Env. Expert	Success if more than the 60% of users are satisfied	The interviewed users declared themselves as satisfied with the possibility of re-configuring the components (in particular, the Global Optimiser) through the use of spreadsheets.	Yes
Cost of development and time of development	Non Functional	Analysis of output parameters	Developers	Success if the costs used for development do not exceed what is foreseen in the project by more than 15%	The costs do not exceed the forecasts in the project's DOW.	Yes

5.3.2 General Indicators

Three general indicators, relevant across the ePolicy tool, have been identified:

- Ease of Use
- Problems Occurred while Using the Components
- Adequacy of Service

Concerning these indicators, the following results are available:

Ease of use.

During High level testing the usability of the interface was tested. As the interface is the means by which the user interacts with the system, it can be assumed that its ease of use is reflected in the easiness of use of the whole system. As reported in Section 4.3 and in the right graph of Figure 9, 64% of the testers considered the interface to be easy to use and only 12% considered it difficult to use.

During Deep Testing the ease of use was measured in terms of the ability of the users to carry out several tasks without guidance. Moreover, the first question asked during the usability questionnaire was intended to measure ease of use (Q1: Looking at the visual interface – do you intuitively know how to use the interface?). As reported in Section 5.1 all tasks of the task completion test have been solved by 83% of the participants and except for one task the users rated all tasks as easy. Specifically for the above mentioned question of usability questionnaire, 83% of users found the interface easily usable (see details in D7.4).

Problems occurred while using the components

During high level test, no specific problem arose. Some suggestion were reported at the end of Section 4.3.

Also in Deep Testing no problems emerged, but again some suggestion for each component were provided (see D7.4 section 6):

1. Optimisation
   a. the "Specify Plan view" is too crowded and should focus on fewer parameters (i.e. only the most relevant)
   b. A reset button for obtaining the default settings should be provided.
   c. The definition of target functions should be simplified.
   d. The colour map showing the qualitative impacts should be explained.
2. Simulation/Incentive Design
   a. The interaction process for getting more details about individual simulation scenarios in the overview should be improved.
   b. In the Time View and the Demographics View, exact values for each bar in the bar charts could be provided, for example via toll-over tips.
3. Opinion Mining
   a. Selection of a time interval should be simplified,

b. The colour legend needs to be fixed

c. the sentiment scale (+2 to -2) should be explained

Adequacy of the service

During High level test, adequacy of the service have been measured in terms of users indicating that the ePolicy system can help the policy makers. As showed in Section 5.2 and in Figure 9, 89% of users agree that the system could support policy makers, and 25% strongly agree.

Moreover if we consider only the policy makers and environmental experts responding to the questionnaire, we achieve the 93% of users which agree on the usefulness of ePolicy.

During Deep testing the adequacy was not tested.

6 Exploitation

6.1 Introduction

From the outset, dissemination and exploitation of the results and knowledge gathered within the ePolicy project has been recognised as a key indicator of its success. This is organised within the Dissemination and Exploitation Work Package (WP10). A number of documents have been delivered on this subject, including D10.5; the Plan for Using and Disseminating Foreground (PUDF) produced in January 2014, which includes an exploitation plan for each partner, and a comprehensive list of dissemination activities.

One of the results of the ePolicy project is a methodology for extending the DSS and all its components to other policy areas. In particular, six possibilities have been identified to extend the system. These are illustrated in Figure 10 below.
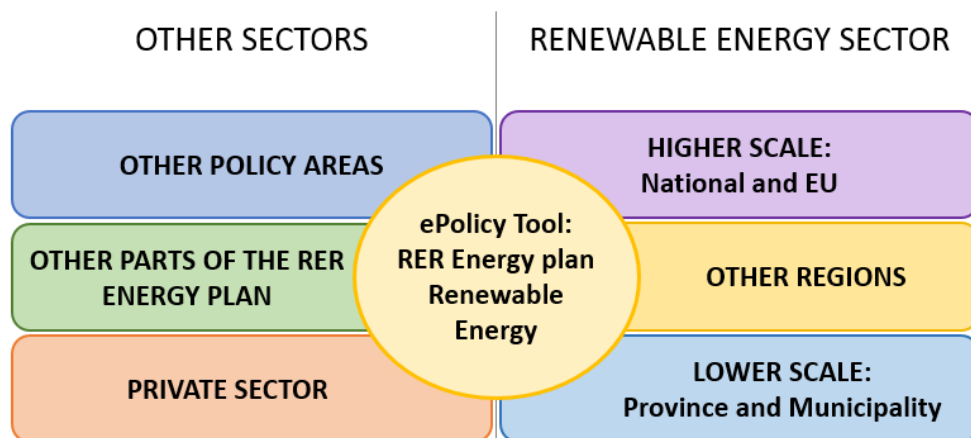

Figure 10 - Extensions to the ePolicy DSS

Three of these possible areas for extension refer to the same policy area (namely that of renewable energy) but focused on either larger (such as National and EU plans) or smaller (provincial and municipality) scales, 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, such as for example regional transportation plan, regional agricultural plan or for distributing Structural Funds through the operative plan. The second is to cope with other parts of the regional energy plan - in particular those dealing with energy efficiency in the residential sector, the industrial sector and transport which are extremely important. Finally, there is the extension to the private sector, for example for product design, manufacturing and marketing decisions, business models and practices and pricing strategies. This extension category greatly widens the scope of the opportunities for exploitation of the tools and knowledge gained within the ePolicy project.

Clearly, some extensions could be combined, for example applying the tool to other policy areas (such as health or transport) at a higher scale (such as national or EU).

This section explains in more detail the potential exploitation opportunities and the estimated level of work and costs associated with developing them. It will also detail the exploitation activities and avenues currently being pursued by the ePolicy team.

6.2 Exploitation of ePolicy Elements

Exploitation of the results of the ePolicy project may involve creating a complete DSS for another application. Alternatively, any one or combination of the component elements (global optimiser, opinion mining, incentive design, social simulator and visualisation) may be exploited independently to create a subset of the capabilities of a complete DSS.

The sections below detail the required activities for each of the exploitation areas in Figure 10 above.

6.2.1 Global Optimiser

The global optimiser component of the project is an optimisation model and solver that produces a set of optimised energy plans given a number of constraints on costs, receptors, and a number of objective functions. It performs both regional planning and the strategic environmental assessment of the plans produced.

The work involved in tailoring the global optimiser to different regions, or to a higher or lower scale (e.g. national or European, or municipal or provincial) is relatively small. This is because in these cases, the majority of the current system can be reused. If the structure of the policy plans are similar to that of RER, then this will consist mainly of the maximum energy per source available in the new region, and any other aims and constraints. Where the policy structure is significantly different, additional time and effort may be required to produce policy plans that are appropriate and relevant to the application.

Where the optimiser is to be applied to different policy areas, different parts of the energy plan, or to public sector applications, then further additional activities are required. Specifically, the subject to be targeted would have to be explored in order to understand:

- the decisions to be taken;
- the likely costs of these decisions and their impacts; and

- the form and structure of the required results.

This will allow the optimiser to be tailored to the new application. A significant amount of data would also have to be sought and input into the optimiser, such as:

- the cost and environmental impact of the primary activities of the plan;
- the secondary activities that are associated with these primary activities;
- the cost and environmental impact of each secondary activity; and
- regional data and limitations.

In all of these cases, the tool would have to be run, tested and validated to ensure that it performs correctly. The integration with any other components and the development of visualisation would also have to be carried out.

Indicative values for the effort involved in each extension is given in Table 2 below. It should be noted that these are estimates intended as rough indication of the potential of exploitation. Values are given assuming the work would be carried out within a commercial consultancy body, and the cost per person month reflects this.

	Extension to Other Policy Areas	Extension to Other parts of the Energy Plan	Extension to Private Sector	Extension to Higher Scale	Extension to Other Regions	Extension to Lower Scale
Approximate Resources Required	2 - 24 person months*	2 - 24 person months*	2 - 24 person months*	1 - 2 person months	1 - 2 person months	1 - 2 person months
Approximate Cost	€42k - €504k	€42k - €504k	€42k - €504k	€21k - €42k	€21k - €42k	€21k - €42k
Other Requirements	Consultation from experts, e.g. environmental	Consultation from experts, e.g. environmental	Consultation from experts, e.g. environmental			

Table 2 - Indicative values for the effort required for the extension of the Global Optimiser component.

* The range of required resources is particularly wide where the extension is to different policy areas, different areas of the energy plan or to the private sector. This is because in cases where the policy structure is similar to the current case study, it will be possible to reuse the majority of the current system. Where the policy structure is significantly different, additional time and effort will be required restructure and tailor the tool to the application.

6.2.2   Opinion Mining

The opinion mining component aims to understand the opinions of a population about a certain subject by automatically determining the sentiment of online blogs and posts. The tool is first 'trained' using a set of posts assessed for sentiment by a human expert, and then the tool can find and assess posts automatically. The sentiment can be visualised over time.

In order to tailor the opinion mining tool to different populations, which would be necessary for extension to other regions, and to higher or lower scale, it will be necessary to re select the websites and sources for the opinion posts to be collected from. This is also the case where the opinion mining is being extended to a different subject area, such as a different policy area or to a private sector application, and the target topics would also have to be carefully defined.

In both of these cases, the activities to be carried out would be very similar, in that it would be necessary to re-train to recognise sentiment about a new subject. This is a significant amount of additional work as the human expert must manually assess a relatively large number of posts. The tool would then be allowed to collect and analyse posts, and the results could then be visualised.

In all of these cases, the tool would have to be run, tested and validated to ensure that it performs correctly. The integration with any other components and the development of visualisation would also have to be carried out.

Indicative values for the effort involved in each extension is given in below. It should be noted that these are estimates intended as rough indication of the potential of exploitation. Values are given assuming the work would be carried out within a commercial consultancy body, and the cost per person month reflects this.

	Extension to Other Policy Areas	Extension to Other parts of the Energy Plan	Extension to Private Sector	Extension to Higher Scale	Extension to Other Regions	Extension to Lower Scale
Approximate Resources Required	3 - 5 person months	3 - 5 person months	3 - 5 person months	3 - 5 person months	3 - 5 person months	3 - 5 person months
Approximate Cost	€63k - €105k	€63k - €105k	€63k - €105k	€63k - €105k	€63k - €105k	€63k - €105k
Other Requirements	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts

Table 3 - Indicative values for the effort required for the extension of the Opinion Mining component.

6.2.3   Incentive Design

The incentive design component is used by the policy maker - given a budget for an incentive and a target power output – to 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. Within the DSS, 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.

In order to develop the existing incentive design tool for different applications, the first step would be to further test and validate the software, and to develop it to full commercial standard. It is also

planned to extend the approach that just uses the integrated social simulator and incentive design component to one that also makes use of an econometric model in order to evaluate the effectiveness of the latter.

Developing the incentive design tool to apply to new policy areas, including different areas of the energy plan, and to private sector will require a detailed investigation of the incentives and objectives. The fund allocation model and objective functions will have to be defined, and the tool developed and reconfigured to reflect these. This will be most demanding for the extension to the private sector, as it is likely that the structure of the problem is significantly different from that of policy issues.

In order to develop the tool for a higher scale, for example national or European, there would need to be further validation to ensure that the approach used within the current tool is scalable. Extensions to other regions and to a lower scale is the simplest development, as the approach is designed to be used for applications of this scale.

For all extensions, the resulting tool would have to be thoroughly re-tested and validated to ensure it acts in an appropriate way.

Indicative values for the effort involved in each extension is given in Table 4 below. It should be noted that these are estimates intended as rough indication of the potential of exploitation. Values are given assuming the work would be carried out within a commercial consultancy body, and the cost per person month reflects this.

	Extension to Other Policy Areas	Extension to Other parts of the Energy Plan	Extension to Private Sector	Extension to Higher Scale	Extension to Other Regions	Extension to Lower Scale
Approximate Resources Required	1 - 3 person months	1 - 2 person months	2 - 3 person months	1 - 3 person months	1 - 2 person months	1 person months
Approximate Cost	€21k – €63k	€21k – €42k	€42k – €63k	€21k – €63k	€21k – €42k	€21k
Other Requirements	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts	Consultation with domain experts

Table 4 - Indicative values for the effort required for the extension of the Incentive Design component.

6.2.4   Social Simulator

The social simulator component is based on agent-based modelling, 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. The ePolicy social simulator is tailored on data coming from the Emilia-Romagna region (RER), collected through interviews, from an on-line questionnaire and from past

data. It simulates the decision making procedure of households in deciding whether or not to install a photo-voltaic (PV) system taking account of alternative incentive mechanisms. The simulator computes the PV adoption in RER. Within the DSS, the social simulator is integrated with the incentive design component, which provides the optimised implementation of the regional government support policies (i.e. selects which agents to support in installing PV).

For extensions to a higher or lower scale and to other regions, where the characteristics of the new population is similar to that is RER (for example to apply the tool to a region very close to RER with a similar population), then much of the existing tool can be used and simply tailored to the new applications. However, for applications where the new population characteristics is significantly different, for example in a different area of Europe, then much more significant work would have to be carried out to understand the decision making factors and processes. This would involve the following activities:

- Carry out a survey of households in case study area;
- Collect required population and demographic information;
- Consult experts and other players;
- Calibrate agent behaviour in light of the survey results;
- Setup the model with the new population;

Where the decision to be made is changed, for example where the policy area has changed or for applications within the private sector, the activities listed above would be required in order to develop the tool.

In all of these cases, the tool would have to be run, tested and validated to ensure that it performs correctly. The integration with any other components and the development of visualisation would also have to be carried out. The effort to carry out these extensions will be largely dependent on the nature of the application itself, and its similarity to the existing tool.

Indicative values for the effort involved in each extension is given in Table 5 below. It should be noted that these are estimates intended as rough indication of the potential of exploitation. Values are given assuming the work would be carried out within a commercial consultancy body, and the cost per person month reflects this.

	Extension to Other Policy Areas	Extension to Other parts of the Energy Plan	Extension to Private Sector	Extension to Higher Scale	Extension to Other Regions	Extension to Lower Scale
Approximate Resources Required	12 - 24 person months	6 - 18 person months	12 -24 person months	12 - 18 months	1 - 18 months	1 - 12 months
Approximate Cost	€252k - €504k	€126k - €378k	€252k - €504k	€252k - €378k	€21k - €378k	€21k - €252k

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Other Requirements	New data, e.g. policy scenarios, household decision-making. Input from policy stakeholders	New data, e.g. policy scenarios, household decision-making. Input from policy stakeholders	New data, e.g. application scenarios, household characteristics and decision-making. Input from policy stakeholders	New data, e.g. policy scenarios, household characteristic. Input from policy stakeholders	New data, e.g. policy scenarios, household characteristic. Input from policy stakeholders	New data, e.g. policy scenarios, household characteristic. Input from stakeholders

Table 5 - Indicative values for the effort required for the extension of the Social Simulator component.

6.2.5 Visualisation

The visualisation modules developed in the ePolicy project have the objective of providing intuitive access to the project's analytical tools. Although the visual interfaces are based on the specific use cases of the project, adaptation to alternative situations is possible. The work involved will depend on the application and its specific requirements, and how they compare with the case study of the energy policy for RER.

The integrated tool visualisation is made up of three parts; the visual interfaces for the optimisation component, the incentive design and social simulation component, and the opinion mining component. The effort to develop and extend these parts includes the adaption to provide the required visualisation results, integration with any extended tool and thorough testing of the system.

Indicative values for the effort involved in each extension is given in Tables 5-6-7 belowTable 2. It should be noted that these are estimates intended as rough indication of the potential of exploitation. Values are given assuming the work would be carried out within a commercial consultancy body, and the cost per person month reflects this.

	Extension to Other Policy Areas	Extension to Other parts of the Energy Plan	Extension to Private Sector	Extension to Higher Scale	Extension to Other Regions	Extension to Lower Scale
Approximate Resources Required	2 - 3 person month	1 person month	2 - 3 person month	1 person month	1 person month	1 person month
Approximate Cost	€42k - €63k	€21k	€42k - €63k	€21k	€21k	€21k
Other Requirements	Consultation with optimisation component developer	Consultation with optimisation component developer	Consultation with optimisation component developer	Consultation with optimisation component developer	Consultation with optimisation component developer	Consultation with optimisation component developer

Table 6 - Indicative values for the effort required for the extension of the Global Optimiser visualisation component.

	Extension to Other Policy Areas	Extension to Other parts of the Energy Plan	Extension to Private Sector	Extension to Higher Scale	Extension to Other Regions	Extension to Lower Scale
Approximate Resources Required	1 person month	1 person month	1 person month	1 person month	1 person month	1 person month
Approximate Cost	€21k	€21k	€21k	€21k	€21k	€21k
Other Requirements	Consultation with opinion mining component developer	Consultation with opinion mining component developer	Consultation with opinion mining component developer	Consultation with opinion mining component developer	Consultation with opinion mining component developer	Consultation with opinion mining component developer

Table 7 - Indicative values for the effort required for the extension of the Opinion Mining visualisation component.

	Extension to Other Policy Areas	Extension to Other parts of the Energy Plan	Extension to Private Sector	Extension to Higher Scale	Extension to Other Regions	Extension to Lower Scale
Approximate Resources Required	4 - 5 person month	4 - 5 person month	4 - 5 person month	1 - 2 person month	1 - 2 person month	1 - 2 person month
Approximate Cost	€84k - €105k	€84k - €105k	€84k - €105k	€21k - €142k	€21k - €142k	€21k - €142k
Other Requirements	Consultation with simulation component developer	Consultation with simulation component developer	Consultation with simulation component developer	Consultation with simulation component developer	Consultation with simulation component developer	Consultation with simulation component developer

Table 8 - Indicative values for the effort required for the extension of the Incentive Design and Social Simulator visualisation component.

6.3 Active Exploitation Areas

As mentioned the exploitation of the tools and knowledge built up within the ePolicy project is considered a key part of the outcomes. In order to support this, a wide variety of dissemination activities have been undertaken by the team. The aim is partly to reach out to potential partners and clients who may be interested in exploitation activities. These activities have included the participating and speaking at various events, the publishing of papers, and the maintenance of a website and social media presence. Potential partners and clients have been actively sought through the use of existing contacts, research and the organisation of events.

As a result, a number of activities have been undertaken to explore potential exploitation areas, and this is set to continue beyond the end of the project. These are detailed below.

6.3.1 Exploitation within Emilia-Romagna Region

The regional government of Emilia-Romagna has been an active part of the project from the beginning. The case study that the project is based upon is that of the energy policy within the Emilia-Romagna Region (RER), and the intention has been that this can be directly used by policy makers within RER to support their decision making. All the data, constraints and objectives inserted into the global optimiser, the types of incentives and the mechanism design has been discussed with experts from both RER and ARPA (who currently collaborate with RER on environmental assessments). The experts from RER are therefore already familiar with the system, know how to use it and trusts its results.

During the exploitation phase of the project, RER has used the ePolicy tools to generate guidelines for the Regional Operational Plan in terms of energy share and energy planning. The region is now planning to use the system for the next Regional Plan that will be decided by the new policy makers that have been elected at the end of November.

The extension of the tool to represent additional RER policy areas is very possible, particularly as there will be the advantage of having clients with direct experience of the tool. After the ePolicy workshop on October 2014, the ePolicy team has been contacted by various policy makers in the RER to extend the system for the following applications:

1) Policies concerning territorial organisation: the Region is in charge of understanding how to group municipalities into Unions and they are very interested in a tool which is able to perform a preliminary analysis. This policy is significantly different than the case study used within the ePolicy project, but analysis is underway to understand the effort required to extend the system in this domain.
2) Policies concerning urban planning: discussions are currently underway to understand how to extend the system to urban planning. Urban planning has more similarities to the ePolicy case study compared with territorial organisation, although the plans are more detailed.
3) Energy plans at municipality level: ANCI is the national associations of Italian municipalities. The RER section of ANCI has contacted the ePolicy team after the workshop and they are interested in using the ePolicy system at municipality level. This will require the existing tool to be scaled down, increasing the level of detail of the plans.

6.3.2 Exploitation within Piemonte Region

The Piemonte Region of Italy is very close to RER, and is also of a similar size. In matters concerning energy policy, RER is in a group of Regions, which is led by the Piemonte region. They have expressed an interest in the ePolicy system, in particular the Global Optimiser.

RER, and the Universities of Bologna and Ferrara were involved in activities to provide a system tailored to providing decision support to the policy makers in renewable energy generation. This includes environmental assessment. Testing started in summer of 2014, and is still underway.

This is a relatively straight forward extension, as the subject matter has not changed, and the region is similar to RER. However, this is the first trial for the extension of the tool, and therefore learnings from this activity could inform future exploitation significantly.

6.3.3 Modelling UK Household Adoption of PV Solar Panels

A potential area of exploitation is being explored to model the adoption of PV panels by the households within the UK. This is an application of the social simulator component that was developed by the University of Surrey.

The partner for this application is the Department of Energy and Climate Change (DECC) within the UK government. Contact was made through existing contacts and research.

This application would allow the DECC to be able to predict future uptake of PV systems, allowing them to plan and produce policy appropriately.

6.3.4 Application of the System for Business Models

ENEL is the largest energy company in Italy, and has been performing an advisory role within the ePolicy project since the beginning. An interesting extension to the ePolicy decision support system has been suggested by the ENEL which is interested in applying the ePolicy methodology to some of their business models and pricing schemes (similar to policy instruments).

One of these are load control schemes, where electricity customers are encouraged to limit or delay their consumption at certain times to help balance generation and load, to support the network, or to provide environmental benefits. In this setting the methodology behind the ePolicy decision support system can be reused. The idea is that the energy utility should define its business models and pricing schemes that on one hand are remunerative for the utility, but on the other hand are efficient for the grid, pushing consumers to consume energy in a way that a flattening of the demand curve is achieved.

The pricing schemes are similar to incentives in the ePolicy project. Their effect on the consumers should be simulated and the more efficient and effective selected pricing schema by the optimiser that could also consider other constraints and objective functions. The ePolicy Global Optimiser could be reused in this setting and could be integrated with its extensions to achieve a policy that is sustainable from an environmental, economic and social perspective and includes information mechanisms that increase consumer awareness of the importance of energy efficiency.

A part of this activity has already started within an EU project called DAREED, launched in September 2013 and funded under FP7-Smartcity. It is being undertaken by the University of Bologna and ENEL, alongside several additional partners.

6.3.5 Regional Operational Programme (POR)

The POR is the Regional Operational Program, a Regional Plan devoted to distributing on different action lines the structural funds of the EU assigned to the region.

Using the environmental assessment part of the ePolicy Global Optimiser, UNIBO and UNIFE have developed a system for the planning and strategic environmental assessment of the Regional Plan. This activity has been funded by ARPA Emilia Romagna.

The system has been extended to cope with activities related to the regional operational program and their environmental impact. The extension of the global optimiser has been very fast, taking two weeks of work for the design of the extension and a further two weeks for the implementation. Alternative plans and their environmental assessment have been produced and these plans have been inserted, as scenario evaluation, into an official document; 'Strategic Operational Assessment of the Regional Operational Plan'.

6.3.6   Scottish Government

The ePolicy workshop at the Samos Summit in July 2014, provided a valuable opportunity for testing of the tool with external personnel. During this workshop, contact was made with a member of the Scottish Government. This relationship has since developed, and several representatives from the Scottish Government have been in direct contact with the project team.

A workshop has been scheduled for January 2015, with the aim of gaining additional feedback and insight from policy makers and analysts, and also discussing the potential of collaborating with them to develop the ePolicy tool for use within Scotland.

The details of this application are not clear, though the workshop will be attended by energy policy personnel and analysts.

6.3.7   Application of the system with ARPA on the allocation of structural funds

ARPA is the regional Agency for Environmental Assessment, who performs Strategic Environmental Assessment of plans and programs on behalf of RER. This assessment is required by the EU on eleven types of plans and programs. They are part of the Advisory and Dissemination Board of the ePolicy project and has been a very active member throughout the project.

University of Bologna and the University of Ferrara, with the support of RER, are involved in extending the global optimiser to take into account the potential activities inserted into the Regional Operational Program. This development allows the optimiser to develop plans with a more accurate and informed environmental element.

6.3.8   Application of the Environmental Assessment to Productive Processes

EULABOR is an institute whose goal is to apply sustainability concepts and accounting to production systems. They contacted the ePolicy team after an interview of the project coordinator to an Italian scientific magazine, Le Scienze. They were interested in the environmental assessment of production processes using the same methodology of ePolicy.

Discussions took place within 2014, and the EULABOR institute has signed a collaboration with the University of Bologna for the extension of the ePolicy methodology, in particular the Global Optimiser. The application to be used is the environmental assessment of production lines of a company producing super yachts.

This extension has potentially far reaching benefits, as the method could be applied to any production line, provided that proper data are available. This would include energy and water consumption, CO_2 emission and costs of the activities.

7 Conclusions

In this document, three aspects of the ePolicy project have been evaluated: the eParticipation process used for stakeholder collaboration, the ePolicy software platform itself, and the exploitation strategy.

Regarding the eParticipation process, two consultation paths were considered: the joint or co-design of the "ioPartecipo+" portal, and public consultation in respect to the Emilia-Romagna Regional operational program on the Green Economy. The results of the evaluation of the two paths have been discussed, highlighting both the very good results achieved in terms of accessibility, usability, methodology followed, and the valuable comments and feedback received, such as the need to communicate the way in which stakeholder input is being put to use by policy makers.

The evaluation of the ePolicy software platform involved the use of two test procedures: Deep and High Level Testing. In both of these tests, the results confirmed the success of ePolicy software platform, achieving very good results. In most cases, these results were far beyond the minimum success threshold defined by indicators presented in D9.2

The ePolicy exploitation strategy includes six extension areas that have been explored. Potential strategies have been identified involving both the whole system, and each of the components. Evaluation has been performed to identify the effort needed for each component to be adapted to each of the six extension areas. Finally, a wide variety of dissemination activities are being undertaken by the team to explore potential exploitation areas, including exploitation in local and national governments, in a range of policy areas, and within the private sector. .