



Supporting Policy Making with innovative assessment tools

**[Support to mutual learning and co-ordination in
research policy making (RTD-OMC-NET)
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**[WP4 – Development of a common comprehensive
methodology]**

D 4.2 Detailed report on developed methodology

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Index

Introduction	4
Part 1 Existing contributions on RTDI policy design	9
Policy Cycle	9
Strategic Planning	11
Regional Characteristics, Resources and Capabilities.....	14
Strategic Policy Intelligence (SPI) tools.....	16
Part 2 The SupPolicy Model	19
Stages in the model	23
<i>Vision</i>	<i>24</i>
<i>Consideration of Existing Policy Framework.....</i>	<i>28</i>
<i>Analyses of Conditioning Factors (Resources and Capabilities)</i>	<i>31</i>
<i>Strategy.....</i>	<i>35</i>
<i>Action Plan Definition</i>	<i>40</i>
<i>Design of Implementation</i>	<i>44</i>
<i>Implementation</i>	<i>48</i>
<i>Coordination and consensus building; Involvement of</i>	
<i>Stakeholders...51</i>	
<i>Feedbacks; Evaluation; Measurement for Results</i>	<i>56</i>
Designing a new regional process of RTDI policy definition	59
Continuous Adaptation	62

Introduction

The importance of science and technology for socio-economic development is widely acknowledged and has become a core field of activity for policy makers in many countries. While scientific efforts are still being undertaken to better understand the mechanisms of knowledge generation, technology transfer and commercialisation, a large array of different policy programmes and initiatives have already been conceived. Among the most important fields of action are: targeted investment in public R&D, promotion of scientific careers, incentives for investment business R&D, reduction of bureaucratic obstacles and fostering of closer interactions between universities, public research organizations and firms (the actors of the "triple helix").

While not directly focusing on the regional level, the increasingly popular triple helix approach illustrates the changing nature of the interactions between the research sector, the business sector and the state. It states that, held together by a complex set of organisational linkages, those spheres begin to overlap, and each sphere is increasingly able to assume the role of another¹. While universities take on entrepreneurial tasks and firms develop academic dimensions, the role of public institutions in promoting research has risen beyond the provision of the rights framework. In this context, the trend towards the devolution of power to the regional level increasingly provides also regional policy makers with a mandate for RTDI policy.

However, the relationship between general strategies for research and innovation and the concrete decision-making processes for the implementation of policy initiatives tends to remain particularly weak at the regional level.

Firstly, by its nature, the political process of translating strategies into decisions about the fields to support, the nature of approaches to be taken and the concrete research institutions to be supported is difficult and slow: even if politicians have clear vision they are usually hampered by pressure from vested interests, bureaucratic imperatives, and political forces, whose vision extends no further than the next election cycle².

Secondly, the reason for this common failure lies in the objective absence of a one-size-fits-all solution for the design and implementation of regional RTDI policies, as a

¹ Etzkowitz et al. 1998a

² Barkenbus, 1998; Dye, 1984

multitude of political and economic trends and framework conditions impose restrictions on the process of policy definition.

Among them, the most important are:

- The different devolution of political powers, providing regions with different mandates to develop RTDI strategies,
- The different scope of political decision-making at the regional level which determines the possible degree of comprehensiveness of policy programmes,
- The different availability of funding from the supranational level, providing regional policy makers with additional budgetary resources,
- The different institutional frameworks, which in many regional policy arenas are characterised by overlapping responsibilities and unclearly defined. Different strands of policy may not be well coordinated.
- The different expectations of the local electorate and the local business sector, which will not necessarily acknowledge RTDI policy as an important field of action.

As set of factors is identical for hardly any two regions it is very challenging to define a generalizable approach to policy definition. Consequently, there is a lack of common language in terms of RTDI policy definition which becomes particularly problematic when it comes to implementation. While norms for the development of policy strategies can adopted from international templates and academic literature they have to be adapted to the individual regional policy arena for which no direct blueprint can be given.

Nonetheless, experiences from existing regions can inform policy makers on how to approach the process of regional adaptation of existing concepts. While directories of policy tools and strategies have been compiled elsewhere, it is the aim of the SupPolicy project to support policy makers in this process of tailoring existing methods to their specific regional needs.

Explaining the Process of Policy Definition

This task is a rather complex one due to the fact that S&T covers a wide range of aspects and regional policies. Policy makers thus have to decide:

- about a focus on research, innovation or technology transfer;
- about a focus on sector-specific vs. multi-sectoral policies;
- about a focus on public vs. private research support;

- About a focus on single institutions vs. support programmes available to all.

The overall experience in this context is that due to the complexity of the multi-level, multi-actor environment that regional policy makers are involved in, approaches of "classical strategic planning" have not often succeeded in bridging the gap between planning and implementation. On the other hand they have not been a total failure either. It is thus the aim of this section to highlight the difficulties faced by a "classical" strategic planning approach without totally discarding the notion.

Public policies for innovation at the regional level

While the knowledge flows and value chains relevant for research and innovation are networked at a global level and it is important to share competencies between countries and sectors, the global networks continue to be anchored at a local level³, particularly when it comes to the transfer of research results from the research to the business sector⁴. Due to their newly acquired political scope of action, regions are possible best able to collect the demand for research and innovation, support the build up of the respective capacities and to foster collaborations between the different players on the supply and the demand side: citizens, enterprises, research and technology transfer institutions, financial institutions, local, national and international government institutions. In order to improve interaction between regional government, research institutions and enterprises, a number of innovative initiatives have been launched: foresight exercises to identify the most promising sectors, scouting initiatives to identify new high-tech entrepreneurial ideas, financial initiatives to promote innovative start-ups as well as the promotion of networks to support interactions between research centres.

WP4: Development of a common comprehensive methodology

In summary, it is the aim of this paper to use concepts from of strategic planning to enable policy makers to more profoundly consider their process of policy definition, while avoiding the traps of directly suggesting blueprints for action. To raise their awareness of key stages and possible bottlenecks the SupPolicy project aims to

³ Cohen et al., 2002, Lechner/Dowling, 1999, Porter, 1998, Cooke et al., 1997

⁴ Corolleur et al., 2004, Mowery et al., 2001, Autant-Bernard et al., 2002; Colyvas et al., 2002; Swann et al., 1999

support regional policy makers by providing a comprehensive model of the process of RTDI policy definition. To do so this paper focuses on the following key issues:

- the nature of the process of policy definition;
- opportunities and pitfalls of strategic planning;
- the consideration of regional characteristics, resources and capabilities;
- The selection of appropriate tools to inform the process of policy definition.

In this framework, the present document integrates contributions from the previous work packages (WPs) of the SupPolicy project

- to provide concrete suggestions for regional policy makers on how to use the available R&I tools to better define research and innovation policies,
- to fit local actors' needs in the policy process, and
- To define a model as a framework to reveal a more effective and efficient way to implement policy decision processes and translates these policies into programmes.

In order to attain these objectives, the following tasks have been performed:

- *Synthesis among previous project research* (Task 4.1). To present and discuss a framework that summarises the output of work packages 2 and 3, presenting the relationship among the policies analyzed and each tools.
- *Development of methodology* (Task 4.2). The framework composed in the first task provides the key elements to develop a common methodology, which helps to characterise a regional RTDI strategy, to select the most suitable tools, and to inform the design and implementation of the process of RTDI policy definition. This methodology is the main result of the present deliverable and will be referred to as “The SupPolicy Model”.

Hence, part 1 of this paper is devoted to the analysis of previous contribution to the design of regional policies, while in Part 2 the SupPolicy model is presented and explained in detail both in its underlying principles and in its operational aspects.

Furthermore, in order to build a common RTDI policymaking culture among the regions participating in the SupPolicy project and, through their actions and best practices, across European regions, the findings of this final paper will be summarised and disseminated.

Dissemination will be based on round tables and dissemination events including members of the consortium, regional civil servants and policymakers as well as representatives of interested stakeholders. A final evaluation of SupPolicy project outputs by policymakers (Task 4.3) will be carried out through a formalized process for gathering feedback, which will provide the basis for final amendments to the document.

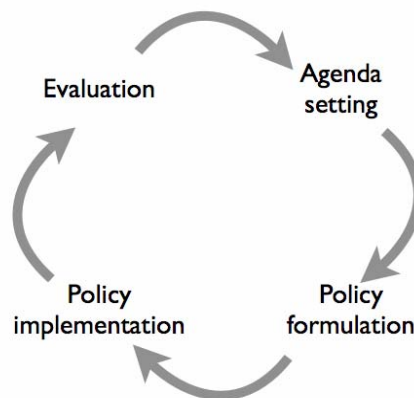
Part 1 Existing contributions on RTDI policy design

Policy Cycle

Policy-making goes beyond formal decisions or the drafting of legislative proposals. It entails the gathering and exchange of information, the elaboration of alternatives and the consideration of the expected consequences of the implementation of programmes⁵.

Political scientists devoted to public policy issues have, since the early 1970s, elaborated a simplified framework illustrating discrete phases or stages associated with the policy-making process⁶. In early versions public policy was portrayed as a process involving four main stages arranged sequentially. As the final stage is connected to the first by a feedback loop this framework is known as Policy Cycle (see Figure 1). While, it was originally suggesting that policy definition was a contained, incremental and systematic activity, newer contributions point out that it can and will often be interrupted by external factors that exert pressure on and cause shifts in the political agenda independent of the internal process of strategy setting⁷.

Figure 1: The Policy Cycle Framework



The first stage is the **agenda setting**: among the variety of concerns of government, only a limited set of issues can be tackled⁸. This is especially true at regional scale

⁵ Simon, 1976, Egeberg, 1999

⁶ among others May and Wildavsky, 1978; Nechmias and Felbinger, 1982

⁷ Marchildon, 2001

⁸ Althaus et al., 2007

where the number of potentially relevant policy issues very often exceeds the competencies and resources of the actors in the regional policy arena.

The second stage is **policy formulation**, which encompasses the stages in the decision-making process set forth as identifying alternatives, gathering and analyzing alternatives and applying a decision tool⁹.

Policy implementation follows as a third stage, in which policy makers have to decide about the ways by means of which they want to strive to achieve the set objective, of which there may be more than one¹⁰. In practice, policy implementation in most cases means the use of a mix of instruments. For example, direct financial measures can be combined with fiscal measures and state aid rules that address market failures inhibiting innovation, and thus be used to increase R&D investment. Framework conditions (standards and regulations), support to public research and Public Technology Procurement can all be used to retain and attract international R&D intensive firms. Venture capital and guarantee instruments are well suited to boost R&D in moderately R&D intensive firms and to bring new R&D performers¹¹.

The last phase of a systemic policy framework is the **evaluation** of socio-economic impacts of policy. The main question consists in identifying the impact of an intervention on some strategic variables and comparing them with the original policy objectives. In the classical framework of the policy cycle, evaluation is both the end of the cycle and the starting point of a new round of policy definition. Evaluation is pivotal to understand if and how the policy has worked and how implementation can be improved. In practice, however, a systematic and thorough policy evaluation at the regional level is the exception rather than the rule¹².

Whether the policy cycle framework can be meaningfully applied to an increasingly complex reality remains subject to debate¹³. There is increasing consensus among scientists that it should not or at least no longer be used as a rigid portrayal of what happens in policy-making. More recent contributions have refined the original framework in order to grasp the consequences of the increasing environmental complexity that policy-makers have to deal with¹⁴. They suggest that the stages can be

⁹ Tonn and Peretz, 1998

¹⁰ Althaus et al., 2007

¹¹ CREST, 2004

¹² Barkenbus, 1998

¹³ Juma/Clarke 1995

¹⁴ Radin, 2000

compressed or skipped and may be not appear in the order suggested in the model¹⁵. Sometimes the stages occur simultaneously or even their ordering in the policy cycle is altered¹⁶. Nonetheless, the authors of these more elaborated versions of the original framework maintain its basic tenet that policy is a process with discrete stages the results of which will ultimately feed back into new rounds of policy making.

Strategic Planning

Modern governance literature unanimously agrees that it is important to acknowledge that there is no single external "scientific" or "technocratic" party setting agendas or planning the processes of implementation. Oftentimes, the "regional authority" or the "regional government" this document will refer to can be regarded as a single organisational entity as competencies for planning and policy making are very often distributed among a range of institutions. Consequently, governance is a process of negotiation between different actors.

The best way to cope with this complex process thus is to try to benefit from an increasing interplay between these various actors at different levels. One of the core consequences of this is to acknowledge that each actor has its own distinct strategy and that it will be futile to attempt to create a "common strategy" for all. In most cases, individual stakeholders will not yield their own strategies and actions to a strategic document due to its mere existence. It is for this reason that so many strategy documents are formulated, yet hard to implement. In many cases, even well-formulated "common strategies" have remained a mirage while the overall policy implementation process has remained unchanged.

One of the problems of a "classical" top-down strategic planning approach thus is that it presupposes the viability of hierarchical policy making, which against the background of the challenges listed above will not usually be possible.

Instead, it is necessary to reconcile the existing individual strategies of stakeholders and create "joint commitment" on individual projects. The regional stakeholders have to be convinced that committing to a certain task is in their benefit and in line with their own strategy. The creation of regional strategy document can provide a good forum to do this. Strategic planning in this sense is a collective and organized mode of strategic thinking. It cannot be based on abstract thinking only but needs to be

¹⁵ Howlett/Ramesh, 2003

¹⁶ Cohen et al., 1972

grounded in operative processes. A strategy document, in this sense, needs to be well-designed, not only well-formulated.

In many cases, currently, the emphasis is too much on the technical production of the plan rather than on the management of the interactive and communicative processes that lead to its formulation and which are crucial to make it successful.

The promotion of regional development is by nature more political than technocratic. Touching-points and common denominators between many objectives have to be constantly looked for and coordinated. Various goals and strategies of individuals need to be made as parallel as possible through communication and negotiation.

Indeed, while modern regional strategies are still oriented on the basic tenets of the "classical" planning approach, the integration of communicative features is becoming more and more common. As a key consequence, they place high emphasis on the involvement of the right stakeholders at the right stage of the process.

Figure 2: Classical Approach to Planning vs. Communicative Approach to Planning

<i>Instrumental</i>	<i>To</i>	<i>Practical-communicative</i>
processing information	to	shaping attention
problem solving	to	problem reformulating
seeking detachment to further objectivity	to	seeking criticism to check bias and misrepresentation
gathering facts	to	addressing significance: gathering facts that matter and interact
treating participation as a source of obstruction	to	treating participation as an opportunity to improve analysis
informing decisions	to	organising attention to formulate and clarify possibilities
supplying a single product, a document with "answers"	to	developing a process of questioning possibilities, shaping responses and engagement
reinforcing political dependency of affected persons	to	fostering policy and design criticism, argument and political discourse
passing on solutions	to	fostering policy and design criticism, argument and political discourse
abstracting from social relations	to	reproducing social and political relations

Source: Sotarauta, 2004

However, a mere communicative approach does not serve the needs of policy makers either as it may lead to an undue reliance on non-hierarchical discourses in forums in

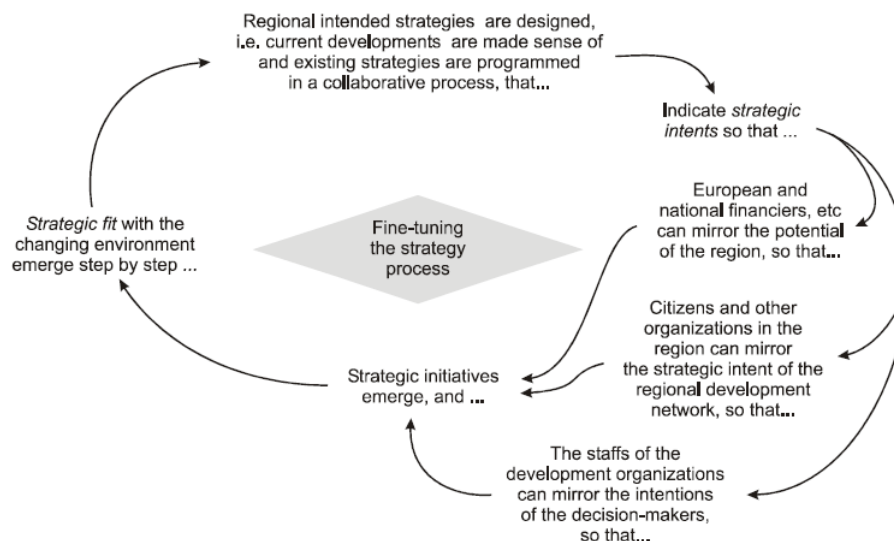
which the notion of efficiency and determination in strategy building will be lost in an attempt to delegate responsibilities.

Any effort in regional RTDI planning needs to combine flexible learning with some degree of guidance of various actors to develop a strategic intent of "what do we need to do differently". No approach to planning is it classical or communicative, is a fallacy as such but indeed can imply an undue belief in and reliance on certain features of policy making.

Consequently, strategy documents need and should still be formulated not only because of external requirements to do so. In modern strategy formulation they have the function of a mirror and documentation of the strategic intent agreed on by different actors, both to actors involved in the process and to external stakeholders.

The aim of modern strategic planning can be understood not as the process of the creation of strategies but as the process of the programming of already existing strategies. Good strategies in this sense are neither centrally designed from scratch nor fully emergent from a political process of bartering and the strategies existing before.

Figure 3: The Process of Generation of Strategic Fit in Modern Planning



Source: Sotarauta, 2004

These arguments suggest that the design and re-design of RTDI policy is complex, the process is much more iterative within the cycle, not only between cycles¹⁷.

¹⁷ Howlett/ Ramesh, 2003

Appropriate policy-making needs a broad knowledge base about context conditions, group behaviour, instruments and their mix and policy effects¹⁸.

Regional Characteristics, Resources and Capabilities

Furthermore, as illustrated in WP2 and WP 3 of the SupPolicy project, policy makers have to consider that policy has to be tailored to the specific characteristics of a region since regions can differ in terms of:

1. *Economic structure.* The structure of the regional economy heavily influences policy objectives regarding innovation and technology transfer. Pre-existing networks among firms in the same or complementary value chains can be an important basis to build innovation policies¹⁹. Regional development initiatives should be tailored to local forces²⁰; the optimal policy response will depend on specific local conditions that might make it easier to improve the strengths rather than to tackle the weaknesses, or vice versa²¹.
2. *Autonomy and institutional framework.* Responsibility for RTDI policy is shared among different levels of governance²², since framework conditions that influence the innovative capabilities and activities of the public and the private sector may be set at local, regional, national, EU or even global level. Policy implementation at the regional level therefore has to consider possible overlaps and aim to develop complementarities with existing policies put in place by other countries and at the European level. In many cases, the national levels retain control over several policy dimensions.
3. *Actors.* The number of players involved in the public policy-making process has increased considerably in recent decades²³. Increasingly actors outside of government have offered advice to decision makers and have supported them in the definition of objectives and formulation of policy. In many countries, to improve efficiency, policy is designed by government, whilst implementation is outsourced to external agencies²⁴. In the simplest situation, an agency deals with only one ministry, but in more complex ones the agency acts as an

¹⁸ Kuhlmann et al. 2001

¹⁹ Asheim et al., 2002; Asheim/Coenen, 2004

²⁰ Cooke, 2002; OECD, 2004

²¹ EIPR, 2006

²² Koschatzky/Kroll, 2007

²³ Howard, 2005

²⁴ EIPR, 2006

intermediary for several government actors. Additionally, the border between responsibilities for policy design and those for implementation is quite blurred and differs from country to country²⁵.

4. *Set-up of policy arenas*. Due to the nature of the innovation process which is contingent on a large array of framework conditions, comprehensive approaches to RTDI policy must be implemented via coordinated action by a number of governmental actors which due to different ministerial affiliations often use different designations for their policy programmes. In practice, RTDI policy very often is and certainly should be intricately interconnected with other policy areas such as industrial policy, education policy, and competition policy.

In more general terms, it can thus be stated that the type of regional RTDI policy approach needed depends on the resources present in the region while its ability to successfully design and implement these concepts depends on the capabilities of regional stakeholders. While approaches in the literature differ, the basic tenets can be summarised as suggested by Sotarauta (2004).

In this overview crucial resources are:

- **Information and Knowledge**; referring to the knowledge base of universities, research institutes and firms
- **Physical Resources**; referring to the necessary physical infrastructure,
- **Enterprise Sector**; referring to general expertise, resources, organizational set-ups and networking capabilities in the enterprise sector,
- **Human Resources**; referring to the skilled workforce available in the region,
- **Living Environment**; referring to "infrastructure for private needs" relevant to attract additional high-skilled workforce,
- **Financial Resources**; referring to available public funding as well as access to private means of R&D financing (which could be leveraged),
- **Networking Resources**; referring to the general structure of networks or interpersonal relations in the region that can be leveraged,

while needed capabilities refer to:

- **Combinative Capability**; the ability of policy makers to create networks and to mobilise resources controlled by actors in these networks,

²⁵ EIPR, 2006

- **Absorptive Capability**; the ability of both policy makers and key stakeholders to identify, assimilate and exploit knowledge from the environment both inside and outside the region,
- **Interpretative Capability**; the ability to create, maintain and re-create the conditions for an open debate among stakeholders coming from very different background and thus to create joint commitment,
- **Strategic Capability**; the ability to guide a discursive process of strategy defining: to define visions, to transform visions into focused strategies, to remain persistent, to find the right timing for conclusion, and finally to bring forth the defined objectives and extend commitment.
- **Excitement Capability**; the ability to raise awareness and to inspire people to participate in a process of policy

Strategic Policy Intelligence (SPI) tools

As illustrated by WP2 and WP3 of the SupPolicy project, tools have been developed in order to provide information and guidance to the design and subsequently the implementation of innovation policies by contributing to better decisions. SPI tools are methods to determine information requirements, capture, distribute and (re-)use information in order to make it available to the right persons at the right time in order to come to informed decisions²⁶. SPI tools include evaluation, foresight, technology and impact assessment, benchmarking, monitoring.

Application of SPI tools and the involvement of stakeholders aim to provide independent input, to avoid a "lock-in" in long-existing patterns of decision-making.

In practice, many politicians face great difficulties in understanding what SPI tools are and which benefits they can yield to support a concrete policy definition process, which has to be tuned and responsive to the needs and expectations of the citizens. There is a widespread tendency to settle for the use of qualitative informative inputs gathered through direct interactions with citizens and a limited number of influential socio-economic stakeholders. Nonetheless, with the extension of the policy mandate and the increasing allocation of resources to the field of regional RTDI policy, an increasing number of regional policy makers recognises the emerging need to build visions and define policies based on a larger set of reliable data, e.g. regarding the

²⁶ Clar et al., 2006

present situation of the socio-economic system of the region as well as technological and socio-economic trend of which it could make use. In fact, SPI tools follow the same imperative than policy makers, in that they aim to use the contributions of knowledge and information of all relevant regional stakeholders.

Based on a multi-objective function, which is defined by the politicians by taking into accounts inputs from the social and economic stakeholders, SPI policy tools provide outputs, that either point out weaknesses to be overcome or opportunities to be exploited in the future. Results vary remarkably depending on the methodology used.

Desk research in the SupPolicy project has established that, for the moment, the most frequently used SPI tools are **Benchmarking** and **SWOT analysis**; while few cases of the use of technology assessment, scenario writing and road mapping can be found.

The likely reason is that **Benchmarking** and **SWOT analysis** can be carried out more easily than scenarios and foresight as their techniques are rather formalized, robust and widely recognized and can be based on data available from many official sources. This means that the emphasis of the analysis is mainly on the present situation and on the effects of the drivers of the past on it, even if some impacts of the drivers of the future are emerging. In this way policy decisions about the future are not adequately supported by a vision of the medium-large term perspectives (alternatives) open to the region, and they are taken as an extrapolation of the trends of the past.

The building of **Scenarios** and the use of **Foresight Techniques** (Road mapping, Technology Assessment), on the contrary, requires a rather complex organisational process, with the involvement of many regional players. Additionally, some of these techniques are not yet well defined and formalised, at least for the use at the regional level. In many regional settings there is a definite need for capacity building to be able to make use of these more advanced techniques, even for the organizations that have already made use of SPI tools.

However, up until now, in most cases, the use of SPI tools at the regional level is discontinuous, i.e. they are used once repeated some (or many) years later, so that a continuous allocation of resources cannot be justified. It is thus important to tailor the use of SPI tools in a way that is compatible and synergistic with the existing organisation and procedures in the regional RDTI policy arena. This means also that the capacity of using SPI tools has to be properly positioned in relation to the organisational structure of the government.

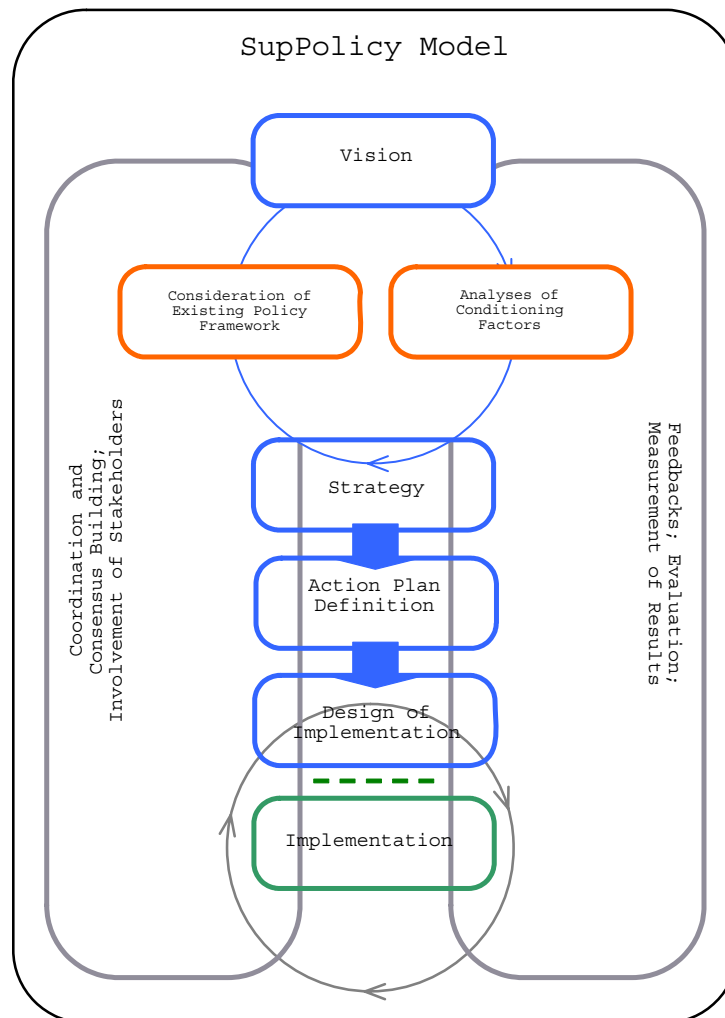
There are thus conflicting needs for the implementation of SPI processes: On the one hand, the capacity to perform these exercises should be autonomous from the organisational units formally in charge of the RDTI policy design, in order to provide unbiased information and views and not to be “captured” by the traditional decision-making process. On the other hand, the application of SPI tools needs to be integrated in the policy design process deep enough that its output cannot be easily disregarded as an "irrelevant external contribution". Consequently, the direct transfer of the outputs of SPI tools into the design of RDTI policy remains very difficult.

While SPI tools are very useful to support RDTI policy making, they cannot substitute the decision making process and cannot structure decisions in a deterministic way. Their main importance lies in the fact that their outputs render the decision process more transparent and, to some degree, oblige the politicians to give evidence of the rationales behind their decisions and the weight which they attribute to the different objectives that they have to balance. Additionally, representatives of vested interests have to (and have the opportunity to) give a proper account of their requirements.

Part 2 The SupPolicy Model

The objective of the model presented in Figure 1 is to provide decision makers with an orientation in the interactive process of RTDI policy design and implementation. As elaborated above, the intention is not to provide a "roadmap for action" but to highlight key stages in the process thus enabling policy makers to identify strengths and bottlenecks and to provide an indication which SPI tools can be helpful in addressing the challenges identified in a particular area.

Figure 4: The SupPolicy Model



The model, as presented here, is constituted by ten different areas of different nature, represented by a specific colour code in Figure 4. They can be seen as stages, but only three of them form successive steps. In the following they are briefly presented.

Decisions

These are activities concerning stages dealing with strategic decisions, the definition of the objectives of the RTDI policy and the definition of the strategy, supporting research and innovation in strong relationship with the territorial policy established by the regional government.

Analyses, Considerations

Activities of this nature deal with the informational support necessary to undertake RTDI policy decisions. In an asset based view of RTDI policy, knowledge concerning the initial conditions of the Region in terms of competencies, areas of excellence, industrial structure, innovative activities etc. is essential in order to point out priorities, objectives and measures required to attain them. Additionally, the policy framework in the region needs to be taken into account to ensure the relevance and viability of concepts.

Application

This field of activities concerns the implementation of the actual set of measures developed or changed based on the RTDI policy strategy, as well as their adaptation in the course of the process. This process generates the basis for feedbacks and further consensus building.

Embedding Activities

These activities take place continuously at all stages of the regional RTDI policy design and implementation process. They are necessary to embed and tailor the process to the needs of the particular region, to disseminate results making an effective relationship with regional stakeholders involved in the RTDI processes. Upon the other hand, these activities allow moving upwards the flow of information coming from each step, with feedback loops that enable corrections and modifications of previous decisions.

These four categories of activity are the necessary functional elements of an effective process of RTDI policy definition:

- A regional **RTDI policy will be more effective when embedded into the broader regional policy**. Most of the attention that innovation has attracted in the past years is legitimised by the assumption that an innovative regional economy generates positive social and economic effects by increasing regional competitiveness. Consequently, the design of a RTDI policy should be part of or at least guided by the broader regional economic development strategy.
- The stages highlighted in the model are defined to comprehensively cover all aspects of the process of RTDI policy definition. Nonetheless, in line with modern concepts of the policy cycle, the **model should be considered as a flexible framework** in which stages form "bricks" the order and importance of which can be adapted to local needs, context and the objectives pursued.
- The processes of **vision building and strategy formulation are intricately linked**. They are strongly influenced by each other as well as by the process of regional consensus building, the regional strategic objectives and the regional institutional context in political routines and capabilities.
- Management of the design and implementation of **RTDI policy requires a strong commitment by the regional government** that undertakes it. The creation of an effective project team is conditional on a positive relationship with many different regional actors and stakeholders with their own peculiarities and objectives (municipalities, firms, associations, foundations, universities, chambers of commerce, service providers, etc.). Even within the

regional government there are typically different needs, interests and objectives with regard to the design and implementation of RTDI policy.

- Given the scarcity of financial resources at the regional level, the efficiency of RTDI policy will be increased by the following principles of governance:
 - Subsidiarity in Implementation: the role of intermediate bodies like associations, or foundations is fundamental at regional level
 - Building on the leverage-effect of public funds: public resources allocation is bound to the presence of private financial efforts
 - Centralisation in Evaluation, focusing on long-term, comparable indicators
 - Generation of a governance culture for RTDI processes which implies learning from other territories and sharing experiences with them.

Stages in the model

In the following, essential features of each stage of the model are presented.

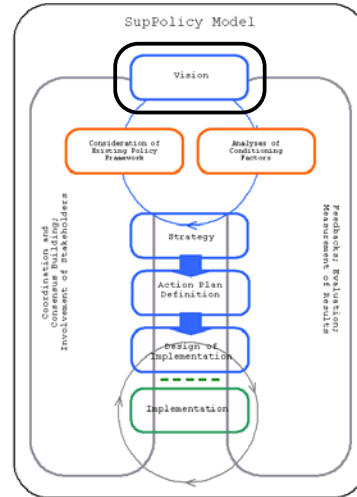
Each *card*, corresponding to one single stage of the model, is characterized by the colour assigned to the category it belongs to, and reports information concerning:

- Its **name** and **objectives**;
- Its **position** within the model;
- The **input** it relies on;
- A detailed **description** of the activities or decisions associated to the stage;
- The relevant **actors** to be involved and their **roles and responsibilities**;
- The **output** the stage is meant to generate;
- links to complementary documentation in the SupPolicy project (**project reference**);
- **regional experiences**

Vision

Objective

Elaborate the mission and the strategic objectives of the RTDI policy as well as the contribution the RTDI policy brings to the achievement of the overall regional territorial policy objectives.



Input

The vision for the regional RTDI policy is based upon the regional territorial strategy, which defines the role the region wants to play in its national and supranational context, as well as the path it wants to follow to achieve that position.

Information and experiences from previous processes of RTDI policy design and analyses of the regions' socio-economic and competitive situation as well as international scenarios are also regularly considered.

Description

The decision of undertaking the RTDI policy definition process requires, as a first stage, to **outline and describe the strategic objectives the region wants to attain** and how they allow the region to achieve the results established by the territorial strategy. In order to set the RTDI vision, it is necessary to create consensus and agreement on the picture the region has of itself, on what it wants to be, and which role it wants to play in the future. Given the transversality of RTDI policy, this consensus and agreement involves, first of all, the different political actors, i.e. regional ministers and DGs, and the different perceptions and insights they have.

Actors and Responsibilities

The regional government and authorities are the key actors of this stage, first because they are responsible for activating the whole process for the design of the RTDI policy and then because they have to participate in drawing the vision, ensuring its coherence to the regional territorial strategy. Representatives of the main stakeholders of the RTDI landscape could already be involved in this first stage.

Output

Output of this stage is the mission of the regional RTDI policy with its strategic goals and the guiding principles for the policy itself, showing the relationships and the contributions to the regional territorial policy and to the achievement of its objectives.

Project References

See also SupPolicy Deliverable D3.2, par. 4.5.

Regional Experiences

Bavaria

The cluster approach to RTDI policy took shape in Bavaria in 2003 when minister president Stoiber first introduced the official label "cluster policy" in a public address. From the beginning, therefore, it drew heavily on pre-existing ideas about the need to introduce sectoral/technological foci in RTDI policy and, due to budgetary constraints, its focus has concentrated to enable better networking.

The first addresses non-surprisingly referred to the known technological strongholds in the automotive field, in electronics, mechanical engineering as well as in Life Sciences. The state government, however, not only decided to further develop these existing sectoral concentrations through newly designed policies but to identify, target and build up further "clusters" of economic activity. The guiding political vision limiting potential eligibility was rather broadly defined as:

- to strengthen innovative dynamics in 19 selected sectors and thus to ultimately increase competitiveness of the Bavarian industry
- To increase productivity of Bavarian enterprises by improving their access to specialised suppliers, a pool of qualified personnel, and good inter-firm communication. Mutual understanding in related field shall be improved, leading to increased cooperation along the value-chain and at pre-competitive stages.
- to strengthen companies' ties to Bavaria as a business location

In this sense, clusters were conceived of as an organised creative network of business and science. Secondary aims were defined as:

- to integrate existing regional initiatives,

- to support the development of clearly profiled research capacities in the field,
- to facilitate access to public funding (European, federal and regional),
- to improve the coordination of education to improve the availability of a qualified labour pool, where necessary support the set-up of new courses at universities,
- To support the set-up of innovative enterprises.

Cantabria

The Spanish region of Cantabria started in 2004 a process for the definition of a RTDI policy, which then resulted in the “RTDI regional Plan 2006-2010”.

An analysis of the regional innovation system had been performed by looking at:

- Agents/actors of the system
- RTDI indicators
- Evolution of the system
- Scientific and technologic productivity
- Industrial fabric versus innovation and specialization

This analysis, with the resulting weaknesses and threats, resulted in the RTDI regional Plan, a tool that has to integrate and support all the Government initiatives undertaken to give Cantabria a place in the knowledge economy on a par with the leading European regions.

Strategic objectives of the Plan are:

- regional dimension: clear bet of the government for Science and technology as the key elements for a sustainable development in Cantabria
- Integration and participation of all actors in the regional innovation system
- Special support to those scientific and technological areas with a major role to be played by Cantabria in the future (setting up priorities)
- Increasing private and public human capital in RTDI activities
- Improving the quality of the scientific research carried out in the region
- Fostering the implication of the private sector
- Promoting a culture of entrepreneurship and hence the creation of new technology based enterprises

This case underlines the iterative and somewhat cyclic nature of the first stages of the model, where analyses are oriented and launched by the regional RTDI vision and are

performed in order to corroborate the vision itself and, consequently to defined an appropriate strategy.

Lombardy

In the following table, an example, from Lombardy region, of principles underlying a RTDI policy is show

1. Focus on the interaction between research and innovation

The regional action field concentrates on research, innovation on a technological base and economical development and on their interactions. The strategy core is therefore the transfer of technologies among producers and users of knowledge.

2. Attention to the improvement for the quality of life.

The region considers citizens as the first stakeholders of the R&I system. The definition of guidelines and strategic priorities takes into account the results that the research activities have on the quality of life, health, culture, environment, social contest, security), paying particular attention to the social demand for innovation.

3. Subsidiarity

Subsidiarity is the increase of the value of the peripheral contribution to the social level and to each subject, private or public, able to co-operate, for ability or proximity, to the discharge of the public duties. The region doesn't substitute to the action of the actors on the fields, but on the contrary it acts to put into the conditions to operate in the best way, favouring strategies such as "bottom -up".

4. Putting into system

The region favours interactions among actors of the system letting appear an organic vision in their strategy, creating occasion of communication and comparison, making easier the alignment among their actions, promoting partnerships, allowing experience exchange, identifying and disseminating good practices, stimulating the emulation of excellent situation.

5. Additionality

In order to guarantee the critical mass, resources concentration and the widening of regional investments, Lombardy region promotes the co-participation of different actors in R&I policies. The additionality is promoted internally the regional Administration (among different ministries), among public bodies (European Commission, national Government, region and local bodies) and among public and private. In particular additionality between public and private is to underline as well as a relevant evidence of the industrial interest for a particular action. For this reason the regional interventions aiming at the support of the demand of innovation through a co-financing able to stimulate and support the private intervention.

6. Contingency

Objectives and different problems require different instruments. Being impossible to find a perfect solution for all the situations, the region diversifies and adapts R&I instruments and policies to the specific technological sector or area, to the specific kind of enterprise(in terms of size, inclination to the innovation, phase of the lifecycle) and to the specific operator for the research.

7. Portfolio strategy

Regional interventions for R&I consider the interaction among different sectors, balancing selective actions (focalised on few excellencies and based on important projects) and transversal actions (orientated to the diffusion of innovation among sectors, to the entrepreneurial creativity, to the generation of something new), paying attention to priorities, sequences and growth routes.

8. Results driven incentives

The region promotes supports and awards initiatives that, besides developing an organic route and a partnership, are excellent, developed by able actors, produce positive and relevant results.

9. Attention to the evaluation and to the monitoring

Awarding depends on a strong attention to the project evaluation (ex-ante proposal, their on-going, ex-post results) to the capability of the actors and to the R&I system status.

10. Sustainability

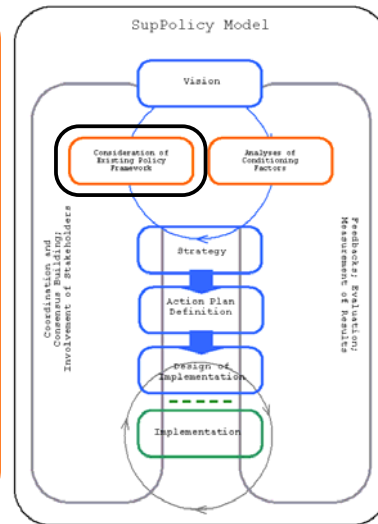
Regional interventions aiming at stability, at the reproduction of policies and instruments and at the simplification of related procedures.

Consideration of Existing Policy Framework

Objective

Elaborate maps of ongoing policies in order to:

- leveraging on previous work and results
- highlight successful or unsuccessful policies or measures
- maintain coherence and additionality where useful and possible



Input

The consideration of the existing policy framework is undertaken simultaneously with the decision to initiate the process for the definition of new regional policies for research and innovation. It uses and interprets the guiding principles of the regional vision in order to structure and assess the available information on the current measures. If the regional government initiates a RTDI policy design process for the first time, there is the need to understand and schematise the initiatives already proposed or activated in order to get an overview and build a comprehensive framework. Even when the region has already developed a structured RTDI policy approach in the past, this analysis can be helpful in depicting the present framework and the changes with respect to what was previously planned.

Description

The analysis is conducted in order to obtain and **assess information concerning the interventions and the efforts already undertaken**, both ongoing and planned.

This information forms the framework of already adopted measures and underlines modifications and changes, in case of a previously designed RTDI policy.

Typically, the analysis aims to structure information about existing measure according to the following main dimensions:

- Objectives
- Target groups
- Tools used and measures implemented
- Duration
- Budget
- Results (achieved, partially achieved or expected)

The framework is then read and interpreted in order to highlight regional strengths and weaknesses in the RTDI policies definition and implementation processes.

By taking into consideration the elaboration of the new Vision, this analysis would help maintaining coherence or abandoning unfruitful measures.

Actors and Responsibilities

This stage is the responsibility of the regional authorities that decide to undertake the design of a new RTDI policy.

Involvement of managers or decision makers of the ongoing RTDI policies as well as the coordinators of the implementation and of the evaluation phases of such policies (e.g. from regional intermediary agencies) is required.

Commitment of the regional government, in order to provide information, is a pre-requisite for the success of this phase.

Output

A document with a comprehensive list of RTDI measures, which have been undertaken and which are ongoing and planned, with their features and results. Highlights on “lessons learnt”: warnings, possible follow-ups with respect to the principles of the new Vision.

Project References

See also SupPolicy Deliverables D2.2, D2.3 and D3.2.

Regional Experiences

In none of the regions that participated in the SupPolicy project could we find an across the board approach to the consideration of the existing policy background.

On the national level, such inventories are for example compiled by the European Trend Chart on Innovation and the ERAWATCH network.

Undoubtedly, such considerations are undertaken in an informal way and all regions have fora in which the overall picture is discussed. However, a structured approach to assessment e.g. as proposed in the SupPolicy Deliverables D2.2 & D2.3 could hardly be found.

Cantabria provides a good example with a view on a stock-taking exercise which at least provides a good overview of the currently implemented policies on its regional web pages.

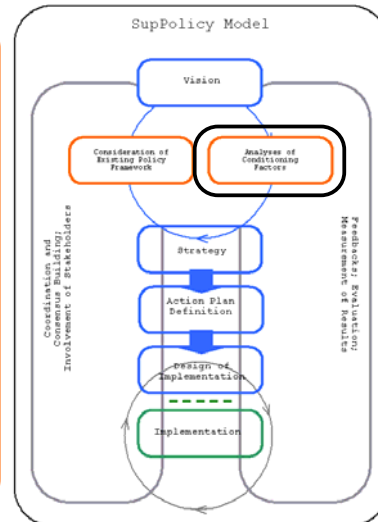
In Lombardy no such assessment of interventions exists up to date.

Despite of numerous activated measures, no additionality principle has been applied, which brings to a lack of awareness on the instruments and on the final impact of the measures (see also for Feedbacks, Evaluation; Measurements of results), inside and outside of the Region.

Analyses of Conditioning Factors (Resources and Capabilities)

Objective

Gain knowledge on the different factors that influence decisions concerning the definition of regional RTDI policies



Input

The consideration of the existing policy framework is undertaken simultaneously with the decision to initiate the process for the definition of new regional policies for research and innovation. It uses and interprets the guiding principles of the regional vision in order to structure and assess the available information on the current framework conditions relevant for research and development in the region.

Description

On the other hand an **analysis of the regional innovation system** can be performed to gather knowledge, gain an overview and better be able to assess possible RTDI scenario for the region. Dimensions of such an analysis can be:

- **Economic structure** (sectoral structure (by revenue and employment), firms' dynamics, localisation of foreign companies and industrial investments);
- **Availability of a highly skilled workforce;**
- **Techno-scientific capabilities** (scientific publications, patents, participation in EU FP projects, undergraduate/graduate/postgraduate/doctoral programs).
- **Autonomy and institutional framework:** it is crucial to determine the authority in charge of certain aspects of RTDI policymaking. Authority on these levers concerns autonomy on the decisional process and the legislative power as well as the budget allocation. Areas of intervention, which can be

possible levers in RTDI policy design are: education, research, public expenditure, fiscal legislation, infrastructures/facilities, and labour regulation.

- **Relevant Actors** and relationships among them: governments at different levels, firms, associations, finance, universities, research institutions and centres, chambers of commerce, service providers, social entities. Each of these actors is a stakeholder in the innovation process with its own interests, objectives and levers, therefore they need to be mapped in order to have a clear picture of those who are already involved and those who can/must be involved in the future decisional process.
- **Set-up of Regional Policy Arenas:** analyse which sub-fields of regional policy have to be aligned to be able to design a comprehensive approach to RTDI policy, and which actors can make the necessary amendments. Typically, RTDI policy can only be developed efficiently if other fields like industrial policy, education policy, and competition policy are taken into account and, ideally, adapted to the requirements of RTDI policy.

This picture of the region informs all the following stages in the model and process. It can also be used as the basis of SPI tool application.

- **Foresight activities** can be carried out in order to understand the global context in which the region is placed with perspectives on the future developments this context and the opportunities and threats that this provides to the region. In particular, foresight activities should highlight the main and most promising technologies as well as the most important areas of application, together with evaluations concerning dimensions like: growth rate, possible impacts on economy and society, mobilization of resources.
- A **benchmarking analysis** of other regions which can be seen as competitors or possible partners for cooperation. Regions which are most important in this analysis are:
 - **Neighbours**, be they regions of the same nation or not. Obviously, in a European context, assets (particularly human capital) flow across borders and often do so most intensely with nearest neighbours;
 - **Regions of Reference**, i.e. those regions, being regions of the same nation or not, which are comparable with regard to their economic structure, their autonomy and regional institutional framework actors,

the relevant regional actors and the set-up of the regional policy arenas.

Actors and Responsibilities

This stage is promoted by the regional authorities that decide to undertake the design of a new RTDI policy. They have to define the scope of analysis, which can then be delegated to regional agencies. Participation of the widest range of stakeholders to the analyses is required, especially for the external ones.

The help of research centres with expertise in policy, economics and management of innovation is advisable, given the different types of information that have to be gathered, integrated, processed, assessed and explained.

Output

The output of the analyses is an identification of the opportunities and threats resulting from the profile of economic, scientific and technological capabilities in the region, as well as the strengths, weaknesses and limitations of the local political framework. A second possible output of this stage is the identification of possible competitors or co-operation partners among European regions.

Project References

See also SupPolicy Deliverable D2.1, for regional analyses and Deliverable 2.2 for further analyses and the identification of comparable regions of reference.

Regional Experiences

Lombardy approaches the Analysis of Conditioning Factors (Regional Resources and Capabilities) in the following way:

The basic assumption is that the policy process is increasingly becoming characterised by **complexity** along the lines of:

1. the increasing presence of **different actors**, with **diverging motivations and objectives**;
2. the variable **degree of decisional and financial autonomy** of regions;
3. increasing degree of **interdisciplinary** research and convergence between previously separated fields of research and knowledge;
4. increasing degree of **international cooperation and knowledge transfer**;
5. Increasing **uncertainty and complexity** of economic trends.

Assets

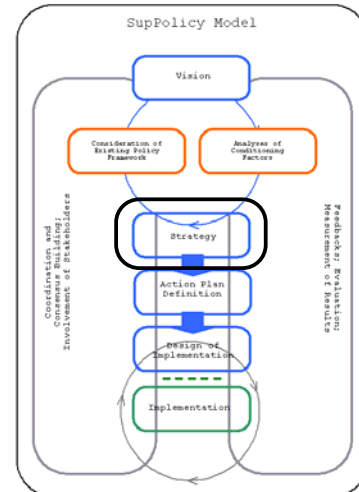
Resources and Capabilities are described as assets in four categories:

1. **Human Capital**,
2. **R&D Base**, related both to the infrastructure they require in terms of laboratories, facilities, and equipment as well as to the existing knowledge base (measurable by publications, patents and contracts),
3. **Industrial Base**, related to organizational set-up, approach to market, internationalization, adoption of new ICT technologies and the ability to absorb new production technologies,
4. **Availability of Public Funding** and **Leverage on Private Funding** relating to the likelihood the public investment can and will mobilise private resources.

Strategy

Objective

Select the areas of intervention where to focus the regional RTDI policy and the objectives for these areas.



Input

The strategy stage benefits from the results of the previous stages. Therefore, inputs of this stage are: the **vision** for the future regional RTDI policy, the **consideration of the existing policy framework**, and the results of the **analysis of conditioning factors**.

Description

The development of a strategy requires a **choice of priority areas of intervention**, and the objectives the region wants to attain in these fields. This choice is made on the basis of the mentioned inputs and the following two principles:

- **Focus.** Due to resource constraints and a need for critical mass in order to reach relevant results, a region needs to focus its policies into areas where investments are more likely to provide return, when taking into account the relevant local fields of competence and the general trends in those fields.
- **Future-orientation.** In addition to support for existing regional competencies and strengths, RTDI policy should aim to lay the ground for future opportunities based on strengths in previously non-existing fields. Therefore, in addition to the focused policies cited above, it is important that a RTDI strategy includes also “transversal” policies that are accessible to beneficiaries irrespective of sectoral affiliation which thus can create the seeds for the development of future areas yet to emerge.

Once the areas have been selected, the RTDI **policy objectives are to be defined**. According to the objectives of RTDI policy implemented in the EU, an example of a possible list of RTDI policy objectives is:

1. Improve innovation governance and strategic intelligence for policy making
2. Foster an innovation friendly environment
3. Higher Education/ Human Capital Development/ Gender Issues
4. Development of Research Infrastructure
5. Strengthen innovation including the protection and commercialisation of intellectual property
 - a. Strengthen entrepreneurial innovation in the SME sector
 - b. Industrial policy and strategic technology policy
6. Encourage technology and knowledge transfer to enterprises and development of innovation poles and clusters
7. Promote and sustain the creation and growth of innovative enterprises

Each of these objectives can be devoted and targeted to a single area of intervention or taken as an objective for transversal policies.

To facilitate the final evaluation of RTDI policy measures, it is at this stage necessary to **define appropriate metrics and indicators to measure performance**. This set of indicators should refer to both the objectives defined in this stage and the strategic ones developed in the vision stage. It is advisable to adopt established indicators, such as those of the European Innovation Scoreboard, in order to obtain comparable results. Nonetheless, each region can and should customise and complement its set of indicators in order to measure regionally specific phenomena and to better understand the impacts of the RTDI policy.

Actors and Responsibilities

The regional government has a major role in leading this stage, especially in identifying the portfolio of areas of intervention and its prioritisation. The definition of the objectives within each area, however, requires a significant involvement of the relevant stakeholders to ensure joint commitment on the objectives.

Output

The portfolio definition produces a document containing the list of selected areas of intervention. Then, for each area, the objectives of the RTDI policy are defined in detail and the expected outcome is operationalized through indicators based on which progress is to be measures.

Table 1: Structure of RTDI Strategy Concept

RTDI Strategy		
OBJECTIVES	DESCRIPTION	SPECIFICATION FOR AREAS OF INTERVENTION
1. Improve innovation governance and strategic intelligence for policy making	...	- transversal: ... - area 1: ... - area 2: ...
2. Foster an innovation friendly environment	...	...
3. Higher Education/Human Capital Development/Gender Issues	...	...
4. Development of Research Infrastructure	...	...
5. Strengthen innovation including the protection and commercialisation of intellectual property	...	...
5.a) Strengthen entrepreneurial innovation in the SME sector	...	...
5.b) Industrial policy and strategic technology policy	...	...
6. Encourage technology and knowledge transfer to enterprises and development of innovation poles and clusters	...	...
7. Promote and sustain the creation and growth of innovative enterprises	...	...

Project References

See also SupPolicy Deliverable D2.2, where a structured toolbox of policy measures currently implemented in the EU is presented classified by objectives.

Regional Experiences

General Considerations

Based on the **asset flows based view** of RTDI policies, measures and decisions the **objectives of an RTDI strategy** are defined as:

- to **increase the availability of assets** in the region, by changing norms and regulations or by investing in the creation of additional
- to **improve the quality of assets** already present, by investing or the improvement assets
- to **reduce the costs of access** to the assets, by changing norms and regulations or by actively building networks to facilitate access

Attractiveness

Since assets for research and innovation are becoming increasingly mobile, it is assumed that a positive balance between incoming and outgoing flows of resources is required in order to maintain and improve competitiveness. Consequently, RTDI policy has to empower all regional actors and institutions, which are capable to change framework conditions to change framework conditions in the following fields.

- **Education system:** presence and quality of schools, higher education institutions, research training, continuous education;
- **Research system:** presence and quality of universities, research centres, research infrastructures;
- **Industrial system:** presence of local suppliers and/or local partners, local demand for innovation and entrepreneurial attitude;
- **Innovation services:** technology transfer systems, innovation and business consultants and business and technology incubators;
- **Financial system for innovation:** presence of private equity funds, venture capital for different stages of development, institutional and/or public funding supporting the economic growth through innovation and entrepreneurship;
- **Labour market regulation and options for mobility,** especially for researchers and highly skilled workforce;
- **Manufacturing infrastructures:** passenger and freight traffic infrastructure, utility networks, safety and environmental regulations;
- **Level of taxation** to industry and people;
- **Regional quality of living:** environmental awareness, pollution, cultural activities, social tolerance and openness, international schools, healthcare system, accommodation and housing, real estate market, bureaucracy.

Cooperation

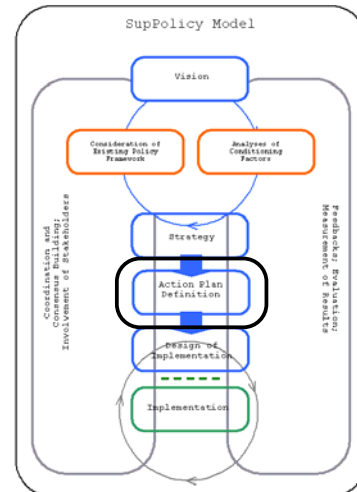
It is assumed that the mobility of resources turns any region into an open system which needs to cooperate with potential competitors for or suppliers of its assets. Inter-regional cooperation is seen as a way for regional actors to improve their access to assets without having to attract them locally, which will not always be possible. Inter-regional cooperation can be realized with different objectives, e.g.:

- cooperation can be established **among strong regions** on advanced research and innovation topics, where large amounts of assets are involved in order to establish and develop new industrial sectors;
- cooperation can be established **among advanced regions and newly industrialized regions** in order to transfer knowledge and to open new markets for mature industrial sectors;
- Cooperation can be developed to leverage complementary capabilities among regions with **different specialisations in science and technology**.

Action Plan Definition

Objective

Define the measures to be implemented at regional level in order to achieve the objectives established in the strategy



Input

The action Plan is mainly built upon the output of the **strategy stage**. Additionally, inputs from the **consideration of the existing policy framework** and the results of **the analysis of conditioning factors** are to be taken into account.

Description

Starting from the table that summarises the strategy by objectives, a set of measures is developed to achieve the set objectives. As already mentioned for the strategy stage, each objective can be pursued differently among the areas of intervention selected as regional priorities which implies the use of different measures.

Like the areas of intervention suitable measures have to be selected from a large array of possible options. For example, the set of possible measures to “strengthen innovation including the protection and commercialisation of intellectual property” could look as follows:

General measures

- streamlining of general national legislation to ease R&D activities
- evaluation of RTDI support measures/programmes

Direct Innovation support

- public support schemes for buying technological equipment
- public support schemes for companies performing R&D

Innovation skills

- public support schemes for the temporary hiring of qualified personnel for R&D, marketing etc.
 - public support schemes for the temporary hiring of young graduates and foreign graduates
- [...]

Non-technological innovation

- public support schemes for introducing organizational innovations
- support of knowledge-intensive business services
- subsidies to increase internationalization of (innovative) SME

Intellectual property protection

- IP protection support
- patent/IP protection royalty exemption

Research commercialization

- support for university-industry technology transfer
- establishment of centers that deal with necessary bureaucratic formalities for the companies

Tax incentives

- tax deductibility of R&D expenditure – in some case to more than 100%
 - general tax relief for R&D related investment
- [...]

Innovation management

- public provision / support for the outsourcing of research services for SME
- support for standardization and quality management issues (ISO certification)

Financing of R&D and innovation

- support schemes by public promotional banks and selected private banks

While this set is a list of *possible* measures, the actual set has to be chosen by taking into consideration the **existing policy framework** and the **conditioning factors**, i.e. the starting conditions of the region both with regard to its political and its research and innovation system.

Each measure is then described in terms of:

- Objectives
- Target groups
- Description
- Duration
- Budget
- Expected results

Together with selection of suitable measures, decisions concerning possible alliances and co-operations with other regions on specific objectives and/or specific measures are part of the action plan definition. Such decisions are taken after a deeper analysis

concerning the characteristics of the areas of intervention in other regions considered as possible partners (see above).

Actors and Responsibilities

This stage is directly in charge of the regional authorities, which decided to undertake the design of a new RTDI policy. It's required the involvement of the people responsible of the Strategy definition, if they're not the same of the Action Plan definition, in order to guarantee internal coherence.

Participation of authorities responsible for implementation and evaluation (regional DGs or Agencies) to this stage, at least at a communication level is recommendable in order to share principles and decisions.

Output

The action plan definition produces an agreement about a set of measures, which will be implemented in order to attain the objectives of the strategy. A list of possible regional partners which are to take a stake in the implementation of certain measures is part of the output of the action plan definition.

Project References

See SupPolicy Deliverable D2.2, Table 1, where a Structured Toolbox of Policy Measures currently implemented in the EU is represented according to an objective based approach, with appropriate sets of measures for each objective. See also SupPolicy Deliverable D3.2, Table 1, where taxonomy of innovation policy tools coming from the literature is presented.

Regional Experiences

Lombardy

Planning in Lombardy means addressing and coordinating activities and resources toward the achievement of regional objectives defined in the PRS: Programma

Regionale di sviluppo” (Regional Development Plan) and its yearly updating document DPEFR (Documento di Programmazione Economica e Finanziaria Regionale).

DPEFR contains detailed elements aimed at guiding the yearly operative regional action.

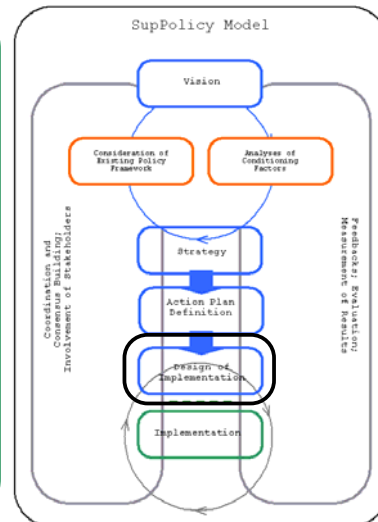
An example:

DPEFR 3 August 2007		
Three years period: 2008-2010		
Objective	Description	Instruments
Support Higher education;	Support to high quality education regional educational system; Support international, interregional cooperation; Increase the territorial attractiveness for students researchers, entrepreneurship etc.	Regional Law 1/2007; Bill related to the new industrial Policy (Industria 2015);
Encourage technology and knowledge transfer to enterprises	Valorisation of the network between research and higher education ; Strengthen Research infrastructures;	Regional Law 1/2007; Agency for dissemination for innovation technology;
Improve innovation governance and strategic intelligence for policy making	Best Practice valorisation and accreditation; allowing the selection of projects aimed at the creation of new innovative enterprise	Valorisation of QUESTIO, Quality Evaluation System in Science and Technology for Innovation Opportunity) ; Setting up of the system of instruments as Bioinitiative, NM and ICT
Strengthening entrepreneurial innovation in the SMEs sector	Best Practice valorisation; allowing the selection of projects aimed at the creation of new innovative enterprise	Valorisation of QUESTIO, Quality Evaluation System in Science and Technology for Innovation Opportunity) ; Setting up of the system of instruments as Bioiniziativa, NM and ICT
All the DPFER have as priorities the support of the participation of SMEs, Research Centers and Universities		
to the VII FP for R&ST financed by the EC		

Design of Implementation

Objective

Set the operational details for each measure defined in the Action Plan together with the results expected from their implementation



Input

The design of implementation stage is strictly connected to the **action plan definition** stage. Input of this stage is the set of measures previously defined.

Description

The design of implementation stage is meant to legally specify and implement the set of measures defined in the action plan definition stage as well as to ex-ante specify criteria for the evaluation of the success of these measures.

Legal Implementation

For each measure, implementation comprises the definition of:

- The managing authority and its responsibilities
- Milestones for the implementation
- Priorities and relationships with other measures
- The way beneficiaries can gain access to the measure

The sum of these definitions for all measures yields the basis for the elaboration of a **complete management framework for the RTDI strategy** as a whole, with a comprehensive calendar of measures activation, priorities and linkages.

This management framework allows policy makers to highlight the most important measures in the overall RTDI strategy, i.e. those measures requiring major efforts in terms of project management and resources. It also allows policy makers to identify

the most important managing authorities, which have to be considered as strategic partners in implementation.

Specification of expected results

The design and implementation of RTDI policies is accompanied by the need to define objectives that the region wants to attain in order to consider the implementation successful. The definition of the expected results is intimately linked to the **vision** and the **strategy** stages as the measures must meet the strategic and specific objectives of the RTDI policy.

The definition of the expected results is also linked to the **feedback** embedding activity as the definition of expected outcomes for each measure provides the basis for any evaluation and measurement activity.

Therefore the definition of expected results should be divided into **short term results**, i.e. those to be attained by each measure up to the end of its delivery process, and **long term results**, which are to be attained by the overall RTDI strategy in terms of the improvement of the regional performance in RTDI.

One possible dimension to describe the desired impact of single measures is their effect on the attraction or the provision of access to necessary external assets.

In the following, a table is presented in which target results can be specified for certain desired outcomes (i.e., in this case, measure "xy" from field "ab" e.g. has been defined to be assessed based on the fact whether it has been able to attract 3,000 extra engineers to the region).

Table 2: Specification of Targets

AREA "AB"; MEASURE "XY"				
<i>Asset</i>	People (skills and competencies)	R&D Activities and Infrastructures	Industrial Complementary Assets	Finance (Mobilization of resources)
Quantity	Target result: <i>300 new engineers</i>			Target result: <i>leverage 100.000 Euro of private financing</i>

Quality		Target result: <i>5 new certified laboratories</i>		
Networking			Target result: <i>7 new co-operative agreements</i>	

Such tables can later be aggregated according to different criteria to enable a synthesis of the results expected from the RTDI strategy. There are several possible criteria by which measures can be aggregated, among them: by **asset**, by **area of intervention** and by **principle**, where each aggregation represents different effects of the regional RTDI policy. In addition, similar tables for long term results can be drawn, with a definition of target results on the **asset level** as well as on the regional **innovation performance indicators**.

Actors and Responsibilities

This stage is in charge of the regional authority that has the responsibility for the project management activities of the RTDI policy implementation.

Decisions concerning planning and expected results are taken together with the regional Government and are shared with strategic partners, who manage the implementation of single measures.

Output

Output of the planning and expected results stage is the necessary legal definition to render each measure operational, as well as a comprehensive master plan with an agenda of the whole RTDI strategy and the indicators based specification of expected outcomes that indicate the level required by the region in order to consider the objectives fulfilled.

Project Reference

None.

Regional Experiences

Lombardy

An example of implementation design:

Box 1 – Technological Voucher

Technological Vouchers are an active instrument in Regione Lombardia since 2005.

Normally used in the welfare sector, “technological” are research vouchers issued by the public administration as grant used by beneficiaries in order to buy innovative “services” from accredited suppliers.

The instrument allows supporting due technological diligence costs and business planning; covering the costs supported by the enterprises in the selection of specialized and qualified human resources; support intellectual property and innovation costs.

Technological Vouchers represent an instrument in support of excellence with manifold advantages: first of all, vouchers are a in form of a Direct Contribution, therefore a flexible instrument, with a streamlined procedure easily usable, able to reply in timeline with enterprise needs, that are normally not compatible with public administration timing which is always longer.

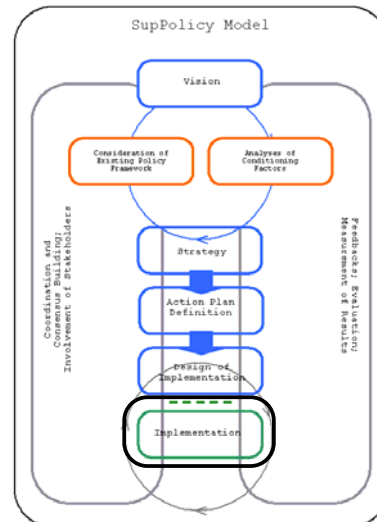
The efficiency and efficacy of the use of vouchers requires the setting up of a network of research and technology innovation centers where the enterprises can use their vouchers.

This brings e competitiveness of distributors and on the public/private partnership, giving support to competition and excellence.

Implementation

Objective

Realize the designed measures, activate feedback loops for ongoing evaluations and corrections for each measure



Input

The implementation of the regional RTDI policy begins with the completion of the **action plan definition**, with the **design of the implementation** and with the definition of indicators to measure the expected results. These must be considered as inputs of the implementation stage.

Description

At this stage, measures are actually implemented, i.e. framework conditions are changed and monetary and non-monetary support is made available to the target groups. The major task during this stage is therefore related to **project management activities**. Moreover, as the implementation of the whole set of measures defined in the regional RTDI strategy could take many years, **continuous evaluation** needs to be performed while the implementation is underway in order to supply feedbacks and to allow corrections and adaptations.

Continuous evaluation wants to verify the coherence **between the expected and the achieved results** as well as **between the planned and the actual implementation** of policy measures. This kind of evaluation is three-fold:

- The evaluation of the **results achieved** by each measure by comparing them to the previously defined expected results. This evaluation is very important

because of the feedbacks it may generate for adjustments to the action plan while the implementation is running;

- The evaluation of the **long term impacts** of each measure. This evaluation can be conducted for some years after the end of the first measure to be able to capture the time-lagged impact on the overall performance indicators.
- an evaluation of the overall **delivery process** itself, which gives feedbacks and allows to correct and amend both current and future measures;

In order to make ongoing evaluation and feedbacks effective, it is necessary to establish *ex ante* guidelines for this ongoing evaluation process, with a view on:

- the coordinator of such activities
- the required information (to be made available by project managers)
- the participants in the evaluation reviews
- the planned schedule of the evaluation reviews

Actors and Responsibilities

The regional authority that is in charge of the project management of the implementation process coordinates this stage. Managing authorities for the single measures are responsible for the execution of planned activities, supplying feedbacks and reporting information. The regional authority that coordinates the design and implementation of regional RTDI policy (often the government) is responsible for the integration of the evaluation's results into future stages of the process of policy definition.

Output

Outputs of the Implementation stage are:

- the **actual implementation** of the measures,
- an **evaluation report** for each measure concluded, concerning the delivery process and the results achieved by the measure itself in comparison with the expected results previously defined,
- A **periodic report** on the state of implementation of the RTDI policy with the results achieved the ongoing processes and the updated Action Plan (the set of

measures to be implemented) and Master Plan (the overall agenda for the regional RTDI policy).

Project Reference

None.

Regional Experiences

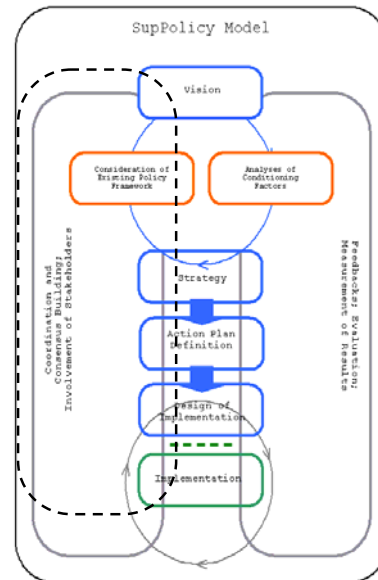
Lombardy

Up to date no evaluation methods are implemented in order to test the R&I measures results nor of the R&I policy.

Coordination and consensus building; Involvement of Stakeholders

Objective

Create the frame work for a successful regional RTDI policy which is both sufficiently communication oriented and guided by strategic intent. Involve the right actors at all stages to efficiently align objectives and interests, to validate interventions, and to create joint commitment.



Input

Actions aimed at coordinating efforts and at building consensus among the different stakeholders start from the knowledge and awareness of the objectives and decisions of the region and of the managing authority and require, as continuously renewed inputs:

- a strong commitment of the regional government as well as from the authority that is in charge for the definition of the policy – if different;
- an analysis of the correct set of stakeholders which can determine the success of the policy
- An acknowledgement that there will be no "regional consensus" that can be forged once and for all but that individual stakeholder will retain their individual strategies and motivations that need to be continuously re-aligned throughout the process.

Description

Policy concepts and strategies emerge from discussions of heterogeneous groups of stakeholders with multiple, different and sometimes opposite knowledge backgrounds and motivations. Additionally, the ideas developed these circles are often discussed with stakeholders from broader society, to ensure accountability and legitimacy.

During the process of policy definition process the composition of the stakeholders involved continuously changes which in turn continuously changes and challenges previously built consensus and joint commitments.

A continued involvement of the right stakeholders and the development of a suitable approach to consensus building are therefore at the core of any successful process of RTDI policy definition. Only on this basis can a regional strategy be developed that goes beyond the formulation of a document. At all stages of the process it is important to align individual motivations and strategies of stakeholders in such a way that an organic connection between strategy definition and implementation can be developed.

Consequently, a continuous interaction among the planning authority and all the actors involved in the process, both on the implementation side and on the target side, is important at all stages of the process.

Based on experiences some policy recommendations can to be taken in consideration:

- The bargaining process among policymakers and stakeholders at the early stage of the design of a new RTDI policy should leverage the experience of those experienced in the field to amend and complement the first drafts of concepts. Relevant actors can help to assess the viability of the drafts.
- While the strategy is been consolidating it could be necessary to anticipate which stakeholders will remain involved in the process, considering the policy from different perspectives.

Actors and Responsibilities

Consensus building needs the direct commitment of the highest authority involved in the definition of the regional RTDI policy.

The managing authority, i.e. a regional agency, with the supervision of the regional authorities, guides coordination in the implementation stages.

The identification of the correct set of stakeholders for the RTDI policy is a major task in this embedding activity.

Output

Outputs of this embedding activity are **joint action plans** for the different stakeholders, co-ordinated efforts, and a timely signalling of changes that may result in the threat of duplication and inefficiency.

Project Reference

See also SupPolicy Deliverable D3.2, par. 1.5.

Regional Experiences

Bavaria

When the German region of Bavaria decided to activate a cluster policy to introduce sectoral/technological foci in RTDI policy, it took three years, for many different reasons, to come to a definition of clusters to be created and funded and to create the first one. The idea of a cluster policy was explicitly mentioned first in 2003, while the first cluster (focused on food) was established in 2006.

This time interval had been used to define the set of clusters, which were worthy to be funded. But many activities, both formal and informal, were undertaken in order to build consensus about the Bavarian government action. In fact, shortly after the basic cabinet decisions, the different ministries activated their formal and informal contacts in order to approach the key actors, to involve them in the decisional process and to access their existing networks. The aim was to identify key players in relevant industries, who would qualify as a cluster spokesperson and raise the interest to participate in the process. During the process itself, there had been many difficult stages, which required discussion and debates, for example the one concerning the uneven distribution of benefits among clusters.

In order to face these stages, a cross-ministerial working group mediated discussions and coordinated activities. In parallel a new medium-level organizational unit had

been created at the state ministry for the economy, to better coordinate activities within the ministry itself.

South Estonian Region

The South Estonian region approached the RTDI policy definition through the investigation of the most relevant actors in the RTDI policy scenario and through their relationship.

In the following table these actors are listed with their name, the type of organization they are and the activities they perform. Possible activities are:

- 1) Supporting knowledge transfer between research organizations & companies
- 2) Providing financial subsidies for innovation and technological development
- 3) Boosting human resource supply for innovation
- 4) Supporting international cooperation between innovative regions and/or research
- 5) Support of networks for regional innovations within the region

Actor	Type of organization	Type of activities
Tartu City	Local Government	2,3,5
Tartu County	Regional Government	5
Tartu University	University	1,3,4,5
Estonian University of Life Science	University	1,3,4,5
Estonian Biocenter	Research Centre	1,5
Tartu Science Park	Regional Development Agency	1,2,3,4,5
Estonian Chamber of Commerce and Industry	Industry Association	4,5
Tartu Business development Centre	Regional Agency	2,5
Enterprise Estonia	National Agency	1,2,3,5
Ministry of Economic Affairs	Ministry	1,2,3
Ministry of Education and Research	Ministry	1,2,3

Source: Regional innovation policy impact assessment template for Tartu

There is some hierarchical relationship between the institutions, for example between Tartu Science Park and Tartu City Government through ownership relations. But

during the implementation of different strategies and activities the responsibilities are divided between different institutions and hierarchical relationship does not play a great role.

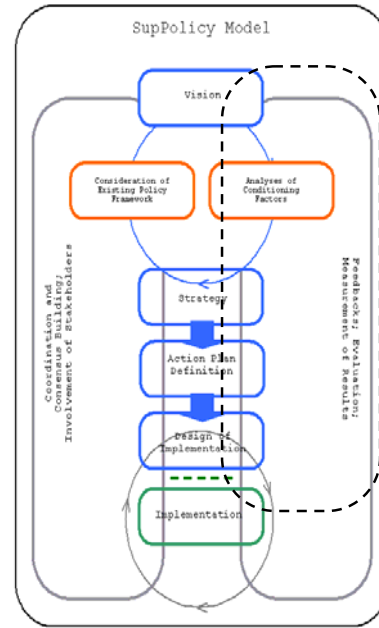
In this region the work done in order to build consensus and to rationalize interventions is significant, in fact the linkages between policymakers and intermediaries are very strong. There are several reasons for that. One reason is the existence of regular meeting of innovation round table. In every two month the meeting of innovation round table is organized. The innovation round table connects policy makers, municipalities, intermediaries, universities and other educational institutions of Tartu region. During these meeting representatives of different institutions present an overview of current activities in their institution in the area of RDTI policy. Also the problems and future plans are discussed. Through these meetings some kind of coordination takes place and the duplication of activities is decreased although it is not possible to eliminate them completely.

Feedbacks; Evaluation; Measurement for Results

Objective

Evaluate and support decisions and corrections during the design and implementation of the regional RTDI policy;

Evaluate the achievements of the regional RTDI policy and its direct and indirect impacts on the regional systems, according to the objectives of the policy



Input

Due to the complex nature of the regional RTDI system (public research institutions, industrial sector) and the system of RTDI policy making itself it is not possible to foresee the impact of neither RTDI policy strategies nor RTDI policy measures. Consequently, it is necessary to foresee and properly arrange an efficient system of feedbacks. This embedding activity requires the involvement of a steering committee (or equivalent organisational arrangements) created by the region's government to follow and monitor the whole design and implementation process of the RTDI policy. The main inputs of this embedding action are the **experiences made at each stage of the process**. Additionally, information can be gathered from the continuous **process of evaluation** needs to be interpreted and aggregated. For the ex post evaluation of the overall strategy, the needs to draw on **set of indicators** developed at the strategy stage.

Description

A **continuous interaction** among the managing authority and the relevant actors involved in the process, both on the implementation side and on the target group side, is important along all the stages of the model. Additionally, all the regional actors continuously **exchange informal information**. Though this information is difficult to

collect and a blueprint how to make use of it cannot be provided, this information is in many cases as important as that from the official assessments provided by continuous evaluations.

Experience shows, that the need for some corrections at the implementation stage is nothing unusual. Instead, adjustments to framework conditions, based on received feedbacks can make the implemented measures more robust and viable.

Consequently, the managing authority needs to develop processes to report progress, difficulties and successes at each stage of the process.

Besides continuous interaction **ex post evaluations** are necessary for both single measures and the RTDI strategy as a whole. Such evaluations aim at understanding which results the RTDI strategy has attained and how each individual measure has contributed to the overall results.

The process is favoured by the definition, *ex ante*, of:

- a clear definition of indicators and methodology,
- The appointment of independent actors as evaluators.

Actors and Responsibilities

Feedbacks need the direct commitment of the **managing authority** with the supervision of the **regional authorities**, via the constitution of a **steering committee** which periodically meets for evaluating progress, drawbacks and problems in order to correct or modify previously taken decisions. These amendments are then the responsibility of the **regional authorities** that have decided to undertake the design of a new RTDI policy. The managing authority that is in charge of the project management of the implementation process participates to this stage as coordinator of the implementation stage.

Output

The output of this stage is a **reporting activity** on the execution and implementation of each stage to the steering committee and, on this basis, the corresponding **recommendations to the regional managing authorities** on how to adjust and amend the process of policy definition.

The output of the ex post evaluation of the RTDI strategy should be a "**regional RTDI strategy final report**", which describes the results achieved during the period of implementation with respect to the general territorial and the more specific RTDI objectives and the efficiency of the respective design and implementation process.

This report should include a **set of recommendations for future RTDI strategies** based upon the 'lessons learnt' both concerning the content and the process.

Regional Experiences

Bavaria

The time interval elapsed between the first idea of the cluster policy and its first operational effects (see also the coordination and consensus building embedding activity) had been used to involve key players at the first stages of the policy definition. The feedbacks coming from these actors, together with the political objectives and criteria (critical mass in the sector, pool of qualified labour, specialised suppliers, critical mass in re-search and academia as well as a tendency of new start-ups to emerge in the sector), resulted in a proposal for the definition of the clusters that changed over time. They were three at the very beginning, announcing a following enlargement to nine sectors. Subsequently, the number of proposals rose to fifteen and then to twenty-one, until the government set a limit to less than twenty and four of the twenty-one were merged to two 'twin-clusters'.

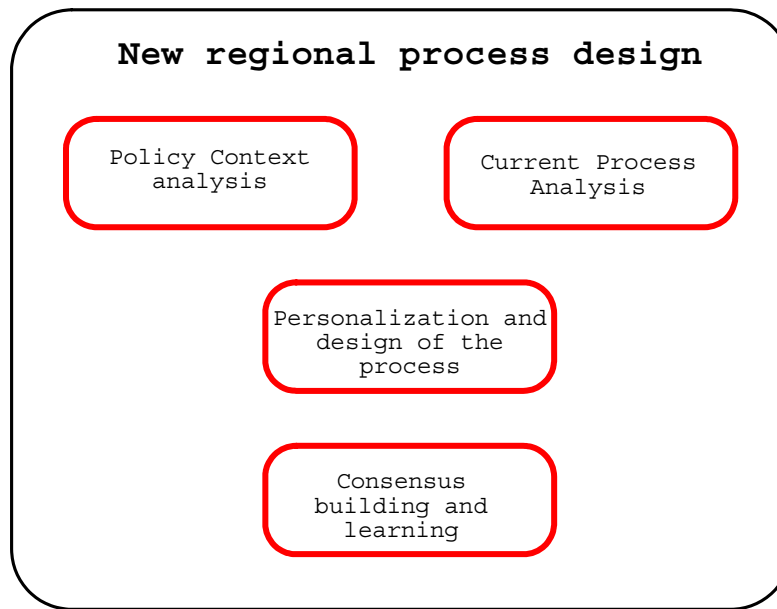
Designing a new regional process of RTDI policy definition

The model proposed is to be considered as a framework of reference for a critical assessment of existing processes of policy design rather than a blueprint that should be copied and followed by every region. It sketches an efficient way to proceed, for the case that policy makers in charge RTDI policy making are free to design this process by themselves. In practice, however, this is often not the case as processes of policy definition are embedded in a broader policy framework which is subject to many external framework conditions and influences and not (or at least not only) driven by strategic planning. In that sense, the model is suitable as a framework of reference and general roadmap, which also, to a degree, already incorporates elements to account for external influences and buffer external impacts (embedding activities). Nonetheless, each region has its own specific dynamics in the policy process, so that and in most practical cases, processes of policy design will deviate from the model in one way or another. These specific dynamics are related to:

- the degree of socio-economic RTDI development and the resulting prominence of RTDI issues on the general political agenda,
- the culture of policy making, especially concerning the propensity to involve different stakeholders and the general attitude to centralised strategic planning,
- scope of multi-actor policy arena, i.e. the number of stakeholders, interests, and motivations that typically determine processes of policy design,
- centralised availability of knowledge about actors and framework conditions in the regional innovation system as well as relevant innovation scenarios,
- Experiences with previous policies, measures and instruments, including the ability and willingness to explicitly use tools of evaluation and analyses.

The extent of possible differences suggests that, in practice, heterogeneity in processes of policy definition will continue to exist. Against this background, it is the aim of the SupPolicy model to inform the process of policy makers about important stages in the process of policy design and their recommendable order. On this basis, they will better be able to identify stages in which their current process of policy definition is weak and may require further attention in the future as well as to realise that it is possibly being performed in an order of stages that may not be efficient.

With a view on the SupPolicy model as a framework of reference, regional policy makers can thus approach the design of its own RTDI policy implementation process following the scheme presented in Figure 5.

Figure 5: Adaptation of the Process of Regional RTDI Policy Design

The fields of activity illustrated in figure can be briefly described as follows

Policy context analysis

The analysis of the regional context aims to determine the competencies and thus the scope of action of regional policy makers, which are contingent on its level of political autonomy as well as the regional and national culture of policy making.

The analysis of the regional context aims to identify the levers available by the local government in RTDI policymaking, i.e. the fields in which it has budget and competencies to act.

Current process analysis

This field of activity aims to raise awareness about and to analyse the existing processes for RTDI policy design. In most practical cases where RTDI policies have been implemented in the past, some sort of implicit decisional routines have been established, although they will often not be formally documented.

In case the region has not yet established a formalised RTDI process of policy definition, it is necessary to take a broad approach considering decisions about different measures and programmes to be able to distinguish genuine routines from idiosyncratic acts. If a process has been formally established, the analysis can be based on the existing documentation, while it remains necessary to critically reflect if the process is really adhered to.

In summary, this step aims to map the existing processes to *ex post* identify their most relevant characteristics along the following dimensions:

- Actors involved (with political, management, and financial responsibilities)
- Information flows
- Formalised instruments for consensus building, dissemination and feedback
- Stages (and order of stages)
- Levers activated (and levers not activated)
- Tools used for planning and controlling
- Methods used for evaluating impacts and results

Personalization and design of the process

The result of the first two activities is the generation of knowledge about the fields of leverage in which regional government can take action (*policy context analysis*) and the current regional process of RTDI policy definition (*current process analysis*). In a next step, the current process is compared to the process sketched by the SupPolicy model. The existing differences are then assessed in the following manner:

- as **acceptable** or **inevitable**, if they are due to the fact that the region does not have the necessary scope of action needed to start activities in this field or a change does not appear viable as it would be in stark contrast to the existing political culture in the region.
- As **issues to be addressed**, if regional policy makers have sufficient competencies and command sufficient resources to take action, and the action seems conveyable to or even desired by regional stakeholders.

Taking the existing gaps as a starting point, the current process is then amended or newly designed from the beginning. It should be documented along the same lines of analyses listed for the prior process in the *current process analyses*.

Consensus building and learning

In a final but possibly most important step, the newly designed process, its stages and their sequence, is to be agreed among the main stakeholders in the regional innovation system. The early communication of the underlying principles and the envisaged operational details is of key importance as it allows policy makers to build the necessary consensus on the performance of analyses, the implementation of RTDI measures and the evaluation of their results.

Continuous Adaptation

Whatever the process specific process that will result from the stages and activities presented above, it will share with the SupPolicy model its nature of being non-linear. Re-considerations and adaptations will remain essential and continuous aspects of the process of policy definition in order to take into account external influences and internal changes, such as:

- **changes in the political context**, i.e. modifications of the regional level of autonomy or other decisions with an impact on the regional scope of action
- **changes in the RTDI context**, for example the availability of new enabling technologies
- **Rising competencies**, policy makers acquire knowledge about the regional innovation system and gain experience with RTDI policy making.

Consequently, the approach proposed in this paper is iterative in nature, as the definition of a new policy will inevitably be an incremental, path-dependent and evolutionary process.

The need for these adaptations is reflected in the SupPolicy model through the embedding activities that mirror the need for **continuous feedback loops** for integrating new knowledge and experience and **continuous consensus building** to achieve regional commitment for joint action among differently motivated actors.

In summary, thus, the purpose of the SupPolicy model is to provide guidance to and raise awareness among policy makers, while in the analyses stages recognizing explicitly the need to consider the specific regional framework conditions.

Likewise, by emphasising the embedding activities as a central prerequisite for a successful process, the SupPolicy model stresses the importance of iterations and continuous adaptations as a learning mechanism for policymakers.

