Project: The Landscape and Isobars of European Values in Relation to Science and New Technology (Value Isobars)

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Title of deliverable*:

Research needs for a value-informed governance of science and technology

Work package: 6

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Deliverable 6.3

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Analysis of research needs for a value-informed governance of science and technology:

1. Introduction

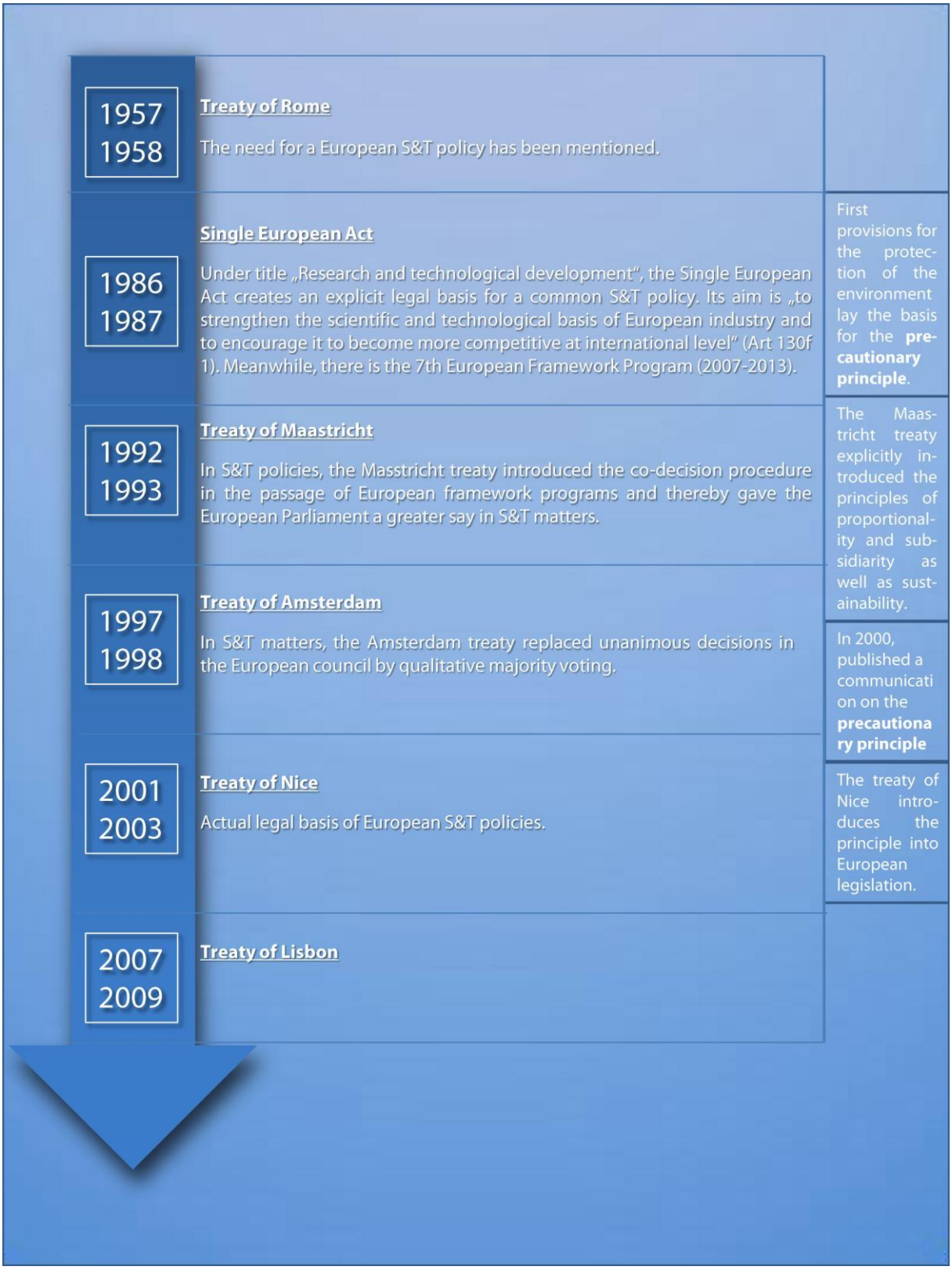
The project Value Isobars worked on the assumption that people's values matter for actions and judgments they make in their life and in society. In particular, the project assumes that values matter also in regard to their attitudes towards emerging technologies and towards ongoing scientific research. On this general basis, the project is reflecting what is asserted in many circles and what assumedly is also believed by many policy makers. Yet, problems seem to arise when this assumption is to be translated into S&T policy and the governance thereof. Experiences have been made, especially in regard to genetically modified foodstuff, that the publics in Europe not only react differently, but to some extent also very strongly in their opposition towards this technology. Several analysts claim to detect a gulf between the perceptions of S&T among the general public and the S&T as it is pursued by policy makers and by large parts of science and industry. Value conflicts have been diagnosed to be at the centre of this gulf.

The reaction to this perception has often been the admission that, indeed, one needs to take account of this public perception and the values behind it. Indeed, it is affirmed that this is precisely what the European Union is set to do:

Article 2 of the Treaty on European Union, consolidated by the Treaty of Lisbon, affirms that 'The Union is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights, including the rights of persons belonging to minorities.' Following up from this general declaration, Article 3 specifies EU's fundamental objectives: first, an area of freedom, security and justice in which the free movement of persons is matched with appropriate border controls (nº. 2); second, an internal market based on balanced economic growth, a competitive social market economy and a high level of protection and improvement of the quality of the environment. An additional objective of the internal market is to 'promote scientific and technological advance' (nº. 3).

There is indeed a history within the development of the European Union that clearly shows how values play into the core principles of its existence. The strong protection of its citizens in harmony with the scientific and technological development can serve as an example of this, highlighted in the salient status the Precautionary Principle has received in the EU.

See e.g. the following table:


1957
1958
Treaty of Rome
The need for a European S&T policy has been mentioned.
1986
1987
Single European Act
Under title „Research and technological development", the Single European Act creates an explicit legal basis for a common S&T policy. Its aim is „to strengthen the scientific and technological basis of European industry and to encourage it to become more competitive at international level" (Art 130f 1). Meanwhile, there is the 7th European Framework Program (2007-2013).
First provisions for the protection of the environment lay the basis for the precautionary principle.
1992
1993
Treaty of Maastricht
In S&T policies, the Masstricht treaty introduced the co-decision procedure in the passage of European framework programs and thereby gave the European Parliament a greater say in S&T matters.
The Maastricht treaty explicitly introduced the principles of proportionality and subsidiarity as well as sustainability.
1997
1998
Treaty of Amsterdam
In S&T matters, the Amsterdam treaty replaced unanimous decisions in the European council by qualitative majority voting.
In 2000, published a communication on the precautionary principle
2001
2003
Treaty of Nice
Actual legal basis of European S&T policies.
The treaty of Nice introduces the principle into European legislation.
2007
2009
Treaty of Lisbon

One answer to this challenge has been the explicit inclusion of ethics as an active criterion for the assessment of S&T projects and future developments. Norm-providing ethics is, however, often conceived of as a restrictive block and permanent trouble-maker. As ethics amongst other things is about analyzing and criticizing actions and institutions with regard to their moral rightness or goodness, its judgments can indeed restrict and limit the range of possible actions – but it can also open new perspectives and horizons. With regard to the specific understanding of ethics as an alleged 'troublemaker', the reference to values seems more promising. Against this background, it seemed very plausible that governance approaches refer to values rather than to 'ethics'. Values make actions possible; one can relate to them without feeling an urgent need to do or leave anything specific. They also take account of the value-pluralism that one sees in modern democracies and in Europe in general.

Another problem is that ethics is typically conceived of as a down-stream activity, i.e. it relates to more or less finished products and technologies, and thus seems to come in late in a technological development. It also raises the question whether or not expert assessments of ethics actually capture the framing in which the public perceives a given issue.

The Project Isobars project therefore assumes that value commitments are a better key to the S&T policy the EU is set to follow. The problem arises what follows from this in terms of concrete governance measures. The project has pursued this challenge through a variety of research strands, organized in different work-packages, and synthesized in WP6. Resulting policy recommendations were provided in Deliverable 6.4 (a & b).

However, while the project was reviewing and critically examining the existing scientific literature and knowledge basis for a value-informed governance, three general observations were also made:

(i) The existing knowledge base is very limited when it comes to studying the question how values and value-sets actually relate to attitudes on S&T issues. This holds true both for purely conceptual studies and for empirical studies.

(ii) The empirical data that do exist are in some sense under-used and assumedly not fully analyzed by more advanced analytical methods.

(iii) Any study exploring how people's values and value-sets inform attitudes towards S&T and how, conversely, beliefs about S&T inform their value-sets, needs to be performed in a genuinely inter-disciplinary manner, drawing on many disciplines from the social and humanistic sciences.

Together these three general observations indicate a clear knowledge gap which should be remedied by further targeted research. On this basis WP6 identified research needs which it directs to the EC so that existing knowledge gaps can eventually be filled, and the research can further enrich a value-informed governance of S&T in Europe.

On an even more general note, it should be noted that the recommendations here presented aim at our currently incomplete conception of the science-society relation. Indeed, research within the area generally depicted as Science-in-Society seems to a large extent limited to studies of the status-quo in perceptions and attitudes to S&T. What is lacking is the depiction of the relevant drivers that will result in future attitudes and perceptions. While this project has not been working on the dangerous assumption that research will be able to accurately

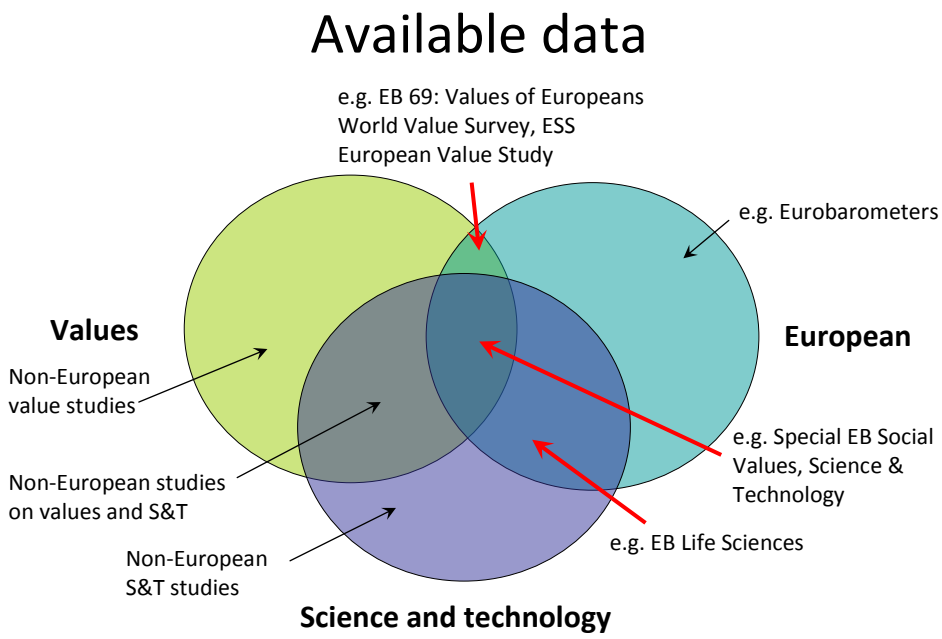
predict future societal trends and attitudes, it has embraced the assumption that significant trends can be unveiled and that some drivers exhibit more stability than others. Value isobars identifies values and value-sets as such basic and relatively stable drivers, and comes thus to the conclusion that better knowledge of these will be an important asset in the forming of an improved governance of S&T, and thus contribute to a better grasp of mechanisms of Science-in-Society. One of our concrete recommendations for a value-informed governance of S&T, the production of a Value Atlas, assumes that maximum use is made of the available knowledge of underlying values and value-sets in regard to S&T.

2. Recommendations on research needs

With this introduction we now want to introduce our recommendations concerning concrete research needs. The recommendations made are in part drawn from some of the partners' deliverables, and in part the result of group discussions.

(i) Limitations in the knowledge base:

Studies of the available literature (as performed in WP2) suggest that there is paucity of studies which cover the three relevant areas which would be of interest for a value-informed European governance of S&T:



(from deliverable 2.3 of WP2; project deliverable nr 26.)

It further emerges that the available studies are dominated by English speaking countries or publications in this language. In regard to a common European S&T policy / governance this indicates a clear gap in the scope of the studies. An immediate research recommendation is thus:

- Empirical research should be undertaken to better cover the interplay of values / value-sets with questions of S&T within the European countries, aiming at a better representation of the cultural and societal variety within Europe.

Furthermore, the limitations of the usual Eurobarometers has also been commented as a restricting factor since they often are a one-shot surveys. This implies that time-series data are not made available. However, it is precisely through the systematic collection of data over a time period that more reliable knowledge is made possible. The Special Eurobarometer on Europeans, Science and Technology & Special Eurobarometer on Social Values, Science and Technology, EB 63.1, of 2005 aimed at better knowledge on S&T attitudes and values, but the singularity of the studies restricted the information value of the data they gathered. Therefore, these Europe-wide surveys should be more focused on the relevant data for value-informed governance, and a questionnaire should be elaborated which would enter such an EB in regular intervals.

- Eurobarometers with relevance for the governance of S&T should be more focused, including targeted questioning of value-related issues, and repeated in regular time-intervals.

Interpreting quantitative data is never an easy task and they often reveal the need for a deeper understanding of the data. Qualitative research is normally a good supplement to these data, especially if performed in several countries. However, qualitative data (such as interview or focus group transcripts) traditionally are less accessible in the public domain. There are several reasons for the difficulty of sharing qualitative data, such as, for example, the fact that the interpretation of qualitative data demands for context knowledge and background information. Especially when it comes to research fielded in different countries and languages, problems abound. However, recent trends indicate increasing efforts to store qualitative data, making it accessible to the wider research community (see for example the Economic and Social Data Service). To date, however, there is no nameable qualitative data base on values in the context of science and technology as held by European citizens.

- Qualitative research on values in relation to S&T should be conducted on a wider scale within the European community.
- Research should be conducted aiming at establishing a European data base for qualitative data on values in relation to S&T.

However, the overall quality of the empirical studies has also been questioned when it comes to actually providing information on people's values and value-sets. Indeed, review of the existing literature indicates that there is no common conception of what a value is, how values can be detected, or how values interact among a value-set, or within a web of belief, or to what extent they are reflected in preferences, norms and actions. Empirical work within e.g. social psychology seems in this sense often detached from claims put forward within philosophy or theoretical sociology or political theory. Within the latter disciplines one has pursued the value discussions without much regard of the challenges connected to detecting and measuring values. It is thus reasonable to expect a better linkage between purely conceptual analyses of value matters with the challenges of empirically studying them. The Value Isobars project has done this to a certain extent, but at the same time the limitations of our limited research efforts in regard these challenges are clearly recognized. The effort should be strengthened by a broader research activity.

- Research should be conducted aiming at cross-fertilization between empirical research on values and conceptual, philosophical and normative research on this issue.

(ii) Improving methods and better analysis of existing data sets

WP2 has indicated some of the challenges in its final Deliverable. They summarized the challenges under three main questions and a further topic: What to ask? Who to ask? How to ask? Data analysis. Details are explained in their Deliverable. In summarizing what emerges for concrete research needs we repeat their findings here:

What to ask?

Major challenges

- There is no standard instrument to measure values in the context of science and technology
- In order to be useful for governance, values need to be addressed in combination with beliefs
- The issue of value conflict needs particular attention; thereby different levels of aggregation need to be taken into account (e.g., individual, social groups, regions, countries)

The first challenge relates to the lack of a standard measurement instrument to detect values in relation to S&T. The need is particularly to develop shorter scales of questions that could be useful in S&T surveys.

The second challenge relates to the observation that the proliferation of different constellations of social contexts necessitates the existence of hybrid and heterogeneous value systems. There is growing evidence that demonstrates that individuals as reflective agents are able to hold multiple identities and values. Hence, people mix and switch between them rather than being guided by universal canons. Instruments need to address values in combination with related beliefs. Only the combination of the subjective importance of a value and the judgment on whether the value is relevant to a particular context will give the full picture.

The third challenge relates to value diversity and conflict. Research needs to attempt to explain and interpret value diversity, ambiguity and complexity that is relevant to policy making. For doing so, data is necessary that can be aggregated and broken down in different ways. Individual-level data that is collected in a number of nation states provides the most flexible data.

- Research should be conducted to develop a practical standard for the measurement of values in relation to S&T. Such an instrument should account for the inter-relation between values and beliefs. The research should aim at explaining value diversity, ambiguity and complexity in the cultural landscape of Europe.

Whom to ask?

Major challenges:

- Research agendas should reflect the diversity of needs and problems within and across societies.
- Qualitative research needs to complement survey research. While the former is better suited to capture the range of value-related concerns, the latter allows estimating the degree to which such concerns are shared or contested.

Within several studies of science and society it emerges that there is no easy or unique answer to the question who is the public. The public is fragmented into several groups and sub-groups, and some of them are active in relation to S&T issues, while others are not. While qualitative research will be more suitable to address the question on what is the range of value concerns within a society (phenomenon representativeness), survey research will be more apt to address the question to what degree such concerns are shared within and across countries (population representativeness).

Governance needs to understand how different social groups use and share values to resolve and frame conflicts as they relate to different technologies. Qualitative methods can help understand how individuals and groups navigate through value dilemmas and the resources they draw on to resolve these in relation to a particular technology.

The strength of surveys is to provide insights on the degree to which concerns are shared within and across countries and other social units; the representativeness of results certainly is of great importance to decision-makers. However, value surveys could be improved by taking the following aspects into account. Individuals' value concerns tend to vary depending on the life domain to which they pertain; identities, social roles and values are closely intertwined. Technologies represent different risks and possibilities for different social groups. We thus see the need for surveys to unearth the differences in value sets between individuals acting as various types of stakeholders (e.g. farmers, activists, NGO members, scientific community etc.) or those not affiliated with an organized stakeholder group.

- Research needs to utilize the full range of methods from quantitative to qualitative research and provide a more detailed picture of how individuals in different roles as stakeholders and citizens utilize various value sets and address S&T issues out of different value perspectives that characterize segments of and functions in society.

How to ask?

Major challenges:

- Values are truistic by nature, which makes rating scales prone to framing effects
- Forced choice or ranking formats activate 'upon reflection' judgments
- Vignettes and scenarios can be used for stimulating deliberation on values
- Piloting of value questions and formats is crucial

One of the problems transgressing several existing studies is the so-called values-as-truism issue, i.e. the tendency to rate most values as very important. There are, however, methods to force respondents to more informative answers, e.g. split ballots or ranking, or the use of

scenarios and vignettes. It is often of crucial importance that piloting is done before the format of a survey is decided. Many of these methods are well-known, but in relation to research on values their use should be intensified and further improved.

- Research should be conducted how in practice to avoid the values-as-truism problem by more advanced methods.

Better data analysis.

Major challenges:
- Often more time and money is spent on data collection than on data analysis
- Existing data could be better exploited
- Data analysis should go beyond single-item interpretations
- There are powerful statistical methods that can help improve measurement quality, the reconstruction of latent values, and the identification of natural groupings
- There is a need for synthesis and integration of results by means of reviews and meta analyses

Publicly accessible data sets such as the Eurobarometer surveys, the European Social Survey or the World Values Survey are rarely used in publications on values in science and technology contexts. In-depth exploration of such sets of data constitutes a clear opportunity. Open access to this type of data also creates the possibility for multiple analyses thus entailing the chance for fruitful scientific discussion. The problem with these data sets is that they rarely address both values and science and technology issues in detail. The challenge hence is finding creative ways of linking datasets in order to explore values not as abstracted from their context but as they relate to beliefs about technologies. There are a number of advanced statistical methods for secondary data analysis available that could be used to extract useful information from existing data and from linking several studies.

- Research should be conducted to utilize sophisticated statistical methods, reviews and meta-analysis in order to improve measurement quality, identification of latent values and identification of natural groupings for publicly accessible data sets in relation to values and matters of S&T.

One should also add a further point here. Participative exercises come in various forms and are often conducted in combination with ongoing research in specific scientific or technological fields. Often they are a part of technology assessment, in rare cases they are a part of an ethical assessment. Some are directed towards stakeholders, while others are directed towards laypeople / citizens. There is an impressive toolbox available how to conduct participatory exercises of this kind. Yet, as our project also has shown there is a paucity of tools that would especially elicit values in relation to S&T. Partner 4 (Vienna) has developed such a method, but obviously further testing is needed. In general one sees a lack of evaluation of these exercises and also comparisons across countries, where possible. Social scientists tend to argue that involvement of stakeholders and the public is advisable, but little research is done how this actually spells out in detail. Stakeholder-fatigue is just one of the problems one often faces. We see a research need in regard these questions:

- Research should be conducted to evaluate the short-term and long-term value of participatory exercises of various forms, and in particular to identify to what degree

these exercises can elicit deeper values or value-sets of people that guide them in their perceptions of S&T.

(iii) Advancing inter-disciplinarity in the study of values in relation to S&T

As has been noted above, the study of values in relation to S&T suffers not only from lack of good data, but also from cross-fertilization between different disciplines from social sciences and the humanities. However, the scope of this problem seems to go even further.

One of the crucial instruments of good governance of S&T is the advancement of so-called integrated studies, i.e. studies that combine scientific and technological research with the addition of social science or philosophical / ethical research. Often this conducted as so-called ELSI research. The principal advantage of such an instrument is that issues of social acceptability and integration are moved up-stream so that adjustments in the design of technology and conduct of the research can be made early. This is at least the carrying idea. The practice is often that the social science or philosophical / ethical research does not reach beyond being a mere addendum to the research, carried out in parallel without much interaction with the scientific or technological research. The reason for that is often the way the research is organized in separate work-packages or how the project is managed in general.

Yet, there are apparently examples of research projects which function better in this regard than others, and the reasons for that are often found in the organization and management of the project. The problem is that this aspect of the research is not itself made an object of research. In other words, what we detect here is a lack of monitoring, evaluation and reflexivity in regard the achieved integration of different research strands. In particular in relation to the question how sensitive research projects are to societal values and value-sets it is of importance to improve the practice of these integrated projects since they, at least in principle, hold the promise of bringing values directly to scientific and technological development. Demands on inter-disciplinarity may seem high, but not insurmountable. Therefore what we detect here as a research need is a study that could identify best-practice models among integrated projects to serve as templates for new projects.

- Research should be conducted reviewing previous integrated research projects in different fields and evaluate the amount of integration of social science, philosophy or ethical components in the scientific and technological work. The research should result in best-practice models for further design of integrated projects.

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In the following we shall include a note brought forward by partner 3 (Tübingen) on further particular research notes. We shall not edit this note or try to integrate it into our format above, since we believe it thereby would lose important elements of presentation. One will therefore find some overlap with what is already said above.

(iv)Bringing different value traditions into deliberation

Contemporary philosophical value considerations acknowledge that different values and value systems are in use in European countries, and that they do not fit undisputedly into one

overarching philosophical theory or system. The condition of value pluralism means that value discourses are fragmented in different value traditions. For instance, in utilitarian value traditions values are seen as measurable entities that can be set off against each other. In contrast, deontological value traditions hold that general values, respectively bearers of values are incommensurable. Hence, in certain contexts not only values are conflicting but also different value traditions. One of the most important questions at stake is how these traditions can be brought into a productive deliberation, both on the philosophical and the governance level.

Action:

- Philosophical research has to focus on developing tools for addressing value conflicts as well as conflicting value traditions in a way that the form of their treatment and possible results that can be accepted by different value traditions.

(v) Reflexivity on implicit economic value judgements in European S&T governance

In the most important European documents (e.g. the Treaty on European Union) respect for human dignity, freedom, democracy, equality etc. are stated as core values of the European Union. At the same time, the European Union is determined to economic progress, which is more often than not regarded as a value itself. Unavoidably, European governance is exposed to tensions between attending non-economic values and pursuing economic goals. Especially, governance of science and technology (S&T) is ostensibly justified by value orientation although economic factors are dominant.

Action:

- Implicit and explicit value judgements in European S&T governance should be made transparent whereby main driving forces of political decisions would become accessible for an open dialogue.

(vi)Relations between values and ethical rules/norms in S&T

In the project, we have elaborated on the different (actual or alleged) views in science and technology on 'values' as domain of positive expressions and productive power on the one hand and 'ethics' as a set of prohibiting and framing rules providing somewhat negative implications. This "Tübingen hypothesis" on values versus ethics shall be explored further: Will and should ethics be replaced by value deliberations? Could that work in a context of governance of science and technology? What would come as the price of getting rid of 'ethics' in that sense?

Action:

- Philosophical and science studies research should focus on the hypothesis that values are conceived of differently than ethics in the sense of a norms/rule system and what implications of the replacement of ethics by value discourse would be.

(vii) Translation of values into governance

In moral philosophy, it is still challenging to translate (partially conflicting) values into norms. The situation is even more complex in governance, where contextual factors (e.g. established power structures) also have to be considered. Therefore, a deeper understanding is to be sought how to amend a variety of existing institutions and procedures in order to allow for value dialogue and the translation into governance norms (be they moral, juridical, political). This is especially true in areas with great uncertainties and diverging values.

Action:

- Research has to focus on the working of different political systems on a local, regional, national and global level and on how they can be amended by mechanisms that allow for better value-informed governance.

(viii) Finding policy instruments for value dialogue

S&T governance takes place on different political levels ranging from universities to supranational bodies such as the European Union. Actors involved in policy making and institutions differ respectively. In order to reach value-based governance, different policy tools are needed to address conflicting values on a diverse set of different governance surroundings.

Action:

- Social science and ethics research should develop together new policy tools that explicitly focus on dealing with value conflicts and test them in different political settings. Research can built on exiting literature on participation and elaborate specific policy tools for value dialogue on different political levels.

(ix)Studying best practice examples of value dialogue

Value conflicts are solved everyday in different social contexts. Decision makers together with stakeholders and scientists have found creative and sustainable solutions to problems where values are disputed and uncertainties are high. However, value weighing and balancing remain very often a black box in these policy processes. Studying these best practice examples can provide insight in successful mechanisms that can be generalised from single cases and employed as governance to deal with value conflicts.

Action:

- A systematic study of specific best practice examples on a local, regional and national level with regard to how they solved value conflicts should be undertaken. It can draw on a wide range of literature e.g. from new institutional economics. Research would focus on the way value conflicts are dealt with and make these mechanisms explicit.

3 Conclusion

The project Value Isobars has studied several aspects that were deemed to be important for a value-informed governance of S&T. On the basis of these studies recommendations for improved governance were forwarded in Deliverable 6.4a. Yet, it became also clear that good governance which could draw on reliable information about values and value-sets among European people would need better and more focused research. We have therefore made an effort to present our ideas of the directions such research should or could take. It is obvious that our recommendations cannot be fully comprehensive, nor can they reach the level of very specific research projects. Our recommendations aim at identifying problem areas that need to be addressed by further research for values to function more explicitly in S&T governance. Our recommendations presented here are a précis of more extensive discussions in several of our WPs. Thus they should be understood on the background of the various deliverables that emerged from these WPs. We do hope, however, that the presentation of the perceived research needs in this form serves a useful function, and we offer our services if further questions should emerge.

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