Exploitation Plan

ABSTRACT
The e-Policy project is aimed at designing and implementing a decision support system for policy makers - in particular regional planners - to assist in the successful operation of the entire life cycle of the policy making process. The European Commission has asked for an exploitation plan at the end of month 18 of the project – which is this document - detailing the ways in which the project partners can benefit from the projects results and how hurdles preventing deployment can be overcome. Information is provided on the expected results from the project, how these may be extended in the future together with the details of possible hurdles to deployment and the steps taken to identify how to address such hurdles.

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Executive Summary

The e-Policy project is aimed at designing and implementing a decision support system for policy makers - in particular regional planners - to assist in the successful operation of the entire life cycle of the policy making process.

The European Commission has asked for an exploitation plan at the end of month 18 of the project – which is this document - detailing the ways in which the project partners can benefit from the projects results and how hurdles preventing deployment can be overcome. A detailed list of the categories of such hurdles at this stage has been derived.

The exploitation plan also takes account of comments from the Commission following the first year project review. The full “Plan for Using and Disseminating Foreground” will be produced, as planned, at month 28 and will provide a cumulative overview of exploitable results, as well as past and future activities aimed at using and sharing knowledge generated within the project consortium.

Both this plan and the later “Plan for Using and Disseminating Foreground” are focused on ensuring that hurdles preventing deployment of the ePolicy results are overcome.

The legal structure for the ePolicy project requires that the partners exploit and disseminate its results. In response to this partners have recognised that the exploitation of the outcomes of the project has two major dimensions:-

- Exploitation
- Dissemination and communications

In regard to exploitation, seven major areas of exploitable knowledge have been identified. Of these the pilot decision support system (together with the methodology for extending this system to other fields) represents the integrated co-ordinated deliverable from the project which is best placed to take forward the intended overall vision. Six directions for extending the use of this decision support system have been developed. In order to take these forward it is intended to seek input from important and influential possible users to see how the system can be best framed to meet their needs. This is an important activity over the remaining life of the project.

Future exploitation of the other five areas of exploitable knowledge (which represent modules of the overall decision support system) will be the responsibility of the party that has taken the lead in each case. These partners describe in this plan their current ideas for future development.

An important activity that needs to take place in the next few months is to start to assess the extent to which the ePolicy results can be commercialised and the next steps that would be required in order to bring this about. Within this an initial market analysis is required.
Effective dissemination and communication is a fundamental activity in any research process, since the success of these activities contributes decisively to the short and long term success of a research project – as measured by knowledge usage by external entities and its degree of adoption. This has been clearly identified as an important matter by the ePolicy project and it is expected that a wide range of scientific and user community publications will be published – and indeed this has already started and is reported on in this report. An ongoing “live” register of dissemination activities is being maintained. This will be used to keep a comprehensive record of all such activities which will be included in appropriate final project reports.
1. Introduction

1.1. General

The e-Policy project is aimed at designing and implementing a decision support system for policy makers - in particular regional planners - to assist in the successful operation of the entire life cycle of the policy making process. As part of the project a case study is being examined. This case study is focused on several sections of the Regional Energy plan of the Emilia-Romagna region in Italy.

Within the overall project plan it was originally intended that an exploitation plan based on the results of the work of the consortium (“Plan for Using and Disseminating Foreground (PUDF”) would be produced in month 28; i.e. towards the end of the consortium’s three year work programme. However in the report on the first year review of the project the European Commission (EC) indicated that whilst they had decided that the project should be allowed to continue, there were some minor modifications required. One of these was that an individual exploitation plan for each partner should be provided at the end of month 18 which should detail the way in which the project partners can benefit from the projects results and how hurdles preventing deployment can be overcome.

Although the EC framed this additional requirement as a plan for each individual partner, the integrated nature of the outcomes and deliverables from the project together with the need for elements of their subsequent exploitation to be appropriately coordinated has led the partners to conclude that a consortium wide exploitation plan that encapsulates those of each of the individual partners would be a more effective way of presenting future intensions.

The plan also seeks to respond to some of the other comments in the EC’s first year review of the project. In particular:-

- It was suggested that the project should include a wider perspective of decision and policy making and in ePolicy in general, with a particular emphasis on the national and European levels.
- The EC review also reminds consortium partners that the intended impact of the project is to equip policy makers with open, transparent and accountable advanced tools that will improve the outcomes of complex global decision making and thus there should be a focus on the provision of a system that will be easily usable for policy makers in order for them to efficiently reach complex decisions on policies.
- It was also mentioned that the consortium should invest strategically into broader dissemination activities.

This document is the response of the partners of the ePolicy consortium to the requirement of the EC to produce an exploitation plan at month 18 and includes initiatives aimed at appropriately reacting to some of the points made in the EC’s first year review of the project.
For the avoidance of doubt, it is confirmed that it is still intended to produce the PUDF at month 28.

1.2. Structure of the Plan

The remainder of this document is structured as follows.

- In the following parts of **Section 1** the legal framework of certain aspects of the ePolicy project is summarized and the approach to exploitation management is described
- **Section 2** looks at the contractual framework and the rights and obligations of the members of the consortium
- **Section 3** specifies the expected outcomes and deliverables from the project and how these can be extended in various ways.
- **Section 4** examines the overall routes for exploitation.
- **Section 5** provides plans for each of the individual partners.
- **Section 6** looks at issues regarding the analysis of possible markets and competitors.
- **Section 7** refers to future commercial issues
- **Section 8** considers the potential future involvement of parties who are not currently direct members of ePolicy.
- **Section 9** discusses the potential hurdles that could limit the deployment of the ePolicy results.

Additional information is provided in the appendix.

1.3. Legal Framework

This section briefly outlines the legal framework surrounding the ownership and use of the expected outcomes and deliverables from the project.

The “General conditions” that form part of the ePolicy grant agreement (GA) between the EC and Alma Mater Studiorum-Universita Di Bologna (to which all partners have acceded) require that each **beneficiary** (defined as the ePolicy partners) shall:

- **Use** - or ensure that it is used - **foreground** (defined as the results, including information, whether or not they can be protected, which are generated under the project) of which it has ownership. This expected use should be reported in the PUDF.
- Where appropriate, provide for the adequate and effective protection of the **foreground**. The EC has step-in rights if this is not done.
- Ensure that the **foreground** of which it has ownership is disseminated as swiftly as possible. If the **beneficiary** fails to do so the EC may disseminate the **foreground**.

**Foreground** is the property of the beneficiary that has carried out the work that has generated that **foreground**. Where work is undertaken jointly then the general conditions state that an agreement will need to be made, establishing joint ownership and the associated terms covering issues such
as, for example, the allocation of and terms of exercising such joint ownership. These conditions also lay out what should happen if no such joint ownership agreement has been put in place.

The “Description of Work”- DOW - (which is an Annex to the GA) specifies, as outlined in Section 1.1, that the PUDF should be produced at month 28 and indicates some of the items that should be in it. In addition there is a commitment to coordinate publications and similar dissemination activities.

The overall legal structure surrounding the project is discussed in more detail in Section 2.

1.4. Exploitation Management

1.4.1. Introduction

ePolicy partners have recognised that the exploitation of the outcomes of the project has two major dimensions:

- Exploitation
- Dissemination and communications

These are examined in more detail below.

1.4.2. Exploitation

Regarding exploitation, this plan identifies

- the expected outcomes and deliverables from the ePolicy project,
- some initial views on how these deliverables could be further utilised
- a number of possible directions in which the ePolicy concept could be extended
- actions to be taken by the ePolicy project to validate these possible directions and to further specify the steps that would need to be taken after the ePolicy project is complete

The PUDF will provide an updated report on these aspects together with dealing with relevant intellectual property rights (IPR) issues such as industrial rights and patents etc. Hence it will provide information on future routes to making full use of the new knowledge produced by the ePolicy project (either commercially, open source or otherwise as appropriate).

The production of this document and the PUDF is the responsibility of the Consortium.

The goal of exploitation management is the development of the exploitation plan (this document) and of the PUDF together with the ongoing management of the dissemination, communication and exploitation process throughout the lifetime of the project.

Generally, each Partner shall be entitled to exploit or to commercialise the results of the project in line with the GA and the consortium agreement. These aspects are further discussed in Section 2. However, to maximise the benefits future cooperation between the partners and potentially third
parties will be required to fully utilise the outcomes, deliverables and technical achievements of the project.

1.4.3. Dissemination and communication

It is clear that effective dissemination and communication is a fundamental activity in any research process, since the success of these activities contributes decisively to the short and long term success of a research project – as measured by knowledge usage by external entities and its degree of adoption.

This plan sets out the details of the types of dissemination activities to be undertaken during the project lifetime. It will capture all dissemination and exploitation activities which are planned and will report on those which have been undertaken by the project partners in the first year of the project.

The project is maintaining a “live” register of dissemination activities and this will be used in the production of the PUDF. There will therefore be a complete picture of all activities undertaken at the time of production of the PUDF. The “live” register will be maintained until the end of the project and thus will be available to provide information on the whole process of ePolicy knowledge dissemination.

1.5. Summary

The exploitation plan is a living document, which is expected to evolve throughout the duration of the project in response to the developments made.

In summary this document sets out the plan for using and disseminating the project foreground knowledge within the framework provided for in the relevant contracts.
2. Rights and Obligations of the members of the consortium

2.1. Who Owns What

2.1.1. Introduction

This section is aimed at explaining the legal structure of the ePolicy project and the various rights and obligation of its members, particularly in regard to exploitation of the results of the project and their dissemination. Hence it covers such topics as IPR, the requirement to disseminate new knowledge, and the use of and access to such knowledge (as well as existing knowledge which is an input to the project). The legal structure is based on:-

- the grant agreement (number 288147) between the EC and Alma Mater Studiorum-Universita Di Bologna (to which all partners have acceded), and
- the consortium agreement (CA) between all of the partners

The terms and conditions surrounding IPR issues are laid out in the GA and the CA. These have been referred to in Section 1.3 above but are described in more detail below and in the following sections.

2.1.2. Grant Agreement

As well as the agreement itself the GA has as an integral part of its terms and conditions a series of annexes. These include the “Description of Work” and “General conditions”.

These “General conditions” define certain terms which are relevant to this plan as follows:-

"access rights" means licences and user rights to foreground or background

"background" means information which is held by beneficiaries prior to their accession to this agreement, as well as copyrights or other intellectual property rights pertaining to such information, the application for which has been filed before their accession to this agreement, and which is needed for carrying out the project or for using foreground

"dissemination" means the disclosure of foreground by any appropriate means other than that resulting from the formalities for protecting it, and including the publication of foreground in any medium

"fair and reasonable conditions" means appropriate conditions including possible financial terms taking into account the specific circumstances of the request for access, for example the actual or potential value of the foreground or background to which access is requested and/or the scope, duration or other characteristics of the use envisaged
"foreground" means the results, including information, whether or not they can be protected, which are generated under the *project*. Such results include rights related to copyright; design rights; patent rights; plant variety rights; or similar forms of protection.

"use" means the direct or indirect utilisation of *foreground* in further research activities other than those covered by the *project*, or for developing, creating and marketing a product or process, or for creating and providing a service;

*Beneficiaries* are named in the GA (and consist of all the partners in the project) and all the *beneficiaries* together form the *consortium*.

As mentioned above, the “General conditions” that form part of the GA require that each *beneficiary* (defined, as mentioned above, as the ePolicy partners) shall:

- Use - or ensure that it is used - *foreground* (defined as the results, including information, whether or not they can be protected, which are generated under the project) of which it has ownership. This expected use should be reported in the PUDF.
- Where appropriate, provide for the adequate and effective protection of the *foreground*. The EC has step-in rights if this is not done (see Section 2.2 below).
- Ensure that the *foreground* of which it has ownership is disseminated as swiftly as possible. If the *beneficiary* fails to do so the EC may disseminate the *foreground*.

*Foreground* is the property of the beneficiary that has carried out the work that has generated that *foreground*. Where several *beneficiaries* have undertaken work jointly and their respective share of the work cannot be ascertained then there will be joint ownership. In such cases the “General conditions” state that an agreement will need to be made, establishing joint ownership and the associated terms covering issues such as, for example, the allocation of and terms of exercising such joint ownership (although it is recognised that the joint owners may agree not to continue with joint ownership but decide on an alternative regime - for example, a single owner with access rights for the other *beneficiaries* that have transferred their ownership share). These conditions also lay out what should happen if no such joint ownership agreement has been put in place – in which case, each of the joint owners shall be entitled to grant non-exclusive licences to third parties, provided that at least 45 days prior notice has been given to the other joint owner(s) and fair and reasonable compensation must be provided to the other joint owner(s).

The “General conditions” also provide for a *beneficiary* to transfer ownership of its *foreground* subject to certain safeguards regarding ongoing "access rights" and in certain other cases.

2.1.3. Consortium Agreement

The CA notes that the relevant articles on ownership, use, dissemination, protection of *foreground* from the “General conditions” of the GA are applicable as well as some additions as follows:

- Joint ownership of *foreground* - in the case of joint ownership of *foreground*, the shares of ownership should be negotiated between those partners involved and be proportional to
the intellectual contribution invested in generating such foreground. In regard to software, the joint owners should agree on all protection measures and the division of related cost in a joint ownership agreement, and establish the appropriate course of action to file applications for patent or other protection.

- **Use of joint foreground** - Where no joint ownership agreement has yet been concluded, each of the joint owners shall be entitled to use their jointly owned foreground in, firstly, further internal academic research activities on a royalty-free basis and without requiring the prior consent of the other joint owner(s) and, secondly, for commercial purposes, including granting non-exclusive licenses to third parties, subject to giving at least 45 days prior notice to the other joint owner(s) and the payment of fair and reasonable compensation.

- **Transfer of foreground** - Each Party may transfer ownership of its own foreground in line with the terms of the GA.

- **Dissemination** (including publications and presentations) – this again is in line with the GA. Prior notice of any planned publication should be made before the publication of a Party’s own foreground or background. An objection is justified if legitimate academic or commercial interests are compromised by the publication; or the protection of another partner’s foreground or background is adversely affected. The partners should then discuss how to overcome the objection on a timely basis.

- **Access Rights** – this is again generally in line with the GA and deals with the background to which partners are ready to grant Access Rights and any that they specifically wish to exclude, and the general principles and arrangements for applying for and using access rights. It is also confirmed that any grant of Access Rights not covered by the CA are at the absolute discretion of the owning Party and subject to such terms and conditions as may be agreed.

- **Specific Provisions for Access Rights to Software** – the arrangements for Access Rights to software are described.

### 2.1.4. Future Agreements

During the timescale of the ePolicy project the potential for further agreements between the partners (and potentially third parties) aimed at fully exploiting the project results will be explored taking into account the outcomes and deliverables from the project, the next steps that are identified by the project, likely market opportunities and the likelihood of successfully obtaining future funding.

The commitment of the project partners is to exploit the main results of the project for the benefit of all the parties involved and to make the knowledge available for future research.

It will be the aim that at the end of the project duration, a viable exploitation agreement, satisfactory to all partners, will be established to cover the exploitation of the project results. This agreement will seek to define the relevant IPR issues.
2.2. Protection of Knowledge

The “General conditions” of the GA lays out arrangements for the protection of foreground. In particular where it is capable of industrial or commercial application, its owner should provide for its adequate and effective protection.

Where foreground capable of industrial or commercial application is not protected or transferred to another beneficiary or certain other parties no dissemination activities relating to that foreground may take place before the EC has been informed. In such a case the European Union may assume ownership of that foreground.

2.3. Dissemination

The “General conditions” of the GA also lays out arrangements in regard to dissemination.

As previously mentioned these state that each beneficiary should ensure that the foreground of which it has ownership is disseminated as swiftly as possible and if it fails to do so, the Commission may disseminate that foreground. Dissemination activities should be compatible with the protection of IPR, confidentiality obligations and the legitimate interests of the owner(s) of the foreground.

Prior notice of any dissemination activity should be given to the other beneficiaries concerned so that any objections may be raised if a partner considers that its legitimate interests in relation to its foreground or background could suffer disproportionately great harm. In such cases, the dissemination activity may not take place unless appropriate steps are taken to safeguard these legitimate interests.

Dissemination activity should be reported in the PUDF

2.4. Access Rights

The “General conditions” of the GA includes a number of provisions regarding access rights. These cover such topics as the definition of the background needed for the purposes of the project, the granting of access rights and any associated conditions or limitations including such grants to other beneficiaries, where this is needed for the work of the project. Such access rights shall be granted on a royalty-free basis.

Regarding access rights for use, beneficiaries are allowed, subject to agreement, access rights to foreground and background, if it is needed to use their own foreground. Such access rights should either be royalty-free or granted under fair and reasonable conditions. Requests for such access rights should be made up to one year after the end of the project or termination of participation by the owner of the background or foreground concerned. However, the beneficiaries concerned may agree on a different time-limit.
3. Exploitable Knowledge and Dissemination

3.1. Introduction

Section 2 above explains that all project partners are contractually bound to report in the PUDF all dissemination, expected exploitation and IPR protection activities in line with the GA and the CA.

In addition, as explained in Section 1.4 ePolicy partners have recognised that the exploitation of the outcomes of the project has two major dimensions:

- Exploitation
- Dissemination and communications

The PUDF - produced at month 28 – will provide a cumulative overview of exploitable results, as well as past and future activities aimed at using and sharing knowledge generated within the project consortium. This exploitation plan (i.e. this document) outlines the structure that will be adopted for the PUDF, provides an indication of the information that will be included, and describes steps that will be taken by the ePolicy project and its partners to facilitate exploitation and dissemination of the results of the project.

The PUDF will be organized into three main sections:

- Exploitable knowledge and its use (Section 1, not available in the public version),
- Dissemination of knowledge (Section 2), and
- Publishable results (Section 3).

The first section will present exploitable results and how these will be exploited by partners. This is discussed in more detail in Section 3.2 below.

The second section will provide a detailed list of events attended by participants or promoted by the project and all papers, presentations, posters, etc produced up to that stage of the project’s lifetime. Again this is further explored in Section 3.3 below.

The third section, related to publishable results, will provide a publishable summary of each exploitable result the project has generated and a list of public deliverables. It will also include a general policy agreed among the partners to manage the follow-up of the project, the usage of its latest results, and the future publication strategy.

3.2. Expected exploitable knowledge at the end of the project and its possible use

3.2.1. General

This section presents the exploitable results (defined as knowledge having a potential i) for industrial or commercial application in research activities, or ii) for developing, creating or marketing a product or process, or iii) for creating or providing a service) which it is expected that
the ePolicy project will have created at the end of its timescale. In Section 4 the opportunities for extending the results from the ePolicy project into other policy areas, different regions, different countries, at the EU level and even in business are considered.

An overview of the exploitable knowledge to be produced by the project is shown in the summary table below, which is accompanied by a short description of each exploitable result, with information on its stage of development and on how the knowledge could be further exploited or used.

<table>
<thead>
<tr>
<th>Exploitable Knowledge</th>
<th>Exploitable Products or Service</th>
<th>Sectors of Application</th>
<th>Owner &amp; Other Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Decision support system (DSS)</td>
<td>ePolicy DSS for regional energy plan</td>
<td>Renewable energy planning</td>
<td>To be agreed</td>
</tr>
<tr>
<td>2 Opinion mining</td>
<td>Tool for opinion mining tuned on renewable energy sources</td>
<td>Renewable energy planning</td>
<td>INESC</td>
</tr>
<tr>
<td>3 Optimization component</td>
<td>Decision making solver for regional planning</td>
<td>Renewable energy planning/energy efficiency</td>
<td>UNIBO</td>
</tr>
<tr>
<td>4 Social Simulator</td>
<td>Social simulator tuned on ER</td>
<td>Photovoltaic adoption</td>
<td>SURREY</td>
</tr>
<tr>
<td>5 Incentive design module</td>
<td>Energy incentive design component</td>
<td>Photovoltaic support</td>
<td>UCC</td>
</tr>
<tr>
<td>6 Methodology for extending the ePolicy DSS to other fields</td>
<td>Extension to other policies or different scales</td>
<td>General</td>
<td>ALL</td>
</tr>
<tr>
<td>7 Visualization Modules</td>
<td>Integration of modules in Fraunhofer IGD visualization framework, adaptation to general strategic environmental assessment, social simulation, and opinion mining models</td>
<td>Strategic Environmental Assessment, Social Simulation, Opinion Mining</td>
<td>Fraunhofer IGD</td>
</tr>
</tbody>
</table>

Figure 1 – ePolicy Exploitable Knowledge

Appropriate patent or other protection will be considered, as appropriate, as these items are developed. The potential timescales for commercialisation will also be examined by the project and laid out in the PUDF.

Shown below are short descriptions of each of the exploitable results.

3.2.2. ePolicy decision support system(DSS) for the Emilia Romagna Energy Plan

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

3.2.3. Opinion mining component

The opinion mining component of the projects results can be used in two phases: the training phase and the user phase. During the training phase, the opinion mining component receives as input a set of inputs from individuals on a specific topic that are manually tagged by a human expert. The tags represent the opinions expressed in the document on the topic. The training phase outcome is a model for tagging other documents and thus automatically extracting opinions. The opinions can be visualized in an aggregated form and each tagged document can be visualized. Also, an important characteristic that is extremely useful for a policy maker is the opinion trend over time.

3.2.4. Social Simulator

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

3.2.5. Global Optimizer

The global optimizer component of the project is a combinatorial optimization model and solver that produces a set of Pareto optimal energy plans given a number of constraints on costs, receptors, and a number of objective functions. The component is based on constraint logic programming. It performs both regional planning and the strategic environmental assessment of the plans produced. The component also receives as input the cost of the primary activities of the plan, the secondary activities and their respective cost and environmental impact.
The global optimizer component is tailored to ER as it is fed with data from that region. However, it could be fed with data concerning other regions, namely the maximum energy per source available in other regions to produce other regional plans provided their structure is similar to the one of ER.

3.2.6. Incentive design module

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

3.2.7. Methodology for extending the software to other domains

One of the results of the ePolicy project is intended to be a methodology for extending the DSS and all its components to other policy areas. In particular, six ways have been identified to extend the system.

Three of them refer to the same policy area (namely that of renewable energy) but focused on either larger (such as National and EU plans) or smaller scales (provincial and municipality) or the same scale but for other regions.

The other three extensions concern other policy areas: the first is the extension of the system for coping with regional planning on different policies, 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 the one on energy efficiency that is extremely important. Finally, there is another extension suggested by ENEL, the Italian utility company (which is a member of the Advisory and Dissemination Board – ADB - of ePolicy) which is interested in applying the ePolicy methodology to some of their business models and pricing schema (similar to policy instruments) that on one hand are cost-effective for ENEL and on the other hand provide energy efficiency and peak reduction in consumption profiles.

These potential extensions to the system are examined in more detail in Section 4.
3.2.8. Visualization Modules

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

3.3. Dissemination

3.3.1. General

As has been previously mentioned effective dissemination and communication is a fundamental activity in any research process, since the success of these activities contributes decisively to the short and long term success of a research project – as measured by knowledge usage by external entities and its degree of adoption. This has been clearly identified as an important matter by the the ePolicy project. For example, in the DOW it is stated that the project will coordinate scientific and user community publications and will seek to ensure that at least four scientific and eight technical papers are published during the its lifetime.

In order to oversee this, an ongoing “live” register of dissemination activities is being maintained. This will be used to keep a comprehensive record of all such activities. The structure of this register is as follows

- Dissemination to the scientific community
  - Papers
  - Conferences
  - Other
- Dissemination in national/local newspapers/web portals
- Dissemination in Public Events

The structure of the tables being used to collect information for each of these categories is illustrated in Figure 2 to Figure 6 below. Appendix 1 provides information about all ePolicy dissemination activities undertaken by the project partners in the period from the start of the project until month 14. An updated version of this will be produced for the PDUF in month 28 and the register will be maintained until the end of the project so that a comprehensive record of dissemination of is established.

In addition the project website, which is already operating, will be maintained (see Section 3.3.3).
### 3.3.2. Structure of tables

<table>
<thead>
<tr>
<th>Date</th>
<th>Name of Journal</th>
<th>Title of publication</th>
<th>Author(s)</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
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</thead>
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*Figure 2 - Dissemination to the scientific community: Papers*

<table>
<thead>
<tr>
<th>Name of the conference, Place and date</th>
<th>Short description of the theme of the conference</th>
<th>Title of the presentation of paper/poster</th>
<th>Name of person who carried out the presentation and its organization</th>
<th>Material presented (slides/posters/…)</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
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*Figure 3 - Dissemination to the scientific community: Conferences*

<table>
<thead>
<tr>
<th>Date</th>
<th>Description of the dissemination activity</th>
<th>Person(s) undertaking the dissemination</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
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*Figure 4 - Dissemination to the scientific community: Other*
<table>
<thead>
<tr>
<th>Date</th>
<th>Title of the article</th>
<th>Newspaper name</th>
<th>Link <em>(if appeared in an online newspaper)</em></th>
<th>Country</th>
<th>Partners involved</th>
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</table>

*Figure 5 - Dissemination in national/local newspaper/web portals*

<table>
<thead>
<tr>
<th>Name of the event, Place and date</th>
<th>Short description of the theme of the event</th>
<th>Title of the presentation</th>
<th>Name of person who carried out the presentation and its organization</th>
<th>Material presented (preferable as an attachment)</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
</tr>
</thead>
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</table>

*Figure 6 - Dissemination in Public Events*
3.3.3. Project website

The ePolicy website has been designed, developed and implemented and can be found at http://www.epolicy-project.eu. The website consists of both a public area, which is generally accessible, and a password-controlled private one for the sole use of the project participants. The website will evolve as the project progresses and it is the intention that whenever possible information, documents and presentations related to the project will be lodged here. The public pages of the website include a Home Page which provides links to the news and events pages which will continue to be maintained. There is also a link to a page that allows individuals to register on a mailing list in order to be provided with information about the project in the future.

Anyone with an interest in the activities of the ePolicy project will be encouraged to regularly visit the projects website. Figure 7 below shows usage of the website over the 12 months ending March 2013. This indicates its regular and growing use.

![Usage summary for epolicy-project.eu](image)

*Figure 7 – ePolicy website usage: year ending March 2013*
4. Exploitation Routes – possible paths for future exploitation

4.1. General

Section 3.2 shows the likely exploitable knowledge at the end of the ePolicy project. Of these the most concrete outcome is expected to be the DSS for part of the ER Regional Energy Plan. Opportunities for the exploitation, extension and development of the DSS together with the methodology for extending the ePolicy DSS to other fields are described in Section 4.2 below.

In regard to the other results from the project the exploitation paths are discussed in the sections as shown below:-

- Opinion mining – see Section 5.1.5
- Optimization component – see Section 5.1.2
- Social Simulator – see Section 5.1.4
- Incentive design module – see Section 5.1.3
- Visualization Modules – see Section 5.1.6

4.2. Decision Support System (DSS)

4.2.1. General

Section 3.2 shows the likely exploitable knowledge at the end of the ePolicy project. Of these the most concrete outcome is expected to be the DSS for part of the ER Regional Energy Plan. Up to this stage one of the most important chapters in this plan – i.e. on energy production from renewable energy sources - has been considered. By the end of the project it is intended to also cover at least one other chapter - namely that on energy efficiency which is also very important for the environment, sustainable development and meeting the EU 20-20-20 initiative advocating a 20% increase in energy efficiency with respect to 1990 levels.

Six possible opportunities for extending the DSS have already been identified

Three of these are focused on the same ePolicy domain - i.e. renewable energy sources - while the other three look towards other policy areas. These are illustrated in Figure 8 below.
For the renewable energy policy sector Figure 8 indicates the following possible areas as those into which ePolicy could be extended:

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

For other policy areas ePolicy could be extended as follows:

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

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

In the sections below for each of these possible extensions a number of aspects are discussed including what needs to be investigated and which stakeholders should be consulted in order to design a methodology for dealing with the different scales, data, and problems of these other areas. All of this activity will be aimed at identifying how to change the DSS that ePolicy produces so that it can be applied to each of these various possible extensions.

These exploitation activities are likely to start during the ePolicy project lifetime, but will also continue after its end ensuring

- extensive dissemination activity including both scientific and stakeholder events,
consultancy activity for ePolicy partners on the expertise acquired during the project,
contacts with public Administrations and local authorities,
opportunities for other funded research
new software products based on the ePolicy methodology.

The sections below examine each of these possible areas of extension of the work of the project in more detail.

4.2.2. To a higher level, i.e. national and EU

4.2.2.1. General

Regarding renewable energy policy, there are several levels at which such policies can be developed. For current purposes the highest possible level is the European level. In the Energy 2020\(^1\) policy statement it is argued that the EU is the level at which energy policy should be developed because of the impact that countries can have on each other and the need for efficient and secure development. National energy policies should then adopt and inherit guidelines from the EU level. Below both the EU and national levels are investigated and an explanation is provided on how to extend the ePolicy DSS to cope with these higher scale decisions.

4.2.2.2. European Level

Following the strategy outlined in Europe 2020, the EU growth strategy for the coming decade - the EU is strongly committed to reducing its greenhouse gas emissions by at least 20% by 2020, relative to 1990 levels, increasing the share of renewable energy sources in final energy consumption to 20% and increasing energy efficiency in Europe by 20%. To drive progress and set the EU on a pathway towards meeting these targets, every country and every region should be committed to providing its own contribution to these objectives.

Therefore, national and regional energy policies need to take account of these guidelines and be designed to meet these ambitious objectives. With a view to achieving the 20% renewable energy target in the EU by 2020, the Renewable Energy Directive establishes legally binding individual targets for the share of renewable energy in final energy consumption for each Member State. For example, Italy is supposed to reach a 17% renewable energy share, UK 15% and Austria 30%. To achieve these objectives, each country and, in some cases, regions are implementing a number of actions focused on the promotion and wide adoption of energy production from renewable energy sources.

Thus a possible extension to the DSS is to focus it on the renewable energy sections of national and European Energy plans. Hence, for the EU plan, the start point could be the current situation as contained in Eurostat studies, such as “Analysis of the latest data on energy from renewable

\(^1\) http://ec.europa.eu/europe2020/
sources”² to understand the needs and the current energy production from renewables. After this the total production forecast in 2020 can be considered and the plan could allocate this amount of energy among countries (instead of specific energy sources as with the ER prototype DSS). Each country has its own current production and this is expected to increase in order to obtain, at EU level, an energy share from renewables of 20% in 2020. Therefore the optimizer model could be adapted to this plan to analyse the decisions that need to be taken.

The optimizer would also need to be extended to take into account the Sustainable Development Indicators (SDIs) that are used to assess and monitor the EU Sustainable Development Strategy (EU SDS) in a report published by Eurostat every two years. These are presented in ten themes. Of more than 100 indicators, eleven have been identified as headline indicators. They are intended to give an overall picture of whether the European Union has achieved progress towards sustainable development in terms of the objectives and targets defined in the strategy. The indicators are not only related to the environment but also to more broadly based sustainable development.

Figure 9 below shows the sustainable development indicators used and the corresponding theme.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Headline indicator</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-economic development</strong></td>
<td>Growth rate of real GDP per capita</td>
<td>Economy</td>
</tr>
<tr>
<td><strong>Sustainable consumption and production</strong></td>
<td>Resource productivity</td>
<td>Economy/environment</td>
</tr>
<tr>
<td><strong>Social inclusion</strong></td>
<td>People at-risk-of-poverty or social exclusion</td>
<td>Society</td>
</tr>
<tr>
<td><strong>Demographic changes</strong></td>
<td>Employment rate of older workers</td>
<td>Economy/society</td>
</tr>
<tr>
<td><strong>Public health</strong></td>
<td>Healthy life years and life expectancy at birth, by sex</td>
<td>Society</td>
</tr>
<tr>
<td><strong>Climate change and energy</strong></td>
<td>Greenhouse gas emissions</td>
<td>Environment</td>
</tr>
<tr>
<td></td>
<td>Share of renewable energy in gross final energy consumption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary energy consumption</td>
<td></td>
</tr>
<tr>
<td><strong>Sustainable transport</strong></td>
<td>Energy consumption of transport relative to GDP</td>
<td>Environment</td>
</tr>
<tr>
<td><strong>Natural resources</strong></td>
<td>Common bird index</td>
<td>Environment</td>
</tr>
<tr>
<td></td>
<td>Fish catches taken from stocks outside safe biological limits: Status of fish stocks managed by the EU in the North-East Atlantic</td>
<td></td>
</tr>
<tr>
<td><strong>Global partnership</strong></td>
<td>Official development assistance as share of gross national income</td>
<td>Economy</td>
</tr>
</tbody>
</table>

Figure 9 - Sustainable Development Indicators (SDIs)

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² http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-12-044/EN/KS-SF-12-044-EN.PDF
To be able to extend the ePolicy DSS to the evaluation of the EU plan, a matrix linking the actions proposed with their impact on these indicators will be needed.

Therefore the data that is needed to extend the ePolicy DSS is:-

- the decisions to be taken,
- the costs of these decisions,
- the impacts of the decisions on society, environment and economy.

Then the system could produce a number of scenarios, each containing an alternative strategy.

4.2.2.3. National Level

Following the EU2020 strategy, each Member State has to consider the guidelines of the EU energy strategy and implement them into a Strategic National Energy Plan.

In keeping with these needs, the new National Energy Strategy (NES) focuses on four main goals:

1. **Significantly reducing the energy cost gap** for consumers and businesses, by bringing prices and costs in line with European levels.

2. **Achieve and exceed the environmental targets** established by the European Union’s 2020 Climate and Energy Package (known as the “20-20-20” package).

3. **Continue to improve security of supply**.

4. **Foster sustainable economic growth** by developing the energy sector.

As an example, looking at the Italian National Energy strategy, in October 2012 a consultation document was issued\(^3\) presenting the strategies that will be contained in the future Energy plan and proposing some questions for public comment. The document states that Italy fully embraces the spirit of the Energy and Climate Package and has adopted the European legislative framework, with the following targets for 2020:

- A binding commitment to reduce emissions by 18% overall. This can be broken down as follows: 21% for the Emissions Trading Scheme (ETS) sectors, most notably electricity generation, and, in the non-ETS sectors, 13% with respect to 2005 levels.

- A binding commitment to attain 17% of energy from renewable sources, including a 10% target for biofuels.

- A commitment to reduce primary energy consumption by 20% with respect to the projected levels. The June 2012 Energy Efficiency Directive identifies a number of measures available to member states to achieve this goal.

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In regard to renewable energy the structure of the Italian plan is similar to the ER one investigated in the ePolicy project. This suggests an interesting (and easy to implement) feature. In Figure 10 below the energy source mix proposed in Italy for 2020 has, compared to 2010, some sources that should be decreased whilst others are increased. In the regional plan considered in ePolicy this is a completely missing aspect, but it has two interesting advantages: firstly, costs could be considered and the impact of decommissioning some plants, and secondly, it is more complete taking into account also the environmental advantages of rebalancing possible energy sources.

**Figure 10 – Italy: Energy Mix in 2020**

This is an important aspect that could be incorporated into a future DSS that could significantly improve the quality of planning and environmental assessment activities.

4.2.2.4. Plan for exploitation

In the ePolicy project, the consortium will define a methodology for extending the project results to both the national and EU level. In doing this it will be very important to interact with a number of stakeholders outside the ePolicy project – located via personal contacts of ePolicy researchers, and involvements in the ADB. These will mainly be potential users of a DSS and, as such, should be important in pointing out the uses of such systems and how they should be designed to be user-friendly.

Two such contacts that have already been established:

- University of Bologna (UNIBO) has contacts with researchers of RSE⁴ - Ricerca sul Sistema Energetico. RSE SpA, is a joint stock company, whose one shareholder is GSE SpA, which undertakes research in electro-energy, with a particular focus on strategic national projects

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⁴ [http://www.rse-web.it/](http://www.rse-web.it/)
of general public interest, financed by the Fondo per la Ricerca di Sistema of the Italian Economic Development Ministry. RSE has agreed to help the ePolicy consortium in defining the methodology for extending the ePolicy system to a wider scale.

- PPA Energy has contacted DECC - the UK Department of Energy and Climate Change. DECC has agreed to become involved in the ADB. There also may be links more broadly to the UK government - in particular to Defra, the Department for Environment, Food and Rural Affairs.

These two contacts represent a unique opportunity for exploitation of project results beyond the project duration and beyond the project scale. It is hope to develop additional stakeholder links in other countries during the lifetime of the project

4.2.3. To other regions

4.2.3.1. General

One of the most straightforward applications of the ePolicy DSS would be to extend it to the Regional Energy plan for other regions – particularly in Italy. Clearly, the energy plans of Italian regions would be similar to that of ER, but it is believed that the ePolicy approach could also be applied to non-Italian Regions.

Clearly, some elements of the system would need to be changed - one of the most important of which would be the social simulator. This component of the ePolicy results is being tuned by interviewing people from the Emilia Romagna region. The idea is to understand which decision making model individual agents use to decide to install renewable energy equipment - taking into account both economic and social aspects.

A methodology will be defined for extending each component of the DSS to other regions. In addition, a survey on the energy plans devised in other regions will need to be performed. The reason for this is to understand if there are some specific features of some regional plans that are outside the capabilities of the ePolicy system. In particular, the special administrative regions of Italy with broad autonomy will be investigated.

4.2.3.2. Plans for exploitation

Regione Emilia-Romagna (RER) is a member of a group of Italian regions on energy monitoring. It is planned to exploit this link to:-

1. Show the results of ePolicy to other public administrations to disseminate the project results
2. Learn about the features needed to extend the ePolicy DSS to other regions
3. Devise a methodology for extending the system.
Other regions outside Italy will be also considered. It is hoped to use the contact with DECC to investigate the means for project exploitation to the regional level outside Italy – which will mean interacting with other national guidelines.

4.2.4. To a lower level, i.e. province and municipality and similar

4.2.4.1. General

Another potential application of the ePolicy DSS is to apply it to lower levels - in particular to provinces, municipalities and similar jurisdictions.

Both at provincial and at municipality level, the main goal is to understand what the optimal mix of resources and interventions is (as far as energy production from non renewable and renewable energy sources is concerned). After studying the Bologna provincial\(^5\) and municipal\(^6\) energy plan, it was concluded that the structure of the plans is the same as the one for the regional plan, despite more details being given on territorial constraints. For example, Figure 11 is taken from the Provincial Plan of Bologna and it is concerned with geographically referenced energy consumption: the red slices represent consumption from natural gas, the green slices refer to electricity, the blue slices concern fuel and the light ones refer to gasoline. This level of detail is not found at the regional and national level where the granularity of the data tends to be coarser.

However, the energy mix is established by using constraints and objectives that are adopted from the regional and national plans.

An initial conclusion that can be drawn from this preliminary study is that the ePolicy DSS can be applied to smaller scale plans with some small changes.

\(^5\) http://www.provincia.bologna.it/ambiente/Engine/RAServePG.php/P/261611030300/M/257111030303
\(^6\) http://www.comune.bologna.it/media/files/pec_volume_2.pdf
4.2.4.2. Plans for exploitation

UNIBO and RER have good contact and collaborate with the Municipality and Province of Bologna (RER also has close relationships with other provinces in Emilia Romagna). These links will be exploited to

1. Show the results of ePolicy to other public administrations to disseminate the project results.
2. Learn about the features needed to extend the ePolicy DSS to smaller scales.
3. Devise a methodology for extending the system.

Figure 11 - Energy consumption in the Bologna province: geo-referenced and divided by types
The situation outside Italy will be also considered.

4.2.5. Integration of the same policy area over different levels

Up to now the same policy area has been examined at different levels. An important future project that could come out from ePolicy (when effectively extended to other levels) is a unique and multi-scale DSS that merges and integrates decisions at different scales and makes them coherent. On this basis, an extension of ePolicy could be proposed for funding either at EU or national level.

4.2.6. Extension to other policy domains

4.2.6.1. General

This is the most difficult potential extension of the ePolicy DSS. In particular, the number of changes that have to be implemented to the system is greater and, more importantly, they are dependent on the policy area that is being considered. However, in analysing different regional plans some commonalities among plans on different policy areas have been identified. Each plan defines a set of activities that should be carried out to obtain specific objectives. Each plan is, in general, organised as follows:

- Existing situation and previous plans - the first step of a regional plan is to analyse in detail the existing situation and the results of previous plans on the same topic. An analysis of environmental, social, economic aspects is undertaken and the results of implementation instruments adopted in the past are identified and evaluated.

- Objectives and Strategies - on the basis of the existing situation, the main objectives to be sought and strategies to be applied are identified. Objectives can be derived from EU and national guidelines, existing rules and norms from citizens and stakeholder participation, from regional goals and specific needs. Ex ante evaluation plays a role in this phase.

- Priorities and intervention lines - To move towards the objectives, the regional plan identifies intervention lines and priorities. For instance the region might decide to invest in industrial research and technology transfer, in renewable energy sources, in land use qualification, etc. On each axis, specific objectives, activities and allocated budget are identified and planned. This is the decision making part of the plan and contains a resource allocation component that is aimed at achieving the objectives by satisfying specific constraints.

- Implementation and Monitoring - To encourage the activities identified at the previous step, implementation instruments need to be defined. These can be grouped into four main categories:-(1) regulatory, such as self-regulation by voluntary bodies, standards imposed by formal standards bodies and legislation; (2) economic: taxes, fees and user-charges, certificate trading, procurement policies, subsidies; (3) cooperation such as voluntary agreements, producer and
consumer associations and (4) information such as labelling schemes, reporting requirements, advice services and technology transfer.

When devising a regional plan, the policy maker has to take into account impacts on the environment, economy and society. In Italy currently the procedure aimed at assessing the environmental impacts of a regional plan is called Strategic Environmental Assessment. This relates activities defined in the plan to environmental and economic impacts. This assessment procedure is now manually implemented by environmental experts to check the effects of a given plan or programme, but it is never applied during the plan/program construction. In addition, this procedure is applied to a given plan that has already been incorporated into regional planning. Taking into account impacts a posteriori enables only corrective interventions aimed at reducing the negative effect of one or more wrong planning decisions.

Following from an analysis of the transportation plan within the operational program of the Emilia Romagna region some similarities and differences with regional energy planning have been identified. A methodology will be devised for extending the components of the decision support system to deal with other policy areas.

4.2.6.2. Plan for exploitation.

The expertise of RER in other policy areas will be utilised to understand if the system developed for ePolicy could be reused and exploited in other domains.

4.2.7. Extension to other chapters of the regional energy plan

In the ePolicy project, one chapter of the energy plan has been considered - energy production from renewable energy sources. However, other chapters are also extremely important and will be addressed in the third year of ePolicy. One of particular importance is the objective of increasing energy efficiency.

Energy efficiency is one of the top priorities of the EU energy strategy. More specifically, the aim is to save a further 20 MTOE of primary energy by 2020, which is equivalent to savings of almost 25% with respect to the European benchmark (thereby exceeding the 20% target). A further aim is to prevent both the emission of about 55 million tonnes of CO₂ annually, and of imports of fossil fuels for about €8 billion each year. The potential of efficiency measures in Italy, many of which have positive economic returns, is considerable. However, there are numerous barriers to adopting them, which are specific to each sphere of application and prevent them from being fully achieved. The efforts to attain the energy savings targets will therefore be designed to overcome the barriers to the adoption of efficiency-enhancing technologies, by making rational and strengthening instruments and actions dedicated to each segment and sector.

There are a number of instruments for supporting energy efficiency:

- Minimum and legal standards concerning for example the construction industry and transport.
• Tax rebates, mainly dedicated to home refurbishment.
• Government and civil service play a lead role for the rest of the economy; since they cannot use the tax rebate scheme they could be granted direct incentives.
• The White Certificates targets and mechanisms. These apply mainly to industrial sectors and services, but are also of importance in the transport and residential sectors.

Therefore the optimizer, the simulator, the mechanism design tool and the opinion mining could be refined to cope with this topic and then inserted and integrated into the current DSS. Part of this work, particularly in regard to the optimizer, will be implemented in the third year of ePolicy.

4.2.8. Extension to business models

An interesting extension to the ePolicy decision support system has been suggested by the large Italian utility company, ENEL which is a member of the ADB.

The expanding application of Smart Grid and “clean” energy production technologies calls for the adoption of novel, “intelligent” techniques to better coordinate and run the future power production and distribution process. In this setting, the task to keep it precisely balanced with supply at all times becomes especially challenging. Maintaining demand curve stability, in particular, can alleviate the risk of disastrous electricity network collapses, and leads to financial and environmental benefits—as then some generators can be run on idle, or even be shut down completely. To this end, several load control programs have been proposed, where electricity consumers are encouraged to limit their consumption, or shift it to off-peak hours in order to reduce the peak-to-average ratio.

Typically, such schemes either involve an intermediary company which manages consumers who agree to contribute to the flattening or “peak lopping” of the demand curve in the event of an impending critical period; or provide a reduced “flat” electricity consumption rate or rebate to consumers for lowering their consumption over a prolonged time period; or require the use of dynamic, real-time pricing. 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 schema 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 schema 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 optimizer that could also consider other constraints and objective functions. To tune the simulator, a number of consumers should be traced to extract their consumption profiles. To this end they should be equipped with smart meters and smart plugs. An important instrument to reduce energy consumption and to flatten it, is to increase consumer’s awareness. This can be done at the political level. The ePolicy DSS 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. The DSS could be integrated with that producing optimal pricing schema to have an interactive information exchange between the two.
5. Exploitation and dissemination planned by individual partners

5.1.1. General

This section provides information on the exploitation and dissemination plans for each of the partners in the ePolicy project.

5.1.2. Alma Mater Studiorum Università di Bologna, Italy

The University of Bologna will exploit the results of the ePolicy project in a number of ways, as follows:

- **Dissemination** - The first immediate outcome a research oriented institution like UNIBO could exploit is the publication of the research results in international conferences, workshops and journals. A number of conferences, workshops and journals have been identified that could be interested in publishing the results of ePolicy. The UNIBO Team is particularly involved in the combinatorial optimization aspect of the project. Therefore, conferences such as:

  - CP, the International Conference on Principles and Practice of Constraint Programming
  - ICLP the International Conference on Logic Programming
  - AAAI The Conference of the American Association of Artificial Intelligence
  - IJCAI The International Joint Conference on Artificial Intelligence
  - ECAI The European Conference on Artificial Intelligence
  - ECMS European Conference on Modeling and Simulation
  - AAMAS Int.l Conference on Autonomous Agents and Multi Agent Systems
  - CompSust Int.l Conference on Computational Sustainability
  - DATE Design and Automation Europe

and journals like:

  - Constraints an International Journal
  - INFORMS Journal on Computing
  - Sustainability – an Open Access Journal
  - Communications of the ACM
are potential vehicles to disseminate the ePolicy results.

- **A platform for further research** - Although the results of the ePolicy project will include a fully operational pilot system specifically focused on the ER Regional Energy plan, there will be many possible improvements and extensions. Six potential extensions (see Section 4) have been identified and a methodology for extending the ePolicy system and its components in a number of ways will be developed. In particular, UNIBO is very interested in extending the global optimizer to higher and lower levels, applying it to other regions and extending it to business models. As well as the platform provided by the pilot system, the software developed in ePolicy - specifically the global optimizer and the tools for understanding arguments from blogs and forum - will also be reused, generalized and extended for other research.

- **Other research** - ePolicy has opened a number of research avenues that are worth investigating. The most attractive of these concern the interaction between decision support and optimization techniques and a simulator of a complex system. In ePolicy one integration and interaction mechanism will be adopted between the optimizer and the social simulator (namely an iterative procedure converging to an optimal and feasible solution) but many other such interaction mechanisms are possible. In addition, ePolicy has opened a very interesting research direction i.e. putting decision making at the forefront of complex systems. Indeed, the regional energy plan should be such that it is achievable by the energy market driven by incentive mechanisms. Similarly, there are a number of other policy areas where decisions that are taken affect or are affected by complex systems. Consider, for example, decision making for influencing and improving vehicular traffic, and decision making for planning wild life corridors for preserving biodiversity. This research direction will be further investigated by the University of Bologna, possibly applying for EU or national funds.

- **National activities in cooperation with other public bodies** - As previously mentioned, one of the possible future applications of the ePolicy system is to apply it to other regions (i.e. at the same level as the pilot system) and at lower and higher scales. In particular, for working at regional, municipality and provincial level, UNIBO will establish connections with public bodies such as other regions (and lower level authorities such as, for example, the Municipality and the Province of Bologna) in order to make use of the ePolicy results through consultancy or agreements between the University of Bologna and the interested public body.

- **Research synergies with other universities and research centers** - Before undertaking the ePolicy project, the UNIBO team was already well known in the combinatorial optimization community with many established links with universities, companies and research centers of the field. The project will support the opening of other collaborations - for example, with computational social scientists, researchers working in opinion mining,
those in visualization and in game theory, as well as contacts with industries operating in the energy field.

- **Improved academic programs** - the UNIBO group has Masters and PhD courses in computer science and engineering. These courses include elements which cover decision making and optimization. The concepts of the ePolicy project will be incorporated in these courses to teach students about the importance of decision support systems for policy making, in order to attract students and researchers to join the research group.

5.1.3. University College Cork, National University of Ireland, Ireland

University College Cork (UCC) will exploit the results of the ePolicy project in various ways, as follows:

- **Dissemination** – UCC will publish the research results in international conferences, workshops and journals. Specifically UCC will target the following venues, which are potential vehicles to disseminate the ePolicy results:
  - ADT, the International Conference on Algorithmic Decision Theory
  - CP, the International Conference on Principles and Practice of Constraint Programming
  - CPAIOR, the International Conference on Constraint Programming, Artificial Intelligence and Operations Research
  - AAAI The Conference of the American Association of Artificial Intelligence
  - IJCAI The International Joint Conference on Artificial Intelligence
  - ECAI The European Conference on Artificial Intelligence
  - ECMS European Conference on Modeling and Simulation
  - AAMAS International Conference on Autonomous Agents & Multi Agent Systems
  - CompSust, International Conference on Computational Sustainability

and journals like:

- Constraints an International Journal
- European Journal on Operations Research
- Artificial Intelligence
- Journal of Artificial Intelligence Research
- INFORMS Journal on Computing
- **Sustainability – an Open Access Journal**
- **Communications of the ACM**
- **IEEE Intelligent System**

- **A platform for further research** - The component of the research programme for which UCC is responsible relates to the development of incentive schemes in the context of public auctions. This general line of research has applications in many different areas of public policy making. UCC will seek opportunities to exploit the results of the ePolicy project in other areas.

- **Other research** - The integration of optimization and simulation is a very interesting area of research which is worthy of deeper study. Opportunities to integrate these techniques arise in many other areas, e.g. disaster management, emergency planning, energy systems management, modeling and designing public transport infrastructure. UCC will explore these avenues for further research and leverage the work done in the ePolicy project in these domains.

- **National activities in cooperation with other public bodies** - Across European member states there are ongoing efforts to incentivise the uptake of renewable energy sources, shared public transportation services, and other sustainability initiatives of benefit to the citizen. The ePolicy project provides a basis for supporting many of these initiatives, providing UCC with a choice of additional exploitation routes. Some of these routes have the potential to have a commercial dimension, which UCC is keen to pursue through licensing and startup ventures.

- **Research synergies with other universities and research centers** - UCC has an excellent track record of winning European research funds, national research funds, and engaging in technology transfer. The ePolicy project further strengthens UCC’s reputation in large-scale collaborative research thereby enhancing the potential for UCC to continue to build national and international research collaborations. For example, UCC has recently initiated discussions with the Institute for Computational Sustainability at Cornell University to explore opportunities for closer collaboration in the area of environmental policy making and sustainability.

- **Improved academic programs** - UCC plans to exploit the results of the ePolicy project through the design of new modules for inclusion in both undergraduate and postgraduate taught programmes. In addition, UCC plans to design a number of adult education and continued professional development courses for professionals interested in using computational tools for public policy making. There is also scope for introducing a European Masters programme amongst a subset of the academic partners involved in ePolicy and other European universities.
5.1.4. University of Surrey, UK

The University of Surrey intends to exploit the results of the ePolicy project in a number of different ways, as follows:

- **Dissemination** - As an academic partner in the project, one main target group for the ePolicy results is the academic community. The ePolicy project can be exploited with respect to this target group in terms of the publication of the research results in international conferences, symposia, workshops and journals. Given the nature of the research conducted by the University of Surrey – agent-based social simulation – the following outlets have been identified as potential vehicles for disseminating the ePolicy project results:
  - JASSS Journal of Artificial Societies and Social Simulation
  - Sustainability – an Open Access Journal
  - Communications of the ACM
  - ESSA Conference of the European Social Simulation Association
  - ECCS European Conference on Complex Systems
  - IJCAI The International Joint Conference on Artificial Intelligence
  - ECAI The European Conference on Artificial Intelligence
  - ECMS European Conference on Modeling and Simulation
  - AAMAS International Conference on Autonomous Agents and Multi Agent Systems
  - CompSust International Conference on Computational Sustainability
  - COIN Workshop on Coordination, Organizations, Institutions, and Norms in Agent Systems

- **New Research Avenues** - Both for the academic as well as policy advisor/maker target groups, the results of ePolicy can be explored further with respect to the integrated prototype that the project is proposing. Thus, ePolicy has opened new research avenues for exploring how the tools provided by the different partners can be used in an integrated way to support the policy decision process. One interesting feature that this integration might offer is to demonstrate how approaches from different disciplines can yield different views on a system and may even produce different results. At a policy advisor/maker level, this could be used to increase the awareness of the issues of model choice for supporting the policy process and in addition demonstrate the usefulness of combining different approaches. For the University of Surrey in particular, the combination of the global optimization component suggesting policy strategies (based on the goals of policy makers)
and the social simulation testing the viability of these plans with respect to the reaction of the subjects (e.g. people and companies) of these plans seems a promising avenue for further research. This further research might be suitable for attracting further collaborations and funding.

- **Research synergies with other projects, universities and research centers** - The results of the ePolicy project can be used within other research projects at the University of Surrey as well as other institutions. These other projects at the University of Surrey include the Evolution and Resilience of Industrial Ecosystems (ERIE) project dealing with similar issues as ePolicy from a company network perspective, as well as the Whole Systems Energy Modelling Consortium (WholeSEM) which aims at helping industrial and wider stakeholders assess future energy technologies and infrastructures, and the potential role of societal and behavioural change in the UK. The ePolicy project will furthermore support the opening of other collaboration with other researchers (e.g. in the area of visual analytics, constraint programming, data mining or game theory) as well as with industries operating in the field of energy.

- **At a national level the ePolicy project has fostered communication with public bodies** - In detail, the University of Surrey has made contact with the UK government Department for Energy and Climate Change (DECC), and the Department for the Environment, Food, and Rural Affairs (Defra) and has started a dialogue to better understand what models are considered as useful by policy advisers/makers and which models they are using or not using. This will help in the design of better models of the policy making process and in consulting with both academics and public bodies on the use and development of models supporting policy decision-making.

5.1.5. INESC Porto, Portugal

INESC Porto is a non-profit making research institution and thus its exploitation plan consists essentially of using the research results. More specifically, the results of the project will be exploited in the context of the following main research-related activities:

- **Publications** – The work to be carried out during the project will serve as the basis for several publications that will be submitted to major forums covering artificial intelligence, data mining and text mining, which are the areas of the contribution of the research team at INESC Porto. Examples of these forums include: (i) the conferences IJCAI, ECAI, ECML/PKDD, KDD, ICML among others; and (ii) the journals Data Mining and Knowledge Discovery, Machine Learning Journal, Journal of Machine Learning Research, Artificial Intelligence, Intelligent Data Analysis Journal and others.

- **Research collaborations** – The work on the project greatly increases collaboration with other research groups in areas complementary to INESC Porto expertise, thus greatly increasing the ability of embracing more challenging research agendas.
• **Academic programs** – Members of the INESC Porto team are involved in several postgraduate programmes at a number of universities, and the work carried out in the project is an excellent test bed for potential thesis topics for students of these programs.

In addition to research activities, the work carried out in the project concerning opinion mining from web sources has great potential in terms of possible applications to other areas outside that of energy. Understanding the opinion of the population on a set of topics, and the tendencies of these opinions, is of key importance for several areas. The work and software developed in the project thus has good application potential. It is planned to exploit this at INESC Porto and at a national level.

5.1.6. Fraunhofer IGD, Germany

Since Fraunhofer is a non-profit research institute, its exploitation plan consists of providing the European community with innovative research results. The results of the project from the perspective of Fraunhofer IGD are twofold. Firstly, visualization prototypes will be designed and implemented. Secondly, expertise will be gathered - in the area of the application of policy modeling, and from collaboration with the scientific partners in the project i.e. optimization, social simulation, opinion mining, and game theory experts.

• **Visualization** - The visualization modules developed by Fraunhofer IGD are adapted to the specific needs of three areas of research. These are optimization, social simulation, and opinion mining. The prototypes are implemented into a framework of Fraunhofer IGD. Due to their generality, these modules can be applied to different problems and contexts in related scientific fields. Three plans to exploit the technical results of the project have been developed. Firstly, the visualization modules can be licensed to user groups of the ePolicy project. A second strategy is to expand the ePolicy methodology to different contexts. The resulting technologies will be refined and reused in other application areas. Here, again the licensing of the visualization modules is planned. A third exploitation strategy is to integrate the visualization modules into existing commercial software from the context of optimization, social simulation, and opinion mining, and again license its use by third parties.

• **Scientific Expertise** - As a further outcome of the project, scientific expertise will be gathered in the area of the application of policy modeling, and from collaboration with the scientific partners in the project i.e. optimization, social simulation, opinion mining, and game theory experts. This expertise can be exploited in two ways. Firstly, Fraunhofer IGD can use this expertise to act as a consultant for customers from the policy modeling domain. This will result in design studies providing customers with intuitive access to complex ICT tools and thus helping them in their decision making processes. Secondly, from a scientific view, the gathered knowledge can be used to attract further research collaborations between Fraunhofer IGD as visualization expert,
and external experts from the fields of optimization, social simulation, opinion mining, and game theory.

- **Dissemination Activities** - Crucial for the exploitation of the results of the project will be dissemination activities. Fraunhofer IGD will focus on the dissemination of the results through publications, positioning of project results in the scientific community and in relevant industrial exhibitions. The project results will be published on dedicated European Technology Platforms and will be presented at trade fairs like CeBIT in 2013. The focus will be on industrial and government applications and on presenting the solutions to potential adopters. To ensure a more direct and effective contact, preference will be given to “one-to-one” presentations (e.g. workshops, company visits). Moreover the achieved research results will be adapted to related research fields. Another positive side effect is the awareness of visualization techniques in general being established and further reused for supporting the policy modeling process.

5.1.7. Regione Emilia-Romagna, Italy

The Emilia Romagna region is a local authority whose responsibilities include the planning of industrial intervention and infrastructures. There is a particular emphasis on energy, industrial matters, environmental aspects and land use planning.

In the current environment of global economic crisis and consequent economic resource restrictions on regional public investments, the optimization of public resources has become imperative. The use of ICT tools developed in ePolicy for

1. Optimizing resource use.
2. Analyzing and assessing social, economic and environmental impacts.
3. Identifying the most effective implementation strategies.

will be used by RER policy makers to identify the most effective and efficient actions to be taken.

The results achieved in ePolicy will be exploited as a **new procedure for the carrying out and the management of planning activities** both within the Region and in other local authorities (provincial and municipal).

Firstly it is intended to propose to those Italian regions that have adopted an energy plan that they should use the prototype DSS to define their regional plans and their expected implementation instruments. They aim of this will be to assess the reliability and feasibility of the results. Alternative plans, corresponding to alternative actions in the field of energy policies will be considered by policy makers to understand if they have the required features and to obtain feedback.
Clearly, since the simulation tool has been tailored for the Emilia Romagna region, the results will be evaluated in the context that there might be substantial differences between regions. These differences are likely to be less important in regions similar to ER, whilst they could be very significant in other regions of Italy (for example, the southern regions) with different economic, social and environmental situations.

Following the successful validation of the DSS, a more ambitious step will be to assess the possibility of applying the model to other regional policies. This is challenging as the model has been “calibrated” on energy issues. However initially those regional plans and programs covering measures relating to such matters as production activities, refurbishment construction activities, urban planning, mobility and agriculture will be examined as possible areas in which the DSS could be applied.

Another area of exploitation for the ePolicy results is the planning of structural funds. The EU is revising the way these funds are provided: therefore a new planning process is required. The methodologies developed in ePolicy could provide a valid support tool for elaborating and managing regional plans and programmes.

Consideration is also being given to the reuse of opinion mining tools. The Emilia-Romagna Region has developed a number of e-participation projects over the last 10 years. The main aim has been to collect and objectively interpret data provided by citizens.

The opinion mining tool developed in the ePolicy project could be reused to extract documents from the “free” web (edemocracy 2.0) without a voluntary involvement of citizens. In addition, these tools could be used to analyse opinions expressed during top-down e-participation processes.

Another innovative way to reuse these tools could be an offline participation process. When the region meets citizens through “traditional” means (such as assemblies, meetings, and others) the opinion and sentiment of people need to be summarised. A method could be defined for obtaining the sentiment of citizens through the opinion mining tool for such off line processes.

5.1.8. PPA, UK

PPA Energy (PPA) is an energy and management consultancy company specialising in the provision of advice to public and private sector clients in the energy, particularly electricity, sector. It is an SME. PPA intends to exploit the results of the ePolicy project in a number of different ways, as follows:-

- **Consultancy** – One of PPA’s main roles in the ePolicy project is in the work package on dissemination and exploitation. This is providing a very good overview of the project’s work and will put PPA in a prime position to include elements of the results of the project into its own ongoing consultancy offerings. PPA’s customers include governments and energy regulation authorities in many parts of the world and the concepts and tools produced by ePolicy may well prove attractive to some of these
bodies. The involvement of DECC in the project should be especially beneficial here. In addition the idea of extending the ePolicy concepts into business organisations as suggested by ENEL may also provide further opportunities for exploitation.

- **Further Research** – Section 4 indicates that there are substantial opportunities for further research in this area and for the extension of the ePolicy concept and pilot DSS into many other policy areas and scales of activity. PPA would be interested in working with others in developing these ideas and in seeking funds at both the EU and national levels to move further towards commercially sustainable products.

- **Dissemination** – As a commercial consultancy SME, PPA does not generally publish its work either through academic journals or conferences or elsewhere. However because of the nature of this project there have already been opportunities to be joint authors of such publications. It is likely that further such opportunities may arise. In addition the direct publication of certain material produced by PPA as part of this project will also be considered.

5.1.9. Aster, Italy

The exploitation activities carried out by Aster within the ePolicy project will be mainly devoted to distribute the research results to enterprises and research centres of the High Technology Network (HTN) of the Emilia-Romagna Region.

- **Mission and Activities** - Aster’s mission and activities are based on the Regional Research and Innovation Law, number 7/2002 (which is the first regional law for innovation in Italy) and its programme for implementing for industrial research, innovation and technology transfer.

Aster’s activities are mainly devoted to the development and coordination of the Emilia-Romagna HTN, which consists of industrial research laboratories and innovation and technology transfer centres organised in six thematic platforms (Agri-Food, Constructions, Energy-Environment, ICT and Design, Mechanics-Materials, Life Sciences).

Two of these six platforms are likely to be particularly interested in the results of the ePolicy project – the Energy-Environment Platform and the ICT and Design Platform.

- **Energy-Environment Platform** - The Energy-Environment Platform is aimed at developing and transferring innovative technologies and methods on

  - environmental quality control,
  - natural resources management,
  - development of renewable energy sources,
  - analysis and reengineering of products,
systems, production processes and anthropic activities in general with the aim of use optimization and the maximization of material and energy recovery. The main organisations with which the Platform interacts are

- those dedicated to environmental control and protection;
- companies specifically focusing on technology production and providing environmental services;
- organizations involved in the energy production value chain; and
- enterprises belonging to all sectors interested in minimizing environmental impact.

**ICT and Design Platform** - The ICT and Design Platform promotes the development, tuning and adoption of ICT (information and communication technologies) for

- tackling social challenges related to the environment;
- health and ageing;
- supporting business organizations with the intelligent management of process and product information;
- addressing individual needs.

Regarding cross-sector ICT applications, the Platform particularly promotes cooperation with other HTN platforms in order to enhance innovation in the business sector.

As a further exploitation activity Aster will evaluate how to use the results of the opinion mining research and related tools to better monitor and to evaluate the impact and effectiveness of the HTN.

ASTER coordinates the Emilia-Romagna High Technology Network in order to promote a competence development model and to assure the availability of an industrial research offer over the territory capable of addressing the technology innovation needs expressed by enterprises.

Currently, beside using traditional monitoring instruments, ASTER is experimenting with several software tools to analyze how well the HTN services and research offers are known, exploring the HTN references on the web in terms of volume (i.e. what penetration has the HTN currently achieved on the internet) and sentiment (i.e. which is the opinion of the customers of the HTN).

This analysis is currently used for measuring the impact of specific events (e.g. CREAM software used for Turboblogging event, [http://www.turboblogging.it/](http://www.turboblogging.it/)), and with the results of the ePolicy project research on Opinion Mining it will be analysed in order to
see how this kind of measurement can be improved in order to support ASTER's activities.

5.1.10. Universita Degli Studi Di Ferrara, Italy

The UniFE research unit has developed the global optimizer for the ePolicy project. As described in the deliverable D3.1 (“Design of the Global Regional Model and its instantiation on the Energy plan”), the global optimizer takes into consideration various aspects (mostly economic and environmental, but also some social and political ones) of policy making at the regional level and of strategic environmental assessment.

- **Adoption of the developed tools** - The exploitation plan for the global optimizer includes the adoption of the tool by the Emilia-Romagna region. The global optimizer could be used as a part of a decision support system to support both the planning phase and the environmental assessment of the next Regional Energy Plan of the Emilia-Romagna region.

- **Possibilities for further research and collaborations** - Beside energy plans, the global optimizer could be used to address different types of plans, like the agriculture plan, or the traffic plan. In fact, the co-axial matrices contained in the optimizer are currently used to assess different types of plans. Moreover, the global optimizer can be used by other regions in Europe. The global optimizer could be used at a different scale, like the national scale, or the municipality level. For these reasons, the UniFE research unit considers exploiting the global optimizer for other European regions (or, in general, public bodies that have to plan for energy). This could lead to collaborations with public bodies (as the UniFE research unit has already done in the past with the Emilia-Romagna region for the environmental assessment), including research contracts. As a by-product, these public bodies would get awareness of the existence of computational logic and optimisation tools, and this could further foster their use of such tools for other (possibly, completely different) projects.

- **Open source licensing** - It is planned to release the global optimizer as open-source software, so that it can be improved by a community of users. This is possible since the application is implemented on top of open source solvers.

- **Consultancy for configuration of the Global Optimizer** - Although the global optimizer will be released as open-source software, in order to have the tool fully functional for other regions, the software will need to be configured using the data from other regions, including their resource availability, physical nature, etc. Although anyone having the necessary information could undertake this task, it could be easier for this to be done by an organisation that has had previous experience in operating the tool. The UniFE research unit has acquired such significant experience in this task, whilst working on ePolicy and in collaboration with ARPA and the Emilia-Romagna region. Thus UniFE could serve as a consultant to other bodies.
• **Publications** - UniFE plans to exploit the results achieved in the project by publishing them both in international journals and international conferences. The UniFE research unit is particularly focused on computational logic, artificial intelligence, constraint programming, constraint satisfaction, constrained optimisation, and machine learning. Possible publication vehicles include the following conferences:
  
  - ICLP (the international conference on logic programming)
  - CP (the International conference on principles and practice of constraint programming)
  - IJCAI (the international joint conference on artificial intelligence)
  - ECAI (the European conference on artificial intelligence)
  - AAAI (the conference of the American association for artificial intelligence)
  - ECMS (the European conference on modeling and simulation)
  
  as well as the journals
  
  - Theory and Practice of Logic Programming
  - ACM Transactions on Computational Logic
  - Annals of Mathematics and Artificial Intelligence

The international visibility that will be so achieved will be very useful in advertising the global optimizer to other public bodies and for acquiring funding to continue the research and the development of the software.
5.1.11. Summary of the plans of the partners

For the PUDF the plans of the ePolicy partners will be summarised using a structure similar to that shown below:

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Topics</th>
<th>Participants</th>
<th>Documents</th>
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<tr>
<td><strong>During the lifetime of the project</strong></td>
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<td><strong>After the ePolicy project is concluded</strong></td>
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*Figure 12 – Indicative structure for summarising the exploitation plans of the ePolicy partners*
6. Market analysis and competitors

An important activity that needs to take place in the next few months and which will contribute towards the production of the PUDF is to start to assess the extent to which the ePolicy results can be commercialised and the next steps that would be required in order to bring this about. Within this an initial market analysis is required. Topics to be examined include:-

a) Market positioning - the functional attributes of the solution will be compared to existing solutions (to the extent that these exist) and also to the decision making processes in a subset of EU member states and at various levels. Contacts with various stakeholders previously mentioned will be utilised to facilitate this.

b) Market study - A preliminary evaluation of the main market issues will be undertaken and the channels to market considered.

c) Alternative exploitation approaches – it has become clear that there are a number of different types of results emerging from the project potentially with differing approaches to exploitation. For example some aspects of these may be open source and therefore for general use by all whilst others may in due course become commercialised into purchasable products. Each aspect will need to be developed separately with the open source one focused on ensuring that all parties who may benefit from making use of it are aware of its existence, and the commercial one taking a more traditional product development route. These issues will be further explored to categorise the approach to be used for each of the project’s results.

d) Assessment of roadmap for future progress - the process by which exploitation can be pursued will be explored.

e) Indicative Business plan – As part of the PUDF the various aspects mentioned above will be brought together to form an indicative business plan. The aim will be to produce a clear vision of the use that will be made of the various results and their commerciality. Issues that are likely to arise include, among others:

- Competitor and alternatives analysis
- SWOT analyses of the product (strengths, weaknesses, opportunities, threats)
- Market size and likely willingness to purchase
- Routes to market
- Legal structure for future development and exploitation
- Proposal for a business model, sharing of development/support costs and revenues, synergistic benefits to participants
7. Commercial Arrangements

Section 6 above identifies the need to start to explore the commercial and legal framework for the future development and exploitation of the ePolicy results. This includes aspects such as business models, legal structure, funding, sharing of development and support costs together with the future treatment of revenues. This also needs to include the potential of the involvement of parties who are currently not direct members of the consortium. (Section 8 below provides an indication of such involvement which has already been identified).

These important aspects will be considered over the coming months in the run-up to the production of the PUDF. Each of the ePolicy results (see Section 3) and, in particular, the extensions of the DSS (see Section 4) will need to be reviewed separately.
8. Exploitation by parties who are not Consortium Members

There are a number of ways in which the ePolicy results could be exploited by public bodies and enterprises that are not currently ePolicy partners. The results that could be exploited are the ones defined in Sections 3 and 4. In the final PUDF a clear plan on how parties that are not Consortium Members could exploit the results of the ePolicy project will be included.

Described below are two organisations that have already indicated an interest in exploiting either the global optimizer or the DSS extension to business models.

**ARPA Emilia Romagna**

ARPA-ER is the Regional Agency for Environmental Protection in Emilia-Romagna. It is an environmental control technical support body to the Regional, District and Local Authorities and is administratively and technically independent. It is an autonomous organisation of the regional government. ARPA-ER's activities cover all aspects of environmental control, including: monitoring, management and surveillance of human activities and their territorial impacts, creation and management of a regional environmental information system, and – of particular relevance to the ePolicy project - activities in support of the environmental impact assessment of plans and projects. ARPA-ER also undertakes activities on behalf of local clients such as soil, water and air quality improvement plans; complex territorial analyses; the study of ecosystems; and research into the development of eco-efficiency in production cycles. The Agency’s activities are aimed at local, regional and national institutional customers, the business world and private citizens. ARPA-ER also collaborates with the Italian Agency for the Environment and Territory (ISPRA), the European Environmental Agency (EEA) and Italian, European and International institutes and research centres. In particular, the Regional Thematic Center for Energy and Environmental Assessment (CTR EVA) supports the network of ARPA-ER on energy and the environment, strategic environmental assessment, environmental impact assessment, and the evaluation of environmental impact. In support to all of these activities ARPA-ER has made available on its website unpublished information in regard to the consumption and production of energy at regional level. This common database is useful for monitoring and drafting reports and the underlying research.

The ePolicy project has established contact with ARPA-ER through its Advisory and Dissemination Board. The main ePolicy result that could potentially be exploited by them after the end of the project is the global optimizer. In particular, the global optimizer could not only be used for performing regional energy planning, but also to perform the Strategic Environmental Assessment (SEA) of plans.

An SEA is legally required for eleven types of plans (i.e. those covering agriculture, forestry, fishing, energy, industry, transport, waste, water, telecommunication, tourism, urban and environmental). Each plan defines activities that should be carried out during the plan implementation.
The global optimizer model includes the coaxial matrices that are currently used by ARPA-ER for performing the SEA of regional, provincial and municipality level plans. It is worth noting that the SEA matrices are completely general and are used with no modifications to the SEA of the above mentioned regional plans. Therefore ARPA-ER could relatively easily exploit the ePolicy results in this way. This will be further discussed with them during the lifetime of the ePolicy project.

**ENEL Ingegneria e Ricerca S.p.A.**

ENEL Ingegneria e Ricerca S.p.A. (ENEL IeR) is part of the ENEL Group, the principal electricity operator in Italy and one of Europe’s main listed utilities. It is an integrated organisation and active in both the power and gas sectors. ENEL today operates in 40 countries worldwide, has over 97,000 MW of net installed capacity and sells power and gas to around 61 million customers. ENEL IeR is a service division for the different companies of the group, managing the engineering processes related to the development and coordination of research activities. It ensures that innovation opportunities for all the business areas of the group - especially those with the most environmental impact – are recognised, developed and exploited.

In 2006 ENEL launched an environmental and innovation programme, representing its plans for the development of renewable energy, energy savings and efficiency, and zero emission power plants.

The Research Technical Area employs about 170 people and has for more than 20 years been active in the field of innovative generation systems, energy conversion, plant diagnostics and automation, generation systems from renewable sources, smart grids and energy efficiency. Research activities are supported by mathematic models and numerical simulation together with experimental tests carried on in ENEL IeR experimental areas.

The ePolicy project has established contact with ENEL IeR, through the Advisory and Dissemination Board. ENEL is very interested in the reuse of the ePolicy methodology and in particular in its extension to business rules described in section 4.2.8.
9. Hurdles to Deployment

The ePolicy project team recognise that there are many possible hurdles which could limit the future deployment of the ePolicy results. The whole of this plan (and the PUDF which will follow it) is focused on, as far as possible, addressing these hurdles. At this stage, these hurdles have been categorised as shown below:

- Usability – will the ePolicy results meet the needs of users? Will they be easy to use?
- Acceptance – will potential purchasers and users accept any “products” that arise from the ePolicy results? Is there a market? What about competitors?
- Applying the DSS to different project areas and at different levels – is this possible and practical?
- Technical – are there any technical limitations to the implementation of the ePolicy results?
- Future development – What future development is needed in order to take the ePolicy results forward?
- Structure – How can such development be structured?
- Funding – How will further work be funded?

Other issues may emerge as development continues.

The previous sections of this plan demonstrate that many ePolicy activities will be focused on addressing these issues and those members of the consortium best placed to address aspects of them will take them forward. They will be regularly discussed by the members of the consortium and reviewed at formal meetings of the Management Committee. Members of the Scientific Advisory Board will also be consulted.
Appendix 1 - Dissemination Activities from Project Start to Month 14

Dissemination to the scientific community

Papers

<table>
<thead>
<tr>
<th>Date</th>
<th>Name of Journal</th>
<th>Title of publication</th>
<th>Author(s)</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
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<tr>
<td>December 2012</td>
<td>Coordination, Organizations, Institutions, and Norms in Agent Systems VII (Lecture Notes in Computer Science Volume 7254)</td>
<td>Normative Run-Time Reasoning for Institutionally Situated BDI Agents</td>
<td>Tina Balke, Marina De Vos, Julian Padget</td>
<td>part</td>
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<tr>
<td>December 2012</td>
<td>Coordination, Organizations, Institutions, and Norms in Agent Systems VII (Lecture Notes in Computer Science Volume 7254)</td>
<td>Operationalization of the Sanctioning Process in Utilitarian Artificial Societies</td>
<td>Tina Balke, Daniel Villatoro</td>
<td>part</td>
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## Conferences

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<th>Title of the presentation of paper/poster</th>
<th>Name of person who carried out the presentation and its organization</th>
<th>Material presented (slides/posters/...)</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
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<tr>
<td>ISAIM 2012-International Symposium on Artificial Intelligence and Mathematics. Fort Lauderdale, Florida, USA January 9–11, 2012</td>
<td>Artificial Intelligence and Mathematics</td>
<td>Constraint and Optimization techniques for supporting Policy Making</td>
<td>Marco Gavanelli (University of Ferrara, Italy)</td>
<td>Paper and presentation</td>
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<tr>
<td>tGov - Transforming Government workshop, Brunel University, UK 8 May-9 May 2012</td>
<td>tGov2012 brings together both local and international researchers and practitioners to participate in sharing ideas for the transformation of government through electronic systems &amp; processes</td>
<td>Presentation of the project</td>
<td>Tina Balke (University of Surrey)</td>
<td>Presentation</td>
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<td>CompSust 2012, Copenhagen (DK), July 2012</td>
<td>3rd International Conference on Computational Sustainability</td>
<td>ePolicy poster and abstract presented at CompuSust12</td>
<td>Marco Gavanelli and Fabrizio Riguzzi (University of Ferrara, Italy) Michela Milano (University of Bologna, Italy) Alan Holland and Barry O’Sullivan (Cork Constraint Computation Center, Ireland)</td>
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<td>Microdebates for policy-making</td>
<td>Paolo Torroni, Simone Gabbriellini, University of Bologna</td>
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<td>What-If Analysis Through Simulation-Optimization Hybrids</td>
<td>Marco Gavanelli (University of Ferrara, Italy), Michela Milano(University of Bologna, Italy) Alan Holland and Barry O’Sullivan (Cork Constraint Computation Center, Ireland)</td>
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<td>Alan Holland and Barry O'Sullivan (Cork Constraint Computation Center, Ireland)</td>
<td>Paper and Slides</td>
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<td>CompSust 2012</td>
<td>3rd International</td>
<td>Decision Factors for Individual Photovoltaic Systems Adoption - An Agent-based View</td>
<td>Tina Balke (University of Surrey)</td>
<td>Paper, presentation and poster</td>
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<td>COIN 2012 Keio University, Yokohama, JAPAN 5.6.2012</td>
<td>10th International</td>
<td>An Agent-based Simulation Approach to Comparative Analysis of Enforcement Mechanisms</td>
<td>Tina Balke (University of Surrey)</td>
<td>Paper (without acknowledgments), Presentation (with acknowledgments)</td>
<td>unfunded</td>
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<td>Normas 2012 (Dagstuhl, Germany 11.-16.3.2012)</td>
<td>3rd International</td>
<td>The ePolicy project</td>
<td>Tina Balke</td>
<td>Presentation, Handout of project brochures</td>
<td>Full</td>
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ISAIM 2012  
Fort Lauderdale, FL. January 9–11, 2012  
International Symposium on Artificial Intelligence and Mathematics  
Constraint and Optimization techniques for supporting Policy Making  
Marco Gavanelli, UNIFE  
Slides, paper  
Full

ISMP is the world congress of mathematical optimization where scientists as well as industrial users of mathematical optimization meet  
Simulation and optimization for sustainable policy-making  
Marco Gavanelli, UNIFE  
Slides  
Full

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<tr>
<th>Date</th>
<th>Description of the dissemination activity</th>
<th>Person(s) undertaking the dissemination</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
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<td>January 27th 2012</td>
<td>Presentation at event: &quot;FP7 eGovernance and Policy Modeling projects: How to make the cutting edge R&amp;D accessible for real use, in a shorter period of time.&quot;</td>
<td>Tina Balke (University of Surrey)</td>
<td>full</td>
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<td>March 12-16 2012</td>
<td>Dagstuhl invitation only seminar on Normative Multi-Agent Systems presentation and discussion of the project, handout of project brochures Dagstuhl, Germany</td>
<td>Tina Balke (University of Surrey)</td>
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<td>April 15- May 3, 2012</td>
<td>National Institute of Informatics (NII), Tokyo, Japan, work on policy modelling and presentation of the project</td>
<td>Tina Balke (University of Surrey)</td>
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<td>May 8-9 2012</td>
<td>tGov workshop: <a href="http://www.iseing.org/tgovwebsite/tgovmainpage.html">http://www.iseing.org/tgovwebsite/tgovmainpage.html</a></td>
<td>Tina Balke (University of Surrey)</td>
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<td>May 23, 2012</td>
<td>Discussions with the Bristol group (University of West England - UWE) of the urbanAPI EU project (<a href="http://www.urbanapi.eu/">http://www.urbanapi.eu/</a>)</td>
<td>Tina Balke (University of Surrey)</td>
<td>full</td>
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**May 28-June 1, 2012**  
European Agent Systems Summer School, http://easss2012.webs.upv.es/, tutorial on agent-based social simulation with special focus on policy modelling and ePolicy as one example  
Universidad Politécnica de Valencia, Valencia, Spain  
Tina Balke (University of Surrey)  
**full**

**July 10th 2012**  
Presentation at FUPOL-URBANAPI-ePolicy-NOMAD Synergy meeting  
Tobias Ruppert  
**unfunded**

**November 27, December 9, 2012**  
National Institute of Informatics and University of Kyoto, presentation of the project and its related research (Titles: “Agents making decisions” and “Normative Run-Time Reasoning for Institutionally Situated BDI Agents”  
Tina Balke (University of Surrey)  
**part**

**N/A. Sent on 10 oct 2012**  
Description of ePolicy on the sustainability portal of Ferrara university, both in English and Italian:  
Marco Gavanelli  
**unfunded**

### Dissemination in national/local newspaper/web portals

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<th>Country</th>
<th>Partners involved</th>
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<td>October 2011</td>
<td>Parte e-POLICY: i politici decidono con i cittadini</td>
<td>Magazine UNIBO</td>
<td><a href="http://www.magazine.unibo.it/Magazine/UniBoInitiative/2011/10/19/Parte_e-POLICY.htm">http://www.magazine.unibo.it/Magazine/UniBoInitiative/2011/10/19/Parte_e-POLICY.htm</a></td>
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<td>November 2011</td>
<td>Ai via E-POLICY</td>
<td>ASTER Website <a href="http://www.aster.it/tiki-read_article.php?articleId=397">http://www.aster.it/tiki-read_article.php?articleId=397</a></td>
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<tr>
<td>October 2012</td>
<td>Oggi a Bologna Smart City</td>
<td><a href="http://www.comune.bologna.it/primopiano/notizie/132%3A14959">http://www.comune.bologna.it/primopiano/notizie/132%3A14959</a></td>
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<td>September 2012</td>
<td>ePolicy project description</td>
<td>Bilancio sociale' (social report) of the University of Ferrara.</td>
<td>Italy</td>
<td>UNIFE</td>
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October 2012  | A Smartcity in vetrina anche il progetto e-POLICY | Regione Emilia-Romagna - Portale Partecipazione | http://partecipazione.regione.emilia-romagna.it/news/normali/a-smartcity-in-vetrina-anche-il-progetto-e-policy | Italy | RER

November 2012 | A Smartcity i primi risultati del progetto e-POLICY | Regione Emilia-Romagna - Portale Partecipazione | http://partecipazione.regione.emilia-romagna.it/news/normali/a-smartcity-i-primi-risultati-dl-progetto-e-policy | Italy | RER

Dissemination in Public Events

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<th>Title of the presentation</th>
<th>Name of person who carried out the presentation and its organization</th>
<th>Material presented (preferable as an attachment)</th>
<th>Level of ePolicy funding support (Full/Part/unfunded)</th>
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<tr>
<td>FP7 eGovernance and Policy Modeling projects: How to make the cutting edge R&amp;D accessible for real use, in a shorter period of time. University of Sheffield, UK 27th January 2012.</td>
<td>Presentation of Epolicy project</td>
<td>Tina Balke, University of Surrey</td>
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<td>Smart City Exhibition Bologna, 29th October 2012</td>
<td>Activities from Universities, Municipalities, Regions on smart cities</td>
<td>ICT for planning</td>
<td>Michela Milano UNIBO</td>
<td>Slides on the web</td>
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