

RESEARCH PROGRAM SCIENCE FOR A SUSTAINABLE DEVELOPMENT (SSD)

CONSENTSUS PROJECT

***INVESTIGATING FUNCTIONS AND
UTILIZATION OF SCENARIOS***

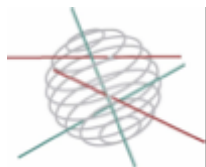
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This document is a working paper elaborated for the Consensus project ('Construction of scenarios and exploration of transition pathways for sustainable consumption patterns') in the context of the work package 3 ('Investigating scenario demand and utilization').
Any comments are welcome and can be sent to Emilie J. K. MUTOMBO (ejempaka@ulb.ac.be).

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INTRODUCTION

OBJECTIVES OF WORK PACKAGE 3

Work package 2 “*Analysis and interpretation of existing scenarios*” (see GOEMINNE and MUTOMBO, 2007) has highlighted how scenario construction exercises intervene in areas with multiple levels of uncertainties and complexities. We concluded that even ‘*successful*’ scenario exercises cannot eliminate such uncertainties and complexities, but that they can help specific user groups to develop some order and coherence in their perceptions of the many possible future pathways. In the present working paper, we elaborate further on the characteristics, which determine a particular aspect of the ‘*successfulness*’ of scenarios, i.e. the impact of scenario exercises.

While scenario exercises are occasionally analyzed for their ‘technical’ robustness and even for their procedural strength, there are only few analyses available which integrate the question of adequacy and applicability of the exercises’ outcomes and processes for policy- and decision-making. The generic objective of WP3 is to investigate the influence of scenario exercises on policy and practices and to gain better understanding of the factors that influence the success and failure of scenario exercises.

Subsequently the results of WP3 have and will participate to configure more consciously the transition process of the present project (WP4, i.e. scenario construction and, partially, WP5 and 6, i.e. transition pathways in system innovation). On the other hand, the present work package will also use the other tasks of the project as a case study which will allow to experiment during the scenario-construction exercise with the identified parameters of success.

Eventually, WP3 will be followed-up by WP7 developing further the governance track in the Consensus project. WP7 is meant to use and structure feedback gathered during the project in order to learn from the present experience, discuss and envisage the way transitions and system innovations could be steered and will submit recommendations and conclusions to policy actors with regard to an implementation in the Belgian context.

The general objective of this paper, within the Consensus research project as well as from a broader scientific perspective, is to contribute to the reflection on long term governance in the context of sustainable development. Through WP3, we focalise our attention on an emerging category of policy instruments (Lascoumes, Le galès, 2004), among which scenario exercises. In this perspective, we want to inform on the usability for SD-policy of this new category of instruments which could become an integral part of the policy-process itself (Bauler, 2007).

METHODOLOGY AND WORKFLOW OF WORK PACKAGE 3

Largely referring to the project proposal, we briefly present the different stages of work package 3.

Task 3.1 Exploration of existing studies on the use and impact of scenario exercises, and typology of encountered factors of success (and failure)

Logically, we started to review the literature in the scenario domain in order to explore existing analyses on the use and impact of scenario exercises, including literature on factors of success (and

failure). As acknowledged in the research proposal, our review confirms that specific literature on the assessment of scenario impact and use is not abundant, and empirical studies quasi inexistent. Despite the current prevalence of scenario exercises, the systematic analysis of scenarios in terms of their objectives and their impacts (on policy) is clearly in its beginning stages.

Most of the analytical stances - and some of the methodology - needed thus to be constructed specifically for the present project, on the basis of adjacent literature (for instance in the field of evaluation use, information impact, etc) and existing expertise and experiences. We complemented thus a first structure of our analytical framework on the basis of two information channels.

On the one hand, a first range of straightforward questions concerning the uses and users of scenarios were highlighted, and submitted¹ to a series of scenario specialists: Al Hammond (*Innovation & Special Projects at the World Resources Institute*), Rob Swart (*European Topic Centre for Air and Climate Change of the European Environment Agency*), William Cosgrove (*World Water Council*), John Robinson (*Sustainable Development Research Initiative at the Institute of Resources, Environment and Sustainability*), and some other authors of articles around scenario functions: Russel F. Korte (*School of Human Resource Development and Technology - University of Texas at Tyler, USA*), Thomas J. Chermack (*Department of Learning and Performance Systems at the Pennsylvania State University, USA*), Clare Harries (*Centre for Decision research, Leeds University Business School, UK*) On the other hand, we expanded our literature review into the study of adjacent information-generating policy processes and their use/effects; e.g. we explored the existing literature on evaluation use, the use and effect of policy instruments in general as well as in particular (e.g. indicators, impact assessments, modeling processes, etc).

As a result we have developed a theoretical framework which synthesises and structures some of the current knowledge on scenarios, and which describes and puts into context the functions and effects of scenario exercises in policy-making situations. In the first place, the framework highlights the main building blocks which define the nature of scenario exercises - in terms of their process and their product – which in their turn influence two levels of outcomes; i.e. outcomes in terms of ‘*adapting mental models*’ or in terms of ‘*facilitating planning and strategizing*’ (as illustrated in figure 1).

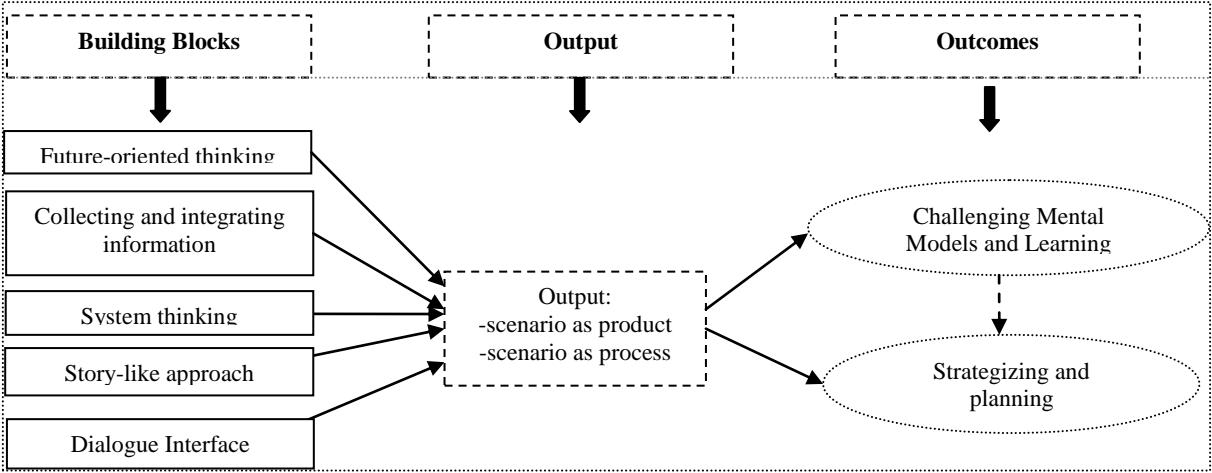


Figure 1: Deconstructing the influence chain of scenario exercises

¹ The dialogue with these experts was conducted either through email exchanges, or prolonged telephone interview.

In order to refine, test and populate the framework at the light of existing experiences, we (ULB-IGEAT and UG-CDO²) conducted ten semi-structured face-to-face interviews with Belgian French- and Dutch-speaking experts, stakeholders and initiators involved in the main Belgian scenario exercises of the last years (See Annex 2: lists of the interviewed experts). We used these interviews also to gain some insights with respect to the two following tasks of the working package: the current demand for scenario exercises (Task 3.2) and the assessment of existing scenario exercises (Task 3.3).

Task 3.2 Identification and characterization of the current demand for scenario construction exercises

We based ourselves thus on these interviews (see task 3.1) to sketch a more precise picture of the landscape of Futures Studies in Belgium, and to gain a better understanding on the existing situation in Belgium in terms of long-term planning and scenario construction exercises. This appreciation of the Belgian context will be more specifically explored with regard to the expectations (i.e. the demand for scenario exercises) of SD actors (policy actors, stakeholders, etc.) during the final stages of phase 1 of the project. We will explore this ‘scenario demand’ with regard to scenarios in general, as well as w/r to initiatives linked to transition management and system innovation.

Task 3.3 Assessment of existing scenario exercises

The conducted interviews (see task 3.1) provided also elements which permit to assess existing scenario exercises. The questionnaire (see Annex 3) has been elaborated on the basis of the conceptual framework (task 3.1) not only in order to refine the framework itself, but mainly to collect information on elements influencing the success and failure of scenario exercises.

Initially the objective was to concentrate on some precisely identified scenario-initiatives and to assess with their developers, participants and users the outcomes and impacts of scenario exercises. However, it occurred that only few scenario-initiatives had been looked upon consciously and critically by initiators, developers or even participants for their impacts on policy situations. Instead of assessing in depth a few scenario exercises (as proposed in the research proposal), it was decided to focus on experts, academics and policy-makers, who had some recurrent and broad scenario development experiences. For Belgium, the most important scenario exercises were selected and a series of experts were identified that were recurrently involved in them. A selection of these experts has been interviewed (Peter De Smedt; Philippe Destatte; Florence Hennart; Frederic Heselmans; Moritz Lennert; Erik Mathijs; Bernadette Merenne-Schoumaker; Michael Van Lieshout; Eva Verstraete; Donaat Cosaert, Stef Steyaert³ - see Annexes 1 and 2: list of interviewed experts and the list of referenced scenarios (and prospective) exercises).

² The Dutch speaking interviews have been prepared and performed by Maarten Crivits (UG-CDO).

³ Besides, we had the opportunity to organize a meeting with Alain Wouters, Managing Director of *Whole Systems* and internationally experienced scenario facilitator. We also discussed these issues with Nadine Gouzée and members of the SD Task Force of the Planning Bureau during a meeting addressed to several research teams in order to diffuse insights drawn from the elaboration of the scenarios of the Fourth Federal Report for SD.

Task 3.4. Providing feedback to improve the robustness and potential use of scenarios of the present project.

The operational objective of WP3 is to use the gained knowledge in order to anticipate difficulties and shortcomings which could occur during the present scenario construction exercise in WP4 and WP5. The conclusion of the present paper provides thus insights for the elaboration of the procedural setting of the scenario- and transition pathway constructions (WP4 and WP5).

PRODUCTS FROM WORK PACKAGE 3

So far, the elaboration of this paper, from research to redaction, has already generated concrete products. The analyses conducted within WP3 have been partly presented in academic conferences. These presentations and the content of the present paper will provide the necessary material to produce at least one paper which will be submitted to an international peer-reviewed journal.

The following presentations were conducted on the basis of WP3:

Bauler, T., Mutombo, E., Wallenborn, G., (2007), *Long Term Strategizing for Sustainable Development: Discussing the difficult linkage between prospective and planning endeavours*. Paper presented at the European Society for Ecological Economics Conference 2007 'Integrating Natural and Social Sciences for Sustainability', 5-8th June 2007, UFZ - Centre for Environmental Research in Leipzig, Germany.

Bauler, T., Mutombo, E., Wallenborn, G. (2008), *The Impact of Long-Term Scenario Exercises on Sustainable Development Policy-Making*. Paper presented at the Conference on the Human Dimensions of Global Environmental Change, 'Long-term Policies: Governing Social-Ecological Change', Berlin, 22-23 February 2008.

Bauler, T., Bonifazi, A., Mutombo, E. (2008), *Sustainability Evaluations in the Context of Long-Term Strategizing. Crossing Insights from Urban Development and Transition Management*. Paper presented at the EASY-ECO Vienna conference 'Governance by Evaluation : Institutional Capacities and Learning for SD', 11-14 March 2008, Vienna.

STRUCTURE OF THE WORKING PAPER

The present paper is divided in two parts. Part I presents the developed theoretical framework. We first highlight what we identified as the main building blocks (A) of a scenario exercise and their interactions. We then develop on potential outcomes of scenario exercises (B). We conclude this part with insights on the place and influence of scenario exercises in the policy context (C).

Part II presents a range of factors of success and failure of scenario initiatives, as well as some intermediary conclusions.

I. THEORETICAL FRAMEWORK

Based on our literature review, we draw a theoretical framework of the functioning of scenario exercises. Subsequently, we develop in two sections, first (A), what we have labeled, *scenario building blocks*, i.e. the principal generic characteristics that define the modes of thinking to which a particular scenario exercise refers itself to. Second (B), we elaborate on the *scenario outcomes*, i.e. the way scenario exercises can be *used* in policy-making.

Finally (C), this theoretical framework will contribute to draw conclusions on the influence of scenario exercises.

INTRODUCTION

Investigating the subject of impacts and uses of scenario exercises in policy-making, and their influence on policy and practices, means to take into account insights from the research field of information- and evaluation use. Generically, literature acknowledges that information can be used "(a) instrumentally, to give direction to policy and practice; (b) politically or symbolically, to justify preexisting preferences and actions, and (c) conceptually, to provide new generalizations, ideas, or concepts that are useful for making sense of the policy scene" (Weiss et al, 2005, p.13).

Instrumental use occurs when there is a direct link or linear relationships between the result of a study (or a group of related studies) and decision outcomes and where the informational content is used as the basis for decision-making (Weiss et al, 2005, pp.13-14; Hezri, 2006, pp.134-137). This is what has traditionally been expected. However, it has been acknowledged that "*pure instrumental use is not common. Most studies are not used as the direct basis for decisions. [And] expectations for immediate and direct influence on policy and program are often frustrated*" (Weiss et al, 2005, p.13).

Political (or symbolic or tactical) use provides legitimation (Weiss, 2005, p.13). It occurs when the content of a study is "*used to justify what decision makers want to do anyway*", when it is "*used as a sign or symbol of some other reality*" (Hezri, 2006, pp.134-137). This type of use is often negatively connoted. There is however no harm in using evidence to strengthen one's position. There is *misuse* of information if the decision maker distorts the results (Weiss, 2005, p.14).

Conceptual use (or use for enlightenment) occurs when a research or study influences a user's understanding of a problem or situation, even if the information is not used to base decisions in a direct way (Hezri, 2006, pp.134-137), or in other words: "*decision-makers might not base their next decision on the evidence, but they often found themselves influenced in more subtle ways in the longer term*" (Weiss, 2005, p.14).

We do argue that this generic typology of 'information influence' can be applied to scenario exercises, because at their basis scenarios encompass the construction of information and generate a wider knowledge base, as we will develop in the next section. However, we argue also that scenario exercises do more than providing 'information'.

In effect, the provision of information is only one aspect of a scenario exercise. The nature of scenarios is multiple: scenarios, more or less explicitly, encompass norms and values, beliefs and emotions and hence cannot be limited to ‘informational instruments’. Scenarios in fact gather the characteristics of different types of tools, approaches, processes (informational tool, participative approach, etc), which makes difficult to classify them. The next section tries to shed some light on these questions.

A. SCENARIO BUILDING BLOCKS

We could have based our analysis on the why-typology highlighted in WP2 and pointing at three different modes of future-thinking (see below point a.). However, these three modes are quite theoretical and as explained in WP2, most scenario exercises are hybrids and do gather characteristics of the different types. To understand scenario exercises impacts and influence we needed to understand how scenarios exercises function. We thus looked for characteristics that are recurrently and more or less systematically referred to in scenario literature and highlighted what we called the scenario ‘building blocks’ which are fundamental elements as such (A1) as well as through their interactions (A.2).

A.1 THE "SCENARIO BUILDING BLOCKS"

Indeed, the scenario literature is quite generous in presentation of methodologies, approaches and tools, generic or ad hoc, but does not seem to highlight clearly the main elements that constitute the core of a scenario exercise. Beyond the chosen methods, tools and processes that configure the mechanics of scenario exercises, we pose that scenario exercises rely on a few central *building blocks*, which define the generic characteristics of a given scenario exercise. Basing on the existing literature, and synthesizing it in an original way, five distinct characteristics are identified: *Future-oriented thinking*
Collecting and integrating information; System thinking; Story-like approach and Dialogue interface. The focus on one or the other of these characteristics is not the same according to the encountered exercises, but these characteristics encompass the variety of realities of the scenario field.

a. FUTURE-ORIENTED THINKING

One of the principal characteristics of scenarios is obviously that they concern the Future. Scenarios can "*generate and integrate knowledge about complex future states*" (Wiek, 2006, p.751) or "*are a means to explore the future and identify what might possibly happen*" (Bood and Postma, 1997, p.635). Even if in most cases these statements are properly contextualized and explained, they remain ambiguous. As the future is unknowable by definition, scenarios are not about generating 'Truth' about it, neither about identifying the ‘Possible’; at best, scenarios explore a small part – and help to define the limits - of the ‘possibility space’ ("*champ des possibles*", Godet, 2007, p.42). As repeatedly stated in the Futures Studies literature, scenarios are not predictions. In fact, they are often acknowledged (for a discussion, see Goeminne and Mutombo, 2007) to tell us much more about the present than the

future, as they focus attention on existing causal processes, patterns of change, uncertainties, seeds of change and decision-points.

As identified in WP2 (Goeminne and Mutombo, 2007, p.3), *futures thinking* can be classified in three modes of thinking about the future. The *predictive* posture, by thinking about what will happen, is a way to identify current main trends and driving forces as well as urgent challenges. The *explorative* mode of thinking is characterised by an open-minded point of view on the possible future events and developments. The strategic purpose is to be better prepared to handle emerging situations with the idea that it is impossible to predict what will actually happen. The *normative* mode of thinking starts from a specific and value driven vision of how society should be, or, which specific goal one wants to reach, and which paths are leading to this vision. These future-oriented modes of thinking create a space of creativity and reflexivity. When we are talking about possible futures, there is no right or wrong point of view and people are freer to expose a divergent point of view. It is the new light brought on the present informed by new perspectives sustained with an open-minded process that contributes to an improved preparation to react to new events or attempt to shape them.

b. COLLECTING AND INTEGRATION OF INFORMATION

The objective of simulating possible future evolutions of a geopolitical entity, a private organization or an ecosystem implies the necessity to gather a considerable amount of information and parameters and to integrate them in order to construct a more or less precise picture of the studied system.

Beyond traditional forecasts (based for instance on trend projections of quantitative data) on the one hand, and descriptive accounts of qualitative elements through narratives on the other hand, the integration of quantitative and qualitative data has been emphasized as being determinant in scenario exercises (Swart et al, 2004, p.141). Notably, this emphasis is made to permit to consider in a "*unified framework, bio-physical, economic as well as social features and cultural, institutional and value aspects*" (Raskin et al, 2004, p.60). Through and beyond this requirement, scenarios have been interpreted as a way to articulate information and knowledge from different scientific disciplines. Furthermore, as illustrated in projects such as the *European Environmental Outlook (EEO)* or the *Millennium Ecosystem Assessment (MEA)*, the construction of scenarios is drawing on the collaboration of different types of experts, who are articulated to bring together their knowledge about ecosystems (in these examples) and society in order to better understand the interactions that shape these socio-ecosystems. According to Swart (et al, 2004, p.141) "*so doing, scenarios also help to organize scientific insight into an integrated framework*".

However, the integration of quantitative and qualitative elements has proven a real challenge (see among others, Parson et al, 2007, p3). So far, a number of scenario projects tried to operationalize such an integration, mainly through the parallel or serial mobilization of both modeling techniques and narrative approaches. But the integration of the respective outputs has proven a considerable challenge notably in terms of consistency, e.g. in the IPCC and MEA scenarios (Parson et al, 2007, p3). Simultaneously, the translation of qualitative sequences of events into quantitative inputs for the models (and, to a lesser extent, of the translation of quantitative outputs of models into qualitative narratives) has proven a difficult methodological step. Among other lessons, the encountered difficulties amplify or highlight a pre-existing bias, which is notably to be linked to the high influence of the implicit normative choices occurring both during the modeling phase and the 'translation' phase. One illustration of these difficulties is, for example, the problematic of comparing or translating qualitative scales into quantitative scales. Another examples include the choice of criteria to be used

for the selection of the quantifiable parameter(s) that will stand for the monitored phenomenon. These operations imply to run implicit (or even unconscious) normative choices.

Second, the difficulties encountered during the integration of quantitative and qualitative aspects can be related to the more general discourse on the necessity of 'integration', which is, among others, linked to environmental management and sustainability perspectives (Scrase and Sheate, 2002). Indeed, the idea to construct a faithful representation of reality implies an objective of integration; integration of data, of different scientific expertise, of the different aspects of a problematic (social, biological, psychological, economical, etc). The term 'integration' itself is positively connoted to the idea of completeness, impartiality, and the reduction of the potential for conflicts (Scrase and Sheate, 2002, pp.276-277).

On another level, the call for integration can be linked to the perspective - rooted in the rationalistic paradigm - that more and better information leads to better decisions and policy making (Scrase and Sheate, 2002, p.275). Nevertheless, such deterministic views can potentially lead to situations where "*questions of an essentially political nature are removed from the realm of democratically accountable decision-making and presented as reconcilable by technical and rational methodologies or procedures*" (Scrase and Sheate, 2002, p.287). It has been highlighted that the link between information, knowledge and decisions is far from straightforward (Bauler, 2007, p.69) and that more information does not generally help "*disputants parties converge around a single, scientifically obvious policy choice, and commonly has the opposite effect*" (Herrick and Sarewitz, 2000, p.319).

c. SYSTEM THINKING

As presented in WP2 (Goeminne and Mutombo, 2007, pp.1-2), historically scenario techniques emerged after WWII in an atmosphere of rising uncertainty and complexity (scientifically, politically and economically). Administrations around the world wanted to simulate the future environments in which decisions will have to be taken. Based on systems analysis, and parallel to the development of computer modeling, scenario exercises emerged in order "*to create holistic, integrated images of how the future might evolve*" (Mietzner and Reger, 2005, p.224). Scenarios are based on a reflection around multidirectional causes and effect chains. They are meant to allow an integrated overview of the studied system, highlighting the relevant variables and trends and the interrelations between different elements, actors, sector, scales, etc., which are traditionally studied in separate fields (economics, environmental sciences, social sciences, politics, ...). Opposed to the reductionist and scientific tendency to fragment reality into (presumed) non-related study topics, a systemic approach tries to identify the interactions between the different sub-systems. A systemic approach does not necessarily imply to work on a global level: it can be applied to transversal issues (such as climate change in the IPCC scenarios) or to more sectoral themes (like water, in the World Water Vision) at any geographic scale.

A weakness of such an integrated and systemic posture is the risk to loose grip to the amount of information - *a fortiori* when working at the global or transversal level - and to end up with a superficial result in terms of insight and analysis. It could also be that our current knowledge about systemic linkages remains rather poor (Rotmans, 1999, p.5), be it in the natural or human sciences.

To a certain extent, the systemic approach can also develop into an answer to the call for integration. Systemic approaches can be designed as a tool to go a step further in the integration of information and in the understanding of the complex interrelations within and between (sub-)systems (MEA, 2005, p.39). Typically used in ecology and ecosystem studies, the systems approach has been extended to the analyses of the impacts of multiple anthropogenic stressors on the environment, and

further of the interrelations between the social and ecological systems. It contributes to further structure and integrate available information and to identify the variables, the functionings and the patterns of change of the studied systems, which eventually also contributes to clarify where uncertainties and decision points are situated.

d. STORY-LIKE APPROACH

The outputs of such a systemic approach (i.e. the interrelations between elements of a studied system) can be pictured through, e.g., a flowchart made of points, lines, and arrows; but they can also be rendered through a narrative. In some scenarios, like the IPCC ones⁴, this narrative part is limited to an explanatory text which is mainly a factual description (usually of the quantitative outputs of the model runs).

Other approaches develop however a full narrative. The classical elements of a narrative are the tension(s) (the driving forces of the story), the actors (and factors) which play a role, the sequence of events and, last but not least, the message (Rasmussen, 2005, pp.231-232). Indeed, stories and narratives in general aim at communicating (about) "*values, visions, strategies, rules and may create a 'we' feeling*" (Rasmussen, 2005, p.233;235); sometimes objectives go beyond persuasion and touch upon the manipulation of the reader.

As most narratives, scenarios can be used to communicate a specific message, and be 'sense making', i.e. "*the narrative scheme serves as a lens through which the apparently independent and disconnected elements of existence are seen as related parts of a whole*" (Barry and Elmes, 1997, p.431).

The story-like character of scenarios is presented as an important element of the scenario approach, as it is "*a more natural way of making judgments and decisions*" (Korte and Chermack, 2007, p.807); a way people are familiar with and which helps highlighting relations between events, actions and consequences. Framing the future through narratives allows, for instance, to better spot incongruence in a chain of reasoning (Harries, 2003, p.807), and thus facilitate the understanding of the studied system. For quantitatively-oriented scenario exercises, it is also a way to better incorporate qualitative knowledge (Pulver, VanDeveer, 2007, p.2): "*The scenario narrative gives voice to important qualitative factors shaping development such as values, behaviors, and institutions, providing a broader perspective than is possible from mathematical modeling alone*" (MEA, 2005, p.40). Beyond these aspects related to the construction of scenarios, the story-like character of a scenario exercise allows to relate the exercise to myths and tails (Mermet, 2003, p.34), which call upon unconscious mechanisms and emotional reactions, often playing on fears, despair and hope.

Scenario stories can thus be seen as "*a 'bridge' between the analytically oriented planning and the creatively oriented vision making activities due to their ability to transmit both rational and creative layers of thoughts and beliefs*" (Rasmussen, 2005, p.230). Scenario exercises, by building coherent and plausible narratives and stories of the futures, are presented, on the one hand, to facilitate understanding, and on the other, to render emotions, both of which combined to influence representations and behaviors.

However, striving towards the elaboration of a compelling scenario narrative requires mastering the balance between identification and fascination, logic and emotion, and to have a clear idea of the

⁴ See for example, IPCC, *Summary for policy makers. Emission Scenarios. Special Report of IPCC working group III*, IPCC, 2000.

objective of the scenario exercise in itself, as well as of the needs of the users. Simultaneously, the effective potential of influence of a scenario is difficult to assess in terms of impacts as it would require tracing and monitoring the links between the reading of a scenario narrative and the change in understanding or behavior. Third, special attention should be attached to the ethical question concerning the carried message and the means used to diffuse it: no narrative is ideologically neutral and the objectives of the author should be clearly presented.

e. DIALOGUE INTERFACE

Scenarios can in general terms also be seen as communication tools. Being articulated narratives (in our understanding), scenarios carry information and can “*ease communication with non-scientific audiences*” (Swart, 2004, p.141).

Beyond the mere informational source-receptor mechanism, scenario exercises can also be understood as *interfaces*, among others between disciplines as seen above, but also between science and policy (van den Hove, 2007), leading to frameworks such as post-normal science focusing on “*uncertainty, value loading and a plurality of legitimate perspectives*” (Funtowicz and Ravetz 2003, p.1).

This plurality of perspectives that should be taken into account is not limited to the interlinkages of science and policy. Scenarios ease not only communication from science towards other groups, but, beyond the mere monologue of science, a dialogue seems necessary, acknowledging that science can also be informed by the experience of non-scientists. As well can scenario exercises create dialogue spaces between science and society, society and policy and/or among stakeholders (see among others, Guimaraes Pereira and Funtowicz, 2003), as well as between scientists from different disciplines (for instance in order to facilitate interdisciplinary understanding and the development of more interdisciplinary approaches).

Scenario processes create such momentum for dialogue interfaces, and as a consequence, a scenario ‘product’ (i.e. a narrative) can be understood as a “*boundary object*” (Pulver and VanDeveer, 2007, p.4). Scenario exercises can be seen as 'co-production process' generating a shared reference (the scenarios), and beyond, a shared understanding and a common language which can facilitate further discussion or even collaboration. Mutual discovery of actors and their respective opinions, exchange of information, debate and settling of agreement or even consensus are targeted as outputs of such interfaces.

However, there is evidence that bringing people together in a same room is not sufficient to label scenarios as interfaces. The question of the results and impacts of such a dialogue interface created through the arena of a scenario construction process remains complete. If there is evidence that, through a well-designed participative approach, scenarios can generate discussion, debate and shared understanding (Guimaraes Pereira and Funtowicz, 2003), the impacts of an improved shared understanding on behaviors or even on the emergence of a shared ‘vision’ seem unclear.

Some factors for a successful initiation of the necessary dialogue have been highlighted, including among many others, trust between the participants as with the facilitator(s) (Selin, 2006, pp.6-7). Other factors include credibility, legitimacy and relevance (see below Part II), as well as other criteria identified in the study field around participation (e.g. the skills of the facilitator, the recruiting of the participants, etc.).

A2 BUILDING BLOCKS INTERACTIONS

These different building blocks of scenario exercises (BB) are not necessarily present in each specific scenario exercise. Though each of the building blocks represents a specific aspect, they are related to one another. A clear common thread across the different aspects is the idea of integration. As developed above, the current discourse in favor of integration can be linked to environmental management and sustainability issues, which claim for more integrated research, integrated analyses, integrated assessment, integrated policies, etc. Scenarios contribute to answer these calls in various aspects. The very idea of elaborating pictures and stories about the future implies an integrated approach (→ see a. Future-oriented thinking above). In order to build a credible and coherent picture of the current ‘realities’ of a specific system, scenarios have to base themselves on a sound diagnosis of the current situation through integrating available information (→b. .) and on a clear understanding of the interconnections between (internal and external) variables through systemic analysis (→ c.). Integration is also a crucial condition to build a coherent and challenging narrative; and vice versa, such a narrative reinforces the interconnected character (→ d.). Finally, participation is a tool to gather new information and diffuse it, and also a way to address the poor existing communication and collaboration between diverse actors (Scrase and Sheate, 2002, p.287) (→ e.).

Beyond the link between each BB and the idea of integration, the different building blocks are directly closely interrelated. Table 1, here under, develops the influences and implications among the five building blocks.

Following Table 1, we further present the interrelations and illustrate them in Figure 2. Both in the text and the figure, we have named each interrelation according to its place in table 1, at the intersection between a lettered and a numbered BB, e.g. ‘C2’ is situated at the intersection between the BB *System Thinking* in the vertical column (C) and *Collecting and integrating Information* in the horizontal line (2).

Table 1 must be read from the vertical axe towards the horizontal axe asking the following question: *What does the perspective or approach of the building block A (B, C, D, E) adds to the other building blocks (1, 2, 3, 4, 5)?* For example, the interrelation represented by the intersection ‘D3’ has to be understood as follow: *‘Adding a story-like approach to a system thinking perspective will helps highlighting potential incongruence in the interrelations framework and presents it through a more accessible language’*. In other words, being attentive to use and implement a story-like approach when focusing foremost on system thinking will contribute to better spot inconsistencies in the interrelation framework and translate the systemic results in an accessible language.

The table is not symmetric. Indeed, the inverse interrelation ‘C4’ does not result in the same outcome (as ‘D3’) and means that *‘adding a system thinking perspective to the story like approach provides the interrelation framework which helps structure the story and develop a coherent narrative’*.

The table could be read as presenting a succession of delimited steps, if we look at the grey-coloured squares of Table 1 and the logical thread between them; this would mean looking at the building blocks as phases of a chronological process. Those steps are somewhat different from the classic sequence proposed in the manual of scenario construction (i.e. 1) Decision focus; 2) Key factors; 3) Pre-determined elements and uncertainties; 4) Selecting the scenario logics; 5) Fleshing out; Ogilvy and Schwartz, 2004). Indeed, what we have presented in this section are not steps of a scenario exercise, but a range of approaches and perspectives mobilized (at different degrees) all along the exercise and which have transversal implications.

These building blocks are not simply tools implemented one after the other. They are different perspectives influencing the exercise and its outputs. They are also all of different nature: *Future-oriented thinking* is a specific 'state of mind', a way of looking at things through the lens of the future; *Collecting and integrating information* is a research phase influencing the exercise to be grounded into facts; *System thinking* is at the same time a formal tool and a state of mind preaching that everything is linked to everything; *the Story-like* approach is a kind of (non-formalized) approach and a way to communicate through a less usual and more entertaining opening up device; the *Dialogue interface* is, in fact, a situation and as perspective it preaches for the necessity to communicate and to learn from diversity of perspectives.

	1. <i>Future-oriented thinking</i>	2. <i>Collecting and integrating information</i>	3. <i>System Thinking</i>	4. <i>Story-like approach</i>	5. <i>Dialogue interface</i>
<i>A. Future-oriented thinking</i>	<i>Future-oriented creativity and reflexivity space</i>	Help look at current knowledge from other points of view, take distance from current knowledge	Help question interrelations taken for granted and to identify new ones through taking other perspectives	Contribute to a creative and open-minded state of mind in the redaction	Provide the open-minded posture necessary for people to listen and understand other points of view
<i>B. Collecting and integrating information</i>	Base of knowledge about the present to project/imagine the future of a given topic.	<i>Research and state of the art of the studied topic; factual base</i>	Base of knowledge on which to build an integrated framework of interrelated variables.	Provide the elements which compose the narrative and ground the narrative in facts	Provide the information on which to base the discursive reflection
<i>C. System Thinking</i>	Identifying potential future patterns of change	Connect and structure the collected information according to the interrelated framework	<i>Construction of the interrelation framework</i>	Provide the interrelation framework which helps structure the story and develop a coherent narrative	Provide the interrelation framework which allow a better understanding of the topic and structure the discussions
<i>D. Story-like approach</i>	Help project into a new world and transmit this future-oriented perspective to writer and reader.	Make the information more accessible through a familiar language	Help highlighting potential incongruence in the interrelations; translate them in a more accessible language	<i>Translation into narrative language</i>	Help people apply causal reasoning and create a concrete collective product.
<i>E. Dialogue interface</i>	Gather the different perspective needed for more creativity and reflexivity	Contribute to gather and exchange new information, to present them through different perspectives	Bring different new lights on the way interactions, power struggles, etc. are understood.	Bring specific inspirations in the way to present things in an accessible and appealing story	<i>Encounter of multiple perspective</i>

Table 1: First- and second-order interactions between building blocks

This table structures and details the interrelations between the identified building blocks in first- and second-order interrelations. The first-order interrelations, i.e. building blocks interacting with themselves (the grey-colored squares), allow accounting for the main purpose(s) pursued by the characteristic (e.g. 'C3', applying *system thinking* during scenario exercises is foremost meant to 'configure a *systemic framework* for the interrelation of variables'). Second-order interrelations allow a more differentiated reading of the implications of building blocks; they define in a certain sense the profile and the overall character of a scenario exercise. For example, 'C2' can be read as follows: 'mobilizing *System thinking* across the scenario exercise's process will allow hardening the connection and structuring the *collected information* according to the interrelated framework'. Conversely, 'B3' means that

'Collecting and integrating information will supply additional knowledge on existing *integrated and systemic frameworks*'.

Most of the time, the five building blocks reinforce each other; even if the interactions between some building blocks may seem to have antagonist tendencies, i.e. *Collecting and integrating information* and *Future-oriented thinking* ('A2';'B1'). Indeed, the research phase of collecting and integrating information is meant to build strong roots into the present and current knowledge, whereas the future-oriented posture, and more particularly the explorative and normative modes of future thinking imply taking distance with what is currently taken for granted. However, the future-oriented perspective is necessary to be endorsed throughout the whole exercise, and is of help to open the door to new way of looking: it can allow a new look, even on the type of information one is searching for. Vice-versa, creativity and reflexivity without a robust factual basis, end up in pure divagation.

Some building blocks provide the work material for others. The research of information building block provides material for the systemic analysis ('B3'); and this latter provides an interrelation framework for the construction of a coherent narrative ('C4'). But it is not mono-directional as, in parallel, the story-like approach also help check the coherence of the systemic framework ('D3') and the systemic approach contribute to structure the collected information ('C2') (see the three central BB in figure 2 for the illustration of these feedback mechanisms).

As said above, these last interrelations could make think the building blocks constitute a kind of step-divided process with simple feedback mechanisms. However, interrelations are multiple and transversal as also illustrated in Figure 2 below.

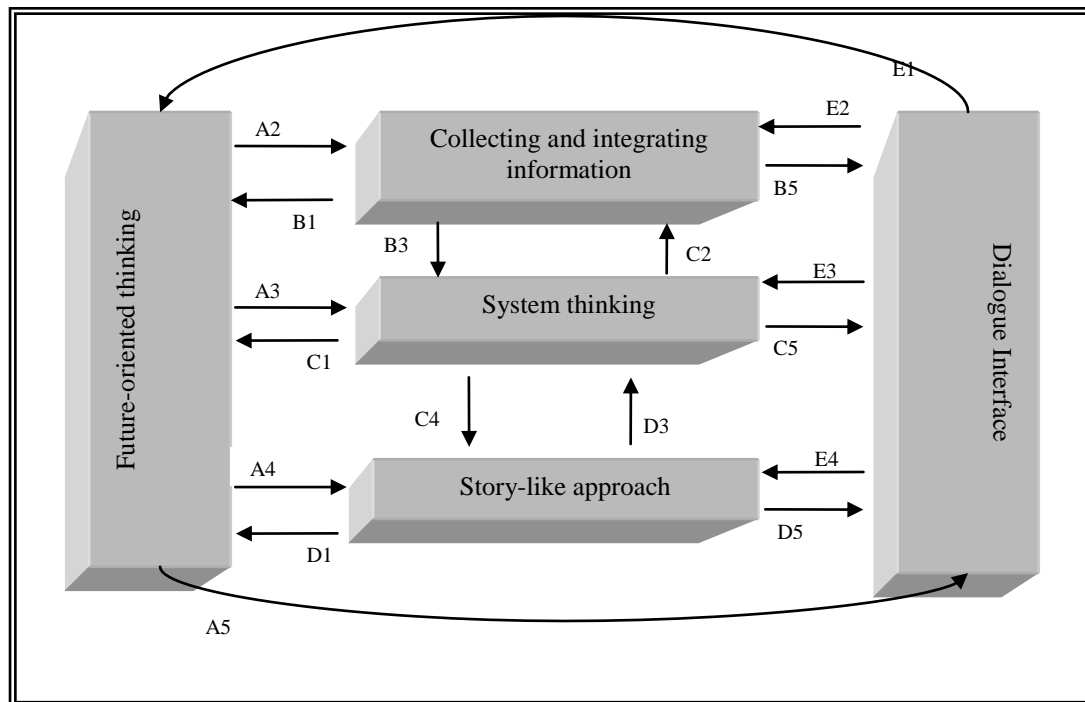


Figure 2 Examples of interrelations between the scenario building blocks

Beyond the already addressed interactions, we can see e.g. that the system analysis also help identifying future patterns of change ('C1'), and to a lesser extent, to structure the discussions in the dialogue interface ('C5'). The research of information posture also influence the story-like approach ('B4') and the dialogue interface ('B5') which need to depart from a robust factual basis. And the Story-like approach facilitates the projection into imagined world and thus reinforces the creativity posture ('D1'). Further, the future oriented perspective necessary to be endorsed during the exercise

generates the creative and reflexive open-minded background posture influencing the other building blocks ('A 2,3,4,5'). This open-minded state of mind contribute e.g. to facilitate the encounter of different types of actors and encourage them to better listen and understand each other ('A5'). While, the dialogue interface also contribute to creativity and reflexivity through 'bringing' the diversity of people and perspectives in the different building blocks ('E 1,2,3,4').

*

The different aspects presented in this chapter are not as such new material in the scenario field. However, the way we present them as five building blocks, i.e. core elements constituting most scenario exercises, interacting with each other in order to enhance the qualities of the scenarios as process and product is a new reading grid. It may help scenario developers and users better understand the mechanisms at stake in their exercise and better structure their approach of scenario exercises.

B. OUTCOMES AND USES

The preceding section described five building blocks of scenario exercises, presenting five generic characteristics of scenarios. These characteristics define the linkages between *how* a scenario process is configured by its initiators, and *what* is produced during the exercise. In the following we investigate what the scenario process and product can influence in a policy cycle; e.g. what the use and impact of scenario exercises are. We address these policy effects as different types of *outcomes*, e.g. *better understanding, debate, shared vision* which we summarize in two main clusters of influence of scenario exercises: *challenging mental models and learning* and *strategizing and planning*.

INTRODUCTION

The *output* of a scenario exercise materializes in one or several scenarios. These outputs - and the process which led to it - generate under certain conditions (see Part II below on factors of success and failure) a series of *outcomes* for the users. Four of these *outcomes* are briefly discussed hereafter.

Here, a distinction must be made between the users of the scenario according to their 'distance' to the construction process. Users who have participated to the construction of the scenarios will be labeled '*producer-users*' and all other are labeled '*recipient-users*'. In many instances, literature proposes a distinction between process- or output-oriented exercises. It is however often impossible to clearly distinct the process from the product and their respective *outcomes* in concrete exercises. This distinction remains however useful at an analytic level. Among the above presented scenario building blocks, some aspects are more unambiguously linked to the content i.e. collecting and integrating information, the systemic and the narrative approach will generate outcomes for both types of users. The whole issue lies in mechanisms which are more linked to the process, i.e. a dialogue interface configuration and a reflexivity and creativity perspective. These types of approaches will firstly generate outcomes for those who have been participating in the process (i.e. the producer-users). The influence on recipient-users will be indirect and tributary of the quality of the diffusion interface (see Part II).

As has been highlighted in point A. developing on scenario building blocks, each of them brings something specific to the whole scenario exercise which generates various outcomes.

First, the *future-oriented character*, which is part of the essence of a scenario exercise, creates a **creativity and reflexivity space**

Second, as a concentrate of *information* woven into a coherent *systemic* framework, scenarios can contribute to the better understanding of a topic or an issue. Through the study of possible structurally different patterns of development, scenario exercises deliver to the user specific information on causal links and interrelations between variables, on possible patterns of change of a system and answer the current discourse urging to take uncertainties into account. In this respect, scenarios can be used as **input for other research and policy processes**, such as impact and risk assessments, policy simulations, etc. (Hulme and Dessai, 2007, p.23).

Third, the *narrative character* of a scenario participates to generate some coherence of the imagined development. Elaborating the narrative facilitates the assimilation of the information and the understanding of the causal links for the producer-users. If the proposed story succeeds in balancing identification and fascination, rationales and emotions the reader is supposed to better understand the content of the scenario and better perceive and apprehend the meaning of it. In this respect, scenarios

can be used as a **communication tool**, be it to communicate scientific based information or a more explicit normative message.

Fourth, scenario exercises acting as *dialogue interfaces* bring different types of actors together and can enhance the creation of a shared understanding of the studied issue, or enhance the emergence of a common language. In this respect, scenarios can **facilitate agreement on issues, problem definition and solutions** (Quist, 2007, p.208) and generate consensus. They can be the source of **networking**, and engagement in further collaboration.

Finally, *scenario exercises as a whole* give us distance from the present, open up the future, challenge or dispel assumptions about the 'official' future and allow renewed thinking by removing obstacles to creative thinking. Scenarios highlight new options for decision making or help reframe existing decisions by providing a new context for decisions (new perspectives and considerations) and exploring the potential impacts of specific decisions.

All of these can be bundled in two more general categories of uses, impacts and effects: scenario exercises main outcomes contribute to **challenge** the views of the producer-users **and** facilitate (higher order) **learning**, two mechanisms which are necessary when engaging into **strategizing and planning**. The next section thus develops what '*challenging mental models and learning*' and '*strategizing and planning*' involve in the context of scenario exercises.

B.1 CHALLENGING MENTAL MODELS AND FOSTERING LEARNING

According to scenario literature, scenario exercises are instruments of reflexivity and learning. They help to be more aware of beliefs and assumptions about the studied topic and contribute to influence it. Indeed, as humans we have a limited cognitive capacity and, even within these limits, we always dispose of incomplete information: "*our judgments of the world are based on perceptions guided by beliefs – our mental models*" (Connor and Dovers, 2002, p.7). Some authors⁵ mobilize this concept of mental models and pose that scenario exercises have an influence on it.

A mental model can be defined as "*a relatively enduring and accessible, but limited, internal conceptual representation of an external system (historical, existing or projected) whose structure is analogous to the perceived structure of that system. [...They] guide, shape, and provide the basis on which individuals interpret and make sense of organizational life*" (Korte and Chermack, 2007, p.648). At a more social level, this corresponds to the concept of discourse developed by Dryzek (1997) as a "*shared way of apprehending the world. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts. Each discourse rests on assumptions, judgements, and contentions that provide the basic terms for analysis, debates, agreements, and disagreements...*" (Cited in Connor and Dovers, 2002, pp.8-9).

Mental models are characterized by a relative inertia as "*individuals often fail to consider alternative models in their reasoning thereby perpetuating the same deductive inferences about causality.*" (Korte and Chermack, 2007, p.647). But of course, people's representations, beliefs, assumptions, etc. may evolve, and so lead to "*a different way of understanding and acting in the world*" (Korte and Chermack, 2007, p.648); and that is through learning.

Learning is generally said to occur "*when individuals assimilate new information, including that based on past experience, and apply it to their subsequent actions*" (Hall, 1993, p.278) and can thus be generated through different channels. Nevertheless, learning through experience can

⁵ Van der Hijden, 1997; Bood and Postma, 1997; Harries, 2003; Korte and Chermack, 2007; Meppem and Gill, 1998, etc.

sometimes be difficult, particularly when a long time-span elapses between action and results and moreover because learning as such is an incremental process occurring over a period of many years and which need to overcome the inertia of mental models to influence patterns of decisions and behaviors (Bood and Postma, 1997, p.636; Harries, 2003, p.799).

Tenants of scenarios pose that such exercises can help challenge mental models and foster learning. Indeed, on the one hand, scenarios, through the construction of alternative futures, highlight the beliefs and values that underly those futures (Korte and Chermack, 2007, p.650) and thus allow to become more aware of beliefs and confront them with other points of view, so, to challenge people's mental models. On the other hand, scenarios act as a simulator, enabling to virtually experiment situation, actions (and their consequences) and to learn from it.

As for individual mental models, organizations also have their specific values, principles and beliefs, their own culture⁶ (Bood and Postma, 1997, p.637). Be it an enterprise, an administration, an ONG, etc., beliefs and assumptions are characterized by inertia and it can be difficult to question the current perspective and to change, without the fear to lose markers.

Scenarios ease the process of questioning current beliefs, as a legitimate framework in which to challenge the current organization and envisage alternatives. They can be used as '*transitional objects*' (Bood and Postma, 1997, p.636; Harries, 2003, p.799): "*Scenario planning, as a form of simulation, may run parallel to the existing cultural context of the organization; It is a method to figure out the actions, beliefs, and knowledge required in a new cultural context without disrupting the existing context*". (Korte and Chermack, 2007, p.652).

The specificity of scenario exercises is that "*different perspectives on the world can be true even if they are contradicting*" (Selin, 2006, p.2), as we are speaking about hypothetical futures. The future-oriented posture would thus work as a de-inhibiting approach allowing people to take some distance with what is usually taken for granted and have a look from other point of view; creating a fertile ground for learning.

This concept is usually disaggregated in different types of learning (technical, conceptual, policy, organizational, social, etc.); depending on the author, the field or the assumed theory, the definitions are quite different and often overlapping.

We choose here to base on the conception of learning of Brown (2003) as it combines elements from a range of theories on learning and is a more operational definition. It has proven to be applicable in projects dealing with innovations (Brown, 2003) and in study cases about the impacts of three backcasting exercises (Quist 2007). This conception distinguishes between first order learning "*which reflects new insights with regard to options in the case of a given problem and a given context*" and higher order learning which "*concerns new insights at a higher level with regard to problem definitions, norms, values, goals and convictions of actors, and approaches how to solve the problem*" (Quist, 2007, p.44).

Brown focuses on 'higher order learning' which "*leads to changes in the frames of actors and thus increases the space for actions and behavioural alternatives and allows for the formation of alliances or cooperation with other stakeholders. Higher order learning is also about actors who change problem definitions and perceived solutions, shift preferred ways and approaches how to deal with the problem and the extent to which these changes and shifts are shared among the participants*" (Quist, 2007, p.72, based on Brown et al. 2003).

⁶ Some authors speak about 'shared mental model' or 'organizational mental models', i.e. "the dominant way in which changes and events in the environment are perceived and interpreted within the organization" (Bood and Postma, 1997, p.637).

It is more precisely defined as “*consisting of three interrelated shifts: (1) a shift in the framing of the problem and of the perceived solution (or a menu of solutions); (2) a shift in the principal approaches to solving the problem, and in the weighing of choices between desirable yet competing objectives; (3) a shift in the relationship among the participants in the experiment, including mutual convergence of goals and problem definitions*” (Brown et al., 2003, p.296). The third type of shift is thus related to what we have highlighted above as creation of shared understanding or common language.

It is widely assumed in the sustainability related discourses that changes and change processes towards SD require learning by stakeholders. However, as argued by Grin and Van de Graaf (1996), “*learning is an important condition but not a guarantee for change*” and has been highlighted as very difficult to achieve (Quist, 2007, p.43;45). Further, effectiveness of such outcomes remains so far difficult to assess as it supposes to pursue in-depth case studies, following developer-users from the beginning of the exercise until the end and beyond.

However, according to Quist, learning is measurable as “*it is possible to reconstruct frame of meanings and evaluate changes with regard to this topic, for instance using in-depth interviews*” (Quist 2007, p.46) and he could observe it through his case studies on backcasting scenario exercises. This confirms the theoretical literature, but would also call for further in-depth research to bring more concrete insights on scenario exercises in general and learning.

B.2 STRATEGISING AND PLANNING

In the scenarios literature⁷, it is obvious that the interest for scenario construction is often linked to the elaboration of strategies or plans. A strategy can be defined as a guide, a line of conduct for action in the future. It is mainly characterized by a focus on the evaluation of the external environment and the identification of opportunities and threats, and on the internal evaluation of strengths and weaknesses (SWOT model) (Risse, 2004, p.36). It can be understood as very similar to *planning*. At this level of definition, the main difference between planning and strategizing is that the first *identifies ways and means* to mobilize in order to reach a fixed objective, while the second is based on *available means*. (Godet (Tome 1), 2004, p.24). But strategy can also be defined as a “*way of doing specific to an organization, a model of behavior coherent through time, etc.*” (Risse, 2004, p.36). Some authors present plans as being part of a strategy (which “*involves a goal, a vision, a blueprint of the future and a plan on how to get there*” (van der Hijden, 2004, p.147). So, according to the authors, users and context, there is clearly some overlap and confusion. For example, if we take the terms of the Belgian federal authority concerning SD, the 'SD strategy' is the law organizing the SD institutions, actors and processes, whereas the 'SD plans' are the documents containing the envisaged objectives and actions. If we take the European level or even the forthcoming Belgian national strategy, the term 'SD strategy' refers to an ensemble of policy objectives and actions to be implemented.

It is interesting to note that a strategy can also be seen as a sense-making and storytelling activity (Barry and Elmes, 1997, p.430) and further as “*something that is constructed to persuade others toward certain understandings and actions*” requiring “*acceptance, approval and adoption*” (Barry and Elmes, 1997, p.433) to be implemented. Strategies as stories-and-*tales* are supposed to provide meaning to the organization and the employees.

⁷ Bood and Postma, 1997; Van der Hijden, 1997; Burt and Van der Hijden, 2003; Mietzner and Reger, 2005; Korte and Chermack, 2007etc.

According to the literature and experience in the private sector (with the emblematic example of Shell), scenarios can help elaborating strategies for organizations: *"they are [...] like hypotheses of different futures specifically designed to highlight the risks and opportunities involved in specific strategic issues"* (Ogilvy and Schwartz, Peter, 2004). Several kinds of scenarios can be developed in a strategizing context for the public field. One can work on the simulation of the impacts of a specific policy (what if scenario); check the robustness of a policy against different possible scenarios (multiple explorative scenarios); or attempt to identify pathways towards a fixed objectives (normative scenarios).

The link between scenario construction and strategizing/planning is often presented as straightforward. However, the analysis of some encountered exercises hasn't confirmed this view. On the contrary, there seems to be a hiatus in terms of temporal horizons, involved actors, modes of thinking; the articulation between the two approaches seems *not* to be straightforward. This is, at least partly, due to a difference of context and actors between the private and the public field.

In the scenario literature based on experiences in the business field, it is quite clear that the focus is on managers, head of services, etc. i.e. decision makers. The Shell methodology advises to set up a process where all the main decision makers of the enterprise are part of the construction process ('primary recipients') or more concretely people delegated to be part of the process and to take 'insights back to their business', and, where the main message of the process and the final scenarios are communicated to the rest of the organization ('other internal recipients') and further ('external recipients') (Global Business Environment, 2003, pp.29-31). Further literature, notably on climate change scenarios, as well as our interviews, confirm this point of view and call for close collaboration between developers and users (particularly at the beginning and ending stages of a scenario exercise) (Parson et al, 2007). If the objective of a scenario exercise is to contribute to a strategizing or planning process, than the targeted users are those contributing to the planning process and to the decision making (if the strategy is to be implanted).

However, even if some authors seem to believe that methods can be indifferently copy-pasted from one (private) context to another (public context), there are clear differences between the private and the public field. The business context supposes a clearly delimited system managed by a group of clearly identified and unchallenged deciders limited in number, and aiming at well defined goals (make profit and sustain the organization in time). In the public field, the boundaries are more blurred, there can be a high number of deciders to take into account for a specific topic or area (particularly in Belgium) and their responsibilities are moreover sometimes overlapping and limited in time (due to electoral terms). And finally, it is not possible to define mono-dimensionally the 'goal of society', or even the mission of the state or the administration.

According to Meppem and Gill (1998, p.126), the *"learning organisation framework is the integrated involvement of an organisation's entire stakeholder community in decision making. When extended from the business to the environmental management and policy domain, the stakeholder community becomes that entire section of society with interests in the relevant issues."* If we follow them, scenario building for strategizing (and learning) at the level of a country demands to involve a large range of actors.

Nonetheless, we know through concrete exercises that it is possible and relevant to develop a scenario exercise at the level of an administration department (e.g. in the socio-foresight exercise conducted at the level of the federal scientific department) or even at the level of a whole administration, as exemplified, e.g., by the report of the French planning office (*The state facing the challenges of sustainable development*, Ayong le Kama, 2005). This kind of exercise has also been organized at a local or regional level, as illustrated by some local experiences (e.g. Liège 2020, Wallonie 2020, Objectif 2020 - Nord Pas de Calais, etc.) with highly variable success and outcomes.

*

Whatever the obstacles between scenarios, planning and further decision making, scenario exercises should be regarded as learning processes which generate a momentum for the renewal of policy options. Scenarios are developed for a number of reasons, but intrinsically all are meant to influence our comprehension of the future in order to orient present decisions towards steering the adaptation of societal development pathways. Scenarios should be understood as being part of the emerging portfolio of instruments for policy-making, which have been termed 'new' (Salamon, 2002) or 'reflexive' (Voss et al., 2007) governance, as is further developed in Point C. below.

C. THE THEORETICAL FRAMEWORK: CONCLUSIONS

As developed in the first section on ‘scenario building blocks’, we see that scenario exercises are multifaceted instrument. It would be reductive to see them only as information and communication tools. It would be plausible to define scenarios as an *interrelated body of beliefs, information, evidence, and explanations*. This is in fact the definition given by Hezri to ‘policy knowledge’ (Hezri, 2006, p.114). If we do not pretend scenarios are a synthesis of knowledge available for policy making, this illustrates however that they can be associated to another level of utility.

The argument for this is two folded, based on the two main types of outcomes of scenario exercises: learning and strategizing.

The learning outcomes of scenario exercises can be linked to what has been highlighted in the evaluation use research as ‘*process-related information use*’. Some authors claim such process-related information use to be another type of use aside the three aforementioned uses (i.e. information use, political use, strategic use). However, other authors like Weiss affirm such process-related use pertains to another *level* as it is not linked to the output of the exercise (evaluation in the original context), but to the process itself (Bauler, 2007, p.87): “*Instrumental use is presumed to yield decisions of one kind or another. Conceptual use yields ideas and understanding. Political use yields support and justification for action or no action. Process use tells how evaluation’s [or, here, the scenario exercise’s] influence arose*” (2005, p.14).

In addition, knowing that scenario exercises and futures studies are associated to the level of strategizing and planning tools, as well in the private (Godet, 2004 tome 2, p.35) as in the public field (Mutombo, 2007, p.28⁸), and that Lascoumes and Le Galès (2004, p.359) pose that planning can be classified as a “meta-tool”⁹, we do argue that scenario exercises can be classified as meta-tools.

Scenario exercises when developed towards learning - or towards the generation of insights for strategizing - are in fact a preparation phase for policy actors and a preliminary phase for other policy instruments. Scenario exercises as open-minded learning processes can generate a momentum for the renewal of policy options. Such ‘participatory’ policy renewal has also been labeled ‘reflexive governance’; “*reflexive governance refers to the problem of shaping societal development in the light of reflexivity of steering strategies – the phenomenon that thinking and acting with respect to an object of steering also affects the subject and its ability to steer*” (Voss and Kemp, 2006, p.4). And further, this “*shift towards (reflexive) governance entails an emerging role to be played by a series of policy instruments among which collaborative decision-tools, informative ‘propaganda’ frameworks, support for accountability... or in other words, softer management tools (including ISD)*” (Bauler, 2007, p.90) and also, we argue, scenario exercises.

Scenarios *tend* to be comprehensive pictures of reality and can synthesize a considerable amount of information in a supposedly understandable way. However, given that the socio-ecosystem is characterized by complexity and uncertainty (and political contentiousness) (Scrase and Sheate, 2002, p.275) an impartial and comprehensive view is not possible, nor desirable, as it can lead to oversimplifications. Further, the quest for better information and knowledge risks to overshadow the

⁸ This can be, among others clues, deduced from, the (partial) reorientation of the missions of some national (former) planning offices (in France, Netherland, Belgium, etc.), towards prospective missions.

⁹ Un “méta-instrument” aiming mainly at “the coordination of heterogeneous intervention modalities” (our traduction from Lascoumes and Le Galès, 2004, p.359) in Lascoumes and Le Galès, 2004, p.359.

conscious value- and problem definitions, a risk which can precisely be the cause of what is a widely admitted diagnostic, i.e. current unsustainable development (Scrase and Sheate, 2002, p.279). But precisely, in order to remain digestible, scenarios cannot avoid simplifications.

Parallel to this, there is an antagonistic tendency at the level of policy decision, "*between the need for simplification and the necessity for 'complexification' of information*" (Bauler, 2007, p.70), as it is important that deciders are provided with clear and understandable information, i.e. necessarily simplified analyses of complex realities, and, at the same time, that they are aware of the diversity of perspectives and controversies.

We think scenarios can be useful for both needs, i.e simplification and complexification: they are pictures of realities, and thus necessarily simplified ones. And they can be designed to unravel to decision-makers the multiplicity of perspectives, be it through the elaboration of multiple scenarios or/and through a transparent participative construction process through the expression of diversity (among experts, or stakeholders, etc.). On the other hand, through and beyond the content-related aspect of scenario exercises, they can provide the opportunity for users to gain insight on alternative options for specific problems in given contexts, and further, for producer-users, to question the way they define policy problems and settle objectives.

II. FACTORS OF SUCCESS AND FAILURE

INTRODUCTION

On the basis of the preceding elements of the conceptual framework, a questionnaire has been elaborated in order to assess the strength of the grid during an interview round and look for insights about the factors of success and failure encountered in some concrete Belgian scenario exercises. A secondary objective of this interview round was to gain insight into the Belgium Future Studies landscape. We have conducted ten semi-structured face-to-face interviews with Belgian (French- and Dutch-speaking) people involved in the development of scenario exercises (See Annex 2: list of the interviewed experts).

Based on the above developed framework, the interview results, as well as the literature review and the first information collected from international scenario experts (see general Introduction on methodology p.5), we identify hereafter a preliminary series of *factors of success and failure*. Those factors are no prerequisite conditions or recipes of success, but should be understood as a series of determinants which appeared as influential to the utilization of scenario exercises, and thus will be considered with care during the configuration of the CONSENTSUS-process (i.e. WP4). In the following section, these elements have been specifically translated to scenario exercises and bundled as factors of success and failure. We tried to illustrate them as much as possible with examples from the various encountered cases of scenario exercises.

Relevant, challenging and plausible are the three most cited criteria when developing evaluation criteria for scenario exercises. They are of course appropriate, but, according to us, they do in fact more address the narrative part than the whole exercise. Further, they appear as a variant of the L, C, S criteria: legitimacy, credibility and salience.

According to Eckley (2001, p.7-8), in the context of evaluating the effectiveness of assessment processes, **Credibility** refers to the believability of the exercise to a defined user. Traditionally, it is based on the 'scientificity' of the exercise and the followed methodology "*prepared with the quality-control of peer review*" (Cash et al, 2002, p.3), or more basically on the credentials and expertise of the producers. **Salience** or *relevance*, refers to the ability of an exercise to address the particular concerns of a user. For example, "*an assessment is salient to a user if that user is aware of the assessment, and if that user deems that assessment relevant to current policy or behavioral decisions*" (Eckley, 2001, p.7). On the contrary, there is lack of salience if the exercise remains on a shelf or asks questions to which a particular user is not interested in. **Legitimacy** refers to the political acceptability or perceived fairness of an exercise to a user. For example, "*a legitimate assessment process is one which has been conducted in a manner that allows users to be satisfied that their interests [or what they consider as legitimate interests] have been taken into account, and that the process has been a fair one*" (Eckley, 2001, p.7).

We do argue that this framework is also applicable as a synthetic way to structure factors of success and failure in scenario exercises. However, there are many elements which influence the legitimacy, credibility and salience of a scenario exercise in the eyes of specific users, such as the nature of the participants, the expertise and involvement of the developers, the expectations of the sponsors, the characteristics of the narrative, the interface with the users, the context of the exercise,

etc. In the following section, these elements of influence have been specifically translated to scenario exercises and bundled as factors of success and failure.

A. FACTORS OF SUCCESS

Time

Scenario construction is a very time-consuming activity. This may sound trivial, but it is an often underestimated parameter which can lead to heavy repercussions in terms of expected outputs and outcomes.

At the operational level, each phase of a scenario exercise is dependent on the dedicated various types of means, among which the allocated time resources is a very important one. The research phase to gather necessary information on the field under investigation, systemic analysis and the development of the narrative are steps which may well be underestimated.

For example, in the Toolsust project¹⁰, two workshops were scheduled with participants in order to construct sustainable visions of their city and to discuss possible policy measures through a backcasting method. In the second workshop, the participants were presented with the finalised visions, in order to discuss and criticise them. After this, too little time was left for the backcasting phase (among others because the meeting had been scheduled in the evening). One possible answer recommended by the Toolsust teams was to “*take framework scenarios that already exists and let stakeholders come up with moves towards sustainability that fit within one or the other scenario*” (Carlsson-Kanyama et al, 2003, p.19). In the Walloon prospective participative exercise, Wallonie 2020, a lack of time at the end of the project has resulted in a change of leadership from citizens and stakeholders to the scientific committee, which has been reported by the participants as a factor of de-ownership, i.e. as if the results were not theirs (see infra).

The selection of suitable participants (experts, stakeholders, etc.) can also turn out to require more time than expected (Mietzner and Reger, 2005, p.236; Van Asselt et al, 2005, p.177; Carlsson-Kanyama et al, 2003, p.14) (this aspect will be developed in the succeeding section on participation).

Moreover, scenario exercises are often spreading over several years, meaning that the motivation of the various actors linked to the project (participants, sponsors, etc) and the developers themselves must be kept vivid. This issue of keeping motivation alive is resource- and time-intensive in itself.

At the more conceptual, generic level and according to the context, the bigger difficulty related to time can be the ability (in terms of time availability and self-capacity) to think beyond urgent matters, particularly if the exercise is developed within an organization. Organizations (private firms, administrations, departments, NGOs, etc.) are submitted to short term pressures (norms, electoral terms, etc.), which tend to limit their view to the short term (Burt, Van der Hijden, 2003, p.1016), and can lead to a subsequent non-investment into time-consuming activities, even more so if these are obviously linked to the long term.

¹⁰ For details about the cited projects and interviewees, see Annexes 2 and 3.

Acceptance and Clarity of the Purpose

Furthermore, according to Van der Hijden, (2003, pp.1016-1020) the non-clarity of the objectives of scenario exercises is an important cause of failure. People who begin to work with scenarios can have very different ideas about what such an exercise can bring to them. It is necessary to make clear and unambiguous what are the main expected outcomes of the exercise, the role of the different actors, etc.

As a corollary, the pursued objectives must be extremely clear for the developers themselves and the participants (and subsequently for the users). To avoid dissatisfaction and frustration, which can have serious repercussions on the process and further use of the results, a 'contractualisation' should be settled with the participants about what the overall meaning of the project is, what is awaited from them and how the product of their work will be valorized and further used, etc¹¹ (Van Asselt, 2005, p.178). *For example*, in the case of the Walloon exercise '*Prospective des politiques d'entreprises*', a factor of failure was linked to the tension between the objectives pursued by the supporting actor and main targeted user (the minister) who expected a strategic economic development plan (and even more precisely, a synthetic 5 pages document with policy actions, budgets and identified actors), while the developers (here, the administration), also better informed about the Futures Studies methods, developed an extensive report on trends and issues, strategic axes and ideas of policy actions¹².

An important point in the context of the Consensus research project, is the reaction of the participants in Fredrikstad (Toolsust project), which "*were not satisfied when they heard that the aim of the whole exercise was to test and develop a method*". Participants "*saw the content as more important and wanted to know what will become of it after the workshops*". Here, it is the relevance of the project which was questioned. The developers propose that in an early phase, one could identify a "*potential custodian*" for the final product (a local authority, etc.), which in this case would have represented a factor of relevance to the citizens.

Acceptance and Clarity of the Method

The scenario approach, so far, represents a novelty for many actors and organizations. It can be disturbing to work with multiple explorative scenarios or backcasting, and leave aside the traditional idea of "*one plausible future, one best solution*" (Burt, Van der Hijden, 2003, pp.1016-1020). It is thus of importance that participants accept the chosen methods and tools; which can be a challenging task, e.g. with experts who have their own agenda or toolbox, or with citizens who are not acquainted to certain types of methods (as has been stated by F. Heselmans with regard to formal methods using multi-criteria choice software). *For example*, in the Toolsust exercise, for the first workshop conducted in Fredrikstad, some participant hadn't understood they were asked to imagine sustainable futures, and not to project current trends, which resulted not only in some lost of time but more dramatically into partially biased outcomes. This necessitates that participants have to be carefully introduced to the used methods and trained if necessary: for example, working for the first time with scenarios in an administration can mean to develop skills which are usually not mobilized as, e.g., be able to perceive the organization in a systemic context (external environments and interrelations).

¹¹ Interview with Frédéric Heselmans.

¹² Interview with Philippe Destatte; Interview with Florence Hennart.

Future-Oriented Thinking Facilitation

One thing is the acceptance and clarity of the method and the scenario exercise objective, another thing is the capacity of the participants to adopt a future-oriented perspective, i.e. the capacity to think beyond short term and disconnect from the current constraints.

Beyond the necessity of time management mentioned above, i.e. the necessity to divert time from urgent matters towards "parallel" activities, it can be difficult to adapt to future thinking, particularly to explorative and normative modes of thinking.

This kind of future-oriented thinking seem to present considerable difficulty to some people. This difficulty can notably be linked to specific local or personal context. *For example*, in the Toolsust project, most participants in Padova had considerable difficulties to envision the possibility for current evolutions to change direction and/or to break current trends (notably because of a series of structural failures of the local governance system, such as the corruption). It is interesting to note that the same phenomenon occurred a second time in Italy, in the Visions project for the Venice workshop. This tends to demonstrate the importance of trust or hope in the system to be able to embrace a pathway which leads to breaking current modes of thinking.

That is why most scenario developers highlight the necessity to devote attention to the ways and tools used to help participants to disengage with the present (imagery, music, art, etc.). This is specifically true for backcasting exercises, where it seems necessary to "*make the visions come alive*", maybe also in an unconventional ways (including artists, etc.) (Carlsson-Kanyama et al, 2003, p.19).

Participation

As it appears from several projects (Toolsust, Visions, "*Étude prospective en appui de la politique scientifique fédérale*"), **recruiting stakeholders**, moreover when more than one meeting is required, is a difficult task. In the Toolsust project, "*several teams thought that the relative success of the first workshop would make the participants come to the next one even with little effort*" (Carlsson-Kanyama et al, 2003, p.14), but e-mail invitations were not enough. That is why, they point out the importance to have personal contact with each participant in order to motivate them to attend the sessions. Van Asselt et al (2005, p.177), based on their experience from the Vision project, speak about "*workshop tiredness*" by many stakeholder representatives as one of the main cause for possible disengagement. Many participative exercises (be it scenario constructions, indicator developments, strategy consultations, steering committees...) use the same pool of prominent stakeholders, which are chronically 'overbooked'. Moreover, it can be that their interests and stakes are not in line with the addressed issues and objectives or that they do not consider themselves as problem-owners (Van Asselt et al, 2005, p.177; Visions-Venise, Toolsust project in Padova). Van Asselt et al (2005, p.178) recommend to "*develop an a priori strategy for recruitment of stakeholders, as well as for communication and feedback processes over the course of the participatory exercise in order to maximize the satisfaction and interest. This will help to provide a base for continuous involvement and the necessary support and commitment of the stakeholders.*"

According to Quist (2007, p.78), contrary to what is expected in some participation literature, a high degree of influence of the participants on the process and/or the content of a participative scenario exercise, i.e. stakeholders-driven, does not influence the exercise's outcomes towards more follow-up activities. Further the choice of a **stakeholder-oriented** (and not stakeholder-driven) approach can "*enable a more effective and efficient use of the stakeholder's time*" (Van Asselt, 2005, p.179), an approach which is also promoted in the Toolsust project (Carlsson-Kanyama et al, 2003,

p.19). Similarly, in the Visions project in Venice, Guimaraes Pereira (2003, p.60) has observed that providing participants with ready-to-use 'extreme' scenarios with which they disagreed strongly (even if it wasn't intended) has triggered a "*rich and effective*" discussion about the future of the city (although the participants tended to ignore the scenarios). From a **methodological** point of view, it is also important to anticipate the structure and the composition of the group (homogeneous/heterogeneous, if they know each other beforehand, etc.) in order to choose an adequate participatory method. This can be done through interviews or a kick-off meeting before the process design (Van Asselt, 2005, p.179).

As it is widely stated in participation literature, **diversity** is an extremely important element if we want to take into account multiple perspectives in the scenario construction process. According to the Visions project evaluation, diversity through participation "*yields a richer knowledge and idea base from which scenario developers can draw*". *For example*, according to Philippe Destatte¹³, there was a lack of participation of young people in the 'Wallonie 2020' prospective exercise (a characteristic which was enforced by the place and timing of the meetings). They decided then to conduct a parallel identical exercise with 5-6 school classes of teenagers, which generated many ideas, which hadn't been brought up by the adults, but with which these later totally agreed. In the Toolsust project, the participants themselves reported that maybe their group was too homogeneous because the generated ideas felt too classical. According to the developers, this would imply that the generation of "*something new*" passes through the gathering of different views and expertises under informal circumstances. One of their conclusions was that they should have devoted more resources (time and money) to the recruitment phase. (Carlsson-Kanyama et al, 2003, p.19).

Further, participants must be properly motivated to engage in a time-consuming scenario exercise. Beyond clear explanation of the methods, their role, the objectives and expected outcomes, the developers have to think from the stakeholder perspective about what the project has to offer them (Van Asselt, 2005, p.178); their time and effort have to be "rewarding"; i.e. the exercise has to be relevant for them. *For example*, the developers of the "*Étude prospective en appui de la politique scientifique fédérale*" exercise have observed it was difficult to keep experts attending all meetings they were invited to during an exercise of several years. One way to motivate them has been to link these meetings to other events, like conferences, that they could valorize (but also further, to rethink the method in order to make it less time consuming; in this case through a mini Delphi via Internet)¹⁴. For exercises involving citizens, if one of the objectives is to collect their opinion, it is of value for them that some influential personality attends the meetings, like an important policy decider: in the case of "Wallonie 2020", the attendance of Minister President van Couwenbergh to every meeting has been highlighted as a factor of satisfaction for the participants¹⁵.

Narrative

The important output of most scenario exercises is the narrative, which describes one/several causal development(s) through time and/or vision(s) of the future. Scenario literature usually puts forward three criteria: *relevant*, *challenging* and *plausible*, further the narrative must of course be consistent (no intern contradictions) and clear (see among other Chermack, 2007, p.11). Indeed, first and foremost, to make a compelling scenario narrative, it is crucial that the underlying idea (or message) makes sense for the user (cf. salience) and appears clearly (this can be hindered e.g. when the scenario story is filled with too many details) (Rasmussen, 2005, p.244). Further, narratives, in

¹³ Interview with Philippe Destatte.

¹⁴ Interview with Frederic Heselmans.

¹⁵ Interview with Philippe Destatte.

general and particularly in scenario exercises, require equilibrium between, on the one hand, credibility (or 'believability') and on the other hand, 'defamiliarization' (or novelty) (Barry and Elmes, 1997, p.434; Rasmussen, 2005, p.232). The first is needed in order to generate identification and make the user feel involved. But it must not sound too familiar, and thus uninteresting. That is why the story must also generate 'fascination' and curiosity (i.e. be challenging). As we noted in the section on story-like approach (I.A.1), this seems to be a difficult balance to reach and certainly requires some (journalistic) skills of communication.

For example, the Toolsust team presents the construction phase of the scenario narrative as a "rather difficult step", and recommends prior experience, and at least that the team works together throughout the project and particularly for "the crucial steps from clusters of ideas to images (scenarios)".

Further, it is quite remarkable that this step is often the less reported aspect of scenario construction in the various cases and documents we did consult.

Diffusion Interface

The interface between the scenario and the users seem to be of utmost importance in the way people will adopt the exercise as relevant, appealing, etc. The design of scenarios, the interface between what scenarios are telling (content, ideas, etc.) and the users will have an impact on the way people will read (or watch or listen, etc.) to the scenarios.

The way people are brought into contact with the scenario exercise depends if they have been participating to the scenario exercise (producer-users) or not (recipient-users). Among these latter, we can maybe make another distinction between a targeted user group and a wider diversified audience.

The producer-users discover the scenario from the inside. They are supposed to have been properly introduced to the future-thinking approach and clearly presented the method and objectives. Depending on the configuration, they have manipulated the data, brainstormed on future visions, etc. Based on the whole process, they have built a judgment about the process and the product they have participated in; their interface is the scenario construction process in itself.

Recipient-users are introduced to a final output, i.e. most of the time a printed version of the narrative, with some explanations on the construction process. Indeed, it is of the utmost importance for the scenario exercise credibility that all users are acknowledged about the followed methodology, underlying data and reasoning in a transparent way, in order to allow the users to judge their confidence in the scenarios, to express critics (Parson, 2007, p.68) and moreover to allow appropriation promoting further use and improvement. Information about content and method are most of the time diffused through a printed report.

However, there is evidence that such static diffusion interfaces are not sufficiently attractive. Some authors say "scenarios must incorporate themes such as songs by the Beatles (Ogilvy & Schwartz, 1998), catchy phrases that are easy to recall (Ringland, 1998), and colorful images to make the set of scenarios aesthetically pleasing (Kahane, 1992)" (Chermack, 2007, p.11). Beyond this, more "personal" contact between the recipient-users and the scenario developers through a life presentation supported by a multi media presentation or a fine tuned speech seem to be a factor of success.¹⁶

Further, if the communication is directed at a clearly identified group, it is of importance to identify the specific characteristics which will appear adequate to their perspective, be they deciders, stakeholders, citizens, etc. In case of a diversified audience, people will have different interests and

¹⁶ Phone Interview with Al Hammond (*Innovation & Special Projects at the World Resources Institute*). (see Introduction on methodology, p.5 of this paper).

information needs, sometimes contradicting, and it is a real challenge to appear "attractive" to the different groups at the same time.

Strategic and Operating Agents

Credibility and legitimacy can also be reached through the individuals or institutions involved around the project, among other, the strategic agents, i.e. those who have "ordered" or are supporting the exercise through financial, logistic help, etc., and the operating agents, who are concretely coordinating and developing the scenario exercise.

A scenario exercise, will be favored if it dispose of a valued support or leadership. For example, if developed within an organization, the exercise needs to have internal support, e.g. to be introduced via the support of a leader or an influential person, so to convince hierarchy and collaborators to engage. The exercise's credibility will be partly associated to such engagement and leadership. When developed to reach a wider audience, such 'valuable' support will be to find among recognized institutions or well known researchers, etc.

A negative example is the one of UK climate scenarios program (UKCIP). The dominance of certain funding institutions "*acted to exclude other potential institutions, research groups, models or ideas from contributing to the scenario construction*". The consequence of this was a deficit in legitimacy as seen by the wider UK peer community and criticisms against the scenarios from other UK climate scientists and against the way the UK government "*secured its scientific advice on climate change*" through a scientific committee of enquiry (Hulme and Dessai, 2007, p.24).

Further, Quist (2007, p.83) propose the idea of a 'vision champion', i.e. "*a leading individual strongly committed to the vision and acting as a vision broker*". Indeed, it has also been highlighted in other participative context, that the presence of a leader, which pushes the project as a locomotive motivates the other participants, seems decisive in the success of such exercises (Mutombo, 2006, p. 46).

In the case of the '*Prospective des politiques d'entreprises*' exercise this was clearly the role of Rudy Aernoudt (at that time chief of the cabinet of the minister of economic affairs, S. Kubla), who initiated the exercise and managed to "sell" his idea to the minister and to the administration.¹⁷

If these actors may play an important role in terms of success, a logical consequence is that change in this support or leadership can jeopardize the exercise.

In the '*Prospective des politiques d'entreprises*' exercise, there has been a clear ownership issue due to a discontinuity in the staff. The exercise has been developed by the administration, but the initiative came from Rudy Aernoudt (see above). When he left his position, the link between the exercise and the minister was fatally weakened.¹⁸The result has been that the minister did not use the results and was even reluctant to diffuse them.¹⁹

To ensure the continuity of this type of projects, it can be necessary to foreseen 'backup' mechanisms and to create intern dynamic beyond single champion (Evans et al, 1999, p.177; Buckingham-Hatfield, et al, 1999, p.4)

¹⁷ Interview with Philippe Destatte.

¹⁸ *Ibidem*

¹⁹ Interview with Florence Hennart.

Consulting the User

Based on examples from the climate scenarios, it seems that so far, scenarios have predominantly been science-led with no or too few mechanisms allowing the users to be heard (Hulme and Dessai, 2007, p.21). Even if some cases seem to show that there is progress to involve users in the scenario development process, like in the MEA exercise, for which "*focus group and interviews in order to identify issues of concern to users*" have been conducted (Pulver and VanDeveer, 2007, p.3), there is a strong call for close collaboration between developers and users (Parson et al, 2007, p).

It is of importance that the people who are targeted as users be heard or associated to the process in a way or another in order for the results to be seen as relevant and legitimate. As stated in the section on strategizing and planning, if an exercise is elaborated in order to inform a strategizing process, the planners' and decision-makers' points of view must at least be listened to. Further, from the encountered cases, it seems that, in order to be concretely used, the exercise has to link to some extent to a request from administration or better from the political level.

For example, in the "*Étude prospective en appui de la politique scientifique fédérale*" exercise, a formal and precise request from the Federal Scientific Policy department (formulated : to identify strategically important domains for federal policy programs) matched a parallel and simultaneous proposal from a research team, the process and objectives having moreover the support of the minister. Beside stakeholders consultations, the exercise has closely involved members of the department. The result was that conclusions of the study have been concretely used to shape the federal science policy programs²⁰ (Verbeiren, 2002).

More negatively, the '*Liège 2020*'-scenario exercise has succeeded in delivering insightful outputs (i.e. 4 macro scenarios for Liège and many micro-scenarios focused on specific sectors or issues) based on the work of an arena of stakeholders and citizens, but which seem to have been institutionally unused so far. This appears to be due to a lack of involvement of decision-makers, and further to the partial independence of the output (for instance in terms of diagnosis) with the stakes and interests of the potential policy users.²¹

Differently, we can see that consulting adequate members of a more or less delimited group is a key to reach and get approval from the whole group. *For example*, the '*Prospective des politiques d'entreprises*' exercise didn't succeed in its main objective i.e. to provide to the minister insights that he could use to elaborate policies. But the exercise can be seen as successful in terms of diffusion in the enterprise field, via the "*Union Wallonne des Entreprises*"²². This seems to be due to the participation of influential business leaders, obviously also acquainted with the UWE and its members. We can deduce that the results have been evaluated as legitimate, credible and relevant by the economic Walloon community because of the involvement of some 'representative' actors.

It appears that, to be relevant and legitimate to a specific user group, a scenario exercise has, on the one hand, to answer an existing demand, and on the other hand, to involve (representatives of) the specific user group in the exercise.

An extreme case is of course when a scenario exercise is 'ordered' by the final users in order to inform a specific decision. But, as we have seen with the example of the '*Prospective des politiques d'entreprises*' exercise, it is no guarantee.

²⁰ Interview with Frédéric Heselmans

²¹ Interview with Philippe Destatte.

²² *Ibidem*

Context

The specific and general context of a scenario exercise has been highlighted as an important factors of success and failure, but also a difficult parameter to analyze. The diversity of scenario exercises' configurations make it already difficult to isolate determining elements in terms of success, contextual aspects are even more diverse. If the specific context of the studied issue has to be taken into account (e.g. conflictual domains like nuclear power or GMO's), external factors as events and ongoing development are highly contingent, they can be enabling or constraining and exert a diffused influence (Quist, 2007, p.221).

For example, the emblematic case of the *Limits to Growth* report of the *Club of Rome* (1972) has an important impact in terms of awareness raising and diffusion of new debate questions at the international level, among other, around demographic, resource use, ecosystem and pollution issues (Mermet, 2003, p.57). But this report was produced in a specific context: parallel to, among others, the oil shocks and an economic crisis, as well as the space conquest (first step on the moon) providing the first images of the Earth from space which have then helped visualized the finitude of the resources. It seems likely that those elements have prepared the ground for the report and contributed to make people more receptive to the message of the report.

But those are elements scenario developers have hardly any grip on and which can mainly be observed *a posteriori*.

B. TENSIONS AND LESSONS

Highlighting the importance of time management can seem a trivial remark, but it has been pointed by lot of practitioners. It is partly because time and other resources are limited that some choices have to be made and trade-offs appear. We have highlighted a couple of those tensions and general lessons.

The tension between product and process has already been highlighted in the literature and in the WP2 (Goeminne, Mutombo, 2007, p.33). Somehow it is difficult to "fully" develop both process and product outputs. This means that there is a trade-off between devoting enough resources on the organization of a dialogue interface where producer-users involve time, creativity and social links and the elaboration of a fully fledged scenario set diffused through an appealing design appearing relevant, credible and legitimate enough to be appropriable by the recipient-users; however they can constitute a fruitful starting point.

Further, a stakeholder-driven approach have better chances to develop scenario exercises which appear legitimate and relevant to those actors who have been fully involved; however we have seen that stakeholder-driven approach is time-consuming and does not automatically bring more outcomes than a stakeholders-oriented approach, based e.g. on pre-existing scenarios. This is partly contradictory as pre-existing scenarios will be less appropriable by the participants.

As well, it can be tricky for someone in the policy field to use an exercise developed by a previous minister, another administration or political color. So we could argue for the development of scenario exercises in independent department or study center, so that they can be used indifferently by different categories of users. However, once more, the exercise will be (considered) more relevant and legitimate if developed inside the specific department where it will be used.

In this respect, it seems valuable to define a main targeted user group from the start and to elaborate a strategy in order to make sure the exercise appear enough legitimate, credible and relevant in their point of view. Beyond this rather limited and homogeneous group, remaining resources can be put into effort to reach a wider audience through appealing diffusion forms.

Another point concerns the importance of transparency in the scenario construction exercise. It will of course contribute to the credibility of the exercise; But more than a factor of success or failure, it is a guarantee of honesty and a reflexivity tool. We have highlighted several time in this paper (and WP2) how personal world views and normative choices influence the scenario content, be it in the choice of relevant data and information and variables, or during the redaction of the narrative. It is unavoidable as there is no such thing as a "neutral" research, and particularly in the scenario field. But transparency is a possible answer (Hulme and Dessai, 2007, p.26). This point confirm what has already been proposed, i.e. a thorough report on the scenario construction process within the Consensus project which will serve as further reference and reflexive tool for the developers (upcoming report on Work Package 4).

This transparency question highlights a tension concerning the diffusion interface. To maximize the credibility of the exercise, it is important that all users have access to details concerning the methodology, the data, the assumptions, etc. through, e.g. a paper report more or less illustrated with maps or graphics. However as stated supra, the design of the diffusion interface have to be appealing, as the narrative itself. A balance has thus to be found between transparency and attractiveness. Depending on the user, this balance will be more or less difficult to reach, as an appealing interface e.g. for experts can be more content oriented than if citizens are targeted and it needs to be very synthetic for decision-makers. This can quite easily be solved through developing specific reports, presentation, etc. for each type of audience. But this, one more, requires more time, financial and skills resources.

This point can be further related to the antagonistic tendency at the level of policy decision highlighted in the conclusions (C.) of the part I. (Theoretical Framework). Deciders at the same time need to be provided with clear and understandable and thus necessarily simplified information *and* to be aware of the intrinsic complexity of reality and of the diversity of perspectives and controversies about reality. One of the main challenges of scenario exercises is thus to reach a balance allowing to answer these specific antagonist needs for policy decisions, particularly in situation of complexity and uncertainty as SD.

C. THE FACTORS AND THE LCS FRAMEWORK

For each user, these different aspects influence the level of legitimacy, credibility and salience of the scenario exercise. We have developed, in table 2, the way these "factors of success" influence the LCS criteria: most of the time, a factor has a determinant impact on one of the criteria, and indirect or second level effects on the two other criteria. We have presented this through colours and arrows: for each factor, the grey-coloured square highlight the most influenced criteria, and the arrows point at second order influences.

From table 2, we can observed that the predominant influence that each factor exerts on one of the three criteria follows a clear logic, linked to the correspondence between the nature of the factor and the definition of the criteria.

The *credibility* of the exercise, defined as based on the 'scientificity' of the exercise and the followed methodology, as well as on the credentials and expertise of the producers, is influenced by the factors which are linked to methodological aspects, including the actors implementing the methodology: Time management, Acceptance and clarity of the scenario approach, Future-oriented thinking capacity and facilitation and the influence of the operating agents predominantly have an impact on the level of credibility of the exercise as they firstly inform the "scientific soundness" of the exercise's methodology.

The *legitimacy* criteria, which refers to the perceived fairness of the exercise and the fact that the exercise has taken into account what is considered as legitimate interests by the user, is mainly influenced by factors caring about the link with specific actors: Participation, Influence of the strategic agents and Consulting the targeted user group all imply taking into account adequate and/or multiple points of view.

And the *saliency* or relevance of the exercise, which refers to the ability of an exercise to address the particular concerns of a user, mainly is influenced by factors bothering about what is of interest (for the user), i.e. Acceptance and clarity of the objectives; about what is concretely said, i.e. which message is carried through the Narrative; about how to present the outputs to raise interest, i.e. the Diffusion interface; and how this interest can evolve due to external factors, i.e. the Context.

On a partially different level of analysis, we also observe that the Diffusion Interface has the specificity to be the synthesis of the different aspects of the scenario exercise, and as such, to encompass different characteristics (linked to those aspects) influencing the three LCS criteria. In addition, the Narrative part of the scenario exercise can be seen as having as much influence on the credibility as on the saliency of the exercise due to the researched balance between 'believability' and 'fascination' (see p.29 of this paper).

	Legitimacy <i>(perception of the scenario exercise's fairness in coping with stakes)</i>	Credibility <i>(perception of the implementation of high standards of scientific work)</i>	Salience <i>(perception of the integration of the stakes valued as important in the domain)</i>
Time Management	Indirectly interferes with legitimacy: adequate time management as pre-condition for the thorough development of the process (e.g. participation).	Basic capacity accounting for the scenario developers' ability to properly manage their exercise (how credible is an exercise with chaotic time management?).	
Acceptance (and Clarity) of the objectives		Indirect link to credibility; can be a guarantee of capacity of the developers to clarify and adapt objectives.	Clear relation to salience as the factor influences how the whole exercise answers a question of interest for the users.
Acceptance and Clarity of the method		Factor linked to the credit and trust that users have to put (blindly) in such relatively 'new' and unconventional exercises.	As a consequence, the user may question the relevance of the method (What is the use of future-oriented thinking for my domain of interest?).
Future-oriented thinking capacity and facilitation		Perceived capacity to help participants to 'disconnect' with their personal situation, i.e. facilitation capacity.	Indirect influence on salience; prepare participants' comprehension of the interest of the chosen approach.
Participation	How participation is organized, sketched and allowed to influence the exercise, influences legitimacy (Have I or the "relevant" stakeholders been involved?).	The acquaintance of the developer with participatory processes influences credibility; and the credibility of invited participants influence the whole project	The involved participants can contribute to reinforce the salience of the exercise according to the stakes they represent or their expertise.
Narrative	The way it presents specific/multiple perspectives of an issue influences the legitimacy of the exercise.		Direct link to salience through the familiarity of the narrative and its 'connectability' to his life, i.e. carry a message which is meaningful and relevant.
Diffusion Interface		Credibility is influenced by the level of methodological transparency conveyed through the interface, as well as by the information channel chosen, the editor...	Salience is influenced through the scenario interface's appeal (design, illustrations, etc.) to the user.
Influence of strategic agents (financial or logistic support)	Legitimacy is influenced by the strategic agents according to the domain of the scenarios. Conflictual domains (nuclear power, GMOs) need specific care w/r to fairness and diversity of represented opinions.	This indirectly influences the credibility of the exercise regarding 'scientific' objectivity quest.	
Influence of the operating agents (scenario developers)		Direct link to the credibility of the operating agent; w/r to capacity, objectivity, trustfulness, etc.	Salience can depend on the capacity of scenario developers to master the method/ the domain
Consulting the targeted user group	Legitimacy is directly linked to the way users are consulted or involved.		And it provides first source of information w/r to the integration of relevant stakes.
Context		Influence on credibility when the context impacts on e.g. paradigmatic shifts.	Diffuse influence on what is considered as relevant at one point in time due to current events, ongoing developments, etc.

Table 2 - Success factors and their influences on LCS

*

The list of "factors of success" highlighted through the encountered implemented exercises which is presented here is not exhaustive and is not, in any way, a 'key for success' or anything alike. As well, the LCS criteria are no recipe for success. The degree of legitimacy, credibility and salience, dependent on the different aspects of the scenario exercise, represent a set of conditions to generate a *usable* exercise.

Indeed, we do think the factors of success, as the utilization and effective outcomes and impacts of a scenario exercise, are deeply linked to the objectives and dependent on the whole exercise's configuration (who, why, how, concerning what, targeting who, with the help of whom, in which context, etc.). This chapter has highlighted aspects of scenario exercises which are factors of success or 'successfulness', i.e. they generate an exercise which can be potentially used as it satisfies basic conditions (not *minimum* conditions). Fulfilling these criteria contribute to the 'usability' of the exercise, and also to its 'appropriability'.

Indeed, if a potential user considers the exercise as sufficiently and adequately legitimate, credible and salient, the exercise will be susceptible to be "appropriate". The appropriation or feeling of ownership developed by users appears as an important condition for the outputs to be effectively used and generate outcomes. Involving people in the exercise seems to be the more straightforward way to generate ownership, through reaching high level of legitimacy as they are themselves involved in the exercise, of relevance, as they can have an influence on the content, and of credibility, as they have a firsthand view on (part of) the methodology. The whole challenge lies in generating appropriation for recipient-users. This will be the results of the different scenario exercises characteristics and to the diffusion interface.

Note that the Consensus scenario exercise will be evaluated with regard to the above factors of success, as well as with regards to the whole theoretical framework. We can at this stage of the scenario construction already observe most of these aspects in our scenario process and product, as well as begin to assess how Consensus did perform on the different factors.

CONCLUSIONS

As was already stated, the research and practical experience concerning the influence of scenario exercises, in general, and particularly their influence on policy-making, are at their beginning stage. To contribute in advances in this field, this paper develops a theoretical framework of building blocks and outcomes of scenario exercises and identifies elements which influence the success and usability of such exercises (as illustrated in figure 3).

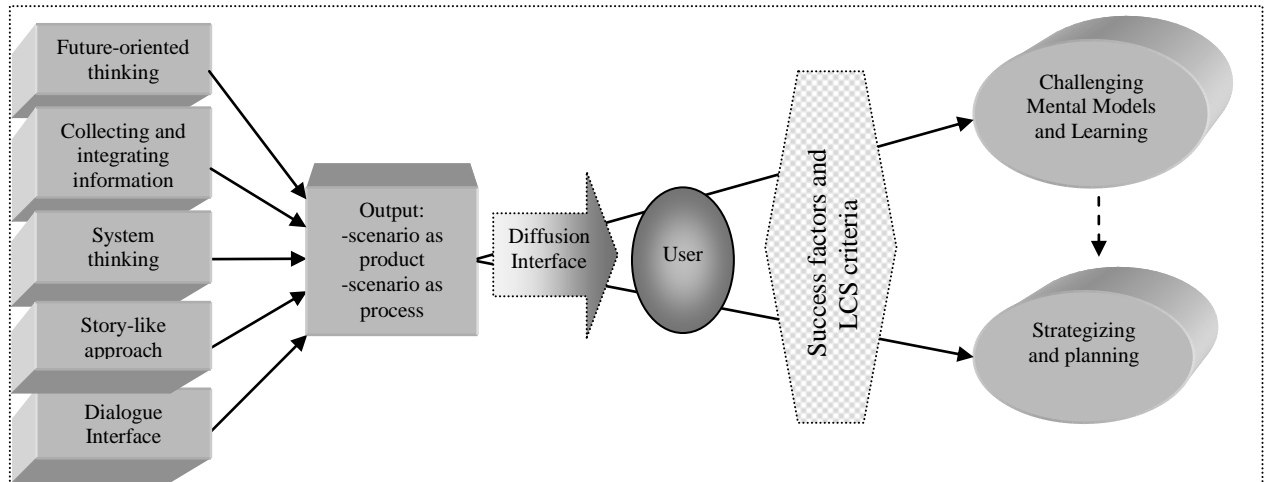


Figure 3 Simplified scenario exercise functioning including the user perspective

The developed theoretical analysis framework may appear linear; and of course it is. What we proposed here is an analysis grid, i.e. a simplifying tool to read a complex reality. As we have mentioned in this paper, simplification and 'complexification' are antagonist tendencies but necessary stances to endorse in order to evolve in reality.

This linear framework is the result of a deconstruction process and an attempt of generalization of a fuzzy field. It is in no way a recipe or a blueprint. This analysis framework has to be adapted to each case and its specific complexity in order to be operational. The grid can be useful to read existing exercises and ease the deconstruction analysis or to structure the reflection when starting to elaborate a scenario exercise project. And this is the main purpose of this paper, as tool for the next phases of the Consensus project.

On the other hand, the interviews did provide us with a range of very concrete example of success and failure from which we deduce a range of factors of usability of scenarios. All of them influence the credibility, legitimacy and relevance as well as the 'appropriability' of the scenario exercise, but are no recipe for success. They should be regarded as a basic checklist to be consulted when developing a scenario process and to be complemented along further experience.

Usability and 'appropriability' conditions can be identified through the LCS factors and the above success factors, however they are part of the definition of each scenario exercise and depend on numerous parameters, differing for each exercise.

This framework is not aimed as baseline for a methodology 'reasoning backward', i.e. starting from the targeted outcomes and working backward to elaborate the success methodology and conditions. However, it can help scenario developers and users to better understand the mechanisms at

stake in their exercise and better structure their approach of scenario exercises, as well as contribute to the research on scenarios in general.

The different aspects of a scenario exercise, i.e. the building blocks, generate different outcomes which are not only typical of future studies (better understanding, debate, shared vision). However, it is the combination of the building blocks and their interactions which generate a specific momentum for challenging mental models and learning; this state of mind as well as the produced (strategic, normative, ...) scenarios are central for renewing strategizing and planning approaches and institutional structures towards sustainable development-oriented outputs and practices.

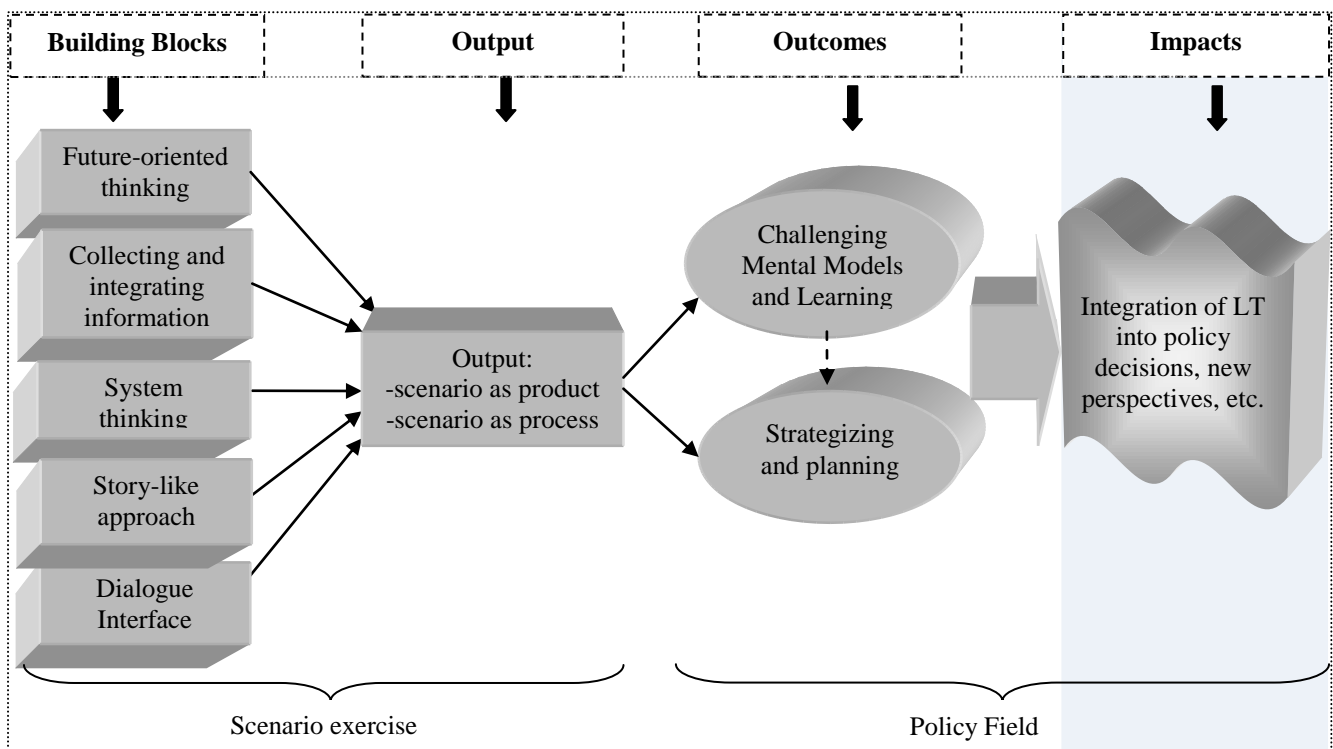


Figure 4 - Deconstructing the influence chain of scenario exercises

Figure 4 illustrates the simplified scenario functioning we have discussed in this paper. At this point of the investigation on scenario exercises uses and influences, research is still wandering into hypotheses, assumptions and wishes about the final impacts of scenarios on effective decisions, behaviors, etc. and further on the way they help striving towards e.g. sustainability. In depth and diversified study cases will be needed before robust conclusions could be drawn. The study of the outcomes and impacts of scenario exercises at an individual and societal level requires mobilizing insights from many different fields: psychology, policy, planning, communication, knowledge management specialists, etc. are needed in this task. Moreover, the fuzziness of the scenario field does not help drawing general conclusions as each exercise seems to be unique in his general configuration (focus, scale, involved actors, etc).

From a policy point of view, scenario exercise should be regarded as a tool among others to be used in function of a pre-existing objective. As a meta-tool, scenario exercise can generate learning processes with regard to new issues and help reframing the perspective on a specific problem definition. So doing, they can generate a momentum for the renewal of policy options. Scenario exercises, as defined in this paper, are part of the reflexive governance trend which preach for “*shaping societal development in the light of reflexivity of steering strategies*” (Voss and Kemp, 2006, p.4).

*

The intention here was to generate insights on the general understanding of functioning and outcomes of scenario exercises. At the project’s level, the objective is to provide the CONSENTSUS-project with insights for the configuration of scenario sketches for sustainable consumption of food (WP4). WP3 insights provide clues to guide the elaboration of the procedural setting of the scenario- and transition pathway constructions (WP4, 5 and 6), anticipate difficulties and shortcomings and improve the robustness and potential use of scenarios of the present project.

The conclusion of this paper should still be considered as intermediary. Indeed, in the following, basing on the practical experience within the Consensus project (i.e. WP4 which is still ongoing until end 2008) we will aim at gathering further insight on scenario functions and utilization.

In the last part of 2008, following the construction of the Consensus scenario sketches, we will also assess the expectations of potential stakeholders and decision-makers with regard to *federal* Belgian scenario exercises, as well as their present knowledge and use of scenario studies through a round table. This appreciation of the Belgian context will be explored with regard to scenarios in general, as well as with regard to initiatives linked to transitions and system innovation.

Further, WP3 will be followed-up by WP7 in the second phase of Consensus, developing further the governance track of the project. WP7 is meant to research on the governance aspects from the transition and system innovation perspective as well as on their implementation in the Belgian context. WP3 is the first phase of this reflection: generating better understanding of the mechanisms of such reflexive (meta-) instruments as scenario exercises, it enlightens us on one of the elements within the emerging portfolio of instruments for SD-policy.

The present work package will act as a reflexivity task throughout the entire project duration, i.e. monitoring and contextualizing project decisions and at a later stage engaging into collecting the necessary feedback from participants, developers and users. The stance taken is to allow us to monitor and evaluate our own efforts. It remains obvious from the existing literature, that it is difficult in many respects with many scenario projects to encounter a sufficiently rigorous information base in order to construct learning also at the level of project operators.

From this reflexivity stance applied to the Consensus project, we can highlight interesting and challenging questions, such as the following: What can be the uses and impacts on policy-making for scenarios elaborated in the context of a research project?

BIBLIOGRAPHIE

- AYONG LE KAMA, Alain, *Horizon 2020 : L'État face aux enjeux du Développement Durable*, Paris, Commissariat Général du Plan, novembre 2005
- BARRY, David, ELMES, Michael, "Strategy retold: a narrative view of strategic discourse", *Academy of Management Review*, n°2, vol.22, 1997, pp.429-452
- BAULER, Tom, *Indicators for Sustainable Development: A Discussion of their Usability*, Unpublished PHD thesis, Université Libre de Bruxelles, 2007
- BECKER, Egon (et al.), *Sustainability: A cross-disciplinary concept for social transformations*, Management of social transformations (MOST), Policy Papers 6, UNESCO, 1997, pp.40-42
- BOOD, Robert, POSTMA, Théo, "Strategic learning with scenarios", *European Management Journal*, vol.15, n°6, pp.633-647, 1997
- BUCKINGHAM-HATFIELD, Susan, PERCY, Susan, "Keys to a sustainable environment. Education, community development and local democracy", in BUCKINGHAM-HATFIELD, Susan, PERCY, Susan, *Constructing Local Environmental Agendas*, Londres, Routledge, 1999, pp.1-17
- BURT, George, VAN DER HIJDEN, Kees, "First steps towards purposeful activities in scenario thinking and futures studies", *Futures*, 35, 2003, pp.1011-1026
- CARLSSON-KANYAMA, A., et al., *Images of everyday life in the future sustainable city: experiences of back-casting with stakeholders in five European cities*, The Integration report of WP4 in the ToolSust project (Deliverable 19), Environmental Strategies Research Group/FOI, Sweden, December 2003
- CARPENTER, Steve et al (Ed.), *Ecosystems and Human Well-being: Scenarios, Volume2. Findings of the Scenarios Working Group of the Millenium Ecosystem Assessment*, USA, Island Press/MEA, 2005
- CASH et al, "Salience, Credibility, Legitimacy and Boundaries: Linking Research, Assessment and Decision Making", John F. Kennedy School of Government, Harvard University, Faculty Research Working Paper Series, RWP02-046, November 2002
- CLUB DE ROME, *Halte à la croissance?*, Fayard, Paris, 1972
- CONNOR, R.D., DOVERS, S.R., *Institutional Change and Learning for Sustainable Development*, Center for Resource and Environmental Studies, Working Paper 2002/1
- DREBORG, Karl, *Scenarios and structural uncertainty. Exploration in the field of sustainable transport*, Royal Institute of Technology (KTH). Swedish Defence Research Agency (FOI), Stockholm, 2004
- ECKLEY, Noelle, "Designing effective assessments: the role of participation, science and governance, and focus", *Environmental Issue Report*, European Environmental Agency, n°26, Copenhagen, Denmark, March 2001

- ESPON PROJECT 3.2, *Spatial Scenarios and Orientations in relation to the ESDP and Cohesion Policy, Final Report, Volume 1, Executive summary*, The ESPON Monitoring Committee and the partners of the projects mentioned, October 2006, p.15
- EVANS, Bob, PERCY, Susan, "The opportunities and challenges for local environment policy and action in the United Kingdom", in BUCKINGHAM-HATFIELD, Susan, PERCY, Susan, *Constructing Local Environmental Agendas*, Londres, Routledge, 1999, pp.172-185
- FUNTOWICZ, S, RAVETZ, J., "Post-Normal Science", *Internet Encyclopaedia of Ecological Economics*, International Society for Ecological Economics, February 2003.
- GLOBAL BUSINESS ENVIRONMENT (PXG), *Exploring the future. Scenarios: an explorer's guide*, Shell International Limited (SI), London, 2003
- GODET, Michel, "La prospective territoriale", *Cahier du Lipsor*, Série de recherche, n°7, 2007
- GODET, Michel, *Manuel de prospective stratégique. Tome 2: L'art et la Méthode*, 2^{ème} édition, Paris, Dunod, 2004
- GOEMINNE, G., J.K. MUTOMBO, E. (2007), *The Field of Scenarios: fuzziness as a chance for building appealing future visions, working paper for the CONSENTSUS project*, CDO-UGent/CEDD-ULB, Gent/Brussel
- GRIN, John, VAN DE GRAAF, Henk, 'Implementation as communicative action', *Policy Sciences*, 29, 1996, pp.291-319
- GUIMARAES PEREIRA, Angela, FUNTOWICZ, Silvio, "Methods for citizen involvement in new governance. Reflections based on three empirical cases", *Theorie und Praxis*, n°2, Juni 2003, pp.58-63
- HALL, Peter, "Policy paradigms, social learning, and the state: the case of economic policymaking in Britain", *Comparative Politics*, vol.25, n°3, April 1993, pp.275-296
- HARRIES, Clare, "Correspondance to what? Coherence to what? What is a good scenario-based decision making?", *Technological Forecasting & Social change*, 70, 2003, pp.797-817
- HERRICK, Charles, SAREWITZ, Daniel, "Ex post evaluation: A more effective role for scientific assessments in environmental policy", 25, 2000, pp.309-331
- HEZRI, Adnan, *Connecting sustainability indicators to policy systems, Thesis submitted for the degree of doctor of Philosophy*, Australian National University, Centre for Resource and Environmental Studies, October 2006
- HEZRI, Adnan, *Connecting sustainability. Indicators to policy systems. Thesis submitted for the degree of doctor in Philosophy*, Australian National University. Center for Resource and Environmental Studies, Australia, 2006
- HULME, Mike, DESSAI, Suraje, "Negotiating climates for public policy: a critical assessment of the development of climate scenarios for the UK", *Global Environmental Futures workshop. Interrogating the practice and politics of scenarios*, Watson Institute for International Studies. Brown University 23 and 24 March 2007, <http://www.watsoninstitute.org/ge/scenarios/publications.cfm>
- J.K. MUTOMBO Emilie, BAULER Tom, WALLENBORN Grégoire, *Méthodes participatives de prospective et de planification pour un développement durable : analyse d'approches et de réalisations*, SPP-Politique Scientifique, 2007, 139p.
- KATES, Robert W., William C. CLARK, Robert CORELL, J. Michael HALL, Carlo C. JAEGER, Ian LOWE, James J. MCCARTHY, Hans Joachim SCHELLNHUBER, Bert BOLIN, Nancy M.

- DICKSON, Sylvie FAUCHEUX, Gilberto C. GALLOPIN, Arnulf GRUEBLER, Brian HUNTLEY, Jill JÄGER, Narpal S. JODHA, Roger E. KASPERSON, Akin MABOGUNJE, Pamela MATSON, Harold MOONEY, Berrien MOORE III, Timothy O'RIORDAN, and Uno SVEDIN. 2000. "Sustainability Science." *Research and Assessment Systems for Sustainability Program Discussion Paper 2000-33*. Cambridge, MA: Environment and Natural Resources Program, Belfer Center for Science and International Affairs, Kennedy School of Government, Harvard University, 2000, p.2
- KORTE, Russel F., CHERMACK, Thomas J, "Changing organizational culture with scenario planning", *Futures*, 39, 2007, pp.645-656
- LASCOUMES, Pierre, LE GALÈS, Patrick, *Gouverner par les instruments*, Paris, Sciences Po, 2004
- LUND, Gyde H., IREMONGER, Susan, "Omissions, commissions, and decisions: the need for integrated resource assessments", *Forest Ecology and Management*, 2000, 128, pp.3-10
- MEPPEM, Tony, GILL, Roderic, " Planning for sustainability as a learning concept", *Ecological Economics*, 26, 1998, pp.121-137
- MERMET, Laurent, (dir.), *Prospectives pour l'environnement, Quelles recherches? Quelles ressources ? Quelles méthodes?*, Paris, La documentation Française, 2003
- MIETZNER, Dana, REGER, Guido, "Advantages and disadvantages of scenario approaches for strategic foresight", *Int. J. Technology Intelligence and Planning*, vol.1, n°2, 2005, pp.220-239
- MUTOMBO, Emilie, *Agenda 21 Local. Bientôt quinze ans de mise en œuvre du développement durable au niveau local : Définitions, avancées et obstacles*, Master Thesis, ULB, 2006
- OGILVY, Jay, SCHWARTZ, Peter, *Plotting Your Scenarios*, USA, Global Business Network (GBN), 2004 (www.gbn.com)
- PULVER, Simone, VANDEVEER, Stacy, "Global Environmental Futures workshop. Interrogating the practice and politics of scenarios", Background paper, *Global Environmental Futures workshop. Interrogating the practice and politics of scenarios*, Watson Institute for International Studies. Brown University 23 and 24 March 2007, <http://www.watsoninstitute.org/ge/scenarios/publications.cfm>
- QUIST, Jaco, *Backcasting for a sustainable future. The impact after 10 years*, Delft, Eburon Academic Publishers, 2007
- RASMUSSEN, Lauge Baungaard, "The narrative aspect of scenario building – How story telling may give people a memory of the future", *AI & Society*, 19, 2005, pp.229-249
- RISSE, Nathalie, *Evaluation Environnementale Stratégique et processus de décision publics: contributions méthodologiques*, Bruxelles, ULB – IGEAT, 2004, pp.30-31
- ROTMANS, J., *Integrated Assessment: A bird's-eye view*, Maastricht, ICIS, 1999
- SCRASE, Ivan, SHEATE, William, "Integration and integrated Approaches to assessment: what do they mean for the environment?", *Journal of environmental policy and planning*, 4, 2002, p.276
- SALAMON, L.M. *The Tools of Government. A guide to the new governance*, New York, Oxford University Press, 2002
- SELIN, Cynthia, "Trust and the illusive force of scenarios", *Futures*, 38, 2006, pp.1-14

- SPANGENBERG, Joachim, "System complexity and scenario analysis", Paper presented at the ninth biennial conference of the international society for ecological economics "Ecological sustainability and human well-being", New Delhi, India, December 15-18 2006.
- SWART, R. J., RASKIN, P., ROBINSON, J., "The problem of the future : sustainability science and scenario analysis", *Global environment change*, 14, 2004, pp.137-146
- VAN ASSELT, M., ROTMANS, J., *Uncertainty in Integrated Assessment. A bridge over troubled water*, Maastricht, ICIS, 2000
- VAN ASSELT, M.B.A., ROTMANS J., ROTHMAN D.S., *Scenario Innovation. Experience from European Experimental Garden*, UK, Taylor&Francis Group, 2005
- VAN DEN HOVE, Sybille, A rationale for science-policy interfaces, *Futures*, 2007, doi: 10.1016/j.futures.2006.12.004, 20p.
- VAN DER HEIJDEN, Kees, "Can internally generated futures accelerate organizational learning?", *Futures*, 36, 2004, pp.145-159
- VAN DER HIJDEN, Kees, *The Art of Strategic Conversation*, Wiley, New-York, 1997
- VOSS, Jan-Peter, KEMP, René, 'Sustainability and reflexive governance: introduction', in VOSS Jan-Peter, BAUKNECHT, Dierk, KEMP, René, *Reflexive Governance for Sustainable Development*, Edward Elgar, Cheltenham – UK, 2006
- WEISS, Carol H., MURPHY-GRAHAM, Erin, BRIKELAND Sarah, "An alternative route to policy influence: how evaluations affect D.A.R.E.", *American Journal of Evaluation*, 26 (1), pp.12-30, (2005)
- WIEK, Arnim, BINDER Claudia, SCHOLZ, Roland W., "Function of scenarios in transition processes", *Futures*, n°38, 2006, pp. 740-766

ANNEXES

As explained in the paper, we have conducted so far ten semi-structured face-to-face interviews with Belgian French- and Dutch-speaking people involved in the development of scenario exercises. As explained in the main introduction of the present paper, we used the outcomes of these interviews to gain insight regarding two aspects: the current demand for scenario exercises (Task 3.2) and the assessment of existing scenario exercises (Task 3.3).

Task 3.2 Identification and characterization of the current demand for scenario construction exercises: We based ourselves on these interviews to sketch a more precise picture of the landscape of Futures Studies in Belgium, and to gain a better understanding on the existing situation in Belgium in terms of long-term planning and scenario construction exercises. This appreciation of the Belgian context will be more specifically explored with regard to the expectations (i.e. the demand for scenario exercises) of SD actors (policy actors, stakeholders, etc.) during the final stages of phase 1 of the project. We will explore this ‘scenario demand’ with regard to scenarios in general, as well as w/r to initiatives linked to transition management and system innovation.

Task 3.3 Assessment of existing scenario exercises: The conducted interviews provided also elements which permit to assess existing scenario exercises. The questionnaire (see Annex 3) has been elaborated on the basis of the conceptual framework (task 3.1) not only in order to refine the framework itself, but mainly to collect information on elements influencing the success and failure of scenario exercises.

Initially the objective was to concentrate on some precisely identified scenario-initiatives and to assess with their developers, participants and users the outcomes and impacts of scenario exercises. However, it occurred that only few scenario-initiatives had been looked upon consciously and critically by initiators, developers or even participants for their impacts on policy situations. Instead of assessing in depth a few scenario exercises (as proposed in the research proposal), it was decided to focus on experts, academics and policy-makers, who had some recurrent and broad scenario development experiences. For Belgium, the most important scenario exercises were selected and a series of experts were identified that were recurrently involved in them. A selection of these experts has been interviewed (Peter De Smedt; Philippe Destatte; Florence Hennart; Frederic Heselmans; Moritz Lennert; Erik Mathijs; Bernadette Merenne-Schoumaker; Michael Van Lieshout; Eva Verstraete; Donaat Cosaert and Stef Steyaert²³ - see Annexes 1 and 2: list of interviewed experts and the list of referenced scenarios (and prospective)

Annexes 1: Interview Questionnaire

Annexes 2: List of interviewed experts

Annexes 3: List of scenarios exercises referenced in the paper

²³ We also had the opportunity to organize a meeting with Alain Wouters, Managing Director of *Whole Systems* and internationally experienced scenario facilitator; and we discussed these issues with Nadine Gouzée and members of the SD Task Force of the Planning Bureau during a meeting addressed to several research teams in order to diffuse insights drawn from the elaboration of the scenarios of the Fourth Federal Report for SD.

ANNEXES 1: INTERVIEW QUESTIONNAIRE

To prepare the interviews, a questionnaire has been elaborated on the basis of the conceptual framework presented in the Part I of this paper. This is the generic version of the questionnaire, which has been adapted for each interview to the specific experience of the expert.

Dimension 1: Objectives/outcomes

- How and why have you begun to be interested by scenarios (to read/to develop/to sponsor)
What did you think it could bring to you or to a targeted user? Was it clear?
 - If yes: explain
 - If no: (*we give examples like better understanding, awareness raising, etc. of whom and to do what, etc.*)

If you use scenarios in order to develop/inform a planning/strategizing procedure, how did you manage to use the information/experience of the scenarios exercise into the planning/strategizing phase?
(*answers linked to the methodology and organisation of the exercise, to political support, the a specific thematic, etc.*)

Dimension 2: Building blocks

- What is for you a scenario (exercise)?
(*a definition like predictive/projection, multiple explorative, normative, etc.*)

What are the main components of it? And what do they bring to the exercise/to the final product, what is their function in the exercise?
(*this type of characteristic or mechanism in the exercise is important in order to reach this types of result/impact, etc.*)

Do you think the following items have something to do with scenarios as you developed/understand it? And what place did/would you give to them?
What did (would) they bring to your exercise/product?:
Future oriented thinking, Collecting and integration of information, system thinking, story-like approach, Interface.
(*in other words or with more explanations*)

Dimension 3: process & Content

In your experience, is the scenario approach, mainly about having a final product, a set of scenarios or about developing scenarios through a certain process, i.e.

- *Reading (or else) and using a final product, i.e., usually a set of scenarios? And what does that bring exactly (to the developers, participants, final product users)? (deciding, problem solving, acting, etc. once only)?*
- *Developing a scenario along a specific process associating specific actors, etc? And what does that bring exactly (to the developers, participants, final product users)? (thinking, opening-up, etc. ongoing)?*
- *Or both?*
In the exercise you experienced, can you clearly dissociate these two aspects (and their results)?

Dimension 4: Who

- Who have been involved in the scenarios you experienced? (types of actors and of status)
Do you think certain types of actors have absolutely to be part of a scenario exercise? And why?
 - *Do you think deciders have to be part of such exercise for them to take sense and have consequences?*
 - *What about the place of stakeholders and citizens? What is their added value in a scenario exercise?*
 - *Etc.*

Dimension 5: general questions

Factors of success and failure

- In the exercises you experiences, were there particular reasons for the success/failure of (parts of) the scenario exercise?
What about the supporting role of personalities, what about the general economical and political context, etc.?

Private vs. Public

- *If they know something about the roots of scenario approach in the private sector or if they directly worked in the public field at any level:*
Do you think the scenario technique which has been developed mainly in the private sector (and military sector) can be useful in the same way in the public field? Would you change something to adapt it to the administration or to the municipality or federal level, etc?

Status of Scenarios

- In the range of tools or instruments you use, how would you classify scenario exercises?
(do you classify it aside intern or extern communication tools, aside planning or strategising tools like existing urban plans, etc.)
Based on your experience, do you think scenario exercises have their place in a policy making toolbox? Why and at what stage?

SD & scenarios

- How would you describe the place of scenarios in the context of sustainability policies?
[to be developed]

- Could you indicate us other scenarios or authors that you find really interesting.
- If you had to start this project over...

ANNEXES 2: INTERVIEWED EXPERTS

Here is the list of the Belgian French- and Dutch-speaking people involved in the development of scenario and prospective exercises that we have interviewed so far. For each person, we mention the date of the interview, the function and the scenario or prospective exercises he/she has been involved in (which will be briefly presented in the next section).

French Speaking Interviews

- **Moritz Lennert** (28 September 2007)
Researcher in the "*Géographie appliquée et Geomarketing*" unit at the IGEAT (*Institut de Gestion de l'Environnement et d'Aménagement du Territoire*) / *Université Libre de Bruxelles*
 - Lead partner in the Espon project.

- **Philippe Destatte** (28 November 2007)
Director of the "*institut Jules Destrée*".
 - Leading developer/initiator of "*La Wallonie au futur*", "*Wallonie 2020*", *Mission prospective "Wallonie 21"*, the *Collège Régional de Prospective de la Région wallonne*
 - Consultant for the exercise "*La prospective des entreprises wallonnes*"
 - Coordinator of the "Intelliterwal" platform (*Plateforme d'Intelligence territoriale wallonne*)
 - Other foresight related activities at the European level (Mutual Learning Platform, Blueprints for Foresight Actions in the Regions), for the Millenium project.

- **Heselmans Frederic** (3 December 2007)
Director of the CLEO (*Centre d'Etude de l'Opinion*) / *Université de Liège*
 - Partner on the exercise "Étude prospective en appui de la politique scientifique fédérale"
 - Redactor of the "*Guide pratique pour la prospective régionale en Belgique*", involved in 'Liège 2020'

- **Florence Hennart** (10 Decembre 2007)
"Direction de la Politique Economique; DG économie et emploi" at the Walloon Region
 - Developers of the exercise "*La prospective des entreprises wallonnes*"

- **Bernadette Merenne-Schoumaker** (9 January 2008)
President and professor at the "Département de Géographie, Faculté des Sciences"
 - Member of the "*Collège Régional de Prospective de la Région wallonne*"
 - Scientific expert for the prospective group at the DATAR (France) (former "*Délégation à l'aménagement du territoire et à l'action régionale*") (Territoires 2020), for the exercise "*Cinq scénarios pour l'Europe de 2020*" (Datar), and in "*Liège 2020*" scenario exercise

Dutch Speaking Interviews

- **Erik Mathijs** (10 December 2007)
Professor (hoogleraar) at the department of Agriculture and Food economy at the University of Leuven.
 - *Dierlijke Productie en Consumptie in de 21ste eeuw. Toekomstscenario's*
 - Initiator *Op grond van morgen, Visie op landbouw in Vlaanderen, anno 2030*, Stedula

- **Peter De Smedt** (21 December 2007)
European Commission - DG Research Environment - Sustainable Development Unit I2,
 - Initiator of ISOA Scenarios, APS, '*Verkennen van de Toekomst met scenario's*'
 - Researcher and facilitator on the IPO (Interbestuurlijk Plattelandsoverleg) Scenario project '*Plattelandsbeleid, een gezamenlijk Innovatieproces. Visie, Instrumenten en Indicatoren.*

- **Eva Verstraete** (16 January 2008)
VLM (Vlaamse Landmaatschappij- Flemish Land Agency)
 - Reseacher and facilitator on the IPO (Interbestuurlijk Plattelandsoverleg) Scenario project, *Project: 'Plattelandsbeleid, een gezamenlijk Innovatieproces. Visie, Instrumenten en Indicatoren.*

- **Michael Van Lieshout** (22 January 2008)
Director *Pantopicon*, consultancy agency
 - Process design IPO Scenario(Interbestuurlijk Plattelandsoverleg) project, '*Plattelandsbeleid, een gezamenlijk Innovatieproces. Visie, Instrumenten en Indicatoren.*
 - Currently involved in several future explorations and Transition Management processes.

- **Donaat Cosaert and Stef Steyaert** (11 February 2008)
VIWTA (Flemish Institute for Science and Technology Assessment)
 - Initiators of the exercise 'Toekomstverkenning energiesystemen – Vlaanderen 2050'.

ANNEXES 3:

LIST OF SCENARIO EXERCISES REFERENCED IN THE PAPER

Through the literature review, the WP2, the interviews and previous research, we have encountered a range of scenario exercises in a broad sense. Some have been used as illustration in the paper. Thus to be clear, we present briefly here

ESPON PROJECT 3.2	
Commanditaire	European
Developers team	IGEAT - AETS (Agence Européenne «Territoires et Synergies » - Fr)
Objectives/ Thematic	Spatial Scenarios and Orientations in relation to the ESDP and Cohesion Policy
Territorial level	Europe and regions
Methodology	Explorative scenarios, expert-driven

ÉTUDE PROSPECTIVE EN APPUI DE LA POLITIQUE SCIENTIFIQUE FÉDÉRALE	
Commanditaire	Federal science policy (Ex OSTC)
Developers team	Vito - CLEO
Objectives/ Thematic	Identify the strategically important domains for federal science policy
Territorial level	Federal administration level
Methodology	Strategic foresight, stakeholders participation

GSG SCENARIOS (Great transition)	
Commanditaire	Paul Raskin (Global Scenario Group et Stockholm Environment Institute)
Developers team	
Objectives/ Thematic	Transition towards SD
Territorial level	Global
Methodology	Trend projection, explorative and backcasting scenarios, experts-driven

LIÈGE 2020	
Commanditaire	SPI+
Developers team	Benoit Collet (coordinator) (consultant: Futuribles)
Objectives/ Thematic	Identification of future challenges for the city of Liège
Territorial level	City
Methodology	Explorative scenarios, stakeholders-driven

MILLENIUM ECOSYSTEM ASSESSMENT (MEA)	
Commanditaire	UNEP/GEF
Developers team	Scenarios Working Group of the Millennium Ecosystem Assessment
Objectives/Them.	Approaches to ecosystem management and the impact on human well-being
Territorial level	Global
Methodology	“Storyline-and-simulation” approach combined with “axes-technique”; Interviews with stakeholders

PROSPECTIVE DES ENTREPRISES WALLONNES	
Commanditaire	Walloon Economy Ministry (Kubla)
Developers team	Administration (consultant: Destrée Institute)
Objectives/ Thematic	Explore needs and wishes of private firms in order to identify propositions of public policy for the Walloon economy ministry.
Territorial level	Regional
Methodology	Strategic prospective, stakeholders participation (business leaders)

TOOLSUST	
Commanditaire	European Sustainable Cities and Towns Campaign ; Fifth framework Programme of the EU (1998-2002)
Developers team	Eivind Stø, The National Institute for Consumer Research (SIFO) (coordinator)
Objectives/ Thematic	Research project SD
Territorial level	City level (participative process in 5 cities): Fredrikstad (Nw), Stockholm (Sw), Padova (It), Guildford (UK) and Groningen (NI)
Methodology	Scenario axes-technique, backcasting approach, participation of citizens

VISIONS	
Commanditaire	Commission Européenne, DG RTD
Developers team	Prof. Jan Rotmans (Maastricht University, International Center for Integrative Study - ICIS) (coordinator)
Objectives/ Thematic	Research project The future of Europe at different scales
Territorial level	Europe at various level (elaboration of 5 scenarios at the different level): Green Heart (NI), Venice (It), Northwest (UK), Europe as institutional level and as a whole.
Methodology	Explorative scenarios (participation of stakeholders, citizens and experts)

WALLONIE 2020	
Commanditaire	/
Developers team	Institut Destrée
Objectives/ Thematic	Renewing the vision for Wallonia (Participants: stakeholders and citizens; Target audience: political parties)
Territorial level	Regional
	The future of the Walloon region
Methodology	Participative prospective