Sustainability Foresight – Practices and Methods for Future-Oriented Innovation Management

Henning Breuer

HMKW University of Applied Sciences for Media, Communication
and Management & UXBerlin Innovation Consulting
Ackerstrasse 76, 13355 Berlin, Germany
E-mail: h.breuer@hmkw.de

Abstract: Strategic foresight, sustainability management and innovation management each have an important role to play in solving the grand challenges of our times. However, while each has developed into a professional discipline, we still lack an integrated approach in theory and business practice to deal with future sustainability and innovation challenges. To fill that gap, we conducted expert interviews with German foresight and sustainability experts. We explored good practices and methods, capabilities and competencies as well as persisting challenges at the intersection of the three fields. Our findings include that sustainability is seen as a relevant, but external factor in scenario projects, which competencies and forms of institutionalization make up foresight practices, emerging new small-scale practices and methods, and the persisting predominance of exploratory over strategic and normative scenario management approaches. We discuss the different expert perspectives and provide an overview of the emerging discourse on sustainability foresight and elaborate on the need for a values-based approach to strategic foresight contributing to sustainable development.

Keywords: Corporate foresight, sustainability management, values, innovation management, exploratory, strategic scenarios, normative scenarios, futures literacy.

1 Challenges at the intersection of foresight, sustainability and innovation management

The threatening polycrisis, the transition towards a sustainable economy, associated European agendas (e.g. the Green Deal, Strategic Foresight-Towards a More Resilient Europe, Industry 5.0), technological breakthroughs and volatile markets as well as changing societal values all create severe new challenges, unforeseen opportunities and desirable possibilities for companies and educational institutions.

Still, phenomena like short-termism, a lack of resources and focus, and daily pressures tend to override mid- and long-term considerations, holistic understanding and systems thinking that constitute *sustainability foresight*, that is, the application of future-oriented practices and methods to facilitate sustainable development and to enhance organisational preparedness for future sustainability challenges. If managers dedicate ten to twenty percent of their time thinking in a five- to ten-year time horizon in order to 'lead from the

future' (Johnson & Suskewicz 2020), how do they and how should they approach the challenges of sustainable innovation and development?

Foresight and scenario management, innovation management and sustainability management each have s an essential role to play in solving the grand challenges of our times. Each has developed into a professional discipline based on a rich body of knowledge and methods. However, in practice they are implemented widely independent from one another with few and seemingly random connections, and there is limited research at the intersection of the three fields. External consultancies and inhouse experts offer specialized support in each field, but their activities are rarely adopted or well-connected across different departments and hierarchical levels.

We initiated a European Alliance for Innovation named Strategic Foresight for Sustainability (see SF4S 2023) to synthesize experiences, practices and methods in the three fields to manage future scenarios, sustainability and innovation. Our research design uses expert interviews to identify grand future challenges in three industries (mobility, agri-food and health), addresses them with new co-development methods and creates educational materials based on new cases and methods to mainstream futures literacy (UNESCO 2023). The findings will enrich educational and training resources to advance green, digital and foresight skills in higher education and professional development. We have two guiding research questions: First, how can we promote futures literacy in organisations and mainstream foresight methods to facilitate sustainable innovation and development? And, second, how can we better prepare students and professionals to deal with current and future sustainability challenges?

This paper takes up the first question. We take first steps to explore good practices and methods, required competencies and capabilities together with persisting challenges at the intersection of futures, innovation and sustainability management. We draw on literature research and expert interviews with nine researchers and practitioners operating at the intersection of the three fields. Our findings include that sustainability is conceived of as a relevant, but external factor in scenario projects, different competencies and forms of institutionalizing foresight practices, the emergence of new small-scale practices and methods in futures thinking, and the persistent predominance of exploratory over strategic and normative scenario management approaches. We synthesize these different expert perspectives to provide an initial overview of the emerging discourse on sustainability foresight and to contribute to research on values-based innovation for sustainable development.

2   Needs and approaches to advance strategic foresights for sustainability

Our research is motivated by four observations (figure 1) made in recent consulting and research projects dealing with future scenarios, sustainability and innovation management:

1. *Need for futures literacy and accessibility of foresight methods*: Companies recognize the need to better prepare for uncertain future developments but experience available methods as too complex and demanding to handle without specialized training. Most rely on a handful of specialized consultancies to create, for instance, future scenarios at intervals of several years. Top and strategic management are then left to deal with them, so that companies struggle to adapt foresight practices across the organisation and across different management levels.

How can we promote futures literacy in organisations and mainstream utilisation of foresight methods?

2. *Need for values and normative future scenarios in innovation management*: Sustainable development builds on normative frameworks at different levels, ranging from the United Nations' sustainable development goals (SDGs) and corporate sustainability directives to individual organisations and actors. Normative scenarios provide a methodological foundation that facilitates values-based and sustainable innovation. However, foresight practitioners often seek guidance from exploratory scenarios and underestimate the potential of complementary normative scenarios and values-based goal forming activities. How can we facilitate adoption of normative scenarios to deal with innovation challenges?

3. *Need to integrate currently isolated efforts to manage future scenarios, sustainability and innovation*: The three fields of scenario management, innovation management and sustainability management are broad in scope and each is demanding in itself. All three are concerned with achieving positive change in the mid- to long-term, but efforts to combine them to make an even greater impact have received comparably little attention by theorists and practitioners. How can we integrate scenario and innovation management to promote sustainable development?

4. *Need to advance green, digital and foresight skills in higher education and professional development*: New skills and competencies in sustainability foresight and futures literacy (UNESCO 2023) are urgently needed to meet the growing challenges facing business and society. However, they are largely unknown even in large corporations and are only taught in a handful of specialized university programs. How can we better prepare students and practitioners to deal with current and future sustainability challenges?

	Needs	Approaches
	1. Industry needs for futures literacy and accessibility of foresight methods	Co-development projects leveraging good practices
	2. Neglect of values and normative future scenarios in innovation management	Combination of exploratory and normative scenarios
	3. Need to integrate distributed efforts to manage future scenarios, sustainability and innovation	Grand challenges across stakeholders and organisations
	4. Need to advance green, digital and foresight skills	Cases & accessible methods for higher education and professional development

Figure 1: Needs and approaches to advance sustainability foresight

3   Interviews with foresight, sustainability and innovation experts

Within a series of more than 70 international interviews exploring the intersections between foresight, sustainability and innovation management, six interviews were conducted with six outstanding European experts in futures research and corporate foresight and three interviews with industry experts in the aviation industry. All nine experts work at the interface of foresight, sustainability and innovation and have professional experience with both explorative and normative scenarios. These experts are:

- Klaus Burmeister, futures researcher and founder of foresightlab & Z_punkt, The Foresight Company

- Dr. Alexander Fink, futures researcher, strategy consultant, co-founder and CEO of ScMI (Scenario Management International)

- Dr. Robert Gaßner, futures researcher, facilitator and founder of Preferable Futures, Office for Futures Research and Goal Setting

- Matthias Kuom, futures researcher and innovation manager, working for various funding institutions, currently as Seconded National Expert (END) at the European Commission

- Beate Schulz-Montag, futures researcher, organisational consultant and facilitator moderator with long experience in corporate and public foresight

- Dr. Karlheinz Steinmüller, futures researcher, science fiction author and director at Z_punkt, The Foresight Company

- Industry experts from three different companies in the aviation industry (IE1, IE2, IE3)

An interview guide was used for the international survey and for the nine interviews making up the empirical basis for this paper. Each interview started with a short introduction into the research project and the motivating challenges behind it. The interview guide then covered the following topic areas: (1) the respondents' experiences at the interface of foresight, sustainability and innovation management, (2) future opportunities and challenges in the fields of sustainability and digitization, (3) methods and practices of futures research and strategic foresight research, and (4) sustainable innovation practices and outlook. The interviews were shaped by the experience-based expertise of the respondents and researcher interests as indicated by the motivating challenges (table 1). Each online video interview took about one hour and was recorded and transcribed.

The interview recordings were analysed in two iterations. In a first step, open coding identified key topics recurring across the nine interviews that were most relevant to contributing to the challenges. Five key topics emerged. In a second iteration, close attention was paid to each individual respondent's framing of and contribution to each topic. Notes from this analysis were aggregated and integrated to a thick description of each topic, enriched with descriptive quotes from the respondents and references to the literature. The quotes were confirmed by the respondents. The following topic insights build on views from 'standing on the shoulders of giants' (but of course the author assumes responsibility for the following interpretation and synthesis).

4 Five recurring topics and insights

The experts confirmed the relevance of the challenges that motivated this project. A review of the interviews yielded five topic clusters: sustainability as a relevant, but external factor in scenario projects, difficulties in institutionalizing foresight practices, different forms of organisational anchoring and required competencies, the emergence of new small-scale practices and methods, and methodological considerations with regards to exploratory, strategic and normative scenario management approaches.

1. *Sustainability: Sustainability has long arrived in futures research and corporate foresight as a key factor in scenario projects, but it is usually treated as an external factor.*

Sustainability has been an important issue in futures studies, foresight and scenario projects for decades, and it has developed from a peripheral to a pivotal aspect of organisational development. Steinmüller attributes the slow pace of this transition to the difficulty of cultural change, which may only happen with a new generation of managers. Sustainability transition is still rarely the starting point for scenario projects, but it regularly emerges as one of the key factors in exploratory scenario projects, and as one of the core dimensions in the resulting scenarios. As such, different aspects of sustainability serve as an *external development* that companies or institutions must face up to, rather than as a strategic goal or normative commitment they pursue.

One reason for this finding is the predominance of economic interests over sustainability values. While some of the industry experts stress the pivotal role of values for employee motivation, sustainable innovation and strategic decision, some of the futures researchers stress the economic limits constraining a values-based and normative approach. According to Burmeister, companies still prioritize economic interests and pursue sustainable development goals (UN 2023) as an add-on rather than as an integral part of a coherent business strategy. In such a setting, investments into foresight and corporate sustainability are difficult to justify. They also have another hurdle in common. Most of these investments only pay off in the long run, and those who initiate such efforts are rarely the ones benefitting from them. Besides, the financial return on these investments can hardly be calculated exactly, and instead only plausible estimates can be given. Steinmüller concludes: 'It is impossible to pursue sustainability strategies without a dash of idealism.'

Similar to science fiction stories, it is not a binding normative framing that makes sustainability in scenario projects attractive, but its *desirability* from the viewpoint of different stakeholders. Fink observed in different projects that the desirability of different scenarios is often highest when they are related to sustainability (e.g. in the sense of green growth or sufficiency).

Sustainability has been a prevalent theme in science fiction worlds since the 1960s (e.g. in the works of Kim Stanley Robinson). Within the 'solar punk' movement, a utopian outlook powered by renewable energy has emerged that starkly contrasts more typical dystopian themes in science fiction. Sustainability becomes the essential driver for normative change in novels like *Pantopia* (Hannig 2022): a strong artificial intelligence calculates social and ecological costs into the prices of all products and services, compensating resulting harms, and establishes a new peaceful world order based on the Universal Declaration of Human Rights. Climate change, energy shortages and environmental disasters are part of the past. Such a widespread hope that a new technology

could solve societal problems might be delusive, but according to Steinmüller it shows what people desire and their low expectations that governments will change the world for the better.

2. *Institutionalization of foresight practices: Few companies have established integrated foresight practices. The futures journey does not end but starts with scenarios.*

Several large companies in Germany like Bayer, Telekom, BASF, Daimler and SAP established their own foresight capabilities to deal with the growing complexity of their market environment and their development. Some, like Volkswagen and Evonik, hired professional futures researchers (often former consultants) to establish their own foresight capabilities. Stemming from different professional backgrounds and working in different corporate functions, *inhouse* experts contribute to professionalising foresight. Especially companies working with long product cycles (such as power plant manufacturers) have an affinity to foresight and sustainability considerations.

For most SMEs and public organisations, corporate foresight and scenario management is facilitated by external service providers. With regard to scenarios, Fink recommends taking a make-or-buy decision (i.e., whether to create new company-specific scenarios or to repurpose existing scenarios) depending on the degree of uncertainty in the company's environment. Especially smaller companies focus on company-specific uncertainties and influencing factors, while drawing on existing scenarios for more general developments.

A classic challenge for foresight *consultants* and futures researchers is that the results of their work in creating, refining or communicating scenarios is left to an uncertain fate in their clients' organisation. Scenarios, the experts stress, are not the end of a futures journey but its beginning. And it depends on the initiative and engagement of enlightened stakeholders within the organisation to put scenarios to use and to integrate futures thinking into daily practices. Schulz-Montag observes that in practice companies usually work with just one reference scenario rather than iteratively considering a number of scenarios and the differences between them.

Once created, scenarios can be reused repeatedly. Sometimes in the light of new, high impact events it might be necessary to 'stress test' the scenarios and review their implications. Fink distinguishes between the development of future scenarios as a mid-term benchmark for follow-up activities and their iterative assessment to reflect on possible deviations from the current state or an expected or desired future in order to devise corresponding plans for action. Burmeister points out that foresight consultancies set important impulses to introduce and professionalize futures thinking in an organisation but that it is also essential that the company reflects on current developments continuously.

In this pragmatic understanding, scenarios provide one useful resource of information in decision-making. However, Burmeister warns that 'strategic decisions are usually not taken because of a scenario, but because someone needs to act in a situation'. This makes it all the more important that external consultants as well as internal foresight specialists gain recognition for their contribution and the value of their services to other stakeholders.

3.   *Anchoring and competencies: Adequate organisational anchoring, internal promoters as well as personal competencies are required to establish and sustain foresight.*

Challenging trade-offs must be made when considering when and how foresight competencies can best be integrated into innovation and strategic projects and processes. As an overarching capability, foresight does not have a natural location in organisations. Foresight teams are often associated with *departments* for strategy, marketing, CSR or HR. Each location comes with specific challenges and advantages (e.g. direct access to customers and first-hand data in marketing or direct lines to top management in strategy). Fink understands foresight as an intellectual basis for strategy (with a more comprehensive coverage of future scenarios to define a company's trajectory), innovation (often with a focus on weak signals or individual future projections to inspire ideation or validate the strategic fit of innovative networked concepts in a scenario space) and sustainability (often involving a more normative approach to envision a pathway to the future).

An integrated approach of foresight with sustainability and innovation management is seen as quite ambitious by some experts, especially for large, complex organisations. Just like in innovation management, different *promoters* (domain expert, process and power; see Hauschildt & Kirchmann 2002) are required to support foresight activities. For instance, upper management support is needed at the beginning to kick off initiatives and at the end to ensure adoption of the results and personal commitment to implement scenarios or innovation goals. In larger organisations a dedicated team may be needed to absorb expert knowledge from and disseminate results and implications of futures studies into the different departments.

Group size and composition are critical to capturing critical indicators for a strategy formation that is independent from the dominant trajectory. As one of the industry experts (IE3) points out, having a diverse group of participants and not only like-minded experts is important for driving innovation, but difficult to practise.

With regards to the *competencies* of foresight specialists and participants in these processes, several experts referred to the importance of a future-open, networked and strategic mindset. Accordingly, future open thinking would embrace uncertainty, networked thinking (to deal with complex systems) and strategic thinking (to look after mid- and long-term benefits). Systems thinking, in general, and business 'ecosystem competence' (which for Kuom includes contractual and technical competence and fair modelling of beneficial alliances) in particular, are vital both for sustainable corporate development and for futures studies that seek to anticipate this development.

While these competencies facilitate collaboration among all participants, experienced futures researchers need additional competencies to steer the process. These include the ability to condense and interpret the vast range of weak signals, trends and scenarios so that they become relevant information for the organization. They must also be able to draw on a rich repository of field knowledge, adaptable methods and related experiences. Given the non-factuality of the future, the foresight specialist must remain self-critical of their own work. Burmeister warns that while trying to prepare for future developments, they can also create misleading, inflated and false expectations.

Consultants and corporate project managers also need advanced psychological and social competencies to overcome resistance, to involve the critical stakeholders, to create an open environment for even unconventional ideas to flourish or to handle conflicting parties, personal peculiarities or the emotional ups and downs in the process. Steinmüller

formulates this insight succinctly when he says: 'Foresight processes almost never fail for methodological reasons, if they do, social reasons [like] group dynamics [are involved]'.

4. Foresight methods: Reviews at regular time intervals, new small-scale practices and easily accessible methods facilitate futures thinking.

Futures thinking is difficult to integrate into daily practices for different reasons, including operational pressures, short-termism, and organisational silos. However, one major hurdle consists in the demanding requirements for the professional use of established methods.

Several experts report a 'trend away from long, big scenario projects towards more rapid small group formats' (IE1). As Burmeister points out, for an SME an annual meeting to discuss recent developments and future-related expectations and challenges in a field can already help. Other experts observe a trend from large group facilitation (such as required in Future Search, see Weisbord & Janoff 2010) towards more distributed iterations with a core team and *small group activities*. Fink suggests cultivating thinking in alternatives before going into simple scenario methods (like morphological boxes with a few key factors) or applying more complex methods supported by specialised software.

In order to make methods more accessible and to mainstream future-oriented practices within organisations, new lightweight methods are being adopted as an alternative to full-scale scientific scenario projects. *Simplifying methods* can already contribute to the orientation knowledge that futures studies provide. A classic and widely adopted format to simplify scenario development has been introduced by the Global Business Network (GBN, 2022 acquired by Deloitte). A four-field matrix narrows down discussions to the two critical factors of high importance and uncertainty (Ogilvy & Schwartz 1998). More recently, other lightweight approaches propose short interventions from design thinking (e.g. Kumar 2011), design-oriented methods (e.g. design futuring, speculative design or transformative scenario planning for organisational development) and gamified approaches (Breuer et al. 2022; McGonigal 2016). As Schulz-Montag remarks, most of these approaches apply a more short-term and result-oriented perspective, focusing on ideation and innovation. Some also pursue normatively defined goals, for example, by asking how we can solve an environmental problem, or how we can achieve a sustainable future.

With respect to normative scenarios, Gaßner considers the future workshop (Jungk & Müllert 1987; Kuhnt & Müllert 2004) to be the most efficient method and a shortcut to more comprehensive approaches (Gaßner & Steinmüller 2009). It allows great flexibility, for example, in replacing the initial phase of critique with a collaborative mapping of exploratory trends. Even in a one-day format participants can sketch a desirable vision, and it is already a success 'if the participants leave this workshop and simply have a better sense of where they stand and what future they would prefer'. An essential advantage of normative-narrative scenarios is, according to Gaßner, the *immediate response* they provoke: 'You can start practically right away asking what appeals to us, where are the attractive points, where are the fears. You can work with it, you can classify things into positive and negative clusters, you can define fields of action.'

Whereas Gaßner and others stress the *communicative function* of scenarios and the importance of transparency (Breuer et al. 2012), an industry expert remarks that consulting companies often channel collaboration with software tools, whereas 'many elements of classic scenario work, namely, bringing many functions together at one table to discuss interdisciplinary topics in order to find a common view of things, are simply lost' (IE1).

Schulz-Montag points out: 'You have to have a whole spectrum [of methods] up your sleeve' in order to decide which method suits which question, and how it can be adapted to each case. She co-edited a volume with *quality standards* for futures research (Gerhold et al. 2022). These include acknowledging that we are always dealing with images of the future to differentiate different modalities of futures (e.g. not mixing up possible, probable and desirable futures) and allowing for argumentative validation using accepted scientific standards to ensure the effectiveness of foresight results. An overview of relevant methods with their strengths and weaknesses is, however, still missing.

5. *Methodological approaches: Predominance of exploratory and strategic over normative scenarios*

Whereas all the experts work with exploratory scenarios, some stress the growing importance and potential of strategic and normative scenarios. 'The topic of normative scenarios is still a rather marginal phenomenon, although it is very relevant for various forms of futures consideration. There is a great need for corresponding methods and competencies, but these are relatively difficult to access' (Kuom). Some experts consider exploratory scenarios as a more scientific approach (or even 'scientistic' or 'pretentious', as Gaßner critically remarks) that is well aligned with immediate economic interests to prepare operations and strategy for a range of potential developments. However, one of the industry experts acknowledges that both are helpful. 'It is good to have a target corridor and say that we want to be a sustainable company in 20 years … [with high standards in] ethics and compliance, doing good for our local and international communities, [to] derive goals and … what we need to do today to get there … The backcasting I find important, but I think it is better if you also look at what the world will look like in this and that year from today. The reality is usually somewhere in between' (IE1).

Exploratory scenarios are created to improve an organisation's future preparedness for uncertainties in the external environment. They are developed in five steps: (1) define boundaries for the scenario field and collect influencing factors, (2) identify critical key factors, (3) project alternative specifications for the key factors, (4) combine matching specifications in order to create raw scenarios, and (5) enrich scenarios and assess consequences before developing an action plan. Managing the process requires methodological skills and advanced knowledge in the subject area.
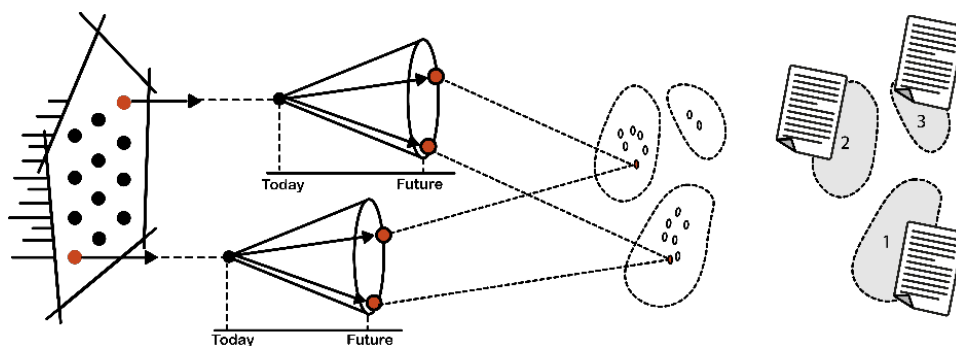

Figure 2: Essential steps in developing exploratory scenarios: Boundary definition, key factor identification, alternative specifications, raw and fleshed out scenarios (illustration by UXBerlin adapted from Kosow & Gaßner 2008; Fink & Siebe 2006)

While exploratory scenarios capture expectations regarding the external context of an organisation, *strategy scenarios* focus on business opportunities and strategic options the organisation can actually control or impact. Their development resembles the creation of exploratory scenarios (from influencing and key factors to bundling alternative future projections for each). It proceeds from selecting the most relevant questions, or strategy elements (rather than key factors), discussing alternative future options (rather than projections) for each and clustering these options into a strategy map (Fink 2019) with consistent core strategies and futures images of what the participants want their organization to look like (Fink & Siebe 2016; Fink 2017). Fink acknowledges that the distinction between uncontrollable framework conditions and controllable options for action can dissolve. He recommends setting a clear focus on either or pursuing both processes at the same time to understand the organisational environment and the organisation's paths into the future before combining them. An interesting feature here is to capture different values-based priorities through the different strategic options—such as the extent to which economic growth can be dispensed with in favour of environmental goals or technical innovation can and must do the job of sustainability. An essential strength of strategy scenarios, which they share with normative scenarios, is that they lead to a clear, well-reasoned and compelling goal definition based on strategic alternatives.

Clarifying basic values and vision is a starting point not only for *normative scenarios*. 'Our values are a starting point for many things, but sometimes you have to be clear about the value in the first step' (IE2). Regardless of method, one industry expert stresses the importance of understanding the problem before turning to solutions and asking 'What is our desired state?' (IE3). Especially Gaßner makes a strong case for normative scenarios, not only as a complementary but even as an alternative method to the exploratory approach. He highlights goal-setting as the most important function of foresight and scenario management and explains: 'It is my deep conviction that the most effective and sustainable way to evolve goals is through normative methodology' (Gaßner). In particular, a consensual, participative approach to creating and reviewing wish scenarios leads participants back to their own values, their motivations and 'gut feelings', which establishes much needed orientation. Still, it is flexible enough to include a review of external and internal trends and developments into the process.

The values-based and normative approach mobilises the whole person of each participant as representative of a stakeholder group and helps them to generate 'more ideas about what they actually want, where they actually want to go, and what fears they actually associate with the future. It's very important to see that others have similar fears and that you can really take your fears seriously. And just as with fears, it is the same with wishes. Participants discover wishes they had been keeping hidden from themselves: wishes for the future, which you do not allow yourself to have because they are too naive or too far-fetched or whatever. One learns to take them seriously again and to connect them with future plans or future topics' (Gaßner).

Wishes and normative visions have been reported as powerful sources of inspiration and as facilitators of innovation development. Much more than worst-case or waiver scenarios, developing a positive vision motivates change (e.g. of becoming able to sleep with open windows in a city centre or letting the kids play outside in a car-free inner-city neighbourhood). Beginning with core elements provided by an initial group of participants, a wider group of stakeholders is then iteratively involved in the verbal formulation of normative scenarios (including a setting, storyline, characters, actions) that thereby gain depth, legitimation and deeper meaning. A clear vision of the desirable then provides a

reliable basis for action-guiding planning. Likewise, Steinmüller demands that instead of vague ambitions of an undefined 'we should', specific commitments with plans for action and iterative checks and adjustment must follow the creation of normative scenarios.
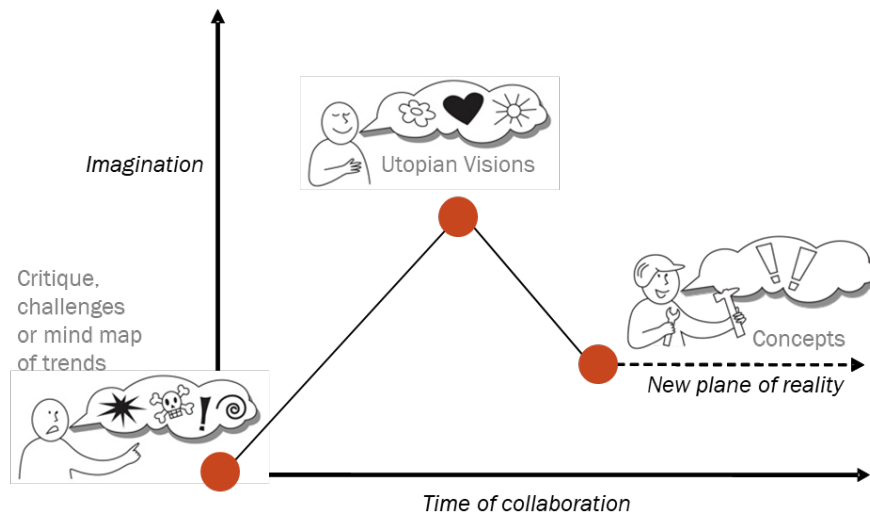

Figure 3: Essential steps in a future workshop to create a normative scenario
(Illustration by UXBerlin, drawn by Gabriele Heinzel)

Reflective subjectivity is not a criterion and strength only of qualitative research (Steinke 2004), but also of futures research and scenario work. Desirable futures must be closely linked to reality, including its unpleasurable aspects. Steinmüller refers in this context to 'openness to the future as the ability to absorb things that are strange, even things that you don't like at first … and also allow unpleasant things to come your way ... It goes without saying that one then attempts to normatively build or enact what one wishes for' (Steinmüller; also Schäfer et al. 2022). Instead of establishing 'no-go areas', for instance when sustainability-related topics threaten or question core business areas, he wants future topics to be treated without taboos. Instead of using objectivity to validate the legitimacy of a speculative endeavour, he calls for a hermeneutic approach and self-reflection by the researcher on their own emotional handling of research decisions, for example, choosing proven methods in order to feel they are in a safe space.

Guiding questions for futures studies would then include: 'What values do I have, and what are my unconscious desires or fears ... where do I want to develop, as a person or as a company' (Steinmüller). He refers to his French colleague Michel Godet who argues that the question of identity (Who am I?) underlies such strategic Kantian questions in futures research as What can happen? (exploratory scenarios), What can I do? (strategic options), What will I do? (strategic decisions) and How will we do it? (actions and operational plans) (Godet & Durance 2011, 17f.). In a business context this process could lead from the development goals of individual managers to hidden agendas. We might add at this point that the deliberate elaboration of normative scenarios can clash with the question of organisational identity and of which values the participants want to work towards.

5   Exploratory, strategic and normative scenarios for sustainability

The classic approach to scenario management puts the exploration of external developments and internal strategic options first before moving on to a prioritization of which scenario and which resulting options to pursue. Similarly, a normative approach enables participants to elicit their own values and to envision a desirable future. These normative scenarios are also exploratory but primarily dedicated to the participants' different notions of the desirable (i.e. values) rather than increasing competitive advantages and future preparedness. More than exploratory and strategic scenarios, normative scenarios fulfil a goal-setting and even an awareness-raising and emancipatory function, allowing participants to break free from the past and envision a desirable path into the future.

This suggests that the normative approach is highly suitable to working towards normative frameworks like the SDGs and to addressing questions like: Which trends and potential developments must be considered (and responded to) in pursuit of sustainability values? Which trends and projections should be mobilised as co-drivers of sustainability-oriented transformation? However, the experts did not mention *an integrated approach* that explores weak signals, trends and influencing factors and options to achieve dedicated sustainability mission through alternative future scenarios and developmental paths.

The different—exploratory, strategic and normative—types of scenarios not only follow different approaches and serve different goals, but also assume different forms of agency (the organisation as reacting to environmental developments, as pursuing strategic self-interests and as pursuing overarching values). The relation between these scenario types and their functions for associated (innovation) management dimensions deserves further elaboration. The *integrated management* framework (Bleicher 1994) with its distinction between operational, strategic and normative management provides a starting point. In this framework, the normative dimension deals with overarching principles, norms and organizational identity; strategic management ensures its competitive advantages; and operational management optimizes processes and tasks to realize the strategies and normative purpose, mission or vision of the organization.

Scenarios provide foresight and management support in each dimension (figure 4). Translated into a context of innovation, exploratory scenarios are used to spot opportunities and to assess the robustness of ideas and concepts for service, product and process innovation. They also provide information for strategy scenarios and strategic development, including issues of positioning and opportunities for business model innovation. Both exploratory and strategy scenarios can feed into normative scenarios to facilitate normative management. A *values-based view* (Breuer & Lüdeke-Freund 2017) also considers the role of cultural values (as well as the fears and desires of participants) in the process. Normative management and normative scenarios provide the basis for all activities. They contribute to organisational identity formation and inform strategies to stay ahead of changing regulations.
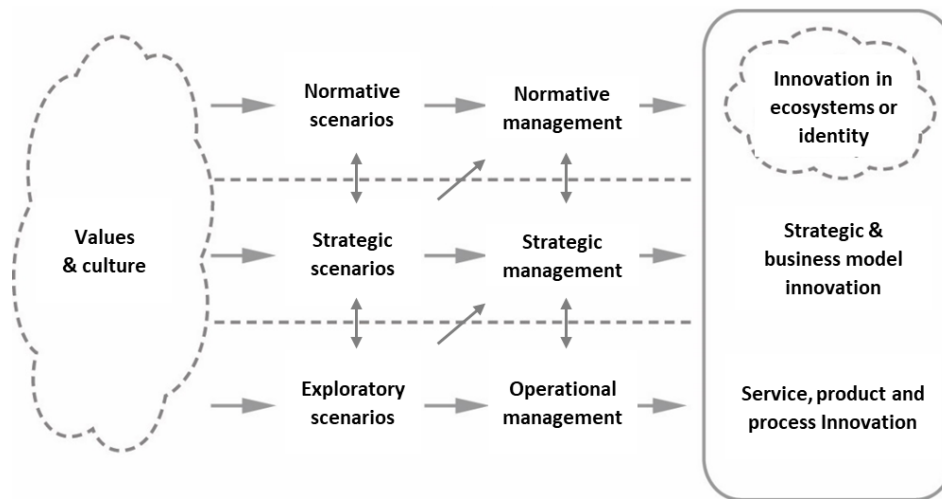
Figure 4: Values-based innovation management applying
exploratory, strategic and normative scenarios

In the transition to a sustainable economy, the *goal-building function* of foresight and scenarios is essential to overcome reactive ways of working, to facilitate collaboration among different, even competing organisations, and 'to join forces and achieve much more together' (IE3). As one of the industry experts points out, we need to overcome 'this competitive thinking, [and] rather join forces in whatever industry you are in, whether it is the airline industry or another. Looking for solutions together, because the whole industry is facing the same challenges and should ultimately have the same goal, at least in terms of sustainability' (IE3).

Sustainability-oriented regulatory frameworks like the European Corporate Sustainability Reporting Directive (EU 2022) and the EU Taxonomy (EU 2020) have just come into effect in 2023, requiring large and mid-sized companies to redirect their business activities towards the SDGs. With increased pressure from such directives, we can expect an increased demand for normative approaches in addition to strategic scenarios and external exploration of future developments.

6 Futures research and scenario management to leverage values-based and sustainable innovation

In the midst of an ecological crisis, futures researchers and foresight specialists need to be able and willing to radically reimagine the world (Burmeister refers to works of Bruno Latour 2015). Even if such reimagining proceeds in accordance with strict quality criteria (Gerhold et al. 2020), the challenge of translating what is imagined into action and innovation remains. Schulz-Montag points to start-ups created by futures researchers to make green investments more sustainable as a role model. Similar start-ups, corporate venturing and values-based innovation projects can be initiated in established firms that already pursue a strong sustainability strategy and seek to advance their values-based and sustainable innovation culture.

Titles such as *Sustainability Foresight* or Strategic Foresight for Sustainability (SF4S 2023) already imply a combination of both a normative directive towards enhancing sustainability and strategic foresight as a means to this end. Alternative projections of external factors and internal options can boost the sustainability performance of participating firms and their ecosystems. For instance, in the mobility sector, we ask: Which future business models do we need to prepare for and which sustainable business models should we pursue?

Establishing corporate foresight practices (such as using strategic radars to spot weak signals, strategizing with scenarios to identify economically superior courses of action, and experimenting with these new courses of action) and thus increasing future preparedness positively impact the economic performance of companies (Rohrbeck & Kum 2018), especially if there is a high complexity (number of competitors, difficulty to identify competitors) and volatility of the environment. Are such findings from comparative studies on economic value creation transferable to social and ecological value creation? A multiple case study design should explore the relations between integrated foresight practices, sustainability and the different maturity levels of values-based innovation management. Sustainability in terms of economic, social and ecological business performance can be assessed based on objective indicators from corporate reports to comply with the Corporate Sustainability Reporting Directive, as well as an expert assessment of the firms reports.

To what extent are new or different methods—integrating foresight, sustainability and innovation management—required to boost sustainable development? Follow-up research and development is needed to advance accessible and integrated methods that enhance futures literacy and to promote not only organisational preparedness, but the spearheading capabilities needed to drive sustainable innovation. One overarching insight is taken from the interviews and follow-up reflections: The fundamental openness of the future and the non-factuality of future images throw us back on subjectivity and notions of what stakeholders find desirable in the process of creating exploratory and/or normative scenarios. The project owner's motivation and decisions initiate dedicated foresight, specify its goals and methods and set the basic scope for anticipating alternative futures. Project participants select and refine the key influencing factors, create the resulting scenarios and interpret their business implications. In the end, future developments depend on which activities the actors undertake. *Reflective subjectivity* on behalf of the participants and the elicitation of stakeholder values are basic though often neglected methodological building blocks of any futures research.

Acknowledgements

References

Bleicher, K. (1994). Integrative management in a time of transformation. Long Range Planning. 27 (5): 136–144.

Breuer, H., Schulz, J. & Leihener, J. (2012). Learning from the Future: Modeling Scenarios Based on Normativity, Performativity and Transparency. Proceedings of XXIII ISPIM Conference Barcelona. International Society of Professional Innovation Management.

Breuer, H., Bessant, J. & Gudiksen, S. (2022). Gamification for Innovator and Entrepreneurs: Using Games to Drive Innovation and Facilitate Learning. deGruyter.

Breuer, H.; Lüdeke-Freund, F. (2017). Values-Based Innovation Management: Innovating by What We Care About. Macmillan Education.

EU (2020). Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088.

EU (2022). Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU.

Fink, A. & Siebe, A. (2016). Szenario-Management. Von strategischem Vorausdenken zu zukunftsrobusten Entscheidungen [Scenario Management: From Strategic Thinking Ahead to Future-Proof Decisions]. Campus.

Fink, A. & Siebe, A. (2006). Handbuch Zukunftsmanagement. Werkzeuge der strategischen Planung und Früherkennung [Future Management Handbook: Strategic Planning and Early Detection Tools]. Campus

Fink, A. (2017). Zukunftsrobuste Strategien. Scenario Management International.

Fink, A. (2019). Visionary orientation with a strategy maps. Scenario Management International AG: Paderborn (Online: https://www.scmi.de/images/downloads/dateien/en/scmi-themenflyer-strategieszenarien-englisch.pdf)

Gaßner, R. & Steinmüller, K. (2009). Welche Zukunft wollen wir haben? Visionen, wie Forschung und Technik unser Leben verändern sollen. Zwölf Szenarios und ein Methodenexkurs. IZT WerkstattBericht Nr. 104.

Gerhold, L., Holtmannspötter, D., Neuhaus, C., Schüll, E., Schulz-Montag, B., Steinmüller, K. & Zweck, A. (2022). Standards of Futures Research. Guidelines for Practice and Evaluation. Springer. (https://doi.org/10.1007/978-3-658-35806-8)

Godet, M. & Durance, P. (2011). Strategic Foresight for Corporate and Regional Development. DUNOD – UNESCO – Fondation Prospective et Innovation.

Hauschildt, J. & Edgar Kirchmann, E. (2002). Teamwork for innovation: The 'troika' of promotors. R&D Management Volume 31, Issue1, pp. 41-49

Hannig, T. (2022). Pantopia. Fischer.

Johnson, M.W. & Suskewicz, J. (2020). Lead From the Future: How a Future-Back Strategy Can Lead to Breakthrough Growth. Harvard Business Review Press.

Jungk, R., Müllert, N. (1987). Future Workshops: How to Create Desirable Futures. Institute for Social Inventions.

Kosow, H. & Gaßner, R. (2008). Methods of future and scenario analysis overview, assessment, and selection criteria, DIE Studies No. 39. German Development Institute.

Kuhnt, B., Müllert, N.R. (2004). Moderationsfibel – Zukunftswerkstätten verstehen, anleiten, einsetzen. Neu-Ulm.

Kumar, V. (2012). 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization. Wiley.

Latour, B. (2015). Face à Gaia. Huit conferences sur le nouveau regime climatique. Éditions La Découverte.

Ogilvy, J. & Schwartz, P. (1998). Plotting Your Scenarios. In: Learning from the Future, Liam Fahey and Robert Randall (eds.). John Wiley & Sons.

McGonigal, J. (2016). SXSWedu Keynote: How to Think (and Learn) Like a Futurist. Online: youtu.be/CKvMmtclUBA

Rohrbeck, R. & Kum, M.E. (2018). Corporate foresight and its impact on firm performance: A longitudinal analysis. Technological Forecasting and Social Change. Volume 129, April 2018, pp. 105-116.

Schwartz, P. (1991/1996). The Art of the Long View: Planning for the Future in an Uncertain World. Doubleday.

Schäfer, K., Steinmüller, K. & Zweck, A. (eds.). (2022). Gefühlte Zukunft. Emotionen als methodische Herausforderung für die Zukunftsforschung [Felt Future: Emotions as a Methodological Challenge for Futures Research]. Springer.

SF4S (2023). Strategic Foresight for Sustainability: Supporting our transition to a more sustainable European economy. Online: www.sf4s-project.com.

Steinke, I. (2004). Quality Criteria in Qualitative Research. In: A Companion to Qualitative Research, U. Flick, E. von Kardorff, & I. Steinke (eds). Sage.

UN (2023). United Nations Sustainable Development Goals. Online https://sdgs.un.org/goals

UNESCO (2023). Futures Literacy. An essential competency for the 21st century. Online at https://en.unesco.org/futuresliteracy/about

Van der Heijden, K. (1996). Scenarios: The Art of Strategic Conversation. Wiley.

Weisbord, M. & Janoff, S. (2010). Future Search: Getting the Whole System in the Room for Vision, Commitment, and Action. Berrett-Koehler Publishers.