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Analysing the Beyond Growth Debate

An Explorative Assessment of Potential Promises and Pitfalls for Implementation of Alternative Economic Concepts in the Netherlands

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Management Summary

As a response to current environmental and social development crises, a public and academic debate has arisen about whether or not there is a need for more fundamental changes to our current economic system. In this 'Beyond Growth' debate, many alternative economic concepts have been proposed, however their implications for future societies are unclear. To provide more clarity in the debate and to examine potential implementation options of the suggested innovative policy routes in practice, this report examines in detail the alternative economic concepts: Green Growth; Mission Economy; Broader Welfare; Doughnut Economics; Degrowth; The Great Mindshift; and Buen Vivir; and their Dutch counterparts: Green Growth; Broad Welfare; Post Growth; and Purpose Economy. This paper examines the position of the various concepts in this debate in relation to each other, their proposed final impacts, and the policy routes towards these impacts, as well as possibilities to model quantitative impacts of the concepts, with a view to their potential implementation options in the Netherlands.

It is found that alongside their position towards GDP growth, important dimensions that distinguish the different concepts include the degree to which they propagate change of current social norms and the degree to which they foresee direct governmental steering. Furthermore, it is found that each of the economic concepts investigated holds distinguishing possibilities for innovative policymaking and for new societal solutions. However, it is also concluded that all of the concepts still show significant gaps in their proposed policy impact chains, from proposed policies to final societal impacts. Hence, for a practical implementation in Dutch policymaking, more empirical analysis would be needed of the required inputs and expected outputs, outcomes, and final impacts of the policies and pathways that are proposed by the concepts. Further research and empirical testing by policy experiments and evaluation is therefore necessary.

Undertaking four main activities in particular can guide these efforts: complete policy impact chains for all concepts; analyse what is seen as welfare by the concepts and which views on norms and values they hold; quantify the potential impacts of individual innovative policy measures suggested in the concepts; and examine public support for policies that aim at influencing current norms and values. It is also recommended to broaden the current, mainly economy-centred public debate to the underlying normative questions regarding different societal definitions of our future welfare and the role of government in influencing our individual norms and values. Recognising that these issues are at stake could help to take new steps in the public and academic debate.

The current 'beyond growth' debate on alternative economic concepts is blurred

Internationally agreed climate, biodiversity and sustainable development goals are far from being met with currently planned policies (e.g. IPCC 2022a; IPBES, 2019; UN, 2023). Neither are most of the scientifically advocated planetary boundaries likely to be safeguarded (Richardson et al., 2023). Realising the urgency of the existing and ensuing environmental and social crises, an international scientific and public debate has emerged about the possibilities for system changes that can solve these crises. In particular it is questioned if our current economic system, focusing mainly on economic growth, will be able to deliver on these environmental and social targets (e.g., Spash, 2020; Widuto et al., 2023). In that debate, many alternative economic concepts have been proposed. However, so far the debate on these concepts is blurred and contested. This exploratory study therefore investigates the 'beyond growth' debate, with the main question of: what are the potential promises and pitfalls of the proposed alternative economic concepts for implementation in the Netherlands?

The main research question of this report is:

What are the potentials, pitfalls, and further research needs for implementing alternative economic concepts?

The following sub-questions are identified
1. How do the different concepts relate to each other?
2. What are the theories of change of the concepts?
3. How can potential impacts of the concepts be quantitatively assessed by modelling?

Eleven international and Dutch concepts were investigated in detail

Through a comprehensive literature review, this study identified seven prominent and distinct international concepts in the debate that have been investigated in detail: Broad Welfare & Wellbeing Economies ('Broader Welfare'); Green Growth; Mission Economy; Doughnut Economy; Degrowth; Great Mindshift; and Buen Vivir. In addition, four concepts specific to the Dutch debate were identified: Brede Welvaart (Broad Welfare_NL); Groene Groei (Green Growth_NL); Postgroei (Post Growth NL); and Betekeniseconomie (Purpose Economy NL). Some of these four concepts largely align with their international versions, but there are also elements that are unique to the Dutch situation to be considered. These concepts largely align with the corresponding international versions, but also contain some specific elements relating to the Dutch situation.

An assessment of the concepts was performed, resulting in a taxonomy that maps the debate and position of the concepts with respect to each other. This was complemented with a theory of change assessment, in order to investigate the completeness of proposed policy impact routes of each concept, i.e. how does each concept explain how it can reach its intended societal impacts with the proposed policies? In the taxonomy, the roles of: GDP; redistribution; technology and behavioural change; and norms and values were examined for each concept. In the theory of change assessment, for each concept a policy impact chain

was constructed that consisted of concrete policies proposed and the indications given by the concept about the inputs, outputs, outcomes and final impacts aimed at.

'Inputs' in this chain are defined as the resources needed to implement a certain policy, e.g., funding or staffing. 'Policies', or more generally 'activities', are the concrete actions that are implemented. 'Outputs' are the tangible products that result from a policy, e.g. 5% higher prices for environmentally damaging goods and services. 'Outcomes' is what is achieved by a policy in the longer term, e.g. the decoupling of economic activity from natural resource use. 'Impacts' are the final reason, goal or aim of a policy that derives from an accumulation of outcomes, e.g. broader welfare, or a sustainable society (FBK, 2023). In addition, the theory of change assessment comprised an analysis of underlying assumptions, proposed scaling mechanism and possible risks, drawbacks and side-effects of each concept's policy impact chain (Figure S.1).

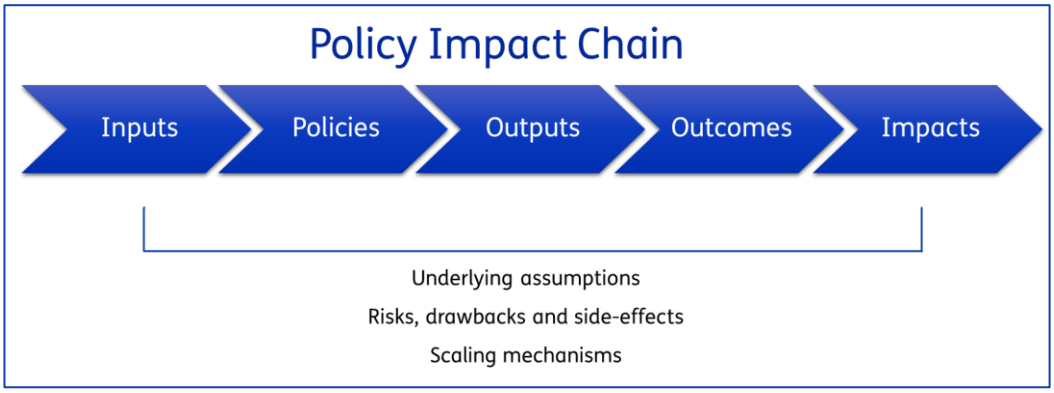

Figure S.1: Theory of change analysis of alternative economic concepts, adapted from Rogers (2014) and FBK (2023)

Three main families of beyond growth concepts were identified: those that take present norms and values as a given, those that see change of norms and values as necessary, and a measurement family

Alternative economic concepts can be classified in three main families: a Current Norms and Values-family that takes present social norms and values as a given and mainly focuses on GDP growth and technological innovation; a Change of Norms and Values-family that regards change of norms and values as a necessary precondition to achieve environmental and social goals and sees economic growth or degrowth as a secondary result after prioritising environmental and social goals; and a Measurement-family that focuses on measuring a broad series of economic, social and environmental indicators, and claims to be policy neutral.

Using additional information on scaling mechanisms obtained from the theory of change assessment, the concepts were further distinguished by their primary driver for change being either governmental policies (top-down) or initiative from markets or citizens (bottom-up). This led to a proposed taxonomy of concepts shown in Figure S.2.

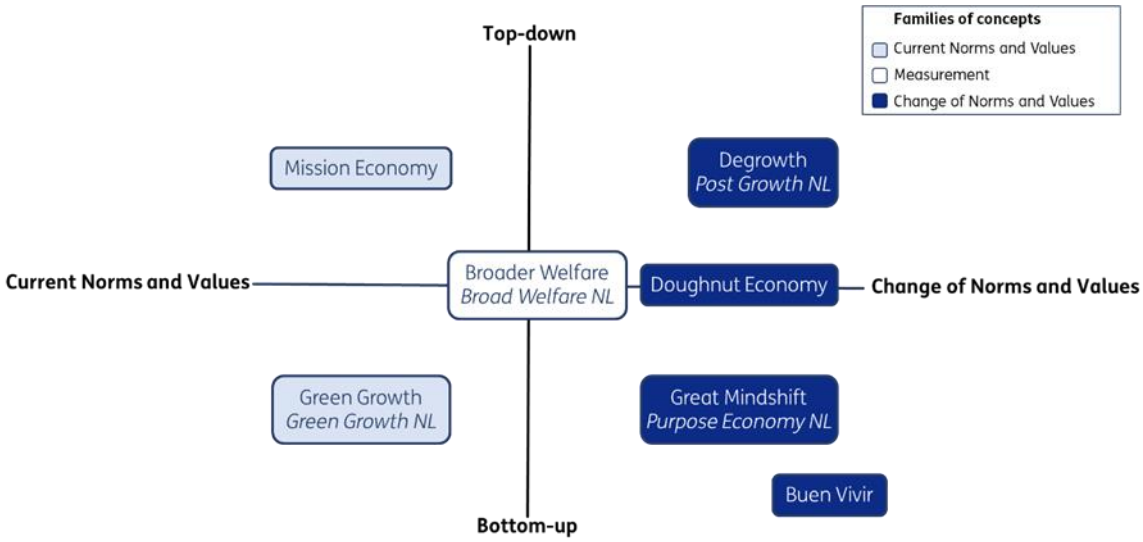

Figure S.2: Proposed taxonomy of alternative economic concepts

In the assessment of the theory of change of the selected alternative economic concepts, it was found that all concepts show critical gaps in their policy impact chains. Also, they rely on underlying assumptions that need further empirical underpinning. The Change of Norms and Values-family is particularly unclear about how the final impact of more eco-centric values in practice would look like. The Current Norms and Values-family mainly lacks evidence of the feasibility of an absolute decoupling between economic activity and natural capital use as a result of technological innovation. Furthermore, it was found that the Broader Welfare-family is not yet able to clarify how providing a more comprehensive set of indicators will lead to policy innovation in practice.

The assessment of current modelling tools for quantitative analysis of policy impact chains and final impacts furthermore showed that none of the state of the art models by itself is at present able to fully assess the policy impact chains. However, by assembling relevant suites of different models together it might be possible to obtain a more precise overview of these chains and their final quantitative impacts.

The concepts offer a variety of potentials and innovative individual policies that need further analysis

Looking at pitfalls and potentials of implementing alternative economic concepts in the Netherlands, the main overall pitfall found are the gaps in the policy impact chains of all concepts. As a result, there is no conclusive scientific evidence yet that Green Growth, Degrowth, nor any of the other concepts are able to address the environmental and social crises mentioned at the outset. Therefore, none of the concepts is ready for full implementation in the Netherlands. However, as current policies also seem limited in their abilities to meet international agreements on environmental and social goals, continuing with the status quo might carry large risks as well.

The main overall potential is that all concepts offer policies and partial policy pathways that are innovative from a societal perspective, and therefore deserve further policy and research attention. Examples of such policies are, for instance, a progressive tax on consumption, substantially reduced working weeks, or inclusion of unpaid care work into the economic system. Furthermore, the call for a shift in norms and values by some concepts has already

contributed to bottom-up action in several fields that at least should be monitored for its potential to scale up in the future. The main potentials and pitfalls per concept are identified in Tables S.1 and S.2.

Table S.1: Analysis of the main potentials and pitfalls of international alternative economic concepts

Concept	Key policy impact chain-mechanism	Key potential(s) identified	Key pitfall(s) identified
Broader Welfare	Wide indicator set to guide policymaking towards 'broad welfare'	Allows for multi-criteria analysis of 'broad welfare'	Trade-offs between indicators unspecified; no guidance on how indicator set will lead to changes in policymaking
Green Growth	Internalisation of environmental externalities in prices and stimulation of (primarily) technological innovation	Fits with present economic views through reliance on market based policies to reach environmental goals. No major changes in norms, values, and institution needed	The possibility of absolute decoupling of economic activity from natural capital depletion in practice lacks conclusive scientific evidence
Mission Economy	Mobilisation of economy and society by directive governmental action	Allows the steering of innovation into chosen directions. Fits with present norms and values. Strong governmental action might overcome (market) barriers	Risk of 'Mission' failures with high impacts to economy and society because of high public investments
Doughnut Economy	Regenerative and redistributive policies steer change that keep the economy within social borders and planetary boundaries	Offers a different perspective on societal welfare. Agnosticism about economic growth might gain more societal support, than negative economic growth as a goal in itself	Final societal impacts and exact policy routes are unclear
Degrowth	Strong governmental policies lead to reduced consumption and/or keeping the society within social borders and planetary boundaries	Offers a different perspective of societal welfare together with alternative policy options	Wide variety of more and less radical interpretations of the concept. Lack of clarity about final societal impacts and intended policy routes towards value change
Great Mindshift	Bottom-up innovation in 'niches' aided by 'regime' and 'landscape' shifts will provide necessary economic and societal change	Offers a different perspective of societal welfare starting from individual value change	Lack of clarity about scaling mechanism from individual personal or entrepreneurial innovations towards societal change
Buen Vivir	Community-based governance and rights for nature lead to living in balance with natural resources and to meeting social needs	Offers a different perspective of societal welfare based on the connectedness of people and the planet as they are all part of nature	Unclear scaling mechanism from local to global level. Dependency on specific cultural contexts unclear

Table S.2: Differences in potentials and pitfalls with international counterparts of Dutch alternative economic concepts

Concept	Related international concept	Differences with counterpart	Differences in potentials/pitfalls assessment with counterpart
Broad Welfare_NL	Broader Welfare	Relatively high stage of development required, and implemented in the Netherlands already	None
Green Growth_NL	Green Growth	Specifies sectoral policies for the Dutch context	Less strict interpretation of Green Growth, with more attention to redistribution and social welfare
Post Growth	Degrowth	Follows growth agnostic interpretation of Degrowth. Progressive consumption tax combined with reduced tax on labour are main instruments. Specifies sectoral policies for Dutch context. Provides explicit policy impact chain	Less strict interpretation of Degrowth, relatively well developed theory of change
Purpose Economy	Great Mindshift	Strongly focuses on entrepreneurial frontrunners. Few/no specifics for Dutch context provided	None

Main directions for future research are: policy impact chains, scenario analysis, modelling, and public support investigation

This project involved an exploratory investigation as well as the setting up of a new assessment methodology for the alternative economic concepts. A set of alternative economic concepts that figure prominently in the current debate were identified, but given time and capacity constraints, others might have been missed due to the limited scope of this study. Also, additional assessment criteria (e.g. looking in detail into the intended energy and material use impacts of specific environmental goals) might refine the taxonomy of alternative economic concepts. Further research is therefore necessary.

For a future research agenda regarding alternative economic concepts, it is recommended that policy makers and researchers work together to produce more evidence regarding policy impact chains of alternative economic concepts as a whole, as well as regarding individual policies within these concepts. Four key research directions and ten underlying questions are suggested in Text box S.1, which could shape the research agenda for alternative economic concepts.

Text box S.1: Proposed research agenda on alternative economic concepts

Route 1: Complete policy impact chains for all concepts

1. **Policy impact chain** – This project showed that many concepts remain unclear about steps in their policy impact chain and how they are linked. Further research is therefore needed to fill the gaps in inputs, policies, outputs, outcomes and final impacts in the policy impact chains that were identified.
2. **Risks** – Risks, side-effects and drawbacks of each concept have mainly been raised from outside the main proponents of a concept, often by proponents of a different concept. A more detailed risk analysis for each concept, also investigating possible routes for risk mitigation, would therefore be necessary.

Route 2: Analyse scenarios based on the norms, values, and welfare views that are underlying to the concepts

3. **Underlying assumptions -** To what extent are the underlying assumptions of concepts empirically supported, e.g. could absolute decoupling of economic activity and natural resource use be achieved for a wide range of resources simultaneously on a global scale and for a longer time frame? And could such a decoupling rely solely on technological innovation, as Green Growth and Mission Economy seem to imply?
4. **Scenarios** – There appears to be alternative views on welfare, norms and values underlying the concepts and these need to be further analysed. How would society look in practice if a concept like Degrowth or Mission Economy would be implemented? Could concepts be implemented in different contexts, e.g., could concepts from the Global South, such as Buen Vivir, be adopted in the Netherlands?
5. **Governance and power relations** – What would transitions mean for transitional governance, leadership, democracy and power relations? Who would be winners and losers and how could they accelerate or delay a transition?
6. **Measurement** – To what extent are the indicators of e.g. the Broad Welfare dashboards, robust enough for different worldviews underlying to the concepts? What priorities would be given to different indicator sets in different scenarios?

Route 3: Quantify the potential impacts of innovative policy measures suggested in the separate concepts

7. **Modelling** – The final impacts of concepts and of selected individual policies on society could be investigated and quantified by way of modelling.
8. **Individual policies** – Within the alternative economic concepts, several individual innovative policies, like a progressive consumption tax, significantly shorter working weeks, and including unpaid care work in the economy are proposed. These could be further explored, independent of the concept in which they were proposed.

Route 4: Examine public support for policies that aim at influencing current norms and values

9. **Public support for norms and values policies** – Some alternative economic concepts require not only behavioural change, but also changes in underlying norms and values. If social innovation via change of behaviour, norms, and values is considered necessary, how could public support for such policies be realised?
10. **Policy evaluation and experiments** – While some concepts have been applied on larger or smaller scale (for example, Green Growth, Mission Economy, Doughnut Economics), others have not. Policy evaluation and experiments into the application of the concepts could provide empirical insights into the effectiveness of suggested policies.

The ‘beyond growth’ debate could be widened from economics to a discussion on societal welfare and wellbeing definitions, norms and value change, and governance in order to move forward

Finally, revisiting the academic and public debate on alternative economic concepts, the research findings show that while a whole range of alternative economic concepts is identified in this project, the most prominent debate seems to take place between the concepts of Green Growth and Degrowth. Yet, so far there appears to be no conclusive arguments for either side of this debate.

However, underlying to the debate are two fundamental questions that so far are only addressed to a limited extent. One question concerns the differing views on what welfare is composed of that is at the core of all concepts: how should individual wellbeing and collective welfare be defined? The other question concerns the extent to which the government is normatively allowed and practically capable of influencing present individual norms and values to fit with a collectively defined notion of welfare. It is therefore recommended to focus the further debate on these societal and governance questions, rather than on the question of whether we should go for growth or degrowth economics. In this way, it is believed that fruitful next steps could be taken in the beyond growth debate.

Contents

Appendices

1 Introduction

1.1 The need for discussing systemic change

The world is currently not on track to meet internationally agreed environmental and social development targets. The IPCC (2022a) warns that the Paris Agreement goal is moving out of reach: climate mitigation would need rapid acceleration to stay below 2°C warming. Without an acceleration and expansion of current policies, a temperature rise of 2.7°C (Climate Action Tracker, 2023) or even 3.2°C (IPCC, 2022b) can be expected by the end of the century. Action towards meeting multilateral biodiversity targets are also not on track (IPBES, 2019). Next to climate change, this is one more vital threat to global quality of life, as, according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services *"many of nature's contributions to people are essential for human health"* (IPBES, 2019:22).

Moreover, there are signals that the world is also surpassing other planetary boundaries for which international political agreements have not yet been made. In 2023, six of the nine planetary boundaries as formulated by Rockström et al. (2009) were already crossed and two others close to being crossed (Richardson et al., 2023; see Figure 1.1).

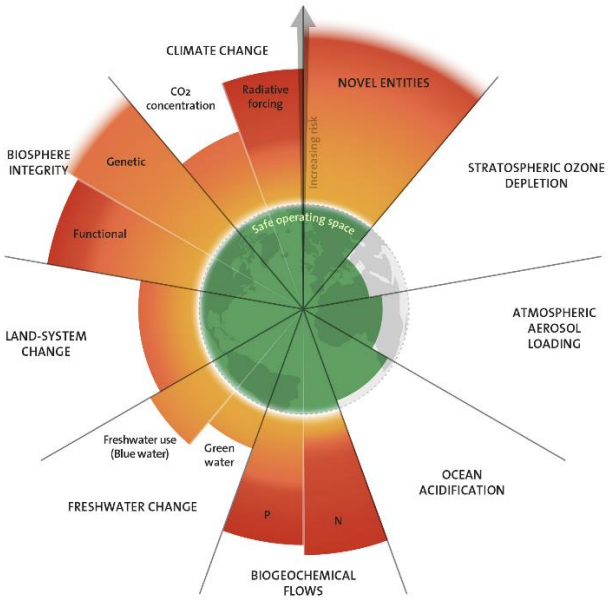

Figure 1.1: Status quo of planetary boundaries in 2023. Source: Stockholm Resilience Centre, based on Richardson et al. (2023)

A drastic turn is also needed to reach the United Nations' Sustainable Development Goals (SDGs) (United Nations, 2023). Although progress has been made on some goals, the majority of the 17 main goals are currently far from being reached by 2030. Amongst other alarming signals, global distribution of wealth is still very uneven and eradication of extreme poverty in 2030 (SDG1) is not yet in sight: it is estimated that under current trends, 575 million people will still be living in extreme poverty in 2030 (United Nations, 2023). And also the OECD warns that, although *"OECD countries have been slowly progressing towards*

achieving many SDG targets", the OECD area as a whole so far only *"has met or is close to meeting one quarter of the targets for which performance can be gauged"*. Therefore, *"with less than 10 years to go, strong policy actions are needed to fulfil the entire 2030 Agenda"* (OECD, 2022).

With current policy trends so far from meeting the multiple environmental and social crises the world is facing, a public and scientific debate has emerged in many countries on the need for more fundamental systemic change. An important topic in this debate is whether or not our current GDP growth based international economic system would need adaptations or revision to meet our future welfare needs (Stiglitz et al., 2008). In this debate it is argued that without intervention, the focus on economic growth inherently encourages the depletion of natural resources and that the current distribution of access to resources, means of production, and goods and services leads to societal inequalities. In short, this 'beyond growth' debate challenges the neoclassical macroeconomic paradigm of economic growth for its compatibility with both ecological sustainability and just distribution (Spash, 2020; Widuto et al., 2023).

Rooted in a longer academic and public discussion that dates back to the 'Limits to Growth' report in the 1970s (Meadows et al., 1972), and to discussions on 'steady state' and green economics from the 1990s onwards (e.g Pearce, 1992; Daly, 1991; 2014), in recent years the 'beyond growth' discussion has evolved into a topic that is on the agendas of national and international policy makers and renowned academic institutions. In 2023, the European Parliament for instance organised a large international 'Beyond Growth' conference based on an initiative of 20 Members of European Parliament from various parties (European Parliament, 2023). To *"reconcile the economy with the planet"* is also the underlying goal of the European Green Deal (Von der Leyen, 2019, 11 December), and in the Netherlands, a debate about the concept of 'degrowth' was organised by Parliament in March 2023 (Tweede Kamer, 2023). In the scientific debate, the current quest for alternative economic concepts is illustrated by the discussion on incremental or transformational adaptation for sustainability in the IPCC AR6 Mitigation report (2022a: 172-178), in which the alternative economic concepts 'green growth' and 'degrowth' are discussed as potential pathways towards respectively incremental adaptation and deliberative transformation.

1.2 A blurred debate

Notwithstanding the extent of the public and academic debate, the alternative economic concepts proposed vary largely in the extent to which they outline policy pathways and intended final societal impacts. Stances differ widely e.g. on the need for incremental or more fundamental systemic change, on ultimate impacts to be aimed for, and on pathways to get there. The European Parliament for instance states that *"[w]hile the beyond growth thinking implies a shift from seeing growth as an end in itself to seeing it as a means to achieve social and environmental goals, there is no general agreement on how to do it or even whether such a shift is needed"* (Widuto et al., 2023).

Neither is there a scientific and public consensus on the benefits and limitations of the alternative economic concepts proposed (e.g., Fagiolo & Roventini, 2012; Harangozo et al., 2018). Some economists, policymakers, and politicians argue that economic growth is compatible with environmental and social goals, and might be even necessary to achieve these goals, while others argue that economic growth is not compatible with a decrease in consumption and a reduction in negative environmental impacts (Alcott, 2005). This is also reflected in the Dutch debate, where on one hand, writers with backgrounds in various political parties contributed to a book on 'post-growth' (Schenderling et al, 2022), while on

the other hand the call for 'degrowth' is strongly disputed by the Governmental Central Planning Bureau (Hasekamp, 2023).

Furthermore, as a result of the lack of concrete definitions of concepts, the discussion sometimes gets semantic, with different interpretations of what is understood by a certain concept. Nor is there a fundamental clarity on how concepts relate to each other in the exchange of arguments of pro and contra, or on how they are meant to achieve their intended final impacts, and on what underlying presumptions they are actually based.

1.3 Research objectives

Against this backdrop, this study aims to provide a scientific analysis and comparison of key alternative economic concepts that are currently in public and academic discussion in the Netherlands and worldwide. The goal is to explore potentials, pitfalls, and further research needs of these alternative concepts for policymaking in the Netherlands.

This is achieved by: comparing alternative economic concepts to each other (i.e. providing a 'taxonomy' of concepts); assessing their policy impact chains ('theories of change' of concepts); exploring possibilities for quantification of their policy impact chains by way of modelling; discussing potential implementation options for the Netherlands; and finally, by providing recommendations to Dutch policymakers concerning future research needs in this area (Text box 1.1). While many of the alternative economic concepts that are analysed have normative and worldview based aims, this explorative study will not take position as to the desirability of implementation of any of the concepts.

Text box 1.1: Main research question and sub-questions of this project

What are the potentials, pitfalls, and further research needs for implementing alternative economic concepts in the Netherlands?

Sub-questions

1. **How do the different concepts relate to each other?**
2. **What are the theories of change of the concepts?**
3. How can potential impacts of the concepts be quantitatively assessed by modelling?

1.4 Reading guide

The report proceeds as follows. Chapter 2 elaborates on the research method used for this study. Chapter 3 introduces the alternative economic concepts that are analysed in detail in this study. In Chapter 4, these concepts are assessed on a set of features, resulting in a taxonomy of alternative economic concepts. In Chapter 5 the theory of change and underlying assumptions of the alternative economic concepts are scrutinised. Chapter 6 presents possibilities and challenges for future to modelling of alternative economic concepts. Based on the insights gained from these assessment, Chapter 7 provides final conclusions and recommendations for further research directed at potential policy implementation of the concepts in the Netherlands.

2 Research method

This chapter describes in more detail the research method. Section 2.1 provides an overview of the method, its scope and definitions as well as the main research steps. Sections 2.2 to 2.9 outline in more detail the individual steps in the research methodology, consisting of a: literature search; concept selection; taxonomy assessment; theory of change assessment; concept fiches; comparative analysis; modelling options; and verification by the advisory board.

2.1 Overview

2.1.1 Scope and definitions

The aim of this project is to analyse the potentials and pitfalls of alternative economic concepts for the Netherlands, with the main research question and sub-questions as outlined in chapter 1 of this report. 'Beyond Growth' in this report is seen as an umbrella term for a wider range of different economic concepts, each providing different ideas for unifying environmental targets with economic and/or social targets.

The project is an exploratory study designed as a comparative case-study analysis. The study does not intend to provide a normative analysis for policy implementation of any of the alternative economic concepts. Instead it provides a neutral and comprehensive assessment and mapping of the concepts.

An explorative study
Alternative economic concepts are presently heavily debated in society and academia, but to our knowledge, no deeper comparative studies of alternative economic concepts have been performed to date. The project is therefore set up as an exploratory study (e.g., Swedberg, 2020), meaning that this new topic will be examined in order to set routes for further detailed analysis in the future. An assessment method has been developed to carry out this exploration.

A comparative case-study analysis
The study follows the main guidelines for setting up qualitative comparative case study research, as proposed by, for instance Yin (2017). The alternative concepts are treated as individual cases. All cases are clearly analysed based on a coherent framework of analysis developed in this project and outlined as separate 'fiches' in the appendices of this report.

No normative analysis for implementation
While the assessment is directed at finding potentials and pitfalls of policy implementation of the concepts in the Netherlands, no preferences for any of the concepts are given. Prioritising them is a task for public debate and politicians. As such, this study does not attempt to answer the normative question of *"which concept should be implemented"*; rather, the study has to be regarded as examining a range of potential scenarios, which in theory might be an option for future policy implementation – albeit with different potentials and pitfalls.

As 'alternative economic concepts', comprehensive proposals for societal change with economic impacts were regarded. Individual economic policies were therefore disregarded, as they are not providing a comprehensive view on societal change. Concepts that are not, primarily, aiming for economic change per se were not excluded if it was evident that their implementation would have such economic impacts. This led, e.g. to the inclusion of the concept The Great Mindshift into the selection of concepts to be reviewed in more detail. Definitions of important terms used in this study are given in Text box 2.1.

For welfare and wellbeing, several economic and psychological definitions exist that do not necessarily coincide, nor is it always clear if welfare and wellbeing refer to the collective or to an individual. Welfare in economics is for instance often defined as 'the utility or satisfaction derived from consumption or any other economic activity' (Waglé & Koirala, 2014), while welfare in psychology might mean 'a group of value judgements and emotional reactions concerning the grade in which the own experience is lived as satisfying, pleasant and positive' (Enríquez-Villota, 2019). As the definitions of welfare and wellbeing differ between authors and disciplines, in this study, it was chosen to define 'wellbeing' as a concept that refers to individuals, and 'welfare' as a concept referring to the collective and to society as a whole. Throughout the whole report, wellbeing and welfare are referred to in these meanings.

Furthermore, several alternative economic concepts base their theories of change on a range of underlying hypothesis, such as the Easterlin paradox, Jevons' paradox, absolute decoupling, and the Environmental Kuznets curve, and the need to resolve 'environmental externalities'. These terms are used in the concept fiches in Appendix A and B and in the discussion chapter of this report.

Text box 2.1: Definitions of key terms used in this project

Alternative economic concept – A comprehensive proposal for systemic and societal change that claims to contribute to providing solutions for the current sustainability crises and to lead to increased societal welfare by changing existing economic and/or institutional structures in our society.

Wellbeing – The intrinsic value of the quality of life of an individual, measured by way of a normative set of subjective and/or objective indicators, that can differ per alternative economic concept considered.

Welfare – Collective state of wellbeing of all individuals in a society, measured in terms of a normative set of subjective and/or objective indicators that can differ per alternative economic concept considered.

Easterlin paradox – The hypothesis that over time, happiness does not increase as income grows (above a certain level): *"while people on higher incomes are typically happier than their lower-income counterparts at a given income level, higher incomes do not produce greater happiness over time"* (Easterlin, 1974). In other words, depending on a normative view of happiness as an indicator for welfare and wellbeing, the latter does not necessarily increase with higher individual incomes.

Jevons' paradox – **The hypothesis that efficiency improvements in use of natural capital are neutralised by autonomous growth in demand for such capital, e.g. for a specific resource (e.g. Bauer & Papp, 2009; York et al., 2016).**

Absolute decoupling – The assumption that economic activity can be fully decoupled from, and independent of, the use of natural capital, and thus an economy can (permanently) grow while preserving its natural capital (e.g., Haberl et al., 2020). It is often assumed that technological

innovation can lead to such decoupling.

Relative decoupling – The assumption that the amount of natural capital used per unit of economic output can be reduced, in particular by technological innovation. With relative, but without absolute decoupling, economic growth at some point will lead to the depletion of natural capital.

Environmental externalities – The notion that the social costs of depletion of natural capital are not fully reflected in market prices. These 'externalities' can be 'internalised', for instance by **implementing market based instruments, e.g., cap-and-trade systems or environmental taxes (e.g., Bithas, 2011).**

Environmental Kuznets curve – The hypothesis that per capita income as a function of the emissions of pollutants, or more generally natural capital use, follows an inverted-U shape. Thus, for sufficiently high levels of income per capita, emissions and natural capital use will decrease with increasing levels of income per capita (e.g., Stern, 2004)

2.1.2 Main research steps

Key research steps made in this project (Figure 2.1):

1. Literature search of alternative economic concepts
2. Selection of alternative economic concepts to be assessed
3. Taxonomy assessment framework
4. Theory of change assessment framework
5. Establishment of alternative economic concept 'fiches' in which each concept is summarised and assessed in detail
6. Comparative analysis of alternative economic concepts and their potentials and pitfalls for implementation in the Netherlands
7. Examining options to quantify and model impacts of alternative economic concepts
8. Review by external advisory board

These research steps are outlined in more detail in the following sections.

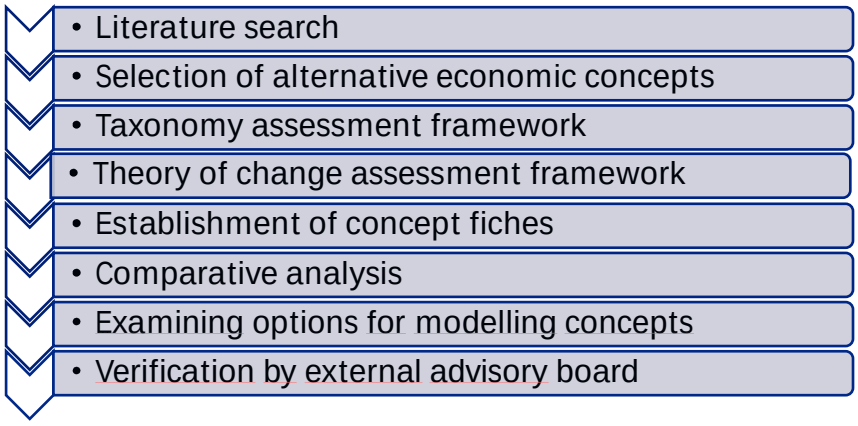

Figure 2.1: Key research steps project potentials and pitfalls of alternative economic concepts

2.2 Literature search

The initial stage of the project consisted of a search of academic and non-academic literature on alternative economic concepts. For the academic literature, a systematic

literature review was conducted following a backward and forward snowballing methodology as described by Wohlin (2014). This literature search focused on finding recent review articles and special journal issues to obtain, in a relatively short timeframe, a more comprehensive overview of potential concepts that are part of the current academic debate. 37 academic articles were scrutinised, including 9 comprehensive review articles of alternative economic concepts (e.g., Fitzpatrick et al., 2022). For non-academic literature, the search included websites and social media sources in order to include key sources from the public debate.

Initially, a small subset of keywords describing potential alternative economic concepts was used. As an outcome of this initial search, a larger set of keywords outlining potential further concepts to be examined was created (Table 2.1).

Table 2.1: Key words describing potential alternative economic concepts

	Initial key words	Additional potential concepts found
International concepts	• Degrowth • Broad Welfare • Doughnut Economy • Wellbeing • Sufficiency • Green growth	Beyond GDP, beyond growth, post growth, green GDP, General Prosperity Indicator (GPI), sustainable lifestyles, sustainable consumption, great mind-shift, good life, buen vivir, happiness, prosperity without growth, steady state economy, a-growth, ecomodernism
Dutch concepts	• Postgroei (post growth) • Duurzame en solidaire economie (sustainable and solidary economy) • Brede welvaart (broad welfare)	Groene groei (green growth), transitietheorie (transition theory)

2.3 Selection of alternative economic concepts

From the snowball search, a number of alternative economic concepts was selected to be assessed in more detail. No 'absolute' criteria for selection of the concepts could be established without prior detailed knowledge of each of the concepts. Without the intention to cover 'all' alternative economic concepts found, a series of 'soft' criteria were therefore used for the selection of alternative economic concepts to be further examined:

- Concepts had to be part of the current public debate, i.e. not only represented in academic papers and journals;
- Sufficient variety in concepts had to be assured based on the initial assessment of concepts in the snowball search;
- Concepts that seemed similar were grouped together to be examined in one 'fiche'; and
- International as well as specific Dutch concepts were chosen to be included separately in order to account for the project aims as providing recommendations specific to the Dutch policy landscape.

Application of these criteria led to the selection of seven main international and four Dutch alternative economic concepts for further examination[1]. These concepts and their core ideas are introduced in more detail in Chapter 3.

1. Broader Welfare
A branch of alternative economic concepts that focuses on measurement and dissemination of indicators related to 'broader' societal welfare and individual 'well-being'. Broader Welfare concepts aim to be politically neutral, providing a basis for various normative views on policy making (e.g., CBS, 2023). Ideas of the Wellbeing Economy Alliance (2024) are seen as similar to those of the Dutch Broad Welfare concept and therefore grouped together with the 'Broader Welfare' concept. Broader Welfare and Wellbeing Economy concepts are already implemented in practice to different degrees in several countries, including the Netherlands.

2. Green growth
An alternative economic concept that is used in international and national policies in many countries since more than a decade after being adopted by e.g. UNEP (2011), OECD (2011) and World Bank (2012). Sustainable growth of GDP, internalisation of environmental externalities and technological innovation are important aspects of the concept (e.g. Bowen & Hepburn, 2014; Smulders et al., 2014). Inclusive green growth, with a focus on redistribution of capital and wealth, and ecomodernism, focusing on high-tech innovation for sustainable development, are regarded as subbranches of Green Growth.

3. Mission economy
An alternative economic concept introduced by Professor Mariana Mazzucato of University College London (2021). In the concept, 'societal missions' that are directly led and closely monitored by governments are the key driver for fundamental changes in society. The concept is inspired by the 'Moonshot Mission' to land a man on the moon that was announced by US president Kennedy in 1961. Advice by Mazzucato on the Mission Economy was, for example, used by the European Commission to guide its Horizon Europe research programme (Mazzucato, 2019b).

4. Doughnut Economy
An alternative economic concept that was introduced by Professor Kate Raworth of Oxford University (2017). Key to the concept is the 'Doughnut model', in which the economy has to perform within an 'inner' border of social targets and an 'outer' border of environmental planetary boundaries. Experiments with 'Doughnut Economics' are currently taking place in various cities, including in Amsterdam (DEAL, 2024).

5. Degrowth
An umbrella term for a range of alternative economic concepts used by different authors and thinkers to discuss various ideas and policy proposals for negative or 'a-growth' rather than positive economic growth as a basis for increased societal welfare (e.g. Kallis, 2011; Chertkovskaya et al., 2019; Hickel, 2020). Ideas about 'Steady State Economies' (e.g., Daly, 1991) and 'Prosperity without Growth' (Jackson, 2016) are also grouped under this heading.

[1] The selection criteria led, for example, to the exclusion of 'circular economy' for further examination, because this is a resource based concept without an outlined vision on economic or societal impacts, and to the exclusion of sectoral concepts like a 'biobased economy'.

6. The Great Mindshift
An alternative economic concept proposed by the former director of the German environmental consultancy Wuppertal Institut Maya Göpel (2016). It strongly builds on transition theory thinking that was developed by Dutch academic thinkers such as professors Jan Rotmans, Frank Geels and Johan Schot (e.g., Rotmans, 2014; Geels & Schot, 2010). The core idea is that a fundamental and bottom up shift in norms and values by enlightened entrepreneurs and individuals will inspire an increasing number of followers to a similar shift, after which policies will also stimulate 'laggards' to follow in this transition.

7. Buen Vivir
A Southern alternative economic concept that was developed in Latin America and applied in practice in governmental policies in Ecuador and Bolivia (e.g., Villalba, 2013; Acosta & Abarca, 2018). It is based on a preference for local community development and indigenous knowledge of striving towards a holistic unity with nature. It is here regarded as related to the South African 'Ubuntu' concept and to the Bhutanese 'happiness economy' and strongly based on indigenous, community-based norms and values.

Furthermore, four specific Dutch concepts were selected for further analysis because of their prominence in the Dutch debate. They roughly correspond to several of the selected international concepts, but work these out in the Dutch context and therefore also partly differ from their international counterparts.

The selected Dutch concepts were:

1. Brede Welvaart (Broad Welfare)
A dashboard with broad welfare indicators was developed by the Dutch statistical office CBS and is already partly implemented in Dutch policymaking (CBS, 2023). The dashboard is considered to be based on the international Broader Welfare concepts.

2. Groene Groei (Green Growth)
Professor Barbara Baarsma outlines ideas on the application of Green Growth for the Netherlands (2022). The ideas build on the international Green Growth concept, but provide specific details for the Netherlands.

3. Postgroei (Post Growth)
Implementing Post Growth as an alternative economic concept in the Netherlands was proposed by a writers collective around author Paul Schenderling (2022), and it is related to the international Degrowth concept. Ideas of the Dutch network for a Sustainable and Solidary Economy are related to the Post Growth concept and are discussed under this heading. Hans Stegeman (Triodos Bank) is another Dutch author advocating Post Growth (Stegeman, 2023).

4. Betekeniseconomie (Purpose Economy)
The concept of a Purpose Economy for the Netherlands was proposed by Professor of Applied Sciences, Kees Klomp (2022). It shares similarities with the Dutch transition theory and the international Great Mindshift concept.

2.4 Taxonomy assessment

A first step in the analysis of the concepts was to investigate how they relate to each other, i.e. an assessment to establish a taxonomy of alternative economic concepts. Therefore a search was performed into existing taxonomies of alternative economic concepts in order to find a framework for assessing the concepts.

The search revealed that views on how to distinguish between alternative economic concepts vary widely between authors. Jensen et al. (2023) for instance distinguish between 'green and inclusive growth', 'degrowth' and 'post-growth', referring respectively to a position in which economic growth remains a central policy objective but adjustments are necessary to make it more sustainable; economic growth is in itself a problem; and economic growth is less important than social and environmental goals.

Pesch (2018) distinguishes between the three narratives: 'growth' (seen as substituting existing products and services by more environmentally ones), 'innovation' (seen as developing new and less environmentally polluting products and services) and 'degrowth' (seen as stopping economic growth altogether). Similarly, van den Bergh (2018) argues in favour of 'agrowth' instead of 'anti'- and 'pro-growth'. De Mooij & van Den Bergh (2002) distinguish an 'immaterialist', 'pessimist', 'technocrat', 'sceptic' and 'optimist' perspective on economic growth. Furthermore, different categories are visible in dashboards and composite indicators: they differ in their respective focus on wellbeing today (wellbeing), wellbeing for all (inclusion) and wellbeing in the future (sustainability) (WISE, 2024).

Given these large differences between the various existing taxonomies, we chose to develop a new taxonomy based on the differences that were identified between the concepts. A first and obvious difference (given the 'beyond growth' origin of the debate) between concepts that was found, was about the position of GDP (per capita) as an appropriate indicator for societal welfare. In addition, three more differences were considered as potential primary distinctive features between the concepts: their take on technological innovation (roughly corresponding with 'innovation' as defined by Pesch), how they handle redistribution of wealth within and between countries (roughly corresponding with 'inclusion' in the WISE framework) and their view on whether or not it is possible to change norms, values and institutions. The latter was added as an element for analysis since the initial literature search indicated that views on whether or not to regard present preferences of citizen-consumers as a given, or to see change of norms and values as a prerequisite for transition notably differed between concepts. This resulted in an overall taxonomy assessment framework as outlined in Table 2.2.

Table 2.2: Indicators used in the taxonomy assessment of alternative economic concepts

Assessment of concepts on their position towards
▪ Their key focus ▪ Role of GDP as an indicator for societal welfare ▪ Stance on redistribution of wealth ▪ Role of technological innovation as an instrument for improving societal welfare ▪ Norms and values change as an instrument for improving societal welfare

2.5 Theory of change assessment

The second part of the analysis consisted of a theory of change assessment of the alternative economic concepts. This assessment of how each concept aims to move from proposed policies to overall societal impact is based on policy evaluation theory as described by, for example Chen (1990) and Weiss (2000). In this analysis, policy evaluation theory is applied as an ex-ante evaluation, as most of the policies proposed by the different concepts are not yet applied in practice.

As an overall framework for assessment in this project, a simplified policy impact chain was used that is also applied by the United Nations (e.g., Rogers, 2014; FBK, 2023) (Figure 2.2). This means that the policies proposed by each concept are examined, including the inputs required for these policies, their outputs, their wider outcomes and finally the societal impacts that are aimed at. In this way, it was checked if a coherent (hypothetical) causal effect chain could be established that links the final societal impacts (or goals) to concrete and feasible policy pathways.

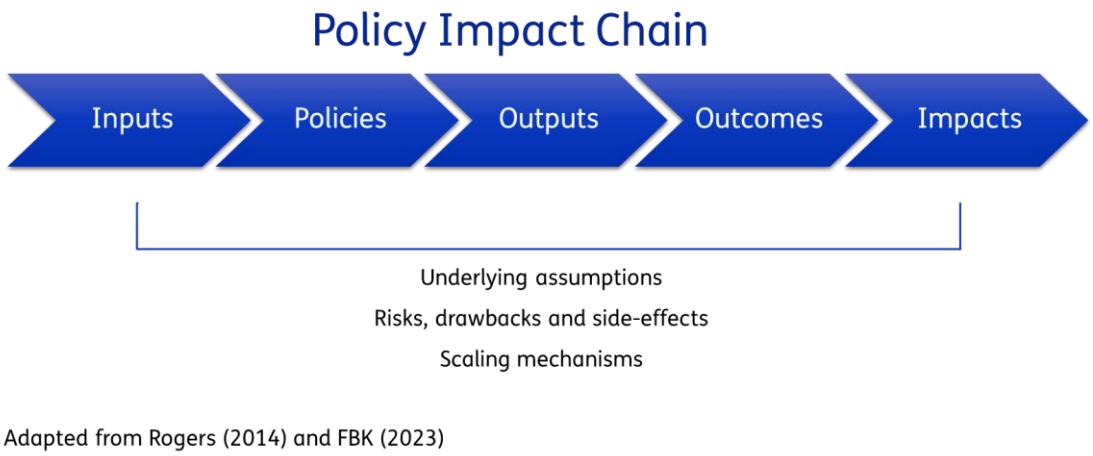

Figure 2.2: Theory of change analysis by way of constructing policy impact chains

'Inputs' in this chain are defined as the resources needed to implement a certain policy, e.g., funding or staffing. 'Policies' or more generally 'activities' are the concrete actions that are implemented. 'Outputs' are the tangible products that result from a policy, e.g. 5% higher prices of environmentally damaging goods and services. 'Outcomes' is what is achieved by a policy on the longer term, e.g. decoupling of economic activity from natural resource use. 'Impacts' are the final reason, goal or aim of a policy that derives from an accumulation of outcomes, e.g. broader welfare, a sustainable society (FBK, 2023).

The theory of change assessment also included an analysis of the underlying assumptions made in order to move from one step in the policy chain to another, e.g. to what extent these assumptions can be backed up by empirical evidence, for example that a certain policy leads to absolute decoupling of economic activity and natural resource use, or to a change of norms and values. Furthermore, the assumed scaling mechanisms of a concept were also evaluated, as each of the concepts aims at bringing about societal change that will have to start at a certain actor level (individuals, enterprises, or governments) to be then scaled up towards a national and in the end also international level. Finally, it was assessed what are potential risks, drawbacks and side-effects of each concept, since any societal change on a

larger scale is very likely to also bring about effects that are not foreseen (and potentially not wanted). Table 2.3 gives an overview of indicators used in the theory of change assessment.

Table 2.3: Indicators used in the theory of change assessment of alternative economic concepts

	Assessment of concepts regarding
Theory of Change assessment	▪ Policy impact chain (inputs – policies – outputs – outcomes – impacts) ▪ Underlying assumptions ▪ Scaling mechanisms ▪ Potential risks, drawbacks, side-effects

2.6 Establishment of concept fiches

The assessment of concepts leading to a taxonomy and the theory of change assessment were carried out by writing a 'fiche' that summarised each alternative economic concept. The following standard format for the fiches was developed:

Fiche format of alternative economic concept X

1. Introductory text –briefly introducing and positioning the concept
2. Main actors – outlining who has introduced the concept and which actors are pursuing its further development and implementation
3. The concept in short – giving a summary of main aspects of the concept and introducing main related concepts
4. Taxonomy assessment of concepts – the assessment of the concepts leading to a taxonomy, as discussed in section 2.4
5. Theory of change assessment – the policy theory of change of the concept as discussed in section 2.5
6. Questions for further research – main research questions for further implementation of the concept that follow from the analysis

All fiches were based on analysis of the literature collected per concept. As empirical evidence, the findings per assessment indicator were illustrated with quotes from the analysed literature on the concept regarding the indicator.

The fiches are presented as Appendix A (international concepts) and Appendix B (Dutch concepts) of the report.

2.7 Comparative analysis

After writing the fiches, a comparative analysis of the concepts was performed. First, the concepts are individually introduced in Chapter 3. Then, the results of the comparative assessment of the taxonomy and theory of change are outlined Chapters 4 and 5, respectively.

The results are presented as qualitative observations that follow from the assessment. Specific attention is paid to gaps in knowledge, for example the gaps in underlying assumptions and empty parts of the policy chains. These results are the basis for a research agenda presented in the policy recommendations in Chapter 7.

2.8 Examining options for modelling concepts

To complement the comparative analysis, this project explored the possibilities to model potential impacts of alternative economic concepts. This is because the quantification of such impacts – and of the policy impact chain as a whole – is likely to be an important precondition for their implementation.

In Chapter 6, main current modelling approaches are outlined and examined on their potentials and limitations for representing the alternative economic concepts and their corresponding policy chains.

2.9 Verification by external advisory board

This study involved a qualitative assessment of the indicators by the researchers. In order to validate this assessment and to prevent the inclusion of subjective judgements, a broad external advisory board consisting of a diverse range of stakeholders in the Netherlands was established. The members of the external advisory board are presented in Appendix C. The advisory board comprised researchers working on alternative economic concepts at Dutch universities and policy assessment agencies, as well as policy makers, a representative of an NGO and of a business stakeholder (bank). All advisory board members are in some way involved in research and debate about alternative economic concepts in the Netherlands, albeit from different positions and with different opinions.

The advisory board commented on the research methodology, results, conclusions and recommendations at an early stage, and in the final stage of the research project. Final results and conclusions nevertheless remain the full responsibility of the research team.

3 Alternative economic concepts identified

This chapter introduces the seven international and four Dutch alternative economic concepts that have been selected for further assessment in more detail. The international concepts are introduced in section 3.1, the Dutch concepts in section 3.2. The full concept fiches, containing more extensive introductions of main actors and concepts, as well as the taxonomy and policy impact chain assessments that were performed, can be found in Appendix A and B of this report respectively.

3.1 Selected international alternative economic concepts

3.1.1 Broader Welfare

There is a range of alternative economic concepts that focus in particular on new measurement frameworks beyond GDP. These concepts are grouped here under the term 'Broader Welfare'.

Main actors

The notion that welfare is broader than material welfare ('broader welfare') finds its origin in the 'The Limits to Growth' report by the Club of Rome (Meadows et al., 1972). After a request from the French president Sarkozy, the concept was further explored by the 'Commission on the Measurement of Economic Performance and Social Progress (CMEPSP'), led by professors Stiglitz, Sen and Fitoussi (2008) and later by Stiglitz, Fitoussi, and Durand (2018). Several countries have now developed wellbeing and broader welfare frameworks, and some of them are united in the 'wellbeing economy alliance', which also includes a range of organisations and academics (WEALL, 2023). Countries that have developed such indicator frameworks or composite indexes are also listed at WISE (2024). With their focus on broader measurement of wellbeing and welfare, statistical offices play an important role in the development of Broader Welfare economies. This also includes the Netherlands, where 'broad welfare' indicators, measured by the statistical office CBS, are in a process of being integrated in governmental policies.

The concept in short

The concept of Broader Welfare encompasses the call for a different interpretation of welfare than GDP: in particular to conceive welfare, societal progress and well-being beyond material and financial aspects. The aim is to develop measures that align with this broader concept of human well-being and ultimately to direct policy efforts to achieving this broader goal of well-being. This concept is rooted in the notion that subjective well-being, broader welfare or also happiness – terms that in this context are used interchangeably (e.g., Fox, 2012) – is distinguishable from material welfare measured only by GDP (Easterlin, 2004; Layard, 2006). In this respect the concept builds on the view that *"...we can think of a person's well-being as arising from a combination of what they have (material), how they are able to use what they have (relational) and the level of satisfaction or subjective quality*

of life that they derive from what they have and can do" (McGregor and Pouw, 2017, p. 1124).

Setting human well-being as a general policy target is not novel in itself. *"People's well-being, both subjective and objective, is often the ultimate objective of public and private policy"* was already stated by the British National Research Council in 2014 and economics as a science has aimed to improve human well-being and welfare since the times of Adam Smith (Hill, 2020). However, the conceptualisation of well-being economies in recent years offers a new perspective by the actual measuring and tracking of well-being by a range of indicators, or with one composite indicator that also includes non-material aspects. The aim is to adopt policy measures based on the frameworks developed, that serve both to guide the design and evaluation of policy measures (OECD, 2011). Examples of frameworks developed in recent years include the OECD Better Life Index, the Genuine Progress Indicator (Cobb et al., 1995), the United Nations Human Development Index, and the Happy Planet Index developed by the New Economics Foundation (JRC, 2012). The frameworks include separate indicators, on the basis of which policy decisions can be made. Trade-offs between the indicators are not included in the frameworks.

3.1.2 Green Growth

The concept of green growth was introduced by a number of multilateral organisations in the early 2010s (OECD, 2011b; UNEP, 2011; World Bank, 2012). Since then, it became well established as a national and multilateral policy term used in many governmental documents and strategies worldwide, including in the Netherlands (e.g., Dutch Government, 2024). The concept aims for the absolute decoupling of detrimental environmental impacts and economic growth, in particular through technological innovation (Bowen & Hepburn, 2014; Smulders et al., 2014; Capasso et al., 2019).

Main actors

The aim to strive for 'green growth' derives from a long-held policy concern about achieving environmentally sustainable development and the need to address the linkages between economic development and environmental quality (Smulders et al., 2014). In the context of this agenda, Bowen and Hepburn (2014) identify the use of the 'green growth' term dating back to 1989. Nevertheless, 'green growth' as a label for a novel economic model of growth and multilateral policy agenda appears to date from the 2000's: *"[a]s a multilateral agenda, green growth was first adopted in 2005 by 52 Asia-Pacific countries at Seoul's 5th Ministerial Conference on Environment and Development (MCED)"* (Sarkodie et al., 2023; p.1).

In the 2010s, the concept gained significant attention due to the initiatives from various major international organisations to delineate and promote the implementation of green growth strategies, which were disseminated in flagship publications, in particular: OECD (2011) – Towards Green Growth; UNEP (2011b) – Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, and; World Bank (2012) – Inclusive Green Growth: The Pathway to Sustainable Development.

The concept in short

Green growth can be understood as being built on three main elements. First, it recognises economic growth as a means to produce societal benefits (e.g. income growth) and poverty and inequality reduction. The latter is pursued in particular under the subheading 'inclusive green growth' supported by, for instance, the World Bank. Second, it acknowledges the undesirable environmental consequences of economic activity due to environmental

externalities in production and consumption of goods and services. These consequences are understood to be long-lasting and typified by the depletion of natural capital (e.g. biodiversity losses, deforestation, depletion of carbon budget). Third, the depletion of natural capital is considered as detrimental for societal welfare. The elements together entail that pursuing a 'conventional' growth strategy according to 'Green Growth' is inadequate and likely self-defeating from a welfare perspective.

The concept highlights that there currently exists a trade-off between economic growth and natural capital preservation, and aims to soften this trade-off by looking for ways to grow the economy while preserving the environment. A distinction can be made in this regard between 'weak' and 'strong' green growth (Jakob and Edenhofer, 2014; Smulders at al., 2014). *"The weak view holds that typically there are trade-offs between income growth and the environment, but that appropriate policies can soften this trade-off... The strong view sees complementarities between maintaining natural capital and maintaining income as more the norm"* (Smulders at al., 2014, p.424), and thus *"environmental policies would have positive effects [on the economy] put even in the short run"* (Jakob and Edenhofer, 2014, p.449). Weak green growth aims at a relative decoupling of the depletion of natural capital and economic growth (i.e. reduce environmental impacts of economic growth), whereas strong green growth aims for an absolute decoupling between these variables (i.e. prevent or remove detrimental environmental impacts of economic growth). 'Ecomodernism', developed by Nobel Prize winner William Nordhaus and Michael Schellenberger (2005) can also be viewed as a sub-branch of Green Growth, and has a particularly strong focus on high-tech development in order to reduce or remove pressures on natural capital.

3.1.3 Mission Economy

The 'Mission Economy' is an alternative economic concept developed by Professor Mariana Mazzucato at University College London (Mazzucato, 2021). It focuses on strong state intervention in markets to solve all kinds of 'wicked problems' in society, including climate change. Inspired by the 'Moonshot Mission' championed by President Kennedy in 1962, Mazzucato's concept proposes that the government should define the encompassing and detailed 'Missions' as policy strategies to address specific complex societal problems, and take a close lead in realising them.

Main actors

Mariana Mazzucato is a professor in the Economics of Innovation and Public Value at University College London. Her work centres around the role of the state and the private sector in innovation. The mission economy concept was presented in detail in her book 'Mission Economy: a Moonshot Guide to Changing Capitalism' (2021). The book builds upon her earlier work, such as The Entrepreneurial State, Debunking Public vs. Private Sector Myths (2013), which emphasises the important role of the state for creating opportunities and covering risks for innovations. Other work published by her on the Mission Economy includes 'The Value of Everything, Making and Taking in the Global Economy' (2018) and, with Rosie Collington, 'The Big Co]n, How the Consulting Industry Weakens our Businesses, Infantilizes our Governments and Warps our Economies' (2023).

The concept in short

According to Mazzucato, the current economic system is not suited to adequately address the challenges of climate change and inequality (2021). More specifically, in her view, we currently face four issues: the short term focus of the financial sector; the financialisation of firms (where according to Mazzucato the largest part of finances is spent on financial

constructions rather than on productive activities); the climate crisis; and the prevalence of slow or absent governments (2021:28). Therefore, we need a 'Mission Economy' in which the government takes a leading role in boosting innovation by focusing on specific societal 'missions'.

In Mazzucato's view, societal issues persist because governments focus on market fixing instead of market steering, and on creating a level playing field for business instead of tilting the playing field in a green direction (Mazzucato & McPherson, 2018). Key to achieving a Mission Economy is therefore the 'redefinition of capitalism', and with that, a transition in how government is structured, how the private sector is governed, and how private and public organisations relate to one another (Mazzucato, 2021: 22). Restructuring of organisations is at the core the concept.

Concerning the role of the government, Mazzucato (2021) states that governments need to move away from a mere focus on controlling public finances. Instead, this finance should be mission driven. Such missions are also called 'Moonshots', in reference to the moonshot speech by US President J.F. Kennedy in 1962, in which he presented the mission to put a man on the moon by the end of the decade. According to Mazzucato, governments should pursue such Moonshot Missions by setting ambitious goals and then structure public budgets accordingly: *"[t]he wrong question is: how much money is there and what can we do with it? The right question is: what needs doing and how can we structure budgets to meet those goals?"* (Mazzucato, 2021:8).

A Mission Economy according to Mazzucato would be a way to overcome pure profit-focused capitalism: *"[t]his [mission orientation] means restoring public purpose in policies so that they are aimed at creating tangible benefits for citizens and setting goals that matter to people – driven by public-interest considerations rather than by profit"* (Mazzucato, 2021:6). By assuming that it is possible to remake the current capitalist system by a strong governmental strategy (Kibasi, 2021), a Mission Economy thus differentiates itself from neoliberal economic ideas, where promoting market competition rather than direct governmental intervention is the primary means to achieve societal outcomes.

Mission Economy ideas were implemented in the European Horizon Europe programme (European Commission, 2024) and in the funding of research in the Netherlands Netherlands research funding (Dutch Government, 2024b).

3.1.4 Doughnut Economy

The Doughnut Economy is an alternative economic concept introduced by Professor Kate Raworth in 2017. The concept sees economic development as limited between an 'inner' layer of social goals and an 'outer' layer of ecological planetary boundaries. Graphically it is therefore represented as a 'doughnut' (Figure 3.1).

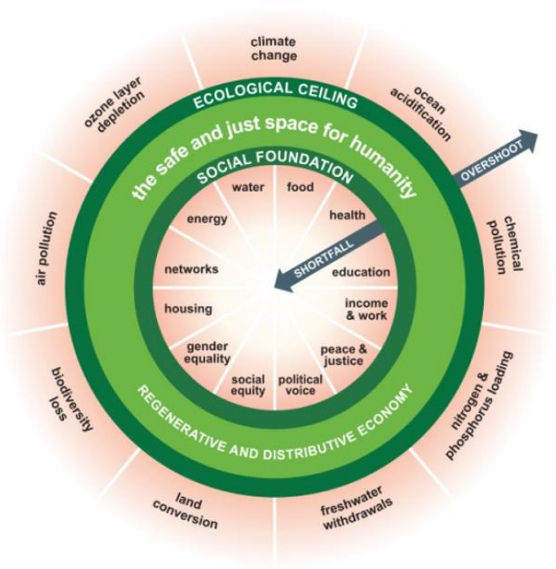

Figure 3.1: The Doughnut (Raworth, 2017:44)

Main actors

The Doughnut Economy concept was developed by Kate Raworth and presented in the book 'Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist' (2017). Raworth is professor of economics at Oxford University and is affiliated with the University of Applied Sciences in Amsterdam. The doughnut concept is now applied as a policy experiment at a local scale in cities worldwide, including Amsterdam, Barcelona, Philadelphia and Wellington (DEAL, 2024).

The concept in short

According to Raworth (2017), we currently fall short on fulfilling the basic needs of all people, while at the same time overshooting ecological boundaries. Therefore we need economies that enable all people to live above social minima and do not overshoot planetary boundaries. This leads to 'outer' ecological boundaries and 'inner' social boundaries, depicted as a doughnut.

Raworth (2017) sees the economy as consisting of households, the state and the market, but also gives an important role in the economy to the commons, which are shared and community-governed resources such as land or websites. The economy is regarded as 'embedded in the Earth', since everything that is produced depends on energy and material inputs (Wahlund & Hansen, 2022). Reintroducing the planet into our understanding of the economy logically leads to the question *"how big the global economy's throughflow of matter and energy [can] be in relation to the biosphere before it disrupts the very planetary life-support systems on which our well-being depends"* (2017:76).

The Doughnut Economy is sometimes criticised as remaining rather abstract, with only a limited number of concrete policy proposals (e.g., Wahlund & Hansen, 2022). It is also argued that further development of the concept *"should aim to capture the interconnectedness between the socioeconomic and natural systems while differentiating between the need to fulfil basic human necessities and the urgent need for sufficiency"* (Dragicevic, 2024).

3.1.5 Degrowth

'Degrowth' is an alternative economic concept that has gained much attention in the public debate in recent years. Degrowth focuses on environmental and societal welfare, to be reached by a decrease of consumption. Its proponents often present it as the key alternative to, in their eyes, the failing concept of 'green growth' (e.g., Kallis, 2011; Chertkovskaya, 2019; Hickel, 2020). Due to its sometimes activist framing and far-reaching proposals for policy and societal change, the concept has also found many opponents (e.g., Van den Bergh, 2011; Lennaerts et al., 2021; Hazekamp, 2023).

Main actors

Academic literature in the field of degrowth has expanded rapidly in recent years. In a systematic review of literature over the period 2005 – 2020, Fitzpatrick et al. (2022) identified 1166 texts (articles, books, book chapters, and student theses) referring to degrowth, leading to a total of 530 policy proposals. Policy topics covered span a large number of areas, including e.g. food, energy and environment, global governance, finance, technology, and work. Degrowth literature has also branched out into modelling, empirical assessments, and the study of concrete implementations (Weiss et al., 2017).

Several authors on degrowth in recent years (e.g., Hickel, Kallis, d'Alisa) are working at the ICTA Institute of Environmental Sciences and Technologies at the Autonomous University of Barcelona. Since 2008, an international network of societal actors, non-governmental organisations and political parties interested in the topic has developed. Part of this network centres around websites like degrowth.info and degrowth.net. The network has further evolved around a series of international academic degrowth conferences that were organised in recent years. In 2023, there was also a Beyond Growth conference organised by the European Parliament that focused on policy applications (European Parliament, 2023). Some conclude therefore that in practice a Degrowth 'movement' has developed, that is however *"still hard to pin down because of the intangible nature of [its] networks, which exist through diverse and often informal connections, without an overarching structure of communication, coordination or cooperation."* (Barlow et al., 2022).

The concept in short

Degrowth finds its origin in 'Décroissance' (French for degrowth), a term first used in 1972 by French intellectual André Gorz who responded to the Limits to Growth report by Meadows and colleagues (Muraca, 2013). It was then popularised in the 1990s and 2000s in particular by Serge Latouche, who criticised economic development as a policy goal. In the early 2000s, 'degrowth' was used as a slogan by environmental and social policy activists in France, Italy and Spain (Lennaerts et al., 2021). In 2008, the English term entered academic journals (Kallis et al., 2015). Since then, many interpretations have been given to the concept of degrowth. Van den Bergh (2011) distinguishes at least five different interpretations in the degrowth debate: GDP degrowth; consumption degrowth; work-time degrowth; degrowth of the economy's physical size; and 'radical' degrowth, referring to a comprehensive transformation of society and its governance.

More recently, the degrowth debate seems to move from economic degrowth as a policy goal in itself (e.g. Kallis, 2011) towards putting social and environmental goals above economic growth, without explicitly aiming to reduce the GDP (e.g. Hickel, 2020). The latter could be seen as 'a-growth' (van den Bergh, 2011), being indifferent on whether the economy grows or not, and is now sometimes also labelled as 'Post Growth' (Schenderling, 2022).

Degrowth has been criticised in the public debate as implying a policy steering towards the reduction of economic and GDP growth, leading to less autonomy for citizens (Hasekamp, 2023, 26 June) and to less possibilities to increase material welfare in developing countries (e.g., Milanovic, 2021). Indeed, in some interpretations, degrowth will *"inevitably entail a smaller – and qualitatively different – economy"* (Kallis, 2011). However, more recent interpretations of degrowth emphasise that economic degrowth is only one possible – but not a necessary – outcome of actual policy changes proposed under degrowth. It would be a potential side-effect rather than a goal in itself: *"degrowth is not about reducing GDP. GDP is not a dial we can turn. Of course, slowing down unnecessary production and decommodifying public services is likely to cause GDP to grow more slowly, or stop growing, or even decline. And if so, that is OK."* (Hickel, 2020; p. 30).

It is also stressed by Hickel et al. (2022) that the concept of degrowth should apply in particular to richer economies: *"[w]ealthy economies should abandon growth of gross domestic product (GDP) as a goal, scale down destructive and unnecessary forms of production to reduce energy and material use, and focus economic activity around securing human needs and well-being."* Hence, in this interpretation a *selective* degrowth of specific economic activities is suggested; this is supposed to lead both to reduced energy and material use, and to increased human well-being (sometimes also referred to as 'happiness' or 'a good life').

3.1.6 The Great Mindshift

'The Great Mindshift' is an alternative economic concept that strongly builds on transition theory thinking for its proposed change towards a more sustainable society. An essential role for bringing about systemic change is given in this concept to businesses and citizens as innovators on a niche level in the economy. With their innovative mindsets and actions, they can be important seeds for change.

Main actors

'The Great Mindshift' is a book by Maja Göpel (2016), former director of a German environmental consultancy. It brings together different lines of transition (sometimes also called transformation) research that are driven by respectively social scientists, natural scientists and political economists. Prominent authors in the field frequently quoted by Göpel are for instance Dutch scientists John Grin, Jan Rotmans, Frank Geels and Johan Schot (e.g., Geels & Schot, 2010; Grin et al., 2010), but also international thinkers from earlier decades like Donella Meadows (1999), Thomas Kuhn (1962) and Karl Polanyi (1957). Important institutions behind transformation research mentioned by Göpel include the European Sustainability Transitions Research Network (STRN), founded in 2005 (now Sustainability Transitions Research Network), the German Advisory Council on Global Change (WBGU) and the Stockholm Resilience Centre (Göpel, 2016).

The concept in short

A 'Great Mindshift' is seen by Göpel as a basis for a successful transformation. This is defined as *"a new set of values, institutions, laws and symbols with which people imagine their social whole"*. In this way, the Great Mindshift aims at aligning environmental ecosystem sustainability with people's needs for social relations, engagement and respect by creating *"untried beginnings from which to evolve a fundamentally new way of living"* (Göpel, 2016: 17).

Göpel builds in her book on several aspects of transformation research, in particular the 'multi-level perspective' and the 'multi-phase pattern of system change' that distinguish between a 'niche', 'regime' and landscape' level of system change and see system change evolve over time as an S-curve. Successful systemic change, in her view, can originate on several of these levels and needs to be supported by all levels to be successful, but a key role in change is often performed by innovators (either businesses or citizens) on the niche level, where with their innovative ideas and actions, they can sow the seeds for change. She furthermore stresses the need for fundamental economic change: *"the most critical aspect for turning the wheel toward fulfilling the SDGs is changing the economic paradigm…"*, as this *"informed the creation of the practices, norms, laws, rules, business and market structures, and technologies that delivered unsustainable development in the first place"* (Göpel, 2016: 3). In her view, this needs to be done, in part, by adopting a broader framework to measure welfare, as in the Broader Welfare concept.

3.1.7 Buen vivir

Buen Vivir is a 'Southern' alternative economic concept that originated in Latin America and has found much attention there, but also in other parts of the world. It has been applied in governmental policies in Ecuador and Bolivia. It focuses on a 'good (enough) life', for which economic growth is not or limitedly relevant, and conceptualises humans and their communities as an integral part of nature.

Main Actors

Buen Vivir is rooted in the worldviews of the Kichwa and Aymara indigenous communities from Ecuador, Bolivia and Peru, and it is related to outlooks of various other indigenous people's way of living in South-America (Acosta & Martinez Abarca, 2018). It has gained attention in national policymaking in particular with its impact on the Ecuadorian and Bolivian constitution. Work by Eduardo Gudynas (2011), an Uruguayan environmental scholar, and Alberto Acosta (2018), an Ecuadorian economist and politician, have contributed to further international attention for Buen Vivir.

The concept in short

The concept started with the post-development scholars that criticised development economics for imposing a Western dominated view to other parts of the world (Latouche, 2009; Dearden, 2014). This includes 'sustainable development', which critical scholars regard an oxymoron (Kothari et al., 2014). The post-development movement in the beginning of the 21st century, the concept of 'Buen Vivir' gained much attention (Acosta & Martinez Abarca, 2018; Villalba, 2013): *"after decades in which neither state-driven industrialisation nor neoliberal market-driven policies have been able to resolve the problems of poverty and inequality, a new post-neoliberal period seems to be opening up in some Latin American countries"* (Villalba, 2013:1428).

Buen vivir is a concept that rethinks and criticises western development thinking altogether (Van Norren, 2020). Its philosophy is *good* living (Spanish '*buen* vivir') *"based on living in harmony with (and not at the cost of) others or nature and in balance between spiritual and material wealth"* (Van Norren, 2020). Its central features include a biocentric view on nature, a focus on 'living well' instead of 'living better', recognition of the significance of communities, a call for pluriform approaches (instead of one, Western-set agenda) and an acknowledgement of spirituality.

3.2 Selected Dutch alternative economic concepts

3.2.1 Broad Welfare NL (‘Brede Welvaart’)

Use of the term ‘Broad Welfare’ in the Netherlands dates from the 1990’s, when it was first mentioned by the Social Economic Council SER (SER, 2021). The central idea of the Broad Welfare NL concept is that ‘welfare’ should be assessed with more than only economic indicators. In recent years, the concept has found its way into the Dutch national governmental policy process, as evidenced by the broad welfare monitor that was developed by Statistics Netherlands (Centraal Bureau voor de Statistiek) in accordance with guidelines by the United Nations Economic Commission on Europe (UNECE, 2014). The concept is worked out in practice in particular as a ‘broad welfare monitor’ encompassing a dashboard of indicators to measure Broad Welfare.

Main actors

The main actors behind the ‘broad welfare monitor’ in the Netherlands are the Dutch statistical office (CBS) and the national policy assessment agencies. They are asked yearly by the Dutch parliament to evaluate the national budget based on several non-economic indicators. They are also asked by Government to develop the monitor into a forward planning policy instrument. Results of the monitor have also been integrated into the Dutch national budget report (Dutch Government, 2023). Academic and private actors furthermore developed the concept of broad welfare into an aggregate indicator (Universiteit Utrecht, 2023). Currently, research by the Dutch governmental policy assessment agencies and TNO is under way on how to expand the evaluative monitor into a forward looking policy planning instrument (CPB, 2022; Mulder et al., 2024).

The concept in short

The ‘Broad Welfare Monitor’, officially ‘Monitor of Well-being and the Sustainable Development Goals’ (MWS), is a measuring instrument developed in the Netherlands. It is based upon the notion that welfare encompasses not only economic prosperity, but also environmental and social aspects. The monitor describes the well-being of the population living in the Netherlands today (‘here and now’), the impact of their present level of well-being on future generations in the Netherlands (‘later’) and on people living in other countries (‘elsewhere’) (Figure B.1).

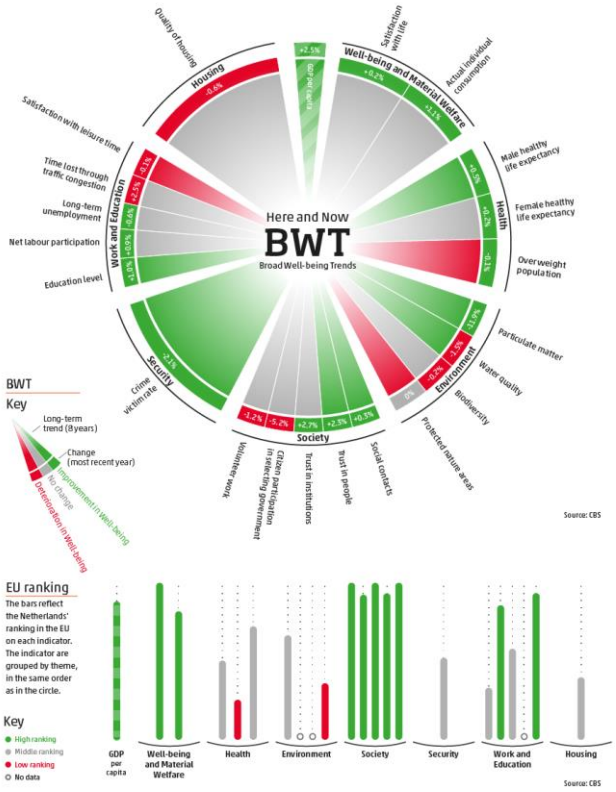

Figure 3.2: CBS Monitor 'Well-being and the Sustainable Development Goals'. Indicators shown are for well-being 'here and now' in 2023. Similar indicator wheels are provided for 'later' and 'elsewhere' (CBS, 2023)

3.2.2 Green Growth NL ('Groene groei')

A Dutch contribution to the international Green Growth concept was provided by Professor Barbara Baarsma with the publication 'Groene groei – over de (on)zin van economische groei ('Green growth – about (non)sense of economic growth') (Baarsma, 2022). In the publication, the international concept of 'green growth' is taken as a starting point and modified for proposed application in the Netherlands. More recently, other Dutch authors argue again in support of Green Growth in the Netherlands (e.g. Swets & Ederveen, 2023). Green growth has been an important framework in Dutch economic policy thinking since many years (e.g. Dutch Government, 2014). It is now also used in the name of the ministry 'Climate and Green Growth' of the new Dutch government installed in 2024.

Main actors

Barbara Baarsma is a Professor of Applied Economics at the University of Amsterdam and chair of the Bank Council of the Dutch National Bank DNB. Currently she works as a chief economist at PwC.

The concept in short

In her book, Baarsma argues that if we want future generations in the Netherlands to live on the same welfare level as current generations, an economic growth level of about 3% per year is necessary to finance, amongst others, the costs of an ageing population and a more equal welfare distribution on a national level. She discusses how such growth could be assured within ecological boundaries and while providing equal opportunities to all.

3.2.3 Postgrowth NL (‘Postgroei’)

The book ‘Postgroei – Er is leven na de groei’ (‘Postgrowth – There is life after growth’) was published in 2022 and claims to provide a *“substantiated, attainable and broadly supported plan”* for making the Netherlands *“happier, more just and more sustainable”*. The concept is presented as ‘very close’ to the international degrowth literature, with a main difference in communication: *“[w]here degrowth is more straight forward, Postgrowth acknowledges that, while in the future we will consume less in a material sense, this can go hand in hand with more welfare, leisure time, happiness, community and democracy”* (Schenderling et al., 2022: 19).

Related concept: Platform Sustainable and Solidary Economy
In 2023, the Dutch ‘Platform Sustainable and Solidary Economy’ (‘Platform Duurzame en Solidaire Economie’), characterising itself as a *“thinktank that criticizes the existing neoliberal vision on welfare”*, published a manifesto for change, which consisted of points that to a large extent coincide with Postgrowth, therefore the ideas of the Platform are not discussed separately here.

Main actors

Paul Schenderling is an economist working in consultancy. He wrote ‘Postgrowth’ together with a writers’ collective consisting of twelve policy makers and experts from eleven different political parties. He also co-founded a research and advice centre that disseminates the ideas around Postgrowth (Centrum onderzoek en advies brede welvaart, 2023).

The concept in short

Postgrowth is presented as a *“plan for a happier, more just and more sustainable society. A substantiated, achievable and publicly supported plan that is justified by the enormous urgency to make a policy switch at last”* (Schenderling, 2022:19). The central measure suggested in Postgrowth is a ‘fair consumption tax’, defined in the book as a progressive tax on CO2 and materials consumption, together with a reduction of taxes on labour (2022: 38). This measure includes an absolute cap on per capita consumption and, together with a broad package of complementary measures in various sectors, this concept proposes that this will result in a change in the ‘intrinsic values’ of citizens and companies. The book first discusses in detail the central measure and then specific supporting measures in the fields of labour, pensions, inequality, agriculture, energy and mobility and health care.

3.2.4 Purpose Economy NL (‘Betekeniseconomie’)

The Purpose Economy aims to provide a view of a different economy that connects change of norms and values within companies and by individuals with changes on a macro level in the economy and society.

Main actors

The concept of the Purpose Economy is developed by Kees Klomp, former Professor of practice in ‘Purpose Economy’ at the Rotterdam University of Applied Sciences. He teaches and researches on this topic and has published the book ‘Betekeniseconomie – de waarde van verweven leven’ [Purpose Economy – The Value of Interconnected Living] (2022).

He is also founder of the THRIVE institute, a think-tank to help organisations to *"maximise their impact"* and contribute to *"a system in which everybody can flourish"* (Thrive Institute, 2023).

Related concept: Transition theory
The purpose economy places at its core the change of individual norms and values, and in particular the change of individual norms and values of entrepreneurs. 'Frontrunners' in business will have to engage 'followers'. When the number of followers has become large enough, finally 'laggards' will also be inspired to change. A similar theory of change is advocated by e.g. Jan Rotmans' 'Transition theory'. This theory does not explicitly aim for economic change, but rather sees societal and structural economic change as a result of bottom-up change starting from frontrunners (Rotmans, 2014).

The concept in short

The Purpose Economy, according to its author, tries to address five interlinked crises: ecological, social, economic, individual and existential crisis. It is proposed as a successor of our current knowledge economy and is *"based on the virtues social participation, engagement and solidarity' that lead to value creation by business"* (Klomp, 2022: 53). It should also be regarded as *"a cultural evolution of the relationship between mankind and nature to a constructive, mutual relationship"* (2022: 55) and as connecting *"collective purpose"* and *"individual meaning"* (2022: 59-62).

The Purpose Economy is built on three pillars: a 'meta-economic' view that sees the economy embedded in a larger political and socio-cultural context; a 'post economic' view in which ecology rather than economy determines our view on society; and a 'deep' perspective that envisages development of eco-centric views on life: *"[t]he more we acknowledge life as a mutually dependent, complex and dynamic network of relations, the higher the chances of [developing] a more inclusive and constructive behaviour will be"* (2022: 75). In practice, the Purpose Economy pays much attention to change within individual businesses towards more sustainable, value based business models based on a 'changemaker canvas' developed by Klomp to guide businesses in their process of change.

4 Taxonomy assessment

In this chapter, the alternative economic concepts are assessed based on the key indicators discussed in section 2.4. In sections 4.1 to 4.5, the key focus of the concepts, their view on the role of GDP, the need for redistribution, the role of technology, and the need for change of behaviour, norms, and values are discussed. The comparisons made in the sections are based upon the fiches of each individual concept that are presented in Appendix A. Since the Dutch concepts are in many respects related to the international concepts, section 4.6 focuses on main similarities and differences between the international and the Dutch concepts (see Appendix b). Finally, based on this chapter's assessment a taxonomy of concepts is presented in section 4.7.

4.1 Key focus of concept

Table 4.1 presents the key focus of each of the international concepts as discussed in more detail in Appendix A.

Table 4.1: Key focus of the alternative economic concepts

Key focus	
Broader Welfare	Better and broader measurement of welfare than GDP alone to enable policymakers to prioritise policies based upon a broad set of economic and non-economic indicators.
Green Growth	Sustainable economic growth: economic growth that leads to increased societal welfare and individual wellbeing, while the natural environment is preserved.
Mission Economy	Solving societal problems with 'Moonshot Missions' aiming at a more just and sustainable society.
Doughnut Economy	Providing a way to meet basic needs for all, while not overshooting planetary boundaries.
Degrowth	Decreasing energy and materials consumption and increasing wellbeing, which is seen as broader than material and financial prosperity alone.
The Great Mindshift	Change of norms and values towards a new paradigm that leads to aligning environmental ecosystem sustainability with people's needs for social relations, engagement and respect.
Buen Vivir	Environmental and social wellbeing by a self-sustaining and life-nurturing economy without economic growth as focal point.

Comparing the key focal points of the concepts, it is clear that all analysed concepts focus on a positive contribution to the environment. Additionally, all concepts aim at having social impact: from societal wellbeing in general (Green Growth) to a social foundation on specific pillars (Doughnut Economics) to a different way of social interaction(the Great Mindshift).

Next to environmental and social aims, what stands out is that Green Growth is the only concept that also has economic growth as a key aim. Mission Economy, Doughnut Economics, Degrowth, the Great Mindshift, and Buen Vivir do not have economic prosperity as key aim (although Mission Economics sees it as pathway to reaching sustainability targets). Finally, Broader Welfare is not specific on its aims, but by including economic, social, and environmental indicators in the dashboards, it allows for being a policymaking tool for the aims prioritised by policymakers.

Moreover it becomes clear that some concepts vary in their view on environmental impact: Doughnut Economics operationalises environmental impact on the nine planetary boundaries. Degrowth distinguishes between energy and material use, which should both be reduced. Buen Vivir sees environmental goals as self-sustaining and life-nurturing. The aim of the Great Mindshift is a new paradigm, which in turn enhances environmental goals. Due to the different notions of environmental sustainability it is not always clear if the concepts aim at the same final impacts when referring to environmental sustainability. The same holds for social impact.

4.2 Role of GDP

As revealed by the assessment of the individual concepts in Appendix A, the role of GDP (or GDP growth: economic growth) is a key distinctive feature of the concepts. Table 4.2 summarises the different views of the concepts.

Table 4.2: Role of GDP of the alternative economic concepts

Role of GDP	
Broader Welfare	Welfare and wellbeing are seen as broader than economic welfare and specifically GDP alone. Dashboards offer other indicators next to economic measures among which GDP, some of which capture subjective wellbeing.
Green Growth	Inclusion of externalities is a main aim, GDP growth is not questioned and generally seen as important for achieving environmental goals.
Mission Economy	Economic growth can go hand in hand with social and environmental goals and serves to maintain sustainable governmental budgets despite higher public expenditures.
Doughnut Economy	GDP is subordinate to social and ecological goals. Doughnut Economics is 'agnostic' towards growth: it strives for 'thriving' economies and wellbeing, whether GDP is increasing, decreasing or being stable. A limit to growth might be economically plausible.
Degrowth	More recent interpretations see economic goals as subordinate to social and environmental goals. Hence, they tend towards an agnostic view on economic growth ('a-growth')
The Great Mindshift	GDP and economic welfare indicators should not dominate social and environmental development. A dashboard of both monetary and other measures is proposed.
Buen Vivir	GDP or economic growth do not play a (big) role: economic aims should be subordinate to environmental and social welfare. The 'Northern' notion of development in general is absent or even rejected all together, in terms of economic but also broader welfare.

For the role of GDP we see three different groups of concepts. Firstly 'GDP-dominant' concepts are those to which GDP growth is generally an important focus point (Green Growth) or at least an important pathway for achieving goals (Mission Economy). Both concepts plea for an alternative way to obtain economic growth. Mission Economy holds that societal missions should determine the direction of innovation which enhances economic growth. Green Growth argues that GDP should become 'greener' by producing differently and that negative environmental externalities should be internalised in prices.

The second group can be seen as 'GDP-neutral'. It consists of one concept: Broader Welfare. Broader Welfare dashboards claim to be overall policy neutral and offer a collection non-economic metrics next to economic metrics like GDP.

The third group considers GDP growth as subordinate to other goals. The group consists of Doughnut Economics, Degrowth, the Great Mindshift, and Buen Vivir. Even though Doughnut Economics seems neutral at first because it claims to be 'agnostic' towards growth, it is explicitly argued that prosperity does not depend on economic growth. This view is theoretically underpinned by presenting economic activity as an S-curve that in the end has to slow down, rather than to remain constant or increase. This is contrary to the exponential model underlying the current economic paradigm, which hypothesises economic growth as continuous into the future, and thus economic activity becoming exponentially larger. Moreover, Doughnut Economics rejects the Kuznets Curve and Environmental Kuznets Curve, which theorise that economic growth will eventually solve inequality and environmental problems.

Another observation can be made on the different decoupling strategies proposed by the concepts. Green Growth argues for absolute decoupling of natural capital use and economic activity, by means of technological innovation. Doughnut Economics, which sees GDP as subordinate to other goals, goes one step further. While in the Global South relative decoupling would be adequate, the Global North should achieve 'sufficient absolute decoupling'. That means that absolute decoupling of resource use and economic activity needs to be done to an extent that is sufficient for an emission decrease, that also takes into account (redistribution) needs of the Global South.

Next to Doughnut Economics, Great Mindshift, Degrowth, and Buen Vivir all see GDP as subordinate to other goals. The Great Mindshift argues against the dominance of economic indicators over social and environmental development aspects. Nevertheless a dashboard containing monetary and other measures of progress is suggested, which is comparable to the broad welfare approach. Degrowth is originally conceptualised as being directed at steering towards negative economic growth. While in some interpretations this goal is still pursued, in others negative GDP growth is not seen as a policy goal in itself. Rather, more recent interpretations of Degrowth (e.g. Hickel, 2022) seem to tend towards an agnostic attitude towards economic growth ('a-growth').

Economic growth does not play a big role in Buen Vivir at all. While some Buen Vivir policy practices saw initial economic growth needed as a precondition to later scale down extraction, this approach is not seen as coherent with the core values of Buen Vivir. From the 'Southern' or development perspective of Buen Vivir, economic growth is accompanied by western capitalist dominance, hence undesirable. Degrowth holds a similar perspective on the Northern interpretation of development and pleas for 'decolonisation of the global South'. Some Buen Vivir traditions even reject the very notion of development or progress.

All in all, Green Growth and Mission Economy could be seen as compatible with the current economic growth-focused paradigm. On the other hand, the 'GDP subordinate'-group questions this focus on governance directed at economic growth. These concepts would therefore not be compatible with the current economic paradigm and claim the need for a radical paradigm shift: one for which societal and environmental goals form the foundation. Economic growth would only be a side-effect (in Doughnut Economy, Great Mindshift, and recent Degrowth interpretations) or an undesired outcome (in some Degrowth interpretations and Buen Vivir).

4.3 Stance on redistribution

The role of redistribution in the different concepts is assessed by answering the following questions: next to pursuing environmental goals, does the concept aim for the redistribution of income and wealth? If so, how central is this for the concept? This analysis is based on the findings for each concepts as presented in the 'Redistribution'-paragraphs in Appendix A. Table 4.3 shows the stance of each concept.

Table 4.3: Redistribution in the alternative economic concepts

Views on Redistribution	
Broader Welfare	Social indicators such as equality are included in most frameworks.
Green Growth	Redistribution of capital is not an explicit aim, but some policy agendas (*"inclusive Green Growth"*) include distribution and poverty reduction.
Mission Economy	*Inclusive* growth is mentioned as a part of the concept, for which both pre-distribution (structures that lead to fairer outcomes) and redistribution (taxes and benefits) are needed.
Doughnut Economy	Redistribution of income and capital is central to the concept next to environmental goals. Without redistribution, environmental policies would continue to privilege the affluent. Emissions are skewed towards those that consume more, hence redistribution also benefits the environment.
Degrowth	Redistribution and social justice with reduced inequalities are important.
The Great Mindshift	Redistribution is not an explicit part of the concept. However it also does not seem excluded, as The Great Mindshift claims to build on the Doughnut Economy, of which redistribution is an important part.
Buen Vivir	Buen Vivir is meant to redistribute wealth on a large scale: from capitalist owners (state or markets) to local communities. A need- and solidarity-based economy is envisioned, which would mean inherent distribution according to needs.

All concepts discuss the redistribution of capital. In the most limited form, Broader Welfare and the Great Mindshift do not include it as a normative goal of the concept, but rather as part of a dashboard with indicators that would provide evidence to support the formulation of policies to steer redistribution. The Great Mindshift indirectly borrows ideas on sufficiency and needs for redistribution from Doughnut Economics. The other concepts are more explicit on redistribution: it is at the core of Mission Economy, Doughnut Economy, Degrowth, and Buen Vivir. This also applies a specific part of Green Growth agenda's, namely those of 'Inclusive Green Growth' (e.g. pursued by the World Bank).

Taking a closer look at the concepts, redistribution is conceptualised as follows: in the Green Growth concept, some degree of redistribution is expected to be achieved, as restructuring the economy will lead to growth for some sectors, and shrinkage for others. Ensuring that benefits and losses of the green growth path are more equitably distributed is a goal by itself in the sub-variation, Inclusive Green Growth. For Mission Economy, inclusivity and social justice are seen as wicked problems that need to be solved, hence redistribution is deemed as important. Next to redistribution by taxes and benefits, Mission Economy proposes the idea of 'pre-distribution': design of economic structures that inherently leads to fairer outcomes. For Doughnut Economics redistribution is key as well, namely, to have everyone reach social minima such as sufficient food and gender equality. Moreover, it is argued that without redistribution, environmental policies would continue to benefit the affluent and that a social foundation is beneficial for staying within planetary boundaries. Redistribution is also an important aspect of Degrowth, which is suggested to be organised not only via

taxation on capital, but also via taxes on resource use. Buen Vivir also calls for redistribution and moves the discussion on this topic to a global level. Not only on national scale should capital be redistributed, from capitalist owners (market or state) to the community. Also between nations, wealth should be redistributed.

Although all concepts include redistribution, and most very explicitly, the assessment reveals that the degree of redistribution that is aimed at remains vague in all concepts. What exactly is considered fair? How much income and/or wealth inequality is acceptable? The answers to these questions are essential policy outputs, but as yet, are not addressed.

4.4 Role of technological innovation

The view of the different concepts on the role of technological innovation is summarised in Table 4.4.

Table 4.4: The role of technological innovation in the alternative economic concepts

	Technological innovation
Broader Welfare	Technology has no role on itself, but is implicitly included in some indicators. With the exception of the Transitions Performance Index, technology is not central to most dashboards.
Green Growth	Technological innovation is key to Green Growth: development of green technologies will enable reaching environmental goals. Investments and policies need to be directed towards those goals.
Mission Economy	Technology or innovation at large is key to the concept. Public investments should be directed towards valuable innovation as defined in Governmental 'missions'. It is recognised that complex (environmental) goals need more than technology alone, for example regulation and behavioural change.
Doughnut Economy	Technology has a limited role, although open source innovation and digital commons ('open source approaches') are seen as policy instruments for regeneration. Technology should be distributed, rather than centralised.
Degrowth	Technology has no specific role in the concept. However, it is implied that technology should be designed and applied differently, for example it should be publicly instead of privately owned and production should rather be low-tech and labour intensive.
The Great Mindshift	The concept considers technological innovation as potentially relevant for change, but it is suggested that technology choices should be based upon alignment between humans and nature. Information technology in particular, is seen as a pathway to decentralised wellbeing with limited resource use.
Buen Vivir	The concept is critical towards technological development and western knowledge generation in general. Technology-driven accumulation is considered to be the driver of the dominant economic paradigm, which leads to environmental deterioration. Knowledge should be 'decolonised', room should be given to local knowledge and technology.

Some concepts see technological innovation as the main solution to environmental problems. Green Growth hypothesises that technological progress can put environmental goals within reach. Mission Economy can also be read as a handbook for innovation policy, advocating in particular that technological innovation is the driver of social goals. At the same time, Mission Economy states that reaching complex goals needs more than technology alone. Broader Welfare is neutral about technology. Technology can only be identified as underlying factor of some welfare measures in most dashboards.

Compared to Green Growth and Mission Economy, technological innovation is less central to Doughnut Economics, Degrowth, the Great Mindshift and Buen Vivir. Doughnut Economics, Degrowth and the Great Mindshift comment on the ownership of technology: it should be distributed rather than centralised (Doughnut Economics), it should be publicly instead of privately owned (Degrowth), and the portfolio of technologies to choose from should be increased by breaking up path dependencies of current technologies (the Great Mindshift). For the Great Mindshift, information technology has a special role, as it could contribute to wellbeing with relatively little material and energy.

Buen Vivir is critical about technology. It argues that the technology-driven accumulation of goods, which is encouraged by the dominant, Western economic paradigm, accelerates the destruction of nature, therefore, all knowledge, including technology, should be *"decolonised"*. This gives room for local knowledge and technologies that are currently being pushed out by Western knowledge and technologies that have near-global hegemony. Instead, Buen Vivir calls for a pluriform approach, by using technological inventions from all world cultures.

4.5 Change of norms and values

Table 4.5 summarises the views of each concept on change of norms and values. These are seen as different from behavioural changes. For example, where Green Growth sees current preferences of consumers as a given, it nevertheless can include instruments to affect behaviour (but not deeper norms and values underlying to the preferences of consumers).

Table 4.5: Change of norms and values in the alternative economic concepts

Assumptions about change of norms and values	
Broader Welfare	Although individual behaviour, norms and values are part of some wellbeing metrics, the 'policy-neutral' frameworks do not propose any suggestions to change these.
Green Growth	Current preferences, norms and values are taken as a given. However, in some cases, policies are suggested in order to affect demand (behaviour).
Mission Economy	Current preferences, norms and values are taken as a given, behavioural change is not central to the concept. However, behaviour and citizen engagement are mentioned as potentially important for achieving societal missions.
Doughnut Economy	Behavioural change and change of norms and values are central to Raworth's (2017) work. Humans are seen as boundedly rational decision-makers with fluid rather than fixed preferences. Policies that address certain preferences and as a consequence evoke sustainable behaviour. 'Nurturing human nature' is a way to achieve change.
Degrowth	Behavioural change and change of norms and values are an integral part of the Degrowth policy portfolio. Norms and values should become eco-centered, reflected by behaviour focused on 'giving back' and on being an integral part to nature.
The Great Mindshift	A 'Second Enlightenment' should lead to different ideas, norms, principles and values that encompass a de-commodified view on human needs, nature, and money. A change in behaviour, norms and values is thus central to the concept.
Buen Vivir	Norms and values should become eco-centered. The current Northern paradigm of growth needs to be overcome. Change of behaviour, norms and values will be changed by bottom-up community action.

The assessment of the different alternative economic concepts suggests that their views towards change in behaviour, norms and values, or 'societal preferences' are rather the opposite of their position towards technological change. Concepts that see technological innovation as key for reaching environmental goals pay relatively limited attention to societal preferences as a driving force. Green Growth and Mission Economy see current preferences as a given, although Mission Economy does mention that behavioural change is needed to solve complex societal issues. Green Growth brings forward behavioural intervention policies, but without altering underlying norms and values. For Mission Economy it is unclear whether a change in underlying norms and values is deemed necessary, although it is mentioned to be important for achieving societal aims.

On the other hand, Doughnut Economics, Degrowth, the Great Mindshift and Buen Vivir see a change in societal preferences as the main solution. Doughnut Economics elaborately argues this by presenting an alternative view on humankind as a whole: preferences of humans are considered as not static, but rather fluid and dependent on role and context. Intrinsic values and reciprocity between citizens can mobilise behavioural change. Degrowth proponents argue that norms and values should become eco-centric: nature should be seen as an ecosystem, of which humans are an integral part. Buen Vivir holds a similar view, as it arises from cultures in which individuals see each other as part of nature and community, which inherently also holds values of sustainability and solidarity.

Most explicitly, a 'mind shift' is the very starting point of the Great Mindshift-concept. In this concept, a 'Second Enlightenment' should provide different ideas, norms, principles and values that support another view on nature and human needs. Pioneers have a crucial role: they can question the status quo by demonstrating different behaviour.

4.6 Dutch concepts

Four Dutch alternative economic concepts have been assessed in detail (See Appendix b). Here, main differences with their international counterparts are summarised (Table 4.6).

Table 4.6: Main differences of Dutch Alternative Economic Concepts from their international counterparts regarding taxonomy indicators

	Broad Welfare NL	Green Growth NL	Postgrowth NL	Purpose Economy NL
Most related to	Broader Welfare	Green Growth	Degrowth	Great Mindshift
Main differences	Relatively far in its policy implementation	A specific level of at least 3% economic growth is mentioned	Progressive tax on CO_2 and materials consumption	Focus on bottom up innovation by businesses building on value change
	Regional dashboard developed	Governmental funds resulting from economic growth should be used for specific policy reforms in the Netherlands	Specific accompanying measures for several Dutch policy sectors	'Changemaker Canvas' for individual firms to change their mission, strategy and operation

	Broad Welfare NL	Green Growth NL	Postgrowth NL	Purpose Economy NL
	Research ongoing to turn the dashboard into a forward looking instrument	The possibility of full decoupling of economic growth and natural capital is not scientifically proven, therefore according to Baarsma, it is better to speak of 'greener growth'	Eight 'intrinsic values' as a final impact	

Broad Welfare
The Broad Welfare concept as developed in the Netherlands fits into the range of Broader Welfare concepts as developed for instance in the Wellbeing Economies Alliance (WEALL, 2023) and in countries where similar dashboards are used such as in Australia, Germany and France. Its indicators and main dashboards (now, later, elsewhere) are internationally agreed in the UNECE commission (2014). In its key focus as a monitoring instrument, and in its aim at neutrality towards the use of it for policymaking it therefore closely resembles developments in other countries.

However, comparing the concepts with other countries, it seems that the Netherlands is relatively far in the process of its implementation into policies, although contrary to other countries (New Zealand, Wales) a direct link with policies is avoided. An annual discussion of the evaluation results of the dashboard in parliament is already mandatory, and the dashboard results have also been used in the latest Dutch governmental budget (2023). Furthermore, a regional broad welfare indicator dashboard has been developed and is currently being implemented in practice. Research towards turning the concept into a forward looking instrument supporting future policy design and building on societal cost-benefit analysis is ongoing.

Green growth
Green growth in the Netherlands as described by Baarsma (2022) generally follows the international green growth concept in its support for economic growth. More specifically, it is stated that a level of 3% economic growth would be needed to live in the future at the same level of welfare as now. According to Baarsma, by using additional governmental budget made available through GDP growth for reforming healthcare, education, the labour market, the pension system and the housing market in the Netherlands in particular, the happiness of people in the Netherlands could be stimulated. People could be empowered to direct their own lives – individual freedom to choose is seen as a key factor for life happiness.

Market based instruments and technological innovation in Baarsma's view could stimulate the decoupling of economic growth from the depletion of natural capital. However, Baarsma outlines that there is no scientific consensus about whether or not the Environmental Kuznets Curve (diminishing environmental impacts with higher incomes) applies. Therefore, it would be more correct in her view to speak of 'greener growth' than of 'green growth'.

Post Growth
The Dutch concept of 'Post Growth', as described by Schenderling et al. (2022), incorporates many ideas from the international concept of Degrowth, but prefers to use the term Post Growth for communication reasons. The concept focuses on a progressive tax on CO2 and materials consumption as a central policy measure, but also proposes many specific accompanying measures in different policy sectors across the Netherlands. Its aim is to achieve societal change towards eight 'intrinsic values': improvement of the climate,

biodiversity and other natural values; more free time and less stress; new forms of cooperation and cooperatives; welfare and earning capacity for the long term; more social equity; a stable governmental budget; more life security; and better health and prevention of diseases.

Purpose Economy
The purpose economy, as developed by Kees Klomp (2022), is an alternative economic concept that builds on 'a meta-economic view', a 'post economic view' and a 'deep ecocentric perspective'. With its focus on bottom up innovation by businesses building on value change, the concepts holds parallels in particular with the Great Mindshift as an international alternative economic concept, as well as supporting the 'broad welfare' dashboard approach as a basis for measurement. The concept develops a 'changemaker canvas' for firms that helps change the mission, strategy and operation of individual companies.

4.7 Discussion: Taxonomy of alternative economic concepts

The key features presented above suggest that the concepts that were examined can be grouped into three main families. In addition to their difference in positions towards GDP growth, the families can be differentiated based on their views towards norms and values change (Figure 4.1).

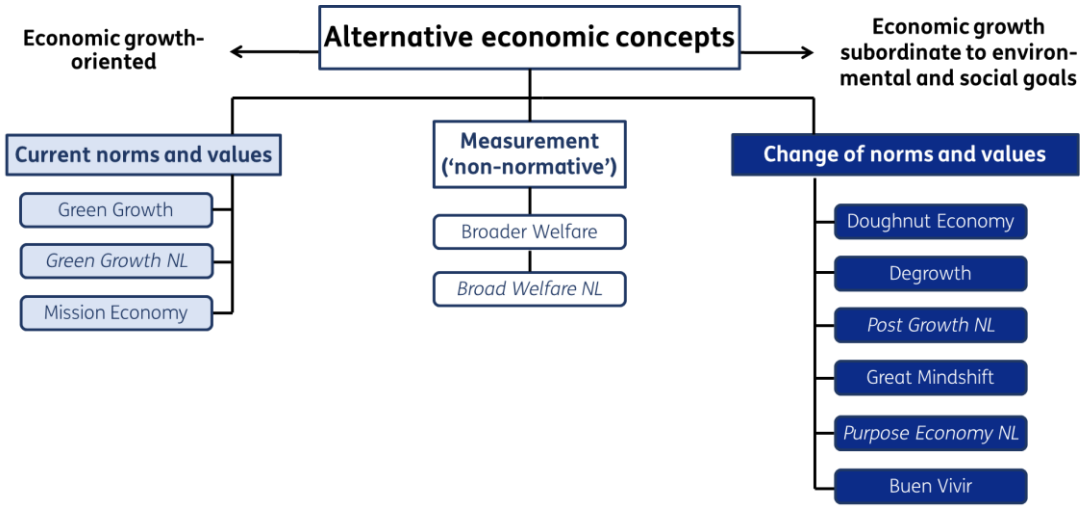

Figure 4.1: A taxonomy of alternative economic concepts.

In Figure 4.1, the following families of alternative economic concepts are specified:

- A **Measurement**-family that does not take a specific position towards the need for economic growth or not, nor a position on redistribution, technological innovation or norms and values change. Rather, it aims to be non-normative and to accommodate for different political views. This family consists of the members Broader Welfare and Broad Welfare NL, which see composite indicators or indicator dashboards as a key supporting instrument to guide policymaking, without intending to take a normative view on any of these policies.

- A **Current Norms and Values**-family that sees economic growth as the key indicator to guide policy makers. While behavioural change in this family is sometimes pursued, it departs from current preferences of consumers and sees no need for a fundamental change of current norms and values. Instead, emphasis is placed on technological innovation to enable the changes in behaviour needed to achieve environmental and social goals. Redistribution is sometimes pursued, e.g. in 'Inclusive Green Growth', but is generally not a key aim. This family consists of three main members: Green Growth, Green Growth NL and Mission Economy.

- A **Norms and Values Change**-family that considers the change of the current norms and values towards more ecocentric views as crucial for successful societal change. In this family, economic growth is seen as subordinate to social and environmental goals, with either an 'a-growth' or a 'degrowth' attitude, or even considering economic growth as a 'Northern' paradigm that is not relevant at all. Furthermore, redistribution is important in this family, while technological change is generally also pursued, often with a stress placed on open access and common ownership, however this is not a dominant feature. This family consists of six main members: Doughnut Economy, Degrowth, Post Growth NL, Great Mindshift and Buen Vivir.

The three families of alternative economic concepts will be further explored in Chapter 5.

5 Theory of change assessment

Having mapped the alternative concepts in a taxonomy in chapter 4, this chapter takes a closer look into the final impacts that the concepts aim to achieve and the pathways to get there, i.e. into the policy impact chain of each concept. By analysing the literature available for each concept and attributing statements made by each concept to each of the steps in the policy impact chain (inputs – policies – outputs – outcomes – impacts, see section 2.5), we deconstruct each concept's narrative into a hypothetical theory of change. This analysis also provides an assessment of the underlying assumptions, the intended scaling mechanism from first start to general application on a national and international level, and an analysis of potential risks, drawbacks and side-effects.

For the discussion of the results of this assessment, we use the division between the three main families of international alternative economic concepts (Broader Welfare measurement – current norms and values – norms and values change) made in Chapter 4. The chapter is structured into six sections. In section 5.1 we look into the policy impact chains from inputs to impacts.[2] In section 5.2 we present the often implicit, underlying assumptions on how to progress from one step in the policy impact chain to the next. In sections 5.3 and 5.4, we study the assumed scaling from initial action towards full implementation on a national and international level, as well as the potential risks, drawbacks and side-effects of the concepts. In section 5.5 we discuss the degree of adaptation of each concept to specific Dutch circumstances. Finally, in section 5.6 we discuss the potential promises and pitfalls of implementation of the concepts in the Netherlands, based on the theory of change assessment.

5.1 Policy impact chains

Table 5.1 summarises main findings regarding the policy impact chains of each of the international alternative economic concepts assessed in Appendix A.

Measurement family
The policy impact chain of the Measurement family (Broader Welfare) is incomplete by design. A broad dashboard of indicators is provided as an **input** for policymaking, and is assumed to be policy neutral. Based on the dashboard indicator values that are measured, policy makers have to decide what policies they want to pursue in order to reach (their interpretation of) wellbeing and broader welfare, and how the outcomes of a given policy package are evaluated and communicated. **Policies**, **outputs**, **outcomes** or **impacts** are generally not specified (although the Wellbeing dashboards of e.g. New Zealand and Wales provide some policy guidance).

Current Norms and Values family
The policy impact chain of the Current Norms and Values family (Green Growth and Mission Economy) is found to be relatively complete, with **inputs**, policies, **outputs** and outcomes more or less identifiable. The intended policy **outcomes** and final **impacts** of the two

[2] For an explanation of the policy impact chain see chapter 2. For more details per concept see Appendices A and B.

concepts in this group are comparable, with (mainly technological) innovation leading to a decoupling of economic activity from the depletion of natural capital. However, their main **policies** and policy routes are quite different: Green Growth in general sees markets as the key driver for change (with governments providing indirect support for change by stimulating technological innovation and internalising externalities in market prices), and Mission Economy governments (who take direct decisions on desired directions of technological innovation). Also, there is an empirical gap between absolute decoupling of economic activity from natural capital use as a policy and as an outcome: it is unclear whether the policy targets on e.g. resource use will actually lead to absolute decoupling.

Change of Norms and Values family

In the Change of Norms and Values family, policy impact chains are described less explicitly, with particular policy **inputs** and **outputs** generally quite difficult to identify.
Moreover, the clarity of the policy chain in the Degrowth concept suffers from various interpretations given to it by different authors, varying from more growth indifferent, 'a-growth' and 'sufficiency' directed views, to more hardcore 'negative economic growth' as a preferred policy **outcome**. In terms of **impact**, more detailed visions of how a society with changed norms, values, and institutions would look like beyond 'human prosperity', 'a new sustainability paradigm' and 'ecocentric values' are lacking. When following Hickel's interpretation, **policies** are worked out to a specific level.

Table 5.1: Policy impact chains of assessed international alternative economic concepts

Family	Concept	Policy impact chain in short
Measurement	Broader Welfare	Concept provides as a policy input a dashboard of indicators that is meant to be for measurement only. Based on the results of the measurements of indicators, policy makers are assumed to change policies, leading to different policy outputs and outcomes. Final impact goals include (unspecified, policy dependent) wellbeing and broader welfare.
Current Norms and Values	Green Growth	Markets are key for change. Governments design market conditions to internalise environmental impacts in costs and benefits, and to incentivise (technological) innovation, but do not determine the directions of innovation directly. Inputs, outputs and outcomes in the impact chain are generally specified. The final impact goal is environmentally sustainable economic growth, by the absolute decoupling of economic activity from the use of environmental capital.
	Mission Economy	Governments have a leading role in steering the direction of innovations, in particular through investments. Inputs, outputs and outcomes are specified, a multiplier effect is expected from public investments. The final impact goal is an (unspecified) redirection of innovation and economic growth.
Change of Norms and Values	Doughnut Economy	The economy, consisting of the market, commons, households and state, is conceptualised as embedded within a double boundary of social and environmental conditions (doughnut). Regenerative and distributional policies are needed to steer change. Examples of outcomes are given (public goods, caring households, commons), but inputs and outputs are less clear. The final impact goal is 'human prosperity in a flourishing web of life'.
	Degrowth	Interpretations differ between 'a-growth' and 'strict degrowth'. For Hickel, who argues for a-growth, the suggested impact chain is a combination of financial reform, political reform, ending planned obsolescence, cutting advertising, a shift from ownership to usership, ending food waste, and scaling down ecologically destructive industries. Concrete policies and outcomes are given by way of example, inputs and outputs are less clear. Intended impacts are diverse, from individual wellbeing in robust welfare systems to decolonisation of global South and value change towards ecocentrism.

Family	Concept	Policy impact chain in short
	Great Mindshift	Systemic and individual change are supposed to happen at niche, regime or landscape levels. There are four main lines of policies: an economy of the common good, transition towns, a communing movement, and beyond growth accounting. Intended outcomes are specified while expected policy inputs and outputs remain unclear. An (unspecified) 'new sustainability paradigm' is the overall impact aimed for.
	Buen Vivir	Community-based governance is suggested, with a plural transition strategy based on indigenous and 'Southern' norms and values. Main policies are rights for nature, community-based property, economic sovereignty, and a new view on production and labour. Rights for nature are an important policy instrument. Inputs, outputs and outcomes are less clear. The final impact goal is 'a self-sustaining and life-nurturing economy without growth'.

Overall observations on the policy impact chains

When comparing the levels in the policy impact chain, the following main observations can be made:

- For most concepts, the **input** (resources for policy implementation) and policy **outcome** levels in the policy impact chains are not defined. It is generally unclear where funding or personnel for implementing proposed policies would come from and what policies would no longer be pursued in order to allow for the new policies (= input level). Neither is it clear in most cases what policy outputs are, e.g. the level of dietary change that is needed to reach system change. The only concept that focuses on the input level in the chain is Broader Welfare, which, staying neutral on the policies to be selected, provides a new set of indicators as an input to policymaking.

- On the **policy** level, the Change of Norms and Values-family provides a number of policies as examples. However, the coherence of these policies, and their potential (unintended) side effects, are hardly discussed. Generally it does not become fully clear in the concepts what the direct policy outputs are.

- Finally, on the level of final **societal impacts** aimed for, despite hinting at ideas like 'happiness', 'solidarity' or 'mentality shift towards ecocentrism', most concepts only vaguely describe what kind of societies overall are envisioned. This vagueness is more problematic for the Change of Norms and Values-family than for the Current Norms and Values-family, where current societal patterns, values and institutions are not altered and are therefore more or less extrapolated to the future.

Observations on the proposed policies

Table 5.2 focuses on the policy level of the theories of change of all concepts. It lists the main policies that are suggested by each of the concepts.

Table 5.2: Policies suggested by alternative economic concepts

Family	Concept	Policies
Measurement	Broader Welfare	None, the concept is intended to provide a neutral overview and instrument as a basis for policymaking in general.
Current Norms and Values	Green Growth	Instruments to internalise negative environmental externalities, e.g. via cap-and-trade systems, pollution taxes, standards, direct regulation and (financial) instruments to stimulate and direct (technological) innovation.
	Mission Economy	Public funding and direct regulation to realise solutions to main societal challenges ('missions') identified by governments.
Change of Norms and Values	Doughnut Economy	Regenerative and distributional justice policies such as: meeting social needs; redistribution of wealth and income; open source innovation; including unpaid household and care work in the economy; digital commons; taxing resources rather than work; citizen co-ownership of firms; and basic incomes in the global South.
	Degrowth	Financial reform (e.g. neutralising debts, state based money creation); political reform (e.g. direct democracy); ending planned obsolescence (e.g. right to repair); cutting advertising; shift from ownership to usership (e.g. cars); ending food waste; and scaling down ecologically destructive industries
	Great Mindshift	Niche and regime innovations; landscape change such as user value balance sheets; transition towns; measurements; and commons beyond GDP development.
	Buen Vivir	Political reform (e.g. self-management of local communities); ecological reform (e.g. decrease extractive production); and economic reform (e.g. support for local producers, redistribute working hours).

Comparing the policies of the concepts in this way with each other, the following observations can be made:

Within each of the concepts, there are more and less radical individual policies. Table 5.2 shows that, while some of the suggested policies in each of the concepts are rather far from present practices (e.g. self-management of communities in Buen Vivir, neutralising debts in Degrowth), others are found to be indeed very close to current policy practice in several countries (e.g. policies to reduce or end food waste, as suggested by Degrowth).

- **Key policies that can drive the change that is proposed in each concept are lacking.** In the Current Norms and Values family, a key policy outcome that is aimed at is the internalisation of negative environmental externalities into consumption prices, which in turn should lead to an absolute decoupling of economic activity from the use of natural capital. For greenhouse gases (GHG) this mechanism is already applied at large scale, take for instance the European Emission Trading System (EU ETS), where the intended emissions reduction is linked to the number of issued permits. For other dimensions of natural capital (e.g. biodiversity), similar complete impact chains that translate policy outcomes that are aimed at into exact policy instruments and execution are missing. Also, interactions and trade-offs between an absolute decoupling of various resources simultaneously are missing. The same observation holds for the Change of Norms and Values family: while changing human behaviour, norms and values towards ecocentrism

are a general aim of this family, none of the concepts in this family has specifically outlined ideas of how this change should be achieved.

- **Some proposed policies seem compatible with multiple concepts.** Hence, it is up to debate whether the implementation of the individual policies is in fact specific to the concept in which it is presented. For instance, it is reasonable to think of the implementation of cap-and-trade systems in the context of green growth as well as in the Doughnut Economy or in Degrowth. Similarly, albeit to different extent, redistribution policies are described as possible options in the Change of Norms and Values-family as well as in the Current Norms and Values-family.

5.2 Underlying assumptions

The analysis of the theory of change of the concepts also comprises an assessment of the underlying assumptions made on how societies will be moved from one step in the policy impact chain to the next. These assumptions generally remain implicit, but are crucial for understanding how the change aimed at can be implemented in practice. Table 5.3 summarises main underlying assumptions that are derived from the literature about each concept.

Table 5.3: Main underlying assumptions of alternative economic concepts

Family	Concept	Main underlying assumptions
Broader Welfare Measurement	Broader Welfare	Measurement of more indicators and presenting them as a dashboard or as a composite indicator will give better information to policy makers steering towards wellbeing and broader welfare. Policy makers will use this information and change their way of policymaking.
Current Norms and Values	Green Growth	Economic activity can grow without depleting the stock of environmental capital; (in particular technological) innovation can lead to absolute or relative decoupling of environmental impact from economic growth that keeps the economy within environmental boundaries; no fundamental changes in institutions or norms and values of citizens are needed.
	Mission Economy	Governments can change current pathways of economic growth to make them stay within environmental boundaries by defining and overseeing large-scale 'innovation missions' that will trigger appropriate market and societal responses.
Change of Norms and Values	Doughnut Economy	Distributive justice and regenerative policies will lead the economic system to stay within planetary and social boundaries, and to 'human prosperity in a flourishing web of life'.
	Degrowth	Steering towards negative economic growth (radical degrowth interpretation) or towards strict environmental and social goals ('a-growth interpretation') will lead to norms and values change and towards final impacts that include happiness, sense of meaning, solidarity and robust welfare systems.
	Great Mindshift	Bottom-up niche innovations together with regime and landscape shifts have to lead to fundamental societal change including change in norms and values.
	Buen Vivir	Indigenous 'Southern' knowledge leads local communities to live in balance with nature.

Main observations from this assessment are:

- All concepts depend to some degree on unproven assumptions regarding the functioning of the policy impact chain from one level to another (e.g. what inputs are needed to realise certain policies? What would be the concrete outputs of these policies? And how would this translate to broader policy outcomes and to final impacts?

- Gaps in the assumptions can be found in different parts of the chain for different families, e.g. for Broader Welfare the dashboard provides very concrete inputs for policymaking, but how this will lead to different policymaking and 'better' scores regarding the indicators is not elaborated. . For Green Growth there is, in particular, a lack of evidence as to whether the policies will lead to the absolute decoupling outcomes that are aimed for, and for the Change of Norms and Values family, the relationship between policies that are mentioned as examples and the impacts aimed at, including norms and value change, are unclear.

Particularly heated discussions in the public debate concern the scientific evidence for absolute decoupling in the case of Green Growth and the question how stable economies and societies can be maintained with zero or negative economic growth in the case of Degrowth (e.g. Haberl et al., 2020; Lennaerts, 2021; Milanovic, 2021). Proof for these underlying assumptions would therefore substantially contribute to underpinning the validity of the theories of change of these two concepts.

5.3 Scaling mechanisms

Change starts with one action or policy, usually on a limited scale, by one specific driver: citizens, market or government. In order to become effective, the action subsequently has to be replicated and to be implemented on larger scales. In the end, successful change needs to be implemented and effective on all levels in society, from local to national and international. How this scaling works is crucial for a successful implementation of each alternative economic concept and therefore assumptions about scaling are separately assessed. The summary of this assessment can be found in Table 5.4.

Table 5.4: Main scaling mechanisms of alternative economic concepts

Family	Concept	Main scaling mechanism
Broader Welfare Measurement	Broader Welfare	Broader Welfare dashboards are used by various governments and regional authorities as a support for policymaking and are generally assumed to be policy neutral, hence no viewpoint is taken towards the scaling of policies. In practice, a broad welfare indicator dashboard can be used by national, regional and local policy makers alike.
Current Norms and Values	Green Growth	Internalisation of externalities and stimulation of technological innovation has to occur top-down via governments. After that, markets should scale up environmentally friendly innovation by themselves.
	Mission Economy	Governments have a strong, top-down influence on the directions of innovations, as well as on enforcement. Implementation of innovation is left to the market, with close monitoring by governments.

Family	Concept	Main scaling mechanism
Change of Norms and Values	Doughnut Economy	The city is an important governance level for the starting point of change, from which wider change on national and international levels might arise.
	Degrowth	A bottom-up movement will lead to democratic change. This in turn will allow for top-down system change policies in e.g. financial system, capital distribution, labour markets and creation of commons.
	Great Mindshift	Individual innovators (persons, firms) will form a 'niche level' (bottom-up) drive 'regime' and 'landscape' shifts.
	Buen Vivir	Indigenous knowledge and communities drive change. Scaling is less important, as a new societal model will be primarily driven by smaller, local communities.

Overall it seems that, while all concepts offer different routes for scaling, none of the proposed scaling routes is as yet backed up by strong empirical evidence as to its functioning in practice for a large scale societal transition. Other main observations from the assessment of scaling mechanisms are:

- The Measurement-family intervenes only at the input level of the policy impact chain. Scaling is generally left to voluntary uptake of the information provided in the broad welfare dashboards by policy makers.
- Governments are important first movers of change in the Current Norms and Values-family. Scaling then has to take place primarily via the market (Green Growth) or via direct governmental interference in the Mission Economy.
- In the Change of Norms and Values-family, a strong role for governmental policies is foreseen in Degrowth, while change rather more evolves from the bottom up level in Great Mindshift and Buen Vivir by citizens and entrepreneurs as first movers. In the Doughnut Economy, change starts from government and citizens alike, but a strong role is also imposed on cities.

5.4 Potential risks, drawbacks and side-effects

Essential for the implementation of any of the alternative economic concepts in practice is knowing about their potential risks, drawbacks and side-effects, so that these can be mitigated where possible. Table 5.5 summarises the results of this assessment.

Table 5.5: Main potential risks, drawbacks and side-effects of alternative economic concepts

Family	Concept	Main potential risks, drawbacks and side-effects
Measurement	Broader Welfare	A large number of indicators makes policy prioritisation difficult. Trade-offs between indictors in the dashboard provided are unknown.
Current Norms and Values	Green Growth	Irreversible damage to natural capital might result if the assumed possibility of absolute decoupling of economic growth from natural capital depletion might not hold. There is no indication as to in which moment in time decoupling would ultimately have to be reached in order to prevent such irreversible damage. It is not clear to what extent Jevons' paradox (rebound effect) might undo any progress achieved by technological innovation.
	Mission Economy	Failure of some missions has to be taken into account. This might complicate acquiring and maintaining public support for social missions. Missions for fundamental societal change might require very large governmental budgets. It might be difficult to steer markets in the desired directions of the mission.
Change of Norms and Values	Doughnut Economy	Policy steering on multiple social and environmental indicators is more difficult than steering primarily on economic growth. Public support for such steering might be hampered by trade-offs between the indicators.
	Degrowth	Final impacts aimed for are not fully clear and might lack public support in the case of trade-offs. Maintaining stability of a society with negative economic growth might be difficult.
	Great Mindshift	Scaling mechanisms of bottom-up, 'niche' innovations by way of mentality change are not clear. Final impacts on a societal level are not clearly defined.
	Buen Vivir	Scaling mechanisms of local, indigenous knowledge based communities on a global level are unclear. Final impacts on a societal level are not clearly defined. The concept can be misused as window-dressing for neo-extractivist strategies by national governments.

Main observations from this assessment are:

- Alternative economic concepts generally focus on showcasing the complete failure of other concepts, hereby outlining the need for change and the potential advantages of implementation of the concept in question. The authors of concepts very rarely provide any more extensive reflection on their own concept regarding potential risks, drawbacks and side-effects of implementation of the own concept.

- Potential risks are diverse and partly follow from the gaps in policy impact chains (see paragraph 5.1), a lack of clarity in underlying assumptions (see paragraph 5.2) and incomplete scaling mechanisms (see paragraph 5.3) that were found in the other parts of the theory of change assessment. In the Measurement-family, there are no guarantees if, and how, information provided in the dashboard will result in any change of policymaking, let alone in an effective change of policymaking, and on how the results of policies are evaluated and communicated. In the Current Norms and Values-family, assuming that absolute decoupling of economic activity from natural capital use in particular is a risk if absolute decoupling is not better defined (e.g. which components of natural capital are to be decoupled) and if

progress towards this intended policy outcome is not closely monitored. In the Change of Norms and Values-family, public support for policies that aim at change of norms and values of people is perhaps the largest risk. Similarly, the need for incentives and support for the emergence of the bottom-up movements is often overlooked.

- The most prominent drawbacks of any of the concepts can probably be found in their extreme application: internalising environmental costs in market prices of goods and services might, without redistributive policies, result in societies where the rich can still afford to pollute and the poor are deprived from basic goods and services. Likewise, an extreme application of Change of Norms and Values concepts might result in restricted freedom of choice of individuals.

- Side-effects of alternative economic concepts might include geopolitical tensions between countries that introduce new concepts and countries that do not. In the absence of more detailed information about the policy impact chains of all concepts, it is difficult to assess how such side-effects might work out on global scales.

5.5 Dutch concepts

Regarding theories of change, the four Dutch concepts (CBS Broad Welfare, Baarsma Green Growth, Schenderling Post Growth, Klomp Purpose Economy) to a large extent follow their international counterparts.

The CBS Broad Welfare concept seems relatively well-implemented in policies already. Interestingly, Post Growth is the only assessed concept in this report that explicitly specifies a policy impact chain. It consists of two main pathways: 1) a fair tax on consumption and lower labour taxes; and 2) supporting measures in the fields of labour, pensions, inequality, agriculture, energy and mobility, and health care. Outputs, outcomes and impacts for these policy pathways are specified, while inputs have to be inferred. The proposed measures are claimed to be 'budget neutral for 90% of the population'. Baarsma also specifies policies for the Dutch context, although her proposed policy impact chain is more implicit. Klomp mostly refrains from concrete references to the Dutch situation and therefore its impact chain remains rather unclear.

5.6 Discussion: Theories of change of alternative economic concepts

Summarising this chapter's analysis, the assessment of the theories of change of the alternative economic concepts points to several main conclusions.

First, while some policy impact chains are more complete than others, they all contain gaps that leave questions about how presumed inputs and policies will lead to the final impacts that are aimed at. For instance, it is neither clear whether and how absolute decoupling can be achieved under Green Growth, nor do the proposed policies in Degrowth logically lead to a shift towards eco-centric values. Nor do authors or proponents of the concepts provide clear self-assessments of underlying assumptions and associated risks, drawbacks and side-effects of their own concepts.

Secondly, all concepts offer, to various degrees, innovative policies. These vary from cap-and-trade for pollutants other than CO2 and societal 'missions', to much shorter working weeks, incorporating household work into the economy, or fundamental reforms of financial institutions. While these policies are now primarily associated to one specific concept, they do not appear to fundamentally contradict the principles of other concepts and thus be applied under them. For example, while the 3-day working week is now proposed as a policy under Degrowth, there seems to be no objections to investigate, and if found robust, apply such a policy in a Green Growth context as well.

Thirdly, the assessment of the policy impact chains shows that the proposed scaling mechanisms of the concepts do vary substantially with respect to their main drivers for change. In Green Growth, governments set borders to markets and subsequently these markets have to 'do the job'. In Mission Economy, government is the primary driver that defines and guides societal missions. Here, the market is rather an instrument for a strong government that sets very clear directions not only in industrial policies, but also encompasses these in strong narratives that are supported by society as a whole. Likewise, Degrowth is often said to give an important role to citizens as a bottom-up movement (e.g. Khmara & Kronenberg, 2020), but the policies proposed suggest a very strong role of government to achieve societal change. On the contrary, Great Mindshift sees a role for government to obtain 'landscape changes', but seems to be driven far stronger by bottom up innovation in 'niches' where enlightened citizens and entrepreneurs find support for their social or technological innovations.

Overall, the findings regarding the scaling mechanisms lead us to propose a second dimension to distinguish alternative economic concepts. Next to the three families, presented in Chapter 4, the concepts can be distinguished on the concepts' views on the scaling mechanism: the role of 'state' versus the 'individual', with the latter seen as either entrepreneurs and businesses or citizens. Figure 5.1 presents the expanded taxonomy. Note that the concepts' views on the role of GDP are not displayed anymore: we discussed in Chapter 4 that the concepts could be more clearly distinguished upon their views on norms and values. The Current Norms and Values-family has an economic growth-oriented view, the Measurement-family is neutral towards economic growth, and economic growth is subordinate to environmental and social goals in the Change of Norms and Values-family.

Seen in this way, four concepts in particular seem to span a two-dimensional coordinate system in which the other concepts can also be plotted: Green Growth, Mission Economy, Degrowth and Great Mindshift positions (Figure 5.1).

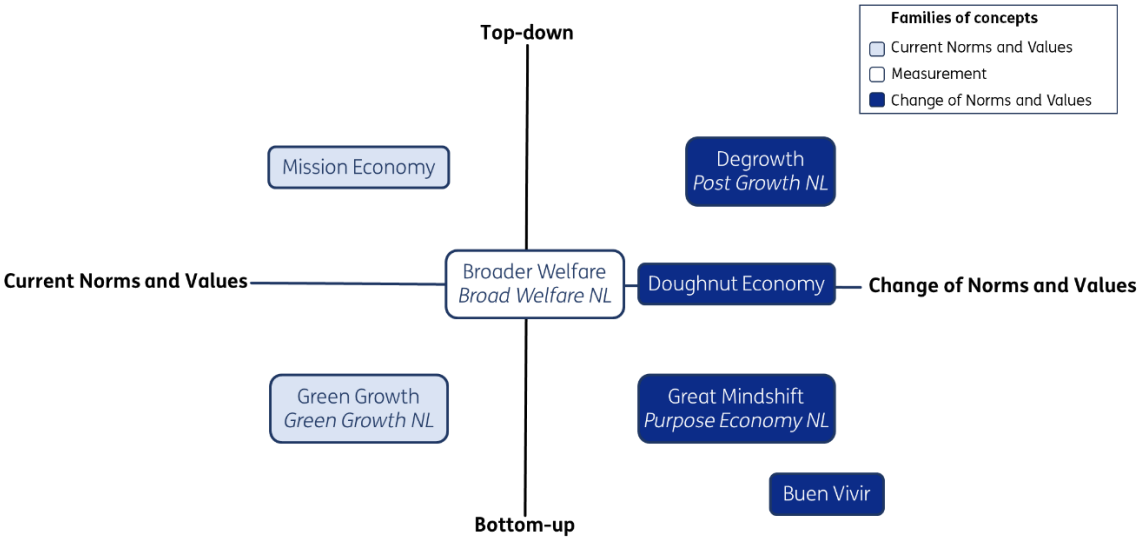

Figure 5.1: An expanded taxonomy of alternative economic concepts

6 Modelling of alternative economic concepts

6.1 Introduction

The concepts' assessment, leading to a taxonomy, and the theory of change assessment in the previous chapters respectively, serves to specify the distinctive aspects of the alternative economic concepts and to delineate the policy chain that operationalises the societal change envisioned by each concept. However, the extent to which the distinctive elements of a concept and the proposed policy chain can lead to the intended policy impacts remains an open question.

A relevant step to gain further insight on this is undertaking a quantitative modelling of the alternative concepts. With this motivation as a backdrop, this chapter introduces some of the most prominent existing modelling frameworks that can be used to quantitatively study the alternative economic concepts and assess their impacts (e.g. economic activity, environmental outcomes). The chapter focuses on the capabilities and limitations of some of these modelling frameworks in light of the characteristics of the seven international alternative economic concepts that we analyse in this report. This analysis intends to inform choices to streamline the modelling requirements of a quantitative assessment of the alternative economic concepts.

As a first step, we link the main aspects of the international concepts to key attributes or characteristics that a model should have to represent these differential aspects. The differential aspects of each concept are collected from the taxonomy of the international concepts. For the key model attributes, in section 6.2, based on previous literature and our own assessment, we produce a list of attributes that we consider relevant to adequately represent the collection of differential characteristics of the concepts. The key modelling attributes and differential characteristics of the concepts are matched, per concept, in Table 6.1Table 6.1.

In section 6.3, we introduce some of the existing modelling approaches that can be used to quantitatively assess (the proposals of) the alternative economic concepts. Here, we distinguish between two classes of modelling approaches: applied macroeconomics and alternative approaches. We present the main capabilities and limitations of applied macroeconomic models on the basis of the key modelling features required to represent the alternative economic concepts in section 6.4. In section 6.5 we do the same for some alternative modelling approaches that can be used to complement the applied macroeconomics approach, and overcome its main limitations. In section 6.6 we discuss some considerations for projects aimed at performing quantitative assessments of the alternative economic concepts, including the integration of different types of models.

6.2 Key attributes to represent alternative economic concepts in models

The alternative economic concepts presented in this report present a vision for the future of society that does not (fully) align with the status quo and can even radically deviate from it. To different degrees of detail, the concepts offer a view on the policy chain that is to bring about the transition towards the envisioned future. As such, the modelling of the alternative concepts should represent large-scale societal transitions, and their drivers.

We use the two comprehensive reviews by Köhler et al. (2018) and Hafner (2020), on desirable model capabilities to represent large-scale societal transitions as a starting point to compile a list of model attributes that we consider relevant to adequately represent the alternative economic concepts analysed in this report. [3] From these two reviews, we identify six common model attributes (attributes 1-6 below). We complement these six common attributes with two additional elements (attributes 7 and 8 below) that, according to our taxonomy, are of great importance in representing differential aspects of the concepts. We consider that altogether these eight key attributes can provide an encompassing framework to assess capabilities and limitations of different modelling approaches intended to represent the alternative economic concepts.

The eight key attributes of models to represent alternative economic concepts are:

1. **Non-linearity:** this refers to two elements that models need to take into account in order to reflect the differential aspects of the alternative economic concepts. First, the graduality of response of the endogenous variables (i.e. dependent on other variables within the model and solved by the model) to the exogenous changes (i.e. independent of other variables that serve as model inputs) that set the transition in motion. This attribute is important to adequately capture the time dimension of the transition and the time-scales at which the societal benefits and cost of the transition may materialise (e.g. short-run costs v. long-run benefits). Second, modelling a non-linear relationship between variables should be possible; this refers to the speed and direction of change of a system (economic, ecological, societal) which are dependent on its current state. This feature is important to operationalise notions like the implementation of the 'safe borders' within which a system can operate (cf. Doughnut), or like the need for a governmental 'big push' to get mobilise innovation efforts in the right direction (cf. Mission Economy).

2. **Changes in social norms and values:** this attribute is necessary to reflect one of the fundamental enablers of change that we identify in various alternative concepts (cf. Degrowth and Great Mindshift). It refers to whether a model can produce, preferably endogenously (e.g. in response to changes in policy variables), a change in values and preferences of individuals and/or where new social norms can emerge (e.g., the emergence of a lifestyle of sufficiency as in the degrowth proposal). This can be for instance a consequence of explicitly modelling interactions and learning processes

[3] Köhler et al. (2018) propose an assessment based on the model capabilities to represent: non-linear behavior; qualitatively different system states; changes in social values and norms; diversity and heterogeneity; dynamics across different scales; and open processes and uncertainties or contingencies. Hafner et al. (2020) propose a comparison of modelling approaches based on the following features: complexity, non-linearity, non-ergodicity and deep uncertainty; importance of time, path-dependency, lock-in, irreversibility; heterogeneity and behavioral elements; interdisciplinarity; role of institutions and social context; ethical and moral philosophical aspects; finance; multiple equilibria and disequilibrium.

among heterogenous agents (see next element). Therefore complex interactions such as social tipping points and behavioural reciprocity (conditional behavioural change) also need to be taken into account.

3. **Agent heterogeneity:** this refers to the capability to analyse the impact of alternative paths for different types of agents in the population (i.e. those belonging to different income groups, or with different preferences towards consumption of material goods), i.e. the distributional consequences between different agents of a given path. Moreover, and related to the previous point, this feature may serve to explicitly account for how interactions between diverse agents can trigger wider societal changes (e.g. how agents interact and influence each other, and thus how the preferences of a few can over time become widespread preferences).

4. **Changes in system states:** several of the alternative concepts (e.g. green growth, degrowth, mission economy) advocate for quick action to redirect the path of society, for instance in terms of decoupling economic activity from natural capital depletion. The underlying rationale behind this is that possible future states of the systems (economic, environmental, social) are not independent of the current state ('path dependency'), and there may, for example, exist tipping points in natural capital depletion (i.e., environmental degradation beyond repair). Additionally, several of the alternative economic concepts offer radical views on future changes in society, thus "*a transition is not just change towards more or less of the same*" (Köhler et al., 2018; p.4), and the modelling approach should be able to reflect this.

5. **Linkages across different scales:** the alternative concepts prescribe changes at different aggregation scales (micro, meso, macro), at different levels of geographical aggregation (from local to global), and at different time scales. This feature refers to a modelling approach that explicitly links these different scales, and keeps track of the associated feedback loops.

6. **Uncertainty:** the potential implementation of the policy chains associated to the alternative economic concepts will occur in an environment with numerous and significant sources of uncertainty (e.g., the precise timing and magnitude of future of damages caused by climate change is uncertain). Whether a model is able to accommodate different sources of uncertainty is important from the policymaking perspective, as it would allow an exploration of how uncertainty impacts the policy chain of a concept, and if a given policy chain can mitigate or reinforce the effects of uncertainty.

7. **Evolution of innovation and technology:** the alternative concepts have different views on the pre-eminence of technological change as an enabler of the societal transition. This ought to be adequately quantified, such that one can assess requirements/limits/possibilities of this enabler of the transition.

8. **Integrated (multi-disciplinary) outcomes:** the alternative concepts are all built on the view that GDP is an imperfect and incomplete metric of societal welfare. This calls for a modelling approach that produces outcomes, beyond GDP, associated to different disciplines (economic, environmental, and social outcomes – a 'multicriteria approach'). The Broader Welfare concept presented in this report discusses in detail how the evaluation of these multi-dimensional outcomes can be assessed.

Table 6.1: Modelling of alternative economic concepts

Alternative economic concept	Main differential aspects of the concept	What needs to be explicitly modelled	Key modelling attributes 1 non-lin	2 norms and values	3 agent hetero	4 change states	5 diff scales	6 uncert	7 inno & tech	8 int outc
1. Broader Welfare	Large number of outcome variables, including environmental and social dimensions; in some cases subjective welfare too	Direct and indirect links between variables in multiple disciplinary domains Subjective welfare dimensions					■			■
2. Green Growth	Planetary boundaries; Natural capital scarcities	Innovation and environmental market failures; policy tools to correct them	■			■		■	■	
3. Mission Economy	Integrated governmentally driven 'missions'	Interactions between multiple governmental interventions; impacts on multiple broader welfare variables	■			■		■	■	■
4. Doughnut Economy	Planetary boundaries and social indicators; Changes in norms and values	Absolute and relative position of social and planetary boundaries (at different scales)	■		■	■	■			
5. Degrowth	Planetary boundaries and social indicators; Changes in norms and values	In the a-growth interpretation: impacts of proposed larger institutional changes, e.g. of the financial system; In the negative economic growth interpretation: impacts of negative growth on environmental and social indicators		■		■				■
6. Great Mindshift	Bottom-up change by niche innovators; Regime and landscape change; Changes in norms and values	Scaling processes of bottom-up changes; key indicators for regime and landscape change	■	■	■				■	
7. Buen Vivir	New community development and governance arrangements; Changes in norms and values	Impacts of larger governance changes based on 'native knowledge'		■		■				

The rest of this chapter focuses on describing existing modelling approaches that can be applied to represent the alternative economic concepts and the extent to which these approaches incorporate the key attributes described in this section. Section 6.3 sets the stage and gives and overview of the landscape of existing modelling approaches. The different approaches are discussed in detail in sections 6.4 and 6.5.

6.3 Existing modelling approaches: an overview

The alternative economic concepts aim at enabling transitions that ultimately have an economy and society-wide impact. In this section we present an overview of the most prominent existing quantitative modelling approaches that can serve to represent these types of transitions and thus potentially suitable to represent (some distinguishing characteristics) of the alternative economic concepts. We split the existent approaches between *"applied macroeconomics"* and *"alternative approaches"*. Table 6.2 overviews these modelling approaches including their main advantages and disadvantages.

Table 6.2: Overview of existent modelling tools to represent the alternative economic concepts

Modelling approach		Type of Model	Main advantages	Main disadvantages
Applied macroeconomics		Computable General Equilibrium (CGE)	Direct and indirect links between multiple variables; Consistency with data	Deterministic; Static norms and values; Aggregate representation of economy and environmental impacts
		Benefit-Cost Integrated Assessment Models (IAM)	Incorporation of environment-economy feedbacks	Static norms and values; Aggregate representation of economy and environment (possible misrepresentation of environmental impacts)
Alternative approaches		Process-Based Integrated Assessment Models (IAM)	Bottom-up, highly disaggregated; (environmental and technical) processes	Reduced-form representation of economic system: limited representation of well-being impacts
	Complex Systems	Evolutionary Economics	Agent heterogeneity; Modelling of bottom-up (societal) transitions	Aggregation and representation of macro-scale
		Agent Based Models (ABM)	Agent heterogeneity; Modelling of bottom-up (societal) transitions	Mapping to micro-data and data limitations for calibration; Modelling of aggregate system change
		Socio-ecological Systems (SES)	Highly detailed evolution of ecological systems	Underspecified societal dimension and transition
		System Dynamics (SD)	Representation of (aggregate) system changes	Unspecified micro-foundations (bottom-up interactions/transitions)

Applied macroeconomics

The large-scale scope of the concepts, where a complete overhaul of overall economic activity (what we consume and produce) is required, suggests that a quantitative assessment of the proposed policy chains should, at least in part, include the evaluation of aggregate outcomes (e.g. economic activity, aggregate emissions). Taking this into consideration, and in addition, the importance that the policy chains attribute to changes in the behaviour of economic actors (e.g. consumers, firms), a natural starting point to discuss existing modelling tools is applied macroeconomic modelling. This type of modelling (which includes for instance, Computable General Equilibrium models, and Benefit-Cost Integrated Assessment models) is designed for the evaluation of aggregate outcomes, and is widely used by policymakers to perform ex-ante evaluations of alternative policy scenarios. One potential reason for the relevance of this type of modelling for policy analysis relating to alternative economic concepts is that interlinkages between economic activities (such as the links between different sectors, or the connection between income and expenditure flows) are at the core of the macroeconomic modelling approach. These linkages serve to investigate the direct and indirect consequences of alternative pathways and thus identify potential unintended consequences of implementing (policies associated with) a given concept, and for instance evaluate the extent to which the role of technological progress in reducing the environmental impact of economic activity is impaired by rebound effects.

Based on its relevance in policymaking, we see applied macroeconomic modelling as a relevant starting point, yet we emphasise the importance of seeing these models as a **building block** of a modelling toolbox that can more comprehensively accommodate the inputs and outcomes associated to the alternative economic concepts. As presented in further detail in the next section, macroeconomic models, standalone macroeconomic models fail to capture some of the distinguishing elements of the alternative economic concepts, such as changes of norms and values which is a differential aspects to various concepts (as seen in Table 6.1).

Alternative modelling approaches

A more encompassing approach to assess the alternative economic concepts along different dimensions is to consider the use of alternative modelling approaches to capture different relevant domains that the concepts aim for (e.g. economic, social, and environmental). For instance, due to its saliency as a driver of societal change according to various of the alternative economic concepts (e.g. Degrowth, Great Mindshift), (some of the) models to be considered for a quantitative analysis of the concepts should be able to accommodate changes in norms and values, and if possible inform how these changes can be stimulated and what may stifle them. This is something that, as explained in the next section, applied macroeconomic models are not well-equipped to analyse, but as detailed in section 6.5, some alternative approaches do (e.g. Agent Based Models).

We see these alternative approaches as complementary to the applied macroeconomic modelling, and thus relevant to consider as blocks of a more comprehensive modelling toolbox that aims at assessing the alternative economic concepts.

We now move to a more detailed description of the types of modelling approaches, where in section 6.4 we present the applied macroeconomics approach and in section 6.5, the alternative approaches. Here, their advantages and disadvantages are assessed in light of the key modelling features discussed in section 6.2. Following from 6.2, and in particular Table 6.2 where the main advantages of some approaches relate to the main disadvantages of others, section 6.6 reveals the complementarity between these modelling approaches

and underscores the importance of considering the combination of models to analyse different aspects of the alternative economic concepts.

6.4 Applied macroeconomics

Alternative economic concepts are all concerned with outcomes that go beyond the material output of the economy. In particular, the interaction between economic activity and the natural environment is key for the assessment of the alternative concepts. When it comes to this multidimensional analysis, applied macroeconomic modelling has by-and-large been concerned with the interaction between economic activity and the environment, more specifically in the context of climate change. This type of 'integral' analysis has been conducted mainly based on two macroeconomic modelling approaches (Rivera et al., 2018): Computable General Equilibrium (CGE) models and Integrated Assessment Models (IAM).[4]

Here we present these two types of applied macroeconomics models. We first start with CGE models and place them within a wider framework of macroeconomic models. We discuss how these models are used to quantify the interaction between the economy and the environment. Then, we describe IAM. To this end we adopt the perspective offered by Fisher-Vanden and Weyant (2020), and initially focus on the applied macroeconomic Benefit-Cost IAM. In section 6.5 we present other types of modelling approaches that are not common in applied macroeconomic analysis, but offer an alternative avenue to explore social transitions (including, for instance, the bottom-up Process Based IAM, and Complex Systems Models).

6.4.1 Computational General Equilibrium models

Macroeconomic general equilibrium: brief introduction

Macroeconomic general equilibrium models were designed with the goal to represent observed economic activity at a relatively aggregate level (e.g. the production level by different sectors in a country). Due to their capacity to represent observed economic activity, these models are generally used to perform ex ante policy assessments (i.e. so-called 'what if' analyses). This type of models work on the principle that economic agents interact in different markets, where they face allocation decisions under certain restrictions, and the decision-making is geared to maximise some objective. For example, households decide how much and what to consume, given their income, to maximise their utility (i.e., the satisfaction that they derive from a consumption bundle). Similarly, firms decide how much to produce, given their technology, in order to maximise their profits. This decision-making processes, which are not necessarily explicitly modelled provide the economic foundation for the specification of demand and supply functions that are explicitly represented in equilibrium models (i.e. underpin specific modelling assumptions). Supply and demand functions specify how quantities of goods react to prices, and in turn, guided by demand and supply functions, market interactions determine prices and quantities produced and consumed.

[4] An exhaustive review of existent applied macroeconomics models is beyond the scope of this chapter, and we choose to focus on CGE and IAM because they appear to be more immediately applicable to the assessment of the alternative concepts. However, it is important to be aware of the existence of other applied macroeconomic approaches, with their own capabilities and limitations. These other approaches include, among others, Dynamic Stochastic General Equilibrium models, Input-Output models (IMPLAN, 2017), Econometric models (for instance, the E3ME model; Cambridge Econometrics, 2022).

Equilibrium models can include different types of representative interdependent agents in the economy, each playing distinctive roles; these can broadly classified in three categories:[5]

1. Households: demand goods and services and supply factors of production (e.g. labour);
2. Firms: produce goods and services and demand factors of production; and
3. Government: implements policy (e.g. collects taxes, distributes subsidies), supplies public goods and services.

A macroeconomic general equilibrium is characterised by equilibria in the markets of goods and services on one hand, and of production factors on the other hand. In the market of goods and services, households act as consumers and firms as suppliers, while firms act as consumers and households as suppliers in the market of factors of production. These market interactions are compounded by any redistribution of resources organised by the government, and by the interaction of the domestic economy with the rest of the world, via international trade flows. The notion of 'general' equilibrium accounts for the interactions and feedbacks between these distinct markets, where for instance both household income and consumption are endogenous outcomes of the model. The general equilibrium ensures consistencies in aggregate flows in the economy, where for instance the total value of the goods and services produced by an economy is equal to the consumption of goods and services originating in that economy, and the total remuneration to the factors of production that intervene in domestic production is equal to total domestic income.[6]

Time scale and dynamics: non-linearity

CGE models can be either static or dynamic. Static CGE models can be used to compare an initial equilibrium of the economy to the new equilibrium that emerges after a (policy) shock is introduced; this however would fail to represent the adjustment process of the economy from one equilibrium to the other. Instead, dynamic CGEs can better characterise the transition path of the economy from an initial equilibrium to a new (longer-term) equilibrium induced by a policy shock. Dynamic CGEs then provide outcome at different time horizons, typically split in year (or multi-year) time intervals. Dynamic CGEs are therefore better suited to studying the effect of policy paths that are gradually implemented, but also to capture the graduality of response in the outcomes that are to be affected by the policy.

In general equilibrium models, of which CGEs are a subclass, dynamics can be mainly incorporated in two ways. In forward-looking models, decision rules (by households, firms, government) are explicitly derived from their forward-looking behaviour, whereby economic agents plan a full path of their current and future actions, rather than just current ones, given their expectations about the future state of the economy. Alternatively, models can have a recursive structure, where current decisions or rules do not respond to expectations, but still have an impact on future outcomes. Dynamic CGE models can be either forward looking or recursive (for details on the distinction between these two dynamic approaches see Babiker, 2009). A potential implication of this choice is that under forward looking models, graduality in responses is an endogenous feature of the model where agents 'optimally' spread the costs and benefits of their actions over time, whereas in recursive models this graduality is more of an imposed assumption.

[5] Typically macroeconomic models assume representative households (firms), which are meant to describe the behaviour of a collective of identical entities.

[6] An alternative modelling approach are partial equilibrium models where a market (or subset of markets) is considered in isolation, and how changes to the equilibrium of one market affect demand or supply in others is not accounted for.

Geographical representation: Linkages across different scales

Depending on the question at hand and data availability to calibrate the parameters of the model, CGE models can represent different levels of aggregation. CGE models are often used at the national scale, where the economic structure of the rest of the world is not explicitly modelled, and foreign supply and demand are exogenously given.[7] These models can also be employed at the regional level, where the economic structure of various countries in the same region is modelled in detail. Global variants of CGEs usually split the world economy in aggregate sub-regions with some large national economies or with an economy of particular interest modelled as an individual entity.

Endogenous R&D: Evolution of innovation and technology

When innovation is not at the core of the research question, CGE models often assume exogenous technological progress (e.g. in the form of constant improvement in the productivity of sectors). This is used as a reduced-form to deliver a rate of economic growth that is consistent with long-term trends in the data. However, when one is specifically concerned with the role of R&D, the evolution of innovation and technology, one can opt for a CGE model with endogenous R&D, where innovation inputs (e.g., R&D expenditure) and outputs (e.g. productivity improvements) are endogenous outcomes of the model, rather than a pre-imposed parametrisation.

Consistency with the data

While consistency with the data is not explicitly denoted as a key modelling feature, it still plays an important role when thinking of the policymaking use of a given type of model. This capability implies that models can aptly represent the current state of the economy and use this as a starting point for ex ante policy analyses. CGE models are characterised by their consistency with the data. Yet, this makes them demanding in terms of the data requirements to calibrate the model. Model parameters are calibrated to (i.e. the values of exogenous parameters are set to) reproduce the current (or most up-to-date) situation of the economy. However, this process of calibrating the parameters of the model so that the model results match observed data requires detailed, comprehensive, and consistent statistical information on the value of transaction flows between economic agents in a given period of time, for the geographical entities being modelled, as captured by the Social Accounting Matrix (SAM).[8] [9] These detailed data requirements constitute the main challenge when one is considering to extend a CGE framework, for instance to incorporate more agent heterogeneity, as one requires data disaggregated at the level of heterogeneity that the model is to represent.

6.4.2 Benefit-Cost IAM

Integrated assessment models (IAM) are research tools devised to bring together the knowledge from different disciplines (e.g. climate science, energy systems, economics) that evaluate scenarios where feedbacks between the outcomes of different model blocks (each associated to different disciplines) need to be accounted for.

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[7] The feasibility to divide the national economy into sub-national entities is determined by the availability of data on the transactional flows across such entities.

[8] For details on the concept of SAMs, how to estimate them and their role as input in CGE modelling see Mainar-Causapé et al. (2018)

[9] CGE are extensively used to inform policymaking across the world. An example of this is the GEM-E3 CGE model by the JRC-Institute for Prospective Technological Studies is used to provide advice to the European Commission. This model "*...is especially designed to evaluate energy, climate and environmental policies. GEM-E3 can evaluate consistently the distributional and macro-economic effects of policies for the various economic sectors and agents across the countries.*" Further details can be found in Capros et al. (2013).

Core of IAM: Integrated (multi-disciplinary) outcomes
From the perspective of the alternative economic concepts, a key (multi-disciplinary) interaction being studied with IAM is that between economic activity and the environment, where two classes of IAM can be distinguished: Benefit-Cost IAM and Process-Based IAM (Fisher-Vanden and Weyant, 2020). The Benefit-Cost IAM *"…fully integrate a stylised socio-economic model with a reduced-form climate model to simultaneously account for the costs of mitigation and the damages of global warming using highly aggregate cost functions"* (IAMC, n.d.a). This is the class of IAM used in applied macroeconomic analyses, and thus is discussed in more detail in this section. *Process-Based IAM*, can be considered as an alternative approach to applied macroeconomic modelling and are discussed in Section 6.5.

From a macroeconomic perspective, Benefit-Cost IAM have been primarily used to study the Climate-Economy interaction, at a low level of geographical and inter-temporal resolution. This stylised form of Climate-Economy models is built on two interacting blocks, a climate block and economic block. The economic block links aggregate economic activity to GHG emissions, which are then fed into the climate block. The climate block keeps track of GHG atmospheric concentrations and how these affect global temperature via an aggregate damage function. Temperature is translated into (long-lived) economic damages, which are then fed into the economic block. The economic block typically follows the logic of a macroeconomic general equilibrium framework with forward-looking agents, as described above, where economic activity is represented at a high level of aggregation (e.g. without complex inter-sectoral interactions)

The closed-loop logic (i.e. where feedbacks between blocks are fully accounted for) of stylised Climate-Economy IAM serves to quantify how changes to economic activity translate into changes in emissions, and how these ultimately translate into changes to (the present value) of economic damages associated to global warming. These type of quantifications are useful to perform ex ante cost benefit analyses to determine the efficiency of a policy path and to produce most-efficient paths that optimally weigh the cost of policy (e.g. forgone economic activity and mitigation costs) and its benefit (e.g. averted damages).

A prominent example of a global and highly aggregated Climate-Economy IAM is Nordhaus' DICE (Dynamic, Integrated Climate and Economics) model, and its multi-region variant RICE (Nordhaus, 2020), which have been extensively used to estimate the social cost of carbon. Other examples of similar models are PAGE (Policy Analysis of the Greenhouse Effect) and FUND (Climate Framework for Uncertainty, Negotiation, and Distribution) (Fisher-Vanden and Weyant, 2020).

6.4.3 Limitations of applied macroeconomic models

Applied macroeconomic models are able to represent the evolution of economic activity at different levels of temporal, geographical, and sectoral resolution, and have been aptly extended to incorporate interactions between the economy, the energy system, and the environment (in particular in the climate change domain). This makes them good tools to evaluate the evolution of various socioeconomic outcomes over the course of a societal transition, and thus assess some of the consequences of the policy chains and policies associated with the alternative economic concepts, such as the impact of implementing more stringent carbon pricing on the net income of households.

However, relying (exclusively) on existing applied macroeconomic frameworks to the study of the societal transitions prescribed by the alternative economic concepts faces some challenges. Below, we discuss four main limitations of this modelling approach in light of the key modelling attributes required to represent the alternative economic concepts introduced in section 6.2.

Integrated (multi-disciplinary) outcomes: Limited social outcomes (market v. non-market interactions)

Applied macroeconomic models are built on the notion that the interactions between agents are transactional and occur in the market. Thus, some outcomes of the social domain that derive from non-market interactions (the production and consumption of relational goods), are key for some alternative economic concepts and cannot be aptly captured in these modelling frameworks. This means that the models are unable to go beyond the (standard) division of time between work and leisure (non-work) that determines labour supply or the aggregate notion of social capital. For instance, it is difficult that these models include the quality of relational goods as a endogenous variable that can be affected by policy interventions, and thus to model how society can transition towards a consumption mix that more intensive in immaterial relational goods (and is less material-intensive). This limitation does not necessarily arise from a theoretical conceptualisation (e.g., Heikkinen, 2015; 2018); instead data availability measuring the quantity/quality of these interactions is required in order to calibrate the models so that they can produce meaningful quantifications of relational/social outcomes for alternative scenarios.

Changes in social norms and values: Fixed norms and values

Various alternative concepts consider a change in norms and values as a lever to enact the type of societal change intended by the corresponding policy chain. Nevertheless, norms and values, which shape individuals' preferences over their possible choices (i.e. the lenses through which individuals evaluate their choices) are (implicitly or explicitly) taken as given in the applied macroeconomic models. Thus, beyond assuming how exogenous changes in norms and values translate into exogenous changes in model parameterisation (i.e. as a pre-imposed input to the model), applied macroeconomic models are unable to inform how these changes can come about, whether these changes can be an equilibrium outcome of other processes in the economy and what type of interventions can spur or deter these changes.

Agent heterogeneity: Limited agent heterogeneity

Some alternative concepts are concerned with distributional impact of policy chains, these impacts can only be captured in modelling frameworks that incorporate agent heterogeneity. While applied macroeconomic models can incorporate some elements of heterogeneity, for instance income groups or age cohorts, the classification of agents is likely to remain relatively coarse and unable to quantify intra-group distributional effects. The need to calibrate models on observed data before performing any simulations, limits the possibility to model agent heterogeneity at a high level of resolution. Also, and related to the previous point, agent heterogeneity is a key feature for bottom-up concepts (e.g. Great Mindshift) where some agents play a pioneering role in starting larger scale societal shifts.

Changes in system states: No institutional change

The institutional arrangement in applied macroeconomic models is given. Ownership and exchange is all defined in the context of market interactions with well-defined property rights. Production occurs in a decentralised non-cooperative manner, where firms own the production technology. The transition to alternative modes of exchange and production, for

instance, with collective ownership, that feature in some alternative economic concepts cannot be characterised in applied macroeconomic models. As an initial step, one can attempt to translate these institutional changes into exogenous changes in model parametrisations. This can be done, for instance by imposing alternative pricing rules that reflect a more cooperative production environment. This however will fall short of capturing potential feedback effects between the state of the institutional setting and other domains, and would not allow to assess the underlying mechanisms that can enable the change in the first place.

Moving forwards with the modelling of the alternative economic concepts

We do not interpret these limitations of the existent applied macroeconomics models to represent the alternative economic concepts as this being a completely inadequate approach. Instead, this suggests that one needs to 'adjust' the modelling framework to better reflect the key modelling features required to represent the alternative economic concepts. For this, generally speaking, there are two possible paths forwards, which are compatible with each other: extend existent models and/or combine different types of models. In text box 6.1 we briefly discuss the role of analytical models as a first step to extend existent applied macroeconomic models. In section 6.5 we present alternative modelling approaches that can serve as complements to the applied macroeconomic approach, and the combination of models is discussed in section 6.6.

Text box 6.1: Stylised analytical models as a starting point to extend applied macroeconomics models

In the context of alternative economic concepts, there exists a macroeconomic modelling approach with the goal of presenting a stylised characterisation of the potential trade-offs across the economic environmental and societal dimensions, as well as with the goal to represent the potential enablers of a transition. This approach represents the economy at a highly aggregated and stylised level (e.g. with a single producing sector that produces a single final good), and does not necessarily rely on numerical solutions (hence the classification as analytical) to describe model outcomes. The focus of this approach is to identify how the optimal path of the economy is affected once a more encompassing definition determinants of societal welfare (beyond material consumption) is adopted. This approach introduces novel assumptions in traditional macroeconomic equilibrium (growth) models to capture some elements associated to the alternative economic concepts (e.g. voluntary simplicity in consumption).

The goal is then to illustrate how the introduction of these novel assumptions change the optimal path (i.e. the welfare maximising path) of the economy relative to a model without these assumptions. These models can also serve to compare welfare maximising paths with the path that would emerge under a decentralised (market) and thus identify whether a decentralised solution is sub-optimal (usually the case because the novel assumptions normally imply adding externalities to the modelling framework) and the type of (policy) interventions may be required to implement the welfare maximising path (Bilancini and D'Alessandro, 2012; Germain, 2017; Heikkinen, 2015; 2018).

This modelling approach does not aim to precisely and accurately represent the economy. Instead, this approach serves to transparently translate qualitative characterisations of the alternative economic concepts, and their proposed policy chains, into specific innovative modelling assumptions, and to understand how these assumptions directly affect modelling outcomes. These analytical models can provide insight and a theoretical underpinning to modify more detailed quantitative frameworks in such a way that these can better incorporate some of the notions of alternative economic concepts. This means that using this approach can be an initial step to develop extensions to existent modelling frameworks (e.g. how is voluntary simplicity in consumption modelled and how can a demand equation be adapted to capture this notion).

6.5 Alternative modelling approaches

Some of the aforementioned challenges associated with applied macroeconomics models can be overcome by adopting complementary modelling approaches. This complementarity in modelling lies on the capability of alternative approaches to incorporate key modelling attributes to represent the alternative economic concepts that are missing either in the CGE or in the Benefit-Cost IAM (or both), namely: agent heterogeneity; changes in norms and values; system states changes; and linkages across different scales. These modelling approaches can, for instance, include more disaggregated agent heterogeneity, or explicitly model the process of changes in social norms and values as an endogenous outcome of the model.

6.5.1 Process-Based IAM

Integrated (multi-disciplinary) outcomes

Process-Based IAM focus *"on the analysis of transformation processes depending on a broad set of activities that induce emissions as side effects. They describe the interlinkages between economic activity, energy use, land use, and emissions with emission reductions and removals as well as broader sustainable development targets. GHGs and other climate pollutants are caused by a broad range of activities that are driven by socioeconomic developments and also induce broader environmental consequences such as land-use change and air pollution [and]... typically do not close the loop with climate change and damages that affect the economy"* (IAMC, n.d.a)

Linkages across different scales

This class of IAM represent the geographic, temporal, and sectoral scales at a finer level of resolution than the Benefit-Cost IAM (Fisher-Vanden and Weyant, 2020). In particular, the process-based approach presents a more detailed representation of (biophysical and socioeconomic) processes. However, the focus of these models is on the physical impacts of these processes (e.g. emissions) rather than on the socioeconomic effects. The socioeconomic system in this type of models is generally characterised by the sectoral use of physical materials and energy; these are not the result of a macroeconomic equilibrium but rather outcome of cost-minimisation processes under a set of technological assumptions. The economic process is thus unaffected by physical/environmental outcomes. These models can be used to perform cost-effectiveness analyses of alternative policy or technological paths (e.g. Dalla Longa et al. 2020).

6.5.2 Other modelling approaches

A wider view on modelling, presents other approaches to the to study societal transitions ,as those proposed by the alternative economic concepts, that can serve to make up for the key modelling features that are missing (or insufficiently represented) in the applied macroeconomics approach. Specifically, as detailed below, these other approaches offer the possibility to model **agent heterogeneity** more granularly, represent **changes in norms and values**, emphasise the role of **system state changes**, and incorporate the social dimension in a set of **integrated multi-disciplinary outcomes**. We follow Hafner et al. (2020) and Köhler et al. (2018) analyses on the modelling of societal transitions, to classify these alternative approaches and highlight the key modelling attributes with which they can complement the applied macroeconomics approach:[10]

[10] A detailed presentation of these alternative approaches is beyond the scope of this chapter. Details on these modelling approaches applied to the study of low carbon energy transitions can be found in Hafner et al. (2020) and applied to sustainability transitions in Köhler et al. (2018).

- **Complex systems**
  Not a unified approach, instead *"a portfolio of approaches to understand a class of phenomena - referred to as complex"* (Köhler et al., 2018; p.7) where complexity entails that *"a reduction to independently responding components is not possible [and] system components interact to generate emergent behaviour that cannot be adequately understood without the description of intermediate, interacting levels of structures"* (Gotts, et al., 2019; p.2).

  - **Evolutionary economics models**: **Agent heterogeneity**
    A sub-class of complex system models, that represent *"processes of change and competition in a population of decision makers using three core concepts from evolutionary biology: variation, selection and differential replication… [which] alters agents' fitness to their environment"* (Köhler et al., 2018; p.6). This modelling approach can be applied to investigate *"changes in consumer preferences, social structure and institutions, in addition to technology innovation… However, applications so far have concentrated on the microeconomic level. There are few examples of evolutionary models of macroeconomic processes… Therefore, their application to normative change has so far been limited."* (pp.6-7)

  - **Agent-based models (ABM): Agent heterogeneity; Changes in social norms and values**[11]
    ABM are used to *"analyze behavior of complex social systems from a bottom-up perspective… ABM allows for the generation of emergent phenomena on the level of a group, organization, or other collection of actors"*. (Köhler et al., 2018; p.9). This type of models are *"able to represent **changes in norms, values and preferences**, including normative change on the group or societal level"* (p.10).[12] *"[**Agent heterogeneity**]is seen as a major strength of ABMs and is one of the key reasons to adopt this approach"* (p.10). These models *"are an extremely successful tool for theory development, that is, to explore the macro-level implications of micro-level assumption"* (Monti et al., 2023; p.1) however, *"a significant drawback of ABMs is their inability to estimate agent-specific (or "micro") variables, which hinders their ability to make accurate predictions using micro-level data."* (p.1)

  - **Socio-ecological systems (SES) modelling: Integrated multi-disciplinary outcomes**
    This approach emphasises the role of the social dimension, and thus is complementary to the focus on economy-environment link of the applied macroeconomics approach. SES *"has the objective of modelling interlinked dynamics of social and ecological systems…They are identified as a separate class of model because they place an emphasis on the coupling of ecological a social processes"* (Köhler et al., 2018; p.12). However, *"the human side of SES modelling has been given relatively little attention in comparison to the ecological side, and models where social and ecological components are fully integrated are rare"* (Gotts, et al., 2019; p.1). To overcome this limitation, SES models have adopted ABM modules in their approach, to explicit model (micro-level) human interactions in a way *"that does justice to the social aspect"* of socio-ecological systems

[11] Dawid, H., & Gatti, D. D. (2018) for a review of the ABM approach applied to macroeconomics.
[12] See for instance Beal Cohen et al. (2021).

(p.2), as this can serve to represent agent heterogeneity and endogenous norms and values (Köhler et al., 2018).

- **System dynamics (SD)**: **Changes in system states**
  SD is often seen as a complementary approach to ABM. These models *"provide an endogenous view on how the dynamic behavior of a system unfolds… based on causal relations between stock and flow variables and constant parameters"* (Köhler et al., 2018; p.10). These relationships can form reinforcing or balancing feedback loops (Köhler et al., 2018). In this approach *"the treatment of changes in norms and behavioral diversity is usually limited"* (p.12), yet these models can be *"informed by various disciplines and by quantitative data… and qualitative sources… [thus,] the SD methodology is well-**suited to consider social and institutional contexts as well as ethical and moral philosophical aspects, if** judged as relevant for model the purpose"* (Hafner et al., 2020; p.8). Therefore, these models can be used to represent both what unravels a **system state change** and its consequences. Their complementarity with ABM rests on the different levels of aggregation. SD serves to represent the evolution of aggregate variables, and these in turn characterise the environment that influences (micro-level) individual interaction and decision making in the ABM approach (Gotts, et al., 2019).

  When applied to the economy, SD and ABM approaches can incorporate Stock Flow Consistent (SFC) modelling (Hafner et al., 2020). The advantage of this combined methodological approach is that *"SFC models emphasize the importance of consistent accounting of all monetary stocks and flows as well as the representation of financial assets and liabilities. Consistent accounting can lead to relevant conclusions by itself because it introduces certain constraints"* (Hafner et al., 2020; p.8) in a manner that is consistent with economic aggregates, such as total output or employment.

6.5.3 Examples of alternative modelling approaches in literature

Table 6.3 presents relevant applications in the literature of the alternative modelling approaches discussed above. The examples presented there are relevant from the perspective of the alternative economic concepts as these specifically deal with societal transitions and produce outcomes from different domains .

Table 6.3: Examples of alternative modelling approaches

Model	Type	Documentation	Recent application
TIAM-ECN at TNO	Process-Based IAM	IAMC (n.d.b)	Dalla Longa et al. (2020) Project the contribution of CCS to emission abatement in industry and power generation in Europe, and quantify the role of technological progress and climate policy stringency in CCS diffusion.

Model	Type	Documentation	Recent application
LowGrow SFC	SD-SFC	Jackson and Victor (2019)	Jackson and Victor (2020) Economic, environmental, and social implications of alternative futures for the Canadian Economy. Outcomes are quantified using two composite indices: an Environmental Burden Index (EBI); and a Sustainable Prosperity Index (SPI)
EURACE	ABM-SFC	Dawid et al. (2016)	Ponta et al. (2018) Economic effects (e.g., GDP, unemployment) of introducing a feed-in tariff instrument to foster investment in renewables.
MISO-v1	SES	Wiedenhofer et al. (2019) – Appendix A1	Wiedenhofer et al. (2019) Socio-economic metabolism space (e.g., in-use material stocks) of two alternative global scenarios of primary and recycled material use.

6.6 Discussion: modelling alternative economic concepts

In this section we discuss some considerations for a modelling project of the alternative economic concepts that relies on the modelling approaches described in the preceding sections.

In general, models are tools to reduce the complexity of the real world with the aim to explain observed past phenomena or, as it would be of relevance for the alternative economic concepts, explore and predict the impacts of alternative pathways.
An adequate quantitative assessment of the alternative economic concepts should rely on a coherent, comprehensive, and consistent modelling framework within which the proposed policy chains of the concepts can be assessed based on a, pre-selected, set of outcomes. Furthermore, the modelling of the alternative economic concepts should be directed to help decision makers and stakeholders to better envision alternative policy paths and understand the potential (intended and unintended) impacts of these paths. To achieve this, we put forward three key points to consider in projects that aim at quantitatively assessing the alternative economic concepts: i) use of the 'narratives' of the concepts a basis for the qualitative **design of scenarios** (visions of the future) that can be quantitatively assessed via a modelling framework; ii) policy chains of the alternative concepts as a source to inform the **selection of the outcomes** to be produced by modelling framework; and iii) **combination of modelling approaches**.

Scenario design
A qualitative scenario design can transparently translate (elements of) the concepts' narratives (i.e. how hypothetical policy chains are to bring about desirable changes at a meaningful scale in a timely manner) into concrete modelling choices. This transparent interpretation of the alternative economic concepts requires acknowledging that models necessarily lean on simplifying assumptions and are not meant to be all-encompassing evaluation frameworks: a quantitative evaluation of the alternative economic concepts considering all of the nuances of a concept, as described in this report, is an impossible and futile task. Instead, the scenario design based on the alternative economic concepts needs

to be accompanied by an explicit selection of the elements of an alternative economic concept that can be translated into specific modelling choices that are distinct across scenarios: model parameterisations, values exogenous of policy variables, which modules in a model (or models in a multi-model approach) should be (in-)active. Doing this in a transparent and well-documented fashion would facilitate both the replicability of the scenario design and adapting the scope of the scenarios in future exercises.

Selection of outcomes from policy chains

Just as important for the modelling exercise is the selection of the outcomes to be analysed. For this, it is key that the most relevant outcomes are not directly imposed (mechanically given) by the scenario inputs(e.g. if an outcome of interest is the emission efficiency of economic activity, this should not be given by an exogenously assumed rate), but rather are a truly endogenous outcome of the modelling exercises, (e.g. emission efficiency can be improved via innovation and innovation effort is determined within the model). The comparison of outcomes across scenarios should help to further our understanding of the potentials and pitfalls of the alternative concepts, by for instance identifying if the outcomes of a concept's proposed policy chain respond as intended to (changes in) the inputs.

Combining different models to cover more key modelling attributes

The selection of elements for the scenario design, of outcomes to be analysed, and of the type of model(s) to use, will ultimately be determined by the (policy) question that the modelling project is looking to answer. One should, however, expect that questions associated with the alternative economic concepts often deal with outcomes in multiple disciplinary domains. Ideally, one should approach this type of questions with a modelling framework that combines various domains, and potentially different model types.

Our analysis in sections 6.4 and 6.5 shows the existent complementarities between different modelling approaches in terms of the key modelling attributes required to represent the alternative economic concepts in a quantitative assessment. This is illustrated in Table 6.4 where, based on the discussion in sections 6.4 and 6.5, we highlight which of the key modelling attributes required to represent the alternative economic concepts more prominently appear in each of the modelling approaches. As demonstrated, no single modelling approach covers the eight modelling attributes. Thus, if all or various of the concepts are to be jointly evaluated in a single exercise, this may call for various models to be combined. Such an endeavour may even be necessary for exercises that focus on a single concept. Whereas the applied macroeconomics approach and the Process-Based IAM can serve to represent 'Green Growth' and 'Mission Economy', concepts like 'Degrowth' that highlight the role of 'changes in norms and values' and 'innovation and technology' may be less satisfactorily captured by a single-model approach.

Moreover, Table 6.4 reveals that changes in norms and values' and of 'uncertainty' are two key modelling attributes that appear to be less adequately covered by existent modelling tools. Quantitative exercises to assess the alternative economic concepts, and that intend to rely on an pre-existent model, can then benefit from considering model extensions that attempt at capturing these features.

Overall, considering a modelling framework for the alternative economic concepts that relies on combining different models, appears particularly relevant if various of the concepts are to be jointly evaluated. However, the combination of various models is a challenge on its own, as ensuring consistency across models, the complexity of establishing hard linkages (i.e. that account for feedbacks across models), and to a lesser extent the usage of common inputs across models, and the performance of cross-checks of common model outcomes, impose

high demands on modelling capacity. Whether this challenge can be overcome will be determined by the modelling capabilities of a given research project, but also on making sensible choices to streamline the modelling requirements.

Table 6.4: Key attributes of modelling approaches

Modelling approach		Model	Key modelling attributes							
			1	2	3	4	5	6	7	8
			non-lin	norms and values	agent hetero	change states	diff scales	uncert	inno & tech	int outc
Applied macroeconomics		CGE	■						■	
		Benefit-Cost IAM	■			■			■	■
Alternative approaches		Process-Based IAM				■	■		■	■
	Complex Systems	Evolutionary Economics	■		■				■	
		ABM	■	■	■	■				
		Socio-ecological Systems	■			■	■	■		
		System Dynamics	■				■			

7 Conclusions and Recommendations

This study has aimed to provide a scientific analysis and comparison of key alternative economic concepts currently being debated in academia and the public realm in the Netherlands and worldwide. These concepts offer policies and pathways that potentially contribute to achieving internationally agreed climate, biodiversity, and sustainable development goals, as well as to staying within scientifically recognised planetary boundaries. Seven international concepts and four Dutch concepts were assessed and compared on their key features and their theory of change. Moreover, this study investigated how the impacts of the concepts can be assessed by modelling, hereby providing insight into the possibilities to analyse the concepts quantitatively. This chapter presents the main conclusions and recommendations of the analysis.

This chapter is structured based on the main research questions formulated at the outset of the report (Text box 7.1). Before answering the research questions, section 7.1 outlines the study's limitations. We then answer the three sub-questions (section 7.2), before turning to the main promises and pitfalls of the concepts for implementation in the Netherlands that follow from the analysis (section 7.3). Section 7.4 provides a proposed agenda for policy makers and researchers, and section 7.5 finally revisits the beyond growth debate with recommendations for next steps in the discussion.

Text box 7.1: Main research question and sub-questions

Main question
What are the potentials, pitfalls, and further research needs for implementing alternative economic concepts in the Netherlands?

Sub-questions
1. How do the different concepts relate to each other?
2. What are the theories of change of the concepts?
3. How can potential impacts of the concepts be quantitatively assessed by modelling?

7.1 Research limitations

Before turning to the conclusions and recommendations of this study, it is useful to take into account the limitations of this research project. First, it is clear that not all alternative economic concepts that are out in the public and academic debate could be analysed here. Rather, based on snowball sampling, a set of alternative economic concepts that figure prominently in the current debate have been selected for closer scrutiny. For example, while Buen Vivir was included in the assessment, other concepts from the Global South such as Happiness Economics (Bhutan) and Ubuntu (South Africa) were not examined in detail.

In addition, some concepts that could be regarded separately were assessed as one in this report. This particularly applies to the Broader Welfare concept: while there are many Broader Welfare frameworks that aim at measuring welfare in broader terms than solely economic, differences between these frameworks exist. Not all of them include the same

indicators or the same dimensions of welfare, and some are more normative than others (e.g. those that take wellbeing as a policy goal). Due to the similarities, we analysed all *"Broader Welfare"* dashboards and composite indicators as one concept, but the nuances could be studied in more detail. Moreover, in this project no detailed comparison was made with a 'business as usual' pathway. This study thus offers a detailed comparison of alternative economic concepts, but not a comparison between alternative concepts and the current economic paradigm and policies. Also, additional assessment criteria (e.g. looking specifically into intended impacts on specific environmental goals such as energy and materials use) might further refine the taxonomy of alternative economic concepts.

This study should therefore be regarded as an extensive and detailed exploration of the beyond growth debate that is the first step in a much larger research trajectory. It thereby paves the way for further empirical research upon which concrete policy decisions can be based. The next sections will suggest some main routes for these investigations.

7.2 Alternative economic concepts assessed

First we turn to the three sub-questions that were asked at the outset of the analysis.

7.2.1 How do the concepts relate to each other?

Even though the alternative economic concepts show similarities, it was found that they can be differentiated on their views towards several aspects. This differentiation can serve as a basis for a taxonomy of concepts.

Concepts can be distinguished based on their view towards the position of GDP. Three overall positions are found: GDP is a dominant indicator and GDP growth is necessary for reaching environmental and social goals (Green Growth, Mission Economy); GDP is one indicator next to a whole set of other indicators (Broader Welfare); or GDP growth is subordinate to reaching environmental and social goals. In the latter view, several variants can be identified: GDP growth or degrowth is a subordinate result of governmental steering towards environmental and social goals ('a-growth', found in Doughnut Economy, Great Mindshift and with some authors under the Degrowth concept); governmental steering towards negative GDP growth is a goal (found with radical authors of the Degrowth concept); and finally, GDP is not a relevant indicator at all (Buen Vivir).

The Degrowth concept comprises different views towards GDP, with recent authors leaning towards an 'a-growth' interpretation of the concept. Contrary to what the name of the concept suggests, opinions about the need for steering towards negative economic growth within the concept differ between authors. In recent interpretations of the concept, e.g. by Jason Hickel, an 'a-growth' position is taken: positive or negative economic growth is an outcome of policies towards environmental and social targets, rather than a policy goal by itself. Sometimes this is also referred to as 'Post Growth'.

Views towards change of norms and values are a further basis for distinction between the concepts. One main approach here is to take norms and values as given. This position generally sees technological innovation as a key lever for change. In particular Green Growth and Mission Economy appear to support this approach. In contrast, an alternative view found is that norms and values need to be fundamentally *changed* as a main driver for transition. This position is held by Doughnut Economy, Degrowth, Great Mindshift, and Buen Vivir. Between these two contrasting approaches, there is a *neutral* approach towards policy implementation, therefore also towards changes of preferences, norms and values. This

approach is held by the Broader Welfare concept. Overall, the view on the change of norms, and values partly overlaps with the take on the role of GDP. Concepts that see current norms and values as a point of departure for policies also see GDP as an important indicator, and concepts that see norms and value change as important generally, see GDP as subordinate to environmental and social goals.

Three main families of concepts can be distinguished based on the overall taxonomy analysis. The three families are a Measurement-family, a Current Norms and Values-family, and a Change of Norms and Values-family. The seven international and four Dutch alternative economic concepts that were assessed can be grouped within these families (Figure 7.1): Green Growth, Green Growth Netherlands, and Mission Economy are part of the Current Norms and Values-family, whereas Doughnut Economy, Degrowth, Post Growth Netherlands, Great Mindshift, Purpose Economy Netherlands, and Buen Vivir can be grouped under the Change of Norms and Values-family. The Measurement-family comprises Broader Welfare concept as well as Broad Welfare Netherlands, that either provide indicator dashboards or composite indicators to measure Broader Welfare.

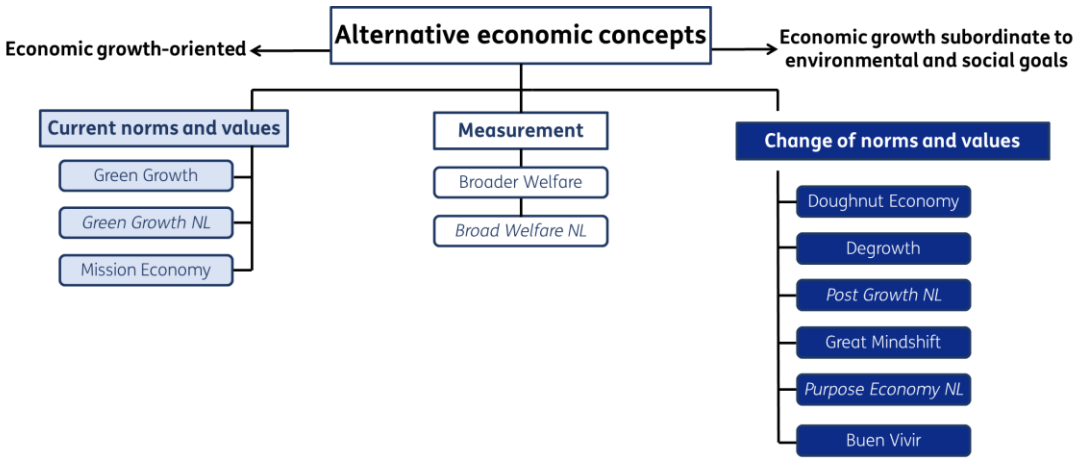

Figure 7.1: A taxonomy of alternative economic concepts

7.2.2 What are theories of change of the concepts?

The theory of change analysis of the alternative economic concepts revealed several key findings.

All concepts show significant gaps in their theories of change and partly depend on unproven assumptions. For concepts in the Current Norms and Values-family, there is in particular a gap between policy outcomes and outputs: it is not clear if and how the outputs of policies will lead to the desired absolute decoupling of economic growth from natural capital use (taking into account not only decoupling from greenhouse gas emissions, but also preventing the simultaneous depletion of a wide range of other natural resources on a global scale, and over a long period of time). For the Change of Norms and Values-family, the relationship between suggested policies and the impacts aimed for are particularly unclear.

Furthermore, all concepts partly depend on unproven underlying assumptions, for example whether or not proposed policies for internalisation of externalities in Green Growth will lead

to absolute decoupling of economic growth from the use of natural capital, or if proposed policies in Degrowth will indeed lead to a shift towards ecocentric values of citizens. None of the different scaling routes that are assumed by the different concepts are as of yet backed up by conclusive empirical evidence.

A self-assessment of risks, drawbacks, and side-effects is missing for all alternative economic concepts. Rather, concepts point to the assumed weak points of other concepts in order to support their own position. The assessment of weak points in this study indicates that potential risks for all concepts lie, in particular, in their incomplete policy impact chains that lack a sound and detailed underpinning of how the implementation of the suggested policies would lead to the intended final impacts. Drawbacks of concepts might be found in their extreme application, potentially resulting in a society in which higher incomes can still afford to pollute while lower incomes are deprived from basic goods and services in the case of Green Growth, or in more or less far going restrictions of individual freedom of choice in the case of Degrowth.

Concepts nevertheless provide several innovative ideas for policymaking. The assessment revealed that all concepts offer a spectrum of innovative policies, some of which are very far-away from current policies (e.g. reform of financial institutions), others are in fact very close to standing policy in some countries (e.g. reduction of food waste, right to repair). Many of these policies in fact appear to be independent from the concept under which they are presented. For example, redistribution policies presented under Degrowth could be also implemented under the umbrella of the Green Growth concept.

Different scaling mechanisms and views on governmental roles provide a further basis for a distinction between concepts. While some concepts suggest strong governmental interference as a primary driver for change, others rather suggest that markets or citizens and entrepreneurs could be the key drivers for change. In this way, a dimension of 'driven by state or government' versus 'driven by individual citizens and entrepreneurs' can be added to the taxonomy. This expands the identified dichotomy of current norms & values versus norms & value. The resulting coordinate system is spanned in particular by four of the examined concepts, i.e. Green Growth, Mission Economy, Degrowth and Great Mindshift, while the other concepts can also be plotted in the figure (Figure 7.2).

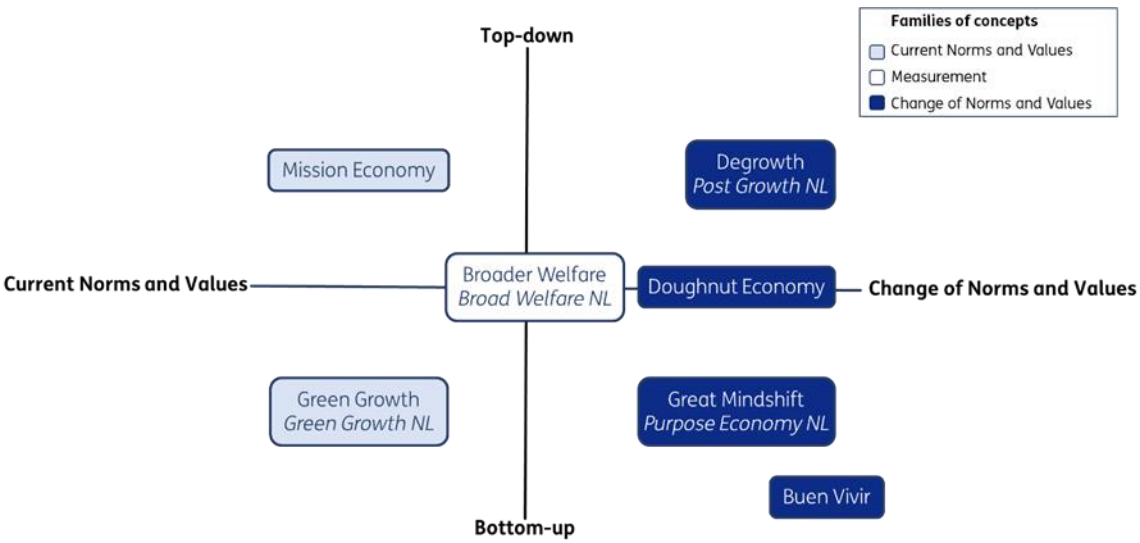

Figure 7.2: An expanded taxonomy of alternative economic concepts

7.2.3 How can the concepts be analysed with modelling?

The analysis indicates that modelling tools from different disciplines can be used to perform ex ante assessments of the alternative concepts. This can shed light on whether a concept can reach its intended impacts through the proposed policy chain and to unveil the (unintended) side effects of a large scale implementation of the suggested policy chain.

Models need a set of eight key attributes to be able to quantitatively assess alternative economic concepts. For a model to represent the concept adequately, the concept's differential aspects should be expressed in the model's attributes. We identify a set of 8 key modelling attributes that are necessary for adequately representing alternative economic concepts: non-linear responses of society to change; changes of norms and values; agent heterogeneity; system changes; linking different geographical and time scales; dealing with uncertainty; technological innovation; and multidimensional outcomes. Comparing these to the distinctive features of each alternative economic concept, it can then be assessed to which extent current modelling tools (including applied macroeconomic models and alternative approaches such as Process-Based IAM and Agent Based Models) include these attributes.

For a comprehensive assessment, a suite of various models is needed. It is concluded that no single modelling tool so far seems to incorporate the full list of key attributes that are deemed relevant to comprehensively quantify the potential impact of the concepts. Rather, the selection of a modelling tool needs to be driven by the specific (policy) question that the modelling project is after. In such a case, an individual modelling tool may be adequate to evaluate a limited set of concepts or a limited set of differential aspects of the concepts, however as a good practice, these limitations should be transparently acknowledged. If instead, the question at hand requires a comprehensive, and joint evaluation of the concepts, this is likely to require setting up a modelling framework with various complementary individual models.

The taxonomy can inform the selection of model outcomes and scenario design to assess the impacts of different alternative economic concepts. Next to the selection of the modelling tool(s), modelling projects need to deal with how to differentiate between economic concepts and how to evaluate the impacts of the concept. For the assessment of individual concepts, their policy chains can be used to inform the *selection of the outcomes* that the modelling framework is to produce, i.e. what parameters should be modelled. The taxonomies and policy chains of the individual concepts can also be used for qualitative *design of scenarios* that can then be further translated into alternative inputs for the modelling exercise.

7.3 Main potentials and pitfalls of alternative economic concepts

The main pitfall for implementation of alternative economic concepts in the Netherlands is the gaps in the policy impact chains of all concepts. These gaps in the policy chain indicate that, so far, there is no conclusive scientific evidence that Green Growth, Degrowth, or any of the other concepts are able to address the environmental and social crises mentioned at the outset. Therefore none of the concepts would be ready for full implementation in the Netherlands. However, as stated at the introduction of this report, the current growth-focused policies do not seem fully capable of meeting international

agreements on environmental and social goals (IPCC, 2022b; OECD, 2022). Continuing on the current trajectory may therefore carry large risks as well .

As a main potential, all concepts are found to offer policies and policy pathways that are innovative from a societal perspective and therefore deserve further policy and research attention. Examples of such policies are for instance a progressive tax on consumption, substantially reduced working weeks, or the inclusion of unpaid care work into the economic system. Furthermore, the call for a shift in norms and values by some concepts has already contributed to bottom-up action (e.g. Doughnut Economy policies in the municipality of Amsterdam) that at least should be monitored for its potential to scale up in the future.

The specific potentials and pitfalls per concept that are identified are listed in Tables 7.1 and 7.2.

Table 7.1: Analysis of main potentials and pitfalls of international alternative economic concepts

Concept	Key policy impact chain-mechanism	Key potential(s) identified	Key pitfall(s) identified
Broader Welfare	Wide indicator set to guide policymaking towards 'broad welfare'	Allows for multi-criteria analysis of 'broad welfare'	Trade-offs between indicators unspecified; no clear guidance on how indicator set will lead to changes in policymaking
Green Growth	Internalisation of environmental externalities in prices and stimulation of (primarily) technological innovation	Fits with present economic views through reliance on market based policies to reach environmental goals. No major changes in norms, values, and institution needed.	The possibility of absolute decoupling of economic activity from natural capital depletion in practice lacks conclusive scientific evidence
Mission Economy	Mobilisation of economy and society by directive governmental action	Allows to steer innovation into directions chosen by governments. Fits with present norms and values. Strong governmental action might overcome (market) barriers.	Risk of 'Mission' failures with high impacts to economy and society because of high public investments
Doughnut Economy	Regenerative and redistributive policies steer change that keep the economy within social borders and planetary boundaries	Offers a different perspective on societal welfare. Agnosticism about economic growth might gain more societal support than negative economic growth as a goal in itself.	Final societal impacts and exact policy routes are unclear
Degrowth	Strong governmental policies lead to reduced consumption and/or keeping the society within social borders and planetary boundaries	Offers a different perspective of societal welfare together with alternative policy options	Wide variety of more and less radical interpretations of the concept. Lack of clarity about final societal impacts and intended policy routes towards value change.

Concept	Key policy impact chain-mechanism	Key potential(s) identified	Key pitfall(s) identified
Great Mindshift	Bottom-up innovation in 'niches' aided by 'regime' and 'landscape' shifts will provide necessary economic and societal change	Offers a different perspective of societal welfare starting from individual value change	Lack of clarity about scaling mechanism from individual personal or entrepreneurial innovations towards societal change
Buen Vivir	Community-based governance and rights for nature lead to living in balance with natural resources and to meeting social needs	Offers a different perspective of societal welfare based on connectedness of people and the planet as they are all part of nature	Unclear scaling mechanism from local to global level. Dependency on specific cultural contexts unclear.

Table 7.2: Analysis of main potentials and pitfalls of Dutch alternative economic concepts

Concept	Related international concept	Differences with counterpart	Differences in potentials/pitfalls compared to counterpart
Broad Welfare_NL	Broader Welfare	Relatively far stage of development and implementation in the Netherlands already	None
Green Growth_NL	Green Growth	Specifies sectoral policies for the Dutch context	Less strict interpretation of Green Growth, with more attention to social welfare
Post Growth	Degrowth	Follows growth agnostic interpretation of Degrowth. Progressive consumption tax combined with reduced tax on labour are main instruments. Specifies sectoral policies for Dutch context. Provides explicit policy impact chain	Less strict interpretation of Degrowth, relatively well developed theory of change
Purpose Economy	Great Mindshift	Strongly focuses on entrepreneurial frontrunners. Few/no specifics for Dutch context provided	None

7.4 An agenda for policy makers and researchers

Based on these research results, the alternative economic concepts seem to hold a variety of promising policies and societal innovations, but are in their current stage of conceptualisation not yet ready to be implemented in practice as a complete policy package for solving current environmental and social problems. Therefore three main recommendations are given, with the first two especially directed to policymakers.

1. The main recommended action for policy makers based on the conclusions of this report is to further explore different scenarios for alternative futures for society in the Netherlands. As outlined above, the alternative economic concepts that were investigated offer an alternative to current economic policies and thereby a chance to reach

environmental and societal goals that are currently not on target to be met. Seeing each of the alternative economic concepts as a possible scenario for a future society in the Netherlands that is based on a distinctive worldview, and elaborating these scenarios in more detail could substantially widen the available portfolio for future policies. Depending on prevailing political and societal worldviews, a systematic selection of the policies and concepts embodied by these scenarios could then be made.

2. It is also recommended to experiment and co-create concrete innovative policies for the future that are based on the alternative economic concepts, together with researchers, stakeholders and the public. Policymakers could specifically engage in three activities: policy experiments, policy evaluations, and modelling studies. These could be undertaken at national, regional, and local governance levels. Policy experiments can serve as an empirical assessment that could demonstrate the actual effects of suggested policies. Policy evaluations of experiments that have already taken place (such as with Doughnut Economics in the municipality of Amsterdam) could provide lessons for practical implementation in the future. Quantitative scenario studies furthermore could yield insights into the more precise impacts of a transition to an alternative economy.

3. Finally, it is recommended to carry out further research into alternative economic concepts along four main routes. The four suggested routes for such research are: to complete the policy impact chains for all concepts; to analyse scenarios based on the underlying norms, values and welfare views that are underlying to the concepts; to quantify the potential impacts of individual innovative policy measures suggested in the concepts; and to examine public support for policies that aim at influencing current norms and values. Based on these four main research routes, Text box 7.1 proposes a more detailed research agenda for alternative economic concepts.

Text box 7.2: Proposed research agenda on alternative economic concepts

Route 1: Complete policy impact chains for all concepts

1. **Policy impact chain** – This project showed that many concepts remain unclear about steps in their policy impact chain and how they are linked. Further research is therefore needed to fill the gaps in inputs, policies, outputs, outcomes and final impacts in the policy impact chains that were identified.
2. **Risks** – It was analysed that risks, side-effects and drawbacks of each concept have mainly been brought forward in criticism from the outside, often by proponents of a different concept. A more detailed risk analysis for each concept, also investigating possible routes for risk mitigation, would therefore be necessary.
3. **Underlying assumptions -** To what extent could underlying assumptions to concepts are empirically supported, e.g. could absolute decoupling of economic activity and natural resource use be achieved for a wide range of resources simultaneously on a global scale and for a longer time frame? And could such a decoupling rely solely on technological innovation, as Green Growth and Mission Economy seem to imply?

Route 2: Analyse scenarios based on the norms, values, and welfare views that are underlying to the concepts

4. **Scenarios** – Underlying to the concepts, there appears to be alternative views on welfare, norms and values. These need to be further analysed. How would society look like in practice if a concept like Degrowth or Mission Economy would be implemented? Could concepts be implemented in different contexts, e.g. could concepts from the Global South, such as Buen Vivir, be adopted in the Netherlands?
5. **Governance and power relations** – What would transitions mean for transitional governance, leadership, democracy and power relations? Who would be winners and losers and how could they accelerate or delay a transition?
6. **Measurement** – To what extent are the indicators of e.g. the Broad Welfare dashboards robust for different worldviews underlying to the concepts? What priorities would be given to different indicator sets in different scenarios?

Route 3: Quantify the potential impacts of innovative policy measures suggested in the separate concepts

7. **Modelling** – The final impacts of concepts and of selected individual policies on society could be investigated and quantified by way of modelling.
8. **Individual policies** – Within the alternative economic concepts, several individual innovative policies like a progressive consumption tax, significantly shorter working weeks and including unpaid care work in the economy are proposed. These could be further explored qualitatively and quantitatively independent of the concept in which they were proposed.

Route 4: Examine public support for policies that aim at influencing current norms and values

9. **Public support for norms and values policies** – Some alternative economic concepts imply not only behavioural change, but also change of underlying norms and values. If social innovation via change of behaviour, norms, and values is considered necessary, how could public support for such policies be effectuated?
10. **Policy evaluation and experiments** While some concepts have been applied on larger or smaller scale (for example, Green Growth, Mission Economy, Doughnut Economics), others have not. Policy evaluation and experiments into application of the concepts could provide empirical insights into the effectiveness of suggested policies.

7.5 Further steps in the Beyond Growth debate

Finally, we return to the Beyond Growth debate as a whole. It was found that at present, a particularly lively vehement debate seems to be taking place between Green Growth and Degrowth proponents, with so far, no conclusive evidence to fill the current gaps in their policy impact chains for either side.

However, the taxonomy of alternative economic concepts that was proposed in this report suggests the possibility of another approach to the debate. Indeed, the axes of the proposed taxonomy of alternative economic concepts (Figure 7.2) indicate that, underlying to what appears to be at first sight an economic debate about growth, there seem to be two more fundamental normative questions. One concerns our norms and values, the other the system of governance that we prefer:

- **How do we want to define our future individual wellbeing and collective welfare**? Does individual wellbeing and collective welfare start from our current norms, values, and preferences, or would more fundamental norms and value shifts for the collective good be necessary and acceptable?

- **Who do we allow to influence us on the road towards future individual wellbeing and collective welfare?** Should change be fundamentally based on bottom-up actions from enlightened businesses and citizens, or should rather government take a very direct and prescriptive role in nudging us towards change?

Taking these two fundamental questions as a new starting point for a future discussion, a more constructive public, policy and scientific debate seems possible if the existence and legitimacy of different normative answers to these questions would be recognised. Based on such a recognition, various scenarios for different sustainable societies in the future could then be developed and analysed along the main research routes that were suggested in this report. In this way, it is believed that in the years to come, fundamentally new, and hopefully more fruitful steps in the Beyond Growth debate could be taken.

References

Acosta, A. (2018). *O Bem Viver: uma oportunidade para imaginar outros mundos*. São Paulo: Editora Elefante.

Acosta, A., & Abarca, M. M. (2018). Buen Vivir: An alternative perspective from the peoples of the global south to the crisis of capitalist modernity. *The climate crisis: South African and global democratic eco-socialist alternatives,* 131-147.

Alcott, B. (2005) Jevons' paradox, Ecological Economics, Volume 54, Issue 1, 2005, Pages 9-21, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2005.03.020.

Baarsma, B. (2022) Over de (on)zon van economische groei, Uitgeverij Pluim, Amsterdam/Antwerpen

Babiker, M., Gurgel, A., Paltsev, S., & Reilly, J. (2009). Forward-looking versus recursive-dynamic modeling in climate policy analysis: A comparison. *Economic Modelling*, *26*(6), 1341-1354.

Barlow, Nathan, Livia Regen, Noémie Cadiou, Ekaterina Chertkovskaya, Max Hollweg, Christina Plank, Merle Schulken and Verena Wolf (eds.) (2022) Degrowth & Strategy – How to bring about social-ecological transformation, Mayfly Books, ISBN 978-1-906948-60-3.

Bauer, Diana; Papp, Kathryn (2009) Book Review Perspectives: The Jevons Paradox and the Myth of Resource Efficiency Improvements, Sustainability: Science, Practice, & Policy. 5 (1), doi:10.1080/15487733.2009.11908028

Bergh, Jeroen C.J.M. van den (2011) Environment versus growth — A criticism of "degrowth" and a plea for "a-growth", Ecological Economics, Volume 70, Issue 5, 2011, Pages 881-890, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2010.09.035

Bilancini, E., & D'Alessandro, S. (2012). Long-run welfare under externalities in consumption, leisure, and production: A case for happy degrowth vs. unhappy growth. *Ecological Economics*, *84*, 194-205.

Bithas, K. (2011) Sustainability and externalities: Is the internalization of externalities a sufficient condition for sustainability?, Ecological Economics, Volume 70, Issue 10, 2011, Pages 1703-1706, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2011.05.014.

Bowen, A., & Hepburn, C. (2014). Green growth: an assessment. *Oxford Review of Economic Policy*, 30(3), 407–422.

Cambridge Econometrics (2022). E3ME Model Manual. https://www.e3me.com/features/"

Capasso, M., Hansen, T., Heiberg, J., Klitkou, A., & Steen, M. (2019). Green growth–A synthesis of scientific findings. Technological Forecasting and Social Change, 146, 390-402.

Capros, P., Van Regemorter, D., Paroussos, L., Karkatsoulis, P., Fragkiadakis, C., Tsani, S., ... & Abrell, J. (2013). GEM-E3 model documentation. *JRC Scientific and Policy Reports*, *26034*.

CBS (2023) Dossier Well-being and the Sustainable Development Goals, https://www.cbs.nl/en-gb/dossier/dossier-well-being-and-the-sustainable-development-goals

Centrum voor onderzoek en advies rondom brede welvaart (2023) Sufficiency https://www.postgroei.nl/

Chen, H.-T. (1990). Theory-driven evaluations. Newbury Park, CA: Sage Publications Inc.

Chertkovskaya, E., Paulsson, A., & Barca, S. (Eds.). (2019). *Towards a political economy of degrowth*. Rowman & Littlefield.

Climate Action Tracker (2023). 2100 Warming Projections: Emissions and expected warming based on pledges and current policies. December 2023. Available at: https://climateactiontracker.org/global/temperatures/.
Cobb, C, Halstead, T., Rowe, J. (1995) If the GDP is up, why is America down? Atlantic - Boston, 276 (1995), pp. 59-79
CPB (2022) Notitie 'Brede welvaart: het CPB voorbij het bbp', cpb.nl
Dalla Longa, F., Detz, R., & van der Zwaan, B. (2020). Integrated assessment projections for the impact of innovation on CCS deployment in Europe. *International Journal of Greenhouse Gas Control*, *103*, 103133.
Daly, H. (1991). Steady-State Economics. Washington, D C.
Daly, H. (2014) Beyond growth: the economics of sustainable development, Beacon Press
Dawid, H., & Gatti, D. D. (2018). Agent-based macroeconomics. *Handbook of Computational Economics*, 4, 63-156.
Dawid, H., Harting, P., van der Hoog, S., & Neugart, M. (2016). A heterogeneous agent macroeconomic model for policy evaluation: Improving transparency and reproducibility. *Working Paper*.
DEAL (2024) Doughnut Economics Action Lab, website DEAL (doughnuteconomics.org) Retrieved 28-6-24
De Mooij, R.A., van Den Bergh, J.C. (2002). Growth and the Environment in Europe: A Guide to the Debate. *Empirica* **29**, 79–91 https://doi.org/10.1023/A:1015642326265
Dearden, J. (2014). *English as a medium of instruction-a growing global phenomenon*. British Council. Retrieved on 23 November 2023 via download_file (ox.ac.uk).
Dragicevic, A.Z. (2024) Deconstructing the Doughnut, Current Opinion in Environmental Sustainability, Volume 68, 2024, https://doi.org/10.1016/j.cosust.2024.101451.
Dutch Government (2014) Government supports green growth of the economy, website, retrieved 6-5-2024, https://www.rijksoverheid.nl/onderwerpen/duurzame-economie/groene-groei
Dutch Government (2023) National Budget [Miljoenennota] https://www.rijksoverheid.nl/onderwerpen/prinsjesdag/miljoenennota-en-andere-officiele-stukken
Dutch Government (2024) Overheid steunt groene groei economie | Duurzame economie | Rijksoverheid.nl Website, retrieved 28-6-2024
Dutch Government (2024b) 'Mazzucato als inspirator voor Missiegedreven Topsectoren- en Innovatiebeleid' | Nieuwsbericht | Topsectoren Website, retrieved 28-6-2024
Easterlin (1974) Does Economic Growth Improve the Human Lot? Some Empirical Evidence, in Paul A. David; Melvin W. Reder (eds.). *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz*. New York: Academic Press, Inc.
Easterlin, R. A. (2004). The Economics of Happiness. *Daedalus*, *133*(2), 26–33.
Enríquez-Villota, M.F. (2019) A Psychological Approach to the Scientific Study of Welfare, Psychology, Vol.10 No.7, 2019
European Commission (2021). Transitions Performance Index 2021, Towards fair and prosperous sustainability. Retrieved at Transitions Performance Index (TPI) (europa.eu) on 16 October 2023.
European Commission (2024). EU Missions in Horizon Europe. Website, EU Missions in Horizon Europe - European Commission (europa.eu) retrieved 28-6-2024.
European Parliament (2023) Beyond Growth 2023 Conference website https://www.beyond-growth-2023.eu/ (retrieved 12 January 2024)
Fagiolo, G., & Roventini, A. (2012). On the scientific status of economic policy: a tale of alternative paradigms. *The Knowledge Engineering Review*, *27*(2), 163-185.
FBK Fund Against Child Labour (2023) FBK Theory of Change Guidelines 1-FBK Theory of Change Guidelines 0 | PDF | Cognition | Cognitive Science (scribd.com)

Fisher-Vanden, K., & Weyant, J. (2020). The evolution of integrated assessment: Developing the next generation of use-inspired integrated assessment tools. *Annual Review of Resource Economics*, *12*, 471-487.

Fitzpatrick, N., Parrique, T., & Cosme, I. (2022). Exploring degrowth policy proposals: A systematic mapping with thematic synthesis. *Journal of Cleaner Production*, 365, 132764.

Fox, J. (2012). The economics of wellbeing. *Harvard Business Review*, *90*(1-2), 78-83.

Geels, Frank W., and Johan Schot (2010) The Dynamics of Transitions. A Socio-Technical Perspective In Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change, edited by John Grin, Jan Rotmans, and Johan Schot, 9–102. New York: Routledge.

Germain, M. (2017). Optimal versus sustainable degrowth policies. *Ecological Economics*, *136*, 266-281.

Göpel, M. (2016) The Great Mindshift - How a New Economic Paradigm and Sustainability Transformations go Hand in Hand, Springer Open, Wuppertal Institut

Gotts, N. M., van Voorn, G. A., Polhill, J. G., de Jong, E., Edmonds, B., Hofstede, G. J., & Meyer, R. (2019). Agent-based modelling of socio-ecological systems: Models, projects and ontologies. *Ecological Complexity*, 40, 100728.

Grin, John, Jan Rotmans, and Johan Schot, eds. (2010) Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change. Routledge Studies in Sustainability Transitions. New York: Routledge.

Gross National Happiness USA (n.d.). Genuine Progress Indicator. Retrieved at Genuine Progress Indicator – Gross National Happiness USA (gnhusa.org) on 2 October 2023.

Gudynas, E. (2011). Buen Vivir: today's tomorrow. *development*, *54*(4), 441-447.

Haberl, Helmut; Wiedenhofer, Dominik; Virág, Doris; Kalt, Gerald; Plank, Barbara; Brockway, Paul; Fishman, Tomer; Hausknost, Daniel; Krausmann, Fridolin; Leon-Gruchalski, Bartholomäus; Mayer, Andreas (2020). "A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: synthesizing the insights". *Environmental Research Letters*. 15 (6): 065003. Doi:10.1088/1748-9326/ab842a. ISSN 1748-9326. S2CID 216453887.

Hafner, S., Anger-Kraavi, A., Monasterolo, I., & Jones, A. (2020). Emergence of new economics energy transition models: a review. *Ecological Economics*, 177, 106779.

Harangozo, G., Csutora, M., & Kocsis, T. (2018). How big is big enough? Toward a sustainable future by examining alternatives to the conventional economic growth paradigm. *Sustainable Development*, *26*(2), 172-181.

Hasekamp, P. (2023, 26 June). EW Economie-lezing Pieter Hasekamp: Van investeren en verdelen komt de winst. Retrieved on 11 December via EW Economie-lezing Pieter Hasekamp: Van investeren én verdelen komt de winst - EW (ewmagazine.nl).

Hazekamp, P. (2023) Van investeren én verdelen komt de winst, CPB lezing, 26 June 2023

Heikkinen, T. (2015). (De) growth and welfare in an equilibrium model with heterogeneous consumers. *Ecological Economics*, *116*, 330-340.

Heikkinen, T. (2018). An equilibrium framework for the analysis of a degrowth society with asymmetric agents, sharing and basic income. *Ecological Economics*, *148*, 43-53.

Hickel, J. (2020) Less is more, how degrowth will save the world, Penguin Books, London

Hickel, Jason, Giorgos Kallis, Tim Jackson, Daniel W. O'Neill, Juliet B. Schor, Julia K. Steinberger, Peter A. Victor & Diana Ürge-Vorsatz (2022) Degrowth can work — here's how science can help, Nature, Vol 622, 15 December 2022, p. 400-403.

Hill, L. (2020). Introduction: The New Science of Welfare and Happiness. In: Adam Smith's Pragmatic Liberalism. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-19337-9_1

IAMC. (n.d.a). *What are IAMs?*. Integrated Assessment Modeling Consortium. Retrieved November 23, 2023, from https://www.iamconsortium.org/what-are-iams/

IAMC. (n.d.b). *TIAM-ECN.* Integrated Assessment Modeling Consortium. Retrieved November 28, 2023, from https://www.iamcdocumentation.eu/index.php/TIAM-ECN

IMPLAN. (June 27, 2017). *Detailed Key Assumptions of IMPLAN & Input-Output Analysis. What are IAMs?*. https://support.implan.com/hc/en-us/articles/115009505587-Key-Assumptions-of-IMPLAN-Input-Output-Analysis

IPBES (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Bonn: IPBES secretariat. Retrieved on 11 December via Global Assessment Report on Biodiversity and Ecosystem Services | IPBES secretariat.

IPCC (2022a). Sixth Assessment Report IPCC_AR6_WGII_FullReport.pdf

IPCC (2022b). *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926

Jackson, T. (2016) Prosperity without Growth. Economics for a finite earth. Routledge, ISBN 9781138935419

Jackson, T., & Victor, P. A. (2019). LowGrow SFC: a stock-flow-consistent ecological macroeconomic model for Canada. *CUSP Working Paper*, (16), 71.

Jackson, T., & Victor, P. A. (2020). The transition to a sustainable prosperity-a stock-flow-consistent ecological macroeconomic model for Canada. *Ecological Economics*, 177, 106787.

Jakob, M., & Edenhofer, O. (2014). Green growth, degrowth, and the commons. *Oxford Review of Economic Policy*, *30*(3), 447–468.

Jensen, J. (2023) Beyond growth - Pathways towards sustainable prosperity in the EU, EPRS European Parliamentary Research Service, PE 747.108, May 2023

JRC Joint Research Centre, Institute for the Protection and Security of the Citizen, Saisana, M., Philippas, D. (2012) *Sustainable society index (SSI) – Taking societies' pulse along social, environmental and economic issues*, Publications Office, **https://data.europa.eu/doi/10.2788/6330**

Kallis, G., Demaria, F., D'Alisa (2015) Degrowth. In: James D. Wright (editor-in-chief), International Encyclopedia of the Social & Behavioral Sciences, 2nd edition, Vol 6. Oxford: Elsevier. pp. 24–30. ISBN: 9780080970868.

Kallis, Giorgos (2011) In defence of degrowth, Ecological Economics, Volume 70, Issue 5, Pages 873-880, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2010.12.007.

Khmara, Yarina & Jakub Kronenberg (2020) Degrowth in the context of sustainability transitions: In search of a common ground, Journal of Cleaner Production, Volume 267, ISSN 0959-6526, https://doi.org/10.1016/j.jclepro.2020.122072.

Kibasi, T. (2021). Mission Economy by Mariana Mazzucato review – the return of the state. The Guardian, 20 January 2021, retrieved via Mission Economy by Mariana Mazzucato review – the return of the state | Politics books | The Guardian on 11 October 2023.

Klomp, K. (2022) Betekeniseconomie – de waarde van verweven leven. Noordhoff Business, Groningen / Utrecht

Köhler, J., de Haan, F., Holtz, G., Kubeczko, K., Moallemi, E., Papachristos, G., & Chappin, E. J. L. (2018). Modelling sustainability transitions: An assessment of approaches and challenges. *Journal of Artificial Societies and Social Simulation*, 21(1).

Kothari, A., Demaria, F., & Acosta, A. (2014). Buen Vivir, degrowth and ecological Swaraj: Alternatives to sustainable development and the green economy. *Development, 57*(3-4), 362-375.

Kuhn, Thomas (1962) The Structure of Scientific Revolutions. Chicago: University of Chicago

Latouche, S. (2009). *Farewell to growth*. Malden: Polity Press.

Layard, R. (2006) Happiness and Public Policy: A Challenge to the Profession, *The Economic Journal*, Volume 116, Issue 510, March 2006, Pages C24–C33, https://doi.org/10.1111/j.1468-0297.2006.01073.x

Lenaerts, K., Tagliapietra, S., & Wolff, G. B. (2021). Can climate change be tackled without ditching economic growth? Bruegel. http://www.jstor.org/stable/resrep36341

Lenaerts, K., Tagliapietra, S., & Wolff, G. B. (2021). Can climate change be tackled without ditching economic growth? Bruegel. http://www.jstor.org/stable/resrep36341

Mainar-Causapé, A.J., Ferrari, E., McDonald, S. (2018). Social accounting matrices: basic aspects and main steps for estimation. *JRC Technical Reports* (EUR 29297 EN). Publications Office of the European Union

Marchand, L., & Hérault, M. (2019). The implementation of buen vivir in Ecuador: an analysis of the stakeholders' discourses. *European Journal of Sustainable Development*, *8*(3), 282-282.

Mazzucato, M. & McPherson, J. (2019) What the green revolution can learn from the IT revolution: A green entrepreneurial state, IIPP Policy Brief 08, July 2019

Mazzucato, M. (2019b) Governing Missions: Governing Missions in the European Union, https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/governing-missions-european-union_en

Mazzucato, M. (2013). The Entrepreneurial State, Debunking Public vs. Private Sector Myths. Dublin: Penguin Books.

Mazzucato, M. (2018). The Value of Everything: Making and Taking in the Global Economy. Dublin: Penguin Books.

Mazzucato, M. (2021). Mission economy: A moonshot guide to changing capitalism. Penguin UK.

Mazzucato, M. (2023) The Big Con, How the Consulting Industry Weakens our Businesses, Infantilizes our Governments and Warps our Economies' Penguin UK.

McGregor, J. A., & Pouw, N. (2017). Towards an economics of wellbeing. *Cambridge Journal of Economics*, *41*(4), 1123-1142.

Meadows, D.H. et al. (1972). The Limits to growth; a report for the Club of Rome's project on the predicament of mankind. New York :Universe Books

Meadows, Donella (1999) "Leverage Points: Places to Intervene in a System." Hartland, VT: The Sustainability Institute. http://www.donellameadows.org/wp-content/userfiles/Leverage_Points.pdf.

Milanovic, B. (2021) Degrowth: solving the impasse by magical thinking - A critique of degrowth, Global inequality and more, Degrowth: solving the impasse by magical thinking (substack.com)

Mulder et al., P. (2024) Socio-economic impact of green transitions, TNO

Muraca, B. (2013). Décroissance: A Project for a Radical Transformation of Society. *Environmental Values*, *22*(2), 147–169. http://www.jstor.org/stable/23460976

Nordhaus, Ted & Schellenberger, Michael (2005) The Death of Environmentalism – Global Warming Politics in a Post-Environmental World, env_v3.indd

Nordhaus, W. (February 3, 2020). *DICE/RICE Models: Scientific and Economic Background on DICE models*. https://williamnordhaus.com/dicerice-models

OECD (2022) The Short and Winding Road to 2030: Measuring Distance to the SDG Targets, OECD Policy Insights https://www.oecd-ilibrary.org/docserver/3326f232-en.pdf?expires=1705052944&id=id&accname=oid017645&checksum=83C4795A4C640ADE133E1C49A6FDF01D

OECD (2011) Compendium of OECD wellbeing indicators. *OECD*, *50*, 1-40.

OECD (2011b) Towards Green Growth, OECD Publishing, Paris

Pearce, D. (1992). Green Economics. *Environmental Values*, *1*(1), 3–13. http://www.jstor.org/stable/30301251

Pesch, U. (2018). Paradigms and paradoxes: The futures of growth and degrowth. *International Journal of Sociology and Social Policy, 38*(11-12), 1133-1146.

Polanyi, Karl (1957) The Great Transformation: The Political and Economic Origins of Our Time. Boston, MA: Beacon Press.

Ponta, Linda, Marco Raberto, Andrea Teglio, Silvano Cincotti (2018) An Agent-based Stock-flow Consistent Model of the Sustainable Transition in the Energy Sector, Ecological Economics, Volume 145, 2018, Pages 274-300, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2017.08.022.

Raworth, K. (2017). *Doughnut economics: seven ways to think like a 21st-century economist*. Dublin: Penguin Books.

Richardson, K., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S. E., Donges, J. F., ... & Rockström, J. (2023). Earth beyond six of nine planetary boundaries. *Science advances*, *9*(37), eadh2458.

Rivera, G. L., Malliet, P., Saussay, A., & Reynès, F. (2018). The state of applied environmental macroeconomics. *Revue de l'OFCE*, (3), 133-149.

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., ... & Foley, J. A. (2009). A safe operating space for humanity. *Nature*, *461*(7263), 472-475.

Rogers, P. (2014) Theory of Change, Methodological Briefs: Impact Evaluation 2, UNICEF Office of Research, Florence

Rotmans, J. (2014) Verandering van tijdperk, Aeneas Uitgevers

Saisana, M., & Philippas, D. (2012). Sustainable Society Index (SSI): Taking societies' pulse along social, environmental and economic issues. *Environmental Impact Assessment Review*, *32*, 94-106.

Sarkodie, S.A., Owusu, P.A. & Taden, J. (2023). Comprehensive green growth indicators across countries and territories. *Sci Data* 10, 413. https://doi.org/10.1038/s41597-023-02319-4

Schenderling, P. (2022) Er is leven na de groei – hoe we onze toekomst realistisch veilig stellen. Bot Uitgevers.

SER (2021) Brede welvaart: waarom de SER al 30 jaar hamert op het belang ervan, website notice 12 October 2021, retrieved 2 February 2024, https://www.ser.nl/nl/Publicaties/brede-welvaart-ser

Smulders, S., Toman, M., & Withagen, C. (2014). Growth theory and "green growth." Oxford Review of Economic Policy, 30(3), 423–446

Spash, C. L. (2020). A tale of three paradigms: Realising the revolutionary potential of ecological economics. *Ecological Economics*, *169*, 106518.

Stegeman, H. (2023) Maak de economie minder afhankelijk van groei, ESB 108(4827), 508-511

Stern, D.I. (2004) The Rise and Fall of the Environmental Kuznets Curve, World Development, Volume 32, Issue 8, Pages 1419-1439, ISSN 0305-750X, https://doi.org/10.1016/j.worlddev.2004.03.004.

Stiglitz, J.E., Fitoussi, J.P., Durand, M. (2018). Beyond GDP, Measuring what counts for economic and social performance. Paris: OEDC Publishing. https://doi.org/10.1787/9789264307292-en. Retrieved at https://www.oecd-ilibrary.org/docserver/9789264307292-en.pdf?expires=1697450838&id=id&accname=oid017645&checksum=34B24D171FE67BCD49A0F45973A422E6 on 16 September 2023.

Stiglitz, J.E., Sen, A., Fitoussi, J.P. (2008). Report by the Commission on the Measurement of Economic Performance and Social Progress. Retrieved at https://ec.europa.eu/eurostat/documents/8131721/8131772/Stiglitz-Sen-Fitoussi-Commission-report.pdf on 16 September 2023.

Stiglitz, J.E., Sen, A., Fitoussi, J.P. (2008). Report by the Commission on the Measurement of Economic Performance and Social Progress. Retrieved at https://ec.europa.eu/eurostat/documents/8131721/8131772/Stiglitz-Sen-Fitoussi-Commission-report.pdf on 16 September 2023.Stockholm Resilience Centre (2023). The 2023 update to the Planetary boundaries. Licensed under CC BY-NC-ND 3.0. Retrieved on 18 December via Planetary boundaries - Stockholm Resilience Centre.

Swedberg, R. (2020). Exploratory Research. In C. Elman, J. Gerring, & J. Mahoney (Eds.), The Production of Knowledge: Enhancing Progress in Social Science (Strategies for Social Inquiry, pp. 17-41). Cambridge: Cambridge University Press. Doi:10.1017/9781108762519.002

Swets, F. & Ederveen, S. (2023) Streef groei na die past binnen planetaire grenzen, ESB 108 (4827), 504-507

Swets, F. & Ederveen, S. (2023) Streef groei na die past binnen planetaire grenzen, ESB 108 (4827), 504-507

Thrive Institute (2023) website, https://thriveinstitute.nl/, retrieved 18-12-23

Tweede Kamer (2023) Gesprek Jason Hickel en Barbara Baarsma over degrowth, 8 March 2023, https://www.tweedekamer.nl/debat_en_vergadering/commissievergaderingen/details?id=2023A00282

UNECE (2014) Conference of European Statisticians Recommendations on Measuring Sustainable Development, https://unece.org/fileadmin/DAM/stats/publications/2013/CES_SD_web.pdf

UNEP. (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* , United Nations Environment Program

United Nations (2023, 27 April). Progress towards the Sustainable Development Goals: towards a rescue plan for people and planet. Report of the Secretary-General, A/78/80-E/2023/64. Retrieved on 11 December via secretary-general-sdg-report-2023--EN.pdf (un.org).

Universiteit Utrecht (2023) Brede Welvaartsindicator, website, https://www.uu.nl/onderzoek/instituties-voor-open-samenlevingen/brede-welvaartsindicator, retrieved 18-12-23

Van den Bergh, Jeroen (2018). Agrowth Instead of Anti-and Pro-Growth: Less Polarization, More Support for Sustainability/Climate Policies. The Journal of Population and Sustainability 3 (1):53–73. https://doi.org/10.3197/jps.2018.3.1.53.

Van Norren, D. E. (2020). The sustainable development goals viewed through gross national happiness, Ubuntu, and Buen Vivir. *International Environmental Agreements: Politics, Law and Economics, 20*(3), 431-458.

Villalba, U. (2013). Buen Vivir vs Development: a paradigm shift in the Andes?. *Third World Quarterly*, *34*(8), 1427-1442.

Von der Leyen, U. G. (2019, 11 December). President von der Leyen on the European Green Deal (europa.eu)

Waglé, U.R., Koirala, B. (2014). Welfare Economics. In: Michalos, A.C. (eds) Encyclopedia of Quality of Life and Well-Being Research. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-0753-5_3209

Wahlund, M., & Hansen, T. (2022). Exploring alternative economic pathways: a comparison of foundational economy and Doughnut economics. *Sustainability: Science, Practice and Policy*, *18*(1), 171-186.

WEALL (2023) Wellbeing Economy Alliance. Website https://weall.org/ on 25 October 2023

Weiss, C. H. (2000). Which links in which theories shall we evaluate? New Directions for Evaluation, 87, 35–45

Weiss, Martin, Claudio Cattaneo (2017) Degrowth – Taking Stock and Reviewing an Emerging Academic Paradigm, Ecological Economics, Volume 137, Pages 220-230, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2017.01.014.

Wellbeing Economy Alliance (2024) For an Economy in Service of Life, website, retrieved 11 March 2024, https://weall.org/

Widuto, A., Evroux, C., & Spinaci, S. (2023). From growth to 'beyond growth': Concepts and challenges. Briefing for the European Parliament. European Parliamentary Research Service. From growth to 'beyond growth': Concepts and challenges | Think Tank | European Parliament (europa.eu)

Wiedenhofer, D., Fishman, T., Lauk, C., Haas, W., & Krausmann, F. (2019). Integrating material stock dynamics into economy-wide material flow accounting: concepts, modelling, and global application for 1900–2050. *Ecological Economics*, 156, 121-133.

WISE (2024) Beyond GDP WISE Database, website, https://beyond-gdp.world accessed 31 January 2024

Wohlin (2014) Guidelines for Snowballing in Systematic Literature Studies and a Replication in Software Engineering, EASE '14: Proceedings of the 18th International Conference on Evaluation and Assessment in Software Engineering, May 2014, Article No.: 38Pages 1–10https://doi.org/10.1145/2601248.2601268

World Bank. (2012). *Inclusive Green Growth: The Pathway to Sustainable Development*.

Yin, R.K. (2017) Case Study Research and Applications, Design and Methods, 6th edition, Cosmos Corporation

York, Richard; McGee, Julius Alexander (2016) Understanding the Jevons paradox, Environmental Sociology 2 (1): 77–87. Doi:10.1080/23251042.2015.1106060. S2CID 156762601.

Appendix A
International Concepts

See separate appendix document.

Appendix B
Dutch Concepts

See separate appendix document.

Appendix C
Advisory Board

Dr. Ruud van den Brink (WKR)

Dr. Sander de Bruyn (PBL)

Dr. Bram van Dijk (EZK)

Mr. Sonny Duijn (ABN AMRO)

Dr. Sander Gerritsen (EZK)

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