POLICY MODELLING SUPPORTED BY E-PARTICIPATION ICT TOOLS

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Abstract. The paper presents an approach to collaborative policy modelling, as proposed in the FP7 ICT project OCOPOMO. Within this approach long-term strategic planning is supported by a combination of narrative scenarios, agent-based policy models, and e-Participation tools integrated in a single platform. The policy model for a given domain is created iteratively, in an active co-operation of various interest groups, including decision makers, analysts, experts, and the general public. Principles and key concepts of collaborative policy modelling are discussed in the paper. A high-level architecture of ICT tools and software components is described in this paper together with envisioned functionality of the platform. Finally, the overall approach is demonstrated on an example of pilot application focused on the development of a strategy for exploitation of renewable energy resources.

1. – Introduction

In the last decade, information and communication technologies (ICT) were intensively and increasingly used in numerous innovative solutions in the field of e-Governance. At political level, this development was initiated in early 2000s by the Lisbon strategy [1], where the shift to the knowledge economy was identified as a strategic objective. Since then, several initiatives and research frameworks [2, 3] have been launched to support innovative applications and widespread use of ICT not only in the private sector, but also in the public sector and civil society. The main focus of the invoked development approaches was on employment of ICT for modernisation of governments, namely increasing efficiency and quality of provided services. Consequently, the issues of interoperability between various types of fully or partially automated electronic services became a central topic in the research agenda [4].

The service-centric notion of advanced e-Government solutions enables effective co-operation and information exchange between the involved parties - governmental bodies, civic sector, citizens and businesses, upon a given policy. For the service consumers it is, however, often quite difficult to understand the policy and its implications, to participate in the policy development, to monitor its implementation, and subsequently modify it, if proves necessary. This is true also due to the fact that the potential of advanced ICT solutions in support of policy making and governance in combination with e-Participation tools was underutilized so far. A lack of involvement of the public in the process of policy creation and the inability to anticipate all consequences of the adopted policies can be illustrated also on the example of the current economic and financial crisis. This inability applies specially to the

prediction of dramatic changes in the economy and society (or in any complex system). This factor was accompanied by another interesting phenomenon - ignoring those few individuals who were warning the governments before the threats and potential negative trends.

Hence future trends in the e-Governance research and applications should extend the paradigm of service provision towards a broader active participation of general public and various groups of stakeholders in a collaborative policy creation. In particular, the challenges that need to be addressed in this respect include:

- suitable ICT support in foresights and policy modelling, especially in the long-term policy planning, capability of managing complexities in strategic planning and policy making in complex socio-economic environments,
- open and transparent collaboration in the process of identifying the crucial features of complex social and macroeconomic models to simulate potential alternative policies, efficient collaboration of communities of stakeholders relevant to the given policy area, supported by proper e-Participation tools,
- focus on developing, visualising and simulating appropriate policy models that can help in a qualitatively better management of socio-economic processes, presentation of the results of foresight scenarios and policy modelling in a "user-friendly" way (i.e. understandable not only to policy modelling experts but also to the general public), visualisation of policy models, including identification and interpretation of interdependencies, that result in complex social and economic relations likely to affect future processes, and
- development of collaborative environments for comprehensive IT solutions to support policy modelling and simulation as a basis for wide collaboration among policy analysts, policy operators, wider interest groups and the general public.

The outline of these challenges indicates important directions and prerequisites for further scientific research and development in this area. The policy modelling, supported by econometric methods and agent-based social simulation [5], can provide an environment for visualisation, monitoring, and verification of goals for advanced e-Governance applications. Furthermore, the connection between scientific models and informal observation of human behaviour can be supported by advanced e-Participation techniques enabling adaptation of policy models in a social interaction.

The design of a software platform and methodology providing an environment for modelling policies in a collaborative manner is in the focus of the OCOPOMO project (***Open COllaboration for POlicy MOdelling***). OCOPOMO is co-funded by the European Commission under the 7th Framework Programme, Theme 7.3: ICT for Governance and Policy Modelling [6]. It is co-ordinated by the University of Koblenz-Landau and the project consortium consists of ten partners from five European countries. The project started in January 2010 and will last for three years. Achievements of OCOPOMO will be applied and tested on two pilot applications in Italy and Slovakia.

The principles and approaches adopted in OCOPOMO are described in this paper. After an overview of related research achievements, a vision and objectives of the project are presented in section three. A preliminary design of high-level architecture together with the envisioned functionality of the platform is described in section four. The OCOPOMO approach is then demonstrated in section five on an example of Slovak pilot application, which is focused on developing a strategy for renewable energy resources.

2. – Related research

The collaborative policy modelling applied in the field of e-Governance can be seen as an interdisciplinary concept, which is supported by several mutually related topics. Namely, it includes the agent-based or statistical theory-based policy modelling, scenario-based foresights, collaboration environments, and e-Participation approaches.

The *policy modelling* is a traditional research topic and is particularly applied on general modelling and analysis of economy at the macro level. The approach of L. R. Klein [7], based on Keynesian system of macro-theoretical relationships, uses econometric (statistical) techniques applied on empirical macro-data to estimate parameters for these relationships. The models produced by this approach are still frequently used, even the econometric estimation techniques become more sophisticated and the content of models was expanded over the past 60 years. The modern trends include the adaptive statistical techniques stressing the short-term and long-term equilibrium modelling and reflecting new development of the macro- and microeconomic theory.

A more recent approach, reflecting the critique of R. Lucas against predictions based on highly aggregated data [8], consists of a set of dynamic stochastic general equilibrium (DSGE) models [9] and is based on micro theoretical relationships [10]. The analysis and modelling is performed in a respect to the behaviour of so-called 'representative agents' – independent actors that are taking decisions to maximise their utilities over an infinite time horizon.

These two conceptions of policy modelling differ in the source of data as well as in the direction of handling and processing the data. The former econometric modelling uses so-called top-down approach. Settings of statistical techniques employed in the model calculation are pre-defined by an expert and thus are driven by a particular theory. Accuracy and appropriateness of such a model is significantly dependent on the correctness of input data and is highly sensitive to possible deviations. The latter conception of agent-based modelling employs bottom-up approach. The specifications of behaviour at the micro level are calibrated against 'stylised' macro-relationships. It unifies the agents' behaviour on the macro level into a single scheme of rational acting.

From an evidence-based perspective, it is not easy to reconcile either the econometric or general equilibrium approaches to the *policy modelling applied in e-Governance.* The society understood as a complex system is composed of agents existing at different levels of social reality, and their interactions both within and between levels. Individual actors represent the micro level, social groups and organisations the mezzo-level, nations and societies the macro level. Interactions that often are described as links in a network may be of both economic and social nature. They include, for example, supply-demand-relations between producers, flows of capitals, administrative dependency, social influence or social interdependence. Each of these interaction types can be, in principle, described by sets of rules describing the main tendencies of stakeholder behaviour. These rules then drive the behaviour of software agents in policy simulation models. Experience shows that simple, but realistic, rules of individual behaviour and social interactions may lead to the emergence of complex patterns of public opinion [5]. In a policy modelling system applied for e-Governance, it is especially important to capture these complex patterns on a more global level and recognise the tendencies that may provide inputs to strategic planning. In a non-linear cross-level social system, the decision of an individual agent to adopt a particular strategy usually depends on the decisions of other agents. Each agent adopting a strategy increases the chances of adoption of this

strategy by other agents what leads to clustered strategy switching that resembles avalanches. In a related model Moss et al. [11] explicitly introduce purely social factors into a model of self-organised criticality.

The accuracy and adequacy of a policy model evolving in a complex social interaction is determined by a distribution of relevant information among agents. The decisions of particular actors, i.e. stakeholders involved in the modelling a policy for a given topic, need to be driven by an understandable explanation of possible alternatives, constraints and future trends that can affect the topic of interest. The technique of *narrative scenarios* is an advanced and commonly taken method for representing a definition and exploration of futures in a domain [12]. The scenario-building procedure aims at generating different perspectives of the future to gain more insight into possible opportunities and threats. This technique allows better and more effective exploration of alternative trajectories of a certain domain beyond short-term forecasting [13]. Typology and classification of scenario types proposed in [14] distinguishes the criteria of application area, time horizon, starting point, goal, degree of tractability, and assignment of occurrence probabilities to future situations. Particular types include scenarios for decision-making or orientation, internal or external scenario projects, scenarios on situation or process, explorative or anticipative scenarios, descriptive or prescriptive scenarios, forecasts or foresights, extreme or trend scenarios, long-term, mid-term, and short-term prognosis.

The agent-based approach to policy modelling is highly dependent on influence and information exchange among participating actors [5]. Individual goals, interests and preferences are confronted with actual status of the policy model, expressed in a set of relevant narrative scenarios. Active participation of an actor in the process of policy modelling should include a means for customisation and modification of both scenarios and models, which can then became a subject of further discussion or can serve for verification of various (sometimes even contradictory) ideas. This process can lead to a self-organisation and the consensual balanced policy model may be produced as a result of the collaborative activities [11].

Interaction among actors developing or affected by policy initiatives requires a proper suite of collaborative tools enabling presentation of stakeholders' own ideas, discussions and negotiations between actors, voting on open issues and selection of alternatives. Consequently, the policy modelling solution should include ***e-Participation*** applications that mediate the input from stakeholders for development of policy in a given domain. In this sense, e-Participation provides means for 'constant involvement of citizens in their own governance' [15], whereas the whole policy modelling solution follows the principles of *e-Governance* to facilitate effective decision making and improvement of public policies [16].

Some technologies and tools are available for the above-mentioned approaches, namely:

- *Agent-based policy modelling tools*, built on the platform of multi-agent systems (MAS). Nowadays, probably the most popular open-source software platforms for developing MAS are JADE (http://jade.tilab.com) and Repast (http://repast.sourceforge.net). A survey and evaluation of available agent-based simulation tools can be found e.g. in [17].
- *Content management systems* (CMS), which are capable to facilitate collaborative digital content creation. CMS can be used for maintenance of shared policy models, narrative scenarios and supporting documents. Traditional CMS such as Apache Lenya, Drupal, Jackrabbit, Plone, etc. may be further enhanced by semantic technologies and knowledge

management features [18] and the semantic metadata descriptions can then be used for advanced search or mediation of collaboratively created content.

- *Collaboration platforms* (groupware), supporting communication between involved participants, collaborative work upon shared information artefacts and co-ordination of actors' activities [19]. Among wide variety of currently available groupware systems we can mention examples of open source solutions such as Hipergate, Open-Xchange, KP-Lab, Lucane, eGroupWare, OpenGroupware.org, etc.
- *E-Participation platforms*, typically based on Web 2.0 features, include an ICT support for social networks such as discussion fora, wikis, blogs, chats, podcasts, etc. These means, when applied in e-Governance applications, involve actors in the opinion-making process up to the point of making a decision [20]. Extensive survey of existing e-Participation projects and solutions was elaborated within the MOMENTUM project (http://www.ep-momentum.eu). The frameworks such as LEX-IS, VoicE, or LexiPation can be mentioned as examples.

The aim of OCOPOMO project is an integration of some of these specialised ICT tools into a single e-Governance toolkit that will enable a collaborative policy modelling for decision support of governmental representatives.

3. – Vision, objectives and scope

The OCOPOMO approach towards the policy modelling focuses on the long-term strategic planning for governmental policy operators and decision makers. The project vision is to demonstrate that, with appropriate ICT, the integration of formal policy modelling, scenario generation and open and widespread collaboration is not only possible but essential at local, regional, national or global level of policy formation. Transparency and continuous validation of the modelled policy should be supported by involving all relevant stakeholders, all of whom should be able to participate actively in the design process. Thus the main objective of OCOPOMO is to implement an ICT solution available for the target groups (domain experts, decision makers, elected representatives, NGOs, etc.), to provide a collaborative environment for an integrated process of scenario generation and policy modelling by means of simulation experiments.

In order to satisfy the core objective, the following specific objectives were defined and will be addressed by the project:

- Creation of two policy analyses at regional level, in the scope of pilot applications in Italy and Slovakia (cf. section 5).
- Development of a general model of macroeconomic relations constrained by data produced at national and European level.
- Conceptual and functional integration of narrative scenario analysis with formal policy modelling. The resulting policy analyses should possess the precision and clarity of formal models as well as the rich contextual and imaginative content of verbal narratives.
- Integration of the model of macroeconomic complexity with the regional policy models. The aim is to ensure that the regional models, which potentially can generate a range of surprising results, can be analysed both formally from macro-model output and informally by actors using scenario exercises or e-Participation tools.

- Development of ICT solutions that will support the engagement of "core" stakeholders – user partners in OCOPOMO and will be open for participation of external stakeholders who have an interest or expertise in the policy issues and/or in the modelled domain.

The policy modelling approach adopted in OCOPOMO is agent-based and bottom-up. The prerequisite for such an approach is a balanced range and structure of target users, stakeholders involved in policy creation and modification. Initial definition of a basic policy framework is under responsibility of policy analysts and policy operators, i.e. those responsible for preparing and developing the strategic decisions to be made in parliaments and/or in respective government bodies. The policy proposal is confronted with preferences of various interest groups and to some extent also with opinions of wider general public. The OCOPOMO solution will allow these "external" user groups to comment and propose modifications to the proposed policy, negotiate their viewpoints and share ideas. Whilst the technical aspects of model development are not accessible to stakeholders, they will be able to engage with the models by playing the roles of any stakeholders otherwise played by software agents. This way, OCOPOMO should enable actors of respective target groups at different levels of government "to master and shape future developments so that the demands of its society and economy are met" [21].

4. – Approach and architecture of the solution

The conceptual schema of collaborative policy modelling adopted in the OCOPOMO project is depicted in Figure 1. It presents interactions and communication flows between target user groups of policy analysts, policy operators, groups of experts, external interest groups and citizens. The iterative process of policy modelling in the scope of OCOPOMO is focused on two pilot application cases, in which stakeholder groups will participate to collaboratively develop scenarios for a strategic area of high interest. The order of interactions between particular stakeholders is marked by numbered items.

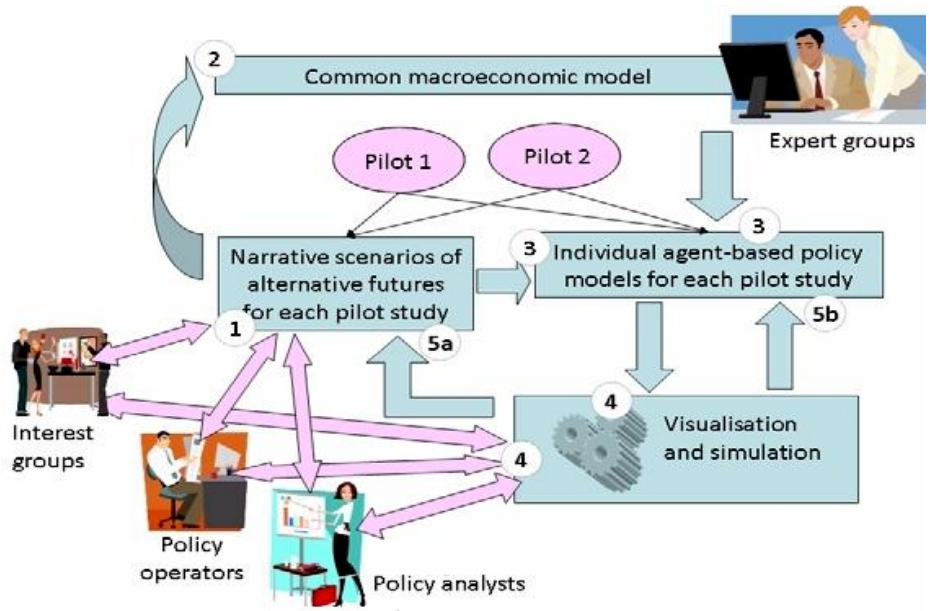

Figure 1 : OCOPOMO concept of open collaboration in scenario-based policy modelling

At the beginning, the policy analysts, policy operators and interest groups collaborate in the process of scenario development. Thereby, they depict alternative narrative descriptions of a policy area which demands foresights and strategic decisions (1). The policy operators,

decision makers in governments and politics, provide an initial descriptive policy scenario. The policy analysts may accompany the scenario with various supporting materials and explanations needed for better understanding of the proposed policy as well as for creation of respective policy model. The interest groups, which include representatives of specific unions, non-governmental organisations, chambers, etc., and the general public, may influence the policy creation even in the phase of initial design. Using e-Participation tools, they can make comments and propose modifications in the scenario. The result of this first step is a number of alternative scenarios for each policy domain (i.e. for each pilot application case).

Produced narrative scenarios are then used as a basis for two types of policy models. Experts in the area of policy modelling produce the common macroeconomic agent-based simulation model (2). It produces the sort of unpredictable changes in economic conditions observed, for example, during the recent credit crisis and which affect policy outcomes. The individual agent-based policy models will be developed specifically to reflect the concerns, objectives and perspectives of particular local stakeholders who will be represented as agents in the model (3). Consequently, the macroeconomic model provide a context for each of the individual pilot models to simulate the wider economic environment in which the regional policies are to be implemented.

The policy models, aligned to the supporting narrative scenarios, are then visualised and simulated in the OCOPOMO platform (4). The stakeholders may actively and collaboratively modify the parameters of agent-based models, validate and evaluate the policies based on the scenarios developed in step 1. A collection of revisions and modifications for the alternative scenarios, the parameters identified as those being crucial in the policy domain, and the individual policy models are provided as a result of this step.

The procedure continues iteratively by processing the generated requests for modifications. Depending on what revisions and on which place are requested, the process continues:

- (5a) with the changes in alternative scenarios developed for each policy domain, which starts the process again at step 1, or
- (5b) by modifications in individual policy models at step 3.

In the scope of the OCOPOMO project, two iteration milestones for this process are planned. However, in practice, the process is likely to be ongoing and incremental with many partial revisions. Finally, after a consensual approval of most of the involved shareholders, the resulting narrative scenarios and policy models will help policy operators to make their decisions on the basis of better quality of policy analysis results available. The consultative process itself, which brings key stakeholders in the domain together on a collaborative development of the resulting policy, is a valuable outcome as well. Since the stakeholders will have actively contributed their views, concerns and understanding during the policy-creation process, interest groups will have better knowledge and understanding of the decisions taken by policy makers.

The suite of ICT tools enabling such a collaborative policy modelling includes software technologies for:

- development and maintenance of narrative scenarios and policy models,
- presentation of personal opinions, communication and information exchange, searching and manipulation with digital content (including policy models and scenarios),
- underlying storage and maintenance of shared digital content.

These technologies will be integrated in OCOPOMO into a single ICT toolbox. A high-level architecture of the toolbox, including its components and interfaces, is presented in Figure 2.

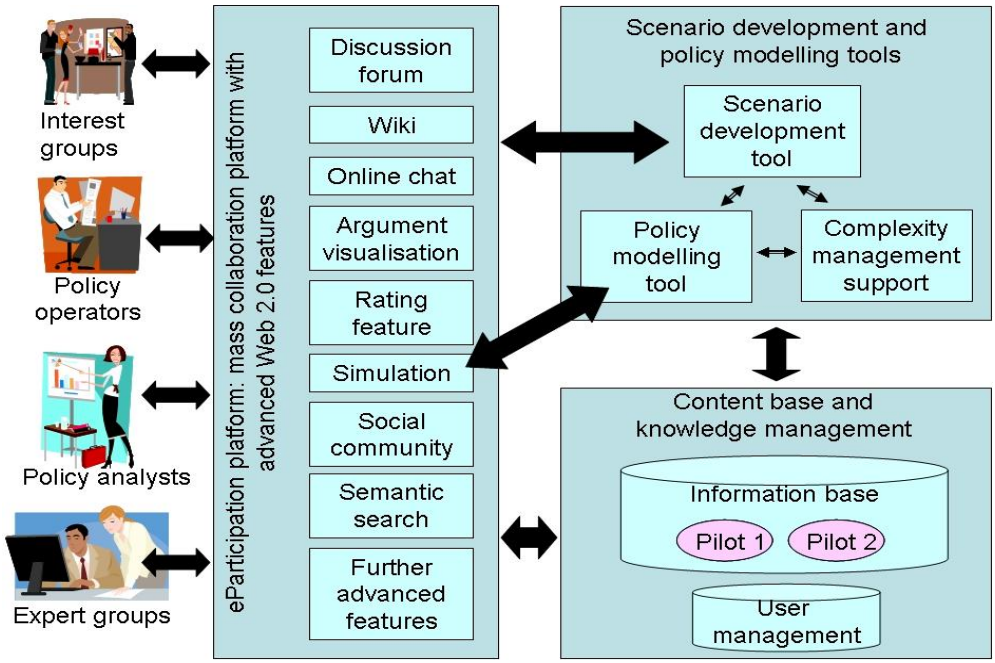

Figure 2 : ICT toolbox supporting open collaboration in OCOPOMO

The open collaboration in narrative scenario development (step 1 of Figure 1) is supported by the e-Participation platform that encapsulates advanced participation and collaboration features of Web 2.0. One of the challenges is the design of the user interface - enabling involvement of stakeholders in the scenario generation and policy modelling (enhancing thus the e-Participation dimension of the project) in a user-friendly way. The used tools provide means for structuring the scenario formulation supported by discussion, assessment and rating features of the key parameters to be identified in a verbal policy description. The module of e-Participation platform comprises a collaborative space of the shareholders' community, which enables storage and accessing of personalised digital data such as alternative policy models, customised scenarios, supporting documents and materials. These features are especially utilised in steps 1 and 5 of Figure 1.

Tools for policy modelling, visualisation and simulation will be integrated and functionally interconnected with scenario development tools in order to support the different target groups in performing the steps 2, 3 and 4 of the procedural design shown in Figure 1. The scenarios, policy models, and other materials published in shared collaborative space are semantically annotated by the elements of a common knowledge model [22]. Using such a semantic enhancement, heterogeneous information resources can be mediated and organised on a basis of unified vocabulary (i.e. a set of basic terms with agreed meaning). In addition, it allows stakeholders to search and access published information in meaningful semantic relationships.

5. – Pilot applications

As already mentioned above, the OCOPOMO platform will be applied and tested on two pilot cases. The policy areas of the pilot applications are as follows:

- *Pilot Campania*: Campania Region (http://www.regione.campania.it), Italy. The main goal of the pilot is to develop ICT and methodological support in policy decisions in respect to

an optimal allocation of EU Structural funds in the region and thus to improve economic growth, socio-economic balance in the region. The objective is to manage the distribution of EU resources for local development policies with specific regard to such issues as environmental sustainability, cultural and tourism appeal, competitiveness of the region's productive economy, energy, accessibility and transport, information society, urban development and quality of life.

- *Pilot KSR*: Kosice Self-governing Region (KSR, http://www.vucke.sk), Slovakia. The key policy topic is the development of a sustainable long-term strategy for exploitation of renewable energy resources. The interest of KSR is to better understand and identify potential impacts of policies in use of renewable energy resources, namely the impacts on employment, the financial implications of the investments, the environmental impacts and a wide range of associated issues. The aim is to see how efficient the existing measures are, how many jobs the strategy may create, etc.

Both pilot application cases were defined on a regional level, with an assumption to incorporate the macro-level policy of European and national dimensions as well as to reflect and integrate the micro-level policies of particular municipalities in the region.

The development of the OCOPOMO platform started with the specification of user requirements for both pilot applications. It includes the identification of existing and potential stakeholders in the domain and the detailed analysis of the current status of policy creation process. The sub-processes that could/should be provided for collaborative work need to be identified and assigned to respective groups of stakeholders. To demonstrate the adopted approach, we will describe these steps on an example of KSR pilot case. In the first step, the stakeholders were identified for each of target user groups as follows:

Target groups:

- Energy utility such as VSE (http://www.vse.sk, member of RWE Group), SPP (http://www.spp.sk, gas producer and distributor), TEKO (http://www.teko.sk, local producer of heat), small energy producers (e.g. owners or operators of small hydropower plants);
- Potential investors, i.e. those already registered by KSR as well as new potential investors;
- NGOs and civic associations that are active in the field of energy saving, environment protection, etc. (about 20 organisations have been identified so far);
- General public.

Policy operators, decision makers:

- Members of the regional parliament, working groups in the parliament.

Policy analysts:

- Department of Regional Development and Land Planning in KSR (DRDLP);
- OCOPOMO partners specialised on policy modelling and analysis (i.e. Centre for Policy Modelling, Manchester Metropolitan University, http://cfpm.org).

External groups of experts:

- Slovak Innovation and Energy Agency, http://www.sea.gov.sk;
- Regulatory Office for Network Industries, http://www.urso.gov.sk/sk;
- Slovak Environmental Agency, http://www.sazp.sk.

After identifying the target user groups, proper communication channels need to be established with all stakeholders. Citizens, NGOs and various interest groups can be contacted, for example, based on previous cooperation, via personal contacts, local media channels, web forums or web-based social networks.

In the second step of the procedure, initial narrative scenario describing KSR's plans in the area of renewable energy will be formulated and published on the OCOPOMO platform for wider discussion. A first draft of the scenario will be prepared by policy analysts according to the current status in the domain, existing process of policy development, and KSR's vision of future development in the area of renewable energy resources.

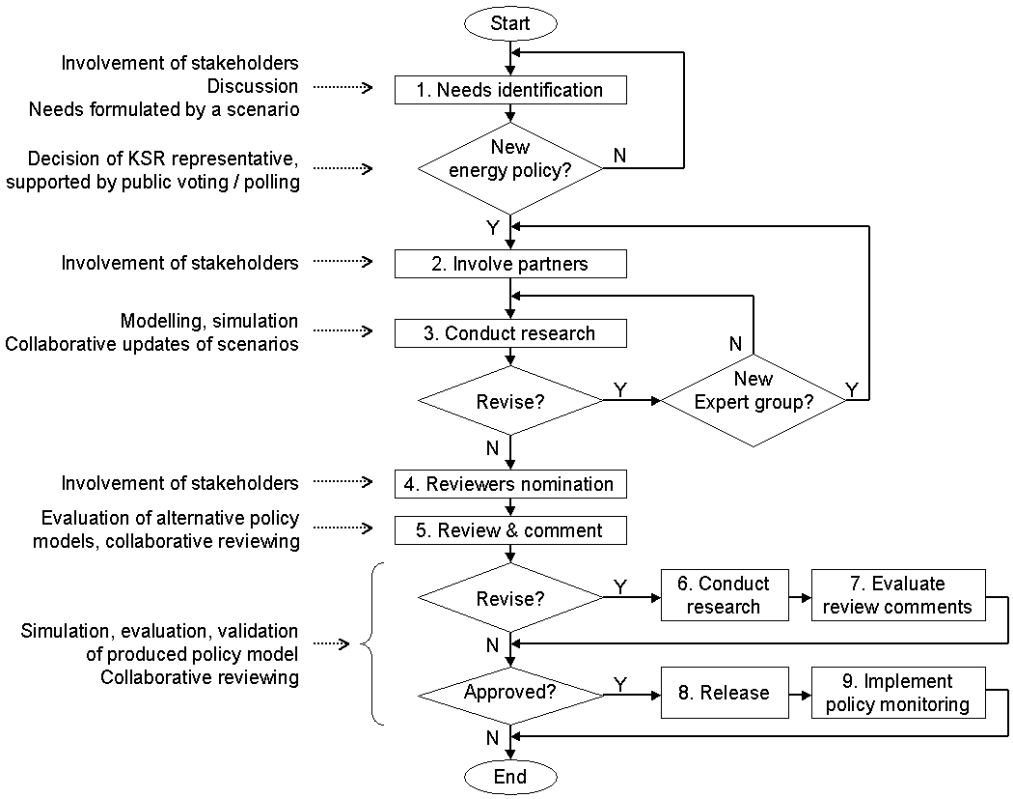

Figure 3: Process of policy creation in the KSR pilot use-case

The process of policy development, as it is nowadays applied in KSR, is depicted in Figure 3. Internal stakeholders (Regional Parliament Committee, Executive Board, internal Expert Group and related working groups created by DRDLP), act in phases 1-9 to produce and implement a strategy for the domain of interest. Based on an informal discussion or any form of proposal, the needs for policy changes are identified in phase 1. If the requested changes are fundamental, then a new process for the policy revision/development is initiated. The Expert Group, consisting of internal domain experts and external consultants, is created on the level of DRDLP (phase 2). The involved experts in phase 3 perform an analysis of legal and economic environment, technical solutions, and appropriate measures for conducting the updated policy. The research and analysis can be accomplished in several cycles, where particular drafts of the policy proposals are produced and reviewed internally by the Expert Group. After internal approval within the Expert Group, the policy proposal is forwarded to the Executive Board of the KSR, which may re-initiate the policy preparation (step 3) or even re-nominate the members of Expert Group (step 2). If the policy proposal is accepted, the Executive Board nominates reviewers and initiates the reviewing process (steps 4 and 5). The results obtained from Executive Board reviewers may invoke modifications and refinements of the policy proposal in an iterative manner (steps 6 and 7). Resulting draft directive,

produced as a result of review and improvement cycles, is then forwarded to the parliamentary session for approval. If the strategy is officially approved by the parliament of KSR, the policy is published in step 8. The policy can be implemented directly, in the institutions supervised by KSR, or indirectly, via support for projects or provision of grants. Finally, in step 9, the monitoring procedure is implemented to provide a feedback to the regional parliament on the policy implementation.

The described process can be enhanced/extended by means of the OCOPOMO platform, as is indicated by comments on the left-hand side of Figure 3. The consortium of stakeholders can be flexibly modified and may include all relevant user groups. The e-Participation tools supporting on-line discussions, presentation of alternative ideas, information sharing, polling on problematic issues may be very productive in phases 1, 2, 4 and 5 of the process. OCOPOMO capabilities of collaborative development of narrative scenarios and related policy models, integration of macro-level and micro-level views, simulation and validation of alternative models are essential for analysis, research and evaluation in phases 3, 5, 6 and 7. The portfolio of stakeholders may use the resulting policy model accompanied with narrative scenario and supported materials even after the policy release and implementation (phases 8 and 9), namely for transparent monitoring and progress evaluation as well as for continuous on-demand improvements and modifications of the applied policy.

6. – Conclusion

The presented concept of collaborative policy modelling, proposed and applied in the FP7 ICT OCOPOMO project, aims at enabling active and sustainable participation of a wide range of interest groups in a policy development. It uses a combination of explanatory scenarios, simulations by means of agent-based policy models, and e-Participation techniques, which may enhance the e-Governance solutions towards higher transparency and wider public acceptance. Two pilot applications in Italy and Slovakia, targeting a development of regional strategies for domains of EU structural funds and renewable energy resources, are proposed as a “proof of concept” for this approach.

In the time of writing the paper (March 2010), the OCOPOMO project is in its very early stage. Efforts of the project consortium are now concentrated on collecting user requirements, evaluating available ICT tools and technology frameworks, designing the architecture and modules of the OCOPOMO platform. In parallel, narrative scenarios and related policy models for pilot applications on both macro- and micro levels are developed in a co-operation of the user partners (i.e. KSR and Campania) and policy modelling experts.

According to the project plan, the platform architecture and components will be designed in autumn 2010. After implementation and testing, the first prototype of the integrated OCOPOMO platform should be ready in summer 2011. More information on the OCOPOMO project can be found at http://www.ocopomo.org.

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