



## Scenarios for sustainable futures beyond GDP growth 2050

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### ABSTRACT

The idea of continued economic growth is increasingly questioned and critically analysed on the basis of its potential negative sustainability impact. Along with the critique, visions and strategies for alternative systems need also be brought onto the agenda. The aim of this paper is to present the qualitative content of scenarios that explore sustainability strategies for the Swedish society when economic growth is not seen as an end in itself, and instead the objective is other values/targets that society might wish to achieve. Multi-target backcasting scenarios are developed that illustrate future states in which four sustainability targets (climate, land use, participation, and resource security) are to be attained. The focus of these four scenarios is: 1) a Collaborative economy, 2) Local self-sufficiency, 3) Automation for quality of life, and 4) Circular economy in the welfare state. In the paper, we also present the process of the development of the scenarios, and feedback from stakeholders. Although the focus is on Sweden, the process and scenarios may also be relevant for other similar countries. The scenarios are discussed in terms of their relevance and their purpose, the fulfilment of the sustainability targets, and the multi-target approach.

### 1. Introduction

Unless human societies manage to take critical decisions and actions that lead us on to sustainable paths, the earth system may become locked on pathways that could not be reversed, steered, or slowed (Steffen et al., 2018). There is a broad consensus that sustainable development includes environmental aspects, such as natural boundaries and the carrying capacity of ecosystems (e.g. Rockström et al., 2009; Steffen et al., 2011), as well as social aspects, such as social justice, equality, and governance (Ibrahim, Koshy, & Filho, 2015). Raworth (2012) combines these essential dimensions of sustainable development and presents the outlines of a safe

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and just space for humanity. Even though this sustainable space is not impossible to reach according to Raworth (2012), several obstacles and potential goal conflicts are present. One example of an obstacle relates to efforts to maintain economic growth (measured as an increase in Gross Domestic Product, GDP), which has historically been followed by increased emissions of greenhouse gases (e.g. Raftery, Zimmer, Frierson, Startz, & Liu, 2017). If societies strive for increased economic growth and consumption without reflecting on consequences for the environment, it might become impossible to reach environmental goals.

In many of today's societies, there seem to be a bedazzlement of the narrative of quantitative economic growth as means to achieve prosperity, happiness and a good life. Growth has been associated with good economic performance following the economic depression of the 1930s, and since that time has generally been seen as a remedy for unemployment (Domar, 1946; Harrod, 1939). Many politicians, business leaders and researchers advocate a stepwise development towards more sustainable societies within the current systems, rather than a complete break with the narrative of the necessity of GDP growth (Mol, Spaargaren, & Sonnenfeld, 2014). There are also arguments that continued economic growth can be a tool to fight environmental degradations, through for example providing means for adopting more environmentally friendly technologies (Apergis, 2016).

However, several authors, particularly in the field of ecological economics, have stressed the physical constraints for economic activities and the need to change course and find other options (e.g. Meadows, Meadows, Randers, & Behrens, 1972; Jackson, 2009). Victor (2010) asks if and how economies can be adjusted to the planets biophysical boundaries and lays out three options: 1) to continue striving for economic growth in developed countries, while attempting to reduce its negative impacts; 2) to encourage growth in sectors of the economy that use fewer resources, such as the service sector; or 3) to limit growth itself. The first and second option implies a green economy, or green growth, that is based on consumption and activities that can enable decoupling (Jänicke, 2012). Going beyond this notion, "genuine green growth" is discussed, which implies sufficient decoupling to stay within planetary boundaries (Stoknes & Rockström, 2018).

All three options could in theory include a shift in perspective in which social sustainability is the aim, ecological sustainability is a fundamental requirement, and the economy is seen as a tool (Alfredsson & Wijkman, 2014). A possible response to the third option is a steady-state economy as envisioned by e.g. Daly, 1996; Daly (1977) and Daly (1996) where qualitative development is disconnected from quantitative growth. Another is "degrowth", a notion developed both in research and activist communities (e.g. Schneider, Kallis, & Martinez-Alier, 2010; Demaria, Schneider, Sekulova, & Martinez-Alier, 2013). One definition is that degrowth concerns equitable downscaling of production and consumption that increases human well-being and enhances ecological conditions at the local and global level, reducing societies' throughput of energy and raw materials (Schneider et al., 2010). Others yet, argue for a complete break with the capitalism system, and the end of capitalism and money (e.g. Hornborg, 2016; Ott, 2012).

One can also view the issue from the perspective that it is the focus on GDP growth that is the problematic issue, and not the growth in itself, and argue that society should be indifferent to GDP growth. This perspective has been termed "a-growth" and is argued on the basis that GDP cannot be a measure of social welfare, and that the constraint of unconditional GDP growth hampers human progress (van den Bergh & Kallis, 2012).

Regardless of whether a steady state, a degrowth, or an a-growth perspective is taken, we argue that there is a need to explore alternative futures, which do not rely on the notion of continued economic growth. But how could society move away from the current structure? Dreborg (1996) argues that when problems are complex, effect many sectors and levels of society, when there is a need for major change, when marginal changes within the prevailing system are not sufficient, when dominant trends are part of the problem, and the time horizon is long enough to allow considerable scope for deliberate choice, then we could shift focus from where we seem to be heading, to where we want to go, and how we could get there. Backcasting (Dreborg, 1996; Robinson, 2003; Robinson, 1982), that starts out from future states that satisfy some specific objectives, can then be used as an approach to change our perceptions of what is possible or realistic, and to broaden the scope of solutions that are considered in the current setting. Such explorations that address sustainability are common (e.g. Doyle & Davies, 2013; Mander et al., 2008; Neuvonen et al., 2014). However, scenarios that explore the link between economic growth, welfare and the environment, and future societies that do not rely on continued growth are scarce. One of the few examples is Sessa and Ricci (2014) "New Welfare"-scenario that explores well-being beyond GDP, a considerable transition characterised by cooperation, concern for the environment and social welfare, and increased share of immaterial consumption. In contrast, it is common that sustainability related scenario studies assume sustained GDP growth, or do not explore growth dynamics at all (Musabasic, 2015). This in spite of the fact that the assumption that GDP globally will continue to grow is questioned and under scrutiny (Alfredsson & Malmaeus, 2017). Hence, there is a need for moving from criticism and identification of sustainability problems to analysing what it could mean to achieve values that are considered desirable, regardless of economic growth.

The aim of this paper is to present the qualitative content of scenarios that explore sustainability strategies for the Swedish society when economic growth is not seen as an end in itself, and instead the objective is other values/goals that society might wish to achieve. The scenarios take on a degrowth perspective in the sense that consumption of goods is drastically downscaled, and an a-growth perspective in the sense that no particular level of GDP growth is the objective in the scenarios. In the paper, we also present the process of the development of the scenarios and feedback from stakeholders. Although the focus is on Sweden, the process and scenarios should also be relevant for similar projects and countries wishing to explore alternatives beyond the focus on GDP growth.

Another purpose of developing the scenarios is to contribute to increased interest in, and stimulate discussion of, alternative future developments that need not have growth as a starting point. Such discussions are relevant regardless of whether low or negative growth is seen as a threat and a result of failed growth politics or economic crises, or if it is seen as an opportunity for conscious degrowth or a steady state economy to attain sustainability targets.

## 2. The project

The scenarios have been developed within a trans-disciplinary five-year project that explores sustainable future developments beyond traditional GDP growth. The research team holds competence in fields such as environmental systems analysis, future studies, sociology, urban studies, political science, organisation theory, social anthropology, economics and human ecology. The project also includes societal partners. During the scenario development, there were between 9 and 11 partners involved during different periods: five Swedish municipalities, the region of Västra Götaland, one membership bank (JAK), the Swedish Civil Contingencies Agency, the regional unit of the Swedish Ministry of Enterprise and Innovation, the Transition Sweden movement, and the Club of Rome.

Three case study municipalities are also tied to the project. In these municipalities, in-depth studies, e.g. focus groups and interviews to develop scenario content and acquire feedback, have been carried out. One is a sparsely populated northern municipality (Övertorneå, about 5000 inhabitants and approx. 2490 km<sup>2</sup>); one is a western middle-sized municipality, (Alingsås, about 40,000 inhabitants and approx. 550 km<sup>2</sup>) in the vicinity of the major city of Gothenburg; and one a southern, relatively large, municipality (Malmö, about 320,000 inhabitants and approx. 330 km<sup>2</sup>).

## 3. Scenario process and development

### 3.1. Scenario type

A backcasting approach to scenarios is used. Scenarios of this kind have slightly different connotations in the future studies literature, such as future visions (Milojević & Izgarjan, 2014; Mont, Neuvonen, & Lähteenoja, 2014), desirable futures (Van der Voorn, Pahl-Wostl, & Quist, 2012) and target-fulfilling scenarios (Svenfelt, Engström, & Svane, 2011). The present study uses the latter approach. In this line of thinking, backcasting is a process of developing normative scenarios that can help provide an answer to the question of how a specific target can be reached (Börjeson, Höjer, Dreborg, Ekvall, & Finnveden, 2006). Such scenarios are desirable in the sense that they meet specified targets, but the measures for fulfilling the target might not be desirable for everyone.

In this paper we use the word scenarios and scenario narratives, although it might be argued that a scenario should include a pathway or hypothetical sequences of events (e.g. Kahn & Wiener, 1967). The definition of what a scenario is differs between different traditions, as it can denote both descriptions of possible future states and descriptions of developments (Börjeson et al., 2006). In target oriented backcasting scenarios, the pathways do not lead up to the scenarios, but is it the other way around. This pathway or sequence of events can be more or less in focus in backcasting scenarios. Åkerman and Höjer (2006) for example, argue that working out detailed paths may be insufficiently flexible or robust to cope with inherent uncertainties of future developments. In the backcasting scenarios presented here, the scenario narratives, together with the assumptions and the targets are more in focus than pathways.

In target oriented backcasting, usually only one target is used (e.g. Höjer, Gullberg, & Pettersson, 2011; Kok, van Vliet, Bärlund, Dubel, & Sendzimir, 2011), but in the scenarios presented here, four targets for socio-ecologically sustainable development, which are specified below, have been used. Hence it is a multi-target backcasting approach that aims to deal with several targets simultaneously as a way to avoid building in target conflicts in scenarios. This is because scenarios opting for just one target, without conscious awareness of other targets, can lead to difficulties in identifying conflicts and synergies, and can also lead to an actual (albeit unintentional) build-up of conflicts. Multi-target backcasting can also be performed using participatory methods, which can strengthen the identification of conflicts between the different targets, and the way in which different actors could be affected.

The scenarios are radical in the sense that they fulfil ambitious environmental targets, which are far from being reached in current affluent societies, while also maintaining social welfare values. All scenarios contain elements that imply a break with today's Swedish society, even though some current elements are maintained. For example, concerning governance and planning, a basic assumption applicable to all scenarios is that Sweden still exists as a nation and that a minimum role that the state has is to ensure that the territorial borders are monitored and protected, and to maintain some form of common national legislation.

### 3.2. Method for developing scenarios

The backcasting method used is based on four main steps (Höjer & Mattsson, 2000; Svenfelt et al., 2011):

- 1 Problem definition and establishment of criteria and targets for what is to be achieved.
- 2 Analysis of present potential and future challenges for achieving targets by analysing current trends and expectations.
- 3 Development of scenarios that strive towards meeting the targets.
- 4 Analysis of how well the targets and criteria are achieved, and analysis of the consequences for policy and planning.

This paper mainly concerns elements of Step 2 (expectations) and Step 3. Step 1 and the trend analysis in Step 2 were presented in (Faurö, Svenfelt, Finnveden, & Hornborg, 2016) and are only summarised here. Results from step 4 is published in other papers (e.g. Francart, Malmqvist, & Hagbert, 2018; Hagbert & Bradley, 2017) or ongoing research.

The scenarios were developed in an iterative and participatory manner: in some activities only the core scenario developers were involved; in other activities all project researchers. Other activities included societal partners; and some included other stakeholder groups. Stakeholders were represented throughout the process and also partook in developing the scenarios. The scenario generation started with identifying relevant aspects and theories to explore a sustainable future that does not rely on economic growth. This was

done through: literature studies; a workshop (May 2014) with the research team and partners; workshops in the three municipalities; and four supplementary interviews. In the workshops, the participants voted on the most important and least certain aspects, creating a gross list of relevant aspects to explore in the scenarios. The literature studies concerned theories that could form the basis for the scenarios, such as welfarism (e.g. Mill, 1895), governing the commons (Ostrom, 1990), and the capabilities approach (Nussbaum, 2002).

Based on the identified aspects and theoretical approaches, and taking into account the priorities from workshops, 20 scenario sketches were designed by the core scenario developers. Sketches means that aspects and theoretical approaches were drawn out in different directions to create different dimensions of the same aspect and a variety of outcomes. For example, the aspect “state governance” became two different sketches named “the state provides welfare” and “collective welfare”.

The titles of the scenario sketches, based on the identified aspects and theoretical approaches, were:

- The new commons
- Automated production
- Global justice
- No profit
- Managing power conflicts
- Circular economy
- Technology and the market solves the problems
- Alternative measurements of welfare
- Consumption without money
- Just/fair distribution of opportunities
- Money is more valuable than time
- Investing in free time
- Democratic organisation and distribution of natural resources
- Local self-sufficiency
- Just/fair distribution of resources
- Welfare organised and financed through collaborative solutions
- The welfare state
- Planned degrowth
- Degrowth to reach environmental targets
- Post capitalism

These sketches were then the basis for further prioritising and development. Additional workshops with societal partners (December 2014) and the research team (January 2015) provided input regarding potential imaginations of what might have happened in the Swedish economy for us to have ended up in the scenario, what economic transactions could look like in the scenario, and which type of governance might dominate the scenario and why. Based on these inputs, the scenario sketches were merged or removed according to priorities set by workshop participants, so that 13 sketches remained. Additional filtering was done by consideration of what the scenario sketches could entail in terms of GDP growth. This in order to remove sketches that explicitly assumed continued GDP growth, since these were not the focus of the project. The remaining sketches were again processed and transformed back-office and in a researcher workshop (March 2015).

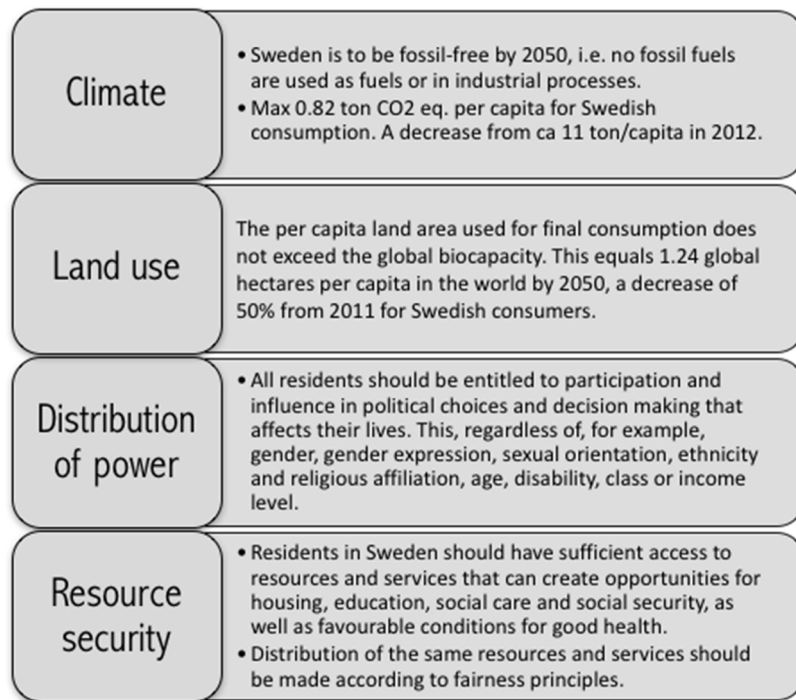
The four scenario sketches that emerged were fleshed out into a test version of the scenarios, with more information and descriptions published in a report in Swedish (Svenfelt et al., 2015) and in four scenario summaries. The test scenarios had the same names and main strategies as in the final version (see Fig. 3), and during 2016 the scenarios were submitted to scrutiny by a variety of actors.

### 3.3. Scenario revision

The test scenarios were scrutinised through:

- 1 Discussions in open seminars with invited speakers with expertise on a specific strategy.
- 2 Five workshops (three with civil servants in the case study municipalities, one with ca 20 municipal public health officials from across Sweden, and one with about 40 members in the Swedish Society for Nature Conservation).
- 3 Workshops with the project researchers and the societal partners.
- 4 Focus groups in the three case study municipalities. Two in each case study area, with representatives from the municipality, local business and civil society. In total 35 participants took part in the focus groups.

The scenarios were then revised to take in the feedback and shortened into brief, 4–5 pages of popular science scenario descriptions for Swedish practitioners (Gunnarsson-Östling et al., 2017).



**Fig. 1.** The four targets that all scenarios strive to achieve by 2050. Regarding resource security, the target focuses on financial resources, or resources that can replace financial resources, such as trading of goods. The fairness principles mentioned can play out differently in different scenarios. The targets are described in (Fauré et al., 2016).

### 3.4. Sustainability targets that should be achieved

Four sustainability targets that the scenarios should strive to achieve have been developed and defined (Fauré, Svenfelt, Finnveden, & Hornborg, 2016). The targets are based on the “doughnut model” for an economy within a safe and just operating space for humanity (Raworth, 2012). Aspects of the doughnut were prioritised by the research and societal partner group, and then reformulated into targets adjusted to the Swedish context, but assuming a global equal distribution of environmental benefits and burdens. Two of them have a primary focus on the environment (climate and land use) and are set from a consumption perspective as opposed to the territorial perspective usually considered in Swedish policy, and two have a primary focus on social issues (distribution of power and resource security) (Fig. 1).

## 4. Future scenarios beyond GDP growth 2050

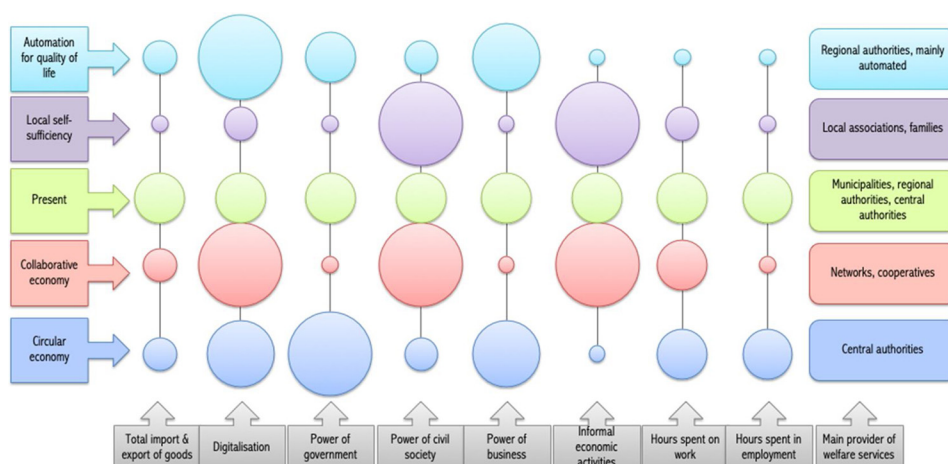
### 4.1. Basic assumptions in all four scenarios

The scenarios presented here are not distributed along some particular axes or dimension, or in a scenario cross, as is common in scenario planning and backcasting (Odegard & van der Voet, 2014), but are instead built around specific theories, discourses and strategies (Fig. 3). The chosen four scenarios for sustainable futures beyond GDP growth are: 1) Collaborative economy; 2) Local self-sufficiency; 3) Automation for quality of life; and 4) Circular economy in the welfare state. Here, the main characteristics of the scenarios will be provided.

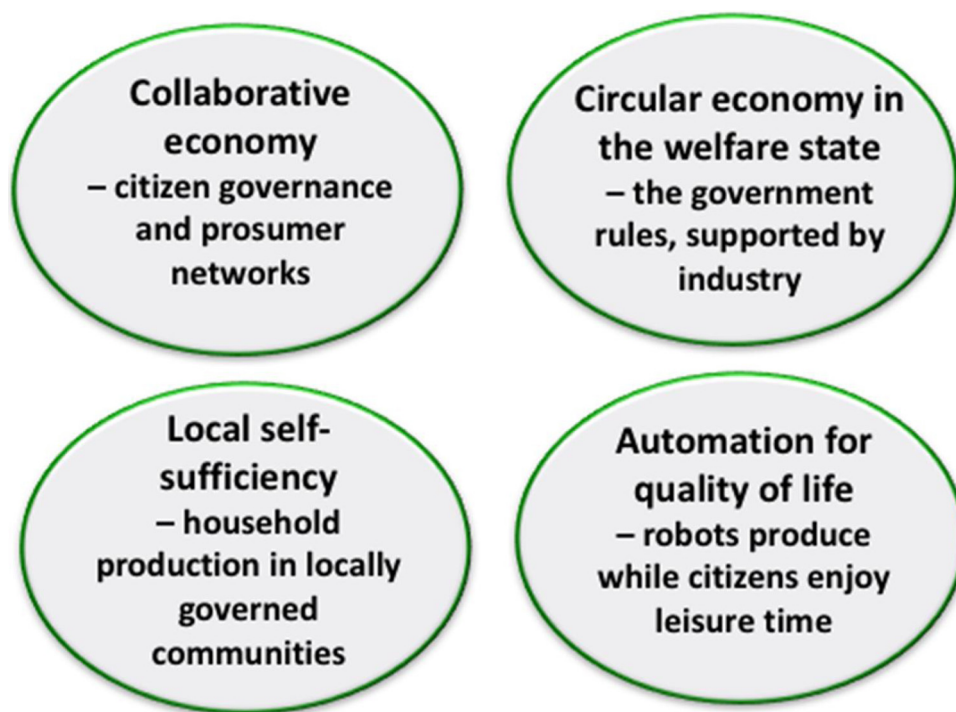
Building scenarios on different and separate leading ideas makes it more difficult to compare the scenarios with each other, but the method can on the other hand relieve restraint on creativity and does not limit the potential of exploring alternative futures that are identified relevant by stakeholders. Hence, the scenarios are not designed to be completely comparable, since the purpose is to develop alternatives that can be analysed in relation to the present, rather than with each other. However, the scenarios are designed to be logic and consistent within each scenario. Also, main differences in specific aspects, between the scenarios, and in comparison with the present, can be described. In Fig. 2, some of the main characteristics, and how they differ between the scenarios and in relation to the present, are described. In the figure the size represents the width of the bubbles, the present is set to 3 for all aspects, and the aspects in the scenarios are either set to the same (3), less (2), much less (1), more (4) or much more (5).

All scenarios explore different strategies for achieving the four targets. All scenarios assume a population of 13 million in Sweden by 2050, which can be compared with 10 million in 2017 (Statistics Sweden, 2017). The scenarios are a-growth scenarios (van den Bergh & Kallis, 2012), in the sense that they are indifferent to economic growth. All scenarios are however selected on the basis that they do not require continuous economic growth, hence the economic activity in the target year is probably in steady state or





**Fig. 2.** Comparison of different aspects, between the scenarios, and in comparison to the present. The present (middle row) is set to 3 for all aspects, and the aspects in the scenarios are either set to the same (3) less (2), much less (1), more (4) or much more (5). The size of the bubbles represents the width.



**Fig. 3.** Leading ideas in the scenarios.

declining, but this is uncertain. The scenarios presented are neither predictions nor utopias, but only a few of the infinite number of possible futures. They are drawn out and exaggerated in order to create the basis for analysis and discussion. They are not mutually exclusive.

## 4.2. Main scenario storylines

### 4.2.1. Scenario narrative: collaborative economy

This scenario is built on ideas of sharing economy, collaborative consumption and collective governance of the commons (e.g. Albinsson & Yasanthi Perera, 2012; Bauwens & Kostakis, 2014; Botsman & Rogers, 2011; Ostrom, 1990). In this scenario, people in Sweden have learnt to live on less economic resources. Trading, borrowing and sharing practices have become frequent and have become woven into societies. Power over resources and decision-making has increasingly moved from hierarchical institutions to

interlinked networks and digital platforms. Citizen power, informal economic activities, and collaborative solutions have become increasingly important.

Digitalisation is a tool for bringing about more sustainable solutions without reducing well-being, and, through technology, people can be digitally interlinked and less restricted by spatial structures. People gather in dense clusters and networks of medium-sized cities, scattered across the country. A large part of everyday life takes place in both digital and analogue collective contexts. Social skills, and access to social networks, is very important when it comes to social status. Information and communication technology is a prerequisite for the networking and sharing, while other types of technology are managed and controlled by users.

Power is dispersed over many different actors. Bottom-up initiatives, joint management based on reciprocity and active involvement are important features. Open data combined with widespread access to digital technology stimulates citizens and other actors from civil society to get involved and take the initiative to influence societal development. There is a national legal system and public authorities, but in practice much of the decision making and management of, for example, welfare services are left to different types of networks and associations. Digital arenas for decision-making are important for managing joint resources and for how an effective civil society can also be stimulated in other respects.

The networks form the basis for the provision of goods and welfare services. People are not primarily seen as consumers, but as “prosumers”, co-creators who are not locked into lifelong contracts with large-scale suppliers. Much of the paid work has been replaced by unpaid work in the form of efforts for different types of associations and networks, from which desired goods and services are gained. People's total working time depends upon their situation in life. Time banks create a buffer for periods with less work.

In production, power and ownership have been transferred from organisations/ corporations to groups/collectives. This also means that power/ownership is transferred from the individual to the group/collective.

#### 4.2.2. Scenario narrative: local self-sufficiency

This scenario is built on ideas of increased local self-sufficiency, strong local communities, and decreased ecologically unequal global exchange (e.g. Curtis, 2003; Hinchrichs, 2003; Hornborg, 2009). In this scenario, people in Sweden have found possibilities for resource security and sustainable solutions in the local ecosystems. Voluntary simplicity and sufficiency have become keywords, with the idea that sustainable societies should adjust the living standards to the local ecosystems' capacity to supply resources and absorb emissions. People have become satisfied with less consumption of goods, and export and import have dramatically decreased. Since resources at the local level are the most important for food and goods supply, the power and independence of local communities and municipalities have increased and the population is participating in decisions.

The focus on local production and consumption means that productive land is very attractive. Many people live in rural areas and in small towns, and the metropolitan areas have been diluted, with large areas for cultivation. Everyday life is built around the provision and production of food, basic goods, maintenance of buildings and care, as well as the decision-making and education necessary for that provision. Technology and tools are highly “convivial”, i.e. possible for their users to construct, repair and have control over.

Civil society actors (the family, households, local production associations, networks, cooperatives, etc.) play an important role. People cooperate in local associations to enable the production of food and other necessities to function as resource-efficiently as possible. Local communities have assumed a significant role for the entire society, at the expense of the state. Most local systems have, for example, their own types of tax systems and incentives that are adapted to local conditions.

The total working hours has decreased slightly compared to 2015, but a high proportion of the work is unpaid, since much of the work is for the purposes of self-sufficiency. All citizens of working age are expected to participate actively in the local production of food and other goods, but also in the production of welfare services such as elderly care, childcare and education. The design of welfare policy is thus steered to a high degree by the local civil associations, and is adapted to the needs that exist locally.

Production is labour-intensive, which means that labour productivity is relatively low. Capital intensity and energy intensity are low as a result of limited access to energy, low access to productive capital, and limited trade flows. Essential production, such as food production, is prioritised. Complementary currencies exist and can only be used for the consumption of locally produced goods and services in order to stimulate a socially and ecologically sustainable economic development based on local conditions.

#### 4.2.3. Scenario narrative: automation for quality of life

This scenario is built on the idea that increased automation and ICT does not have to be seen as a threat to employment, but as an opportunity for liberation from employment and work, and that the benefits of production efficiency can be traded in for more free time and a more meaningful life (e.g. Gorz, 1999; Max-Neef, 1995; Sanne, 2010). In this scenario, people in Sweden have gained insight that the national production capacity and access to resources are sufficient for everyone's reasonable needs, and the challenge lies instead in distributing the resources more evenly. There is a political majority for reduced consumption and reduced paid work. This new view has been driven by a broad popular movement that has raised public opinion both with respect to planetary boundaries and to questions of quality of life and health. At the same time, technological development has resulted in the automation and robotisation of large parts of production, and people have been able to exchange these productivity gains for reduced working hours.

Sufficiency characterises people's lives rather than the previous pursuit of material status. Digitisation and the ability to work less enables people to live more scattered over the country, but live mainly in big cities and often in new, high-efficiency urban cores. Everyday life is inspired by a view of quality of life in which material resources and assets are not valued, but instead the focus is on high-quality leisure time and being free from obligation.

Technical innovations have a central position in society as well as in politics. The government works closely with market actors

(especially innovators and technology developers) to continuously develop automation opportunities. Political decisions are taken on several levels, but it is the national level that is dominant. Society has some features of corporatism, which in this case means that, for example, technology development companies have a strong influence over public policy. At the same time, the possibilities for direct democracy, which in turn involves extensive spread of power, have increased as smart systems have evolved.

Virtually all manual work and also many routine administrative tasks are performed by robots and computers. Human labour is needed primarily for advanced administrative tasks, knowledge production and transfer, and creative work, as well as to stimulate social contacts. Since many shall share the duties that require human labour, working hours have been reduced radically to an average of 10 h per week. More people are engaged in social activities with family and friends, spending time with sick and elderly. Local leisure activities increase as people stay at home to a greater extent, and also the conditions for greater involvement in non-profit organisations strengthens civil society's welfare functions.

Automation has meant that activity in the formal economy is relatively high, despite a low level of paid work. At the same time, technological development has increased resource efficiency. One measure to avoid increased wealth and income differences is the distribution of productive capital (technology, machines) so that a few people do not control an excessively large part of production and incomes. Another measure that has been introduced is highly progressive taxes on income from capital, since the real capital contributes much more to automated production and is thus an important primary source of income.

#### 4.2.4. Scenario narrative: circular economy in the welfare state

This scenario is built on the idea that linear production patterns that developed since the industrial revolution, are built on an unsustainable foundation and that a circular economy in which materials are re-used and circulated is needed (e.g. [COM/2014/0398, 2014](#); [The Ellen MacArthur Foundation, 2013](#)). The drivers behind the ideas of a circular economy and strong welfare state are ideas that available energy and resources should be sufficient for providing for everyone; it is only a matter of using the resources in a smart, long-term way and supplying more renewable energy. In this scenario, waste no longer exists as a concept. The products used in Sweden are designed and optimised to be disassembled and re-used. The economy is based to a greater extent on service consumption than material consumption, which is not as resource and energy intensive. Consumption of welfare services, culture and nature experiences has become a high priority. The state has a strong role and is an important guarantor for creating conditions and incentives for efficient resource use, which is seen as essential for future welfare and development opportunities.

Policy has focused on efficient, large-scale solutions to reward sustainable design and innovation, to reduce the extraction and use of raw materials and other materials, and to influence people's consumption patterns and lifestyles. The focus on large-scale solutions has resulted in a heavily urbanised Sweden. The population and economic activity are concentrated in major cities and metropolitan areas, with a regional hinterland. Material status is no longer important but instead consumption of exclusive services or leisure activities are the focus. Many appreciate the occasional possibility of voluntary simplicity in nature.

The state takes the majority of governance decisions and uses both carrot and stick to secure resource efficiency in all areas of society. Welfare is organised and financed by state, and there is a very strong social safety net. Power is also in the hands of companies who own and control the resources used in production. However, although it is representative democracy, citizens are not very politically active.

The basis for people's provision is paid work in the private or public sector. Time expenditure for paid work is high, as the 40-h week is the norm, but more dependent on the season; for example, in the tourism industry, working hours can fluctuate. The circular economy has created many knowledge-intensive jobs in recycling and the service sector. Through progressive taxes and redistribution systems the state guarantees that all people have access to basic welfare services and pensions.

The economy is a mixed economy, with some tasks being organised by the public sector and other tasks being performed by private, cooperative or social enterprises. Labour-intensive production is cheap relative to energy conversion, materials and capital-intensive production. The service sector is therefore large relative to production of physical goods. A large part of the manufacturing industry is working to enable re-use and recycling, which has created many new jobs.

## 5. Stakeholder feedback

Feedback on the scenarios from the municipalities, and other actors in workshops and at seminars, was diverse and extensive. In general, we found that the scenarios did indeed stimulate discussion about sustainability and pressing issues, particularly in the municipalities. Several participants in the municipal workshops and focus groups expressed that it was interesting and a relief to be able to discuss long-term developments in the municipality without the burden of always having to discuss increased economic growth as well. Often, in focus groups, workshops and in seminars, stakeholders wanted to discuss the strategies and assumptions, and questioned if the scenarios were really realistic, and commented that they believed something else or some other trend would be important in the future. Also, several wanted to pick elements from all four scenarios and merge them into one to provide, for them, a more desirable future. The stakeholders identified both risks and potentials in all of the scenarios – different scenarios were seen as implying more risks or more potentials in different parts of the country (these results will be presented in another publication).

The stakeholder feedback resulted in several revisions of the scenarios. For example, in the test version of the scenarios, assumptions regarding the external global development led to the future state in Sweden 2050 were included in the scenario descriptions as a simpler form of external scenarios. Three different global descriptions were developed (called global sustainability, fragmentation, and slow transition) based on the IPCC's socioeconomic scenarios and climate modelling ([O'Neill et al., 2015](#)) and allocated to the four different scenarios. There were, however, a lot of comments on these descriptions from stakeholders. A main conclusion made was that the rest of the scenario descriptions were, in fact, not dependent on the respective description of the



external development. It was therefore decided to omit these in the final version of the four scenarios. Instead of being specific for each scenario, these external developments can be seen as modules that can be attached to any scenario, if assumptions about global developments are needed in discussions/analyses.

Other revisions concerned the Local self-sufficiency scenario, which several participants experienced as a very negative description of society in the test version. The feedback was that it should be seen more as a possibility that will attract people to Sweden, with its abundance of natural resources (Övertorneå), and that this could also enable people in cities to become more self-sufficient (Malmö). In the test versions, there were also more detailed descriptions of the types of family units in the different scenarios. These were often commented on by the stakeholders. In Local self-sufficiency, the test-scenario described that traditional families are important, while in the Circular economy, single households are common and in the Collaborative scenario, the traditional family is replaced by the networks. For example, it was seen as sad and negative in a social sense if the family, as a social structure, is weakened and instead we have to depend on strangers for provision of resources (Malmö). Since these descriptions raised a lot of discussion and were not at the core of the purpose of the scenarios, they were also omitted in the final versions.

## 6. Discussion

The four scenarios elaborate on different ways of striving for a sustainable future and show that there are potentially many possible ways available to reach sustainability targets. Stakeholder reactions show that there is great interest in discussing possible futures without being restricted by a short-term focus on economic growth. Since continued economic growth cannot be taken for granted, there is a need to plan for situations with limited or no growth. By focusing on what society wants to achieve, new solutions and alternatives can develop.

Many Swedish municipalities have experienced no-growth or low-growth during the last decades, but they rarely plan for low-growth futures. If anything, they attempt to plan to enhance possibilities for economic growth. Still, these municipalities have to function in all kinds of future developments, including ones that do not imply continued economic growth. Hence, new and more radical planning approaches are called for to provide higher capacity to be proactive and adapt in development planning, and in this context, scenarios such as this can be of use.

### 6.1. Growth, degrowth, a-growth, prosperity?

Continued economic growth is often taken for granted. This means that society has a very low preparedness for a situation of diminished economic growth. Around 1950, economic growth became an official policy objective in many countries to increase prosperity and power and has since come to be viewed as the natural state of the economy. Economic growth in the decades following World War II was, however, exceptionally high; an increasing number of economists and commentators are now challenging the common assumption that GDP growth will continue to grow at a “normal” rate of 2.5% in the coming century. An annual growth rate of 1% or lower is proposed by some economists (e.g. Gordon, 2012; Grantham, 2012) primarily due to a lower expected pace of technological development and hence a lower growth-pace of productivity. In addition to such endogenous factors, resource constraints and negative effects from environmental deterioration and climate change may put downward pressure on economic output (NCE, 2014; Turner, 2008). This is a risky situation, since continued economic growth cannot be taken for granted, and can be limited by e.g. resource scarcity as is elucidated in the Circular economy scenario. Negative effects of low or no economic growth may include loss of labour employment, financial turmoil, indebtedness and hardship for businesses. These familiar effects from faltering growth are typically short-term, partly resulting from planning and decisions based on the assumption of continuous growth (Malmaeus & Alfreðsson, 2017).

Societal planning based on other premises, such as the targets the scenarios are designed to fulfil, may contribute to avoiding these and other negative effects. Conscious planning and policy that takes into account both likely and unlikely events can enhance the capacity to adapt and be proactive. The scenarios along with stakeholder feedback give insights into how changed policy objectives can provide an alternative basis for societal development. When such alternatives are described and used in discussions, the capacity to plan for emerging issues, change and uncertainty in the future can increase (van der Heijden, 1996). Instead of disaster, there may be ways to create, as the Odums put it, a “prosperous way down” or slower growth by design (Odum & Odum, 2006; Victor, 2008). This is one strong argument for why it is relevant to use scenarios for illustrating future developments that are not based on continued economic growth, but rather targets and objectives as presented in this paper.

Another strong argument for the relevance of the scenarios is that the present-day economy exhibits major shortcomings in terms of prospects for sustainable development, which includes sustainable economic development as well as ecological and social sustainability. Hence, alternative economic systems, as a more network-oriented future like in the Collaborative economy scenario and sometimes radical options, like a re-orientation from globalisation and urbanisation towards more self-sufficiency as in Local Self-sufficiency scenario, need to be brought out into the open to be analysed and discussed. As described in the introduction and above, questioning economic growth as a foundation for a prosperous society is not new. A lot of criticism and calls for alternative models can be found in, for example, the degrowth research. For example, (Kallis, Demaria, and Alisa, 2015, p4) have pointed out that degrowth is not only about doing less of the same but doing it differently: “in a degrowth society everything will be different: different activities, different forms and uses of energy, different relations, different gender roles, different allocations of time between paid and non-paid work, different relations with the non-human world.” This perception is heeded in the scenarios in how key factors play out in different ways. Societies characterised by degrowth would not have to “grow or die”, and the norm of efficiency would be replaced by striving towards sufficiency. The scenarios provide insights into how this can be done, e.g. less manual labour and more

leisure time as in the Automation scenario, more non-paid work in the Collaborative economy and the Local self-sufficiency scenario. But also, how resource scarcities can be handled through different means, such as a notion of sufficiency that is a dominant feature in the Local self-sufficiency and the Automation scenarios. However, there is still a shortage of studies and approaches that explore and scrutinise strategies for actually achieving an equitable and sustainable downscaling – what it could be like, what the opportunities and downsides would be. [Washington and Twomey \(2016\)](#) argue that in order to be a responsible critic of economic growth, you also need to have an alternative to offer.

We do not offer one alternative, but several. We also acknowledge that several other alternatives could have been developed. Notwithstanding, the four scenarios presented in this paper are intended to challenge assumptions that a future that does not require economic growth must equal dystopia. Rather, these scenarios are exploring options for strategies that do not have to rely on economic growth to produce social and ecological sustainability, but instead uses sharing, resource-self-sufficiency, directed technological development through automation to free up time and welfare-state-circular-economy-investments as the vehicles to achieve the agreed-upon targets, regardless if that lead to high/low/no/de-growth. We argue that this is relevant because alternatives need to become visible and laid out for discussion and analysis, hence providing a basis for new discourses in Sweden and elsewhere.

Regardless of whether low or negative growth is seen as a threat and a result of failed growth politics and economic crises, or if it is seen as an opportunity for conscious degrowth or a steady state economy in order to attain sustainability targets, it is relevant to explore and analyse alternative options. However, both arguments place significant focus on economic growth or degrowth itself, rather than what the growth or degrowth is intended to achieve.

Our approach has instead been to let go of economic growth and income as values that should be strived for or even focused on, and instead placed the focus on what is to be achieved, and what means are able to achieve it. The focus is on sustainability, and economic growth is not in focus (a-growth). The questions could then instead be how to avoid or distribute the negative effects of downscaling, and how to redistribute resources and the opportunities they give, more equally. The scenarios presented in this paper are designed to achieve just that – they should fulfil sustainability targets, which implies a considerable and equitable downscaling of material throughput.

## 6.2. Fulfilment of sustainability targets

The scenarios are designed to fulfil the sustainability targets set up, but use different strategies to contribute to fulfilment of these targets. Lower material throughput may result from: the sharing of goods and services (Collaborative economy); circulating material flows (Circular economy) or reduced levels of material consumption, imports and transportation (Local self-sufficiency); or increased automation in combination with less work, and decreased material consumption (Automation for quality of life). These strategies may in turn result in lower greenhouse gas emissions and possibly reduced land use. The environmental targets are ambitious in relation to the current situation as they imply a 92% reduction of GHG emissions and a 50% reduction of the land area used for Swedish consumption, respectively ([Fauré et al., 2016](#)). This means that for all scenarios, irrespective of the strategy chosen, the total consumption of goods and services will need to change substantially. However, it is not self-evident that the strategies will actually lead to the required changes. For example, the strategy in itself might not be efficient in fulfilling the required targets for climate change. Instead the measures and actions used when implementing such a strategy can be crucial.

Both social targets, distribution of power, and resource security, are formulated in order to allow for different interpretations, and can play out a bit differently in the different scenarios. Resource security and welfare may be satisfied by a strong state as in the Circular economy scenario, by social networks as in the Collaborative economy scenario, or a combination of these. Whether or not the scenarios fulfil the social targets is often a matter of how it is perceived. Stakeholder feedback indicated that the same strategy and scenario can be seen as both positive and negative, depending on perspective and local context, and working in such a participatory process helped, as earlier mentioned, to unveil potential goal conflicts or synergies.

Fulfilling both the climate and land use targets can have a positive effect on other environmental issues, but also include a global justice consideration as they imply a more equal distribution of use of environmental goods and emission of greenhouse gases. As these targets are set for the consumption of Swedish inhabitants, it is a way to avoid displacing emissions to producing countries (e.g. [Isenhour, 2016](#)). The social targets are however set for Sweden. Hence, they do not say anything about social justice in other countries. Sweden could have influence on such issues, for example through its imported consumption.

Furthermore, even if the scenarios should achieve these four targets, they may not be sustainable regarding other aspects, and might have negative and unforeseen impacts that have not yet been analysed. Hence, whether these strategies and solutions actually have the potential to reach other sustainability targets is more uncertain; further evaluation is required to gain knowledge of which elements in the scenarios might be sustainable in the short and long-term, and which may have negative side effects. The scenarios' narratives and the scenario process serve as a platform to further analyse alternative futures in this respect.

## 6.3. Non-predictability and reality based fiction

Envisioning and illustrating sustainable and desired futures can be a powerful tool to nudge perceptions of what is possible or realistic, and to broaden the scope of solutions that are considered in the current agenda. Also, as [Boulding \(1995\)](#), for example, has argued, positive images can also create positive action. To explore sustainable futures beyond GDP growth, as we have done together with relevant stakeholder groups, has enabled a dialogue about what a sustainable economy is and should be. A reaction to the scenarios among some stakeholders was that they were unrealistic and the future will probably be something else, or a mix or something more desirable. In such cases, our task was to emphasise that the purpose of our scenarios and the backcasting process is

not to predict, or try to understand what is going to happen. Rather it is an exploration about what may happen if certain development plans or fulfilment of certain goals are pursued in a society. We do not, as a collective, favour any of the scenarios; neither do we draw any conclusion about which developments are more likely than others, as this is not the purpose. An important point of departure is the recognition of uncertainty in planning and decision making. Conditions are constantly changing and the future is unpredictable. The target for decision making ought not to be to eliminate uncertainty and surprise, but to reduce the undesired impacts from the same (Dewar, 2002). Since knowledge about the future cannot be obtained, it is risky to depend on continued economic growth as part of the solution to attain sustainable societies. So rather than to try to predict, a way forward would be to ask instead as Walker, Haasnoot, and Kwakkel (2013) suggest, if we cannot predict, which actions today are most likely to serve best in the future?

Michael (1985) argues that futures studies are about storytelling, and that what is described in a scenario are stories being told about the future. In order to incorporate uncertainty into decision making present discussions and analysis needs to be opened up for alternatives. One way to do that is to present multiple future options, and to stress that they are a way of telling different stories about a society that is not centred around economic growth but rather the sustainability targets that should be achieved in the scenarios.

The scenarios are quite different from each other, illustrating the very diverse perspectives different groups have of a more sustainable society. The reasoning in each of the different scenarios can be found in contemporary movements and R&D projects related to a sustainable society. For example, the Circular economy scenario in writings and videos from the Ellen MacArthur Foundation, the Self-sufficiency scenario in, for example, the Open Source Ecology project, but also parts of the more dystopian Dark Mountain Project, as well as the more expectant transition movement Transition Towns, the Automation scenario in the grandiose Venus Project, and the self-sufficient high-tech RegenVillages, and for the Collaborative economy scenario, networks such as OuiShare, Shareable and Collaborative Consumption.

It can be argued that the scenarios keep in place the worldviews that created the problems in the first place, since they are not a complete break with current capitalistic societies. Can scenarios achieve set targets if they maintain structures and knowledge systems of the existing society? We are aware of the contemporary profound criticism of capitalism as such, where some works are based on classical Marxist theory (e.g. Harvey, 2014) and others based on other ideas, according to which capitalism is already vanishing on its own account, leaving humanity in a state of radical “uncertainty and indeterminacy” (e.g. Streeck, 2017, p. 69). In relation to these radical ideas, our work has been framed around ideas that have been selected and develop together with stakeholders in a wider and established policy context. Among the first scenarios sketches were also ideas like post-capitalism and consumption without money. These sketches did not become main storylines because they were not prioritized in workshops by either researchers or the reference group. This process probably made the scenarios more relevant for the current context, and made them useful to discuss alternatives to the current system, but perhaps left out scenarios that are radically different from the present.

All the same, our scenarios are still radical in the way that they break with, for example, assumptions of continued high GDP growth and also challenge existing ways of organizing society and everyday life in other respects, for example the-end-of work thinking in the Automation scenario and how the economy and the societal decision-making function more through networks than markets and bureaucracies in the Collaborative economy scenario.

The scenarios are also radical in the sense that they assume that a majority of the population have changed their ways of living out to a more extreme and commonly adopted strategy. Furthermore, even a scenario such as the Automation scenario, that assumes a similar market based system, challenges other structures of current society because the whole focus on work and income as central features is challenged.

The scenarios are also quite radical in what they are supposed to achieve; 0.82 ton CO<sub>2</sub>eq per capita instead of 11 tons implies major changes in lifestyle, and strategies for maintaining welfare services in spite of decreased tax revenues will also be challenging. Although there are major differences between the scenarios, there are also similarities, concerning, for example, no domestic use of fossil fuels. These similarities could also be a basis for actions that can be taken in the present order to move to a more sustainable society.

#### 6.4. Experience of multi-target backcasting

In contrast to most other target-fulfilling scenario studies, the present one uses a multi-target approach. Even though assessment of goal conflicts and policy implications has long been argued to be an integral part of backcasting studies (Robinson, 1982), it is rarely done, or done too late to impact the scenario development process. Therefore, it is of interest to test a multi-target approach in backcasting scenario development. In the present project, the four targets were decided on early in the process and thus guided the content of the scenarios to be developed. In the workshops with stakeholders and/or researchers, scenario descriptions were continuously scrutinised in relation to the four targets. However, the analysis and discussions of the scenarios made it evident that the climate target were easier to relate to than the land use target which was difficult to interpret. Hence none of the scenarios describe land use that much, and this aspect could have been developed further. The two social targets were important for unveiling potential risks of social exclusion in some of the scenarios, and generated critical discussions important when revising the scenarios. For example, these targets elucidated that individuals with less social and networking abilities would risk being disfavoured in the Collaborative economy scenario.

Multi-target backcasting adds complexity to an already complex process. The transdisciplinary scenario development process partly reduced this difficulty, since researchers and stakeholders with varied expertise focussed their consideration on different targets. The multi-target approach would not have been implemented as well without this variety in expert backgrounds among the researchers and participating stakeholders. Nevertheless, it became evident that the targets were more or less operative in terms of

guiding the descriptions of a future society. An important scope of the project was to inform local and regional development officials of new perspectives. The land use target was difficult to interpret in this context, leading to limited consideration in the final scenarios.

This complexity of the process, with several targets and several stakeholders and a multidisciplinary research team, means that different perspectives are always present. This creates long and continuous discussions, but also learning, and both scenarios and knowledge well anchored and possibly more directly useful in societal, for example municipal, contexts. Although the process becomes more complex overall, it contributes to more relevant scenarios that can hopefully facilitate the strategic work of many actors, and to a public debate about which futures are seen as desirable (and by whom). The future is not predetermined but can be influenced, and can play out in many different ways, depending on actions in the present. The scenarios describe an initial version of future states, but it is still not established that the targets are achievable. Additionally, the scenarios do not describe planning, measures, instruments and alterations that need to be in place to get to the future visions, and major obstacles need to be overcome on the way. Continued work should focus on analysing whether the scenarios can reach the sustainability targets, and also on the implications for policy and planning.

## 7. Conclusions

Even though there are many different opinions on what future to strive for, there is also much agreement on the need to reach, for example, climate targets. However, this does not mean that there is a consensus on what a target-fulfilling future should be like. The Beyond GDP-growth scenarios illustrate alternative futures, and such illustrations can play a major role in highlighting different perspectives and different ways of managing and solving problems. By that, the scenarios show that there are ways to think about the future other than what is commonly expected to happen. This way, different actors can see the consequences of adopting a certain perspective and using a particular solution and reflecting on other variants of perspectives and solutions. Since many of today's discussions, projections and scenarios are (consciously or unconsciously) based on the promise of continued growth, the Beyond GDP-growth scenarios are relevant and complementary.

To consider alternative growth scenarios and look at alternative development paths makes sense, even if one were to promote continued economic growth. This is because continued expectations of future economic growth are locking society into specific modes of economic thinking that could lead to economic policies that cannot deal with faltering growth. And policies that fail to be robust in relation to such a decline cannot prevail in the long-term. The Beyond growth scenarios illustrate alternatives that can be used to enhance the flexibility and robustness of current policy.

It is important to also prepare for futures without economic growth, regardless of whether decoupling is possible, if economic growth continues or halts, if consumption volumes need to be decreased in order to move towards more sustainable production and consumption; the alternatives to current developments and policies need to be taken into account and the consequences analysed. Can we, and do we want to, achieve sustainable societies without continued economic growth? If not, what happens with sustainability in economic decline and no preparedness? In order to answer those questions, relevant strategies and policies need to be formulated, analysed and implemented. These scenarios can aid in such a process.

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