This section provides an overview of the principal tools used within FUTURREG. More detailed reports are available on the project website www.futurreg.net. The descriptions illustrate how the tools can address the motivations/needs and issues/variables of the regional actors and their projects. Where relevant they are cross-referenced to case studies of FUTURREG regional sub-project futures exercises in Section 9.B of this Toolkit, in which the tools were employed singly or in combination.

5.1 Scenario Building

What are Scenarios?

Scenarios are special stories that portray plausible futures. One expert describes scenario building as ‘a tool for ordering one’s perceptions about alternative futures environments in which one’s decisions might be played out’ (Schwartz, 1996: 4). Scenarios can be very powerful tools to contemplate the range of possible futures that could develop from the influence of key drivers, events and issues. Although scenarios can take advantage of quantitative forecasts and projections, scenarios are not designed primarily to predict the future per se, but rather to develop capacity to consider a range of possible futures, developed from the interactions between important variables.

Scenario Building is different to other analytical methods in its focus on plausible futures. Methodologically, it digresses from some of the quantitative methods of analysis that seek to understand the future. Information on trends is a very important input in developing scenarios. However, scenarios are not merely extrapolations of current trends. To understand how the future might develop, it is important to note that ‘most if not all trends eventually change direction and speed as time passes’ (Cornish, 2004: 99). Inherent within scenario building is an acceptance of complexity and non-linear thinking. Scenarios can use the same essential set of variables or issues but construct different futures based on how they might interact differently.

Usually, a number of scenarios are developed in parallel. The typical number of scenarios developed to address a particular issue is three to four. The scenarios are researched to provide a sufficient level of plausibility, detail and scope for real decision-making.
Objectives and Main Uses

Scenario Building has been used both in companies and in public organisation to address a number of objectives. Within public organisations, the main uses made of scenarios are the following:

⇒ Development of strategy and policy: this is a typical use of scenarios in public sector organisations. Scenarios can be used as a key tool in the development of a variety of strategies and policies (thematic, spatial and organisational), e.g. a new innovation strategy, a corporate plan, a territorial or spatial plan;

⇒ Stimulate critical thinking, challenge assumptions - within organisations, the general population. All sorts of issues can be addressed using scenarios, and on different scales, e.g. regions might a scenario building approach to challenge stakeholders to think about scenarios that deal with globalisation and climate change. This approach can be used equally for the internal processes and culture of the organisation.

Why use Scenarios?

The Scenario Building approach has several advantages:

⇒ Offers a non-linear and dynamic way of thinking
⇒ Ability to deal with complexity, to consider multiple variables simultaneously, and with ‘different interpretation’ over time
⇒ Counteracts the historical bias of quantitative forecasting approaches
⇒ Challenge assumptions
⇒ Thinking “outside in” - big, external forces
⇒ Creating common language and understanding - working across disciplines, departments etc
⇒ Organisational alignment to vision
⇒ Develop group of people with ability to think strategically

The main benefits of scenarios outlined by Shell (cited in Ringland, 2002: 4) are:

Scenarios help us to understand today better by imagining tomorrow, increasing the breadth of vision and enabling us to spot change earlier.

Effective future thinking brings a reduction in the level of “crisis management” and improves management capability, particularly change management.

Scenarios provide an effective mechanism for assessing existing strategies and plans and developing and assessing options.

Timescale

There is no prescribed timescale for scenarios. It varies according to organisational needs, question addressed and themes covered. Generally scenarios cover periods of 3-5, 10, 20, or even 50 years. Examples of medium to longer term timescales include

⇒ CIA, Global Trends (2015)
⇒ Shell, Energy needs, choices and possibilities (2050)
Outline of Implementation Steps

The following implementation outline is a common approach, developed by Schwartz (1996) – steps 1 to 8 – and extended by Ringland (2002) – steps 9 to 12.

Step 1: Identify the focal issue or decision
Step 2: Key forces in the local environment (microenvironment)
Step 3: Driving forces (macro environment)
Step 4: Rank by importance and uncertainty
Step 6: Fleshing out the scenarios
Step 7: Implications
Step 8: Selection of leading indicators and signposts
Step 9: Feed the scenarios back to those consulted
Step 10: Discuss the strategic options
Step 11: Agree the implementation plan
Step 12: Publicise the scenarios

5.2 DELPHI

What is Delphi?

Delphi is a tool for generating a series of expert opinions on a given subject. Usually, experts give their judgement - on an individual basis - on the specific questions posed. The Delphi Method is based on a “structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback” (Adler and Ziglio, 1996). According to Helmer (1977) “Delphi represents a useful communication device among a group of experts and thus facilitates the formation of a group judgement”.

Objectives and main uses

The objective of most Delphi applications is the reliable and creative exploration of ideas or the production of suitable information for decision-making.

While many people label Delphi a forecasting procedure because of its significant use in that area, there is a surprising variety of other application areas.

Among those already developed we find:
⇒ Gathering current and historical data not accurately known or available
⇒ Examining the significance of historical events
⇒ Evaluating possible budget allocations
⇒ Exploring urban and regional planning options
⇒ Planning university campus and curriculum development
⇒ Putting together the structure of a model
⇒ Delineating the pros and cons associated with potential policy options
⇒ Developing causal relationships in complex economic or social Phenomena
⇒ Distinguishing and clarifying real and perceived human motivations
⇒ Exposing priorities of personal values, social goal

**Timescale**

The time horizon of Delphi is the long run (more than 20 years), when it proves to be a really useful method. In the late 50’s, ‘long range’ was defined as the span often to fifty years. There are also cases, where the method was used for short range forecasting (2-3 years).

**Implementation**

The Delphi applications are practical when accurate information is unavailable or expensive to obtain, or evaluation models require subjective inputs to the point where they become the dominating parameters. Thus, the method is quite time consuming. “A single round of a simple application requires three weeks; a three-round Delphi is at least a three to four months affair, including preparation and analysis time” (Gordon, 1994).

**Technology example**

The Delphi method is constructed along a hierarchical model.

**Level One** includes the monitoring and evaluation committee that decides on the main technology fields that the exercise will cover, and the main concepts for the evaluation of the technology fields (i.e. role within the industry, social implications, national and international leadership etc.). This usually leads to a dozen fields, more or less common in all national technology foresight exercises. A sub-committee is then set up for each technology field.

**Level Two** concerns the work of sub-committees deciding on the further division of each field into more detailed technology topics. Once the topics are defined, each sub-committee discusses and selects the technology related questions and indicators for the specific technology field. The sub-committee discusses and selects the technology related questions and indicators for the specific technology field. The sub-committees also select the experts who will be asked to answer the questionnaire concerning each technology topic.

**Level Three** is the work done by the experts in each technology field and topic. The experts are asked to fill in the questionnaires in successive rounds, and each round they are informed of the answers given by the other experts. The main advantage of the method is that the experts can shift position, and this is a normal effect of communication and interaction between them. The rounds end when there is a stabilisation of answers. In the end the result may exhibit bipolar views, since the method does not force consensus. In a famous Delphi (RAND 1964) the first round began with a blank sheet, and the panellists provided the first issues, (Linstone and Turoff, 2002).
5.3 Visionary Management

What is Visionary Management?

A vision is a shared picture of the desired future. The vision is made up of the ultimate aims and of the optimal goals which could show the long-term direction that should guide the common strategy of the decision makers, the stakeholders and the citizens. Visionary Management consists of bringing a group of players - involved in a territory (defined or to be defined), a business or an organisation, etc. to form a common vision of their future on behalf of the general interest (e.g. a region, an organisation, or a company). The collective formulation of a future desired for a territory will guide the collective strategy of political decision-makers, stakeholders (businesses, administrations, associations, etc.) and the citizens in order to provide a concrete response to identified issues.

Main objectives and uses

Vision elaboration can be applied in all areas of economic and social life, and is relevant for all levels of territorial governance.

Visionary management is actually part of a strategic foresight process structured in several main phases: identification and diagnosis (1), shared elaboration of long-term issues at stake (2), building the ultimate aims and the common vision (3), bridging the present with the vision by elaborating a strategic programme (4), identification and launching of strategic actions (5). The first three phases are in the realm of foresight - our ability to project ourselves into the future. These phases formulate the vision, followed by the two final phases of the strategy.

Timescale

As shown in the diagram below, the vision is the far horizon, and from this starting point the strategy is introduced at short-, medium- and long-term. From an operational point of view, the vision must be situated at a temporal reference point that is far enough in the future to enable a long-term reflection, yet close enough to have a mobilising and participative potential. Experience with various foresight exercises has shown that a time horizon of 15-20 years is the most practical.

Implementation

The formulation of the territory’s vision is structure in three steps mentioned above. For each step we shall identify their subject, the objectives pursued to formulate the vision progressively, and the methods of reference.

**Step 1: Identification and diagnosis**

Concretely, the diagnosis phase aims at:

- Providing a knowledge base;
- Identifying the common ground;

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4 Blueprints for Foresight Actions in the Regions, Transvision Bridging historically and culturally close neighbouring regions separated by national borders, October 2004
5 A similar approach could be applied for the development of a company or any organization.
- Expressing the mental representations;
- Confronting with the realities;
- Sharing of the diagnosis.

It is important to stress that this diagnosis must not only be a preliminary to the later phases - identifying long-term issues and formulating a vision - but it can also form the groundwork for a knowledge base on developments in the territory which may take shape in various ways depending on the situation.

**Step 2: Shared formulation of the long-term issues at stake**

The vision definition relies on a previous analysis of the potential paths over the long term and requires attention to be paid to many sources of change, interaction and complexity. This key step focuses more specifically on identifying internal and external trends in the territory's evolution, as well as any possible discontinuities (possibles) in order to deduce their impact in terms of issues for the territory.

Concretely, this step aims at:
- Identification of the global driving forces and their impact on the territory;
- Selection of the main issues for building a common vision for the territory;
- Identification of the role and the power of actors against these issues.

Futures workshops and computer-based tools as MICMAC can be used to classify the key issues. Developed by the LIPSOR\(^6\), MICMAC is a method by which the interrelationships between the issues can be highlighted and the complex multiple interactions between them assessed in a systematic way.\(^7\)

The process of organizing the issues raised can be useful to determine the ability of the actors to deal with change. To ascribe a hierarchy to the challenges, it is possible for example to use an importance vs. control matrix. The actors can be

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\(^6\) Conservatoire national des Arts et Métiers, Paris

\(^7\) See [http://www.3ie.org/lipsor/logiciels.htm](http://www.3ie.org/lipsor/logiciels.htm) (free software).
asked to identify the critical changes and the inertias and assess how to reduce or increase their impact. By positioning the issues in the four zones, it is possible to determine the importance of the issues and their current degree of control. This kind of matrix can open the discussion about the involvement of actors in change management, about their control of the issues and about their ability to reduce the impact of the changes out of their control.

**Step 3: Building the ultimate aims and the common vision**

The exploratory phase of determining the future issues is followed by the normative phase of defining a future vision aimed at directing the action. In a future with multiple possibilities there may be many responses to the issues identified.

The vision will therefore constitute the desirable future by responding to challenges identified over time and of mobilising all stakeholders, decision makers, actors and citizens to achieve this objective.

Concretely, this third step aims at:

- Formulating the desirable futures and the ultimate aims
- Sharing of the vision

The vision must be global, voluntary, workable and have a long-term perspective so as to give direction to the actions and act as a support for the strategy to achieve it.

Many methods may be used to construct this vision, ranging from simple to more elaborate techniques using for example complex matrices comparing possible futures and desirable futures.

### 5.4 Horizon Scanning

**What is Horizon Scanning?**

Horizon scanning\(^8\), often also referred to as environmental\(^9\) or technology scanning or just scanning, is a futures tool\(^10\) which supports policy design work and strategy development in the public and private sectors in terms of medium to long-term futures. According to the UK-based Defra (Department of Environment, Food and Rural Activities), horizon scanning may be defined as “the systematic examination of potential threats, opportunities and likely future developments which are at the margins of current thinking and planning. Horizon scanning may explore novel and unexpected issues, as well as persistent problems or trends. Overall, horizon scanning is intended to improve the robustness of Defra’s policies and evidence base”.

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\(^8\) Brown and Weiner (1985) define scanning as “a kind of radar to scan the world systematically and signal the new, the unexpected, the major and the minor” (p. ix).

\(^9\) Aguilar (1967), in his study of the information gathering practices of managers, defined scanning as the systematic collection of external information in order to (1) lessen the randomness of information flowing into the organization and (2) provide early warnings for managers of changing external conditions.

http://horizon.unc.edu/courses/papers/enviroscan/

\(^10\) According to the FOREN Guide, scanning “is not a Foresight method as such, more a necessary background to the topic of Foresight.”
Main objectives and uses

Coates (1985) identifies the following objectives for horizon/environmental scanning:

- detecting scientific, technical, economic, social, and political trends and events important to the institution,
- defining the potential threats, opportunities, or changes for the institution implied by those trends and events,
- promoting a future orientation in the thinking of management and staff, and alerting management and staff to trends that are converging, diverging, speeding up, slowing down, or interacting.

More broadly, horizon scanning is currently being recognised as a high impact futures tool which through its application provides policy intelligence, reflected in insights (trends and drivers) and implications (policy challenges and actions).

Some of the main practical uses of horizon scanning are:

- **Horizon Scanning as intelligence-gathering activity**
- Horizon scanning for priority setting for S&T research and innovation investments.
- Horizon scanning for benchmarking
- Horizon scanning for organisational learning

**Horizon scanning may be used to address a range of national and regional policy challenges:**

(i) Broad Policy Challenges
- systematic and evidence-based approaches to improve current and future policy design
- to improve the robustness of policy approaches
- to challenge existing policy approaches and underlying assumptions on which they are based
- to explore alternative policy options based on radical, disruptive or out-of-the-box thinking /tools
- to identify and provide an early warning on new threats and risks as well as new opportunities

In practice, horizon scanning is used by governments to address a mix of policy objectives and challenges, ranging from a move towards more evidence-based policy design and formulation to more long-term strategic outlooks in decision-making.

(ii) Sectoral Policy Challenges
(iii) Societal challenges
(iv) Technological challenges

**Timescale**

The tool is generally used to address 10+ time horizons, however time horizons may vary in accordance with context and the preferences of the sponsor and/or implementing agency. For example, the UK Horizon Scanning Centre is to identify future issues (and future aspects of current issues) of **potentially significant impact or opportunity**, over 10, 25, and 50-year timescales.

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5.5 Trend Analysis

What is Trend Analysis?

Trend Analysis is one of the most often used methods in forecasting. It aims to observe and register the past performance of a certain factor and project it into the future. It involves analysis of two groups of trends:

- quantitative, mainly based on statistical data, and
- qualitative, these are at large concerned with social, institutional, organisational and political patterns.

Specific techniques for forecasting fall into two main categories, exploratory and normative.

Exploratory techniques are primarily concerned with the analysis of historical data. Selected attributes such as functional performance, technical parameters, economic performance etc. are outlined against time. Since it is usually assumed that progress is evolutionary and that regional development is not random, it is possible to generate characteristic curves or patterns from the data and from these patterns forecasts can be made with varying degrees of certainty. However, changes do occur and the influence and impact of new or surprise factors must not be disregarded. Trend identification and extrapolation are examples of relevant exploratory techniques. These rely on a large amount of statistical data.

Normative techniques start by proposing a desired or possible state giving preference to certain trends, and work backwards from this to determine the steps

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necessary to reach the required outcome. The number of foreseeable paths of
development from the present position to the objective could range from 'none',
implying for examples a completely new technology, innovation or law, to 'several'.
Each feasible path to reach the objective is analysed for its relevance and
difficulty. Examples of relevant normative techniques are: relevance trees,
morphological analysis, technology watch and technology monitoring, Delphi
analysis and Trend Impact Analysis (TIA).

Information needed for normative techniques is more qualitative than that needed
for exploratory techniques (Figure 1).

<table>
<thead>
<tr>
<th>Forecast variable</th>
<th>Forecast variable</th>
<th>What measures should be taken to achieve an objective?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past</td>
<td>Future</td>
<td>Time</td>
</tr>
<tr>
<td>Trend so far</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>Variant 1</td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>Variant 2</td>
<td></td>
</tr>
</tbody>
</table>

**Main objectives and uses**

Trend analysis is a methodology of value to both futures researchers and policy
evaluators; its data can be used to extrapolate previous trends term concerning
both future goal achievements and future policies. Time series can also be used
to relate policies to goals provided that the reciprocal effect of goal
achievement on policy adoption and vice versa is taken into consideration (Case
study 1 is one example of this).

Trend analysis can be applied in various planning and decision-making
situations. It is well suited for policy and strategy level planning and
monitoring. Policy level includes the formulation and impact assessment of
policy options (mainly aims, objectives and resource allocation). At strategic
level the main instruments are plans and programmes. They are more detailed
in content, and their objectives and impacts are easier to put into context and
to locate.

The results of trend extrapolations can either be used directly in order to
establish an idea of the future evolution of an indicator (e.g. demographic
change: either they are used as input to other methods like scenario analysis or
modelling. Trend analysis refers to the study of general development trends
needed as an information basis when carrying out various planning and
decision-making tasks.
One of the hallmarks of trends analysis is the understanding that regional development paths can only be fully understood if the influencing factors (their frequency and distribution) are examined in terms of region, scope, and time. Trend analysis is used for regional development surveillance and monitoring, for forecasting, for program evaluation, for policy analysis, and for risk analysis (investigation of potentially causal relationships between risk factors and outcomes). Rosenberg (1998, 195) lists several issues a trend analysis may focus on:

⇒ The overall pattern of change in an indicator over time
⇒ Comparing one time period to another time period
⇒ Comparing one geographic area to another
⇒ Comparing one industrial sector, line of business, population group, consumption patterns etc. to another
⇒ Making future projections

**Implementation steps**

The type of implementation depends on the variant of trend analysis undertaken. Trend extrapolation and trend impact analysis are two common approaches in Foresight exercises. Further guidance on these approaches is contained within the accompanying report on trend analysis.

### 5.6 Futures Workshop

**What is a Futures Workshop?**

A futures workshop is a method for creating ideas for a preferable future and the means to reach it in collaboration with the others involved. The work in futures workshops is based on the analysis of a present situation with its problems and possibly also its strengths.

The basic ideas of the method are

⇒ empowerment and active futures work in cooperation with other people in the workshop;
⇒ work based on the analysis of the present circumstances of a topic;
⇒ the open and rich creation of different ideas concerning the possible futures of the topic within a selected time horizon;
⇒ the evaluation of the created ideas e.g. to select a desired future and suggest other possible futures in cooperation with the workshop;
⇒ the formulation of concrete action plans, with which it is possible to reach the desired future from the topic’s present situation.

**Timescale**

A futures workshop is suitable for a study that has a 5-25 years time horizon. If the workshop’s target is to make only a vision, an even longer time horizon is possible. But for the planning of concrete activities too long a time horizon is worthless. If an extremely long-term vision is needed, it is possible to arrange futures workshops with some year’s intervals for its implementation. At the same time it is also useful to revise the vision.

**Implementation steps**

The essential principles of futures workshops are that all participants are equal in the workshop and the whole working process should be transparent. Every
workshop should have a trained leader, who has the task of guaranteeing the equality and transparency of the process.

The main phases of a futures workshop are the following:

**A Critique Phase**
The examination of the present situation with its problems and/or characteristics

**The Imagination Phase**
The free creation of future possibilities by breaking out of present requirements and constraints

**The Evaluative Phase**
The choosing of e.g. on the one hand preferable or desired futures, and on the other hand possible ideas for realisation

**The Realisation Phase**
The definition of the means of realisation for those ideas that are chosen (who, what, when, how etc.)

**Number of workshops**
Future workshops can vary in number: from one single workshop to a series of (usually) 2-4 workshops. One single workshop is a compact working session. It is easy to commit oneself to the work in this workshop, when the demand made of one’s time is limited. This kind of workshop can take a half or a whole day. At a minimum 3-4 hours are required.

In a series of workshops the issues to be discussed can be incubated between different workshops. Participants have the opportunity to work with the subject between the workshops and thereby support the whole working process. Workshop leaders can guide all participants in this kind of work or provide them with an occasion to do it. Also workshop leaders have the possibility to analyse intermediate results between different workshops and lead the workshop process further based on them. It is easier to insert time-consuming
complementary methods into a series of workshops than into just a single workshop, simply due to the length of the disposable time available. A series of workshops can be arranged during a weekend or with several intervals. An interval should not be too long; otherwise participants will lose touch with the dynamic ideas and thoughts of the productive process. If all workshops are arranged in one weekend, neither leaders nor participants have the opportunity to work on ideas between workshops. When this kind of work is important, workshops should have some time - even weeks - between them.

You should now:

- **Understand the main objectives and uses** of Scenario building, Delphi, Visionary Management, Horizon Scanning, Trend Analysis and Futures Workshops

- **Be ready to access and analyse** more comprehensive tools information in taking forward your own exercise/project.