

Strategic dialogues for research policy making in Germany

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Abstract

Purpose – *The mere generation of foresight results is not sufficient in itself to influence research policy. Research policy makers need specific information and insight on how the structured view of the future provided by foresight affects their strategic planning. Therefore, deriving the maximum benefit from foresight activities requires a carefully designed and actively driven transfer process of foresight results into research policy making. This paper aims to present such a process ("strategic dialogue") and illustrate it with recent examples from Germany.*

Design/methodology/approach – *The authors compare strategic dialogues with existing dialogue instruments and investigate the relevance of their theoretical foundations to transferring foresight results into research policy making. They capture the lessons learnt from such dialogues in a seven-step process that can be adapted to specific situations. Specific success factors are identified and linked to the process.*

Findings – *Strategic dialogues have proved to be an effective and efficient instrument for achieving the transfer of results from strategic processes such as foresight into research policy making. They ensure that foresight results are processed into a form that is directly useful as an input for policy development. They also help to create a joint vision for the future and to shape supporting infrastructure measures.*

Originality/value – *The transfer of foresight results into research policy making has not featured prominently so far in discussions of foresight efforts and methods. However, it is a crucial element in ensuring that such activities have maximum impact.*

Keywords *Foresight, Strategic dialogue, Research policy, Stakeholder alignment, Scenario planning, Germany, Innovation, Strategic planning, Governance, Management*

Paper type *Case study*

1. The challenge of transferring foresight results

Through research policy, governments provide a foundation and framework for research, set focus areas, and thus ultimately shape the future. The success of research policy is dependent on the alignment of a broad range of relevant stakeholders from academia, industry, politics, and society. It is essential to reach a common understanding about current challenges, potential future paths, and the necessary steps to move forward based on an overall perspective that integrates individual stakeholders' points-of-view. Given the crucial role of research output in the global competitiveness of countries, in securing employment and in reaching and setting benchmarks of innovation capability, effective alignment of stakeholders can be regarded as one of the prerequisites for national wealth and well-being.

Research policy cannot limit itself to the continued support of established activities and trend lines. Rather, it needs to anticipate future opportunities as well as future societal needs. It is therefore essential to underpin research policy with robust assumptions and a structured view of possible future developments. Foresight activities provide such a view and are therefore a crucial element in a responsible allocation of public funds to research efforts in academia and industry.

However, the mere generation of foresight results is not sufficient in itself, even if the foresight process was designed and conducted with maximum care and methodological stringency. Research policy makers do not just require the structured view of the future that foresight activities provide, but also specific information on how this view affects their strategic planning. The key challenge is that research policy makers are not a homogeneous group, even within a single institution, but are rather embedded in specific topics and focus areas within the organizational structure. The relevance of a set of foresight results therefore needs to be explored individually for each research policy making unit. From this, an overall national perspective can be derived.

Furthermore, the existing organizational structure in a research policy making institution (such as a government department) reflects earlier priorities and perspectives that may collide with the conclusions drawn from the most recent foresight results. In other words, an organization might have to adapt its structure again and again to optimize its ability to absorb each round of foresight results and act on them.

In addition, the integration and implementation of foresight results may also require the creation of new infrastructure for interdisciplinary research. This is an area that tends to be overlooked when research policy making only focuses on defining new research topics.

In this paper we demonstrate how existing approaches for transferring foresight results into strategic planning can be applied to research policy making. We present a seven-step process that is suitable as a generic framework for defining the most appropriate approach to a given situation to support research policy making. Finally, we illustrate the process with three examples from Germany and the German Federal Ministry of Education and Research related to transferring results from foresight and similar strategy processes into research policy making and research infrastructure creation.

2. Lessons from earlier work

The challenge of transferring foresight results into strategic planning is well known in a business context. Using the adaptation of businesses to sustainability considerations as an example, Cagnin and Loveridge (2011) discuss challenges as well as detailed models and processes. They describe how a business can become more and more receptive to foresight results, and how the necessary changes can be captured and measured in a management framework. They also discuss the contributions foresight can make to the management system at different stages of development (cf. Table 3 in their paper).

Specifically with respect to research policy development in Germany, Meister and Oldenburg (2008) argues that both foresight and subsequent transfer activities have to be constructed as dialogue processes involving all relevant stakeholders. With his summary of the key results of foresight activities in Germany in the early part of the last decade, he also illustrates once more their wide-ranging and interdisciplinary nature and hence the need for an active and carefully designed transfer to research policy making.

If the transfer of foresight results is essentially a dialogue process then the question arises which established models and methods are suitable for such dialogues. Welp *et al.* (2006) have investigated this area for science-based stakeholder dialogues. Their analysis is relevant because the motivation and the challenges of those dialogues tie in with those of transferring foresight results, including the call for greater impact of results as well as greater accountability for the generation of those results. Welp *et al.* (2006) contrast science-based stakeholder dialogues with other types of dialogues. In an overview, they cover:

- science-based stakeholder dialogues – initiated by scientific institutions with the aim of increasing knowledge and understanding as well as ensuring societal relevance;
- policy dialogues – initiated by policy makers to gain public support (not to be confused with the process of developing policies in the first place);

- multi-stakeholder dialogues – for governance on an international level, for example in the environmental area; and
- corporate dialogues – initiated by businesses to communicate in the context of supplier networks and with society as a whole.

Dialogues used for transferring foresight results into research policy development do not fit any of these categories even though individual characteristics show a certain overlap. In our work, we use the term “strategic dialogues” to describe such processes. They are wide-ranging dialogues initiated by political sponsors of foresight activities and similar strategy processes and involve stakeholders from politics, academia, industry and society. The overall aim lies in making foresight results as usable and useful as possible in the work of research policy makers and in turning the transfer into an integral part of policy development. Generally, similar types of strategic dialogues can be employed as a method whenever consensus views of complex and controversial issues need to be generated based on constructive debate and mutual trust, but in this paper we restrict ourselves to their discussion in the context of research policy making.

To what extent can the theoretical foundations described by Welp *et al.* (2006) for the four types of dialogues in their discussion be applied to strategic dialogues? Welp *et al.* (2006) consider three theoretical frameworks to derive effective methods and techniques in a range of dialogue situations. Table I their relevance to strategic dialogues for transferring the results of foresight activities and similar strategy processes into research policy development.

3. The situation in Germany

To support research policy development the German Federal Ministry of Education and Research (BMBF) conducts Foresight and related strategy processes. In addition, a number of other activities are oriented towards identifying and analyzing areas for future research and technology, including some that use a mission-oriented approach within the framework of societal needs defined by the so-called “High-Tech Strategy”.

To ensure success and impact of these activities on the innovation system strategic dialogues are used, both during the process of creating consensus views of future developments and during their translation into research policy and the creation of research infrastructure.

The main objectives of a strategic dialogue are the joint review of previous results, the definition of general conditions to push invention and innovation, the identification of potential constraints that might stem from economical, technological or societal implications, an assessment of the relevance for basic education and advanced training as well as the consideration of ethical and legal aspects. An efficient transfer of foresight results has to be secured proactively to grasp the opportunity to consciously shape future research in a competitive and dynamic environment. The context is dynamic and drivers as well as trends are only partially known. At the same time, diverging interests, opinions and agendas pose challenges to the new and still crystallizing ideas contained in foresight results.

Details of the optimum approach depend on the subject matter as well as political considerations. Key results of strategic dialogues are the development of recommendations for the BMBF as input for future research policy. Additional results might be community building between stakeholders from various disciplines in academia as well as strengthening of networks between academia and industry.

4. Characteristics and use of strategic dialogues

As a highly flexible tool, strategic dialogues have been employed on multiple levels in the process of research policy development: Firstly, strategic dialogues have helped to overcome the necessarily limited perspective of individual units within an organization such as a federal ministry by connecting units with each other in a loose network where ideas can

Table 1 Overview of theoretical frameworks developed by Welp *et al.* (2006) with relevance to strategic dialogues

Model/framework	Relevance to strategic dialogues
<p>Rational actor paradigm (RAP) – The RAP assumes that all individuals maximize their personal benefit without communication with, or consideration of, others</p>	<p>Although the RAP is viewed skeptically by Welp <i>et al.</i>, it does provide guidance for strategic dialogues. When designing such processes, it is easy to ascribe characteristics to stakeholders purely based on their affiliation to a specific group (“Stakeholder X is responsible for Y at the University of Z, therefore we assume his/her viewpoint is consistent with typical viewpoints in academia”)</p> <p>By contrast, a successful strategic dialogue does take into account that each individual has a very specific agenda, focus points, blind spots, likes and dislikes and thus needs to be involved in the process in a targeted way. A careful choice of individuals to participate in the dialogue in the first place is beneficial</p> <p>A recurring example of the application of the RAP is the involvement of representatives of trade bodies in strategic dialogues. The process should be constructed to make maximum use of the concentration of knowledge about one particular industry that such a trade body representative has. However, the process also needs to take into account that trade body representatives have their hands tied in terms of changing their viewpoint during a dialogue since they are answerable to the members of the trade body</p>
<p>Bayesian learning – This model describes the beliefs an individual has about the world and defines a mathematical way of capturing the influence of external events onto those beliefs</p>	<p>Appropriately framing and structuring the issues that need to be the subject of a strategic dialogue is a crucial element. It has to happen early on. However, framing and structuring cannot be achieved in a single well-defined step – it is an iterative process throughout the life of the dialogue</p> <p>To involve a wide range of stakeholders in a topic area that is initially rather fuzzy, a strategic dialogue has to succeed in crystallizing the topic area into a concise definition of scope and goals. This clarity, together with clarity of terminology, is a prerequisite for expressing the dialogue in a Bayesian way</p> <p>Making Bayesian belief networks explicit as outlined by Welp <i>et al.</i> (2006) is a useful internal exercise for the facilitators of a strategic dialogue but not suitable in discussions with stakeholders since many of the issues are politically sensitive and/or inconsistent with the self-image of stakeholders. Strategic dialogues can navigate the landscape of stakeholder beliefs, agendas, reservations and sensitivities but need to do so without assuming these can necessarily be influenced</p> <p>The process of beliefs being updated that is captured by the model of Bayesian learning applies in several contexts during a strategic dialogue. In particular, research policy makers operate in the context of political priorities and guidelines that are set at higher levels of the government institutions they work in. If those priorities change – either in the light of foresight results or through unrelated shifts (e.g. change of government after an election) – then belief networks of research policy makers can be affected. Similar effects can be observed in corporate hierarchies. Strategic Dialogues need to be flexible enough to cope with this kind of change</p>
<p>Organizational learning – In such models, stakeholder dialogues are considered as social learning processes</p>	<p>Strategic dialogues lend themselves well to being described in terms of organizational learning. Learning happens at multiple levels, both within groups of similar stakeholders and across groups. The “dialogue” aspect is in line with the definition of Bohm (1996) who draws a clear distinction between “discussion” as an exchange of views aimed at winning an argument, and “dialogue” as a creative process aimed at generating insight and, in some cases, consensus</p> <p>In the case of strategic dialogues, organizational learning does not just support and drive the actual transfer of foresight results. It also has a long-term effect in that stakeholders who have been involved in the dialogue change their thinking and their action in anticipation of potential research policy changes triggered by the dialogue (such as new funding programs)</p> <p>This can be a problem since government institutions need to be careful about raising expectations that may remain unfulfilled. On a positive note, though, if research policy initiatives do result from the strategic dialogue, stakeholders in industry and academia might be aware and receptive of them since they have already had a stake in shaping them</p>

be discussed and explored in a safe environment, supported by neutral facilitation. Secondly, strategic dialogues have been conducted on a larger scale involving outside stakeholders, typically from academia, industry, and society in addition to politics, combining their perspectives at an early stage to explore promising pathways for politic decision making. Stakeholders from academia might, for example, include university departments, scientific networks, non-university research organizations, polytechnics, and academies. Industry stakeholders may be small to medium-sized enterprises as well as global multinational companies, industry associations or research partnerships. Society can be involved, for example in the form of pressure groups, think tanks, trade unions, religious organizations, and charities. Finally, beyond the Federal Ministry of Education and Research, other governmental institutions might need to be involved, for example other federal ministries, state governments and district and city councils.

Relevant stakeholders from politics need to be identified at the beginning of the process to ensure their involvement in initializing the strategic dialogue and clarifying relevant issues and expected results. External stakeholders are being identified in the course of the process based on input from political stakeholders complemented by input from our own research as well as established networks into academia and industry.

In a heterogeneous field of stakeholders, contrarian interests and different value propositions might be encountered. Therefore, it is essential to create an atmosphere of mutual understanding where different perspectives are being honored amongst the stakeholders involved. This can be achieved by neutral and experienced facilitation. Language problems and lack of trust can also become issues that require the intervention of an “interpreter” and the conscious facilitation of cooperation leading to agreement on binding rules for all parties. Transparent information and communication is also crucial and requires managing content and channels while taking into consideration the needs of various stakeholder groups.

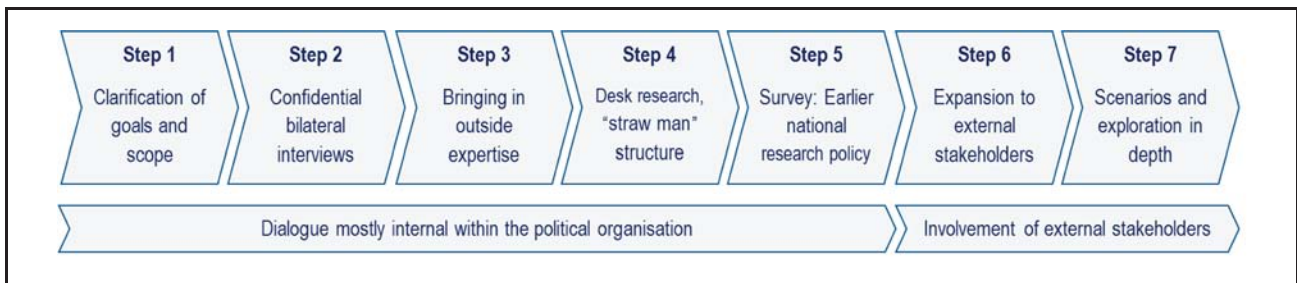
While strategic dialogues are tailored to the characteristics and requirements of stakeholders and research areas there are recurring patterns in the context of research policy making that can be structured in a seven-step framework shown in Figure 1 and described in the following sections.

4.1 Step 1: Clarification of goals and scope

In this first step, goals and content are specified and clarified between the relevant organizational units in the BMBF and, if already relevant, other federal ministries. This can be achieved in a joint meeting or interactive workshop session. The subject area is examined with respect to its relevance to individual units and being clarified with those holding overall responsibility in the BMBF. Thus, a basic common understanding amongst political stakeholders of the topic and its challenges is achieved. Well-structured summaries based on desk research help to prepare the discussion and to describe the starting point in more detail.

At this stage it is possible to map out in a first iteration the disputes that may hinder the strategic dialogues. By its nature, foresight is more radical than day-to-day activities of

Figure 1



research policy makers, and uncertainty and conflicting approaches to entering such uncharted territory need to be observed and managed. Methodologically, mutual gains approaches (e.g. Fisher and Ury, 1991; Susskind and Movius, 2009) can already be useful at this stage in that discussions and guiding questions in workshop are framed in terms of needs and interests rather than positions. Thus, a constructive framework for further discussions throughout the process can be established.

4.2 Step 2: Confidential bilateral interviews

The viewpoints, concerns and agendas of individual organizational units are subsequently captured in step 2 through separate confidential bilateral talks with each unit. A key result is transparency of the specific challenges of each unit and of the criteria it uses to assess the value of future outcomes of the strategic dialogue. Expectations regarding the final results as well as the process design are addressed. Key success factors as well as potential obstacles are also covered. Furthermore, these interviews generate leads and recommendations for other relevant stakeholders that could be brought into the dialogue at subsequent stages.

An important element of this step is the establishment of trust. During the interviews, stakeholders need to be assured of our neutral role as facilitators of the process. However, stakeholders must not get the impression that the facilitator is “on their side”. Again, we draw on insights from the Harvard Negotiation Project (Fisher and Ury, 1991).

4.3 Step 3: Bringing in outside expertise

Step 3 widens the field of exploration and brings in expertise on the subject matter from outside the ministry. A small number of selected experts covering different aspects of the subject matter and a variety of perspectives are selected and questioned in semi-structured interviews. These typically last about one to one and a half hours and cover the outside view of the expert on the subject to be examined including an assessment of current challenges and success factors. Furthermore, relevant activities in the field are mapped, such as pilot projects, existing networks and stakeholders in an international context. Gaps in previous research and the need for governmental support are being identified from the experts’ perspective. The perception of the BMBF as well as the role it should play is also reflected from an external perspective.

In this step, the involvement of outside experts is purely a fact-finding activity. The experts here are not necessarily stakeholders in the strategic dialogue but primarily sources of information. However, they may become actively involved in later steps. The information obtained is used to generate initial hypotheses.

4.4 Step 4: Desk research and “straw man” structure

Issues that were raised and initial hypotheses are explored further and complemented by desk research in step 4. The goal is to organize preliminary results into a clear and simple structure that consolidates and crystallizes issues into a small set of statements and questions that offers a language for BMBF units to discuss the subject area. In this step, a strategic dialogue may also explore the European and international context to identify best practice and allow a better positioning in view of a competitive global environment. This clear and simple structure resembles the “straw man” proposal that Fisher and Ury (1991) use during negotiations: it does not claim to be objective or to represent a consensus, but it is a first cut of describing the wide-ranging and fuzzy topic area provided by foresight results with a tight map that can be used as guide and context for the following steps.

4.5 Step 5: Survey of earlier national research policy

Where funding programs are considered as an element of future research policy it is important to gain an overview of previous funding activities in relevant subject areas as well as lessons learnt. This information is not always readily available given the wide range of possible funding bodies as well as the fact that the subject of the strategic dialogue is likely to be novel and cut across boundaries of existing funding programs. Hence, step 5 of a

strategic dialog might be a survey of earlier national funding activities and a gap analysis between those activities and the potential support of future ambitions.

4.6 Step 6: Expansion towards external stakeholders

Based on the collected information from various sources the issues to be addressed in the further course of the process can be expressed with greater precision. A proposal for a customized process design is developed and agreed according to the requirements of the BMBF. At this point, BMBF units as well as other relevant ministries are brought together again to review the results and the options and recommendations that follow from them. If there is consensus to widen the dialogue and involve stakeholders from outside the BMBF the strategic dialogue enters a new phase.

This is achieved in a series of workshops with stakeholder representatives selected for their familiarity and expertise in the subject area, their ability to add a unique perspective, their openness to consider and explore a broad range of possibilities and viewpoints, and their influence within their organizations. Step 6 would be an initial workshop aimed at verifying challenges and assumptions, identifying obstacles and key success factors, and obtaining a clear picture of possible short- to medium-term research steps. Part of the workshop could also be to reflect on possible roles of academia, industry, politics and society and to develop recommendations for further supporting activities. The size of such workshops ranges from 30 to 80 participants.

4.7 Step 7: Scenarios and exploration in depth

Given that future-looking activities of the BMBF often span time periods of ten to 20 years it can be fruitful to engage all stakeholders in building normative and/or exploratory scenarios as a guide and framework for defining research policy. Therefore, step 7 brings together a small group of experts to develop one or more scenarios and understand the drivers leading to them. The scenarios are subsequently turned into prose based on the results of discussion in the workshop. The draft is circulated for review and completion by the experts over the course of two feedback loops. The scenario process as described can also be followed by further workshops to explore and detail certain aspects.

Depending on the workshop format and the number of participants in step 6 and step 7 it can be helpful to conduct individual interviews in preparation of an event. This cannot replace the workshop itself but rather ensures that fact-finding does not take up any of the valuable time (maximum of one and a half days) that stakeholders can afford to spend on supporting policy making in this way. Furthermore, prior interviews allow the facilitator to set the right focus in the workshop, anticipate relevant topics, sensitivities, and group dynamics. The upfront interview results are usually consolidated and presented in structured form at the beginning of the workshop to kick-start discussions.

At this stage, the strategic dialogue has overcome the following challenges:

- A heterogeneous set of stakeholders within and outside the BMBF with different agendas, value systems, interests and communication practices has been brought together and has reached a joint understanding of the subject and its challenges as well as a joint view of the future with potential paths to move forward successfully.
- The potential lack of experience amongst stakeholders in dealing with other parties who have a different background and use a different terminology has been overcome and turned into an established way of cooperating and communicating based on mutual trust both between organizations and between individuals. Often workshop events have helped to initialize short- and long-term cooperation activities between parties involved.
- Conflicts between stakeholders have been resolved with proven techniques such as the Mutual Gains approach applied by a facilitator.
- Relevant stakeholders have been actively engaged and start to act ideally as promoters and multipliers of the subject within their networks and organizations.

For the BMBF, a wealth of structured information has been generated that allows formulating a future vision and recommendations for research policy initiatives, such as new funding programs, both at the level of individual organizational units and through cooperation of multiple units and departments. Because of the wide involvement of stakeholders up to this point, policy initiatives are highly likely to meet stakeholder requirements and ultimately achieve their goals.

Overall, the strategic dialogue has resulted in a generation and translation of a joint view of the future into prerequisites and recommendations for a coherent research policy and its implementation through programs and/or dedicated institutional structures.

5. Illustration with recent examples

As outlined above, strategic dialogues consist of recurring standard elements that are combined and tailored depending on the subject as well as the specific requirements of the client. The following three examples outline specific cases of application and demonstrate the power of strategic dialogues as an instrument for a broad range of subject areas in the context of national research policy making.

These are not presented as full case studies due to the sensitivity and confidentiality of certain aspects. They are intended as illustrations of the framework outlined above and they show the application of this dialogue approach in a range of different situations.

5.1 Strategic dialogue to transfer results from the BMBF Foresight process

Strategic dialogues were conducted, for example, for focus areas from the latest BMBF Foresight process (German Federal Ministry of Education and Research, 2010a), an overview of which is given by Warnke and Cuhls (2011). For the focus area “ProduzierenKonsumieren 2.0” (Production Consumption 2.0), the strategic dialogue involved seven organizational units within the BMBF drawn from the full range of BMBF departments concerned with research policy. In addition, contact with three other German federal ministries was established. To transfer the results of the focus area “ProduzierenKonsumieren 2.0” into activities, a holistic view across a complex landscape of relevant stakeholders, including relevant disciplines as well as players across the value chain is required.

In the first phase, the results of the Foresight process were reframed to pinpoint their relevance to each of the BMBF units and to crystallize a joint understanding of “ProduzierenKonsumieren 2.0” (steps 1, 2, 3, 4 in the framework outlined above). In a second phase, a survey of previous funding programs showed a need for initiatives to exploit the potential of “ProduzierenKonsumieren 2.0” and the need to involve communities in academia, industry and society in identifying practical steps towards addressing the situation (step 5). This wider involvement is currently in progress in phase 3 of the Strategic Dialogue and is supported by all stakeholders in the BMBF. Most recently, a workshop with 65 stakeholder representatives was conducted (step 6). The objectives of the workshop were:

- generating concrete topics with a need for further research and development and with high potential that have not sufficiently been addressed by governmental support so far;
- defining necessary prerequisites and requirements for additional cooperation from the perspective of external stakeholders; and
- initializing networking between highly fragmented communities covering individual aspects of the subject with limited interfaces and interaction so far.

The results of this workshop event are currently being evaluated and translated into next steps.

5.2 Strategic dialogue to generate a joint vision for forward-looking projects

Another strategic dialogue was conducted for a so-called “Forward-looking Project” in the frame-work of the High-Tech Strategy. Forward-looking Projects are designed to map out scientific and technological developments over a period of ten to 15 years in specific areas, and to communicate them to a wide audience.

In this example, all seven steps in the framework outlined above involved both the BMBF and the Forschungsunion Wirtschaft-Wissenschaft, a panel of high-ranking experts that advises on the implementation of the High-Tech Strategy.

The final, seventh, step of the Strategic Dialogue resulted in a pragmatic vision for a “CO₂-neutral, energy-efficient and climate-adapted city” that was developed in a scenario workshop with a cross-disciplinary panel of 20 experts. Semi-structured interviews were conducted in advance to explain the objectives and the process to the experts as well as to collect initial input to describe the starting point and to define trends and drivers. Drawing on the joint assessments of potential economic, social and technological developments, elements for a coherent vision were created in the workshop by the experts. A first draft of the vision created from the workshop results was refined in a number of feedback loops. The vision is now a key element for communicating the Forward-looking Project in the media and for involving the public (German Federal Ministry of Education and Research, 2010b).

5.3 Strategic dialogue to develop a model for public private partnerships

A third example of a successful strategic dialogue was the definition of a novel type of innovation cluster across academia and industry implemented as public private partnerships. A range of views on numerous aspects of cooperation models was collected from selected stakeholders from academia and industry as well as politics and researched internationally (steps 1, 2, 3). Key issues were crystallized in a dialogue process with the BMBF (step 4) combined with consolidated results from semi-structured interviews with 40 experts and decision makers from academia and industry (step 5 and preparation of step 6). The results were then addressed in a tightly structured workshop with about 35 experts (step 6 with elements of step 7). Points of agreement became transparent as well as issues of potential conflict. The resulting outline of a possible new type of innovation cluster has proved to be stable throughout further discussions in various policymaking contexts and is leading to calls for proposals.

Key success factors across all examples have included:

- a careful selection and engagement of stakeholders considering their potential contribution, their role in developing research policy, and their commitment to future activities;
- consideration of the existing structure of departments within the Ministry as well as known difficulties in initiating activities across departments;
- ensuring relevance and a joint understanding through appropriate presentation and transfer of results from Foresight and related strategy processes; and
- compatibility with existing strategic planning activities in individual units within the BMBF.

6. Conclusions

Strategic dialogues have proved to be an effective and efficient instrument for achieving the transfer of results from strategic processes such as Foresight into research policy making. They trigger and facilitate opinion-forming processes within political institutions and involve other relevant stakeholders in a wide-ranging dialogue to deal with societal challenges.

From the perspective of research policy makers, strategic dialogues provide the missing link to transfer the results of foresight and similar strategy processes into research policy making. They ensure that foresight results are processed into a form that is directly useful as an input for policy development. They also help to create a joint vision for the future and to shape supporting infrastructure measures. Also, they result in the creation of new informal

networks within the BMBF, between BMBF units and external stakeholders, and among external stakeholders. These networks persist beyond the end of the actual dialogue and can facilitate the interplay of actors in research as well as research policy.

Through our work we have come to the conclusion that a carefully designed transfer of foresight results into research policy making would be beneficial in a wide range of situations, not just in Germany but also within the EU and internationally.

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