

Backcasting, scenario-based planning and climate assemblies

Background document for KNOCA workshop, November 14, 2022

As a long-term systemic challenge, responding to climate change calls for futures thinking. It is not unusual that political administrations dealing with spatial planning and climate change use foresight methods to take into account future uncertainties and risks in their decisions. Up until now, however, foresight methods have rarely been applied in climate assembly processes.

This background document offers an introduction to backcasting and scenario-based planning and raises questions as to how these methods might be integrated into climate assemblies (and vice versa).

The document places particular attention on “normative foresight approaches” such as backcasting and scenario-planning that recognise that scientific and technical insights alone are inadequate to balance the different priorities and perspectives across social groups. Combining normative foresight approaches with the structured deliberation fostered within climate assemblies may be particularly valuable for exploring contrasting climate futures.

Foresight

The term foresight covers a wide variety of methods for dealing with the future, which can roughly be divided into three categories (see Fig 1):

1. *Forecasting approaches* focus on predicting most likely futures. They are by definition projective, as they rely on trend extrapolation and both qualitative and quantitative historical data. Such deterministic approaches treat the future as something similar to the past yielding a ‘surprise free’ future that is connected to the present in a straightforward way (Sardar 1999).
2. *Exploratory foresight approaches* are used to explore alternative futures. Unlike forecasting, exploratory foresight approaches focus on possible futures.
3. *Normative foresight approaches* focus on desirable or undesirable futures. Normative vision-oriented approaches include, for example, backcasting, normative scenarios and roadmapping. Robinson (1990) has argued that these approaches are not only about how desirable futures can be attained, but also how undesirable futures can be avoided or anticipated.

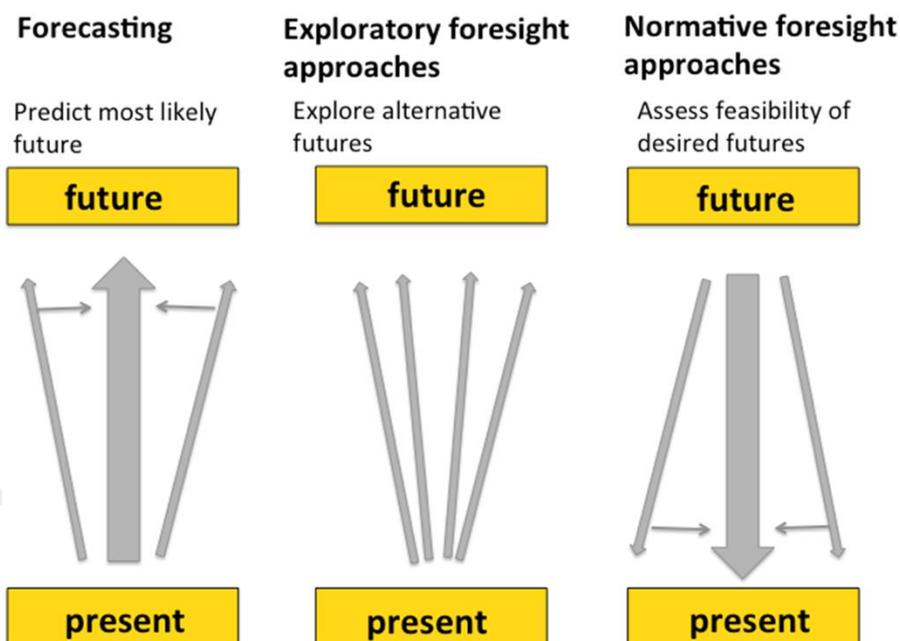


Figure 1: a typology of foresight approaches

Forecasting and exploratory foresight approaches are mainstream in climate change adaptation and mitigation studies (Döll et al. 2008; Girod et al. 2009; Leemans 2009), but they have limitations. On the one hand, forecasting generally results in business-as-usual scenarios that do not account for uncertainties. On the other hand, exploratory scenarios approaches are well equipped for mapping uncertainties but often do not account for normative preferences or desirability (Quist 2007; Van der Voorn et al. 2012; 2017). Normative foresight approaches aim to account for these shortcomings.

Normative and exploratory foresight approaches: backcasting and scenario-based planning

Neither scenario planning or backcasting predict likely climate futures, but rather enable the exploration of desired climate futures and potential pathways to these futures, which are surrounded by risks and uncertainties. Backcasting and scenario planning are particularly useful in situations, when there is a need to:

- Account for human perceptions and differences in viewpoints,
- Address persisting trends that are part of the problem, especially breaking trends
- Adopt a long-term horizon to define priority problems and priority actions (often approximately 50 years)
- Apply an integrated and systems approach to develop a whole systems change.

Scenario planning is about making assumptions on what the future is going to be and how the current situation will change overtime in light of that future. Scenario planning is an approach used to inform long-term decision-making, and is widely applied in the field of climate change adaptation and mitigation. Scenario planning results in explorative scenarios which elaborate possible futures.

Backcasting develops normative scenarios that show what should happen now and in the future in order to achieve certain strategic targets. Backcasting begins with defining desirable futures

(visions of the future) and then works backwards to identify policies and programs that can connect to one or more desired future to the present.

Scenario planning and backcasting can be effectively combined (Berkel and Verburg 2012; Kok et al. 2011) whether in relation to low-carbon futures and climate change mitigation (e.g., IPCC scenarios) or climate adaptation

Key steps in backcasting and scenario planning

In the climate adaptation literature, variety can be found in backcasting approaches. For instance, Quist et al (2011) have addressed key differences in whether and how stakeholder participation has been organised, in the number of steps in which the backcasting approach has been split, the methods that are used, the kinds of topics being addressed, the nature and scale of the systems addressed (e.g. local, regional, national, consumption systems, or societal domains), the number of visions and scenarios developed and how the visions and scenarios have been developed, and if the focus is on learning and raising awareness among stakeholders, or on realising follow-up and implementation.

One way of summarising the different elements of scenario planning and backcasting is provided by the BackCasting Adaptive Management methodology (BCAM) developed by Van der Voorn et al. (2017). This methodology translates backcasting into six stages (or steps) (see Figure 3). Guiding questions and considerations along with evaluation criteria for these steps are presented in the Appendix.

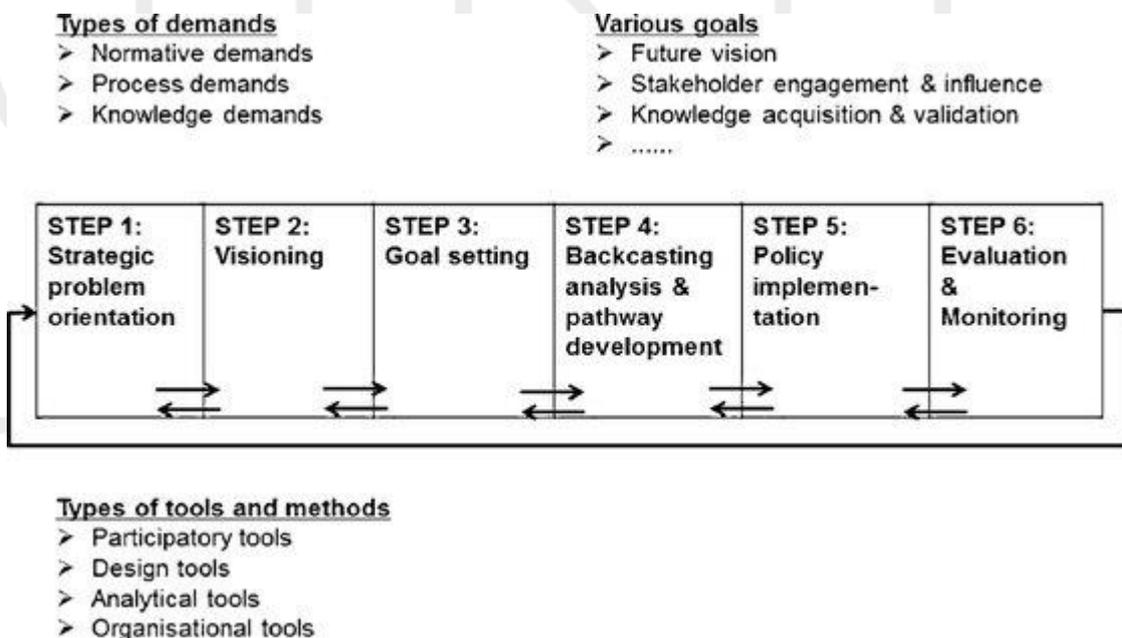


Figure 3: The BCAM methodology taken from Van der Voorn et al (2017).

Step 1: Strategic problem orientation. A baseline assessment of the current situation defines the problem and generates valuable insights into current performance and innovative capability. Developing a set of scenarios supports exploring how the current situation may develop over time under different conditions (drivers for change). Each scenario is based on different assumptions about these future conditions. The number of scenarios to be developed depends on the number of drivers for change included in the scenarios, but also on the availability of resources and knowledge for the scenario content.

Step 2: Visioning. Identification of alternative futures that we wish or do not wish for ourselves using, for example, analytical (cognitive mapping), design (visualization), modelling and simulation (Systems Dynamics) tools and methods. These futures articulate desired ways to anticipate the drivers for change of the scenarios that are developed in the first step.

Step 3: Goal setting. Progressing from aspiration to action, the vision needs to be translated into a set of goals providing guidance and direction to bring about the desirable change. Ultimately it is all about transforming key challenges expressed in the vision (e.g., sustainability) into opportunities (e.g., circular economy).

Step 4: Backcasting analysis & pathway development. The backcasting analysis is about closing the gap between where we are today and where we want to be. It involves a backwards looking analysis starting from the future to the present in order to strategise and plan how it could be achieved in terms of actions and measures. This step deals with long-term aspects, as well as with options to act in the short term in order to pick low-hanging fruits. The aim is to develop attractive options for possible pathways – a time-based sequence of actions and measures - to the desired future. Due to uncertainty about the future and the expected impact of actions and measures, multiple pathways should be developed to have alternative routes that lead to the desired future. Scenarios can support identifying alternative pathways and assessing their robustness under changing conditions.

Step 5: Policy implementation. Implementation of actions and measures, ideally involving stakeholders from all relevant societal domains like business, research, government and civil society.

Step 6: Evaluation & monitoring. Assessment of whether implementation is proceeding according to plan. If there is a discrepancy between the expected and actual implementation, a change in the course of action (pathway) or switching from one pathway to another may be required.

Integrating backcasting and scenario-based planning with climate assemblies: some questions to consider

Scenario planning and backcasting processes typically involve different stakeholders, whether these are public officials, businesses, civil society organisations or everyday citizens. The aim is to integrate the different perspectives and experiences of these actors to ensure that the process is sensitive to their needs and desires. Currently, a range of stakeholder engagement methods are employed at different stages of the process.

Climate assemblies are very particular mode of stakeholder engagement which prioritises the participation of everyday people (for an introduction to climate assemblies, see

<https://knoca.eu/what-is-a-climate-assembly/>). While they vary in practice, climate assemblies share two key features. First, the use of sortition (or stratified random selection) ensures a diverse membership of an assembly that mirrors key characteristics of the wider society (e.g., age, gender, social class, etc.). Second, facilitation ensures structured learning, deliberation and decision making. The role that experts and other witnesses play is typically highly structured: witnesses provide evidence to members, but typically it is the citizens who then use that evidence to develop recommendations (“experts on tap, not on top”).

We can think of the integration of climate assemblies and backcasting / scenario-based planning in two ways:

1. Elements of backcasting and scenario-based planning can be integrated into climate assemblies to support members’ learning, deliberations and decision making.
2. Climate assemblies (or similar deliberative processes) can be integrated into backcasting and scenario-planning exercises as a way of structuring citizen engagement.

In exploring this integration, key questions include:

- How can climate assemblies benefit from the application of backcasting and scenario-based planning? Which elements of the backcasting and scenario-based planning could be effectively integrated into a climate assembly and how? Not all elements are compatible (e.g., policy integration).
- How can backcasting and scenario-based planning processes benefit from the practice of climate assemblies? Could climate assemblies be integrated into scenario-planning and backcasting processes that engage a wider range of stakeholders and in what point in the process?
- What would the integration of elements of backcasting and scenario-based planning into climate assemblies mean to the relationship between members, stakeholders and experts?
- What consequences would the use of backcasting and scenario-based planning have for the remit and outputs of a climate assembly? For example, in terms of being wide or narrow; dealing with adaptation or mitigation; acceptability and usability of outputs by public bodies?

Appendix

Guiding questions and considerations when conducting a backcasting exercise.

Step	Questions	Actions
Strategic problem orientation	What is the problem? What is the focus of the study?	The aim is to have an adequate demarcation of the problem
Visioning	What future is desired or undesired? What is the timeline?	Focus on avoiding an undesired future or achieving a desired future end state (e.g., carbon

		neutral or climate proof cities)
Goals setting	How to translate the vision into short-term, mid-term, long-term goals? What guiding targets (milestones) can identified for these goals?	The aim is to make goals SMART e.g., if the goal is to reduce CO2 emissions, possible guiding targets are 40%
Backcasting analysis & pathway development	How to backcast the vision to the present and which actions or measures can be identified along the chosen timeline? What are key uncertainties to be addressed?	The aim is to develop multiple adaptation pathways, as times sequences of actions and measures that lead to the desired future
Policy implementation	What policy actions are needed to implement the goals?	This is the actual policy implementation of the actions and measures
Evaluation & monitoring	How to evaluate and monitor goal fulfilment?	The aim is to evaluate and monitor goal fulfilment in terms of the milestones.

Evaluation criteria for backcasting studies (taken from van der Voorn et al., 2017)

Dimensions	Considerations
Input & settings	<p>What is the proper setting of the backcasting?</p> <ul style="list-style-type: none"> • The timeline of the backcasting exercise • Who coordinates? • Are there sufficient financial and human resources available • What is the right setting of the backcasting exercise? (online or physical) • What are the goals of the backcasting exercise? <p>What are the knowledge demands?</p> <ul style="list-style-type: none"> • What types of knowledge are needed and available? Scientific or stakeholder knowledge
Vision development	<p>What are the normative demands?</p> <ul style="list-style-type: none"> • What are key preferences, norms and values to account for?
Pathway development	<p>What adaptation pathways lead to the envisioned future?</p> <ul style="list-style-type: none"> • Does the pathway include measures and actions? • Does the pathway provide room for flexibility in order to switch from one pathway to another, when conditions change?
Stakeholder engagement	<p>What is the process demands?</p> <ul style="list-style-type: none"> • Who is involved and why? > Relates to the goal of the backcasting exercise. • Is capacity building required to have meaningful participation of certain stakeholder like marginal people?

Methodological aspects	<p>What types of tools and methods can support the backcasting exercise?</p> <ul style="list-style-type: none"> • Analytical tools & methods • Design tools & methods • Participatory tools & methods • Organizational tools & methods
Impact	<p>What are the impacts of the backcasting exercise?</p> <ul style="list-style-type: none"> • Are the results included in formal decision making? • Is there a commissioner who authorize the project, endorse the results and looks after follow-up and broader spin-off?

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