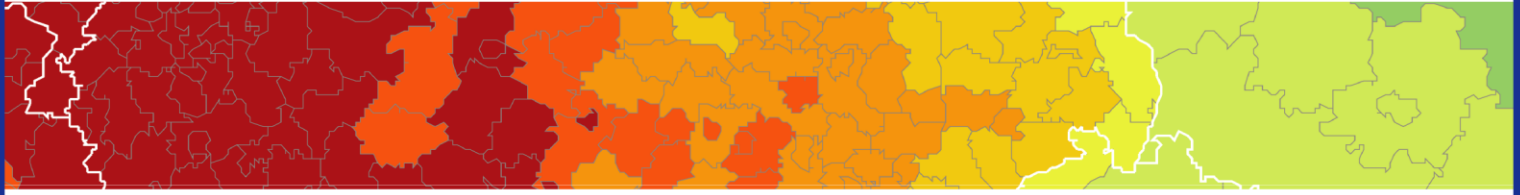


Inspire policy making by territorial evidence



Possible European Territorial Futures

**Final Report
Volume C
Guidelines to Territorial Foresight
Version 21/02/2018**

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Possible European Territorial Futures

Guidelines to territorial foresight

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1 Introduction

This handbook has been developed by foresight practitioners to be useful to other professionals. We would like to inspire foresight practice by providing a number of evidences gathered working on European Spatial Planning during the last decade, particularly in the ESPON Programme.

Our objective is to inspire consultants and researchers when developing foresight studies with a particular emphasis on future implications concerning territorial development.

We believe that the purpose of foresight is not just to think on the future, but to support policy decisions to be taken nowadays. Any future-oriented study is if anything a call for action – the knowledge gathered is not an end in itself but a mean supporting the deliberation required to agree on a given set of actions: which road to take – and often, the conclusion of a foresight study is to take the harder road ahead.

We also believe policies can not be blind to the specificities and needs of places, and people. Just because the de-territorialised nature of globalisation and new communication technologies, the impacts development trends and policies have on people living and working in a given place matters as much than decades and centuries ago, just in a different manner.

Since the possible futures we are able to image are heavily constrained by our memories and present concerns, as well as by our specialised knowledge, foresight always requires a well informed deliberation by as many and as knowledgeable and sensitive persons as possible. Needless to say, the outcomes of this deliberation process will be more useful only if sound methods are applied.

We understand foresight, therefore, as a framework for a group of people concerned with common issues at stake to jointly think and imagine possible futures in a structured and constructive way.

There are a number of well tested methods to support structured forward thinking deliberations, from computerised forecast modelling based on scientific theories, to brainstorming or mental mapping.

In this handbook we present the approach to territorial foresight developed by the ESPON project 'Possible European Territorial Futures', and describe a number methods to illustrate the richness of approaches available. The aim is to provide for a multifaceted view of territorial foresight helping practitioners to design their own successful territorial foresight process.

Based on our foresight practice, we do believe that no single foresight method can ever be both complete and consistent enough to be the ultimate territorial foresight method. We recognise that the application of any handbook or guideline mostly depends on two factors: the tradition in which a practitioner works, and the organisational context in which the work

has to be carried out. Every practitioner will have preferred methodologies, and the choice of which to use must depend on what is appropriate for the study being carried out.

The handbook is structured along three parts.

Part A presents a stepwise guide to the territorial foresight process developed and tested by the ESPON project. The single steps are accompanied by textboxes illustrating how the project has done it. This stepwise guide can be applied – with minor adjustments – at any geographical level (from local to global) and for a wide range of different foresight topics.

Part B provides a more general guide to co-creative foresight oriented policy making. Even though we suggest a stepwise process, we don't expect that neither all steps be necessary on all foresight exercise nor in the sequence we introduce them. Successful foresight is far from being a mechanistic or cybernetic procedure, and the skills and competences needed are as interpersonal as scientific, artistic and philosophical. More than analytic, foresight is systemic.

Part C offers a wider contextual framework useful for exploring territorial foresight. This starts with an introductory chapter ("Concepts") providing an understanding of fundamental foresight concepts, beginning by the difference between foresight and forecast. The next chapter ("Approach") introduces a theoretical background to foresight, based on the co-creation approach, and the competences required to carry on foresight studies. Finally, three main consecutive research ESPON future-oriented projects carried out in the last decade are revisited critically in the latest chapter ("Cases"). To a large extent, the handbook is built from the actual lessons learnt from these cases.

Part A – Practitioners guide to territorial foresight

Territorial foresight is a future oriented approach characterised by (a) critical, lateral thinking concerning long-term developments and their impacts on territorial development, (b) wider participatory engagement and (c) informing public and/or private decision making. Territorial foresight provides a framework to support participants in a structured forward thinking concerning territorial development. To ensure the territorial dimension in foresight thinking, the ESPON approach to territorial foresight adapts elements of the territorial impact assessment developed under earlier ESPON studies. This approach can be used to study any policy questions, future vision or dystopian thoughts.

Territorial foresight can help to better understand the implications of either development trends or ideas for a wanted or unwanted futures. This has various benefits:

- **Approaching complexity and uncertainty:** Bringing together the insights and knowledge of a wide range of different participants allows to approach complexities and uncertainties where no quantitative information about the future is available.
- **Understanding territorial consequences of (im)possible futures:** This helps to understand possible territorial consequences of a major trends, large development objectives or possible dystopias.
- **Creating wide ownership:** With a strong focus on participatory forward thinking involving people with a common issue, also the ownership of the foresight topic, possible territorial consequences and pointers for policy making can be strengthened.
- **Informing decision making:** Being aware about territorial consequences of a foresight topic, can inform policy making. This can lead to policy decisions avoiding unwanted territorial implications or accelerating wanted implications.

Territorial foresight can be conducted at any geographical level. While this study focused on the European level, it could equally well be applied at any other scale from local or global.

The ESPON approach to territorial foresight starts from a roughly defined topic or 'what if question'. Put differently, the approach helps to explore possible answers to a question such as 'What would be the territorial implications, if we had XYZ in future?'

The centre piece of the approach is a well prepared and clearly structure focus group.

The participatory approach to territorial foresight contains a number of steps. Each of the steps is explained in some detail below. Examples boxes for each step show how the step has been applied in the framework of the ESPON study on Possible European Territorial Futures. Overall the various steps can be grouped into three distinct phases:

- **Preparation** (incl. document studies and analysis on foresight topic and preparation of the participatory event);
- **Interactive participatory involvement** (incl. at least one participatory event, possibly also several events or also accompanying online surveys or webinars);

- **Finalisation / post-processing** (post processing of the results of the participatory event(s) including additional analysis where needed).

2 Preparation steps

The success of a territorial foresight depends on how existing information (both quantitative and qualitative) are brought together and fed into participatory processes. Furthermore, the quality of a participatory approach depends on the profile and composition of group of participants. Therefore, the preparation phase (and steps) are important.

Before entering the territorial foresight process, the formulation and definition of the foresight should be agreed and it should be clear who will conduct the foresight study.

2.1 Selection of participants

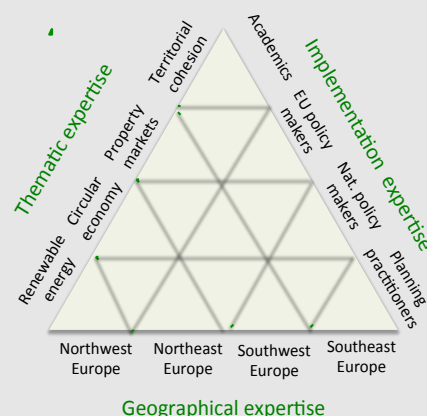
A crucial question for the selection of participants is 'Who has a stake in the foresight topic or relevant expert knowledge?'. Based on this, participants should be selected carefully taking into account: (a) expertise in the field (b) different functions (e.g. academics, policy makers, practitioners) (c) different 'thematic expertise' (e.g. different professions) (d) different 'geographical expertise' (e.g. levels and/or parts of the territory covered).

Depending on the total number of participants and different levels of expertise in the foresight topic, varying modes of involvement can be applied. Some participants can be involved via online surveys or webinars to ensure that the actual workshops and focus groups do not turn into conferences.

How it was done in the ESPON study on Possible European Territorial Futures

For each type of expertise (thematic, implementation, geography), a number of sub-categories have been developed (see figure). On this basis, potential participants for the foresight process have been identified.

As the number of potential participants went into the hundreds, for each sub-category those with the highest level of experience have been identified ensuring a balance between the various types of expertise. Those with highest levels of expertise were invited to the focus groups, while the others were invited to participate in online the survey and webinar.



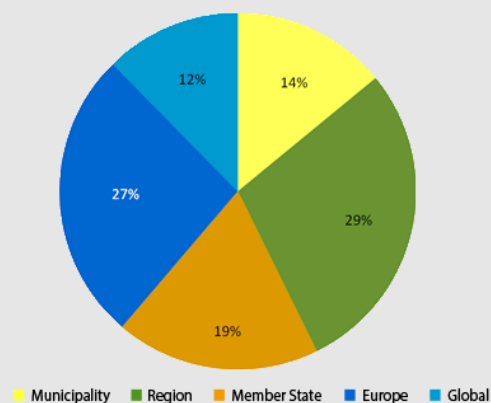
2.2 Online interaction with experts: surveys and webinars

Besides the focus group (see section 3), the participatory process may also include online surveys to allow for a broader participation than what is possible through a focus group. This can e.g. be used to explore trends or seeds of change which are important for the foresight topic or to test preliminary findings.

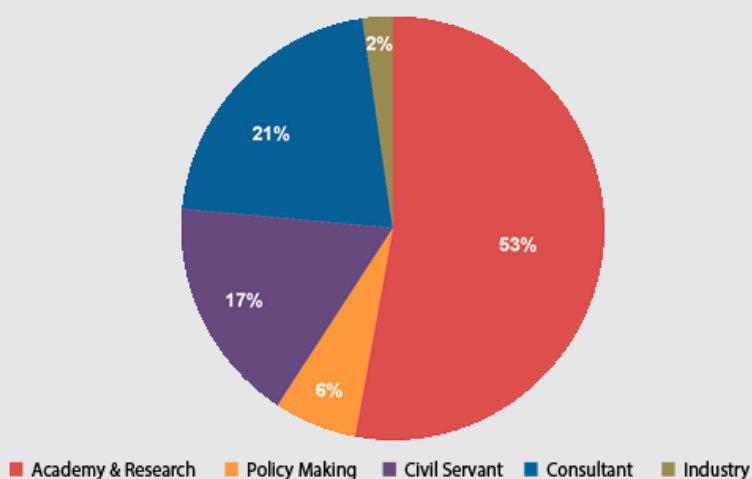
How it was done in the ESPON study on Possible European Territorial Futures

A large online survey has been organised early on in the process. The survey presented a range of different innovative practice examples and asked to what degree these might be early indications of future trends or technologies. The respondents came from all over Europe and many different sectors.

Territorial scope of expert's professional work



Professional background of participants



2.3 Preparation of a discussion paper

Generally, participants should receive input to set the scene, prior to the participatory event (workshop / focus group). This input can be a discussion paper, which sets the mood for the topic to be discussed and provides background information on the process, topic, possible trends/features to be addressed and how far in the future the process should look. The aim is to provide a common basis of understanding and may include:

- Information about the event
 - Context and aim of the event
 - Approach at the event
 - Use of the results
 - Organisational information about venue, time planning etc.
- Content information
 - Description of the topic
 - Information on the topic, including inputs and maps on indicators that show the territorial dimension of the foresight topic
 - Factors impacted and cause-effect chains
 - First hypothesis on territorial exposures and sensitivities (or impacts)

How it was done in the ESPON study on Possible European Territorial Futures

Given the complexity of the topics and the broad European scale, two different focus groups had been organised. A first one on the general understanding of the European territory, important development trends, and the general framing of the foresight topics. For this 24 participants met in Barcelona early on in the process. The input paper focused on latest ESPON results, major development trends, and the understanding of the foresight topics.

The second focus group consisted merely of three parallel workshops (one on each foresight topic). These focused on the actual territorial foresight in terms of possible territorial consequences of the foresight topics. For this extensive preparatory research had been carried bringing together available quantitative and qualitative information on parameters framing each of the topics, current developments and prognosis for the future, first ideas on relevant cause-effect chains leading to territorial consequences and also first statements concerning possible territorial consequences. The paper of 38 pages (covering all three foresight topics) has been sent to the 59 participants prior to the focus group which took place in Vienna.



2.4 Pre-selection of maps and indicators

Existing information such as maps and statistics that can be fed into the discussion when needed ensures high quality discussions at the event. The preselected material may include:

- Thematic information
 - Fine tuning understanding of the foresight topics
 - Forecasts and prognoses for specific aspects of the foresight topics
 - Initial systemic picture showing cause-effect relations between parameters influencing the foresight topic.
- Territorial information showing the territorial diversity of the topic
 - Geographical information with the exposure of types of territories to the topic (see also section 3.5)
 - Geographical information with the sensitivities of types of territories to the topic (see also section 3.6)
 - General territorial background information such as standard indicators on GDP, population, rural-urban distinctions etc., that may be of interest.

How it was done in the ESPON study on Possible European Territorial Futures

In preparation of the focus group in Vienna, for each of the three foresight topics, 10-15 key European maps have been selected showing relevant indicators. The purpose was to have maps at hand which can help the participants to understand the territorial diversity of various aspects more or less directly related to the foresight topic. In the case of the foresight topic 'circular economy' the map collection included among others maps on waste, recycling, sewage water, green patents, organic farming, innovation, and migration.

2.5 Preparing the moderation

To ensure smooth running of the event, preparing and printing materials is helpful:

- Detailed moderation script

- Basic flipcharts for ‘framing the topic’ and the ‘cause-effect chains’
- Empty maps for mapping exposure and sensitivity
- Background maps to inform the mapping exercise
- Feedback form

How it was done in the ESPON study on Possible European Territorial Futures

In addition to moderation scripts which are rather individual, a large number of materials have been prepared for the focus group in Vienna. These included:

- Flipcharts for framing the topic (one per discussion table) structuring the paper in terms of ‘main developments’, ‘challenges’ and ‘regions affected’ (see picture in section 3.1)
- Large papers for drawing cause-effect chains (one per foresight topic) labelling the four corners as ‘society’, ‘economy’, ‘environment’ and ‘government’ respectively. (see picture in section 3.2)
- Blank European maps for own mapping exercises (several per discussion table)
- Background maps (see previous step) (several per discussion table)
- Programme, list of participants and badges (one for each participant)
- Online feedback form

3 Interactive participatory steps

The participatory event or focus group is the centre piece of the territorial foresight exercise. Running a participatory foresight process, is an interesting exercise, where a large number of people need to be guided through a complex discussion rounds.

The general welcome and introduction to the event should clarify:

- Aim of event and use of the results
 - Broadening the scope – ensuring a wide perspective
 - Input for further research
 - Workshop results are not the final results
- Definition of the approach
 - Time perspective – roughly what year in the future is addressed in the foresight
 - The exercise is about what the future might look like (Imagine you wake up and the foresight topic is reality, what will the territory look like?)
 - The exercise is not about how to get there
- Definition of the foresight topic
 - Definition of the system boundaries (e.g. the territory, general information)
 - Parameters describing the foresight topics
 - Technological, social, economic, environmental changes which can. or cannot be assumed

The general introduction, is followed by specific steps towards a territorial foresight discussion.

How it was done in the ESPON study on Possible European Territorial Futures

The main participatory process was a focus group with 59 participants organised in Vienna. The general introduction and discussion of the final conclusion were done in the plenary. The actually foresight work was conducted in three parallel workshops, one for each foresight topics, i.e. circular economy, 100% renewable energy and collapse of property markets. The workshops contained different working moments some of which were conducted jointly by the entire workshop group, and for others the group split into small table discussions.



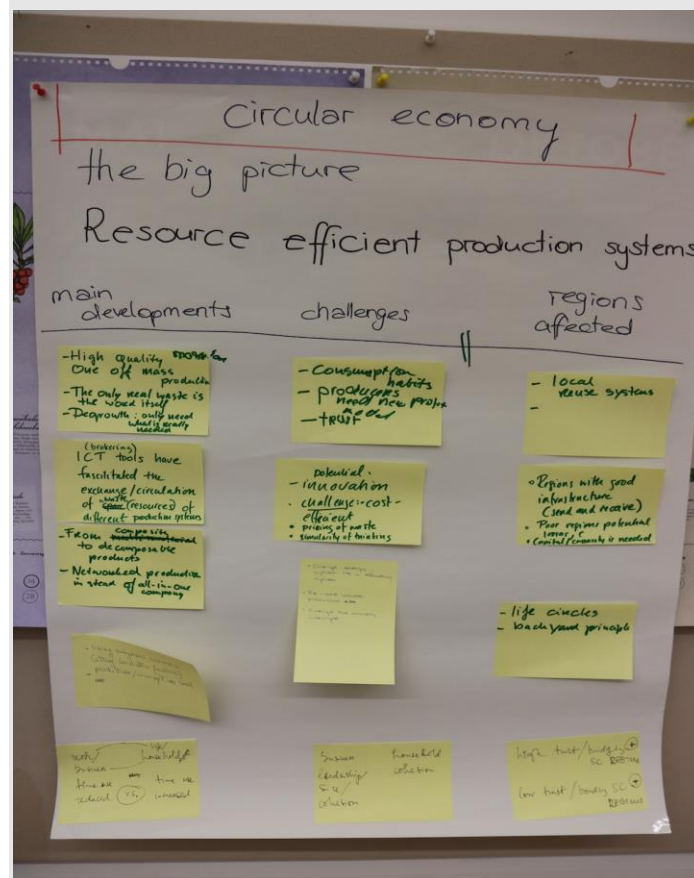
3.1 Framing the foresight topic

The first participatory moment focuses on establishing common understanding, in small working groups, of the topic:

- Imagine, you wake up in the future:
 - What would be the main changes which characterise that new situation in the territory?
 - What would be the main challenges/opportunities people will be facing?
 - What types or parts of territories would be positively or negatively affected by these developments?
- Following a short time for individual reflection, each sub-group starts to populate a flipchart with developments, challenges/opportunities and sub-territories affected.

How it was done in the ESPON study on Possible European Territorial Futures

This step was organised around a number of small discussion tables (4-8 persons per table). Each table got a prepared flipchart and empty post its. The table participants were asked to discuss and note down the most relevant developments, challenges and affected regions – with regard to their foresight topic.



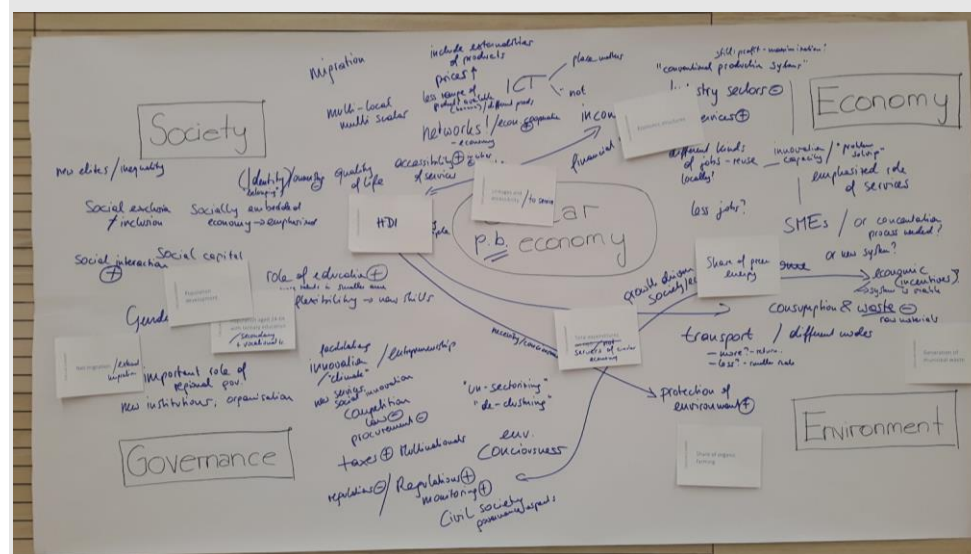
3.2 Identifying relevant cause-effect chains

The second participatory moment focuses on establishing a systemic picture with basic cause-effect relations:

- The group gathers around a large piece of paper where the foresight topic is written in the centre and the corners are labelled economy / environment / society / governance
- The group discusses the territorial effects regarding each factor of economy / environment / society / governance
- Who is affected by the new situation and how?
- What are the relationships between the factors?
- Discussion points are noted on the paper and linked with arrows where appropriate.

How it was done in the ESPON study on Possible European Territorial Futures

Following the table discussions on the framing of the foresight topic, a joint picture on key aspects and causal relationships between different key aspects was established. Key words were put down on the paper and actual relations between them indicated by arrows. As the discussion went on, the moderator ensured that important cause-effect chains evolved step by step.



3.3 Identifying indicators which can help to illustrate key aspects

After describing the systemic linkages possible indicators and factors were identified that could help to describe these linkages:

- Looking at the cause-effect chains developed in the earlier step, the group considers which factors should further discussed;
- The group discusses which factors can be linked to, or represented by, existing indicators;
- The group discusses which factors cannot be linked to existing indicators but can be reflected through qualitative information and/or tacit knowledge.

How it was done in the ESPON study on Possible European Territorial Futures

Following up on the established cause-effect chains, a general discussion was initiated about possible indicators to map relevant parts of the cause effect chains. At that step the moderator played an important role providing information on possible indicators for which data at European level is available. In addition also participants came up with possible indicators and data sources as well as considerations why certain indicators might be more or less suitable. In parts it was also discussed whether for certain indicators, high or low values would be perceived as positive or negative.

The success of this step depends largely on the moderator's knowledge as well as on the preparatory work on researching relevant information and maps (see sections 2.3 and 2.4).

3.4 Selecting what needs to be mapped

Following the general discussion on indicators, the discussion on what should be mapped and what information can be used involves:

- Small group / table discussions focusing on the most important factors / indicators to describe the new Europe?
- Selecting and ranking these factors / indicators (e.g. top 5)
- For each of the factors / indicators, the group discusses what information can help to create a map

How it was done in the ESPON study on Possible European Territorial Futures

In the next steps, people went back to their small discussion tables and started digesting the debate. Each table individually discussed and 'decided' which aspects they believe need to be mapped to illustrate the territorial dimension of the foresight topics. In some cases, the table also decided on narrowing down the foresight topic and concentrating on a specific dimension of it. The discussions also involved expert or tacit knowledge on additional indicators people knew about or at least could present a mental map of.

At this stage the moderator also provided the tables with the pre-selected maps which had been prepared and printed for this exercise (see sections 2.4 and 2.5). While the prepared maps risk to guide participants to mainly look at these indicators, they have been proven valuable for inserting actual territorial knowledge.

3.5 Explore exposures

Exposure: Taking different components of the foresight topic as starting point, exposure is determined by asking: Is a region/territory likely to be (positively or negatively) affected by the change?

The next participatory moment focuses on identifying the factors to be mapped and which territories are exposed. The exercise ought to be preceded by an explanation of "exposure" and "sensitivity" including concrete examples of exposures and sensitivities.

- **Exposure** (foresight question as a starting point): Are the expected changes especially relevant for certain types of regions? This is mainly to find out which regions/territories to consider for further discussion.
- Group discussions on the areas most exposed to this change? (negatively and/or positively)
- Groups put the areas on draft maps
 - Using blank maps
 - Using tacit knowledge

How it was done in the ESPON study on Possible European Territorial Futures

Based on the framing of the foresight topic, the cause-effect chains and the indicators to be selected, each table started to discuss which territories are actually exposed to the change expected from the foresight topic.

As far as possible, the group started also drawing a first own map showing the territorial diversity of the regional exposure to the expected change.



3.6 Explore sensitivities

Sensitivity: Taking regional characteristics as starting point, sensitivity is determined by asking: To what degree will regional development be affected? What is the intensity of impacts due to specific regional characteristics?

The next participatory moment focuses on identifying factors to be mapped, which types of territories are most sensitive to the change:

- **Sensitivity** (regional characteristics as starting point): To what degree will a region/territory be affected? This is mainly to discuss the intensity of impacts that can be

expected in exposed regions/territories, considering the specific characteristics of the regions/territories.

- Group discussions on which areas are most sensitive to the change? (negatively and/or positively). Groups put the areas on draft maps
 - Using blank maps
 - Using tacit knowledge

How it was done in the ESPON study on Possible European Territorial Futures

In the same way as for exposure the tables also discussed and partly mapped which of the exposed territories are more or less sensitive to the expected changes. Often, it was challenging to keep exposure and sensitivity separated in the debate, which is why the debates often merged into one big discussion.

3.7 Develop a foresight narrative

The final participatory element of the workshop focuses on developing the final (mind) map and a short presentation on the rationale or narrative for it:

- Group discussion on the 'final' presentation
 - What to put on the map?
 - What story to tell
- Preparation of a 'final' map
 - Use symbols, colours ...
 - Add a key / legend
- Prepare a flipchart with the story
 - Key messages
 - Rationale / narrative

How it was done in the ESPON study on Possible European Territorial Futures

Winding up the discussion on the territorial dimension of the foresight topics, each table received a large A1 sized blank map of Europe. In that map they brought together the most important territorial features of the foresight topic using colours and symbols according to their own liking and definitions.

In addition to this map they also prepared a flipchart with the key elements of their narratives. Again there was not pre-proposed structure for this. Every group developed its narrative in their own way illustrating key messages and rationale.

Finally all narratives were presented and discussed with the other tables and also the participants of the workshops on the other foresight topics.

4 Finalisation steps

While the participants have done their main duty during the focus group work, a lot of the territorial foresight work comes with the post-processing of the focus group discussions. The insights and discussion points from the interactive participatory work need to be followed up. Subsequent document studies and research inform the territorial foresight report.

4.1 Write-up

Following the participatory event, the results need to be documented, covering:

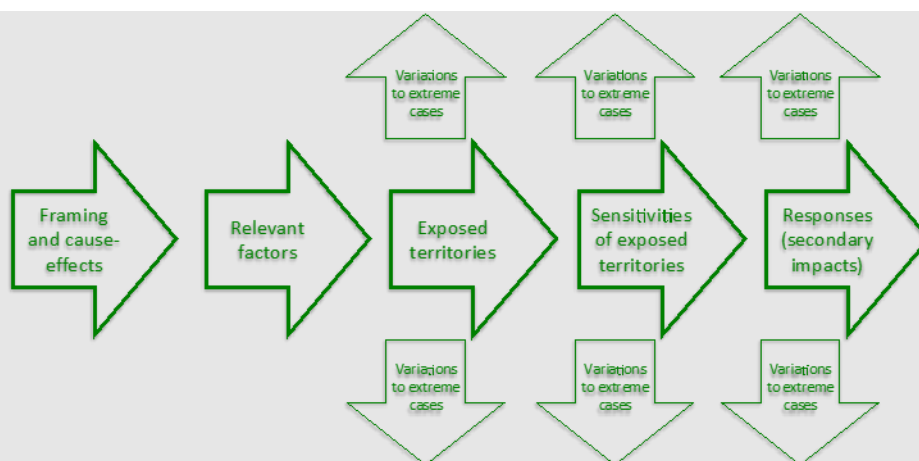
- Discussion findings on
 - Framing the topic
 - Cause-effect relations
 - Types of territories affected
 - Factors to territorialise exposures and sensitivities
- Identification of needs for further information
 - Quantitative
 - Qualitative
 - Cause-effect

How it was done in the ESPON study on Possible European Territorial Futures

A major piece of work concerned the sorting of the information generated during the focus groups and bringing this together with the research done in preparation of the focus group.

For each of the three foresight topics, a specific report has been developed defining the topic as well as key factors shaping its territorial consequences. For each of these key factors, it has been discussed why this factor is important and what it implies. In most cases each key factor contained several dimensions or components. For each of which territorial exposure, sensitivity and impact have been discussed and documented in the report. Finally all information has been brought together to see to how the territorial pattern that emerges differs from the current situation and what the implications are for territorial cohesion.

As the future and the territorial impacts are rather uncertain the development of the reports and analysis also imply a range of possible variations and alternative development paths (see figure). In the report only some of them have been addressed.



The reports are available as Volumes D, E, and F of the ESPON study on Possible European Territorial Futures. (see ESPON website)

4.2 Additional research

The write-up of the foresight report (see above) will also require additional research to follow-up on points raised during the participatory process, as far as possible.

How it was done in the ESPON study on Possible European Territorial Futures

The follow up of the focus groups also implied a wide range of additional research needed to develop the report. This concerned additional literature studies on specific features as well as mapping of indicators which had not been considered in the preparatory work etc.

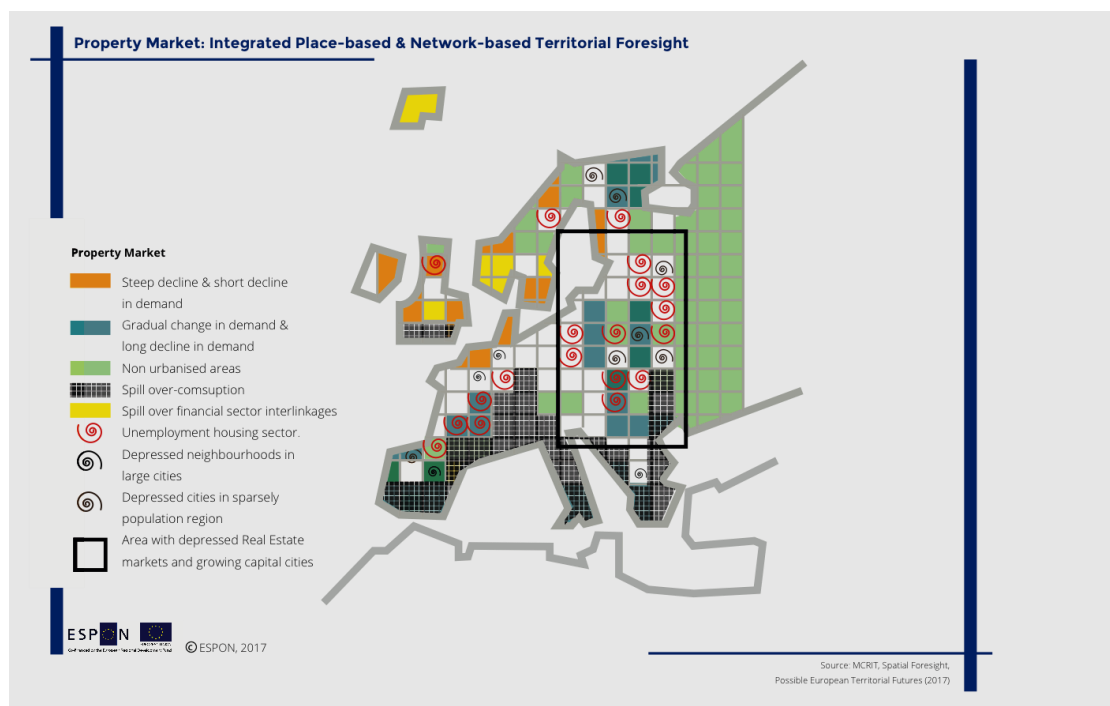
4.3 Combination and fuzzy maps

The hand drawn maps developed during the participatory event (see section 3.7) are more like mind maps. Based on the additional information collection or research, these maps are to be adjusted to better reflect factual elements. However, to communicate that the foresight is not a prognosis nor a forecast, the sketchy character of the maps should reflect the uncertainty by showing only rough ideas of territory affected. Therefore, it is suggested to develop new sketchy or fuzzy maps.

Having that in mind, development of the final foresight report and maps, should repeat the steps in the participatory foresight process, refining and complementing them with additional desk research.

How it was done in the ESPON study on Possible European Territorial Futures

Consulting results of the focus group, existing maps and taking into account expert insights, a series of sketchy or fuzzy maps has been developed for each foresight topic. The development was an iterative process and is to certain degree a collective mind map based in informed estimations.



4.4 Feedback loops

Once the document on the territorial foresight has been written and maps have been developed, the results should be circulated to the participants in the event for feedback. Certainly, responses from this feedback loop need to be considered for further revisions of the report and maps.

How it was done in the ESPON study on Possible European Territorial Futures

For the three foresight reports, two different types of feedback loops were organised. Firstly there was a webinar addressing key conclusions and possible variations of the foresight topics. This allowed for reflections from a broader audience, as the webinar was open to anybody interested and announced on social media. Results of this webinar have been included in the three foresight reports.

Secondly, once the foresight topics had been finalised, they were shared with the participants of the focus groups in Barcelona and Vienna asking for their feedback and reflections. The feedback has been taken into consideration in the revision and finalisation of the reports.

Part B - Guide to co-creative foresight oriented policy making

5 Method: An Stepwise Co-creative Foresight Process

This ESPON foresight guide is designed as a stepwise co-creative foresight approach to policy making. It involves the collaboration among a suite of stakeholders, including scientists, policy-makers, managers, planners, and citizens to understand the system's complexity, explore future alternatives, create sustainability visions and develop robust strategies in ways that are scientifically credible. To enable this interaction and facilitate knowledge production we propose a stepwise framework.

The steps identified as critical are defined in Table 5.1. While they are listed in a chronological order, feed-backs among them have to be also considered. In section 7.2. the competences for successful foresight are explained in detail.

Table 5.1 *Present steps with the competences*

	Foresight Steps	Competences
1	Framework Questions: Boundary Conditions	Reflexivity
2	Open Consultation: Gathering all Views	System's Thinking
3	Understanding the Situation: Diagnosis	
4	Expert's discussion on Scenarios	Anticipatory Thinking
5	Scenario Building: Prospective	
6	Stakeholder's Deliberation	Normative
7	Assessing the Vision: Regulative	
8	Designing Pathways: Executive	Strategic
9	People Envisioning: Communicating the Vision	Interpersonal
10	Empowering Institutions: Learning from the process	

While 2,5,6,9 and 10 steps are focused on different forms of participation (consultation, deliberation, envisioning...), the other proposed steps are mostly to be carried out in parallel by foresight consultants as inputs to feed the participatory process as well as to refine and further develop outputs from the participatory processes. The sequence indicated is just illustrative. More feed-backs between the different steps are highly recommended.

In the next sections the steps are further explained, as well as how –using which kind of methods, they could be successfully applied. Far from being a precise mechanistic procedure, the 10-stepwise process we suggest has to be understood as an overall conceptual framework to be adapted and customised to each case. Our aim should be not to optimise the foresight process but to guarantee a “sufficiently satisfying” process –in foresight, the process matters as much as the final product achieved.

Figure 5.1 Co-creative foresight approach to policy making (main steps and methods suggested)

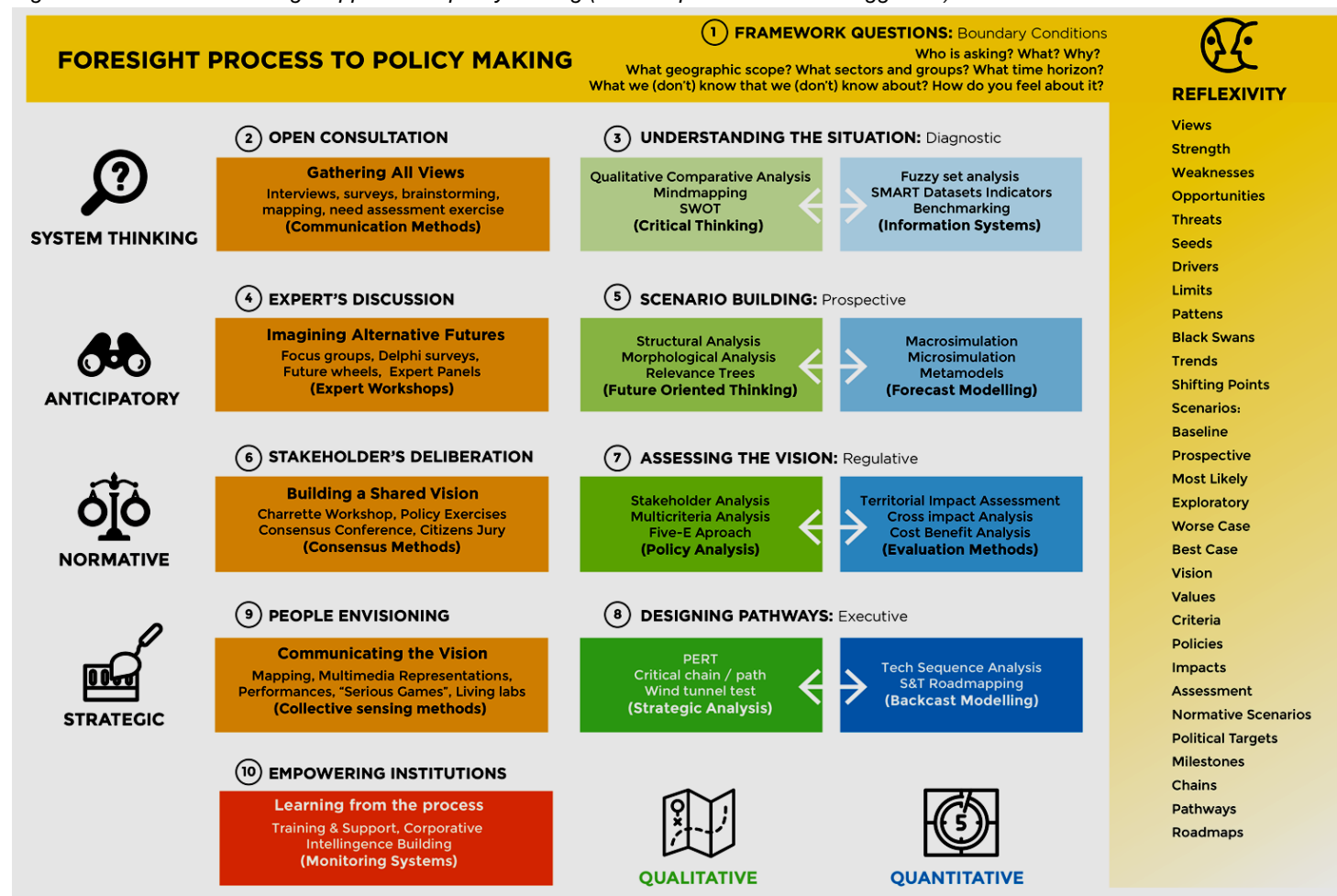
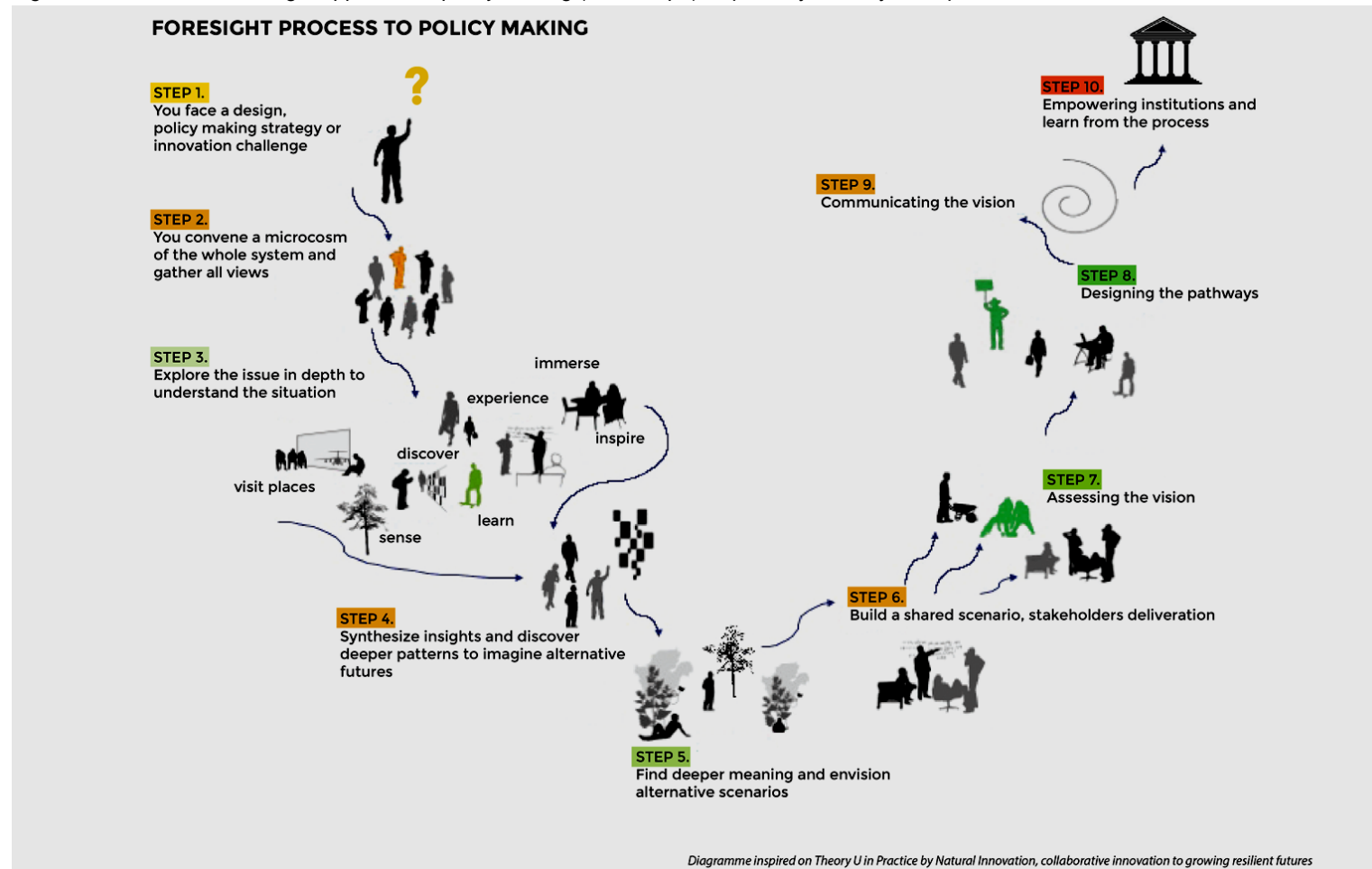


Figure 5.2 Co-creative foresight approach to policy making (main steps) inspired by “Theory U” in practice



5.1 Reflection: Framework Questions (1st Step)

There are fundamental questions to be answered before beginning the actual foresight work. There is first a need to reflect on the bias and prejudices of the different members of the team. More than seeking consensus, the aim should be making explicit the different positions and interests, and mapping proximities and distances between the positions of each one.

There is also a need to reflect on the conditions framing the actual foresight to be carried out –the boundaries of knowledge to deal with: the horizon of the study, the geographic area of the study and the thematic scope (the sectors or subjects being investigated). Beyond these boundary conditions, it is also necessary to define the range of policies/actions to be assessed and possible impacts to deal with.

When applying computerised forecast models to support the foresight process, framework conditions need to be defined strictly –this is a serious limitation of forecast models, because it means to oversimplify the questions, but it also provides for a more systematic analysis, which is useful because it brings more objectivity to the foresight exercise. There is also a need to reflect on the bias introduced by data, indicators and computerised models, and better than using only one model to be using a number of different models providing even contradictory results, because the final aim of foresight is not predicting the future but learning as much as possible and assessing alternative decisions.

Before engaging in the consultation process with stakeholders and experts, it is wise that foresight practitioners carry out an in-depth reflection on the nature of the exercise, and how it may be perceived by others.

5.2 Open Consultation (2nd Step)

Collective intelligence is preferable to the knowledge of a single expert or, needless to say, a given theory or a state-of-the-art computerised model. Open consultations give an opportunity to all stakeholders to express their views with regards to the topic(s) under discussion. They could be online and physical meeting. Open consultations could also imply in-depth interviews with stakeholders since engaging with people directly reveals a tremendous amount about the way they think and the values they hold. Sometimes these thoughts and values are not obvious to the people who hold them, and a good conversation can surprise both the interviewer / researcher and the subject by the unanticipated insights that are revealed. Good policies are built on a solid understanding of these beliefs and values. From this first open consultation, experts and stakeholders need to be engaged to the foresight process, providing inputs and validation to the parallel work to be carried out by foresight consultants.

Therefore, the first interest of open consultation is gathering all views engaging stakeholders and other experts along a knowledge-sharing process. Also in this manner, they will be more likely to have a feeling of ownership concerning the results obtained at the end of the process –often a necessary outcome in relation to stakeholders.

Specific methods and techniques suggested for interaction to be applied in consultation processes

Face-to-face methods include meetings (up to 20 people, no need for formal facilitation methods, a good meeting leader is enough), workshops (up to 100 people, they require structured agendas and professional facilitators), and public conferences open to the public. The online methods include collaborative writing (e.g. using Google drive) for small groups of participants to draft a common statement to be published online, online consultation and idea collection/ranking platforms, and online surveys addressing a large number of respondents (citizens and tourists). In-depth interviews are also another face-to face method. In-depth interviews are loosely structured, in order to allow freedom for both the interviewer and the interviewee to explore additional points and change direction, if necessary.

Needs Assessment Exercise: It is a visual tool draws out information about people's needs, raises participants' awareness of related issues and provides a framework for prioritising needs. Because of the simplicity of the tool people of different backgrounds can participate together, regardless of whether they are literate or not.

Brainstorming: The main objective of brainstorming is to elicit ideas from a group of people. Used in a structured way, this technique can be highly effective way of moving participants out of conflict and towards consensus. Brainstorming is founded on the principle that the quantity of ideas increases their quality. This technique has the following basic components:

- Generating as many creative solutions as possible to tackle a problem
- Setting time limits
- Listing every idea presented without comment or evaluation - deferring the judgment of ideas improves the volume of participant input and consequently the value and encourage creativity
- All opinions are equal
- Subsequently, grouping ideas to reduce redundancy, allow for related ideas to be brought together
- Evaluating or assign priorities to the ideas

Mapping: Mapping can be used to gather both descriptive and diagnostic information. Mapping exercises are useful for collecting baseline data on a number of indicators – as part of a beneficiary assessment or a sequence of rapid appraisal studies – and the process can lay the foundation for community ownership of development planning by including diversely interested groups of people. Maps encourage a high level of participation (exercises are often lead and run entirely by local people) and the recorded, visual output can be used immediately to bridge any verbal communication gap that might exist between local people and outsiders such as development planners. The mapping exercise can be used to generate discussions about local development priorities and aspirations, and the maps themselves will be useful as verification of secondary source information and as training tools. In monitoring, changes can be recorded on maps made during project planning. In evaluation, comparative

maps reveal both the status of actual changes in community resources or infrastructure and of perceived costs and benefits of the changes that have taken place.

5.3 Understanding the Situation: Diagnostic (3rd Step)

Producing a diagnosis of the existing problems and opportunities is necessary as initial discussion paper to feed the consultation process. The diagnosis must be based on a pre-defined set of values and political goals. More than being a sum of specialised analysis, what really matters is the overall understanding of the more relevant issues at stake. Being foresight an effort of synthesis, it is necessary to carry on an extensive review of existing literature to gather all possible views, and multiples sources –from scientific articles to popular media.

In order to understand a given situation (e.g. for a given actor), it is wise just to elaborate a list of strengths, weaknesses, opportunities and threats. The assessment of these attributes involves a more explicit or implicit previous definition of goals.

An objective effort to understand the present situation based on scientific methods is indispensable to create a common ground among participants. Demographic, social, economic, geographic, and environmental disciplines are useful to analyse the present situation and derive possible trends, but beyond specialised disciplines it is convenient to adopt a transdisciplinary approach. A Complex System is a system where there is a continuous interaction of many agents with partial information and not so clear aims. Agents are intelligent, in the sense that learn from their experience, gain information however always partial and have adaptive behaviour. While the understanding of the behaviour of a single agent is possible, to some extent, the whole system maybe unpredictable.

The effort of understanding a Complex System (e.g. the dynamics of a group, a sector, a city or a region) can be facilitated by first investigating:

- Initial conditions
- Boundary conditions
- Main agents involved
- Behaviour/schemata of agents
- Links between agents

Even if the evolution of a Complex System hardly can be predicted with accuracy, at aggregated level there are patterns, regularities that can be observed (e.g. the so-called “time-revenue” rule; according to it, people don’t spend more than 10% of their time or revenue travelling; or the Zipft “rank-size” rule for the size of cities). There are also well-known thresholds and limits (e.g. total housing given land-use regulations, total resource provision). The identification of patterns and regularities requires to explore past evolutions as well as to compare them with other systems under other circumstances. In order to imagine future trends and scenarios, both the micro-analysis of agents and the macro-analysis of regularities at aggregated level is necessary.

In order to design realistic and meaningful trends, based on a deep understanding of the present situation, and develop good narratives and story-lines, we suggest to think along the following elements:

- Seeds
- Trends
- Shifting points
- Limits or thresholds
- Patterns, laws or rules
- Black swans

The process to build up an understanding of the present situation can be facilitated by using simple well-known techniques as the ones next presented:

SWOT Analysis (also called SWAP/SWPO) (Strengths, Weaknesses, Opportunities and Threats) SWOT is a method of systematic group reflection. The purpose is to gather, analyse and evaluate information and identify strategic options facing a community, organisation or individual. It is used to categorise significant internal and external factors influencing an organisation's strategies – or, in the case of Foresight, its possible futures. It generally provides a list of the organisation's strengths and weaknesses as indicated by an analysis of its resources and capabilities, plus a list of the threats and opportunities that an analysis of its environment identifies. The SWOT is often portrayed as a 2x2 matrix, which presents an overview of major issues to be taken into account in developing strategic plans for an organisation – and in preparing Foresight studies in expert panels and workshops. "SWOT analysis is used in a foresight exercise to encourage stakeholders to discuss, map and cluster in a matrix the current strengths, weakness, opportunities and threats. Under each heading, political, institutional, cultural, social, economic, financial, environmental, technological, infrastructure, resources and capabilities (human and other), geographical, spatial and other factors can be taken into consideration. SWOT analysis maps internal and external factors. Strengths and weaknesses can be scored on the basis of their significance (high–medium–low). Opportunities and threats can be scored on the basis of the probability that they will occur and their likely impact. In building the roadmap and strategy, the results of SWOT are used to design actions that match strengths with opportunities, and find effective means to address threats and weaknesses." (European Training Foundation, 2014) SWOT Analysis is a method which first identifies factors internal to the organisation in question (e.g. particular capabilities, brands, etc.) and classifies them in terms of Strengths and Weaknesses. It similarly examines external factors (broader socioeconomic and environmental changes, for example, or the behaviour of opponents, competitors, markets, etc.) and presents them in terms of Opportunities and Threats. This is then used to explore possible strategies – developing and building on strengths and overcoming or accommodating weaknesses, providing insight as to the resources and capabilities required to deal with changing

environments, and so on. It is a very widely used for strategy formulation and decision making (Keenan and Popper, 2007).

Mindmapping: A diagram used to visually organise information. A mind map is hierarchical and shows relationships among pieces of the whole. It is often created around a single concept, drawn as an image in the centre of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those. Mind maps can be drawn by hand, either as "rough notes" during a lecture, meeting or planning session, for example, or as higher quality pictures when more time is available.

Qualitative Comparative Analysis (QCA): QCA is fundamentally a case-oriented method that can be applied to small-to-moderate size Ns. It is most useful when researchers have knowledge of each case included in an investigation, there is a relatively small number of such cases (e.g., 10-50), and the investigator seeks to compare cases as configurations. With these methods it is possible to construct representations of cross-case patterns that allow for substantial causal heterogeneity and case diversity.

Fuzzy set analysis can work in tandem with QCA. The use of fuzzy sets is gaining popularity in the social sciences today because of the close connections it enables between verbal theory, substantive knowledge (especially in the assessment of degree of set membership), and the analysis of empirical evidence.

Present System Analysis: In this portion of the envisioning process, participants focus on the system they're working on, and try to identify its "strengths and weaknesses, what to keep, drop, and create." Theoretically, such a list could be developed at any point in the process. Because it does serve to provide a shared analysis of the problems to be overcome, it might be tempting to do it early on. It is recommended, to wait until future goals are concretized before focusing on the present. It is naturally difficult for people to free themselves from the pressures of the conflict system before defining their goals. If they are asked to begin by evaluating the current situation, it is more difficult for them to accurately express their goals for the future. Therefore, it is important that the goal identification and development exercises precede the present-system analysis.

5.4 Scenario Building: Prospective (4th Step)

The possible futures can be explained in comprehensive narratives, or "Scenarios".

Scenario planning is one of the most well-known and most cited technique for thinking about the future. Scenarios are stories (or narratives) set in the future that explore how the world would change if certain trends were to strengthen or diminish, or various events were to occur. Scenario planning does not attempt to predict what will happen, but through a formal process identifies a limited set of examples of possible futures that provide a valuable point of reference when evaluating current strategies or formulating new ones. This method questions

assumptions about the future and creates confidence to act in a world of uncertainty (UNDP, 2014).

Scenarios focus attention on relationships between events and decision points. As a rule, scenario construction is particularly useful in situations where the past or present is unlikely to be a guide for the future. Scenarios help direct attention to driving forces, possible avenues of evolution and the span of contingencies that may be confronted. Thus they are particularly useful when many factors need to be considered and the degree of uncertainty about the future is high.

More useful scenarios try to illustrate trade-off between policy-aims under dispute. While one scenario may explore “what if” economic growth and job creation play a paramount role, others scenarios may assign the same political relevance to social equity or environmental values. Since the end purpose of scenarios is policy-support, the choice of scenarios must be politically relevant.

Different type of scenarios can be drafted depending on the purpose of the foresight exercise:

- “Baseline Scenario” as the one where actual policies change only marginally
- “Prospective Scenarios” -as possible but still realistic futures
- “Most likely Scenarios” –according to mainstream thinking
- “Worse-case Scenario” –against predefined aims
- “Best Scenario” –to fulfil a set of predefined aims
- “Desired Scenario”, or “Normative”, or just “Vision” –not necessarily the “best” if it involves higher risks, for instance.

The literature frequently divides scenario techniques basically into the “explorative” and the “normative”. These two poles also stand for two basic, ideal-typical stances regarding scenario method techniques.

When used in connection with techniques, the appellations “explorative” and/or “descriptive” designate sets of possible events regardless of their desirability. Such techniques pose “What-would happen- if” questions and take the present as their starting point. They then use considerations regarding developments, driving forces, and possible consequences to work out a conceptual future. The primary function of such techniques is to lay bare the unpredictability’s, the paths of development, and the key factors involved.

An “exploratory forecast” reflects a continuity model of the future – that is, a clear link between the forces at play and their effects on the components of the system under study. The objective is to examine the ways in which those forces and components may play out. It rarely suggests a single outcome but, rather, yields alternative futures. Normative forecasting, in contrast, jumps ahead and states some goal or objective that may be substantially or only apparently discontinuous with the trends at play. Then, having defined that future goal the forecaster looks back to the present to identify the necessary steps for reaching the goal. The scenario-construction process can build a common vision among participants. It can thus be

used to generate consensus and direction. Especially where involved in workshops, participants will understand better the strategies and policy options needed to build alternative futures. In addition, the processes of establishing images of these futures and how to realise them can facilitate action. Participants will also come to better understand the viewpoints and strategies of others.

“Normative scenarios”, on the other hand, assimilate values and interests. They pose questions either about the desirability of conditions in the future “What do we want the future to be like? Where do we want to go with it?” and/or questions which take possible futures as their point of departure. This second type of normative scenario looks back from a future point in time toward the present. Its function is to work out the process by which a specific state of affairs can be attained. It is used to demonstrate how certain goals can be achieved. Normative scenarios have a goal-setting function.

Table 5.2 Schematic comparison of explorative and normative scenarios

	Explorative	Normative
Procedure	Explores possible future developments with the present as point of departure	Identifies desirable futures or investigates how to arrive at future conditions
Function	Explorative and/or knowledge function	Target-building function and/or strategy development function
Implementation	Study of factors and unpredictabilities, test of possible actions to be taken and/or decision-making processes	Definition and concretisation of goals and/or, if appropriate, identification of possible ways to reach a goal
Central question	What? • What if?	How? • How is it to come about? • How do we get there?
Inclusion of probabilities	Possible	Indirect, part of plausible shaping and planning

Source: Kosow H. & Gaßner R. (2008)

Qualitative scenarios

The fundamental criteria to design a scenario is their consistency. Scenarios may not be fully comprehensive, but need to be consistent. While qualitative methods (e.g. based on more or less structured cause-consequence narratives, out from expert's deliberations) tend to produce more comprehensive scenarios, quantitative methods (e.g. macroeconomic forecast) tend to produce more consistent, even if simplified, scenarios. For this reason, it is convenient to begin first by drafting qualitative scenarios, then validating their consistency and likelihood with quantitative methods.

There are a number of technics to be applied in order to support qualitative scenarios

Storytelling: There are a number of useful strategies for story-telling, similar to those applied in fiction –the voice, the narrator and the point of view, the choice of characters, how information is provided to the reader... In a way, any novel, any movie, develops a scenario; any fiction is a simulation of a possible future.

The structural analysis method seeks to represent the 'system' by highlighting key variables, which (potentially) influence the problem under study. It seeks to represent the 'system' by highlighting key variables, which (potentially) influence the problem under study, with the help of a cross-impact matrix (also called a structural analysis matrix). In the cross-impact matrix, the variables are placed in rows and columns, in order to work out systematically whether there are any causal relationships between them.

Structural analysis can be used when a problem is so complex that it is important to ensure no key variables (either internal variables, external variables or major actors) are overlooked or to create a common culture when the working committee is heterogeneous or lacks in-depth knowledge of the problem. It is also a useful tool when you want the foresight exercise to last a long time for whatever reason (common reflection, communication, etc.). It ensures a certain level of quality in the results stemming from the matrix once it has been processed. For each variable it gives: an influence index, which measures the intensity with which a variable acts upon the system; a dependency index, which measures the intensity with which each variable is affected by the system.

Relevance Trees and Morphological Analysis: Both of these are qualitative forecasting methods, which start with future needs or objectives and then seek to identify the circumstances, actions, technologies, etc. required to meet these. They can be used together. A relevance tree is an analytic technique that subdivides a broad topic into increasingly smaller subtopics, presenting this in terms of a tree-like diagram. It thus sets out various aspects of a system, problem or even a proposed solution so as to facilitate a more complete understanding of the topic and a deduction of requirements to reach a particular outcome. It may be used to determine the relative importance of efforts to implement policies or increase technological performance. Relevance trees analysis has demonstrated to be a powerful intellectual stimulus to ensure that a given problem or issue is illustrated in comprehensive detail and that the important relationships among the items considered are shown in both current and potential situations. Morphological Analysis is often used as complementary technique in conjunction with relevance trees. It involves mapping options to obtain an overall perspective of possible solutions. Morphological analysis has often been used for new product development but also in constructing scenarios. (Gavigan J. 2001)

Quantitative trends

In order not to be misleading –just “wishful thinking”, scenarios must be consistent and scientifically sound. In this respect, quantitative methods such as the application of rigorous forecast models may be extremely important.

Generally speaking, a "model" is just an "algorithm" which predicts unknown data, often "forecasting" uncertain "futures". A model is an intelligent simplification of reality. The paramount modelling goal to achieve the maximum simplicity representing reality with the minimum error. Science is about discovering the simple laws governing reality. Compared with other scientific fields (e.g. natural sciences and physics), social sciences in general (those fields pretending to model human behaviour), are far from having convincing explanatory theories and predictive models, and it is reasonable to doubt that never they will because understanding and predicting human behaviour is for humans themselves an ontological impossibility. Social and personal experimentation involves ethical aspects which are not present in natural sciences and physics. The analysis of human behaviour gained scientific attention during last decade (see Himanen et al., 1998). Linear programming models, gravity models, spatial interaction and entropy models, discrete choice models, non-linear dynamics, genetic models, agent-based models and many more. Transportation research in particular has shown the genesis of a fascinating diversity of models (Himanen et al., 1998).

Methods and techniques

Macrosimulation Simulation modelling and analysis is the process of creating and experimenting with a computerised mathematical model, imitating the behaviour of a real-world process or system over time. Simulation is used to describe and analyse the behaviour of a system when asking "what-if" questions about the real system and aid in the design of real systems.

Microsimulation can be distinguished from other types of computer modelling in looking at the interaction of individual "units" such as people. Each unit is treated as an autonomous entity and the interaction of the units is allowed to vary depending on stochastic (randomized) parameters. These parameters are intended to represent individual preferences and tendencies. Whereas macrosimulation sees the system as a whole, without simulating the behaviour of its individual components.

Metamodels are computerised mathematical formulations or algorithms that, combining the results of macro or microsimulation models, provide information about the future somehow also integrating qualitative assumptions (e.g. in the form of thresholds, growth ratios, heuristics...). Needless to say, modelling results may be contradictory among themselves as well as to qualitative assumptions –and metamodels are therefore needed to rethink all. Metamodels use to be developed ad-hoc, linking hard quantitative forecast with qualitative

narratives. If provided with user-friendly interfaces, can be useful for non-experts as well as in participatory process.

5.5 Experts Discussion (5th Step)

Expert's discussion should provide of intelligence and rapid-response relevant for strategic policy making. Experts discussions should ideally be focused more on exploring likely or unlikely futures instead on their desirability –with is related to values and political choices, more relevant therefore to stakeholder's deliberations.

There are a number of technics to be applied in order to support an expert discussion

Focus Group: A planned discussion among a small group (4-12 persons) of stakeholders facilitated by a skilled moderator. It is designed to obtain information about (various) people's preferences and values pertaining to a defined topic and why these are held by observing the structured discussion of an interactive group in a permissive, non-threatening environment. Focus groups are good for initial concept exploration, generating creative ideas. Some purposes of focus groups include exploratory work, pre-test work, aiding event recall and triangulation with other data collection methods. They are particularly useful when participants' reasoning behind their views is of interest, as well as the process by which participants' develop and influence each other's ideas and opinions in the course of discussion.

Delphi: interactive forecasting method, which relies on a panel of experts. The experts answer questionnaires in two or more rounds. After each round, a facilitator or change agent provides an anonymised summary of the experts' forecasts from the previous round as well as the reasons they provided for their judgments. Thus, experts are encouraged to revise their earlier answers in light of the replies of other members of their panel. It is believed that during this process, the range of the answers will decrease and the group will converge towards the "correct" answer. Finally, the process is stopped after a predefined stop criterion (e.g. number of rounds, achievement of consensus, and stability of results) and the mean or median scores of the final rounds determine the results. The Delphi Method is a technique to structure group communication processes to deal with complex issues. It involves expert survey responses in a series of iterative learning rounds. Delphi first establishes the group's initial view, presents instant feedback on differing opinions, and goal seeks an agreed position in the final round. Contributors to the group analysis do not have to meet in person and can see the results as they, and their colleagues, add their views in real time. At the beginning, the organiser(s) formulate questions about the future and present these to contributors. Contributors respond by adding their rankings and comments. The organisers then modify the anonymous comments received to formulate better questions. The process is run again, in a series of rounds, until a consensus answer is arrived at. (GCPSE & UNDP 2014). Delphi is a well-established technique that involves repeated polling of the same individuals, feeding back (sometimes) anonymised responses from earlier rounds of polling, with the idea that this will allow for better judgements to be made without undue influence from forceful or high-

status advocates. Delphi surveys are usually conducted in two, and less commonly three, rounds. They are most often employed to elicit views as to whether and when particular developments may occur, but the technique can be used for any sort of opinion or information – such as the desirability of specific outputs, impacts of policies or technologies, etc. (Keenan and Popper 2007)

Futures Wheel: The Futures Wheel is a way of organising thinking and questioning about the future – a kind of structured brainstorming. The name of a trend or event is written in the middle of a piece of paper and then small spokes are drawn from the centre. Primary impacts or consequences are written at the end of each spoke. Next, the secondary impacts of each primary impact form a second ring of the wheel. This ripple effect continues until a useful picture of the implications of the event or trend is clear

Expert Panel: The main task of an expert panel is usually synthesising a variety of inputs – testimony, research reports, outputs of forecasting methods, etc. – and produce a report that provides a vision and/or recommendations for future possibilities and needs for the topics under analysis. Specific tools may be employed to select and motivate the panel, assign tasks and elicit sharing and further development of knowledge. They are particularly appropriate for issues that require highly technical knowledge and/or are highly complex and require the synthesis of experts from many different disciplines. This method is not designed to actively involve the broad public.

Panels of sectoral and/or technological experts are commonly used in national Foresight studies. The constitution of such Panels, in itself, is not a ‘methodology’, but specific methods may be employed to motivate the panel, assign tasks, and elicit sharing and further development of knowledge (Gavigan J. 2001)

Future workshops: A technique that enables a group of people to develop new ideas or solutions for social problems. It is used in spatial planning to involve citizens in the planning process. Futures workshops are events or meetings lasting from a few hours to a few days, in which there is typically a mix of talks, presentations, and discussions and debates on a particular subject. The events may be more or less highly structured and “scripted”: participants may be assigned specific detailed tasks. The feedback of participants is used to improve the scope of the foresight process. (Keenan and Popper 2007). The aim is to formulate concrete proposals for actions and solutions that the participants themselves can implement. The future workshop is especially suited for working with local issues, and the aim is usually to make solution proposals to meet local challenges or to plan local initiatives meant to promote a desired development. (Andersen D. & Rasmussen B. 2014)

Planning Cell: The Planning Cell method engages approximately twenty-five randomly selected people, who work as public consultants for a limited period of time (e.g. one week), in order to present solutions for a given planning or policy problem. The cell is accompanied by two process-escorts, who are responsible for the information schedule and the moderation of the plenary sessions. A project may involve a larger or smaller number of planning cells. In

each cell participants acquire and exchange information about the problem, explore and discuss possible solutions and evaluate these in terms of desirable and undesirable consequences. Experts, stakeholders and interest groups have the opportunity to present their positions to the cell members. The final results of the cells' work are summarised as a 'citizen report', which is delivered to the authorities as well as to the participants themselves.

5.6 Stakeholder's Deliberation (6th Step)

The purpose and expected impact of stakeholder's participation is building a shared vision. It is different from an expert discussion since deliberation is focused on "normative scenarios" or Visions. Values and policy-aims are embedded into discussions. The assessment of scenarios must be based on the values and aims stated in deliberations, based on existing policy documents and regulations. The stakeholder's deliberations must be oriented towards the following issues:

- Influence policy-analysis from its conception (inclusive planning) and later by engaging stakeholders and citizens in evaluation and monitoring activities.
- Collaborate for the implementation of the policies, as far as this is suitable and feasible, and contribute to improve the implementation itself.
- Raise awareness of problems and solutions, mobilizing the public by means of campaigns, etc.
- Eventually contribute to changes in personal and collective/social behaviours.

While experts invited to join a deliberation do not need to be representative –they have to provide relevant, extreme and contradictory knowledge as much as possible, stakeholders need to be representative of the constituency involved in the policies under discussion.

Possible methods

Charrette: An intensive face-to-face process designed to bring people from various sub-groups of society into consensus within a short period of time. The pre-Charrette planning breaks the main issue into component parts, to which sub-groups of people are assigned. The subgroups periodically report back to the whole group and feedback from the whole is then addressed in the next round of sub-group discussions. This sequence is repeated until consensus is reached at the final deadline for a report. Charrettes vary in size, from 50 to over 1,000 people, and in time, from four days to two weeks.

Policy Exercises: A heterogeneous group of 10-15 participants synthesises and assesses knowledge from various sources and explores various ideas/policy options. Participants (who have traditionally been policy-makers and scientists, sometimes stakeholders) are selected on the basis that they can contribute skills, perspectives and concerns about the general problem. The exercise is a creative process in which a complex policy-issue or system is represented by a simpler one with relevant (behavioural) similarity. The goal is to integrate knowledge from various sources, explore alternative future developments and evaluate new policy ideas in order to obtain a more structured view of complex problems. Policy exercises

aim to identify poorly understood topics and questions and to make discoveries, not to provide the solution. Frequently used tools include: role-play gaming, mental mapping, scenarios, phenomenography, supporting software.

Consensus conference: A public enquiry centred on a group of 10 to 30 citizens who are charged with the assessment of a socially controversial topic. These laypeople put their questions and concerns to a panel of experts, assess the experts' answers and then negotiate among themselves. The result is a consensus statement that is made public in the form of a written report directed at parliamentarians, policy makers and the general public that expresses their expectations, concerns and recommendations at the end of the conference. The goal is to broaden the debate on a given issue and include the viewpoints of non-experts in order to inform policy-making. In addition, the Danish model emphasises the goal of arriving at a consensus opinion, whereas others say that this is not necessary. Consensus conferences usually have a 3-day intensive programme that is open to the public.

Citizens Jury method is a means for obtaining informed citizen input into policy decisions. The jury is composed of 12-24 randomly selected citizens, who are informed by several perspectives, often by experts referred to as 'witnesses'. The jurors then go through a process of deliberation and subgroups are often formed to focus on different aspects of the issue. Finally, the jurors produce a decision or provide recommendations in the form of a citizens' report. The sponsoring body (e.g. government department, local authority) is required to respond to the report either by acting on it or by explaining why it disagrees with it. Usually a 4-5 day process, the Citizens Jury is intended to provide a means for more democratic decision-making. The Citizens Jury method has been applied to a wide range of topics, including economic, environmental, social and political issues. It is most applicable when one or more alternatives to a problem need to be selected and the various competing interests arbitrated. It was invented in the U.S., but its widest use has been in the U.K.

5.7 Assessing the Vision: Regulative (7th Step)

The assessment is needed to provide additional justification of the interest of the Vision by contrasting it against predefined social values and goals. A social, economic, environmental – and territorial impact assessment of a given future scenario or Vision is therefore necessary for policy design. Ideally, this policy assessment should be integrated into the 6th step, to provide an objective reference to the stakeholder's deliberation.

There is no recipe for the perfect Impact assessment. However, all impact assessment should be comprehensive, proportionate, evidence-based, open to stakeholders' views, unbiased, prepared collectively, embedded in the policy cycle, transparent and of a high quality.

The process of finding answers to these questions is necessarily iterative. The Impact assessment process should start from broad definitions of the problem, the objectives and the possible solutions and then narrow them down to what is most relevant. The questions are also interrelated. Compliance with subsidiary and proportionality, for example, can only be

fully verified once objectives are set and the impacts of alternative options assessed. The key questions and principles guiding the impact assessment process can be found in figure 6.4.

In reality, decision-making is sometimes a time-consuming task, as organizations often have more than one decision-maker. In many cases, the 'new' targets are not newly identified for the decisions but they are recognized as an adopted priority. In these cases, the facts were already implicitly known but not yet recognized as priorities explicitly. The target can be modified, but once it is set, it cannot be totally abolished without revising an explicit decision. At this point, either new forecasts concerning the target are needed or if the forecasts are already made and available, the part foresight can play ends, and planning for the future ('forward planning' or strategic planning) or the definite implementation of the decision starts. With foresight tools and methods the priorities can clearly be identified. The table in figure 6.2 summarizes some of the major differences between foresight and forecasting.

Qualitative methods

Stakeholders Analysis: It is the process of the assessing a decision's impact on relevant parties. This information is used to assess how the interests of those stakeholders should be addressed in a project plan, policy, program, or other action. Stakeholder analysis is a key part of stakeholder management. A stakeholder analysis of an issue consists of weighing and balancing all of the competing demands on a firm by each of those who have a claim on it, in order to arrive at the firm's obligation in a particular case. A stakeholder analysis does not preclude the interests of the stakeholders overriding the interests of the other stakeholders affected, but it ensures that all affected will be considered.

Stakeholder analysis is frequently used during the preparation phase of a project to assess the attitudes of the stakeholders regarding the potential changes. Stakeholder analysis can be done once or on a regular basis to track changes in stakeholder attitudes over time.

Multi-criteria analysis (MCA) establishes preferences between options by reference to an explicit set of objectives that the decision making body has identified, and for which it has established measurable criteria to assess the extent to which the objectives have been achieved. In simple circumstances, the process of identifying objectives and criteria may alone provide enough information for decision-makers. However, where a level of detail broadly akin to Cost Benefit Analysis (CBA) is required, MCA offers a number of ways of aggregating the data on individual criteria to provide indicators of the overall performance of options. A key feature of MCA is its emphasis on the judgement of the decision making team, in establishing objectives and criteria, estimating relative importance weights and, to some extent, in judging the contribution of each option to each performance criterion. The subjectivity that pervades this can be a matter of concern. Its foundation, in principle, is the decision makers' own choices of objectives, criteria, weights and assessments of achieving the objectives, although 'objective' data such as observed prices can also be included. MCA, however, can bring a degree of structure, analysis and openness to classes of decision that lie beyond the practical reach of CBA.

Five-E approach. One model of policy analysis is the "five-E approach", which consists of examining a policy in terms of: Effectiveness: How well does it work (or how well will it be predicted to work)?; Efficiency: How much work does or will it entail? Are there significant costs associated with this solution, and are they worth it?; Ethical considerations: Is it ethically and morally sound? Are there unintended consequences?; Evaluations of alternatives: How good is it compared to other approaches? Have all the relevant other approaches been considered?; Establishment of recommendations for positive change: What can actually be implemented? Is it better to amend, replace, remove, or add a policy?

Quantitative methods

Cross-impact analysis is a method that helps the process of scanning the field of possible futures to reduce uncertainties. Cross-impact analysis is the general name given to a family of techniques designed to evaluate changes in the probability of the occurrence of a given set of events consequent on the actual occurrence of one of them. The cross impact model was introduced as a means of accounting for the interactions between a set of forecasts, when those interactions may not have been taken into consideration when individual forecasts were produced. The origin of cross-impact analysis was the problem that Delphi panellists were sometimes asked to make forecasts about individual events, when other events in the same Delphi could affect these events. Thus, it was recognised that there was a need take these cross impacts of one event on another into account. While cross-impact analysis was initially associated with the Delphi method, its use is not restricted to Delphi forecasts. In fact, cross impact models can stand alone as a method of futures research, or can be integrated with other method(s) to form powerful forecasting tools.

Cost-Benefit Analysis has its foundations in the theoretical framework of microeconomics and in the theory of social choice. It is an application of these theories to the practical problems of public sector decision-making, not just in transport, but in health, power generation and environmental protection, amongst others. CBA is a technique which is used by decision-makers (mostly governmental bodies) to appraise the efficiency of a policy. (Annema, J. N., Mouter, N. and Razaei, J. 2015) Cost-benefit analysis (CBA) is a way of providing evidence on the impacts of policies or projects which examines all the costs and benefits they give rise to and seeks to value them at what those impacted would be willing to pay for the benefits and what compensation they would require willingly to bear the costs. (Nash, 2010).

Strategic environmental analysis (SEAN) is a framework to support analysis and planning of sustainable development. It is a structured, participatory process to analyse environmental problems and opportunities for development, to identify main actors, and to define strategic goals at early stages. Diverse applications in developing countries have refined its framework, guidelines, tools and checklists. It has an integrative focus on linkages of environmental and socio-economic issues of sustainability. Its analytical framework has four clusters: environmental context analysis, problem analysis, opportunity analysis and strategic planning.

It has succeeded in putting concrete sustainability goals and environmental issues on policy-makers' agendas and initiating participatory and interactive planning.

Territorial Impact Analysis/Assessment (TIA) can be summarized as "a tool to analyse the effects of physical development in relation to the objectives of the planning or the plans for the area. "The aim of territorial impact assessment is to make a preliminary assessment or estimates in the design of various EU policies and what outcome they can get by territorial approaches and differences. The aim of territorial impact assessment is thus to make an impact from a territorial perspective. These types of assessments have become more realistic to perform when there has been a considerable increase in the regional, local and spatial data available. Assessing territorial impact, helps to identify whether a policy option risks having a large asymmetric territorial impact, also known as an "outlier" impact. (ESPON, 2013)

5.8 Designing Pathways: Executive (8th Step)

In the following step, after the Vision is defined and assessed, there is then a need to precise how we can move from the present situation to the ideal future, solving existing problems and taking advantage of available opportunities. The roadmap from nowadays to the future requires short-term and mid-term political targets, as quantitative as possible, in order to be monitored overtime.

Road mapping can serve as a tool to develop and describe the implementation of a foresight's results. It is useful to study the policy-implementation of the Vision when the foresight exercise is part of a decision-making process with well-defined decision makers who have clearly expressed the wish for a foresight project. However, often foresight recommendations are being used as the basis and inspiration, or as part of a more or less explicit learning or team-building process.

Qualitative methods and techniques

PERT Chart is a project management tool used to schedule, organize, and coordinate tasks within a project. PERT stands for Program Evaluation Review Technique, a methodology developed by the U.S. Navy in the 1950s to manage the Polaris submarine missile program.

Critical Chain/Path (CPA) or the Critical Path Method (CPM) helps to plan all tasks that must be completed as part of a project. They act as the basis both for preparation of a schedule, and of resource planning. During management of a project, they allow to monitor achievement of project goals. They help to see where remedial action needs to be taken to get a project back on course. The benefit of using CPA within the planning process is to help develop and test the plan to ensure that it is robust. Critical Path Analysis formally identifies tasks which must be completed on time for the whole project to be completed on time. It also identifies which tasks can be delayed if resource needs to be reallocated to catch up on missed or overrunning tasks. A further benefit of Critical Path Analysis is that it helps to identify the minimum length of time needed to complete a project.

Wind tunnel test is a fairly straightforward procedure, wherein is checked how well the business strategy, brand or specific products perform when challenged by critical trends and scenarios. Is the strategy, the brand or the product future-proof, do they need minor adjustments or even genuine and fundamental transformation in order to be fit for the future? Provided that the most relevant trends and scenarios are selected, the wind tunnel test provide solid results. It shows the strengths and weak spots and offer guidelines for improvements or re-directions.

The test is normally a part of a strategic activity, and a starting point for strategy development, innovation activities or brand development.

Quantitative methods and techniques

Technology Sequence Analysis (TSA) was first used in the early 1980s to produce a probabilistic forecast of the time at which a technology-dependent system could become available. The method involves the statistical combination of estimates of the time required to achieve intermediate technological steps.

Technology Roadmapping (TRM) refers to various kinds of forecast or Foresight studies including visions and detailed projections of future possible technological developments, products or environments: A roadmap is an extended look at the future for a chosen field of enquiry composed from the collective knowledge and imagination of the brightest drivers of change in that field.

Roadmaps communicate visions, attract resources from business and government, stimulate investigations and monitor progress. They become the inventory of possibilities for a particular field. Usually, roadmapping is a normative tool, like relevance trees and morphological analysis, i.e. the desired future state (or possibly states) is pre-determined.

Two key interrelated functions have emerged as central to the technology roadmapping (TRM) methodology: TRM usually includes graphical representations in which "nodes" (past, present or future states of the art in S&T development) are connected by "links" (causal or temporal relations) showing the nature, rate and direction of potential S&T developments from or towards those nodes. As such TRM is a technology forecasting and foresight methodology. These representations can be put to practical use, in illuminating the way forward and in informing decisions about possible future options. As such, a roadmap is also a planning methodology, "a traveller's tool that provides essential understanding, proximity, direction, and some degree of certainty in travel planning." [Kostoff & Schaller 2001]

5.9 People Envisioning (9th Step)

Envisioning is a central component of the proactive approach to the future -- "creating" it. Here, we not only assume that we can influence the future and make an optimal future more likely, we also free ourselves from the notion that certain solutions are less plausible than others. In order to create it there is a need to communicate the vision to engage others –not always participating in the foresight process.

Envisioning is about experience the future throughout our multiple senses, it combines art, science and policy design. Sensing the vision through pilot demonstrations use to be more relevant than any other method, but often clever images –just sketches, can be very powerful tools to express a given future idea.

Suggested techniques:

Living labs are a user-centred, open-innovation ecosystems, often operating in a territorial context (e.g. city, agglomeration, region), integrating concurrent research and innovation processes within a public-private-people partnership.

Role-playing: Role-playing enables people to creatively remove themselves from their usual roles and from the perspectives that go along with those roles. These activities open imaginations to allow people to understand the choices that another person might face and to make decisions and plans as if they had different responsibilities. They stimulate discussion, pave the way for improved communication and thus stimulate collaboration. Applicable at community and agency levels, these activities involve participants as a group in analytic thinking and assessment. Role playing can be done with simple stories with only a few characters or they can be elaborate street theatre productions with a large array of stakeholder characters. They can be used to acclimate a research team to a project setting, to train trainers and to encourage community discussion about a particular issue or project.

Serious games or applied games are games designed for a primary purpose other than pure entertainment.] The "serious" adjective is generally prepended to refer to video games used by industries like defence, education, scientific exploration, health care, emergency management, city planning, engineering, and politics.] The idea shares aspects with simulation generally, including flight simulation and medical simulation, but explicitly emphasizes the added pedagogical value of fun and competition.

Community Art Experiences: For example Madalena Vitorino work with communities “Art allows us to re-think the way we see the reality, turn it around , look at it from another angle and transform what seems impossible in a possibility, what is wrong in something that can also be right; what is mean in something that can be generous. Art gives power to people, art brings joy. By bringing art into the social tissue all this is possible”

Performativity: explore the ways that social reality is not a given but is continually created as an illusion "through language, gesture, and all manner of symbolic social sign". In the act of performing the conventions of reality, by embodying those fictions in our actions, we make those artificial conventions appear to be natural and necessary. By enacting conventions, we do make them "real" to some extent (after all, our ideologies have "real" consequences for people) but that does not make them any less artificial. One of the most important theorist of this concept is Jacques Derrida and Judith Butler.

5.10 Empowering Institutions: Collective Learning (10th Step)

The final aim of a foresight exercise is lasting influence. Maybe the short-term political debate will allow little room to introduce new visions coming from a foresight exercise, or will consider exploratory scenarios as source of inspiration for negotiations. But most successful foresight exercises always have to remain as a cultural reference and influence experts and decision-makers over time. Foresight is, more than any other thing, a collective learning opportunity in which communication matters as much as knowledge-generation. Dissemination is just the communication activity with less added-value attached since it is not seeking the establishment of a dialogue but just to inform interested persons and institutions of the results of a given foresight project.

Various approaches can be followed to disseminate both the preliminary and final results of the foresight exercise. The main formal methods of disseminating foresight results include:

- Publications (web sites, press articles, if possible radio or TV programmes newsletters, academic publications, reports, databases, etc.)
- Participative events (conferences, workshops, hearings, seminars, meetings, etc.)
- Illustration of foresight success stories in other contexts.

Such outputs need to be carefully tailored to their intended audiences, and professional skills in preparing the publications appropriate to specific media and audiences are required. It is especially important to keep journalists "on side", since there is a tendency in certain sectors of the media to overemphasise problems and failures. It is important not to let tangible outputs displace more informal means of communication, and not to assume that getting the results out in the form of publications is more important than more intangible outputs such as improved networks and embedding new knowledge in people and organisations' practices and approaches to issues. These may be harder to identify and quantify than documentation, but nevertheless represent very important benefits.

As well as the final report, a synthesis of the scenarios or the conclusions in terms of strategic options or the description of the chosen vision could be prepared and more widely disseminated. Although distributing documents of this kind ensures the necessary information is published, it is not always easy to assimilate. It is therefore often useful to organise seminars or meetings with the stakeholders to explain the process and the results.

The informal dissemination of results occurs through the process's participants. The formal dissemination of results of the foresight takes place in two ways: first, through publications, which include formal reports, newspaper articles, press releases and other media-oriented material (for both printed and electronic media), TV and radio programmes, scientific articles etc. and second, dissemination can take place through meetings, such as press conferences, workshops, seminars, conferences etc. In both cases, dissemination should harmonize with each of the different target groups.

To generate a strong and coherent communication and dissemination strategy it should be clear what the project wants to accomplish with communication (objectives), ways in which those objectives could be accomplished (goals or working programme), to whom the project communications should be addressed (target audiences), how the project objectives should be reached (tools and timetable), and how the results of the project should be measured (evaluation).

Some tools could be envisaged to attain communication & dissemination objectives:

- A strong, professionally designed visual identity for the project
- A contact database and mailing list
- A web-site platform for awareness-raising;
- Social media channels (such as Linked-In and Twitter) to create an on-line dialogue about the project and the ongoing progress of the work.
- Mass media: relations establish with key channels at the project outset and retained throughout.

Part C – Wider theoretical framework

6 Concepts: The Nature of Territorial Foresight

6.1 What it is foresight?

We believe that the nature of foresight is not scientific, even if it uses scientific methods when possible. Foresight methods can be either “qualitative narratives” (comprehensive, risking to be inconsistent, and subjective) and “quantitative” (consistent but with limited scope, objective). Independently of the combination of methods applied, foresight is a humanistic activity, it requires artistic and literary expressions and interpersonal communication skills. Once, it was a religious activity, and only those directly connected with the gods were able to read the book of the future. Exploring the future and advising best decisions is maybe the second oldest profession. Some may even claim to be the first. The Oracle in Delphos is one of most famous Ancient foresight sacred places where God revealed the coming future, if properly asked.

Figure 6.1 Oracle in Delphos and user-interface in the Museum of Boston



Source: Museum of Boston (2005)

Nowadays, more than interdisciplinary, foresight is a transdisciplinary activity. Knowledge and communication are just the two sides of the same coin, and it is the ultimate reason why deliberation is always required.

Methodology of transdisciplinary research

Transdisciplinary research investigates problems on a descriptive, normative and operational level. It not only produces knowledge about empirical syndromes in life-support systems (systems knowledge), it is also expected to produce both the knowledge required about the targets of agency and evaluative principles for analysing the effects of such agency targets (target knowledge). Furthermore, transdisciplinary research also has to respond to the need for a third type of knowledge in this context, i.e. knowledge about the necessary conditions and strategies for changing undesired processes and enforcing desired processes (transformation knowledge). Given that sustainable development involves societal problem-

solving based on research, the knowledge held by non-academic actors has an important role to play throughout the process of knowledge production. A number of focal areas exist within the practice of transdisciplinarity that are tied to specific methodological challenges and hence result in different types of transdisciplinary research. The systematicity approaches develop general concepts and methods for the ordering of research questions and integration of heterogeneous knowledge originating from different disciplines operating on normative, operational and descriptive levels. The challenges here include doing justice to the interdependency of systems, target and transformation knowledge and dealing with the problems arising from uncertain knowledge and the accompanying incommensurability of concepts and methods. The trade-and-negotiate approaches describe research, knowledge production and the development of technologies from the perspective of an observing (social) scientist with the emphasis on extra-methodical aspects, such as the social factors behind successful transdisciplinary research. Research investigates and reconstructs the (social) process, in the course of which knowledge has become accepted. Ultimately, what is seen as a good technical solution to a problem in this context is viewed as a successful outcome achieved through "social" forces, such as power, trust, law etc. The learning approaches are target-group oriented and aim to develop actors' problem-solving competencies. It is a question here of working with the actors in transdisciplinary projects to identify issues of regional relevance and of developing the necessary knowledge and skills to resolve the problems.

Methodology of Transdisciplinary Research - G. Hirsch Hadorn, Ch. Pohl, M. Scheringer

We need to think together on everything that matters to us. Like philosophy, foresight is not about discovering answers, but about thinking about the right questions –unmasking wrong questions, therefore, myths, prejudices, stereotypes, being aware on how language –words, figures, maps, are misleading. Best foresight is, quite often, politically incorrect: the most important can hardly be said in plain words. Often only jokers or fools are allowed to say the truth.

Before further advancing on the discussions, we need to provide a definition for a few key concepts.

Foresight – also labelled as forward thinking – is widely understood as a future oriented approach characterised by critical, lateral thinking concerning long-term developments. The Joint Research Center (JRC) describes foresight as framework for a group of people concerned with common issues at stake to jointly think about the future in a structured and constructive way. Foresight provides a number of tools and methods to support participants (i.e. policy makers, experts and other stakeholders) in structured forward thinking.

- Foresight is widely understood as a future oriented approach characterised by critical, lateral thinking concerning long-term developments, large discussions creating wider participatory engagement, ranging from expert panels to crowd intelligence, and shaping the future, especially by influencing public policy.

- Foresight includes qualitative and quantitative means, embedded into participatory processes, and is best and most useful when directly linked to the analysis of policy implications.
- Foresight in government can help condition policies to be more appropriate, more flexible, and more robust in their implementation, as times and circumstances change.

We can consider a “shallow foresight” as the overall process of creating an understanding and appreciation of information generated by looking ahead (Coates, 1985), as well as a “deep foresight” as necessary process for sound decision-making and therefore closely tied to planning (Kerstin Cuhls, 2000).

Forecast –also labelled as scientific prediction, is a narrower concept, always based on a theory implemented into a mathematic formulation, and computerised. In social sciences, forecast computerised models hardly can provide for the accurate predictions they may provide in engineering. Nowadays, the concept of “scientific prediction” or “forecast” is discredited in social sciences –also in economy, almost any “prediction” elaborated from a “scientific” method, typically a computerised model, is to be considered simplistic.

Even if forward thinking is becoming more a “foresight” activity, a deliberative task involving many different points of view, still scientific-based predictive models, often quantitative, provide for an objective and consistent reference to contrast more qualitative analysis, forcing experts to be systematic on the analysis of information and more consistent in their interpretations. Forecast models, if transparent to users, can be also very useful as learning and communication tools, inducing more objective references and somehow balancing “wishful thinking”. We believe forecast is not in contradiction to foresight, but a necessary methodology to be properly used within a foresight process.

Next table displays relevant differences between foresight and forecast:

Figure 6.2 Differences between forecasting and foresight

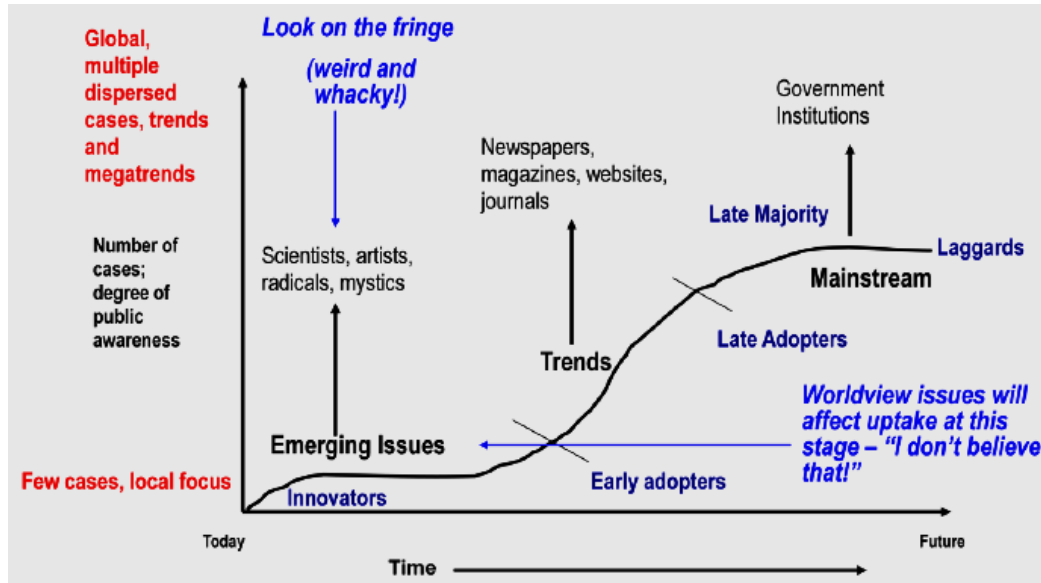
Foresight	Forecasting
<ul style="list-style-type: none"> • Basic points, needs, research questions are still open and looked for as part of the foresight process • More qualitative than quantitative • Looks for 'information' about the future for priority-setting • Brings people together for discussions about the future and for networking, makes use of the distributed intelligence • Criteria for assessments and preparation for decisions • Communication about the future as an objective • Long-, medium- and short-term orientation with implications for today • Finds out if there is consensus on themes • 'Experts' and other participants, very dependent on opinions 	<ul style="list-style-type: none"> • Basic points, topics and research questions have to be clarified in advance • More quantitative than qualitative • Questions what the future in the selected area might look like • More result-oriented, can also be performed by individual people or in single studies (depends on methodology) • Not necessarily assessments, different options and choices or the preparation for decisions • Describes future options, results more important than the communication aspects • Long-, medium- and short-term orientation as well as the path into the future are the major points • No information about consensus necessary • Mainly 'experts' and/or strict methodologies, less dependent on opinions

Source: K. Cuhls (2003)

Forecast, prediction, even extrapolation, are methods that can be embedded into broader foresight processes. We assume that the success of foresight requires, beyond the specialised analysis of critical issues, the capacity to gather collective intelligence and active deliberative processes among experts and stakeholders, through a variety of methodologies. This requires that professionals develop transdisciplinary competences. Beyond knowing the tools and techniques, it is our belief that professionals need to have a broad humanistic culture, as well as interpersonal skills to deal with feelings and values. Emotions matter, on deliberative and decision-making processes, as much as rationality.

Trends are evolutions overtime, either forwards ("prospects") or backwards ("retrospective"). A "spontaneous trend" develops almost unconsciously, independently from the willingness of agents (e.g. gentrification). "Macro trends" develop over a long-term period, and it is hard to change or modify them (e.g. the globalisation process). A "Mainstream" trend is accepted by most –almost business-as-usual. Trends can be linear, or more likely exponential or logistic, as illustrates next graphic.

Figure 6.3 Development of trends and megatrends



Source: Adapted from Graham Mollitor et al.

Policies are collective decisions taken by institutions that may change ongoing trends. The impact of a given policy is the difference between previous trend and the trends after the policy is implemented. "Exogenous policies" are decisions to be considered just embedded with trends, often implicitly, since their impacts are not investigated. For the policies being investigated, there is a need to know their aims, and to predict and assess the impacts they may have changing ongoing trends on a given territory, for a group of people or sector, overtime.

Scenarios describe a plausible version of how the future might develop, based on a coherent and internally consistent set of trends. The 'scenario logic' establishes the key relationships between causes and consequences, identifying driving forces. A "Baseline scenario" is the one in which business-as-usual policies, and previous trends, do not change much, and therefore is not always the more likely one. While "prospective scenarios" are likely futures, "exploratory scenarios" maybe less likely but more relevant to define the more extreme boundaries where the actual future may happen. While scenarios are always the result from a foresight deliberative exercise, their consistency and likelihood can somehow be validated by sound forecast modelling.

Visions are "Desirable scenarios" or "Normative scenarios", to be proposed in a planning process. They describe a desirable picture of the future, based on a core set of ideas, values and principles. In an ideal case, visions are based on large participatory processes creating a large ownership of this shared picture of the desirable future. In some cases, also the terms 'perspectives' or 'long-term strategies' are used. These, however, have a stronger focus on the steps towards the desirable future, whereas visions often mainly describe the picture and not the path how to get there. Visions are most useful when discussing whether a policy or

specific measure is likely to contribute to developments leading to desired territorial patterns in Europe (Zillmer et al., 2015).

The process of foresight involves, in our understanding, not just to imagine alternative futures, it is about designing the best available policies to change actual trends towards a shared Vision. It is also about the assessment of the Vision. The assessment of the impacts of any policy is necessary for the policy-making process, as an input for the multiparty negotiation among stakeholders that any policy approval requires. In order to move from short-term individual positions to long-term common interests, stakeholders need to be aware of all possible actions and likely impacts. Policy goals (e.g. stated in policy documents) need to be translated into a number of “criteria” and measurable “indicators”. Policy evaluation is a critical step along a political decision-making process, since it has to bring an objective measure of the general or collective interest of a given policy. Monitoring the impacts overtime is also necessary for stakeholders and institutions to learn and improve the decision-making process.

Figure 6.4 The key questions and principles of impact assessment

The Questions An Impact Assessment Should Answer	
1.	What is the problem and why is it a problem?
2.	Why should the EU act?
3.	What should be achieved?
The Questions An Impact Assessment Should Answer	
4.	What are the various options to achieve the objectives?
5.	What are their economic, social and environmental impacts and who will be affected?
6.	How do the different options compare in terms of their effectiveness and efficiency (benefits and costs)?
7.	How will monitoring and subsequent retrospective evaluation be organised?

Source: European Commission

Next sections provides some insights into time, as well as place and people, key elements of any foresight. Beyond abstract thinking, we suggest to focus on place and people since any policy is at the end local, even personal –it has different impacts across the territory.

6.2 Times matters

Traditionally, future-oriented studies begun by sentences like: “We live in critical times”, or “the world is unlike anything humankind has experienced before”.

It is in practice impossible for future-oriented studies to escape the tramp of “presentism” – imagining futures in which present times have an overwhelming influence. Old future-oriented studies tell us more about the moment when the studies were elaborated, and about the authors of the foresight, than about ourselves living now in the future they somehow

imagined. Future-oriented studies are useful to take decisions only at the moment when they are elaborated.

As much as enlighten decision-makers with new information, foresight aims to rise their awareness. From biblical prophets like Daniel, to nowadays gurus, authors of popular books available at airport bookstores, visionaries always wave dramatic warnings in order to get people attention –and ultimately save them: “Never been a time of greater promise of potential peril”, and “our present decisions may lead us to heaven or hell”, are usual statements.

More than about what may happen in a distant future, or in a remote place, we are concerned by ourselves, here and now. We need to make explicit our collective fears and hopes in order to take the right collective decisions. Foresight is about exploring our ignorance –being aware of the “Known Unknowns” as well as the more troubling “Unknowns Known” –our “Unconscious drivers”, as the Slovenian philosopher and psychoanalyst Slavoj Žižek explains, or the “Collective unconscious” by Karl Jung.

We know the arrow of time is unstoppable. And the world seems to move following an increasingly accelerated speed, even if it turns around itself. Social and cultural change is driven by technologic progress, builds on the so-called “digital revolution” and it is exponential, systematic, will transform everything and everybody, from companies, governments to the society as a whole, each one of us, our memories and expectations. Also our view of the future –today it seems out of control, one century ago the future was supposed to be designed. There is a wave of pessimist in Europe that is not shared by other parts of the world; even those suffering more difficult living conditions in the slums of developing cities are likely more optimists than middle class Europeans. In most developed parts of the world we cannot say much about the future, if anything often negative. The idea that “the best is to come”, is far from being generally agreed.

Our “Technologic Era” was clearly visualised by Martin Heidegger early in the 20th century, and later on by many social thinkers and philosophers –Hannah Arendt, Richard Sennet, just to name the more direct followers, and critics, of Heidegger thoughts. It is true that the accelerated rise of new technologies and the globalisation process creates a feeling of fear and nostalgia in relation to previous times. Millennial and Digital Born generations are the first generations to feel more familiar with new technologies than their parents and teachers. There are billions of people connected to mobile phones, more engineers and scientists than ever in history investigating with increasing powerful means on artificial intelligence, robotics, the internet of things, autonomous vehicles, nanotechnology, materials science, quantum computing. The paradox is that more than a billion of people still lack access to electricity in the world, and in the coming years few billions will live in slums. Technological progress and globalisation seems to lead towards increasing social disparities in the more advanced societies, and disillusionment among working and middle classes.

Today many people live alone, in the most advanced western cities, and more people die by obesity than famine, in a world where almost 2.500 million people live in the slums of huge megalopolis, in extremely poor urban conditions. We already live a world of “terminal paradoxes” –as Milan Kundera, the novelist, once wrote. The nature of foresight is investigating long-term patterns, as well as highlighting paradoxes, counter or round effects, all sort of counterintuitive possible futures.

We may live a post historical period, in a moment when human condition is about to change in unexpected ways. Thinkers in the nineteenth century were rather optimistic, but nowadays the future looks if anything totally unknown and controversial. While there are technophiles (they believe in a new coming *Era of Homus Deus* –Heaven in Earth) others are technophobic (and believe that technology will end up with the human condition as we understand it, and/or may damage irreversibly fundamental ecological patterns). A number of fundamental questions are threatening the possible futures we can imagine: is time to be almost abolished by increasing fast transport and telecommunication means, as well as because people will enjoy much longer living times?

6.3 Place also matters

Space, place and face-to-face relations will have a diminishing relevance in people lives –the *End of Geography*, increasingly substituted by virtual communities? We already see conflict between global networks and places –while progress seems global, poverty seems local, as well as between transnational corporations and governments, still constrained by territorial jurisdictions. Law is less national and public and becomes more global and private. As the co-founder of Facebook said, before we use to live in farms, then in cities and soon in Internet.

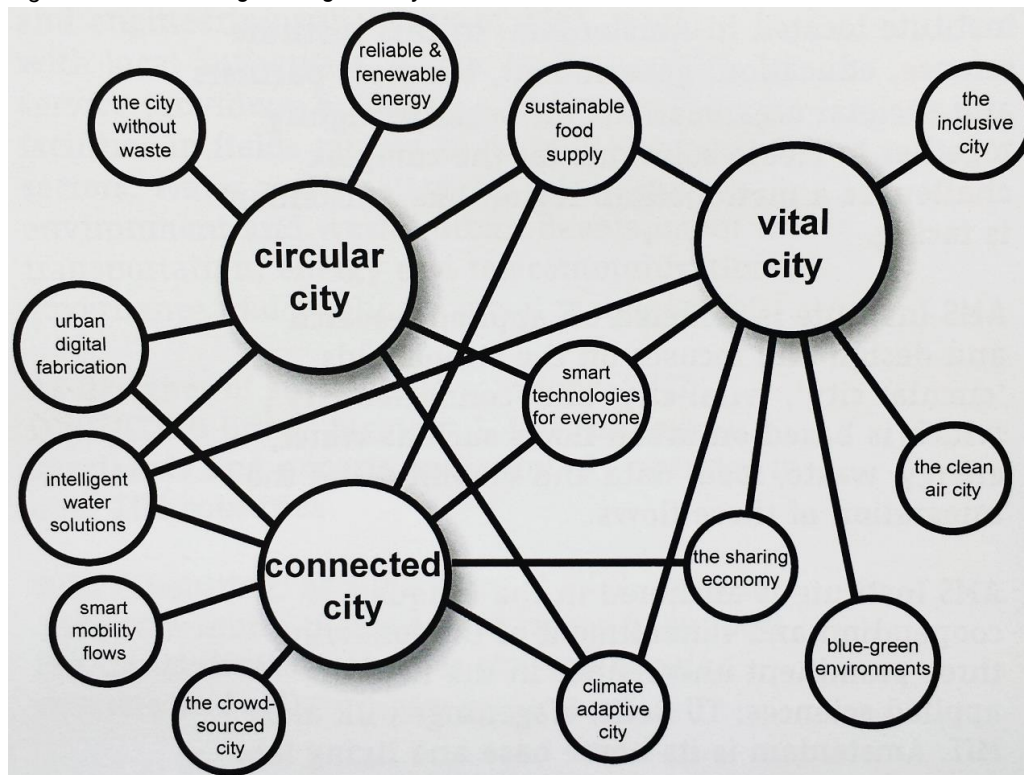
It is not a paradox that in the world of Google, Tesla, Facebook, Airbnb, Uber, or Amazon, many people feel nostalgia of idealised pasts: there is a feeling of “retrospective”, Zygmunt Bauman explained in his latest book, a wish of recovering a sense of purpose and collective memory, as well as place attachment –returning to the idea of “proximity” and “materiality”, both subverted by technology according to Heidegger, confirmed decades later by the investigations of Manuel Castells about the so-called “space of flows”.

Space matters as much as time. Politics is always local, and personal. The future happens somewhere –even in Internet, servers are somewhere located.

Utopias happen literally nowhere –also modern dystopias had no a physical geography attached, but invented ones. Nowadays, however, we see how many visions of the future - societal and technological visions, are embedded within concrete urban and regional visions. From “Smart Cities” to “Ecocities”, “Cities in transition”, “Knowledge cities”, “Creative cities”, “Collaborative City”, “Cooperative City”, “Resilient cities”, “Slow cities”... a number of complementary/alternative visions integrating urban and regional urbanisation form and patterns are being designed and promoted from corporations, public institutes, academia. Common to most of these place-based visions is the dichotomy between “place” and “no-

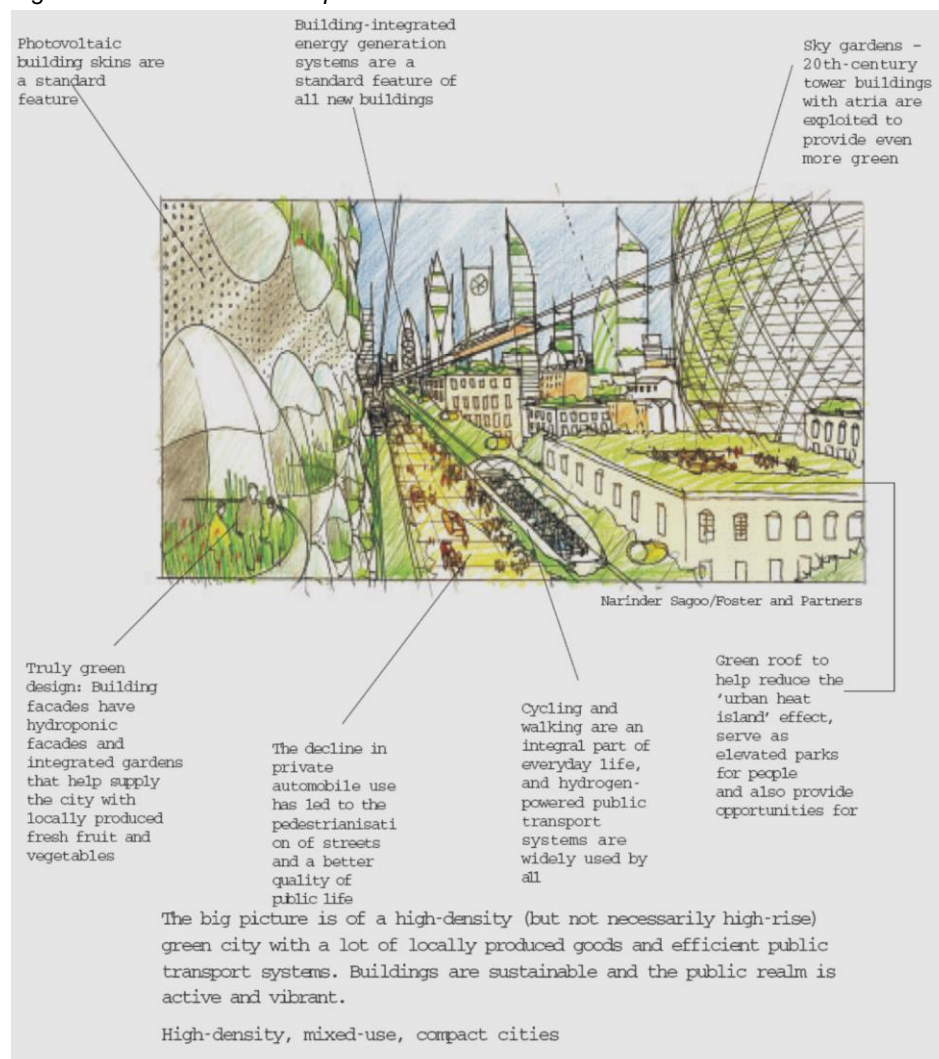
place”, between “border” and “link”, “cultural landscapes” and “political territories”. Foresight studies have to explore one way or another how to reconcile technology –leading to increasingly global and dematerialised economies, virtual communities, cosmopolitan cultures, possible mass customisation and, on the other hand, ecology –the material basis of living, the carrying capacity of ecosystems, as well as culture –the physical relationships, the need for meaning and privacy, identity and self-determination. In terms of governance, it is a matter of “power” –is it the power to change reality diffused in networks globally, or still attached to territorial borders and political institutions? The efficiency and legitimacy of governments is under discussion.

Figure 6.5 “Engineering the City”



Source: Delft University, 2016

Figure 6.6 An artist impression on Urban Colonies Scenarios in 2055



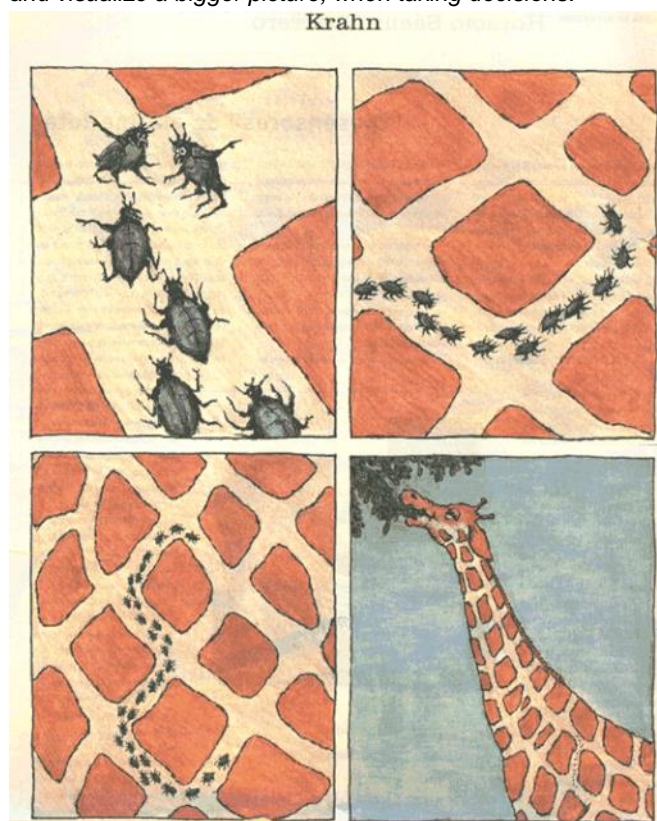
Source: Foresight Programme of the Office of Science & Technology of United Kingdom, 2006

6.4 People first

All policies are not just local, but personal. Foresight deals with medium and long-term prospects, draws upon the views of multiple stakeholders located in different places, interacting in different ways. Policy-making always requires a multiparty negotiation between conflicting positions. To move particular short-term oriented positions towards longer-term common interests, foresight is particularly useful.

We still believe that our own decisions, if well informed, can change the future in line with our wishes. But it is also true that we are far from being pure rational – we don't really know our objectives, and in many occasions we are unable to take the decisions we believe right and would like to take. Often we are unable to explain why – to invent a convincing enough narrative, and we end up in defensive positions.

Figure 6.7 Foresight as the effort to go beyond each one time and place and visualize a bigger picture, when taking decisions.



Source: By Krahn

More than a detailed analysis of everything, or an abstract elucubration, best foresight is about understanding the positions, the interest and the behaviour of key actors, as well as the aggregated patterns that emerge from all. More useful foresight exercises are not just about expert thinking, but mostly deal with stakeholders emotions and feelings. Foresight is a form of “prospective synthesis” at the end, but it is not only “knowledge oriented to action”. Sometimes the process – learning how to communicate with other stakeholders, is as relevant as the final foresight results.

Therefore, foresight is not about predicting with accuracy, but about providing useful information for intelligent and sensitive deliberation among policy-analysts and policy-makers concerning the impacts of alternative options. The key challenge is being able to visualise the whole picture, focusing on meaningful and more sensitive details only, moving stakeholders from their own positions to realise the common interests of all. When we begin by people, we soon realise that foresight involves more than knowledge, it involves finally political principles and values – often not negotiable at all.

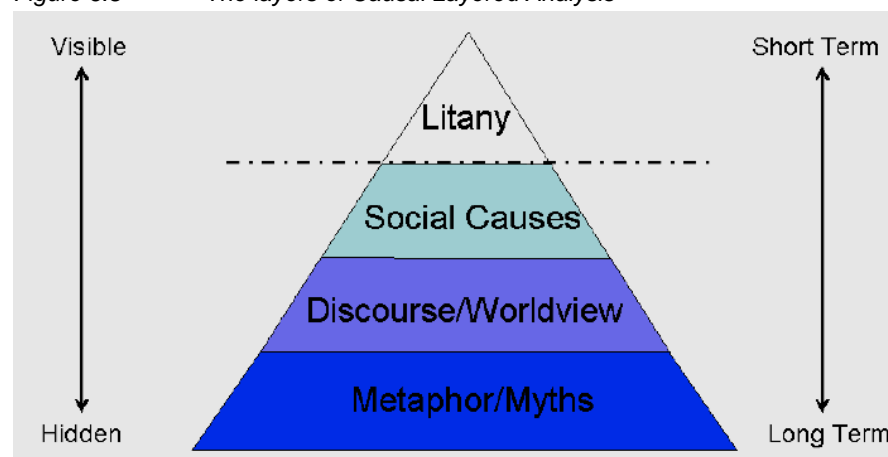
6.5 From Revelation to Deliberation

6.5.1 Mythical Futures

There are differences but also similarities on Ancient and Modern foresight activities. A shocking similarity is to see modern scientists and politicians using narratives not so different from biblical times, when Ancient prophets advised people to change their behaviour before it was too late for Apocalypses. On the other hand, in the eyes of many people, computer models are just black boxes playing very much the role of the distant gods in Delfos. Policy indicators such as GDP or CO2 emissions are almost totemic.

Inayatullah's Causal Layered Analysis (2004), as shown in next figure, is an example of a methodology designed to explore below surface events. With four layers – litany, social causes, worldview and myth/metaphor – this approach takes the litany, commonly held public views and statements about issues and events and interprets it using progressively deeper approaches. The second layer looks for social causes or factors underpinning the events and issues being discussed.

Figure 6.8 The layers of Causal Layered Analysis



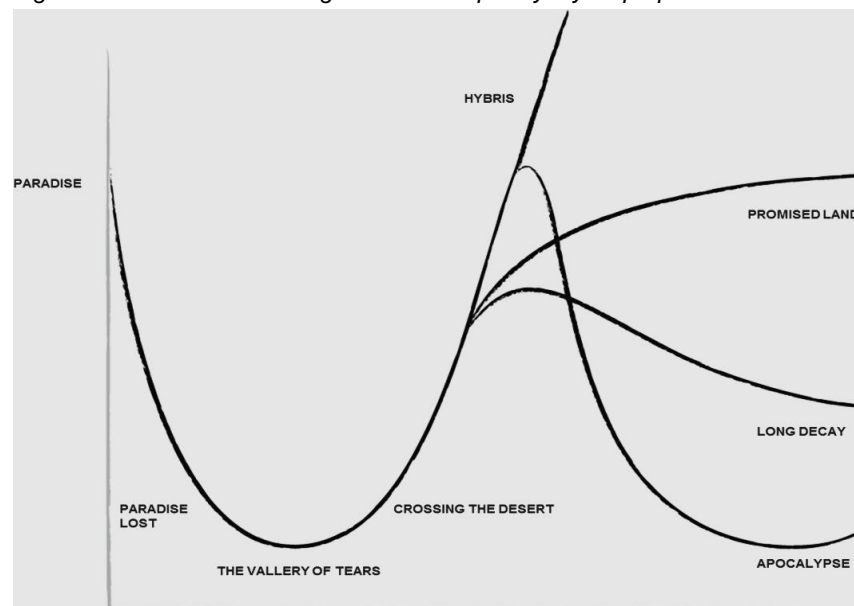
Source: Conway Maree: *An overview of Foresight Methodologies*

The third layer is the discourse, while the fourth layer of analysis explores metaphor and myth to identify intuitive beliefs about the future, and to deconstruct those beliefs to identify what Inayatullah (2003) calls the “civilizational level of identity”.

Our visions of the future are framed by Metaphors/myths. In the Western world, we can easily identify a few mythical/biblical scenarios one way or another influencing or framing our imagination: “Paradise Lost”, “Valley of Tears”, “Crossing the Desert”, “Promised Land”, “Hubris”, “Apocalypses” or the “Long decay”. None of these scenarios need to be described for us to understand what they mean. We could easily classify many popular films into these categories. Still the narrative of the impact of the recent economic crisis in Europe is often based on these scenarios: it is the excess of ambition, the wish to go beyond the limits of growth, that drives humanity to a new “Apocalypses”. When drafting scenarios, it is always useful to compare them against these mythical ones. It is not surprising to see how often

there is a clear one-to-one relation. It is not easy to escape from them. Not surprisingly all these scenarios have a particular geography attached.

Figure 6.9 Mood swings and contemporary myths proposed



Source: Proposed by MCRIT in FLAGSHIP, 7th EC Research Program 2015

- In the Paradise the world is represented as a place in which existence is not anything but positive, harmonious and timeless. At paradise there is only peace, prosperity, and happiness, but is not necessarily represented with wealthy and luxury. At paradise, misery and selfishness do not exist.
- The Paradise Lost refers to the Biblical story of the Fall of Man: the temptation of Adam and Eve by the fallen angel Satan and their expulsion from the Garden of Eden. Here mankind cess being naive and innocent, and that brings a punishment as a consequence.
- The Valley of Tears represents the vision in which mankind is struggling to survive. Everything is sorrow and discomfort. Besides, suffering teaches mankind to live with less superficiality and to comprehend other people situation.
- Crossing the Desert refers to a hopeful journey. The Desert arises archetypal in many cultures and traditions with a dual nature. It is desolation and abandonment, but it is also a place of contemplation, quiet and divine revelation.
- Promised Land is the vision used to describe the land promised or given by God. After crossing the desert, mankind will find a longed-for place where complete satisfaction and happiness will be achieved.
- The vision of Decay refers to films where decadence is the subordination of the whole to the parts. In this vision, humanity falls into a corrosive decline due to an erosion of moral, ethical, and sexual traditions.

- Hubris refers to the extreme pride or arrogance. With hubris, humankind loses contact with reality and has an overestimation of one's own competence or capabilities, especially through the exhibition of the position of power.
- The Apocalypse: This vision refers to the end of times and society. Mankind is in an era dominated by falsehood and misconception. The world as we know it ends."

The idea of the future is of course a social construct. While the future is considered "circular" in many Eastern civilisations, in the Western world was considered "linear", and "progressive", until recently- Nowadays there is a well spread feeling that the future will be "worse" – that we have a "Dark Age" ahead of us, and our children will live in a world that will not be better than ours. This is to a large extent more a perception than a rational analysis: we feel we are living in "Hubris".

The "City of God" by Saint Agustin was already the place of virtue and equilibrium, "Heaven in Earth". In a way, the ethical values embedded in this ideal vision, prudence, justice, were one way or another advocated since the "Ideal City" of Plato.

6.5.2 Rational Futures

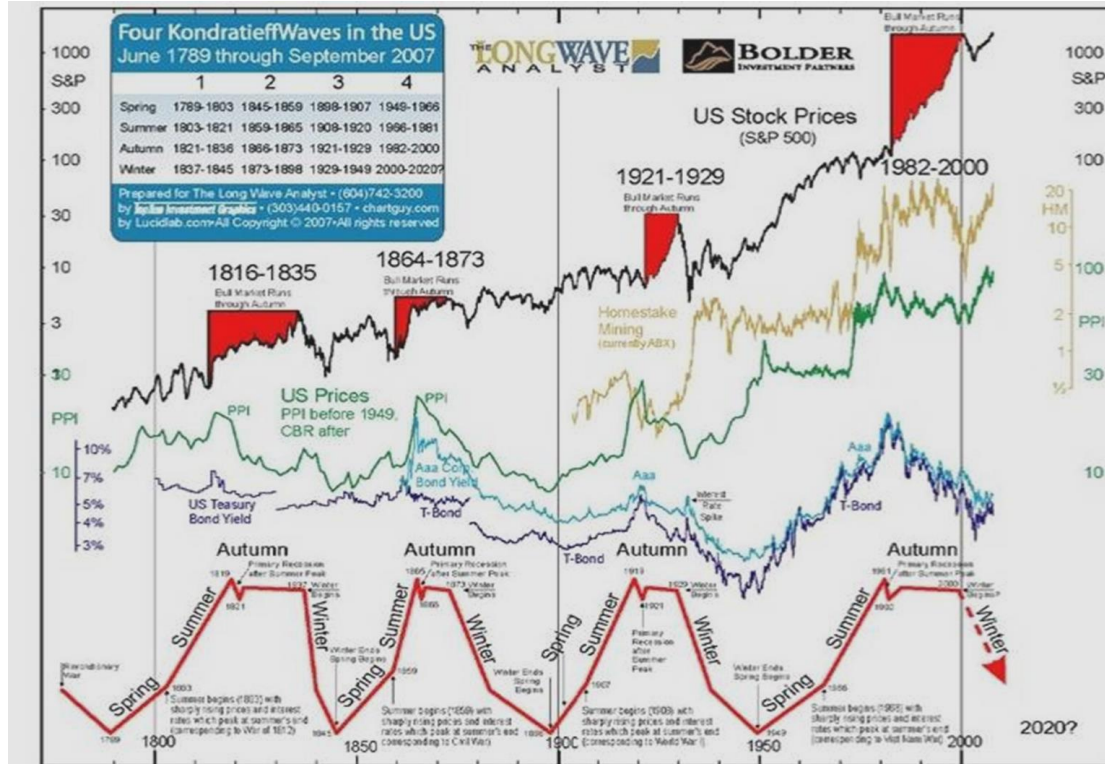
The evolution from myths to logos, and the development of rational narratives to substitute mythical narratives was the beginning of Greek philosophy. "The Republic", by Plato was the first vision of the future – how a community should be governed based on rational thinking.

The first modern future narrative, already in the Renaissance, was probably "Utopia", by Thomas Moro, followed by a number of many other utopian and dystopian narratives.

Robert Malthus is recognised as the first thinker to apply scientific arguments to demonstrate his vision for the future, predicting that human needs and/or ecological impacts grow "geometrically" exponential while resources only "arithmetically" linear.

Following this approach, in early 20th Century, Nikolai Kondratieff proposes the long-cycle economic development waves. This vision for the future – patterns and regularities history has, follow the interest of major 19th Century thinkers like Friederich Hegel or Karl Marx to discover the laws of history.

Figure 6.10 Kondratief Cycles of Economic Growth



The Club of Rome in early seventies in the 20th Century updated the initial thoughts of Robert Malthus by applying the first computers to run a complex dynamic system's model – a non-linear system of equations, of the world. In the context of the “Oil crisis”, these future-oriented studies were extremely influential highlighting the social and environmental problems generated by economic growth – and making the case of “limits of growth” in more scientific terms that was advocated before. These scientific-oriented studies confirmed the earlier visions by American ecologists from the sixties and were reinforced soon after in many people minds after seeing the images of the “Blue Planet” taken from the moon by astronauts. The major public demonstration in the history of USA was the “Earth Day” of 1970. The American Environmental Protection Agency was also created then.

Taking advantage of computers, land-use and transport forecast models, as well as environmental impact models, and macro-economic growth models, were already developed during the sixties (from the so-called 4-steps traffic models in Detroit and Chicago, to the linear programs on the whole economy of the URSS). Together with these early scientific approaches to foresight, more qualitative approaches were also developed by social thinkers –in some cases, books about the future became popular bestsellers.

Nowadays a large number of international public and private institutions (e.g. United Nations, World Energy Institute, IATA, World Tourism Association, Shell...) regularly develop future-oriented studies covering all fields, from demographics to trade or finance, applying all kind of methodologies, including participatory processes.

6.5.3 Scientific forecast

Accurate predictions and transparent meaningful explanations alone, are not the most important model requirements (or at least not the only ones) for using forecast models in decision-making processes. If the model has to be used as planning assessment tool (as a decision-making tool) it has to provide for robust results, in the sense that each run with the same input data yields to the same final results, and marginal changes in input variables do not produce huge variation. This has crucial conceptual implications, since it requires models to be deterministic (even if they include internal scholastic mechanisms) and assumes the existence and unicity of an equilibrium point.

Contrary to intuition, the "predictive" and the "explanatory" attributes of scientific models are not always coincident: Better explanations not necessarily produce more accurate predictions. Outputs from models with wrong explanatory formulations may produce better predictions (e.g. the famous Kepler formulations in relation to Newton gravitatory laws). And the opposite may also be true. Recent developments on non-linear dynamics show the actual limits of any scientific model predicting not just complex human behaviour but even much simpler physical systems. While evolutionary biology is well ranked for providing right explanations and bad ranked for predictions, quantum mechanics is in just in the opposite situation (excellent, amazing predictions but no clear explanation).

An "accurate prediction" is usually obtained using statistically-based paradigms, supported by large volumes of data (it is even possible "to let the data speak for itself" and give the computer the capacity to "learn by itself").

Shortly speaking, scientific forecast models could be clustered on three major paradigms:

- Statistically-based (then data becomes an indispensable starting point –the model is based on just “letting the data to talk by itself”)
- Theoretically-based (then the abstract formulation, e.g. based on scientific analogies is the starting point and data is used mostly to validate)
- Expert-based (e.g. rules of thumbs, heuristics... and then comparative cases and expert's panels are key modelling procedures).

But accuracy predicting short-term trends based on statistic adjustments not always provide meaningful explanations: There is the misperception to consider that strong correlation implies something about causal connections between the variables correlated. Furthermore, overestimating a model formulation with the available data may reduce the apparent "error" (between model outputs and data samples) but may also increase the "real" error (between model outputs and the evolution of the system being modelled, especially in the long-term).

On the other hand, a meaningful explanation is usually obtained by applying a formulation derived from a more general theoretical framework which is independent from a particular set of data. A meaningful explanation may provide less accurate predictions that a meaningless

explanation. Fundamental behavioural hypotheses, such as considering people as rational agents having perfect information, have not being substituted yet by more explanatory hypotheses such as considering people as adaptive agents using local and temporary information to satisfy (rather than to optimise) utilities' thresholds.

Because of the required robustness of models, sensitivity analysis is an indispensable part of the modelling process. Given the likely complexity of any advanced model formulation (with continuous feed-backs and iterations of non-linear mathematic expressions) there is an obvious risk that marginal changes in inputs lead to non-stable solutions (periodic, complex or even chaotic) or simply to very different outputs. Testing the statistical reliability of more sensitive parameters and variables becomes then a crucial quality control to be carried out. Needless to say, when it takes days (or many hours) to run a model, the capacity to carry on sensitivity analysis is seriously constrained. In this cases, the use of well-known and validated algorithms is almost indispensable.

The emergence of Big Data makes more information available, provided by private and global sources instead of public official institutes. It changes the way future-oriented studies are carried out, since new analytic techniques and more sophisticated modelling paradigms become feasible. Even more relevant than moving from a period of scarce official data to abundant data, is the possibility to engage large crowds in knowledge sharing environments.

6.5.4 Consensual Futures

Consensus always involves a mix of contradictory feelings and controversial values, as well as rational knowledge and careful calculation. Emotions –linked to initial positions and self-interests, and rationality, are mixed up on stakeholders minds, as well as in experts' minds. Distinguishing what we would like – our wishes, from what may happen is critical for a healthy deliberation, but hardly can be achieved. All considered, there is always not just an unavoidable ambiguity, but a need for ambiguity, if we have to agree in a common Vision for the future this vision cannot be absolutely clear.

Rationality is needed mostly to reject inconvenient possible futures, but emotion is needed to accept a possible future, since we never can understand or embrace completely.

There is a broad range of foresight methods, resulting for the combination of mythical, rational and participatory approaches. Quantitative and qualitative, analytic and synthetic, descriptive or normative methods can be applied depending on the nature of the foresight exercise to be carried out.

The end of the twentieth century witnessed the advent of many new foresight methods for envisaging the future and combinations thereof. Most of the experiences in organized experiments applying various foresight initiatives concerning future issues in science, technology or society were evaluated as very positive. Companies made use of the data, the media published a large number of articles, ministries reflected once more about their research priorities, and a research institution even based an evaluation on Delphi results

(Cuhls et al., 1998, 2002). In most countries, activities have been supported by research ministries or other public bodies. All foresight process concepts try to implement communicative processes which integrate the different actors in the innovation systems ('strategic' or 'distributed intelligence', see Kuhlmann et al., 1999).

7 Approach: Co-creative foresight

Currently, policy-support and collective decision-making requires new ways of knowledge production and decision-making processes. Beyond gathering collective intelligence, there is a need to reconcile values and preferences, as well as create common understanding of problems and opportunities, and finally a sense of ownership for policy options.

The role of citizens in public service innovation or in co-creating public policy does not have the same history as that one of the private sector, where across different industries, customers have played a crucial role in suggesting improvements, new features, new options for existing services or products. However, if one looks back into history, citizen participation goes back to ancient Greece and Colonial New England. Before the 1960s, governmental processes and procedures were designed to facilitate "external" participation. Citizen participation was institutionalized in the mid-1960s with President Lyndon Johnson's Great Society programs (Cogan & Sharpe, 1986 p. 283).

Nowadays, several social innovations originated from ideas and suggestions outside the government. Often, it was the citizens or citizens groups that "forced" the government to act on their ideas and thus, managing to bring a new dimension into the government –citizens' relationship. The kind of changes that have occurred during the past years, including due to the advent of technology, are related to the fact that citizens became able not only to develop innovative solutions to problems but also, to play a more active role in identifying the causes of the problems.

7.1 Foresight methodologies

The application of a single foresight method does not make a foresight exercise. Usually different methods are used to perform specific functions at different stages in the process. Furthermore, methods are combined with each other and tailored to perform these functions in an optimal way. This leads to a specific arrangement of methods within each exercise. 'Methodological framework' means the overall arrangement.

Methodology can be understood as the attitude towards knowledge generation that underlies any research activity (e.g. 'constructivism', 'empiricism' or 'positivism' are methodological orientations).

The next table shows examples of methodological issues faced by professional practitioners in undertaking Foresight exercises. The examples were all drawn from a workshop in December 2005 of the COST Action A22 network, where members of the different working groups were challenged to surface some of the methodological issues they faced.

Figure 7.1 Examples of methodological issues faced by professional practitioners in undertaking Foresight exercises

Methodological features of Foresight	Examples of methodological issues cited by professional Foresight practitioners
Reflexivity , i.e. reconstructing meaning from a process of interpreted feedback ³	Values, overt goals, questions and problems, types of knowledge, biases, ambiguity, emotion, learning, learning society, ways of thinking, vision.
Simulation , i.e. the generation of alternative worlds, from micro to macro.	Open mindedness, replication, tools, instruments, use of technology, vision.
Time (past/present future), i.e. a pre-requisite for Foresight is a concept of future time.	Interestingly this issue was not noticed as problematical by the participants, except as 'analysis and time'.
Participation , i.e. an engagement with human actors that have a stake now or in the future of the specified issue.	Participatory methods, consensus, diversity, negotiation, community involvement, individual ability to Foresight.
Action , i.e. Foresight is performative	Social impact, policy impact, emotion during transient periods.
Descriptive difference : description of change, i.e. abstraction from whole worlds and re-categorising of concepts or events are fundamental to producing descriptions of different futures.	Creativity, boundaries, meta-analysis, symbols, ordering, classification, situated-ness, redundancy, coherence, selection, risk.
Production of difference , i.e. theories and practice of causality, power and influence.	Knowledge interest heuristics, social impact, intensions of sponsor, language, networks, conflict/co-operation, emergence, resilience, commensurability of models, hegemonic Foresight, anti-Foresight.
Communication and meaning . Foresight do not carry social meaning unless they are communicated to or with others.	Rhetoric, metaphor, deconstruction, action-learning.
Representation . It is typical of Foresight to produce symbolic texts as representations of generated knowledge.	Symbols, framing, commensurability.
Legitimacy , i.e. as with any form of intellectual contribution to society, Foresight has to establish and maintain its political seriousness.	Objectivity (overt goals), rigour, ethics, replication, transparency, epistemological explanations, validity, feedback, costs, transparency.

Source: Fuller T., De Smedt P. & S. Rothman D. (2006) *Advancing Foresight Methodology Through Networked Conversation. Second International Seville Seminar on Future-Oriented Technology Analysis: Impact of FTA Approaches on Policy and Decision-Making.*

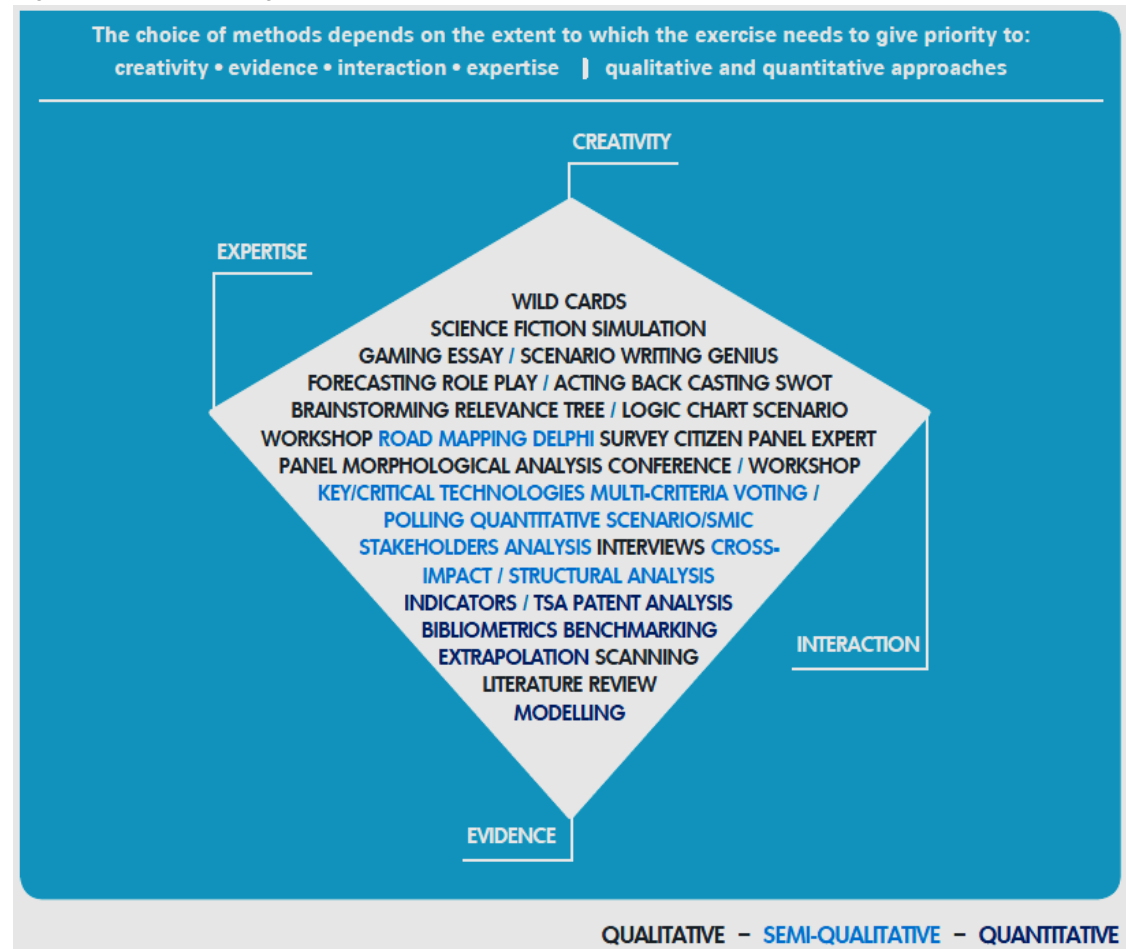
Selecting an appropriate methodology is a key decision.

The methodological decision for proceeding has direct consequences on the work to be carried out. From a pragmatic point of view, two main methodological choices –that can be integrated, can be considered:

- **Expert-based foresight.** It can apply quantitative methods making it necessary to arrive at a firm definition of a reduced number of factors or qualitative methods making it possible to achieve an intrinsically more meaningful observation of details and nuances without the need of definitively including or excluding key factors.
- **Participatory methods**, supported by quantitative/qualitative or both approaches, are based on collective deliberation, aiming interaction and creativity among persons not necessarily experts (e.g. end-users, stakeholders...) but also including experts.

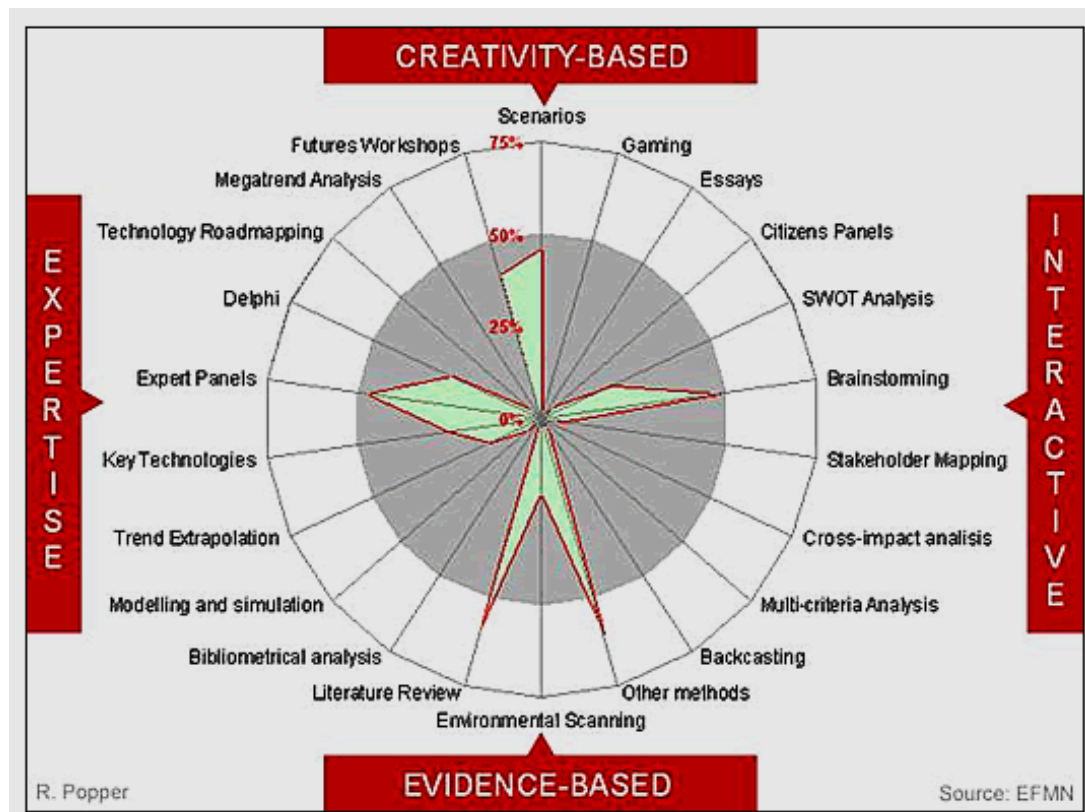
The figure below outlines a range of methods that can be considered. The method must fit the specific context and the purpose, scale and context of the exercise. The combination and sequence of methods or tools also needs careful consideration.

Figure 7.2 A range of methods that can be considered



Source: Popper R. (2008) How are foresight methods selected? *Foresight*, 10 (6).

Figure 7.3 Possible grouping of Foresight methods



Source: http://forlearn.jrc.ec.europa.eu/guide/4_methodology/meth_classification.htm About Co-creation

Today's plea about citizen engagement in policy making departs from the very essence that citizens are the key "experts" and not the public servants sitting in their offices. This takes us to two different approaches widely debated today and mainly:

- The democratic decision-making approach based on the assumption that all who are affected by a given decision have the right to participate in the making of that decision. Thus, for example, citizens know best how a particular service or another works, they know what does not work and they have tried to fix them.
- The technocratic decision-making approach which implies that trained staff "experts" are best suited to make complex technical decisions. However, scientific and technocratic approaches "not only failed to solve social problems but often contributed to them" (Nelkin, 1981. p. 274). The notion that the "cure is often worse than the disease" becomes increasingly important as the technology provides alternative solutions to public policy issues.

Community-based, interactive participatory approaches are nowadays useful means to meet the requirements posed by real-world problems.

Needless to say, expert analysis are still indispensable to assess the feasibility of policy options from financial, legal or institutional point of view, as well as to inform on the most likely impacts of a given policy, as well as to support the policy design process.

Figure 7.4 Co-creation steps



7.2 Competences for successful foresight

In order to carry on successfully territorial foresight study we believe practitioners need develop a number of competences linked to transdisciplinarity knowledge production. While these competences are indispensable for any person coordinating a foresight process, they remain very useful for any participants. Before engaging in the participatory process itself, as well as during the process, we consider useful to devote some time and resources to clarify the need for participants to open their minds and further develop these competences.

Table 7.1 Competences for successful foresight

	Foresight Steps	Competences
1	Framework Questions: Boundary Conditions	Reflexivity
2	Open Consultation: Gathering all Views	System's Thinking
3	Understanding the Situation: Diagnosis	
4	Expert's discussion on Scenarios	Anticipatory Thinking
5	Scenario Building: Prospective	
6	Stakeholder's Deliberation	Normative
7	Assessing the Vision: Regulative	
8	Designing Pathways: Executive	Strategic
9	People Envisioning: Communicating the Vision	Interpersonal
10	Empowering Institutions: Learning from the process	

Transdisciplinary, community-based, interactive, or participatory research approaches are often suggested as appropriate means to meet both the requirements posed by real-world problems. One key aspect of transdisciplinary knowledge production is the involvement of actors from outside academia into the research process in order to integrate the best available knowledge, reconcile values and preferences, as well as create ownership for problems and solution options. As disciplines are increasingly specialised, this need for a new more comprehensive understanding emerge.

The challenge is not only interdisciplinary -experts on different disciplines working fruitfully together, having common goals and aims, but for all of us thinking beyond disciplinary frames, beyond educational barriers and languages. Clever children and elderly people can provide extremely useful insights on urban and regional foresight, for instance, even more relevant than the sophisticated analysis of a specialist. Foresight –as well as urban and regional planning, is a transdisciplinary field by nature.

Early traditions usually formulated their theories in terms of stories. So first we had myths, then –after Ancient Greek philosophy, logos as well, in the Western world. Philosophy, over years, fragmented in social sciences or humanities, physics and natural sciences. But the so-called industrial revolution was not made possible by abstract thinkers, but by the practical work of uneducated engineers from the tradition of medieval carpenters, watchmakers, blacksmiths.

Next, six fundamental competences are briefly described.

7.2.1 Interpersonal-Communicational

A critical competence for addressing spatial foresight challenges is the interpersonal competence, i.e., the capacity to understand, compare, and critically evaluate different positions, perspectives and preferences (epistemological pluralism). Some of the participatory methods that enable system thinking include in depth interviews with stakeholders, surveys to experts and other forms of consultation. In-depth interviewing is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation. In-depth interviews should be used in place of focus groups if the potential participants may not be included or comfortable talking openly in a group, or when you want to distinguish individual (as opposed to group) opinions. They are often used to refine questions for future surveys of a particular group. Theory U (MITx U.Lab) proposes that the quality of the results that we create in any kind of social system is a function of the quality of awareness, attention, or consciousness that the participants in the system operate from.

7.2.2 Reflexivity

A methodological approach to reflexivity emerged in the 1970s with Bloor's (1976) Strong programme. Experts' opinions influence the system within which they are leading inquiries. Hence, reflexivity is suggested as a methodological principle to deconstruct science and any formalised knowledge, and keep track of its social, political, historical and cultural influences. Building on Bloor's 'strong programme', Bourdieu (1988, 1996, 2001, 2003) claimed that experts bear intrinsic biases. Experts can only understand the implications of their biases on their research by reflexively questioning the origins of these influences. Hence, reflexivity is as an act of self-examination to achieve a deeper understanding of one's own values, motivations, and to better appreciate one's relationship with the policy challenges being investigated. Reflexivity is a behaviour that takes the shape of a reflection-action spiral, where reflection influences the actions on the world, and in return, the world affects the reflection.

7.2.3 System Thinking

Systems-thinking competence is the ability to collectively analyse complex systems across different domains (social and cultural, economic, etc.) that interact in a given moment and overtime, in a particular place as well as across different scales (local to global), thereby considering cascading effects, inertia, feedback loops and other systemic features related to spatial problem-solving framework. The capacity to analyse is based on acquired systemic knowledge including concepts such as structure, function, cause-effect relations, but also perceptions, motives, decisions, and regulations. An intimate understanding of the inner fabric and dynamics of complex social systems is a prerequisite for identifying intervention points, anticipating future trajectories and staging transition processes.

7.2.4 Anticipatory Thinking

Anticipatory vision requires the ability to collectively analyse, evaluate, and craft rich “pictures” of the future related to issues and problem-solving frameworks. The term “pictures” has been used (similar to “stories” or “images”) as an open notion to include qualitative information, quantitative information, narratives, imagery, etc. The ability to analyse pictures of the future includes being able to comprehend and articulate their structure, key components, and dynamics; the ability to evaluate refers to comparative skills that relate to the “state of the art”; finally, the ability to craft integrates creative and constructive skills. The capacities to analyse, evaluate, and craft are based on acquired future-oriented knowledge including concepts such as time and uncertainty; peer-reviewed “classics” such as the IPCC’s emission scenarios; as well as methods and methodologies such as simulation and scenario analysis. Anticipatory competence is important in conjunction with sustainability assessments of future trajectories (cf. “anticipatory assessment”: Grunwald 2007), for the creation of transition strategies (cf. “backcasting”: Swart et al. 2004), as well as in conjunction with testing and continuously adapting transition strategies in order to redirect path-dependent future trajectories toward the visions of a sustainable future (cf. “anticipatory governance”: Guston 2008).

7.2.5 Normative

Normative competence is the ability to collectively map, specify, apply, reconcile, and negotiate sustainability values, principles, goals, and targets. This capacity enables, first, to collectively assess the (un-)sustainability of current and/or future states of social-ecological systems and, second, to collectively create and craft sustainability visions for these systems. This capacity is based on acquired normative knowledge including concepts of justice, equity, social-ecological integrity, and ethics (e.g., to know which practices can be transformed or discarded and which must be maintained to sustain viability of life-supporting systems); peer-reviewed “classics” such as the “Brundtland Report” (World Commission on Environment and Development 1987); as well as methods and methodologies such as multi-criteria assessment and structured visioning. Addressing sustainability problems and opportunities requires going beyond descriptive questions of how complex social-ecological systems have

evolved, are currently functioning, and might further develop. The concept of sustainability is unavoidably value laden and normative, since it addresses the question of how social & ecological systems ought to be developed, so that they balance and even enhance socio-economic activities and environmental capacities (Swart et al. 2004). Normative competence is important for constructing direction and orientation about deliberative change. Transition strategies toward sustainability are based on identifying undesirable states and dynamics as well as envisioning desirable ones.

7.2.6 Strategic

Strategic competence is the ability to collectively design and implement interventions, transitions, and transformative governance strategies toward sustainability. This capacity requires an intimate understanding of strategic concepts such as intentionality, systemic inertia, path dependencies, barriers, carriers, alliances etc.; knowledge about viability, feasibility, effectiveness, efficiency of systemic interventions as well as methods and methodologies of designing, testing, implementing, evaluating, and adapting policies, programs, and action plans, involving different societal actors, facilitating varying perspectives, and acknowledging inconclusive evidence. In simple terms, this competence is about being able to “get things done”. This involves familiarity with real world situations and relationships, political understanding, challenging positions at the right time, being able to solve logistical problems, using language that non-academics are comfortable with, working with deadlines that governments insist on, and so forth.

Strategic competence is linked closely to the previous three competencies as strategies for transformative change attempt to effect the transition from the current state of the social-ecological system (identified through systems thinking) toward sustainable states and dynamics (through normative competence), taking into account existing path dependencies that might lead to undesirable future states (through anticipatory competence).

7.3 Insights from Theory U

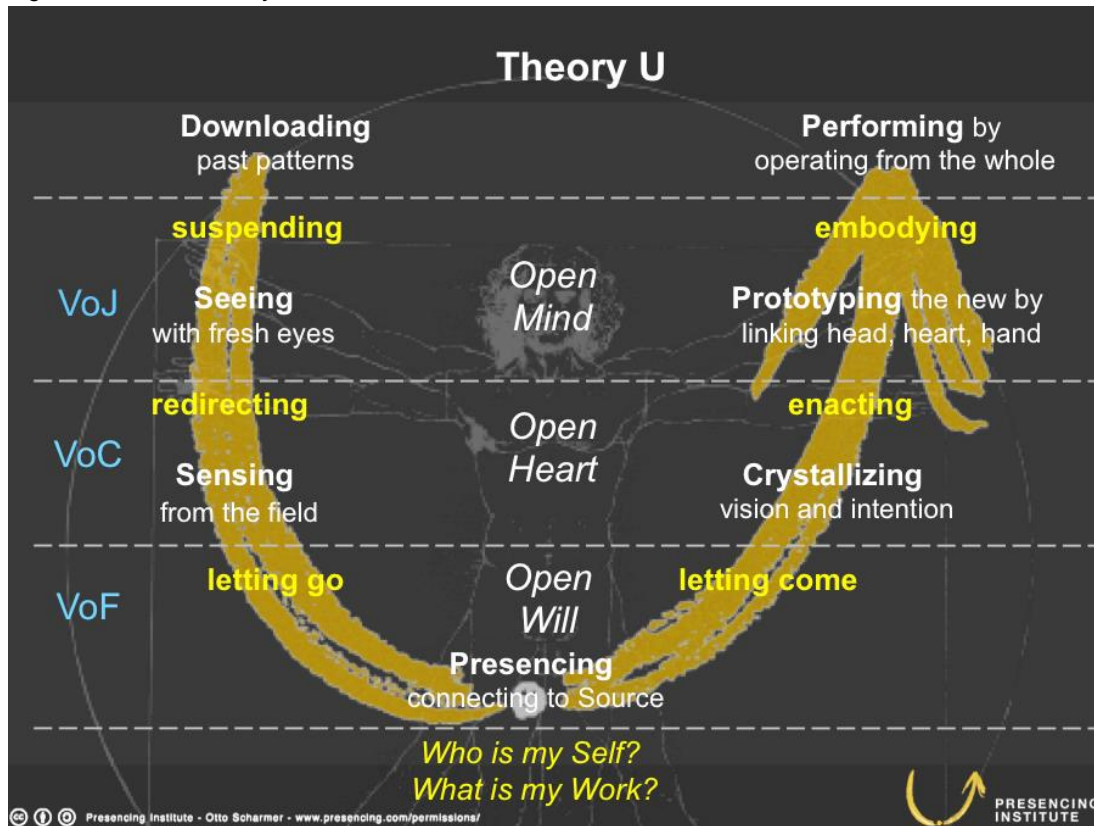
This chapter introduces a theoretical background to Theory U, based on the co-creative foresight approach (see Figure 5.3).

Theory U proposes that the quality of the results that we create in any kind of social system is a function of the quality of awareness, attention, or consciousness that the participants in the system operate from.

Since it emerged around 2006, Theory U has come to be understood in three primary ways: first as a framework; second, as a method for leading profound change; and third, as a way of being - connecting to the more authentic of higher aspects of our self.

The essence of that view is that we cannot transform the behaviour of systems unless we transform the quality of awareness and attention that people apply to their actions within these systems, both individually and collectively.

Figure 7.5 Theory U



Theory U principles are:

- (1) Energy follows attention. Wherever you place your attention, that is where the energy of the system will go. "Energy follows attention" means that we need to shift our attention from what we are trying to avoid to what we want to bring into reality.
- (2) Follow the three movements of the U. We refer to this as the U process because of the "shape" of the journey. In order to get to the deep point of transformation (at the bottom of the U) it is necessary first to "go down the U" (the left-hand side) by opening our minds, hearts, and will, and then, after "passing through the eye of the needle" at the bottom, "go up the U" (the right-hand side) to bring the new into reality.
- (3) Go to the edges of the self. To apply this process in the context of institutions, we have to power it with a new leadership technology. The core of this new leadership technology focuses on tuning three instruments: the open mind, the open heart, and the open will. With an open mind we can suspend old habits of thought. With an open heart we can empathize, see a situation through the eyes of someone else. With an open will we can let go and let [the new] come.
- (4) Pass through the eye of the needle. At the deepest point of each U journey is a threshold. Crossing that threshold, passing through the eye of the needle, can feel like dying and being reborn. The phrase "eye of the needle" refers to a gate in ancient Jerusalem, where,

according to the Bible, “it is easier for a camel to go through the eye of a needle than for a rich man to enter the kingdom of God.” For a man to fit his camel through Jerusalem’s gate, he has to remove all the bags from the camel’s back. Likewise, if we want to go through the eye of the needle at the bottom of the U, we have to let go of everything and offload all the baggage that isn’t essential. Going through that gate means encountering the two root questions of our journey: Who is my Self? and What is my Work? The capital “S” Self is my highest future possibility. The capital “W” Work is my sense of purpose or calling. It’s what I am here on this earth to do.

The three main movements of the U process are:

Going down the U: “Observe, observe, observe.” Stop downloading and totally immerse yourself in the places of most potential, in the places that matter most to the situation you are dealing with.

At the bottom of the U: “Retreat and reflect, allow the inner knowing to emerge.” Go to the places of stillness where knowing comes to the surface. Here you share and reflect on everything that you have learned from a deep place of listening, asking, “What wants to emerge here?” and “How does that relate to the journey forward?” So the key question is: how can we become part of the story of the future rather than holding on to the story of the past?

Going up the U: “Act in an instant.” Explore the future by doing. Develop a prototype. A prototype explores the future by doing something small, speedy, and spontaneous; it quickly generates feedback from all the key stakeholders and allows you to evolve and iterate your idea.

The matrix of Social Evolution in the table below traces the unfolding of evolutionary inversion.

Table 7.2 The Matrix of Social Evolution proposed by Theory U (from “Leading from the Future as it emerges”)

Attention	Micro: Attending (Individual)	Meso: Conversing (Group)	Macro: Organizing (Institution)	Mundo: Coordinating (Global Systems)
<u>Usual communication...</u>				
1.0: habitual awareness	Listening 1: downloading habits of thought	Downloading: Speaking from conforming	Centralised control: Organising around hierarchy	Hierarchy: commanding
<u>Suspending...</u>				
2.0: ego-system awareness	Listening 2: factual, open-minded	Debate: speaking from differentiating	Divisionalised: organising around differentiation	Market: competing
<u>Redirecting...</u>				
3.0: Stakeholder awareness	Listening 3: empathic, open-hearted	Dialogue: Speaking from inquiring others, self	Distributed/networked: organizing around interest groups	Negotiated dialogue: cooperating
<u>Letting go...</u>				
4.0: eco-system awareness	Listening 4: generative open-presence	Collective creativity: speaking from what is moving through	Eco-system: organising around what emerges	Awareness-based collective action: co-creating

If you read the matrix of Social Evolution vertically, you see the process of inversion in all four columns: Individual inversion is about the opening of the mind, heart, and will as a process of accessing the deeper and dormant levels of human intelligence. relational inversion is about conversations that make a system sense and see itself (dialogue). Institutional inversion is about the journey of opening up our institutions and linking them to the intelligence that is embedded in the larger eco-system system around us (ego to eco). and systemic inversion is about evolving our governance from the old mechanisms (centralization and competition) to the new (making social fields to sense and see themselves).

8 Cases: Experiences on Territorial Foresight Studies

8.1 European foresight

Five possible futures for Europe

The first, as well as one of the most influential studies carried out in Europe was developed by the *Forward Unit* of the European Commission. In 1989 the Forward Studies Unit was established by the European Commission as a small 'think tank' staffed with EU officials reporting directly to President Jacques Delors. Now it is known as Bureau of European Policy Advisers. In the "Five possible futures for Europe" (1999) report five comprehensive scenarios, described as images of the future, in qualitative terms, were designed:

- "Shared Responsibilities"
- "Triumphant Markets"
- "One hundred Flowers"
- "Turbulent Neighbourhoods"
- "Creative Societies"

The building of the study followed the so-called *Shaping Actors-Shaping Factors* methodology, inspired by the French tradition (analysis of variables, partial scenarios and global scenarios). From the Anglo-Saxon tradition, the *brainstorming* method was also applied.

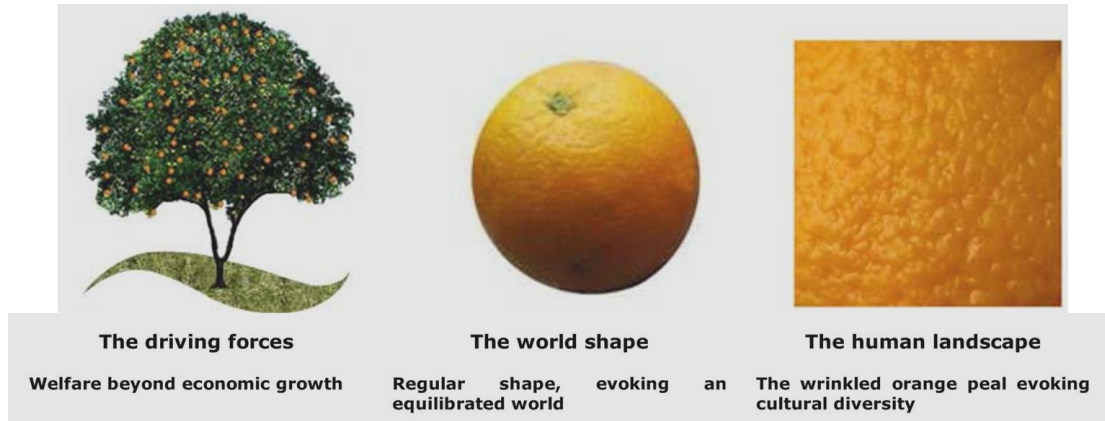
European Research Framework

In the European Research Framework several forecast and foresight studies have been conducted, applying all kind of quantitative, qualitative and participatory methodologies, by multidisciplinary Consortia. Some of these research projects have considered the territorial dimension explicitly.

PASHMINA (PARadigm SHifts Modelling and INnovative Approaches). This was a foresight project conducted under the 7th Framework Programme from 2009 until 2012. The focus was put on plausible and desirable shifts of the overall socio-economic paradigm. The scenario space was structured by speed (do it fast vs. do it slow), and solidarity (do it alone vs. do it together). For the four scenarios resulting from this structure, implications on the transport-energy nexus and changes in land use were analysed.

FLAGSHIP (Forward Looking Analysis of Grand Societal Challenges and Innovative Policies). This was a research project under the 7th Framework Programme (2013-2015) that focuses on transition pathways towards global sustainable well-being. In an iterative process, two opposing, yet plausible and (possibly) desirable storylines were developed. Global, wide-scoped storylines were translated into sector-specific scenarios and contexts and the governance-related implications are analysed.

Figure 8.1 PASHMINA Qualitative scenarios (New welfare: the Orange World paradigm)



Source: PASHMINA (2015)

Global Europe 2050

One of most interesting results from these European Research Framework studies was the “Global Europe” study presenting different scenarios (among others the vision of a “European Renaissance”). In this study, twenty five leading analysts looked into the future and work through a number of scenarios to see where the EU might be in 2050. Their work, presented in this Global Europe 2050 report, analyses three key scenarios which describe different but nonetheless possible pathways that Europe could choose to follow over the decades to come.

- The first scenario is what if “Nobody cares” and Europe just muddles along with no clear vision or direction. In this scenario the analysis shows that economic growth will remain stubbornly lower than in the US and China, and that we will fail to exploit our potential for innovation and will, in consequence, lose our position in terms of global competitiveness to other regions in the world.
- At the other extreme, the “EU under threat scenario” paints a bleak picture of global economic decline followed by reactionary protectionist measures. The EU will see its share of world GDP fall by almost a half by 2050. Frequent food and oil crises will occur. EU Member States will become more inward-looking leading to inefficient fragmentation of effort that will touch every sector especially research – so vital for our future prosperity.
- The third scenario, which the experts call the “European Renaissance”, describes a much more attractive pathway. The EU continues to enlarge and become stronger. It consolidates its political, fiscal and military integration. Innovation systems become more efficient with an increased role given to users. Investment in technological and services innovations will have a direct impact on economic and social development. Member States will work together to make the European Research Area fully functional with research agendas being decided in common across Europe. EU GDP almost double by 2050.

White Paper On the future of Europe

The five scenarios presented in the White Paper aimed to help steer a debate on the future of Europe. They offer a series of glimpses into the potential state of the Union by 2025 depending on the choices we will jointly make. The five scenarios are illustrative in nature to provoke thinking. They are not detailed blueprints or policy prescriptions. Likewise, they deliberately make no mention of legal or institutional processes – the form will follow the function.






- **Scenario 1:** Carrying on: In a scenario where the EU27 sticks to its course, it focuses on implementing and upgrading its current reform agenda. This is done in the spirit of the Commission's New Start for Europe in 2014 and of the Bratislava Declaration agreed by all 27 Member States in 2016. Priorities are regularly updated, problems are tackled as they arise and new legislation is rolled out accordingly. As a result, the 27 Member States and the EU Institutions pursue a joint agenda for action. The speed of decision-making depends on overcoming differences of views in order to deliver on collective long-term priorities. EU legislation is checked regularly to see whether it is fit for purpose. Outdated legislation is withdrawn.
- **Scenario 2:** Nothing but the single market: In a scenario where the EU27 cannot agree to do more in many policy areas, it increasingly focuses on deepening certain key aspects of the single market. There is no shared resolve to work more together in areas such as migration, security or defence. As a result, the EU27 does not step up its work in most policy domains. Cooperation on new issues of common concern is often managed bilaterally. The EU27 also significantly reduces regulatory burden by withdrawing two existing pieces of legislation for every new initiative proposed.
- **Scenario 3:** Those who want more do more: In a scenario where the EU27 proceeds as today but where certain Member States want to do more in common, one or several "coalitions of the willing" emerge to work together in specific policy areas. These may cover policies such as defence, internal security, taxation or social matters. As a result, new groups of Member States agree on specific legal and budgetary arrangements to deepen their cooperation in chosen domains. As was done for the Schengen area or the euro, this can build on the shared EU27 framework and requires a clarification of rights and responsibilities. The status of other Member States is preserved, and they retain the possibility to join those doing more over time.
- **Scenario 4:** Doing less more efficiently: In a scenario where there is a consensus on the need to better tackle certain priorities together, the EU27 decides to focus its attention and limited resources on a reduced number of areas. As a result, the EU27 is able to act much quicker and more decisively in its chosen priority areas. For these policies, stronger tools are given to the EU27 to directly implement and enforce collective decisions, as it does today in competition policy or for banking supervision. Elsewhere, the EU27 stops

acting or does less. Conversely, the EU27 stops acting or does less in domains where it is perceived as having more limited added value, or as being unable to deliver on promises. This includes areas such as regional development, public health, or parts of employment and social policy not directly related to the functioning of the single market

- **Scenario 5:** Doing much more together: In a scenario where there is consensus that neither the EU27 as it is, nor European countries on their own, are well-equipped enough to face the challenges of the day, Member States decide to share more power, resources and decision-making across the board. As a result, cooperation between all Member States goes further than ever before in all domains. Similarly, the euro area is strengthened with the clear understanding that whatever is beneficial for countries sharing the common currency is also beneficial for all. Decisions are agreed faster at European level and are rapidly enforced.

Figure 8.2

Five scenarios presented in the White Paper

	 Carrying on	 Nothing but the single market	 Those who want more do more	 Doing less more efficiently	 Doing much more together
Single market & trade	Single market is strengthened, including in the energy and digital sectors; the EU27 pursues progressive trade agreements	Single market for goods and capital strengthened; standards continue to differ; free movement of people and services not fully guaranteed	As in "Carrying on", single market is strengthened and the EU27 pursues progressive trade agreements	Common standards set to a minimum but enforcement is strengthened in areas regulated at EU level; trade exclusively dealt with at EU level	Single market strengthened through harmonisation of standards and stronger enforcement; trade exclusively dealt with at EU level
Economic & Monetary Union	Incremental progress on improving the functioning of the euro area	Cooperation in the euro area is limited	As in "Carrying on" except for a group of countries who deepen cooperation in areas such as taxation and social standards	Several steps are taken to consolidate the euro area and ensure its stability; the EU27 does less in some parts of employment and social policy	Economic, financial and fiscal Union is achieved as envisioned in the report of the Five Presidents of June 2015
Schengen, migration & security	Cooperation in the management of external borders stepped up gradually; progress towards a common asylum system; improved coordination on security matters	No single migration or asylum policy; further coordination on security dealt with bilaterally; internal border controls are more systematic	As in "Carrying on" except for a group of countries who deepen cooperation on security and justice matters	Cooperation on border management, asylum policies and counter-terrorism matters are systematic	As in "Doing less more efficiently", cooperation on border management, asylum policies and counter-terrorism matters are systematic
Foreign policy & defence	Progress is made on speaking with one voice on foreign affairs; closer defence cooperation	Some foreign policy issues are increasingly dealt with bilaterally; defence cooperation remains as it is today	As in "Carrying on" except for a group of countries who deepen cooperation on defence, focusing on military coordination and joint equipment	The EU speaks with one voice on all foreign policy issues; a European Defence Union is created	As in "Doing less more efficiently", the EU speaks with one voice on all foreign policy issues; a European Defence Union is created
EU budget	Partly modernised to reflect the reform agenda agreed at 27	Refocused to finance essential functions needed for the single market	As in "Carrying on"; additional budgets are made available by some Member States for the areas where they decide to do more	Significantly redesigned to fit the new priorities agreed at the level of the EU27	Significantly modernised and increased, backed up by own resources; a euro area fiscal stabilisation function is operational
Capacity to deliver	Positive agenda for action yields concrete results; decision-making remains complex to grasp; capacity to deliver does not always match expectations	Decision-making may be easier to understand but capacity to act collectively is limited; issues of common concern often need to be solved bilaterally	As in "Carrying on", a positive agenda for action at 27 yields results; some groups achieve more together in certain domains; decision-making becomes more complex	Initial agreement on tasks to prioritise or give up is challenging; once in place, decision-making may be easier to understand; the EU acts quicker and more decisively where it has a greater role	Decision-making is faster and enforcement is stronger across the board; questions of accountability arise for some who feel that the EU has taken too much power away from the Member States

Source: EC (2017) White paper on the future Europe.

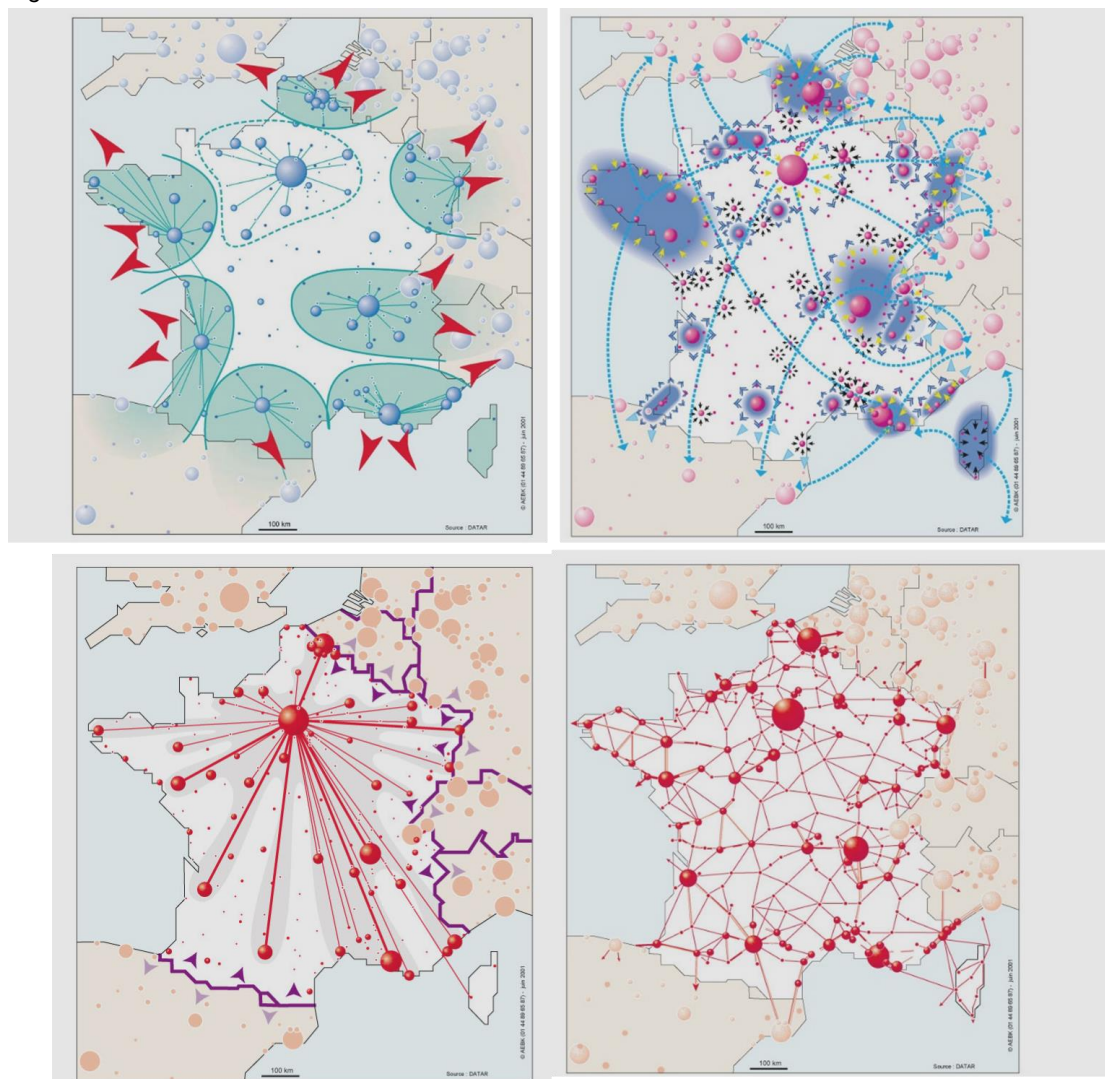
Experiences in Member States

Just a few studies are mentioned just as a reference of the wide variety and interest of foresight studies carried out across Europe:

- D2030 – perspectives for Germany. This projects works on an impendent discourse about the future in Germany. It aims at supporting and enhancing integrated and long-term thinking in social, economic and political decision making processes.

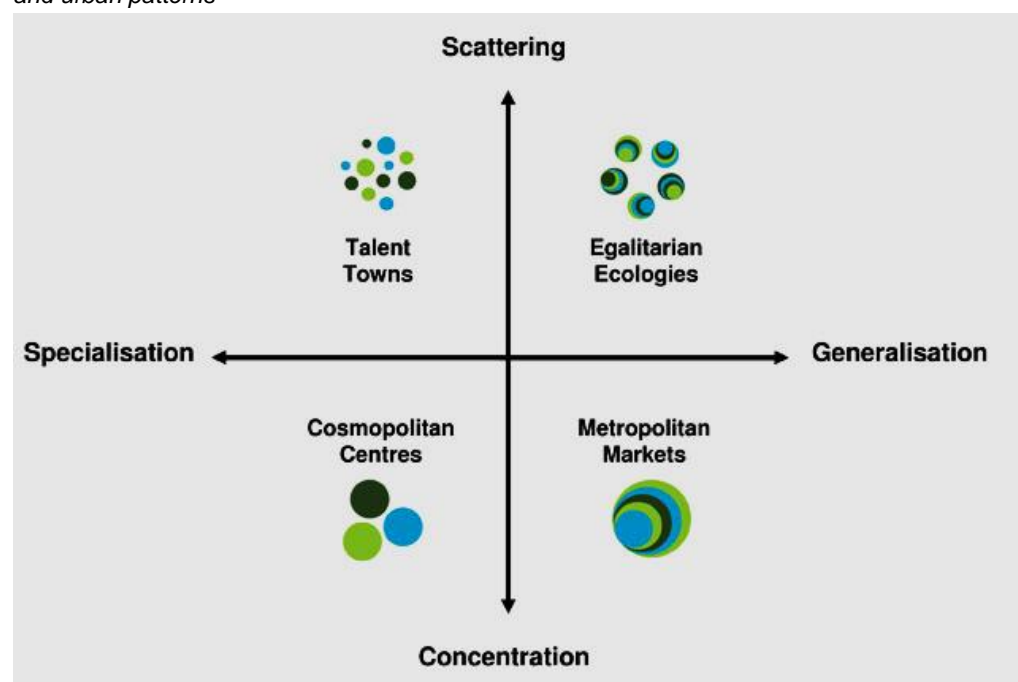
- Spatial Scenarios Austria 2030. This was a project conducted by the Austrian Conference on Spatial Planning (ÖROK). Nine thematic fields, ranging from demography and tourism to the institutional framework and energy, were identified and four scenarios were developed for each field. Afterwards, the 36 thematic scenarios were merged into four integrated spatial scenarios: Overall Growth, Overall Competition, Overall Security, and Overall Risk.
- Dutch study 'Welfare, Prosperity and Quality of the Living Environment'. This study assessed the long-term effects of current policies for the Netherlands. The combined impact of different trends was analysed for various aspects related to the natural and built environment, such as land use, transport, water safety and health. Based on this, four possible scenarios were identified, distinguished by their emphasis on international cooperation vs. national sovereignty and private vs. public responsibilities.
- DATAR Aménager la France de 2020. Mettre les territoires en mouvement. DATAR have always had a large number of activities related to spatial forecast and foresight. The study of 2000 is interesting because of the clarity of concepts and maps visualizing different territorial futures of France in Europe.

Figure 8.3 France 2020. Four different scenarios



Source: DATAR 2002

Figure 8.4 Netherlands 2040. Four different scenarios integrating economic development and urban patterns



Source: SPB 2010

8.2 Revisiting ESPON know-how on foresight studies

A wide range of previous ESPON studies have applied various methods and techniques for foresight studies (see table below). Experience made in different areas useful for foresight can be summarised as follows:

- Quantitative approaches. Quantitative assessments based on large computational models have been applied in a number of studies, in particular in ET2050.
- Qualitative approaches. In other cases, when data is scarce and questions far beyond the boundary of knowledge of existing theories and computational models, more qualitative assessment based on expert judgment was conducted.
- Participatory approaches. Foresight process can benefit substantially from new methods of participatory processes such as co-creation and design thinking. Also here a wide range of ESPON project have made considerable experience over the past decade which will be worthwhile to draw on. Quantitative and qualitative approaches can both feed participatory processes.
- Territorial impact assessment. ESPON has developed approaches to territorial impact assessment which help understand how certain changes or interventions affect different territories differently, and assess to what extend the scenario is desirable, likely to bring the political goals. In particular, the experience of ESPON ARTS and the ESPON TIA Quick Check are of interest to conceptualise a discussion on territorial impacts of different future development paths. This assessment also provides extremely relevant information

to participatory processes since allows participants to contrast “wishful thinking”, by comparing desired scenarios from the most likely ones.

Table 8.1 Overview of relevant methods applied in previous ESPON studies

Methodological focus		Examples of ESPON Projects
Scenario building	Alternative explorative scenarios applied in different models	ET2050
	Gap analysis of path towards targets	NSS
	Downscaling of existing scenarios combined with SWOT	ULYSSES
	Explorative prospective scenarios with expert knowledge	ReRisk
	Explorative & normative scenarios	SEGI
	Predictive & explorative future perspectives	SEMIGRA, TRACC
	Policy impact prediction	ARTS
	Alternative storylines	FOCI, DEMIFER
	Foresight approach	EDORA
	Scenario workshop	ESaTDOR
Territorial	QUICK Check for ex-ante TIA	ARTS
	Modelling alternative policy impact assumptions	ET2050
	TIA governance in selected countries	EATIA
	Island Impact Assessment	EUROISLANDS
	Ex-post impacts of territorial cooperation on socio-economic development	TERCO – CAWI
	TEQUILA2 model for TIA on agriculture and transport policies	TIPTAP
Participatory approaches	Modelling alternative transport policy impacts	TRACC
	Participatory workshops – World café; learning diaries	INTERSTRAT
	Participatory workshops – Design-focused workshops with stakeholders	LP3LP
	Participatory workshops – Delphi, benchmarking, Nexus models	USESPON
	Participatory workshops combined with a set of indicators describing the sensitivity of European regions to assess potential impacts of European policies and present them in maps.	ESPON TIA Quick Check
	Participatory workshops – SWOT and Rural Potentials Stakeholder Template	PURR
	Participatory workshops – focus groups and Delphi	INTERCO
	Participatory workshops - in addition surveys and interviews	ET2050
	Interactive learning – Focus groups and semi-structured interviews	RISE
	Learning networks – Focus Groups	ADES
	Learning workshops – 3 rounds of workshops with potential users to develop and test a territorial impact assessment method	EATIA
	Regional Laboratories – Rating grids and brainstorming	DeTeC

Source: Third ESPON 2013 Scientific Report (Dec. 2014)

From the large number of ESPON projects, three studies were particularly focused on developing comprehensive scenarios and future visions: ESPON 3.2, ESPON 2050 and Possible European Territorial Futures. Each study learnt from the previous one, refining previous methods, further developing earlier conclusions. Because of this evolution, these three projects provide a rich enough basis to present and discuss most relevant aspects involved in future-oriented studies. This handbook uses the experience of these three studies as major source of inspiration.

Next, the experience and added value of each project is discussed.

8.2.1 ESPON 3.2 (2006): A Political Approach

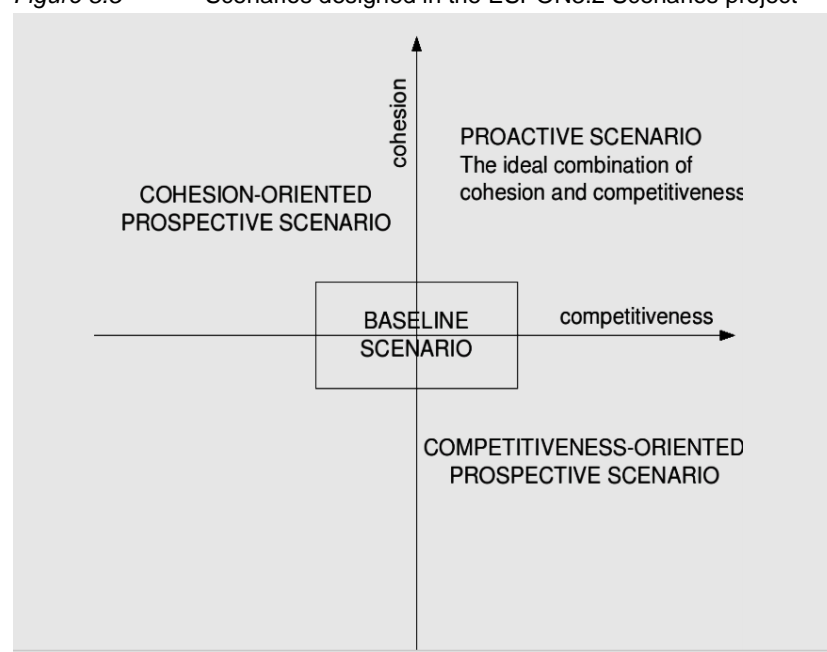
The study was conducted between 2004 and 2005, few years before the crisis of 2008. At that time, the main concern of European policies were related to the insufficient economic growth and technologic innovation of more advanced regions in Europe, in relation to USA and Asian economies. Cohesion policy was not free from disputes, since some influential reports (e.g. by Shapiro) claimed a reform favouring more competitiveness-oriented

investments. Cohesion among regions improved in terms of diminishing economic disparities at least measured in terms of GDP per capita. The Cohesion reports issued at that time justified the positive contribution of Cohesion policies to Mediterranean regions, and Ireland, at that time growing fast and also catching up the welfare levels of most advanced regions. The European Union was in the process to be enlarged to the Eastern European countries.

The main aim of the study was to explore the impact of Cohesion policies across Europe –the possible need to redefine them to help Europe to become more competitive globally. While both quantitative and qualitative methods were applied, the end-results were largely based on qualitative. Authors of the study had experience on previous DGREGIO (and DGXVI) strategic studies, such as the Europe 2000 and Europe 2000+ studies on late eighties and early nineties.

The main driver of the study was the interaction between the experts working on the project and the ESPON Monitoring Committee, with representatives from Member States and the European Commission. A “positive normative scenario” (Proactive Scenario) based on integrating pro-cohesion and pro-competitive policies was designed and compared against prospective scenarios based only on pro-competitive or pro-cohesion policies. This was a way to solve the trade-off between competitiveness and cohesion. In the three ESPON foresight studies this trade-off was always a major concern.

Figure 8.5 Scenarios designed in the ESPON3.2 Scenarios project

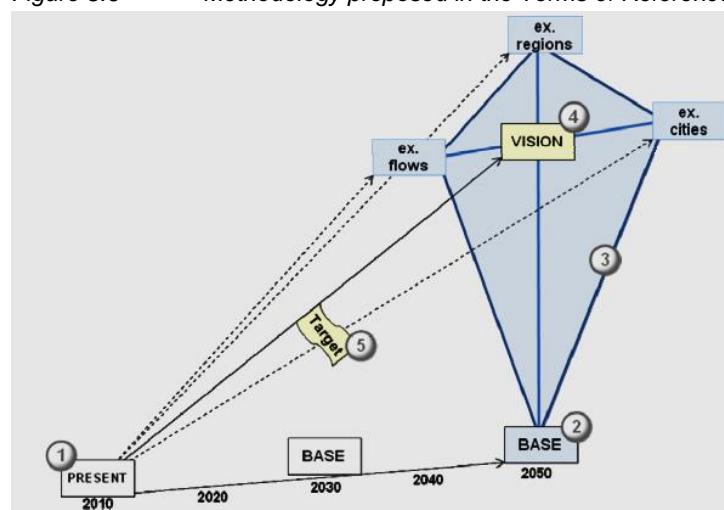


From a methodological point of view, qualitative analysis and narratives were elaborated to describe the scenarios in abstract terms, without detailing time evolutions as story-lines or identifying cities, regions or macro-regions as case-studies. In this sense, the aim of the scenarios designed was mostly political, and related to ongoing discussions related to Cohesion policy. Already existing forecast models were adjusted according to the needs of

the study, and their results were integrated in the narratives only as illustration –but the analysis of modelling results was not carried out deeply enough to be properly embedded into narratives. Even if forecasts at European scale of the economic impact of Cohesion policies may result in small or even marginal differences in absolute terms, results still can be meaningful in relative terms –but this requires a much careful analysis and risk to go beyond the boundaries of knowledge of models. The gap between comprehensive and synthetic narratives –to a large extent coming from stakeholder’s discussions, and specialised analytic tools, such as forecast models, is always a key challenge in any foresight study.

8.2.2 ET2050 (2014): A Scientific Approach

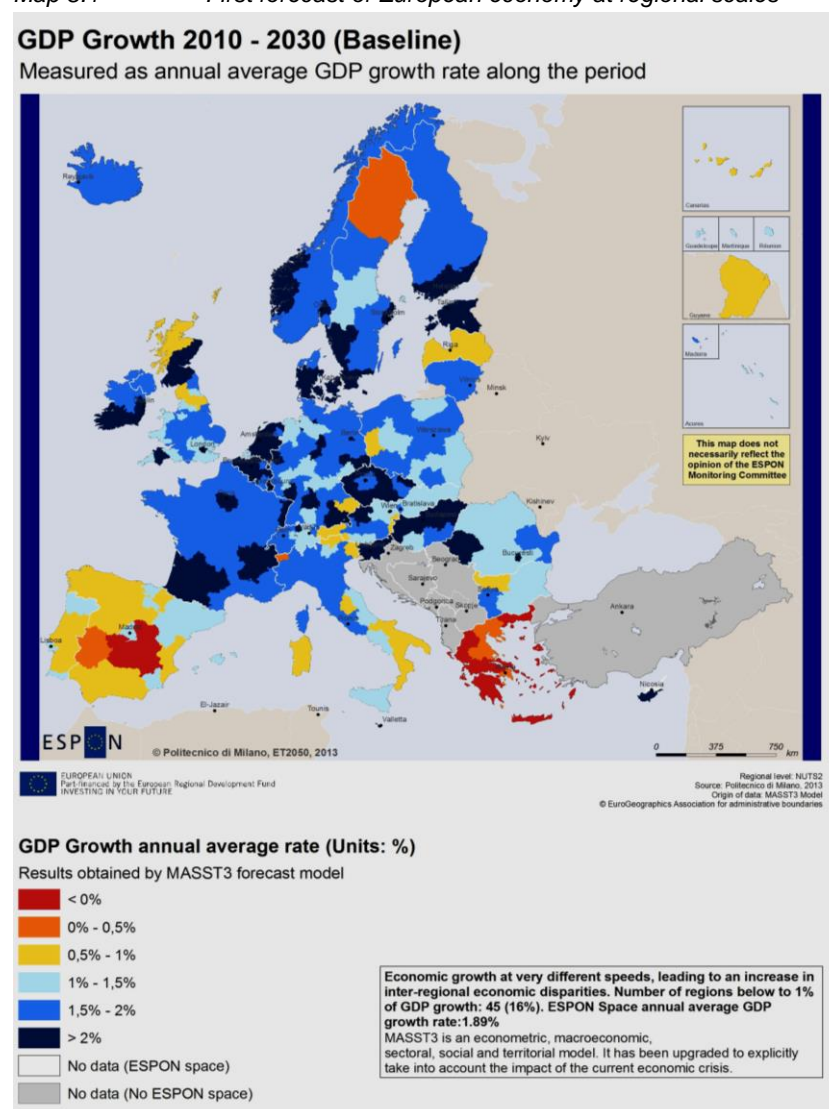
The ESPON study was conducted during the worse moments of the 2008 economic and political crisis in Europe, when suddenly social and regional disparities begun to grow opening a debate regarding the effectiveness not only of Cohesion policies, but in relation to other European policies as well (e.g. monetary).



Based on the experience of the ESPON3.2 project, the Terms of Reference of the study were defined very carefully by ESPON EGTC, taking also advantage of recent future-oriented studies carried out by European institutions (e.g. TRANSVISIONS by EC/DGMOVE, in preparation of the European transport Roadmap for 2050). The Terms of Reference (ToR) asked to design extreme but still realistic scenarios and even define the explicit territorial nature of them (scenarios were named as “cities”, “regions”, and “flows” in the ToR).

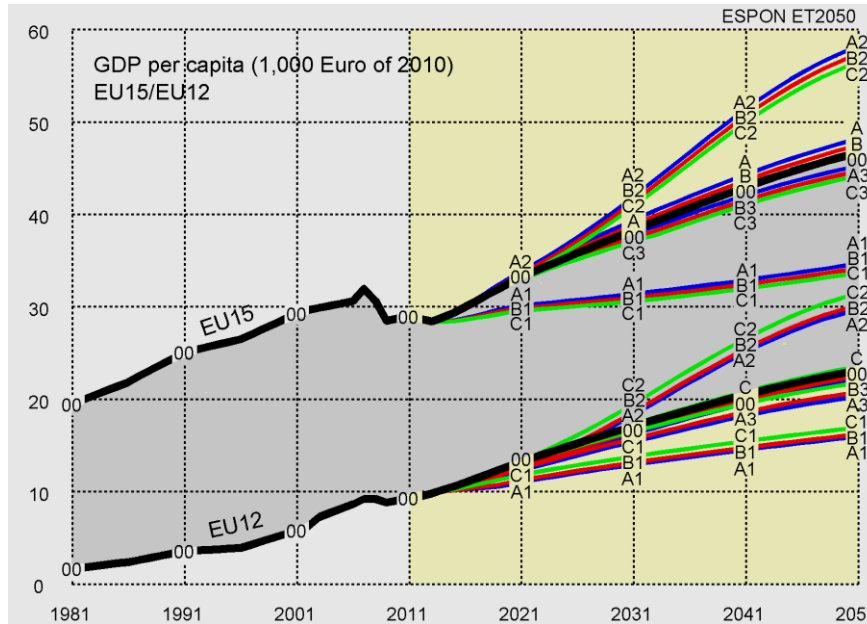
These scenarios were successful engaging the ESPON Monitoring Committee and other stakeholder’s groups to deliberate having the territory always in mind. The scenarios aimed to support the discussions concerning a normative scenario or political Vision for Europe in 2050, a kind of informal “Territorial Roadmap” updating the previous ESDP –instead of a critical review of Cohesion policies having in mind the next programming period. Forecast –and backcast, models, as well as territorial impact tools, were applied to assess possible political pathways and milestones to reach the Vision’s goals.

Map 8.1 *First forecast of European economy at regional scales*



Source: ESPON, ET2050, MASST3, 2015

Figure 8.7 GDP evolution at regional scale



Source: ESPON, ET2050 by SASI, 2015

Different from the previous study, it was no gap between modelling results and narratives, since narratives were largely based on the analysis of modelling results and largely structured according to foresight categories (e.g. seeds, trends, limits, bifurcations/shifting points...). The Vision 2050 emerged mostly from the scientific analysis of the three scenarios and was validated by the ESPON Monitoring Committee. It was also presented to a large number of European institutions and associations.

Also different from the ESPON3.2 project, the driver of the working process was the expert work and, in practice, ESPON Monitoring Committee and other stakeholder's groups consulted (e.g. European Commission, European –and National, Parliaments, European Committee of Regions...) mostly validated and refined the work of experts, and their participation in the actual design of scenarios was limited. The participatory process was open to experts participating in ESPON Conferences, and a number of surveys were made.

The visualisation of results was based on all kind of maps and graphics, designed specifically to express the policy-aims embedded in the Vision. All considered, the project managed to provide a few number of key political messages updating the policy-aims and the Vision of the ESDP. "Openness" was highlighted as a main policy-aim together with "Polycentrism". Similar to ESPON3.2 -that managed to develop a consensus normative scenario balancing competitiveness and cohesion policy-aims, ET2050 managed to develop an integrated European Vision balancing openness to polycentrism, more explicit in territorial terms than ESPON3.2.

8.2.3 Possible European Territorial Futures (2017): A Participatory Approach

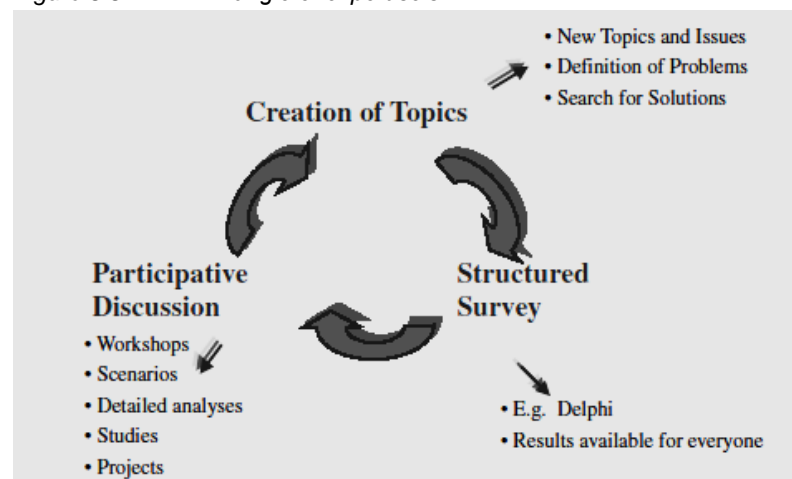
ESPON Possible Futures study focused on foresight, which is different from the building of scenarios or development of visions. Foresight – also labelled as forward thinking – is widely

understood as a future oriented approach characterised by (a) critical, lateral thinking concerning long-term developments, (b) large discussions creating wider participatory engagement (ranging from expert panels to crowd intelligence) and (c) shaping the future, especially by influencing public policy. JRC describes foresight as framework for a group of people concerned with common issues at stake (e.g., future of the European territory) to jointly think about the future in a structured and constructive way. Foresight provides a number of tools to support participants (i.e. policy makers, experts and other stakeholders) in structured forward thinking (Loveridge, 2009; K. Steinmüller & Steinmüller, 2006).

This ESPON study did learn from the previous ESPON3.2 and ET2050 methodologies, as well as from many other foresight experiences. In order to further experiment new foresight methodologies, three foresight topics were considered to explore what territorial impacts may result if Europe in 2030, if Europe is “100% Renewable Energy”, applies a “Circular Economy” paradigm, or if there is a new “Real Market Collapse”.

Differently from the previous two ESPON studies, European Possible Futures study proposed an intense expert and practitioner’s participatory process.

Figure 8.8 Triangle of expertise’s



Source: Cuhls Kerstin (2003) *From Forecasting to Foresight Processes—New Participative Foresight Activities in Germany*. *Journal of Forecasting*, 22, 93–111.

The participatory process was organised in three different formats: online survey, face-to-face workshops and webinars. While the online survey presented a number of case-studies (or seeds), the face-to-face workshop applied a Territorial Impact Assessment method to structure the discussions, and the webinar presented comprehensive scenarios to be discussed among experts.

A single foresight model was applied to provide for a baseline 2030 as a reference for the three foresight discussions, but the impact analysis was based on participants’ judgement, not on modelling. Qualitative conclusions were mapped applying different infographic methods.

All considered, the major difficulty –common to any future-oriented study, was to properly integrate results from different methods and tools, not always consistent, into single meaningful political messages.

8.2.4 Lessons learnt

Forecast and foresight studies are by definition a never ending learning process. Each ESPON project learnt from the previous experience, and based on their specific goals and context, applied with more or less success different methodological approaches:

ESPON3.2 scenarios had an intense stakeholder’s deliberation and applied mostly qualitative methods. Quantitative methods and modelling was also applied and used just as a reference for scenario narratives. The discussion of possible reforms on Cohesion policies –in a moment where lack of global competitiveness was the paramount political goal, was the key issue driving the process.

ET2050 scenarios and visions were mostly scientific and expert-driven. Forecast modelling was very much at the core of the working process. It also had an intense participation, but it was focused mostly on stakeholders and instead of deliberation, activities were oriented towards communication and dissemination. Scenarios were explicit in territorial terms. The Vision was, at the end, an expert contribution to a possible update of the ESDP as “Territorial Roadmap” complementary to other already existing European Roadmaps.

In the study on Possible European Territorial Futures the foresight process had a strong participatory approach, which was supported by intensive deliberation and mostly based on qualitative methods. The project was based on providing a qualitative impact assessment to three foresight topics beyond the boundary of knowledge of main-stream forecast models. No normative scenario or vision was developed as such.

Next table provides a comparative summary of key features of these three foresight projects:

Table 8.2 Comparative summary

Project	ESPON3.2 (2003-2005)	ET2050 (2010-2014)	Possible European Territorial Futures (2016-2017)
Aim	Develop scenarios to assess the impact of Cohesion policies in the 2030 horizon. A pro-competitive and pro-cohesion scenarios were also developed as a basis for a vision integrating the best of both.	Develop a Vision for the European Territory in 2050, and the political pathway to achieve it. The Vision is based on three scenarios designed with an explicit territorial dimension.	Explore possible territorial implications of Circular Economy, Renewable Energy, and Real Estate collapse in the 2030 horizon.
Scenarios and Vision being developed	Pro-Cohesion Pro-Competitiveness Balanced pro-Competitiveness and pro-cohesion normative scenario	Europe of cities Europe of regions Europe of flows Vision “Making Europe Open and Polycentric”	Place-based prospective territorial foresights Network-based prospective territorial foresights
Political Context	Lisbon Treaty. EU extension to Eastern EU	Economic crisis of 2008. End of the period	Political crisis. Migrations flows. BREXIT. Five

influencing the study	countries. Increasing regional cohesion in Europe. Oil-peak concerns. Lack of competitiveness of the advanced European economies at global scale (Shapiro report, González report...).	of increasing cohesion: growing social disparities. Globalisation impacts. Focus on “place-based” approach (Barca report...) and Cohesion policy reform after 2020 period. Europe 2020 Agenda.	Scenarios for the future of the European Union.
Quantitative methods applied	Two forecast models (macroeconomy, transport) were used in an integrated manner. Their results were used as a reference for narratives, among others.	Five forecast models were applied, with planned redundancies between them. The analysis of modelling results was a key element in writing the narratives for scenarios. Ad-hoc meta-models were used to assess political pathways and integrate results from models.	One model was applied to update a baseline forecast for 2030, used only as a reference. Meta-models applied to compute territorial impact of
Qualitative methods applied	Narratives for two scenarios were developed to some extend independently from modelling results.	Narratives were developed based on assuming bifurcations from a baseline scenario story-line.	Intensive literature studies and dialogue with experts about known and unknown factors
Participatory processes with experts and stakeholders.	The ESPON MC had a major influence in the process of designing the scenarios.	A large number of discussions and surveys were carried out with the ESPON MC, and presentations on most European institutions, mostly as validation of previous works.	On-line surveys to experts and practitioners were carried out, as well as webinar presentations and face-to-face workshops. No classical stakeholder’s involvement.
Policy-evaluation of the scenarios	A territorial impact assessment, applying first version that was applied.	Quantitative evaluation based on GDP growth and relative/absolute regional disparities. A territorial impact assessment carried out as a reference.	Territorial impact assessment based on “exposure” and “sensitivity” concepts.
Visualisation	Mostly thematic maps. On-line movies with 2000-2030 map evolution. Fuzzy maps based on diffusion of NUTS2 and NUTS3 results. Infographic solution for the synthetic view of scenarios.	Mostly thematic maps. Infographic solution for the synthetic view of scenarios.	Mostly thematic maps. Fuzzy maps based on diffusion of NUTS2 and NUTS3 results for key indicators. Infographic solution for the synthetic view of territorial foresights or possible European territorial futures.

Lessons learned from these studies

- Be aware of the context of the study, the purpose and the key policy questions being studied. Reflect on your own prejudices and feelings.
- Plan very carefully the working method, and then change it all the time, whenever needed!
- Engage in an extensive literature review, including extreme views.
- Begin with the “end on mind”. Focus on the expected conclusions and, based on previous knowledge, begin by elaboration the key conclusions as working hypothesis to be continuously revisited
- Use a combination of qualitative, quantitative and participatory methods, according to the context, purpose and questions of the study
- Plan redundancies in the work to be done. A “second opinion” should always be welcomed, especially if it contradict main-stream assumptions, mostly concerning quantitative methods –forecast models and impact assessment.
- Use as critical milestones along the working process the participatory activities, not the in-house expert work.
- Design participatory activities well targeted to participants, providing a useful knowledge-sharing and collective learning opportunity. Often, the format is as important as the content.
- Drive the foresight study based on your own decisions, not based on decisions taken in stakeholders or even expert deliberations, but be open to be convinced and change your views in open deliberations. Don’t ask participants to decide by voting –decide yourself based on good and in-depth deliberations.
- Develop comprehensive narratives as story-lines integrating any relevant information, and being aware of the language used –academic, scientific, political, literary, popular... Avoid jargon, as well as a technocratic style. Combine different expression means –from text to images, graphics, maps or movies.
- Use transparent quantitative tools, defining their boundaries of knowledge. If possible, apply different forecast models providing different, even contradictory results, useful to induce deeper discussions. Forecast models don’t substitute your own thinking. They don’t provide accurate predictions but sound references to think about.
- As much as feasible, develop interactive and user-friendly analytic tools based on integrating results from large more sophisticated tools.
- Define objective-enough and transparent, easy to be understood, methods to assess scenarios based on political goals.
- Plan a coherent integration of different methods and expertise. Be transdisciplinary.
- Make an effort to visualise just few key messages, as simple as possible
- Accept some ambiguity, at the end. Nobody can agree on everything.

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Links to Foresight journals, associations, conferences and blogs

Foresight journals

- European Journal of Futures Research ([link](#))
- Foresight: The Journal of Future Studies, Strategic Thinking and Policy ([link](#))
- Futures: The Journal of Policy, Planning and Futures Studies ([link](#))
- Futuribles ([link](#))
- International Journal of Foresight and Innovation Policy ([link](#))
- Journal of Futures Studies: Epistemology, Methods, Applied and Alternative Futures ([link](#))
- LRP Long Range Planning: International Journal of Strategic Management ([link](#))
- Policy Futures in Education ([link](#))
- Technological Forecasting and Social Change: An International Journal ([link](#))
- The International Journal of Forecasting ([link](#))
- The Journal of Forecasting ([link](#))
- World Future Review: A Journal of Strategic Foresight
- World Futures: The Journal of New Paradigm Research

List of webs from institutions, foresight/forecast associations

- Online Foresight Guide ([link](#))
- European Foresight ([link](#))
- The Foresight Guide ([link](#))
- Science and Technology Foresight ([link](#))
- European Foresight Platform ([link](#))
- Foresight Wiki ([link](#))
- UNIDO Technology Foresight ([link](#))
- Forward Visions on the European Research Area (VERA) ([link](#))
- European Strategy and Policy Analysis System (ESPAS) ([link](#))
- EU Science Hub - Foresight and Horizon scanning ([link](#))
- International Foresight Academy (IFA) ([link](#))
- Foresight Institute ([link](#))
- Association of Professional Futurists (APF) ([link](#))
- World Future Society (WFS) ([link](#))
- World Futures Studies Federation (WFSF) ([link](#))
- The Millennium Project (TMP) ([link](#))

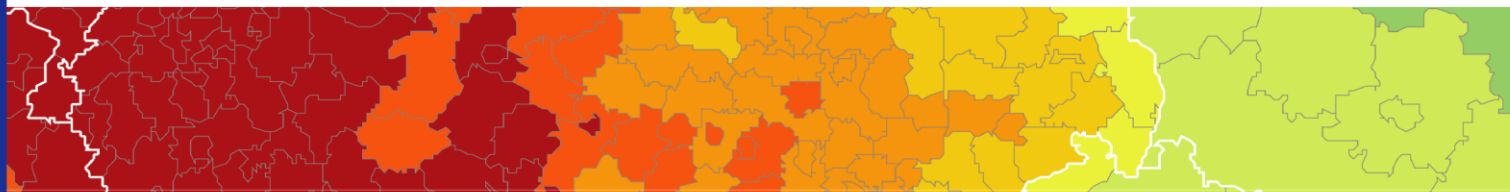
Foresight conferences/congresses

- 3rd Annual International Symposium on Foresight, 19-22 June 2017, Athens, Greece ([link](#))
- Future-Oriented Technology Analysis International Conference ([link](#))
- The International Congress "Participatory Foresight for Smarter Futures – From Design to Impact" ([link](#))

Foresight blogs

- Cliff Hague Urbanisation and Planning ([link](#))
- Dr. Popper's Foresight & Horizon Scanning Blog ([link](#))
- Foresight projects Blog ([link](#))
- Global foresight ([link](#))
- Future of cities Blog ([link](#))
- WorldPress – Foresight ([link](#))
- Foresight Science & Technology blog ([link](#))
- AAI Foresight - Roadmaps to strategic foresight ([link](#))
- Ever Smarter World – Foresight, Tools and Strategies for a World of Accelerating Technological Change ([link](#))
- European Parliamentary Research Service Blog - Scientific Foresight (STOA) ([link](#))
- Futurist Blogs and Speakers ([link](#))

- Blogs SAS ([link](#))
- EU Policy Lab ([link](#))
- Cliff Hague Urbanisation and Planning ([link](#))



ESPON 2020 – More information

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