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Transition-Scenarios towards socially sus-  
tainable global value chains

Insights from the SONA WSK Foresight

## **Abstract**

This paper presents the methodology and findings from a Foresight process on the advancement of social sustainability in global value production networks. A methodology was developed that combines exploratory scenario development with elements from backcasting and normative scenario building in order to develop transformative transition pathways. The approach was applied in two scenario workshops one focusing on smartphone production the other on the textile sector. In total seven transition pathways were developed, five for smartphones and two for textiles. After explaining the methodology we present in detail the findings from both workshops. We then discuss implications for fostering transition towards more socially sustainable value production networks. Finally, we assess the lessons learned in terms of methodology and suggest further avenues of development for the transformative scenario building approach.

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# 1 Introduction

Global production networks (GPNs) in developing countries are often characterized by precarious working conditions, including issues of health and occupational safety, low pay, extensive overtime and the use of child and forced labor. From a long-term perspective, this model of production is problematic not only with regards to the social, but also the economic dimension of sustainability. In recent years, public and political awareness to these problems has increased, in large part due to a number of dramatic events, including the suicide wave at electronics manufacturer Foxconn in China and the collapse of the Rana Plaza building housing garment factories in Bangladesh. Against this backdrop, the objective of the SONA-WSK project<sup>1</sup> was to understand the past evolution of social responsibility in global production networks and to explore possible pathways towards more responsible patterns of value chains.

In particular, the project focused on the value networks of textiles and smartphones. The findings on the analysis of the evolution of these two value chains and their social sustainability is presented in depth elsewhere (cf. Bodenheimer 2018a, 2018b). This working paper is focusing on the future oriented part of the project where we applied Foresight approaches to develop transition scenarios i.e. pathways towards more sustainable value chains. In chapter 2 we discuss our methodological considerations on transition scenario building in the context of Foresight. We proceed in chapter 3 by explaining the approach we developed for the SONA-WSK process and presenting the results. The paper ends with two sets of conclusions, one on barriers and enablers for transition of global value chains towards social responsibility, the other on lessons learned in terms of methodology and avenues for further development of the transition scenario approach.

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## 2 Methodological Framework – Transition Scenarios

Foresight is a broad umbrella term for structured futures dialogues among a group of actors with a broad range of perspectives and backgrounds (Da Costa et al. 2008). The key idea of Foresight is not to predict the future but to use the futures dialogue as a way to enable actors within a certain arena to broaden their perception of the present, getting to know each other's expectations and jointly exploring possible future pathways in a structured way. These deliberations among diverse actor groups are expected to strengthen the capacity of the system to proactively engage with future challenges. A wide range of Foresight methods serves to structure these dialogues in different ways depending on the requirements of the system at stake. These requirements may range from aligning diverse expectations towards shared goals, to breaking up lock-in situations by introducing fresh and more diverse perspectives. Among the Foresight methods, Scenario Building is one of the oldest and best established approaches that has been applied to a wide variety of topics and domains (Godet 2001; van Notten, Philip W. F. et al. 2003; Schwartz 1991; van der Heijden 1997; Ringland 2002, 1998; Dönitz, Schirrmeister 2013; Gabriel et al. 2016). Scenarios in the broadest sense are descriptions of different possible futures. In some cases, these descriptions include full pathways towards these future states, in others the scenarios merely sketch images of future situations of the system at stake with no indication how these came about. Even though there are a number of different approaches to scenario development, most of them start by "deconstructing" a system into a set of individual factors of change, then tackle these factors individually by sketching different possible long-term developments ("projections") and finally reassemble these "factor projections" into different possible future configurations. One of the key benefits of the scenario method is that it forces participants of the futures dialogue to consider alternative futures in a structured way rather than just extrapolating today's developments.

It has sometimes been criticized that scenarios tend to generate variants of today rather than radically challenging anticipatory assumptions or capturing extra-systemic "change in the conditions of change" (Miller 2007). Some Foresight scholars and practitioners have therefore proposed approaches for developing "transformative scenarios" that are explicitly dedicated to describing system transitions. As the transition of global value production networks towards social sustainability is certainly a system transition these approaches were an important basis for our foresight process design.

In particular, the following approaches are of interest for the development of transformative scenarios:

*Frictions as transformation catalysts:* In this approach, transformative scenarios are developed in two stages. In the first stage, participants develop scenarios that describe how an extrapolation of current developments leads to tensions and dilemmas. In the second phase, the transformative scenarios are developed where system changes occur that dissolve these tensions in different ways. This approach has been applied to describe possible transitions of the research landscape (Erdmann, Schirrmeister 2016).

*Challenging cognitive biases:* A second element is to take up insights from cognitive psychology on perception filters and cognitive biases that lead to our tendency to disregard potentially transformative changes (Schirrmeister, Warnke 2013; Warnke, Schirrmeister 2016). In this approach, creativity techniques are applied to counteract these biases and open up participants thinking to include more out of the box perspectives. So e.g. in a foresight process on the future of innovation we systematically requested participants to imagine reverse developments to certain expectations. (Schirrmeister, Warnke 2013; Warnke, Schirrmeister 2016)

*Rigorous imagining:* This approach works by systematically revealing and challenging anticipatory assumptions throughout the Foresight process (Schirrmeister, Warnke 2013; Miller 2007, 2018). After a more conventional extrapolatory futures exercise, a “reframing phase” (ibid p. 123) is conducted where participants are provided with a fictive future framework that departs from existing dominant societal attributes and organizational forms and are asked to describe the issue at stake in this disruptive framework. Afterwards they explicitly reflect on their anticipatory assumptions and “rethink” their expectations.

*Sustainability Foresight:* Scholars with a background in transition research have adapted the scenario methodology to reflect on sustainability oriented system change (Truffer et al. 2008). These scholars build on the so called Multi-Level-Perspective (Geels, Schot 2007) where system transformation is framed as the results of an interplay between niches, regimes and landscape levels. In (Truffer et al. 2008) the authors first develop a set of transformative system scenarios and then assess the sustainability of each option.

*Backcasting:* Finally, sustainability oriented backcasting (Vergragt, Quist 2011) is a straightforward approach to “generating a desirable future, and then looking backwards from that future to the present in order to strategize and to plan how

it could be achieved” (ibid p. 747). In contrary to transition oriented sustainability foresight, backcasting does not necessarily focus on niches as the catalysts of change. Also, it is usually targeting a desirable end state rather than assessing the desirability ex-post. Backcasting is actually rather close to the notion of roadmapping, which is an established tool in the Foresight context (Phaal et al. 2010).

The last three approaches tend to focus on the change of the system under consideration without very much taking into account factors that are external to the arena of change that is at stake.



## 3 The SONA-WSK Transition-Scenarios

### 3.1 Approach

In the SONA-WSK transition scenario building process, we combined elements from several of the above approaches. The core process was based on classical explorative scenario building which is long established in our research team (Dönitz, Schirrmeister 2013; Gabriel et al. 2016). Exploratory scenarios outline possible future pathways of change and often focus on the environment of the system under consideration. The core of the exploratory scenario process is the identification of factors that make a difference for the system's future configuration so e.g. in the case of energy scenarios the price of oil is a typical key factor. For these factors, different future projections are developed and then combined into consistent bundles, which form the nuclei of the scenarios. In a fully-fledged strategy process, these scenarios are then used to test the robustness of different strategies vis a vis the different scenarios ("wind-tunneling") (Ringland 1998).

In SONA-WSK we were aiming at normative transformative scenarios (Börjeson et al. 2006) meaning the scenarios were supposed to describe pathways towards desirable states of more socially sustainable value chains. This had three important implications:

- the scenarios were meant to describe the system itself rather than the system environment.
- scenarios that are consistent but describe unsustainable situation were not of interest
- the scenarios would need to entail a major system transition rather than just gradual change.

To accommodate these requirements, we modified the standard scenario process in two important ways: Firstly, we introduced a visioning process (Schultz et al. 1993) where our workshop participants sketched the key feature of a sustainable value production network much as it is also common in backcasting approaches such as e.g. the examples discussed in (Quist et al. 2011)).

In contrary to most backcasting however, we included within the scenario key factors not only factors within the system that are directly related to the actors' strategies such as the corporate social responsibility strategies of key players like Samsung and Apple. Rather we also integrated factors from the system environment that cannot directly be influenced by any of the system actors such

as e.g. the political development in China (a key factor in the smartphone sector as a substantial share of smartphones are produced in China). This way, we aimed to underpin the development of realistic transition pathways that rely largely on internal system change but also reckon with external forces that function as enablers and barriers. In line with the normative set-up, we decided to work with actors who are striving to foster social sustainability in the value chain. This means that we did not work with the actual system stakeholders like e.g. in (Truffer et al. 2008) but with pioneers active in changing the system who were however intimately familiar with the dominant actors' strategies and behaviors and thereby able to discuss their possible future moves in a highly informed way (see Table 1). It is however important to note that this is a very different setting than a stakeholder workshop that aims to involve the relevant dominant and affected as well as dormant and latent stakeholders that were identified through a critical stakeholder analysis (Achterkamp, Vos 2007). Accordingly, the process benefit lies not in influencing collective expectations of the whole field but rather in aligning and informing strategies of pioneering transition actors as well as policy makers wishing to foster those transitions.

Table 1: Background of workshop participants

<b>Smartphones (n=10)</b>
Federal Agency advising the German government on natural resources
Sustainable Purchasing Activist
NGOs active in fair alternative IT products
Federal Association for Information Technology
Trade Union
Industrial Risk Management
Sustainability researchers
<b>Textiles (n=6)</b>
Journalist specialized on the topic
NGO active in social sustainability labelling of textiles
Industry association working on certification
Researcher specialized in the topic
Church based NGO lobbying for social sustainability in textiles

Due to the different situation in the two fields, textiles and smartphones, the process was slightly different each time but in both cases, the core process evolved as follows:

In a first step, we analyzed recent literature on the respective global value chain and in particular on the status of social sustainability. From this literature, we derived a list of potential scenario key factors including both internal and external factors (cf. Table 2 and Table 3) In the case of smartphones this was done by the project team in advance to the scenario workshop, whereas in the case of textiles the list was largely developed by the participants in the workshop.

The core element in both processes was a scenario workshop, which lasted from lunch to lunch in the case of textiles and from morning to late afternoon for the smartphone case. As explained above, participants were representatives of actors engaged in improving the social sustainability of value chains in the respective industry. After an introductory round, we presented our background analysis of the social sustainability situation in the respective Global Value Production Network.<sup>2</sup> After this the interactive process of scenario development was started. Figure 1 depicts the basic steps of the scenario process which involved the following three core steps:

1. **Visioning:** To identify a shared set of key elements of a socially sustainable production network, we first started from individual visions. We then gradually synthesized shared elements first in small and then in larger groups until finally an agreement was reached among all participants.
2. **Factor selection:** Selection of a set of factors of change to be considered for the transition scenario and selection of the most promising triggers of change.
3. **Development of transition pathways** starting from different triggers of change (and in the case of smartphones considering different framework scenarios)

Finally, in both workshops we asked participants to assess the transition scenarios in two respects:

- How realistic is the pathway?
- How close does it come to the vision?

In the textile workshop, which was extending over two days we also asked participants to write imagined articles from a future where the vision is realized.

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<sup>2</sup> See Bodenheimer 2018a, 2018b

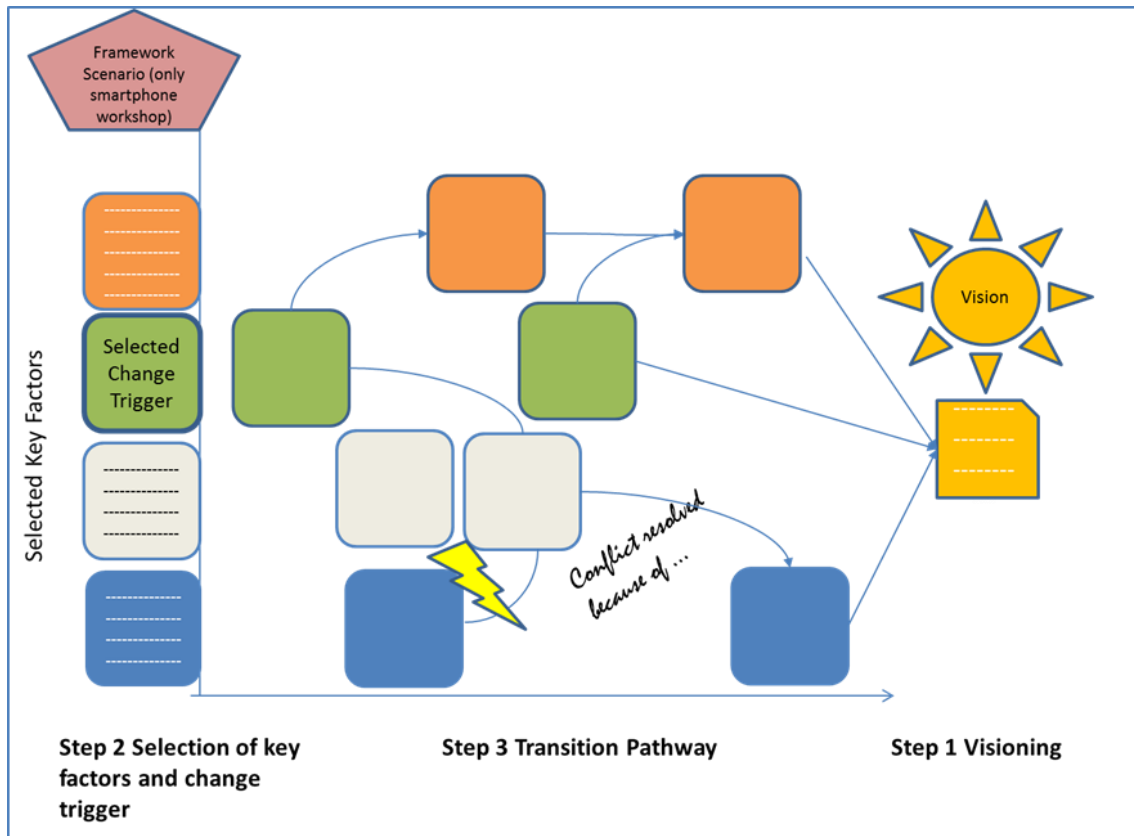


Figure 1: Transition Scenario Process Scheme

## 3.2 Results

For both workshops, we present the vision, the selected key factors, the transition pathways and their assessment.

### 3.2.1 Global Production Network Smartphones

#### Vision

After a long and intense discussion, participants of the smartphone workshop agreed on the following core elements for their vision on a socially sustainable production network:

- Common minimum standards (e.g. ILO living wages) are agreed upon in all countries involved in the value chain.
- In addition to the common minimum standards, locally adapted progressive standards (beyond minimum) are in place that reflect the local living and working conditions and go beyond the minimum standards.

- An International dialogue is established that ensures a suitable balanced power relation among the actors in the value chain.
- The value chain is largely transparent, which is supported by technical devices.
- Sustainability has become a core driver of the innovation process (e.g. life cycle impact assessment) and has replaced the paradigm of innovation as basis for profit and as an end in itself.

## Key Factors

Table 2: Potential Scenario Key Factors Value Chain Smartphones

Factor-name	Description	Current Status
<b>User requirements for a smartphone</b>	What are the requirements for smartphones? According to which criteria are purchase decisions made?	The most important factors are still the technical state of the art and the price. Sustainability aspects only play a role in a very small group.
<b>Status of Smartphones in society</b>	What role do smartphones play in communication and what cultural significance do they have?	Today smartphones are an essential element of their communication and identity for many people. The Smartphone is more than an object of utility (status symbol).
<b>Scandals</b>	Are there any events that draw the public's attention to problems of social sustainability in the smartphone value chain?	Repeatedly events with high publicity such as suicides at Foxconn (2010) cancer cases at Samsung (2010) discovery of child labor in mines and factories (e.g. Cobalt 2016)
<b>Fair Niches</b>	Are there any actors who promote the fair production of smartphones?	2013 Founding of Fairphone and subsequently highly successful development. Other smaller initiatives (Shiftphone, Puzzlephone), all financed via crowdfunding.
<b>Public Attention</b>	How present is the topic of social sustainability concerning smart phone production in the public?	Rising attention until 2012, strong decline until 2015, rising attention again after 2016.

Factor-name	Description	Current Status
<b>Due diligence regulation</b>	<p>Which binding or non-obligatory legal regulations concerning due diligence can be found</p> <ul style="list-style-type: none"> <li>- Concerning mining, trade and use of resources with regard to conflicts and Human Rights violations?</li> <li>- During the production of components and the final devices with regard to working conditions?</li> </ul>	<p>Due diligence regulations are more and more implemented on different levels, e.g. Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains (2015); EU conflict minerals legislation, (binding after 2021); regulation concerning conflict resources in the US Dodd-Frank Act (2010) currently under attack. Modern slavery and forced labor are part of the California Transparency in Supply Chains Act (2010) and UK Modern Slavery Act (2015).</p>
<b>Role of mobile operators</b>	<p>How are mobile operators reacting? How are contracts affecting social sustainability?</p>	<p>One mobile operator supported the founding of Fairphone, after 2016 a rising number of mobile operators offered the Fairphone in their regular assortment. Campaigns like “every year a new smartphone” is raising the pressure for the producing regime.</p>
<b>Public procurement of smartphones</b>	<p>How is the public procurement reacting? Are criteria of social sustainability considered during the purchase of mobile communication devices?</p>	<p>Public procurement managers are increasingly realizing that they can improve their market power and negotiating position through bundling their powers and demanding better working conditions in the production of electronic devices together. Supported by Electronics Watch.</p>
<b>Labor disputes in China</b>	<p>How often and violently are labor disputes and strikes occurring during the production of electronic devices?</p>	<p>In China younger workers’ expectations with regard to working conditions and payment are rising, inspired through the workers shortage since 2003. Dramatic increase of protests in China between 2011 and 2015, 2016 small decrease.</p>

Factor-name	Description	Current Status
<b>Labor Protection Laws in production countries (especially China)</b>	Which labor protection laws exist in countries of production (especially in China) and how strictly is its' observance demanded?	Theoretically there is a relatively strict labor protection law (Labor Contract Law 2008), in reality labor rights are often violated. Both in China and in South Korea labor unions have little power. Workers' protests are increasingly seen as threats to social peace in China. In 2015 there were first guidelines for working conditions in the Guangdong province.
<b>New technologies in the field of mobile devices</b>	Which new technologies are determining the mobile devices?	Increasing role of Augmented reality elements, new gadgets (watches, bracelets, glasses), Internet of Things (new interfaces and protocols), 5G networks.
<b>Price pressure in the industry</b>	Which role does the price play in the value chain of smartphones?	Brand companies (Apple, Samsung) are constantly pressuring suppliers in order to reduce costs and increase the speed. The proportion of labor costs is relatively small compared to the high price of the devices (e.g. iPhone).
<b>Role distribution in the global production network (Smartphone)</b>	What does the role distribution and value chain shares in the global production network Smartphone look like? Will there be similar developments like in the IT area, where contract manufacturers rose up to brand owners? Will there be new brand owners?	Dominant power of some brands like Apple and Samsung over production and distribution (buyer driven GPN). During the production partly high concentration on big companies (e.g. Foxconn) with high vertical integration, therefore high mutual dependence of the few big players. Numerous "invisible" suppliers in third row. Extreme geographical division of value added share with high (F&E, Design →US/ South Korea) and low profit rate (production, assembly →China/Vietnam). Providers of "unbranded phones" are gaining profit shares.

Factor-name	Description	Current Status
<b>Markets</b>	What are the most important markets for smart phones?	For Apple and Samsung industrialized countries are the most important markets. For other companies there is a rising importance of developing countries as Smartphone consumers. Therefore, there is a rising portion of unbranded phones (already 34% in 2011).
<b>Geographical distribution of Smartphone Production</b>	How is the production of Smartphones distributed over the world? Will this distribution change and if yes, how?	During the last ten years, there has been an extreme concentration on a few countries with China at the top (especially Pearl River Delta). Rise in Vietnam, Romania, India and Czech Republic.
<b>NGO Activities</b>	How actively involved are NGOs that deal with social sustainability in the Smartphone business, at the production sites and in international sales countries?	Many NGOs have been active for a long time to improve social sustainability and raise transparency (e.g. China Labor Watch, China Labor Bulletin, SACOM). Electronics Watch is focusing on the public procurement; pioneering role NRW; awarding offices in NRW have to fulfil the ILO-core labor norms.
<b>Transparency of Smartphone Value Chain</b>	How much information concerning the Smartphone value chain is publicly available?	Low transparency, especially after first client stage, yet with a slightly increasing tendency.
<b>Innovation pressure within the industry</b>	How fast are new Smartphone concepts expected and put onto the market?	Production cycles are constantly declining; pressure for new innovations is very high. Yet, since 2016 there is a slowdown of technical progress and growth, and a refocusing on other areas (e.g. Apple MacBook Pro).
<b>Degree of Automation</b>	To what degree is the Smartphone production automated?	Over all a strong increase of automation in the Pearl River Delta. Similar intentions of Smartphone producers as well.



Factor-name	Description	Current Status
<b>Certified raw material supply chains</b>	Do certified supply chains for raw materials exist with regard to social sustainability (conflicts, working conditions)?	First approaches for certification (e.g. fairmined/-trade gold, fair solder, BGR Certified Trading Chains).
<b>Social Audits</b>	How common are Social Audits?	First approaches of use (e.g. through FLA), but accompanied by problems (corruption, lack of know-how by auditors).
<b>Corporate strategies of the dominant brand leaders</b>	What are business models of dominant Smartphone brand leaders (Apple, Samsung)? What is their selling strategy?	Apple is outsourcing 100% of the production, Samsung is mostly producing in own factories. Regime of flexible mass production. Fast change of products and short-term changes are leading towards extreme pressure and high necessity of flexibility at the side of suppliers who then pass it on to their workers.
<b>Corporate strategy regarding social responsibility of the dominant brand leaders</b>	Do dominant Smartphone brand leaders (Apple, Samsung) pursue strategies for social sustainability and how are they anchored in the organization?	Codes of conduct are showing little effects. Audits are concentrating on quality and not on working conditions. Little consciousness for the effects of strategic decisions on working conditions. Voluntary commitment through industry associations: Global e-Sustainability Initiative (GeSI), Electronics Industry Citizenship Coalition (EICC). Concerning conflict resources Apple can show small progress through the Dodd-Frank Act.
<b>Corporate strategy regarding social responsibility of the large contract manufacturers</b>	Do large contract manufacturers (Foxconn, Pegatron) pursue strategies for social sustainability and how are they anchored in the organization?	Almost every company has created guidelines for social responsibility, which are communicated to their customers, that is to say the brand leaders. Nevertheless, they are rarely adapted, especially if there is a pressure of time and costs.

Factor-name	Description	Current Status
<b>Dominant working model of the contract manufacturers</b>	Which working models are prevailing in the production?	Hire and Fire, short-term/ no contracts, almost no development of competences (low skill), strict monitoring, growingly temporary workers/ deployment of interns, highly flexible wage shares, excessive working hours.
<b>Economic strategy China</b>	Which economic and political strategies does China pursue?	Made in China 2025: Aim is to move up in the value chain (indigenous innovation) and to reduce pure manufacturing contracts with small value shares. On a political level more and more authoritarian development (ban of NGOs).

The full set of factors that were emerging from the background analysis is presented in Table 2. The following factors were singled out by participants as possible change triggers:

- National regulation
- International regulation
- Increasing NGO activities
- Increasing number of scandals
- Emerging Niches of fair alternatives

### Transition Pathways

In this session, participants were asked to develop pathways towards the vision starting from the triggers they had identified as most promising for initiating change. For the development of the transition pathway, the groups worked under different background assumptions on the economic and political development in China. For this purpose, we used scenarios that we had recently developed in an exploratory scenario process with a group of China experts for the Bertelsmann Stiftung.<sup>3</sup>

<sup>3</sup> <https://www.bertelsmann-stiftung.de/de/publikationen/publikation/did/china-2030/>

In a nutshell, the two framework scenarios are as follows:

### **1. *Innovated in China***

China has successfully implemented its China2025 strategy. It has moved upwards in the value chain and is now an innovation leader in a number of domains. Many successful brands and a few global market leaders stem from China. China plays a major role in global affairs while the US has rather withdrawn. Wages in China are on the rise. In order to accommodate the demands of an increasingly confident population, reforms have been initiated such as e.g. elections on local level. Values are pluralistic, religion and internet access are free and the legal framework is reliable.

### **2. *More great walls***

Global trade of goods is reduced and regional production clusters have become more important. Nationalist and protectionist strategies are rising globally. Tensions between countries and cyber-crime are rising and international trade has become much more uncertain. China's regime has become even more authoritarian and there is no reliable legal framework in place. Strong tensions between China and US a trade war is looming.



### Storyline:

Rising protectionism in both China and Western countries creates a major uncertainty. Countries compete in attempts for setting standards to protect national companies and production facilities from unfair competition. An **international dialogue** on value chain standards emerges which is however mainly focusing on mediation of conflicts. Nevertheless, this leads to an increase in transparency of the value chain regarding diverse criteria. Some of the new standards are ambitious in terms of social responsibility and go **beyond the mere minimum requirement**. This triggers the emergence of niches of fair production. Through these niches, **sustainability becomes a core innovation driver**. In parallel, an increase in scandals has led to more NGO activities. Together these pressures result in a regulation on due diligence and finally in a minimum standard.

### **Transition Scenario B**

#### Framework Scenario:

- Innovated in China

#### Change Trigger:

- Increasing NGO activities
- rising activism in production countries

### Storyline:

People in production countries form lobbies and demand more rights. At the same time NGO activities increase, which creates more free space for local workers to act and especially to form trade unions. Also, due to the increasing awareness, more scandals are revealed. These developments lead to a steep increase in workplace related conflicts. As a reaction, an **international dialogue** on value chain standards emerges. In this dialogue, **minimum standards** are agreed on and a due diligence regulation is established. As a result, social **sustainability becomes the core driver of innovation activities**. This sets in motion a reshuffling of roles in global value chains including relocation of production sites. China covers the whole value chain. Some companies move to Africa and other countries, others transfer production back to Europe. More niches that offer fair alternatives emerge. Through these niches, **advanced standards that go beyond the mere minimum** emerge.

### **Transition Scenario C**

#### Framework Scenario:

- Status quo remains unchanged

### Change Trigger:

- Scandals and Niches, Regulation

### Storyline:

Driven by rising scandals and emerging niches the landscape has changed. **Transparency** on social standards is achieved and strict international regulation is established. Noncompliance is punished with high fines and blocking of market access. The money from the fines is used to establish an **international dialogue**. Penalty payments are also linked to improving the working conditions in the respective country (in China in this case). Breaches of the regulation do not lead to disruption but result in constructive change management for programs for all levels of the value chain. OEMs carry the ultimate responsibility **and minimum standards are established.**

## **Transition Scenario D**

### Framework Scenario:

- Innovated in China

### Change Trigger:

- Standards, Regulation in Europe and many other western countries

### Storyline:

European countries establish new standards and regulations. The **value chain becomes much more transparent** since prove is required, that regulations are fulfilled. Public awareness is rising based on the increased transparency and the rising conflicts linked to working conditions in China. China is becoming the new innovation leader in the electronics market and this leads to a vertical integration of the value chain and new responsibilities of Chinese producers, who can no longer blame western companies for the working conditions. **Minimum standards are established.**

## **Transition Scenario E**

### Framework Scenario:

- More Great Walls

### Change Trigger:

- Western protectionism

### Storyline:

Protectionism from Western countries leads to a reduced influence of Western companies in China, but China remains the main producer of electronic devices, since Western countries cannot compete with China in this field. China has gained tremendous production knowledge over many years. In China more steps of the value chain are concentrated (vertical integration of the value chain in China). The low standards of today are, to a large extent, caused by the fragmentation of the value chain which has led to a split up of responsibilities and lack of transparency. After the vertical integration of the supply chain in China, work place related conflicts arise. Since no longer foreign companies can be blamed, the authoritarian regime in China tries to calm these conflicts by **establishing new minimum standards**. The aim of the regime is to avoid social conflicts at a larger scale. In consequence, **western countries also establish better minimum standards**.

### **Assessment**

We asked participants to assess the transition scenarios in two respects:

1. How realistic is the pathway?
2. How close does it come to the vision?

Voting was carried first individually and the results were then mapped on a common sheet.

There was no complete consensus among the participants for the assessment of the plausibility of the scenarios. Most participants evaluated scenario A as the most unrealistic scenario, followed by scenario C, which was considered a bit more realistic. Scenario E was evaluated more or less realistic by most participants and scenario B and D were considered the most realistic scenarios. Concerning the extent to which the elements of the vision were achieved in the different scenarios one can see, that the participants considered scenario C as most successfully in establishing the vision elements, followed by scenario B. Scenarios A and E only managed to establish a few or only one element of the vision. Participants felt that it is more plausible, that minimum standards will be achieved because of internal processes in China, assuming a framework scenario in which China is becoming an innovation leader. They concluded that it is difficult to envision transition scenarios based on regulation in Europe that realizes many elements of the vision, without a supportive process within China.

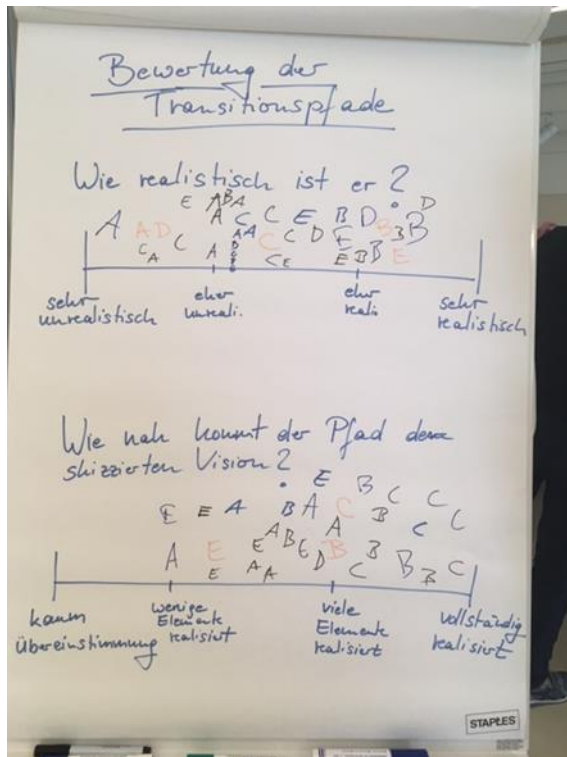


Figure 3: Assessments of transition scenarios. Upper axis how realistic is the transition pathway. Lower axis: How close does it come to the vision?

### Process experience

The group took a long time to develop the vision, as opinions on desirable features of the value producing network differed widely. Some small groups struggled with the development of the transition scenarios which was however in their perception mainly due to the fact that the situation was indeed seen as rather stuck with little room for maneuver. All participants expressed their appreciation of the process in spite of the tough call. Some declared themselves frustrated by the insight that there are only few ideas about realistic transition pathways.

### 3.2.2 Transition Scenario Process: Textiles

#### Vision

The following key elements characterize participants' vision of a socially sustainable textiles value chain:

- Sanctioning mechanisms on the level of WTO are in place



- Freedom for all workers to form trade unions
- Wages that secure a decent life are guaranteed throughout the value chain
- The ILO norms are respected
- Individual contracts are the norm in the whole value chain
- Work security and protection is guaranteed for all workers in the value chain
- The value chain is fully transparent
- A competition law with a “social clause”<sup>4</sup> is established
- A due diligence law is established
- In the EU, the only textile label indicates non-conformity to social sustainability standards.

### **Key Factors**

Table 3 below shows the drivers of change developed by the participants grouped in different categories. We asked participants to select the three factors with highest potential for triggering change in the value chain. The numbers in brackets indicate the number of votes the factor received. The most relevant ones are:

- Pressure of the public
- The strength of labor unions on site in the production country
- The strength and development of international organizations
- The economic system
- Capital markets.

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4 A social clause links trade concessions to compliance with internationally recognized labor standards

Table 3: Potential Scenario Key Factors Value Chain Textiles<sup>5</sup>

Society	Governance	Market	Companies	State
Pressure of the public (4)	Unions on site (4)	Economic system (4)	Purchasing practices of the companies (1)	Regulation in customer countries and implementation (1)
North/South topics are present	Strength and development of int. organizations (2)	Capital market (3)	Risk analysis in companies	Public procurement
Emotionalizing of the topic	Transparency in supply chain (1)	Economic power relations (2)	Accounting in the company (internal billing)	Behavior of the lobby groups
NGO activities in importing countries	Regulation in producing countries and implementation (1)	Competition (1)	Role of CSR in companies	Political development (nationalism, populism ...)
Education	Catastrophes	Means of production	Earnings expectations	Strength of EU
Pioneer- customers	Automation	Internet/Online trade		
NGO activities on site		Concentration Companies		
Customer awareness				

### Transition Pathways

Rather than splitting into groups, participants opted to develop two transition pathways in plenary. As in the case of textiles the landscape is much more diverse than in the case of smartphones, there is no one outstanding context factor that needs to be systematically considered. Accordingly, we did not work with framework scenarios in this case but started right away from the factors of change.

<sup>5</sup> The numbers in brackets indicate the number of votes this factor received



ened. This means that poor working conditions and abuse cost companies money. Driven by this, a critical mass of companies exercises pressure on production countries until in the end unions are legalized in all production countries. The strengthened unions collaborate across the value chain, which leads to a mutual training effect. Together the unions successfully impede cut and run strategies. In the new governance model, the first negotiation partner is always the factory on site. Finally, brand owning companies agree to pay decent wages. The relationship between brands and their factories becomes closer. Long lasting delivery contracts are established.

### **Transition Pathway B**

This pathway focuses on the establishment of the due diligence regulation which was a core element of the vision.

#### Trigger

- Pioneering activities in one buyer country

#### Key Factors Involved

- Change in public procurement
- Rise of scandals
- Pressure by the public

#### Storyline

Building on the Dutch Covenant, the Netherlands adopt a pioneering role in driving social sustainability in the textile value chain and also mobilize allies in other sectors. The initiative gains high visibility. The visionary spirit returns, there is a clear focus on a few basic aspects of social sustainability. The government of the German Land North Rhine Westphalia decides to channel all textile public procurement through the Netherlands to ensure social sustainability standards. France also joins the initiative. Actors in Germany panic as the competitiveness of German companies seems endangered. The comparison puts pressure on German companies. Finally, a group of diverse companies with a long tradition (not niche players!) launches an initiative. This pioneering group positions itself against the mainstream and phases out textiles that do not comply with high social sustainability standards from their portfolio. They recruit well known and highly respected personalities as champions for the cause. Fairwear becomes hip and cool. The existing guidelines are finally concretized. The pioneering group experiences a surge in investment and becomes some-

thing like the “Tesla” of Textiles. Pushed by OECD recommendations policy is putting pressure on other companies to join the club. Further scandals at production sites increase public awareness and pressure. Retailers are increasingly training their staff to address social responsibility requests. Finally, a due diligence regulation is established globally and transferred into national law first in OECD countries and then globally. Sanctioning mechanisms are implemented similar to the UN guidelines on human rights and economy. Trade treaties are established that strengthen local economies. Finally, social responsibility becomes engrained into the DNA of all companies.

### Barriers

- In Germany, the textile sector does not account for much employment. Therefore the “threat” will not be very strong
- Reaching out to other sectors may slow down the momentum

### **Assessment**

We asked participants to assess the transition scenarios in two respects:

3. How realistic is the pathway?
4. How close does it come to the vision?

Voting was carried first individually and the results were then mapped on a common sheet (see Figure 1).



Figure 5: Assessments of transition scenarios. Upper axis: how realistic is the transition pathway. Lower axis: How close does it come to the vision?

Results are as follows:

- None of the pathways is seen as highly realistic.
- A majority of participants assesses B as a rather realistic pathway.
- Only one person sees A as rather realistic all others see A as rather unrealistic.
- Most participants feel that A covers many aspects of the vision. B is seen as covering fewer vision elements.

It can be concluded that A that in the eyes of most participants fulfills many vision aspects and rests on changes within the production countries is also seen largely as the least realistic. The pathway which is less promising in terms of achievements (B) is however seen as more realistic by most participants.

### Recommendations for action

In the final session, participants collected and prioritized recommendations for action for the three core actor groups: policy, industry, research. The most important ones are listed in the table below.

Table 4: Recommendations for action for different actor groups

Policy	Companies	Research
<ul style="list-style-type: none"> <li>• implement transparency law for the value chain</li> <li>• join forces with the Netherlands to increase pressure on EU level</li> <li>• make due diligence mandatory and introduce sanctions for non-compliance</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Gather courage to be pioneer!</b></li> <li>• Integrate sustainability into the business model</li> </ul>	<ul style="list-style-type: none"> <li>• a representative study on knowledge and motivation of consumers to buy fair textiles is needed</li> <li>• research the implications of a mandatory due diligence regulation</li> <li>• maintain independence of research</li> <li>• investigate what are the benefits and drawbacks of a multi-stakeholder approach</li> </ul>

### Process experience

Participants appreciated the creative and constructive mode of working among actors with diverse perspectives, and the high level of expertise of the other participants. They expressed the need for similar formats within the official discourse on the subject, which seems often stuck. The two-day format with a joint dinner in between proved very suitable as it allowed a fresh perspective on the next day and a break from the very dense discussions.

## 4 Conclusions

### 4.1 Transition to sustainable value networks: barriers and enablers

It is interesting to note that in spite of the very different situations in the two value producing networks the two visions are very similar. This implies that actors apply a general definition of social sustainability that is independent of the specific sector. In particular, both visions refer explicitly to the ILO standards. This indicates that these standards serve a highly important orientating and anchoring function across actor groups and sectors. Finally, both visions refer to the transparency of value chains as a core element of social responsibility and this aspect is also highly prevalent across the transition pathways. It can be concluded, that transparency is both an enabler of change and a key feature of the desired final situation that guarantees stability of the situation.

A crosscutting review of the seven transition pathways (cf. Table 5) reveals further common aspects:

- An element that is very strong in both group results is the role of international regulation and in particular the establishment of sanctioning mechanisms to ensure compliance with these regulations (in the textile case part of the vision and pathway A, in the smartphone case part of pathway C).
- Particular emphasis was placed by both groups on a due diligence regulation. Especially participants of the textile workshop made this a special focus of their debate (pathway B and actions) but also in the smartphone case; this was a core element in two pathways (A and B).
- Both groups recognized and addressed the danger of companies adopting “cut and run strategies” that will undermine any positive change in the production countries. In one pathway of the textile case (A) this was counteracted by joint strategies across unions from different countries. In another pathway of the smartphone case (B) a very strong position of China with high vertical integration of the value chain forced companies to keep production in the country in spite of rising wages and improving working conditions.
- Across the transition pathways the role of the trade unions at the production sites stands out as a key enabling factor of change
- It seems that in both cases the pathways that are seen as the most lasting and successful are the ones where change is initiated within the production countries. Nevertheless, complementary activities in the consuming countries driven by better public awareness and the emergence of fair niches play an important complementing role in almost all pathways.



- It is interesting to note that the smartphone group that worked with the framework scenarios developed ideas for triggers of change that went beyond the list of factors that were originally identified. In both framework situations increasing nationalism and protectionism on the one hand and the rise of China towards an innovation leader on the other, groups managed to identify opportunities for change. This implies that for actors looking to initiate long-term change it may well be worthwhile to look towards factors of change in the wider environment and to align their change strategies with these factors. It is also interesting that the two scenarios situated in an “innovated in China” framework were assessed as more realistic and desirable than any of the others.

Table 5: Overview transition pathways

	Triggers	Key elements	Assessment
<b>Smartphone A</b> Framework: More great walls	National regulation in China (driven by protectionism)	<ul style="list-style-type: none"> <li>• International dialogue on standards</li> <li>• Transparency of the value chain</li> <li>• Emergence of niches</li> <li>• Scandals</li> <li>• NGO activities</li> <li>• due diligence regulation</li> </ul>	<ul style="list-style-type: none"> <li>• Rather unrealistic</li> <li>• Addresses some elements of the vision</li> </ul>
<b>Smartphone B</b> Framework: Innovated in China	Increasing NGO Activities, rising activism in production countries	<ul style="list-style-type: none"> <li>• forming of trade unions</li> <li>• workplace conflicts</li> <li>• revealing of scandals</li> <li>• international dialogue</li> <li>• establishment of value chain minimum standards</li> <li>• due diligence regulation</li> <li>• relocation</li> </ul>	<ul style="list-style-type: none"> <li>• Realistic</li> <li>• Almost all elements of the vision realized</li> </ul>

	Triggers	Key elements	Assessment
<b>Smartphone C</b> Framework: Status Quo	Scandals, Niches, Regu- lation	<ul style="list-style-type: none"> <li>• transparency on so- cial standards</li> <li>• international regula- tion</li> <li>• sanctioning mecha- nisms for non com- pliance</li> <li>• fines used to fund dialog</li> </ul>	<ul style="list-style-type: none"> <li>• Rather unreal- istic</li> <li>• Vision mostly realized</li> </ul>
<b>Smartphone D</b> Framework: Innovated in China	Regulation in Europe	<ul style="list-style-type: none"> <li>• transparency of val- ue chain</li> <li>• public awareness</li> <li>• strong position of China and accord- ingly high vertical in- tegration</li> <li>• minimum standards</li> </ul>	<ul style="list-style-type: none"> <li>• Realistic</li> <li>• many elements of the vision addressed</li> </ul>
<b>Smartphone E</b> Framework: More great walls	Western Pro- tectionism (leading to national regu- lation)	<ul style="list-style-type: none"> <li>• vertical integration of value chain in China</li> <li>• work place related conflicts</li> <li>• China takes respon- sibility and establish- es minimum stand- ards</li> <li>• Western countries follow</li> </ul>	<ul style="list-style-type: none"> <li>• Rather realistic</li> <li>• Medium no. of elements of vi- sion realized</li> </ul>
<b>Textiles A</b>	Strengthening of the trade unions in pro- duction coun- tries Pressure from the public	<ul style="list-style-type: none"> <li>• trade unions unite and train each other</li> <li>• implementation of regulation in produc- tion and buyer coun- tries</li> <li>• fixed contracts</li> <li>• policing of regulation compliance</li> <li>• impeding of cut and run strategies</li> <li>• relationship between brands and factories</li> </ul>	<ul style="list-style-type: none"> <li>• Rather unreal- istic</li> <li>• Addressing many aspects of the vision</li> </ul>

	Triggers	Key elements	Assessment
<b>Textiles B</b>	Pioneering activities in one buyer country	<ul style="list-style-type: none"> <li>• public procurement</li> <li>• scandals</li> <li>• pressure from public</li> <li>• cultural change</li> <li>• training at retailers</li> <li>• OECD as mediator</li> <li>• international law</li> <li>• due diligence regulation</li> <li>• trade treaties</li> </ul>	<ul style="list-style-type: none"> <li>• Medium realistic</li> <li>• Some elements of the vision realized</li> </ul>

## 4.2 Transition scenario processes - lessons learned and way forward

The SONA WSK experience clearly indicates that the development of transition scenarios is a highly important activity for advancing change processes towards sustainable value producing networks. We conclude this on the one hand from the participants' feedback. Even though the total number of participants was small, they were all longstanding activists in the field with a high level of expertise and experience in various stakeholder processes. Therefore, their assessment seems highly relevant. In particular, the following considerations stand out:

- Even though many activists agree on the goals of a social sustainability transition, there are only very few ideas on how a change process could actually realistically evolve. Accordingly, participants emphasized the high added value in terms of new insights gained but also expressed frustration at the lack of realistic change scenarios
- Current multi-stakeholder processes seem stuck because of a lack of space for free and deep exchange among them
- Especially in the field of textiles where more players and options are around than in the smartphone case there seems some potential for triggering change through such processes

From our own observations, the following lessons learned seem important:

- The visioning process worked well in both cases and proved a very important and much appreciated element of transition scenario building. The time that is used to develop a vision rather than just providing a goal is well spent as it substantially increases participants' motivation to work together on the transition pathway. Especially in the smartphone case, the visioning process re-

vealed contradictory expectations among the stakeholders but also a small set of shared elements.

- The two-day set-up used in the textile case was better suited to the complex and controversial subject. Especially the night to “sleep over” allowed for more creative attitudes and deeper discussions.
- The development of the transition pathways was highly challenging for the groups on their own and worked better with facilitation
- The elaboration of the factors within the workshop (textile case) was more effective than the provision of factors within the background document (smartphone case). This was partly because the ownership was higher for participants “own” factors but also because the background document elaborated by the team created some misunderstandings that took time to address. The elaboration within the workshop is effective because the expertise provided by the experts involved can be used very well.
- The use of the framework scenarios in the smartphone case led to a new perspective on the possible driving factor (protectionism as initiator for national regulation) and helped to challenge standard interpretations. At the same time participants found it hard to immerse themselves into the framework scenarios which seemed somewhat arbitrary to them. The time provided for taking up the scenarios was rather short considering that these framework scenarios covered many aspects that are not directly linked to the specific expertise of the participants.

This implies three main avenues of further development for transition oriented scenario building:


- better understand how to integrate external factors in order to open up towards new windows for change without alienating participants who are usually focused on the internal system factors.
- better understand how to support a creative development of the transition pathways
- venture to include a wider circle of stakeholders with even more diverse perspectives using the core elements of the shared vision as a common denominator.

## 5 Bibliography

- Achterkamp, M. C.; Vos, J. F. J. (2007): Critically identifying stakeholders. In: *Syst. Res.* 24 (1), pp. 3–14. DOI: 10.1002/sres.760.
- Bodenheimer, M. (2018a): Transition towards Socially Sustainable Behavior? An Analysis of the Garment Sector. Fraunhofer ISI. Karlsruhe (Working Paper Sustainability and Innovation, No. S 07/2018).
- Bodenheimer, M. (2018b): Transition towards Socially Sustainable Transition Behavior? An Analysis of the Smartphone Sector. Fraunhofer ISI. Karlsruhe (Working Paper Sustainability and Innovation, No. S 06/2018).
- Börjeson, L.; Höjer, M.; Dreborg, K.-H.; Ekvall, T.; Finnveden, G. (2006): Scenario types and techniques. Towards a user's guide. In: *Futures* 38 (7), pp. 723–739. DOI: 10.1016/j.futures.2005.12.002.
- Da Costa, O.; Warnke, P.; Cagnin, C.; Scapolo, F. (2008): The Impact of Foresight on Policy-Making: Insights from the FORLEARN Mutual Learning Process. In: *Technology Analysis & Strategic Management* 20 (3), pp. 369–387. DOI: 10.1080/09537320802000146.
- Dönitz, E. J.; Schirrmeister, E. (2013): Foresight and Scenarios at Fraunhofer ISI. In: *Problemy eksploatacji - Maintenance Problems* 4/2013 (91), pp. 15–28.
- Erdmann, L.; Schirrmeister, E. (2016): Constructing transformative scenarios for research and innovation futures. In: *Foresight* 18 (3), pp. 238–252. DOI: 10.1108/FS-06-2014-0041.
- Gabriel, J.; Warnke, P.; Schirrmeister, E.; Dönitz, E. (2016): Qualitative Szenarien als Tool des organisationalen Lernens. In: Schnurr, M.; Glockner, H. (Eds.): *Strategische Vorausschau in der Politikberatung. Beiträge und Diskussionsergebnisse eines UBA-Fachgesprächs*. Dessau-Roßlau: Umweltbundesamt (UBA-Texte, 49/2016), pp. 13–19.
- Geels, F. W.; Schot, J. (2007): Typology of sociotechnical transition pathways. In: *Research Policy* 36 (3), pp. 399–417. DOI: 10.1016/j.respol.2007.01.003.
- Godet, M. (2001): *Creating Futures. Scenario Planning as Strategic Management Tool*. London: Economica.

- Miller, R. (2007): Futures literacy: A hybrid strategic scenario method. In: *Futures* 39 (4), pp. 341–362. DOI: 10.1016/j.futures.2006.12.001.
- Miller, R. (2018): *Transforming the future. Anticipation in the 21st century.* Abingdon, Oxon, New York, NY: Routledge.
- Phaal, R.; Farrukh, C.; Probert, D. (2010): *Roadmapping for strategy and innovation. Aligning technology and markets in a dynamic world.* Cambridge: University of Cambridge, Institute for Manufacturing.
- Quist, J.; Thissen, W.; Vergragt, P. J. (2011): The impact and spin-off of participatory backcasting. From vision to niche. In: *Technological Forecasting and Social Change* 78 (5), pp. 883–897. DOI: 10.1016/j.techfore.2011.01.011.
- Ringland, G. (1998): *Scenario planning: Managing for the future.* Chichester: John Wiley & Sons.
- Ringland, G. (2002): *Scenarios in public policy.* Chichester: John Wiley & Sons. Available online at <http://www.gbv.de/dms/sub-hamburg/339906855.pdf>.
- Schirrmeister, E.; Warnke, P. (2013): Envisioning structural transformation — lessons from a foresight project on the future of innovation. In: *Technological Forecasting and Social Change* 80 (3), pp. 453–466. DOI: 10.1016/j.techfore.2012.10.008.
- Schultz, W.; Bezold, C.; Monahan, B. P. (1993): *Reinventing Courts for the 21st Century; Designing a Vision Process. A guidebook to visioning and futures thinking within the court system.* Edited by Institute for Alternative Futures, Hawaii Research Center for Futures Studies, National Center for State Courts.
- Schwartz, P. (1991): *The art of the long view. Planning for the future in an uncertain world.* New York: Currency and Doubleday.
- Truffer, B.; Voß, J.-P.; Konrad, K. (2008): Mapping expectations for system transformations. In: *Technological Forecasting and Social Change* 75 (9), pp. 1360–1372. DOI: 10.1016/j.techfore.2008.04.001.
- van der Heijden, K. (1997): *Scenarios. The art of strategic conversation.* Chichester: Wiley.

- van Notten, Philip W. F.; Rotmans, J.; van Asselt, Marjolein B. A.; Rothman, D. S. (2003): An updated scenario typology. In: *Futures* 35 (5), pp. 423–443. DOI: 10.1016/S0016-3287(02)00090-3.
- Vergragt, P. J.; Quist, J. (2011): Backcasting for sustainability. Introduction to the special issue. In: *Technological Forecasting and Social Change* 78 (5), pp. 747–755. DOI: 10.1016/j.techfore.2011.03.010.
- Warnke, P.; Schirmeister, E. (2016): Small seeds for grand challenges— Exploring disregarded seeds of change in a foresight process for RTI policy. In: *Futures* 77, pp. 1–10. DOI: 10.1016/j.futures.2015.12.001.



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