Universiteit Utrecht

(Co-)Designing Games for Transformations Towards Sustainability: Connecting Non-Experts with Alternative Socio-Economic and Governance Models

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Dedication

To my parents, and my grandparents. For their unconditional love, care, and support. For their-teaching me the virtues of compassion, and response-ability. For all their labours, so that I may inhabit this virtual freedom, in the bosom of which is my pursuit. For their pushing me to be ever more, to not concede, and for believing in me always. To Hsiang-Yun, my partner. Without her, I would not be pushing myself as far as I do, and opened myself to the world as much as I have. To my non-human confidants, and to my canine companion, Billa. For guiding me past my humanity, and for showing me the wholesome beauty of this world. To my friends, and all those that accompany me throughout this journey, too numerous to name. And to you, dear reader. May our world be one of healing and discovery.

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Someone once said that it is easier to
imagine the end of the world, than to
imagine the end of capitalism.

Fredric Jameson (2003) Future City

It is easy to call for interdisciplinary
syntheses, but will anyone respond? Scientists
know how to train the young in narrowly focused
work; but how do you teach people to stitch
together established specialties that perhaps
should not have been separated
in the first place?

Garrett Hardin (1998) Extensions on the Tragedy of the Commons

Make the world work, for 100% of humanity,
in the shortest possible time, through spontaneous
cooperation, without ecological offense or
the disadvantage of anyone.

Buckminster Fuller (1960) The World Game

It matters what stories tell stories,
it matters what thoughts think thoughts,
it matters what worlds world worlds.

Donna Haraway (2016) Staying With the Trouble: Making Kin in the Chthulucene

Abstract

With social and sustainability goals being in conflict with the dominant "neoliberal" narrative and path-dependent instiutitons, various scholars, activists and practitioners around the world are currently working on a number of radical alternatives (e.g. commons, circular economy), yet there are persistent disconnects between such strands of thought, design and practice, and non-experts as aspiring and/or active 'agents of change' on the other. This thesis critically investigates in scope and depth some of these emerging and 'path-deviant' alternatives, the theories of change associated with them and conceptual heuristics that may be used to facilitate thinking about and practices around them, and how foresight methods and tools, and games specifically, may offer new co-generative templates and boundary objects to integrate such inquiries in playful, engaging, experimental and experiential ways; and forge new connections and virtous cycles of co-creation between the worlds of alternatives, and non-experts, between different sources and ways of knowing. A number of prospectous cross-fertilizations among these fields of study and practice are put forward; and on the basis of these, further critical questions with regard to the normativities and politics of transformations towards sustainability are outlined. The findings are discussed by means of interviews with relevant experts in the respective fields in question. The inquiries into alternative models, theories of change, and foresight methods, are applied in the design of a gamified backcasting prototype that may facilitate reflexive communication around more radical socio-economic and governance alternatives and pathways towards their realization, and further explored in a game testing and co-design workshop with non-expert practitioners in a practical case study. Further avenues are explored with regard to the strategic applications of such tools in ‘post-normal’ and ‘post-political’ times, most notably involving questions around the possibility of scaling such tools to comprise more globally-oriented networked-foresight applications.

Key words: Transformations, Alternative institutional models, Games, Sustainability, Strategic (co-)design

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1 Introduction

Today, the challenges of sustainability are increasingly recognized as persistent and systemic, requiring equally systems-oriented, and innovative, strategic solutions. With these crucially time-stamped (e.g. Rockström et al., 2017) and multi-level challenges, incremental change is no longer seen as sufficient (e.g. Biermann et al., 2012; Kates, Travis & Wilbanks, 2012), and nothing short of radical transformations of our ways of doing, organizing, knowing and framing (Haxeltine et al., 2016) seem to be required to stay within surmisable planetary boundaries (Steffen et al., 2015); to secure diverse, meaningful, and resilient livelihoods; and to preserve and restore, as far as we are able, the complex and dynamic webs of life and non-life that comprise the 'Earth system' and its sub-systems (Biermann et al., 2012).

These deep-seated issues call for deep, inclusive and integrative problem definition and seeking of systemic solutions and pathways; the bridging, and in some cases rethinking and dismantling of disciplinary boundaries; removing silos around knowledge production and use; and collective engagement and experimentation with 'path-deviant' alternatives. With social and sustainability goals being increasingly seen as in fundamental conflict with the dominant neoliberal paradigm (e.g. Longhurst et al. 2017), in recent years there has been an upsurge of new proto-political movements, research areas, socio-economic and governance models, and various experiments around the world with the aims and ambitions to contribute to transformative change towards more sustainable, just and resilient systems and societies, pointing towards a 'humanized economy' (Kemp et al. 2016) and 'egalitarian and emancipatory politics' (Swyngedouw, 2016) more in tune with peoples and the environment.

Many researchers and 'alternative practitioners' (defined as practitioners who engage in some capacity with alternative socio-economic and/or governance narratives, visions, models and practices) around the world are currently working on a number of radical alternatives to the mainstream political economic system. While many such alternatives build on older concepts and are not necessarily new as such, overall it can be said that there has been a revitalized interest in them in recent years (Avelino et al., 2014: 11), both in terms of models that would modify or transform institutions and industry, as well as at the socio-political discoursive and imaginary level. These may be captured under such notions as *circular economy* (e.g. Hobson 2016), *sharing economy* (e.g. Scholz 2016), *commons-based peer-production* (e.g. Benkler, 2004; Bauwens & Kostakis, 2014) and *commoning* (e.g. Bollier, 2016), *collaborative economy* (e.g. Rifkin, 2014), *smart cities* (e.g. Albino, Berardi & Dangelico, 2015; Niaros, 2017) and *open-source* (e.g. Bradley, 2015). At the same time, there is increasing interest in other organizational forms and modes of governance, such as *polycentric* (e.g. Ostrom, 2010; 2012), *collaborative* (e.g. Foster & Iaione, 2016), and *anticipatory* (e.g. Ramos, 2014).

Arguably, a more explicit acknowledgment of such emerging alternatives may inform and open a wider set of possibilities for transformations towards sustainability (Longhurst et al., 2017). That said, while more critical and systems-oriented alternatives thinking is unequivocally on the rise, research and practice regarding such alternatives still finds itself bounded largely to fringes in academia and industry. A great many practitioners (and reseachers alike) today are not familiar with these emerging alternatives – there are persistent disconnects between the current state of such knowledge in models and visions, and the implementation of this knowledge by various communities of practice (Schouten et al., 2017: 24). All the while, as these notions are taken up by different societal actors and actor-networks whose power, capacities, interests, priorities and interpretations often diverge substantially (Avelino et al., 2017), their practical implications and applications are contested to the extent that they range from rather incremental, 'status quo' articulations, to proposed radical departures from current societal and institutional models and developmental trajectories.

Indeed, dominant narratives around and practices of 'transformations towards sustainability' (Patterson et al., 2016) have to date for the most part taken a top-down, 'cockpit-ist' (Hajer et al., 2015) approach, laden with simplified worldviews (Bennett et al., 2016), dominated by 'techno-solutionist' narratives (Carson, 2016), unquestioned economic growth (Kallis, 2017) and overall trust in established neoliberal market-based and state mechanisms, in practice following the (in)famous assertion that 'There is No (viable) Alternative' (to capitalism). The above indicates an acute lack of spaces and (strategic) methods, tools, and mechanisms (e.g. Ravetz, 2017; Scholz, 2017) that would foster and facilitate the imagining, questioning, social salience and political grounding and legitimacy of, as well as place-based and wider collaborative experimentation with, qualitatively different possible systemic configurations and ways of living, grounded in emerging models of and discourses around radical socio-economic and governance alternatives. Furthermore, relevant here is also the pivotal question of the instiutitonalization dynamics of realizing such alternatives, i.e. by what means and in what ways these might modify and/or transform existing institutions. In recent years there has been much developent and branching out of theories and methods to understand the complexities of (social, cultural, political, economic, technological, ecological, etc.) transition/transformation pathways and dynamics (e.g. Geels & Schot, 2007). Frameworks such as 'transition management' Kemp, Loorbach & Rotmans, 2007 and 'transformative social innovation' (Haxeltine et al., 2016), alongside various others, have attempted to offer the theoretical grounding, methods and conceptual heuristics to help inform and structure thinking and (collective) action with regard to transformations towards sustainability (Avelino & Wittmayer, 2014), taking also into account the complexities, power plays, and politics concerning them (Avelino, Grin, Pel & Jhagroe, 2016; Patterson et al., 2016).

In spite of some successes of these methods, there are nonetheless persistent challenges. One concerns the notorious difficulty in more future-oriented thinking as regards collective action in areas like policy, urban planning and social innovation. Another great and perhaps more fundamental challenge concerns commensurating the normative dimensions of highly related environmental sustainability and social justice imperatives (Biermann et al., 2009) with (co-)generative processes involving multiple and often mutually antagonistic interests, worldviews, divergent epistemologies (or, ways of knowing) and ontological assumptions (Vervoort et al, 2015: 65). Questions thus remain as to how can such differences be made productive; how can the persistent gap between alternatives- and more future-oriented thinking and practice be bridged; and in what ways do the current political economic conditions and the societal phenomena associated call for more strategic engagement with the imperatives of path-deviant change towards sustainability.

Notably, promising ways to address the above-outlined issues and lines of inquiry come from the highly diverse fields of foresight and futures studies, which seek to develop processes and tools that "help individuals and organizations better understand the processes of change so that wiser preferred futures can be created" (Inayatullah, 2008: 5). Established foresight methods such as scenarios and backcasting have been used in past decades to inquire into new developmental pathways, however, to date a great majority of foresight practice has been restricted to consultancy-type work that is fundamentally shaped by interests and priorities of incumbent businesses and governments (Ahlqvist & Rhisiart, 2015), sacrificing much of its potential as a more critical and reflexive practice. In recent years, more attention has been paid to how foresight methods could be used to explore alternative and more radical possible futures (e.g. Vervoort et al., 2015; Ramos, 2017). New directions in foresight, such as using games as a tool for 'city-making' (e.g. Tan, 2016; Schouten et al., 2017), experiential futures (e.g. Candy, 2010; Kuzmanovic & Gaffney, 2016), speculative design (e.g. Dunne & Raby, 2013), and network-based foresight (e.g. Ramos, Mansfield & Priday 2012) have also opened up additional lines of inquiry about the possible forms and (political, 'city-making', etc.) roles of foresight. A pertinent and ongoing question concerns the uses of foresight to support more 'anticipatory' forms of governance (e.g. Fuerth & Faber, 2012; Ramos, 2014; Boyd, Borgstrom, Nykvist, & Stacewicz, 2015), social innovation, and design.

Indeed, efforts to contextualize foresight more explicitly in sustainability transformations research and practice are underway, asking fundamental questions about how such methods and tools may offer useful formats for supporting and effectuating transformative change beyond incrementalism and path-dependency, as well as, through a dynamic process involving many other elements, increase stakeholders' 'transformative capacities', i.e. the (collective) abilities of stakeholders to »conceive of, prepare for, initiate and perform path-deviant change towards sustainability within and across multiple complex systems«

(Wolfram, 2016: 126). A relevant and ongoing question here is how exactly foresight, combined with inquiries into transformation dynamics and socio-economic and governance alternatives, can support transformative change. To date relatively little scholarship has focused explicitly on how various theories of change and conceptual heuristics may be operationalized and/or explored in participatory and other (e.g. network-based) forms of foresight practice. Furthermore, research on how foresight methods might be used with and by non-expert stakeholders to support communication around and enhance the mutual understanding and availability of emerging alternative socio-economic and governance narratives and models is only just emerging (Tan, 2016; Schouten et al., 2017).

2 Research Background & Motivation

I would like to acknowledge at the outset that this thesis, as part of a long-standing, and, looking towards the future, expectedly life-long passion project, notably builds on and is in turn shaped by my background and interests regarding the topic of (social) transformations (towards 'sustainability').

Much of my previous engagements with the topic of social and institutional change have taken on a distinctly political sociological perspective. One major influence on my thinking has been Erik Olin Wright's (2009) plea for and articulation of an 'emancipatory social science', entailing the tripartite task of 1.) systematic diagnosis and critique of the world as it exists; 2.) envisioning viable alternatives, and 3.) elaborating a theory of transformation (i.e. how to make viable alternatives achievable), including a theory of strategies of collective action and transformative agency (2010: 7). Another important influence in this regard has been the contributions of Ruth Levitas (2010; 2013), specifically her engagements with the concept of *utopias*, and how they, in terms of an 'imaginary reconstitution of society', could be used as a method to open up new social, institutional and ontological possibilities. Ruth Levitas's line of argumentation is echoed by Boaventura de Sousa Santos's plea for a 'sociology of absences' and a 'sociology of emergences', whereby "the goal of the sociology of absences is to identify and valorise social experiences available in the world — although declared non-existent by hegemonic rationality — (and) the sociology of emergences aims to identify and enlarge the signs of possible future experiences, under the guise of tendencies and latencies, that are actively ignored by hegemonic rationality and knowledge" (Santos, 2004: 24). In my previous efforts to 'exhaust' the concept of 'sociological utopia' (see Kranjc, 2015), I have engaged also with urban and spatial theory, particularly with regard to the notion of 'heterotopia' (Foucault, 1967) and 'heterotopy' (Lefebvre, 2000) respectively.

Building on that background, and just prior to enrolling in the Master's programme of Sustainable Development at Utrecht University, I had immersed myself in topics concerning

alternative ways of socio-economic and political organization that go beyond political sociology and step (also) into political ecology, namely *degrowth* (e.g., Latouche, 2009; Asara et al., 2015) and *collaborative commons* (Rifkin, 2015). These effectively constuted my first (and critical) engagements with the notion of 'transformations towards sustainability'. On this backdrop, I entered my studies at Utrecht University with both high hopes and ambitions with regard to pursuiong the question and practice of how one might use utopias as a way to imagine and realize different, qualitatively more just and sustainable ways of living and insitutional arrangements; and with a particularly critical eye towards evocations of the term '*sustainable development*', especially when coupled with discourses that do not question '*economic growth*' as such.

During my studies in the interdisciplinary fields of sustainability, I was confronted with a plethora of almost overwhelming challenges we as species face in terms of securing a meaningful and prosporous future for all of Earth's creatures, including ourselves, and on the strategic and, hope-fully (Bloch, 1954) deeply collaborative resolution of which hinge also the possibilities of exploration of new frontiers in the expanses of the Cosmos (Sagan, 1980). Most welcome developments in terms of my own thinking around these problematiques are notably engagements with other approaches to theorizing transformations, which go beyond socio-political framings and investigate the social, cultural, ecological, technological, economic, political, urban *et cetera* (e.g. Avelino & Rotmans, 2009) in a fundamentally coupled and holism-oriented fashion. Most welcome were also critical engagements from the fields of political ecology, where particularly the concepts of '*post-politics*' and '*hegemony*' (see, for example, Wilson & Swyngedouw (ed.), 2014) became part of my everyday vocabulary. More recently, my horizons expanded further in the search for less anthropocentric sensibilities, most notably through engaging with critical posthumanism through the works of Bruno Latour (2004), Donna Harraway (2016; Harraway et al., 2015) and Anna Tsing (2015).

Finally, in search of a thesis topic that would make good use of some or all of the above outlined and other engagements, my mentor dr. Joost Vervoort and I discussed how my interests and passions for change could be deepend and complemented with an engagement with the fields of foresight and futures studies. This proved to be another milestone in the development of my thinking, specifically in sparking thinking and research as to how *futures* (in plural) thinking and foresight methods could be operationalized as strategic, 'interventionist', one might even say 'situationist' (Wark, 2015) tools to facilitate the exploration of 'viable real utopias' (Wright, 2010), or 'utopias for realists' (Bregman, 2016), and possible pathways towards sustainability.

The virtual freedom (i.e. a 'freedom' of steering my life of my own accord, in spite of near-hegemony of capitalism) offered by the serendipitous 'fortune' of being born in a specific place, to able, loving, caring and supportive parents, for me entails a deep, unequivocal and

uncompromising responsibility to my fellow human and non-human kind. Not a day goes by that I do not feel hurt with the systematic, *institutionalized suffering* that occurs in the world in every moment of every day, due to a seemingly equally uncompromising and effectively hegemonic neoliberal *biopolitics*, *necropolitics*, and *libido-driven* lust for power and capital, and power *as* capital. Thanks much to the work of my mentor and his colleagues (Vervoort et al., 2015), conceptually I have come to understand and identify my agency as a fundamentally ontological one, where the task is not only in building bridges within a single one 'Reality' or world, but in commensurating what are effectively different and often deeply fundamentally conflictual 'worlds' and 'Realities' (Goodman, 1978), manifest through our epistemologies and ontologies, shaped by our institutional structures and socializations, contingent on history, ancestry, cognition, space and the flows of time.

In this thesis I try to embody and pursue the roles of a critical theorist, an *institutional designer* (Wolfram, Frantzeskaki & Maschmeyer, 2017), a *transition designer* (Irwin, 2015), a *boundary object* and *game designer* (Schouten et al., 2017), an *experience-maker* (Candy, 2010; 2016) an *activist*, and a *catalyst* and *facilitator* (Scholz, 2017) of transformative change. It is my hope that the present thesis can offer a small contribution to the form(ul)ation of the emerging field(s) of explicitly 'transformative' and 'transformations-oriented' science(s), specifically in seeking out possible relationalities, or nexus between emerging socio-economic and governance alternatives, transformation dynamics and pathways, and transdisciplinary foresight practice, in the overarching context of 'transformations towards sustainability' (Patterson et al., 2016). "We *must* change the story; the story *must* change." (Haraway, 2016: 45; emphasis in original).

3 Research Aim & Preliminary Research Questions

Building on my background in theories of transformation, narratives around and models of potential socio-economic and governance alternatives, and engaging with the emancipatory tradition of foresight (see Ahlqvist & Rhisiart, 2015), in spite (or rather precisely because) of the several knowledge gaps identified, in this the following theoretical sections I attempt to explore and critically assess narratives around and models of socio-economic and governance alternatives, theories of change and conceptual heuristics relateing to the notion of 'transformations towards sustainability', and how foresight-based tools and techniques, and specifically games, might be developed and used with and by non-experts to engage with these alternatives, theories and conceptual frames in a way that produces new insights and (thus) opens up more informed, path-deviant and systems-oriented transformation (and effectively transformative) strategies, visions, pathways and projects. I thus put forward a preliminary guiding hypothesis that *foresight-based tools (such as games) that may link up the exploration of alternative socio-economic narratives and models, institutional designs*

and governance mode(l)s, and complexities of transformation dynamics and pathways, can help develop the transformative capacities of non-expert stakeholders, and (thus) contribute to (path-deviant) transformations towards sustainability.

On the basis of this aim and hypothesis, I have formulated three preliminary research questions that guide the theoretical investigation. These stem from my previous engagements with the topics concerned, as well as a preliminary review of literature as part of the initial stages of thesis project. The preliminary guiding questions are as follows:

Preliminary question 1 (section 4.1)

What kinds of radical ***alternative socio-economic*** *and* ***governance models*** *are being articulated and experimented with?*

Preliminary question 2 (section 4.2)

What kinds of ***theories*** *and* ***conceptual heuristics*** *concerning the notion of (social) transformations towards sustainability, and alternative socio-economic and governance models exist, and how have these been, or may be used with and by practitioners as* ***facilitation tools****?*

Preliminary question 3 (section 4.3)

How can ***foresight methods*** *and* ***tools****, and* ***games*** *more specifically****,*** *enable non-expert stakeholders to engage productively with alternative socio-economic and governance models, and the complexities of transformation dynamics and pathways, and (thus) help facilitate and develop their '****transformative capacities****'?*

On the basis of this theoretical investigation of these questions ('Phase One'), I will offer a synthesis in the form of an elaboration of my understanding of the literature and the connectivities among and between the three thematic clusters, namely a.) socio-economic and governance alternatives, b.) theories of transformation and conceptual heuristics, and c.) the potential roles of foresight and games in facilitating transformations towards sustainability.

This theoretical understanding is then complimented by means of interviews with a number of experts (i.e. scholars), which is used to critically assess, validate, and create a more nuanced theoretical understanding of the outlined problematique. The interviewee matrix for this part is outlined in section 5.4 (Validation: Interview Results). Following this is an outlining of the final research questions for this thesis which are used to guide the practical part of this thesis (Phase Two) – which entails an experimental codification and operationalization of (some of) the studied socio-economic and governance alternatives, and theories of change and/or conceptual heuristics, in a 'gamified backcasting' prototype, to be

tested and iterated upon in a workshop with local non-expert practitioners based in the Dutch city of Eindhoven. The choice for the developmental case study (Eindhoven), the methods used to design the foresight tool prototype, and the set-up of the workshop and its results, are explicated in detail in the 'Phase Two' section of this thesis.

I conclude the thesis with a discussion section (9) where I restate the objectives of the thesis, reflect on the results of the theoretical and practical investigation, outline the limitations of the research, and further implications and recommendations for future research.

4 Phase One: Theoretical Investigation

In the following, I offer the results of the literature review based investigation in the form of critical comparative analysis and relating of the concepts within and among the respective thematic clusters. This is immediately followed by reflections in the form of synthesis, and a subsequent attempt at validation through interviews relevant experts.

4.1 Socio-Economic & Governance Alternatives

Many today would argue that transformations towards a more sustainable future is pivotal, however until recently, there have not been many compelling narratives and models outside the neoliberal paradigm (see Longhurst et al., 2017) concerning what those futures might look like (Irwin, 2015: 233). In recent years, a multitude of narratives and/or models have sprung up at the nexus of research and activism, that attempt to problematize the current mainstream social and political economic paradigm, and generate new paradigms and imaginaries around more egalitarian and sustainable ways of living, and possible institutional organization with respect to politics and (planetary) ecology.

Some of the more prominent of these narratives and models, specifically with concern to socio-economic and governance alternatives, are indicated in **Table 1** below (in no particular order), along with some of the key associated literature identified. While here at the outset I make a rough distinction between 'socio-economic' and 'governance' narratives and models (markedly, at the discoursive level), it is often, or arguably indeed always the case that one implies or explicates the other (especially, might I mention, with the term commons). Much of recent scholarly endeavors have also concerned the question of how to fruitfuly compare, and seek out potential relationalities, complementarities, convergences and commensurabilities between such narratives and models in bringing about more holistic and systems-oriented institutional and socio-technical-political-economic alternatives and pathways (e.g. Hobson & Lynch, 2016; March, 2016; Niaros, 2016; Bradley & Pargman, 2017; Niaros, Kostakis &

Drechsler, 2017; Bauwens et al., 2017). I should also mention at the outset that these narratives and models are, or conversely, are not, comfortable with the (neoliberal) capitalist economic framework, to varied degrees. The purported level of their development in terms of 'fully-fledged' and tested institutional models also varies greatly. The list is not necessarily comprehensive, and more narratives and models may be found in the literature (e.g. 'green economy', 'blue economy', 'informal economy', 'care economy', 'transition town movement', 'eco-villages', 'time banks', 'complimentary currencies', 'basic income', 'generative justice').

Table 1: An overview of narratives around and models of socio-economic and governance alternatives

Socio-Economic Alternatives (Narratives, Models)	**Key Literature**	**Governance Alternatives (Narratives, Models)**	**Key Literature**
Degrowth	Latouche (2009), D'Alisa, Demaria & Kallis (ed.) (2014), Kallis (2017)	Commons (governance)	Ostrom (1990)
Post-growth (or, 'Not-for-Profit) economy	Post Growth Institute (2016); Hinton & Maclurcan (2017)	Polycentric governance	Ostrom (2010; 2012), Foster & Iaione (2016)
Commons (economy); Peer-to-peer (P2P) economy	Bauwens & Niaros (2016)	Collaborative governance	Ansell and Gash (2008)
Circular economy	Ede (2016)	Reflexive governance	Voß & Bornemann. (2011)
Sharing economy	Benker, (2004), Bradley & Pargman (2017)	Adaptive governance	Folke et al. (2010)
Platform cooperativism	Scholz (2016)	Deliberative governance	Dryzek (2010)
Collaborative economy	Bauwens & Kostakis (2014)	Participatory governance	Fischer (2012)
Ethical economy	Arvidsson & Peitersen (2013)	Earth system governance	Biermann (2014); Patterson et al. (2016)
Social economy	Neamtan (2015)	Anticipatory governance	Ramos (2014); (Boyd et al., 2015)
Solidar(it)y economy	Miller (2010)	Urban co-governance	Iaione (2016), Foster & Iaione (2016)

Socio-Economic Alternatives (Narratives, Models)	Key Literature	Governance Alternatives (Narratives, Models)	Key Literature
Regenerative economics	Fullerton (2015); Wahl (2016)	Smart cities (i.e. the uses of ICT's and data for the purposes of governance)	Niaros (2016), Niaros, Kostakis & Drechsler (2017)
Gift economy	Cheal (1988)	Open-source urbanism; Open-source resilience	Sassen (2011), Jimenez (2014), Bradley (2015), Baibarac & Petrescu (2017)
Participatory economics ('Parecon')	Hahnel & Albert (1991); Hahnel & Wright (2015)		
Precautionary economy (ger. "vorsorgendes Wirtschaften")	Adelheid (2011)		
Doughnut economics	Ratworth (2017)		

In the subsequent sections, due to time constraints I choose to focus more in depth on a smaller selection of these, namely *commons* (as, possibly, a kind of overarching, 'meta-narrative'), *circular economy*, *sharing economy*; and *urban co-governance*. In some instances, I relate these with other narratives and models that are outlined above. The decision for zooming in on these particular narratives and/or models was made on the following bases:

1.) The preliminary literature review showed that much of the narratives and models that go beyond 'neoliberal' and 'status quo' discourse have been recently captured in scholarship that employs the notions of 'commons' and 'commoning'; be it terms of a normative claim towards property law, common-pool resources, and/or the ways in which such resources *are* and *can/should* be governed, (e.g. Foster & Iaione, 2016; see also Bauwens et al., 2017), or in terms of leaning on the concepts as a more 'performative'and activist socio-political practice targeting the subversion of ingrained socio-political imaginaries specifically.

2.) The choice for sharing economy and circular economy were motivated by the realisation, through literature review, that these, at the conceptual level, are currently contested, while on the other hand, critical scholarship appears to be at this moment in time 'mature' enough to offer a compelling and relatively comprehensive deconstructive and generative critique of neoliberal narratives and incumbent business models employing such concepts. In this regard, it is interesting to note that degrowth and post-growth, at the conceptual, discoursive and practical level, are arguably not subject to such levels of contestation, by the very nature of

their ‘performative semantics’. However, such terminologies are notably sharply confrontational, to the extent that they may not represent as immediately viable discoursive framings in terms of multi-stakeholder deliberations (although in some settings this should be possible, and indeed, overall perhaps even needed). It is thus a strategic choice to focus on the concepts of circular and sharing economy, as they are generally more familiar to stakeholders (at least at the level of terminology), are not as immediately confrontational such as in the cases of degrowth and post-growth, and I identify a need for stakeholders to engage more critical and reflexive discussion around these concepts, i.e. beyond simplistic ‘techno-solutionist’ and ‘status quo’ prone narratives and practices.

3.) The choice for urban co-governance as an explicit focus was motivated on three main grounds: a.) Its congruence with the (urban) commons (meta-) narrative; b.) The specific problematiques it tackles conceptually and in practice (for recent experiments with the model, see Foster & Iaione, 2016; Niaros, 2017) are relevant not only theoretically in this thesis, but also in terms of the applied case study – namely, through its focus on the urban level (in the ’Western’ context), its fairly elaborate articulation of the possible roles of ordinary citizens in the governance of urban resources, and the delineation of a clear discinction between inclumbent for-profit business practice and the potentials of path-devient ‘social innovation’ or ‘enterpreneurship’ – i.e., a conceptual distinction of five actors comprising a ‘quintuple helix’ governance matrix (Iaione, 2016; Foster & Iaione, 2016); c.) The latter term, ‘helix’, is currently part of the everyday vocabulary of many government practitioners, especially in the Dutch context (the practical part of this thesis) where the ‘triple helix’ model originated (see Leydeesdorff, 2012); and is seen as another ‘discoursive way in’ to approach stakeholders productively in the Eindhoven case study.

4.1.1 Commons

Markedly, it is “difficult to settle on a single definition that covers its broad potential for social, economic, cultural and political change” (Niaros, 2017: 2). In this thesis I will not go too deeply into the history of the uses of the concept of commons and the various critiques associated, as these have been extensively written about elsewhere (see, for example, Foster & Iaione, 2016: 287–294). I should however briefly note that the concept was first described by Garret Hardin in 1968, where his postulate of the “tragedy od the commons”, at least as it had been taken up in scholarship, was that a “commons is an unrestricted and unregulated open access resource which allows uncoordinated actors to overconsume or overexploit the resource and then discuss solutions to avoid those tragic outcomes.” (Foster & Iaione, 2016: 287). Later on, the seminal work of Elinor Ostrom (1990) described a “common pool resource” as a natural or manmade resource system “that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining the joint benefits

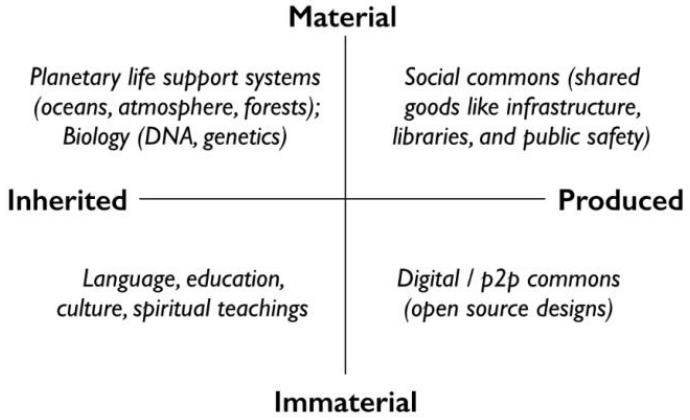
from its use" (Ostrom, 1990; in Foster & Iaione, 2016: 288). Ostrom outlined eight 'design principles' of/for institutions for stable local common pool resource management, based on her extensive studies of how communities dealt with collective action problems with regard to different resources, effectively showing that they need not be *de facto* subject to 'tragedy', given appropriate mechanisms of cooperation, monitoring and sanctioning (see Ostrom, 1990).

In the area of emerging socio-economic and governance alternatives, promising enquiries have emerged in recent times from the legacies and criticisms concerning work on commons. One recent definition has been proposed by David Bollier (2011), namely that a commons is:

- A social system for the long-term stewardship of resources that preserves shared values and community identity.
- A self-organized system by which communities manage resources (both depletable and replenishable) with minimal or no reliance on the Market or State.
- The wealth that we inherit or create together and must pass on, undiminished or enhanced, to our children. Our collective wealth includes the gifts of nature, civic infrastructure, cultural works and traditions, and knowledge.
- A sector of the economy (and life) that generates value in ways that are often taken for granted – and often jeopardized by the Market-State.

A matrix for understanding commons has also been recently proposed by Michel Bauwens in an interview with Daniel Araya (2015):

Figure 1: A proposed typology of commons (Araya, 2015; in Niaros, 2017)



Whatever definition one ascribes to, the proliferation of evocations and use(s) of the term commons arguably by itself warrants a rethinking of what the concept means, or can mean, (socially, economically, politically, etc.) today. Markedly, the term has recently come to be increasingly used in various contexts other than natural or manmade 'common-pool resources', the study of which has historically been largely bounded foremostly to former,

such as forests and fisheries. Indeed, some contemporary scholars go so far as to view commons and 'commoning' as a kind of 'post-capitalist politics' (Gibson-Graham, Cameron & Healy 2016) that offers a framework, vocabulary and imaginary for 'thinking beyond capitalism'.

Some of the more prominent recent conceptualizations include *knowledge commons* (Hess & Ostrom, 2007), *commons-based peer production* and *peer-to-peer* (P2P) (e.g. Benkler 2004; 2016; Kostakis, Roos & Bauwens 2015), the practice of *commoning* (e.g. Bollier & Helfrich, 2012; Bollier 2016, Iaione 2016), *urban commons* and the *city as a commons* (Foster, 2011; Iaione 2015; 2016; Foster & Iaione 2016; Ramos (ed.) 2016), *commons-based urban governance* (Iaione, 2016; Foster & Iaione, 2016), *food as a commons* (Tornaghi, 2014; 2016; Vivero Pol, 2010; 2012; 2014; 2016; 2017), *global design commons* (Smolker & Lanza, 2011; Kostakis et al., 2015), *digital commons* (Coleman & Dyer-Witheford, 2007; Kostakis et al., 2016), and *commons transition* (Bauwens et al., 2017). While due to time constraints I may not engage with and critically relate all such conceptualizations with the proper depth, for the purposes of this thesis I choose to zoom in more in detail as regards the concepts of *commoning*, *urban commons* and the *city as a commons*, and *commons-based urban governance* (the latter being a more concrete and, to an extent, tested instiutitonal model).

4.1.1.1 Commoning

In this thesis I go with the assumption that there is more to the concept of commons than it being a mere analytical category in terms of a (kind of) resource, and attempt to argue that such reductionist lines of inquiry might be seen as a symptom of a "reduction of the sphere of economy to the 'ontic' sphere deprived of ontological dignity" (Žižek, 2005: 75). The term commoning was initially coined by historian Peter Linebaugh (2009) in an effort to accentuate the link between commons as material and immaterial resources on the one hand, and (social, cultural, political, economic, etc.) practice on the other. Since then, this 'verb' for the commons has been taken up by many other researchers, such as David Bollier and Silke Helfrich, who, among others, advocate for the term as a way to provide a new and much needed vocabulary to make visible "the social practices and traditions that enable people to discover, innovate and negotiate new ways of doing things for themselves" (Bollier & Helfrich 2012). That said, some have warned against an (over-) 'ontologizing' of the commons (de Bloois, 2016), which is implied with evocations in the literature of terms such as commoning, or even more so, 'being-in-common'. Let me offer here a somewhat lengthy quote that may function as an example of a usage of the latter (Swyngedouw, 2014: 179):

> *"All manner of people come together in an intensive explosion of acting, of an intensified process of being-in common. This intensity operates in and through the collective togetherness of heterogenous individuals who in their mode of being-in-common, in their multiplicity and process of political subjectivation (that is, in becoming a political actant) and in their encounter, stand for the metaphorical and material condensation of the People (as political category)."*

The general complaint here is that delegating the political "to the realm of the ontological" may function "as a means of compensating for the absence of effective political practice." (De Bloois, 2016: 2). However, "(t)his is not to say that 'commoning' should exclusively resort to pragmatism – ontological issues remain absolutely vital to reformulating politics today – but that ontology should not become the last (or first) resort of politics, thereby running the risk of turning the latter into empty gesturing, however tempting that may be intellectually" (Ibid.). In this regard, David Bollier (2016: 7) also offers a succinct critique, in arguing that "the ontological premises of a commons matter (…) (S)ocial scientists face vexing methodological challenges in determining which factors define a given commons and which are incidental. I believe one can only understand commons as holistic living systems, and that requires new heuristic methods and templates (…) (T)he commons names a set of social values that lie beyond market price and propertization. They honor informal, tacit, experiential, intergenerational, ecological, and even cosmic realities that cannot be comprehended by rational actor theory in economics."

Thus, the endeavors of various 'commons transition' (e.g. Bauwens et al., 2017) advocates, theorists and practitioners may be seen as working with a general recognition of the normative, performative, discoursive and socio-political strategic and tactical aspects of transformative agency, in other words, an attempt at establishing a basis for 'politicization proper' (Žižek, 1999), seeing commons not only as resources, but also in terms of possible reconstitutions of 'modes of (individual/collective) being' that should accompany such socio-political(-technical-ecological) projects. I thus see a need in scholarship envoking the term commons to see the ontic (e.g. the level of 'worldly' institutional arrangements) and the ontological as indeed somewhat dialectically oppositional, but at the same time inextricably intertwined in transformative 'praxis'; i.e. demanding equal attention to both norms, rules, and concrete institutional arrangements and 'socio-ecological metabolisms', as well as the imaginaries, narratives, experiences, speculations, '(self-referential) fictions' (Ranciere, 2017) that (may) comprise the processes of their ultimate constitution.

4.1.1.2 Urban commons & the city as a commons

The concept of urban commons has been used by scholars such as Sheila Foster and Christian Iaione to outline a partial departure from a traditional 'Ostromian' understanding of commons. While many "collectively shared urban resources" (Foster, 2011: 58) may share the characteristics of what Ostrom called common-pool resources, Foster & Iaione (2016: 288) argue that, under certain circumstances, "the commons is less a description of the resources and its characteristics and more a normative claim to the resource (…) (T)he claim is to open up (or to re-open) access to a good—i.e., to recognize the community's right to access and to use a resource which might otherwise be under exclusive private or public control—on account of the social value or utility that such access would generate or produce for the community." Foster and Iaione take the conception of urban commons further by arguing that a city itself may be considered as a commons, as"(f)rom the descriptive framing of the commons, the city is an open access good subject to the same types of rivalry, or contestation, and congestion that needs to be managed to avoid the kinds of problems or tragedies that beset any other commons." (Foster & Iaione, 2016: 288)

Such a conceptualization of urban commons and the city itself as a commons relates directly to evocations of a "*right to the city*" (Lefebvre, 1996; Mitchell, 2003; Harvey, 2008; 2012; Mattei & Quarta, 2015). David Harvey (2008) describes the concept as "far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. The freedom to make and remake our cities and ourselves is, I want to argue, one of the most precious yet most neglected of our human rights."

4.1.1.3 Commons-based urban governance & the quintuple helix

Based on the conceptualizations of urban commons and the city as a commons outlined above, Iaione (2015) and Foster & Iaione (2016) have recently outlined a more concrete (yet, importantly, despite recent experimentation, still largely theoretical) institutional model, namely, commons-based urban governance. Foster & Iaione (2016) base the model on thre design principles, namely 'horizontal subsidiarity', 'collaboration', and 'polycentrism' (2016: 326–334). In the following I zoom in the articulation of polycentricity in the urban context. According to Iaione (2016: 433–434) applications of the principles of polycentric governance may include:

- **Everyday commoning**, or the enabling of collaborative and commining behaviours, habits, and urban civic duties)

- **Wiki-commoning**, or collaborative and public communication, and creation of local networks in forms such as 1.) maps of urban commons and commoners; 2.) platforms for sharing initiatives aimed at taking care of urban commons, and; 3.) systems that involve citizens in monitoring and protecting the urban commons
- **Collaborative urban planning and policy making**, or public, private, and civic collaboration as a strategic innovation in urban development

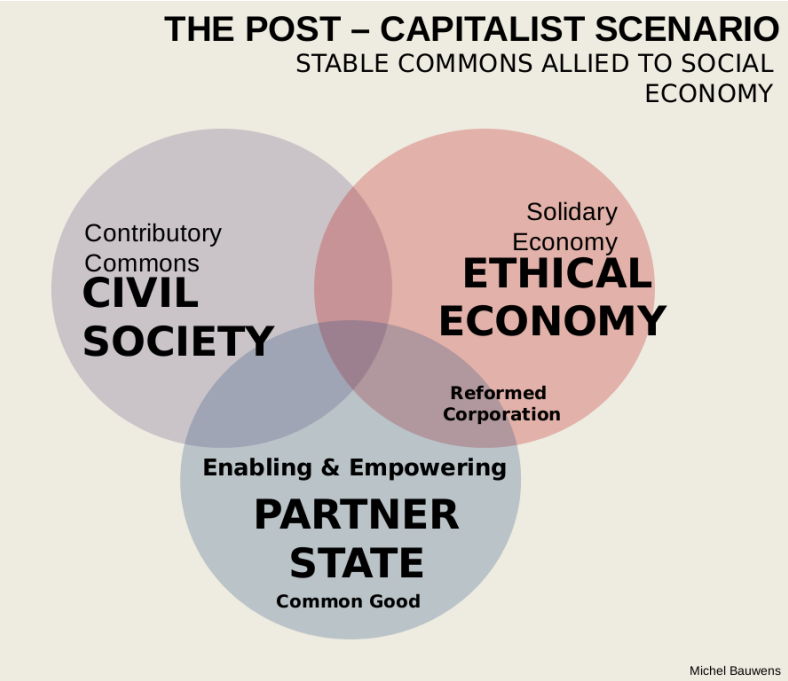
Such articulations notably build on existing projects, such as Co-Bologna (Iaione, 2016: 424), Co-Mantova (Iaione, 2016: 427) and Co-Palermo (2016: 343). Other such experimental projects are however springing up in cities throughout Europe and the world, with another prominent example including the 'commons transition plan' for the Belgian city of Ghent (Bauwens & Onzia, 2017). Notably, the urban commons regulations in the city of Bologna include mainly public spaces, urban green spaces and abandoned or squatted buildings or areas (Iaione 2016:424). According to Iaione, the project initiator, such steps or 'nudges' are necessary for "city inhabitants to start a collaboration with the local government to undertake, through a civic pact, the care and regeneration of the urban commons across the city" (Ibid.), a strategy which can arguably lead to an increase in overall salience and legitimacy of urban commons visions and more collaborative approaches to economic and governance design and functioning.

These theoretizations and experiments have given shape to an articulated model of urban governance, namely, the 'quintuple helix', the five actor types being government, knowledge institutions, industry, nonprofits, social innovators and citizens (Iaione, 2016: 427; Foster & Iaione, 2016: 331). The concept notably builds on the 'triple helix' system which had been initiated in the 1990s in the Netherlands, and which describes the cooperative relations between governments, industry, and universities (Leydesdorff, 2012) The quintuple helix model expands on this model and its criticisms (see Etzkowitz & Leydesdorff, 1998); arguing for a more significant and active role of universities, and knowledge instiutions more broadly, in terms of generating "new institutional and social formats for the production, transfer, and application of knowledge" (Triple Helix Research Group, 2014; from Iaione, 2016: 426) and articulating possible "public-private-community/commons partnerships" (Idid.)

Notably, the notion of 'public-commons partnership' is borrowed here from Tommaso Fattori's (2012) plea to replace the practices of public-private partnership with commons-oriented solutions, identifying a "need a more general recognition and a flexible system of legal protection for commoning activities and for the products of collective creativity – the state and institutions must take an active role in supporting commoning and to support the creation of new commons. This active role must translate into forms of public-commons partnership, where the institutions enable and empower the collective/social peer-creation of common value." In essence, according to Iaione, the challenge is to, in a constitutive political process,

transcend the Leviathan diad of market and state, with actors coalescing and co-articulating a new 'Partner' (Kostakis & Bauwens 2014: Figure 2), 'Enabling', or 'Facilitator' (Foster & Iaione 2016) state.

Figure 2: The Partner state model/scenario (from Kostakis & Bauwens, 2014)



4.1.2 Circular & sharing economy

In this section, I examine the discourses and practices associated to the notions of circular and sharing economy. As there have been recent strides in the literature to show the two (socio-technical-)economic models as intimately related in terms of being ultimately complimentary narratives, principles and modalities of economic production (e.g. Hobson & Lynch, 2016), the subjects are treated in tandem rather than separately. Other narratives and models, such as 'commons-oriented', are related to these notions in various instances.

The concept of a circular economy, emanating originally from the field of industrial ecology, has gained increasing attention in recent years with industry, academia, and policymakers. Closed loop manufacturing, cradle-to-cradle, and zero waste are some of the key concepts that proponents of circular economy see as upcoming design principles that qualitatively differ from that of a linear, non-circular economy (see, for example, Ede 2016; Hobson 2016; Hobson & Lynch 2016; Prendeville, Cherim & Bocken 2017). A move towards a circular economy entails dimensions of "design, production, consumption, use, waste and reuse prac-

tices", with the main goal of keeping "valuable materials in circulation through a series of systemic feedback loops" (Hobson, 2016: 88).

However, while the concept is increasingly being taken up by various actors and organizations, an all-encapsulating and agreeable definition remains elusive. The major scholarly criticism of mainstream debates around and practices of circular economy concerns the reality that a large segment of incumbent organizations (such as Airbnb and Uber) and institutions operate with the concept almost exclusively in terms of technical innovation, production efficiency gains, market-based interventions, and sustained economic growth (Hobson, 2016), offering an incrementalist strategy oriented around "capitalist techno-solutionism" (Carson, 2016), which can leave a range of possible contingent futures underexplored (Hobson, 2016). While explorations of innovative technological solutions and technologically-mediated forms of socio-economic engagement are not undesirable per se, scholars note that currently not much is being said about "the socio-political implications and possibilities for shifting current production-consumption-use-waste practices" (Hobson, 2016: 89).

In other words, the potentially disruptive, generative and transformative innovation space offered by the notion of circular economy seems to be taken up by narratives and practices that obfuscate its social, political, and cultural dimensions. The prevailing narratives thus become promoting sustainable lifestyles (Hobson, 2013; Lorek & Spangeberg, 2013) that ascribe citizens to a de-politicized role of ‘green consumers’ (Akenji, 2014; Fuchs & Lorek, 2005), reflecting a ‘weak’, rather than ‘strong sustainable production and consumption’ orientation (Hobson, 2013). Another emerging criticism concerns the ‘path-dependencies’ generated by a neoliberal market rationality and its proclivity towards economic growth as a prime policy objective in itself (e.g. Longurst et al., 2017), which poses, for example, dangers of a so-called 'circular economy rebound effect' (Zink & Geyer, 2017), a phenomenon whereby increases in efficiency make consumption of certain goods relatively less resource intensive, thus lowering their market price, but which simultaneously result in increases in their use, thus offsetting the environmental benefits of such shifts, and in some cases even leading to higher net impacts.

The current forms and discourses around circular economy, like other narratives and models, thus do not in or by itself appear to offer a panacea for sustainable transitioning. In this light, some critical scholars have argued for imbuing circular economy with deconstructive and generative critiques from degrowth (e.g., Charonis 2012; Hobson, 2015; Hobson & Lynch, 2016), and/or post-growth and not-for-profit business perspectives (Ede, 2016). The notion of circular economy has also been connected to the ideas of open source design, and 'smart cities' (e.g. Niaros, 2016), raising profound questions around the creation, ownership, access and use of data involved in the making and political economies of cities. More radical approaches to circular economy have also been linked to the 'makerspace', open design and

'FabCity' movements. Closely related and emerging concepts also include 'design global, manufacture local' (Kostakis et al. 2015; Kostakis et al. 2016; Ramos, 2016) and cosmolocalism (Manzini, 2013; Manzini & Rithaa, 2016; Bauwens & Niaros, 2016; Ramos, 2016). Newer discourse around and practice practice of the commons, as indicated in the previous section, has been related to circular economy with the notion of 'design commons' (Kostakis et al., 2015), essentially characterized by shared, and developed design tools using principles of open-source. In the emerging disourse around cosmolocalism, or design local manufacture local, several models have emerged. In Table X I include the articulation of Ramos (2016) of one such model, in relation to traditional manufacturing and neoliberal approaches to distributed manufacturing.

Table 2: Comparative logics of (political) economic production (from Ramos, 2016)

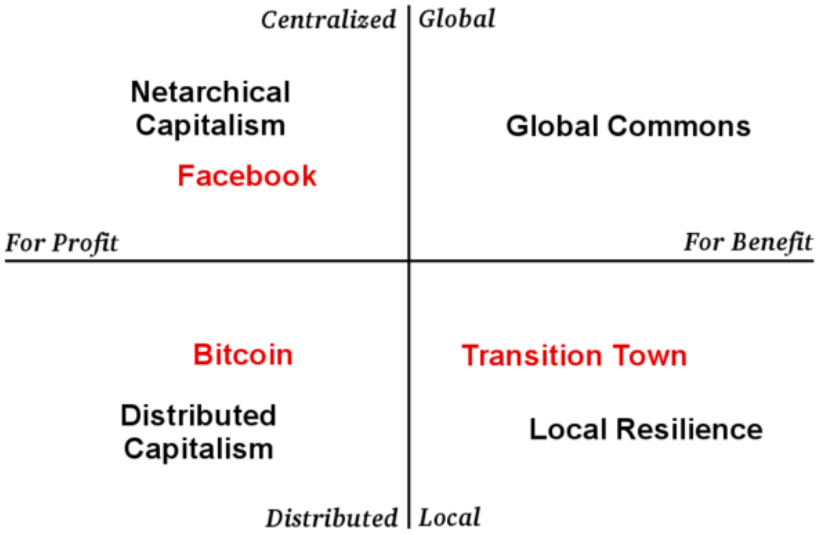
	Traditional manufacturing enterprise	**Distributed manufacturing enterprise (neo-liberal global factory)**	**Cosmo-localization**
IP / knowledge sharing regime	Held by one company	Held by one company or consortium (e.g. Apple)	Shared under open or CC or Peer Production license etc.
Location of manufacturing	A single or local manufacturing center	Global factory, wherever the product can be most cheaply and effectively produced, elements of product can be produced	Globally distributed networks of localized manufacturing, depending on take up and use of global design commons
Transport and trade	Product sent from local manufacturing centers to other places	Parts move across many countries and once assembled are shipped for trade	Requires development of localized production ecosystems for complex manufacturing, Micro-manufacturing clusters
Enterprise model	Publically Listed Corp., Family Owned Corp., Nationalized Corp.	Corporation or consortium with complex supply and distribution ecosystem	Open value network model, Platform Cooperatives, Maker Spaces, Phyles / Transnational collectives

In seeking more integrative narratives and models of political economic alternatives, the circular economy narrative has also been related to the notion of the sharing economy (e.g. Hobson & Lynch, 2016), 'sharing' here denoting a distinct 'modality of economic production' (Benkler, 2004), and seen by some as a kind of commons in its own right (Bradley & Pargman, 2017). In recent years many practitioners and scholars have become critical of invoking the term sharing economy in the context of business models such as those of Uber and Airbnb, perceiving them as a (continued) corporativist appropriation, privatisation, precarisation, commodification and exploitation of the social sphere. Rooted in emerging new socio-technologies, the "corporativist sharing economy" has by some accounts found a rival in a

commons-oriented, and arguably more open and egalitarian "platform cooperativism" (Scholz 2016), standing in stark contrast to what has by some been termed "netharchical capitalism" (Kostakis & Bauwens 2014: 23).

The notion of netarchical capitalism, developed by Vasilis Kostakis and Michel Bauwens in their book, *Network society and future scenarios for a collaborative economy* (2014), refers to the "centralized control of a distributed infrastructure with an orientation toward the accumulation of capital. (…) (N)etarchical capital is that fraction of capital which enables cooperation, but through proprietary platforms that are under central control. While individuals share through these platforms, they have no control over the design and the protocol of these networks/platforms, which are proprietary. Typically under conditions of netarchical capitalism, while sharers directly create or share use value, the monetized exchange value is realized by the owners of capital (Kostakis & Bauwens, 2014: 23). Conceptually, this sentiment is echoed by Nick Srnicek's (2016) critique of so-called 'platform capitalism', and Scholz's (2016) critique of the capture of value by proprietary platforms. For Kostakis and Bauwens, netarchical capitalism may be conceptualized alongside three other scenarios of the possible routes the so-called sharing economy may take, where the two positive scenarios represent the global and local dimensions of a 'mature peer production' (Figure 3).

Figure 3: Four scenarios for a collaborative economy (Kostakis & Bauwens, 2014)



4.2 Theories of Change & Conceptual Heuristics

The institutionalization dynamics of various socio-economic and governance alterantives have been the subject of much debate in recent years, yet much work in this regard is still needed (e.g. Van Laerhoven & Ostrom, 2007). The narratives and models discussed above contain (either implicitly or explicitly) different and often contesting notions of how change might occur (i.e. 'theories of change'), and indeed, different (normative) visions of where such pathways might lead. For this chapter, it is deemed necessary to zoom in on such theories, with respect to contemporary scholarship that deals specifically with the question of how and at what levels (i.e. societal, cultural, political, institutional, ecological, urban, etc.) 'transitions', or 'transformations', may come about, and what kinds of conceptual frames may help structure thinking and inform agency with regards to such changes (i.e. heuristics). This literature in itself is quite varied and employs different disciplinary and multi- or inter-disciplinary perspectives.

In the following sections, I critically examine, assess and relate some of the more used, salient and/or recently developed or still developing theories that concern transitions and/or transformations. In some intances, these are related back to the alternative narratives and models discussed in the previous chapter. At the same time, I zoom in on some conceptual heuristics concerning transformations (relating to such theories, or from other bodies of literature), and lay out a few examples where such heuristic formulations have been used as 'tools' in participatory settings (i.e. multi-stakeholder workshops). I follow up on the above by zooming in on the pivotal questions of the *politics* of transformations, the *governance* of transormations, and offer some preliminary notes concerning *measuring* transformations, respectively. However, at first I deem it necessary to expound shortly on the usages of the terms transition and transformation (towards sustainability) in the literature, and outline the working definition for this thesis.

The notion of 'transformations' is often times used in a vague or ambigous way, with more rigorous approaches necessary towards its application (Feola, 2015). While different theoretical perspectives may be said to have certain commonalities, there are also important differences (for a comprehensive overview, see Patterson et al., 2016). In the literature, the notion of transformations is often times employed synonymously with the notion of 'transitions'. Semantically, transformations denote both the processes and outcomes involved in attaining a different state or systemic configuration, while the notion of 'transitions' arguably only refers to the former (Wolfram, Frantzeskaki & Maschmeyer, 2017: 19). That said, 'transitions' in some scholarship implies not only processes or pathways, but also (desirable, undesirable, possible, plausible, probable, etc.) outcomes (e.g. Sondeijker et al., 2006). It may be said that the uses of either/both the notion of 'transformations' and 'transitions' in the literature denote "particular epistemic communities rather than a

substantive difference in meaning" (Wolfram et al., 2017: 19). That said, the notion of transformation(s**)** does seem to lend itself as a more open and encompassing concept.

The notion of 'transformations towards sustainability' has increasingly been used in sustainability research and policy in recent years (e.g, Future Earth, 2014; Patterson et al., 2016). In this overarching context, different scholarship has zoomed in on particular and pivotal questions, such as those of epistemology, normativity and transdisciplinarity (Scholz, 2017), politics and governance (Biermann et al. 2012; Patterson et al., 2016; Avelino et. al. 2016), power (Avelino & Wittmayer, 2016), 'new economy' (Longhurst et al., 2017); political ecology and urban metabolism (Swyngedouw, 2016); actor capacity development (Wolfram, 2016; Wolfram, et al., 2017), social innovation (Haxeltine et al., 2016), design (Irwin, 2015), and the roles of foresight and visual methods (Ramos, 2017; Ravetz, 2017). For the purposes of this thesis I will refer to 'transformations towards sustainability' as "fundamental changes in structural, functional, relational, and cognitive aspects of socio-technical-ecological systems that lead to new patterns of interactions and outcomes" (Patterson et al., 2016: 2).

4.2.1 Emancipatory social transformation theory

I begin this chapter by examining a theory and conceptual heuristic concerning (social) transformations that may be located more in the tradition and orientation of political sociology, namely the 'theory of emancipatory transformation', first outlined in rigorous detail by Erik Olin Wright in his book, *Envisioning Real Utopias* (2010). His formulation employs 'real utopias' as a key concept, defining them as "alternatives that can be built in the world as it is that also embody emancipatory ideals in the world as it could be and which move us towards that destination" (Wright, 2015). In other words, they "embody, in varying degrees, the values of equality, democracy, community and sustainability to a greater extent than does capitalism" (Wright, 2014). He puts forward participatory city budgeting, Wikipedia, cooperatives, and Universal Basic Income as examples of real utopias (Wright, 2010).

Wright elaborates three distinct strategies of emancipatory transformation, namely *ruptural*, *interstitial* and *symbiotic*. His consideration of ruptural strategies builds on the hypothesis that any attempt at transcending capitalism necessarily entails a decisive rupture, or break with existing capitalist institutions. Conversely, the ideas of interstitial and symbiotic strategies build more on the premise of a gradual and maintained social-institutional metamorphosis, without necessarily a 'moment' of systemic discontinuity (Wright 2010, 303). The notion of interstices here roughly designates "the spaces and cracks within some dominant social structure of power" (2010: 229), or more precisely, "the niches, spaces and margins of capitalist society" (2010: 211), and various interstitial strategies may be located within such spaces. The symbiotic strategy, on the other hand, involves "extending and deepening the institutional forms of popular social empowerment (which) simultaneously

helps solve certain practical problems faced by dominant classes and elites (2010: 211). In this sense, symbiotic strategies are contradictory in that they both expand social power while "strengthening aspects of the existing system" (2010: 212).

Notably, the above formulations are only meant as rough conceptual (heuristic) approximations, or idealizations of real-world processes and strategies of transformation, which are likely in practice more intermixed in terms a.) different strategies being employed by different actors, or perhaps even very same actors, and b.) being mutually influential in terms of the overarching socio-technical-political-economic landscape in which transformative dynamics may be said to occur.

4.2.2 Transition management & the multi-level perspective

An older conceptual framework that may be (quite surprisingly) seen as closely resembling Wright's formulation, is found in the oldest strands of 'transition research', with its roots in social studies of technology and innovation (Avelino & Grin, 2016: 1). This strand of thinking and practice, which may be captured under the term 'transition management' (Loorbach & Rotmans, 2010), notably employs a 'multi-level perspective' (MLP), or tripartite conceptual dialectic between the levels of *regime(s), niche(s)* (effectively, 'interstices', following Wright's above formulation) and the socio-technical *landscape* (Geels, 2002). More elaborate descriptions of this model may be found in numerous existing literatures (see, for example, Geels, 2002; Geels, 2005; Loorbach & Rotmans, 2010; Avelino & Wittmayer 2014: 7–9; Patterson et al., 2016: 6).

Avelino & Wittmayer (2014b: 5) have outlined many practical examples of the uses of the MLP as a method or heuristic tool in so-called 'transition arenas' in the form of participatory multi-stakeholder processes. At the same time, Avelino (2011) and Avelino & Wittmayer (2014) outline several shortcomings of the model, namely (Avelino & WIttmayer. 2014b: 9):

1.) The distinctions between MLP 'levels' are contested on the basis of their treatment of macro-developments as inherently 'exogenous' factors outside ones system focus
2.) It is associated with a particular 'evolutionary' perspective as a conceptual starting point, which does not leave room for more 'relational' perspectives
3.) When applied in participatory settings, the 'regime' context may become an 'excuse' for intertia, and/or is used to justify and legitimise the status quo (i.e. the distinction between 'niches' and 'regimes' can have the unintended effect of reinforcing existing power-relations, rather than overcoming them)

There have also been other criticisms of the multi-level perspective, notably through the concept of post-politics (Kenis, Bono & Mathijs, 2016). Post-politicization is described by

Swyngedouw (2016: 3) as »the continuous and highly politicised struggle and conflict over the institutionalisation of post-democratic regimes of governance, articulated around rendering governing to a techno-managerial and bio-political practice of arranging life without changing the common sense and everyday routines of the existing socio-political configuration and its constitutive power relations.« See also, for example, Žižek (1999: 198–200). In short, according to Kenis et al. (2016), the practice of transition management reflects such 'status quo' techno-managerial tendencies and disregards conflict and contestation as key elements in any (political) transition / transformation endeavour.

Such and other criticisms have led to new iterations, inquiries and developments in a more reflexive and still much developing transition studies research field. Recent turns have been made, for example, towards the discourses (or, narratives; Wittmayer et al., 2015) present, and the power-plays and politics (e.g. Avelino, 2011; Avelino & Wittmayer, 2016, Avelino et al., 2016) in transitions / transformations, which notably take on a more dialectical approach to conceptualizing agency and structure in sustainability transitions / transformations. While it is beyond the scope of this thesis to delineate all of these developments with the proper rigour and detail, in the following section I zoom in on a particular recent and ongoing project at the Dutch Research Institute for Transitions (DRIFT) in Rotterdam, the Netherlands, namely, the TRANSIT (Transformative Social Innovation Theory) project, which aims to synthesize many of these developments in a more reflexive and rigorous framework for studying (and, ultimately, facilitating) transitions / transformations. Specifically, I explore how their work has been related to the notion of 'new economy' (Avelino et al, 2013; Avelino et al., 2015; Longhurst et al., 2017).

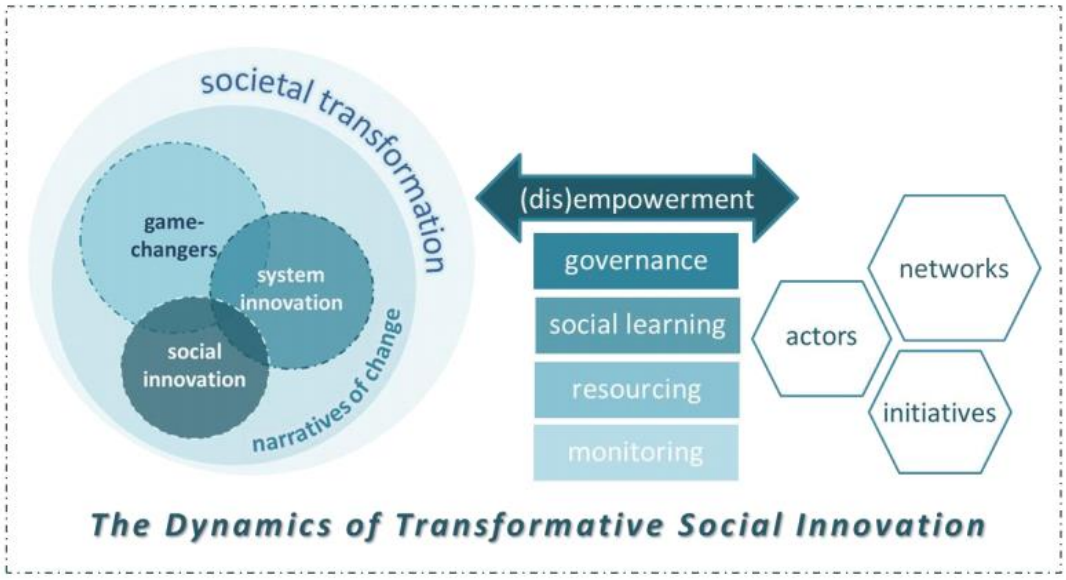
4.2.3 Transformative social innovation theory & the 'new economy'

'TRANSIT' may be regarded less as less a fully-fledged theory of/for transformations, than an ongoing and reflexive body of work that attempts to create a more comprehensive and politically nuanced theoretical as well as practical (or, 'praxical') framework. In this brief segment, I outline the core concepts developed as part of the project (Table 3), which attempt to offer a complimentary or alternative heuristic to the MLP for approaching the question of transitions / transformations (towards sustainability). Table 3 serves as a visualization of these conceptual elements and their interactions.

Table 3: Four shades of change (Avelino et al., 2017)

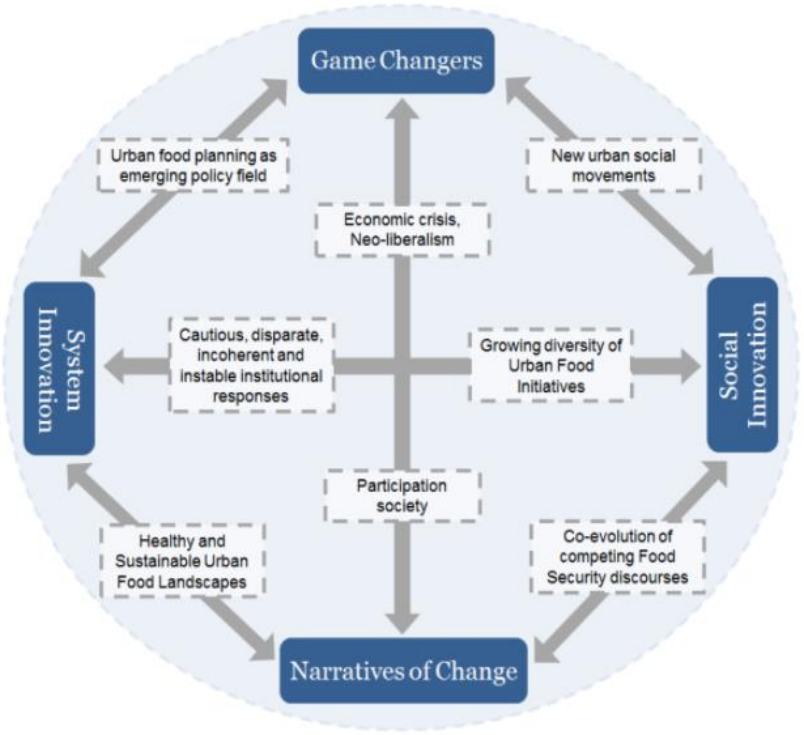
Concept	Definition	Example
Social innovation	Change in social relations, involving new ways of doing, organising, knowing and framing	Ideas around basic income, Complementary currencies
System innovation	Change at the level of societal sub-systems, including institutions, social structures and physical infrastructures	Welfare reform
Game-changers	Macto-developments that are percieved to change the (rules, fields and players in the) ‚game' of societal interaction	Economic crisis; the concept of the Anthropocene (Olsson et al., 2017)
Narratives of change	Discourses on change and innovation, ie. Sets of ideas, concepts, metaphors, and/or story-lines about change and innovation	Commons, Circular economy, Sharing economy, Smart cities

Figure 4: A conceptual heuristic to explore the dynamics of 'transformative social innovation' (Avelino et al., 2014)



These conceptual models have notably been to some extents applied in 'scenarios' and 'back-casting' exercises with stakeholders (see Avelino & WIttmayer, 2014: 14–15). This heuristic model has also recently been used, for example, by Hebinck & Villareal (2016) in assessing the transformative potentials of urban food initiatives in the Dutch cities of Rotterdam and Eindhoven (Figure 5).

Figure 5: Assessing Dutch urban food movements in the context of social transformation



Notably however, these concepts and the distinctions between them are not self-evident or clear-cut – for example, there may be overlaps between social innovation and system innovation, and between game-changers, narratives of change and societal transformations; also, game –changers might refer to short-term trends, butmay possibly have longer-lasting transformative impact (see Avelino et al., 2014: 9). I note here that the notion of social innovation by itself may be seen as highly compatible with Erik Olin Wright's notion of 'real utopias'. However, social innovation, as part of a broader heuristic framework (and, in the literature, more explicitly aligned with 'sustainability'), seems at this time to be a more encompassing concept and will be used throughout this thesis. That said, I recognize both 'real utopias' and 'social innovation' as useful (and in some participatory workshop contexts, perhaps even compatible or complimantary) 'conceptual innovations', but which may conjure up slightly different 'mental images', by virtue of their semantics.

With much relevance to the questions posed in this thesis, Longhurst et al. (2017: 1) identify (alter-/counter-) narratives, such as those which may be found described in the previous chapter (3.1), as posing "a challenge to the dominant neoliberal approach to urban economic development by proposing novel ways of organizing economic relations which might form the basis of a more fundamental transformation in the urban economy. Acknowledging and recognizing this diversity in strategies of urban economic development is a critical step towards opening up future possibilities in urban transition processes "

In the following section, I briefly lay out and critically examine the notions of ‘capture dynamics’, ‘path-dependencies’ and ‘instiutitonal lock-ins’ (e.g. Pel, 2015; Pel et al., 2016), and what may be considered as a ‘dialectical perspective on social innovation institutionalization’. These notions are notably prominent in the newer iterations of the TRANSIT framework, and to a large extent involve scholars who are directly associated with the TRANSIT project.

4.2.4 ‘Path-dependencies’ and ‘capture dynamics’

The notion of “path-dependenve”, in short, signifies the fact that “history matters” and that a history of a (institutional) system fundamentally limits possible next steps (Arthur, 2009). In this regard, a pertinent around social innovation and transformations is “whether the current technological and social innovations and sustainability initiatives supposedly contributing to the large-scale transformations that humanity needs, are actually reinforcing current unsustainable pathways.” (Olsson et al., 2017).

However, in line with criticisms of the MLP perspective, Pel (2015) criticizes the evolutionary economics approaches to understanding the dynamics of capture found in transitions / transformations towards sustainability. In essence, the term here ‘capture’ designates instances where the ‘mainstream’ (political economic) system and its actors ‘appropriate’ or ‘co-opt’ more radical (alter-/counter-) narratives and/or innovations, effectively ‘watering down’ their transformative ambitions and use them in ways that are congruent with the political status quo. Pel (2015) however is not convinced that such dynamics are as ‘fatalistic’ and straightforward as they might appear on the surface, and argues for a more dialectical perspective towards the relations between structure and agency, or, more precisely, institutional change and social innovation (Pel, 2015; Pel et al., 2016). This perspective posits that "the ambiguity and evolution of capture are crucial and closely related aspects", which "becomes apparent through the possible 'inflections' through which initial capture may be followed by radicalization" (Pel, 2015: 4).

Pel (2015) offers an example of such possibilities of ‘inflection’ with the well-known metaphor of the Trojan Horse: the Trojan Horse "exemplifies the latent transformative force that innovations may have, only emerging after and through capture" (2015: 6). Arguably, business models such as Uber and Airbnb may be regarded, following this formulation, as instances of a ‘co-optation’ or ‘capture’ of the discourse and practice of what some more radical scholars and practitioners might term ‘the real sharing economy’ – following Sharon Ede’s (2016) assertion of a ‘real circular economy’. As such (salient) business models profess themselves as a ‘sharing economy’ model, they contribute to conceptual confusion with respect to more radical alternatives that (strive to) go beyond the status quo; while at the same time, following the dialectical perspective, they contribute to the salience of such a concept in the more abstract, which, leaning on more radical scholarship and practice, may result in

more experimentation with more radical models which 'push' the status quo to its limits. Furthermore, as the phenomena of Uber and Airbnb are increasingly criticized in the media (e.g. Baker, 2014) as exclusively profit-driven models that mark a 'gig economy' that contributes to the further precaritization of work and commodification of social relationships; people may eventually either discredit the term, and/or look towards other alternatives. Such a perspective on institutionalization processes in transformative social innovation have also been applied, for example, to the study of 'social solidarity economy' and basic income initiatives (Bauler, Pel & Backhaus, 2017)

Paying close attention to such co-optation dynamics has also been an emphasis of some recent commons-oriented scholarship. For example, the scenario of a 'netharchical capitalism' proposed by Kostakis & Bauwens (2014) and described in the previous chapter, may be seen as encapsulating the seemingly ineliminable lock-ins, path-dependencies, and co-optation dynamics produced by capitalisms' hegemonic tendencies. However, these accounts could be criticized following Pel's (2015) argument for a more dialectical – rather than viewing the four scenarios proposed by Kostakis & Bauwens (2014) as completely distinct possibilities, it may be worthwhile to see these are in actuality more closely intertwined in a dialectical process. Relatedly, Kostakis & Stavroulakis (2013) have formulated the concept of the 'parody of the commons' to accentuate the capture dynamics that concern commons-oriented (alter-/counter-) narratives and practices; and may be critiques on the same basis as the notion of 'netarchical' or 'platform' capitalism.

The dialectical perspective is an interesting one in that it attempts, within a theoretical framework, to commensurate status-quo prone 'incrementalism' with strategies of radical transformation. It is to this question explicitly that I turn in the following section, reffering to bodies of literature that have evolved separately from the TRANSIT project and its affiliates.

4.2.5 Incrementalism or radicalism: towards a radical incrementalism?

Today, it is important to recognize that incremental change alone wil not be sufficient to stay within planetary boundaries (Steffen et al., 2015; see also Biermann et al., 2012). In other words, 'disruptive innovation', as the "ideas that take advantage of opportunities at the regime level but do not fundamentally challenge the broader landscape or institutional level that defines and constrains the problem domain" (Westley et al., 2011: 768), are not seen as sufficient with regard to the scope, temporal urgency, and levels at which the challenges of sustainability and resilience we as a (multi-)species (web) face. That said, there are many challenges in fostering and facilitating radical departures from current developmental trajectories. Turning to Erik Olin Wrights treatise on the notion of interstitial transformations, succinctly summarizes this problematique (Wright, 2010: 228):

> *"If one believes that systemic ruptural strategies of emancipatory transformation are not plausible, at least under existing historical conditions, then the only real alternative is some sort of strategy that envisions transformation largely as a process of metamorphosis in which relatively small transformations cumulatively generate a qualitative shift in the dynamics and logic of a social system. This does not imply that transformation is a smooth, non-conflictual process that somehow transcends antagonistic interests. A democratic egalitarian project of social emancipation is a challenge to exploitation and domination, inequality and privilege, and thus emancipatory metamorphosis requires struggles over power and confrontations with dominant classes and elites."*

In seeking a hybrid or mid-way between 'incrementalism' and 'radicalism', and approaching the question of the possibility (and effectiveness) of purposeful attempts to influence or steer transformation processes towards path-deviant outcomes, Göpel (2016) puts forward the concept of 'radical incrementalism'. Such a strategy "requires intense work of an often highly political character and the acceptance that it takes time. Seeking to change a system too swiftly or too drastically is likely to create self-defensive or destabilizing reactions. The art of system innovation therefore entails finding the right steps and measures at the right time, and also being prepared to deal with unexpected results" (2016: 7). In other words 'radical incrementalism' and similer envocations may be seen as strategies "of incremental change with a transformative agenda, where a normative focus on sustainability transformations helps to orient incremental efforts (such as policy change) within a broader narrative of transformative change" (Patterson et al., 2016: 4). For a lengthier and more elaborate treatise of the notion of incrementalism, see Patterson et al. (2016: 4).

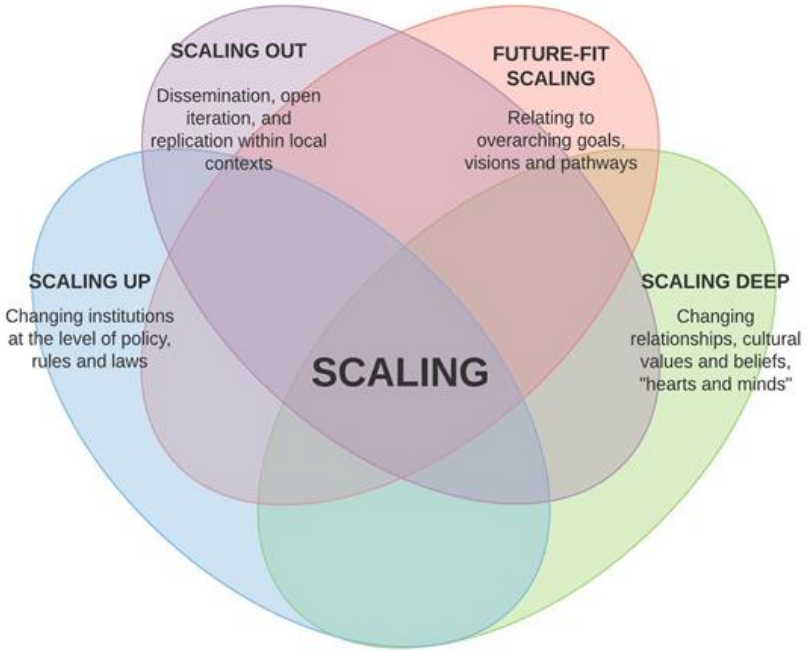
4.2.6 Scaling social innovations: the up, wide and deep (and future-fit?) framework

A pertinent question with regard to social innovation in the context of transformations towards sustainability is at what levels (i.e. social, cultural, political, economic, technological, etc.) and (spatial, temporal) scales should one locate their impact. One particularly useful model in this regard has been developed by Riddell & Moore (2015). They conceptualize the scaling of social innovation as (potentially) occurring at three levels: *scaling up* (i.e., impacting laws and policy – changing institutions at the level or policy, rules and laws), *scaling out* (i.e., impacting greater numbers – replication and dissemination, increasing number of people and communities impacted), and *scaling deep* (i.e. impacting cultural roots – changing relationships, cultural values and beliefs, hearts and minds) (Ridell & Moore, 2015: 3).

Another prominent question here concerns the "temporal nature of social innovation" (Olsson et al., 2017: 3). In this thesis I frame this question of temporality, also with regard to the pre-

vious section on ‘radical incrementalism’, as ‘future-fit scaling’, as a fouth element in the heuristic framework developed by Riddel & Moore (2015) (Figure 6).

Figure 6: The three ‘ways of scaling’, and a proposed fourth, ‘future-fit scaling’ (based on Ridell & Moore, 2015; Olsson et al., 2017)



This element of locating a ‘social innovation’ within a broader (and normative) view of transformations, or transition pathways towards sustainability raises profound questions, for example, of ‘what is the future of governance and the (social) economy?’, and ‘what should governance and the (social) economy going towards such future look like?’. I explore such pertinent questions in the next section, which deals more explicitly with the governance of/for transformations.

4.2.7 Governance and politics of/for transformations

The questions regarding transformations towards sustainability are deeply and unavoidably political (Patterson et al., 2016; Avelino et al., 2016). A pivotal question concerning transitions / transformations towards sustainability remains as to what “kinds of governance (…) will be needed in a transformed world versus those needed to achieve it”, and “how such changes in governance can be achieved, whether a hybrid of these two different models of governance is possible” (Fazey et al., 2017: 9). In other words, clear delineations have to be made when talking about governance *for* transformations (i.e. governance that creates the conditions for transformations); governance *of* transformations (i.e. governance to actively trigger and steer transformation processes); and transformations in governance (i.e. transformations in governance modes/regimes) (Patterson et al., 2016: 4). Also relatedly, Irwin

(2015), in outlining an agenda for a 'transition design' practice - i.e. "design within radically new socio-economic and political paradigms" (Irwin, 2016: 231), puts forward the notion that "some solutions have intentionally short life-spans and are designed to become obsolete as steps toward a longer-term goal. Other solutions are designed to change/evolve over long periods of time. Transition Designers look for 'emergent possibilities' within problem contexts, as opposed to imposing pre-planned and fully resolved solutions upon a situation" (Irwin, 2016: 237).

That said, all the while I would emphasize again that it is important to realize the political character of such endeavors, and that actors and 'actor-networks' with transformative aspirations and ambitions that go beyond incrementalist and status quo views for the great majority find their agency limited by a markedly (near-)hegemonic and 'post-political' (3.2.2) neoliberal 'landscape', marked by entrenched imaginaries (e.g. around human nature, plausible and possible political economic models), institutional lock-ins, path dependencies and various co-optation dynamics (Pel, 2015; Pel et al., 2016) which tend to limit and/or appropriate path-deviant change in quite profound ways.

Once more, incumbent actors with various vested interests will undoubtedly (at least, in the absence of some 'grand gesture' or symbolic moment of collective awareness of the realities and harmonious and convivial possibilities of transforamtions towards sustainability) employ their agency in ways that make it very difficult for alternative socio-economic and governance models to go beyond a 'prefigurative practice'; i.e. a practice that points towards different ways of doing, knowing and framing (and, by extension, the social, economic, political, ecological, etc. realities this may harbinger and foster), yet are fundamentally constrained by the (near-) hegemonic character of the globali capitalist political economy.

4.2.8 Sidenote: towards transformative science(s)?

In recent times, there have been several calls for a more explicit engagement of research with the notion of transformations towards sustainability (Patterson et al., 2016). The modes of disciplinary integration and forms of transdisciplinarity capable of addressing such 'wicked' challenges of today should do well to begin with a deep engagement with thinking about the enterprise of science as such, best starting perhaps with Jerome Ravetz's assertion of/for "post-normal science", a "rationale whereby (…) traditional knowledge is utilised, harmonised, enhanced and validated anew", which "provides the communities with both the means and the confidence, in their struggle to build a better life" (Funtowicz & Ravetz, 2003: 7), and which asks "to what degree is our inherited science part of the problem, and how must it be modified if it is to become part of the solution, understood (...) as the transitions to sustainability" (Ravetz, 2006: 275). This assertion resonates closely with Bruno Latour's plea

for a dissociation of the sciences from Science (Latour, 2004: 9), wherein a hegemonic Science is critically defined as "the politisation of the sciences through epistemology in order to render ordinary political life impotent through the threat of an incontestable nature (Ibid., 10). Conversely "sciences with a small 's'" (Latour, 2002: 44) are for Latour concerned with the "producing, through the institutions of many disciplines and the monitoring of many instruments, robust access to a great number of entities with which the polity has to be built" (Latour, 2015: 148).

While such research is still very much in development, in this general context two new scientific areas have been proposed, namely *transformation science(s)*, i.e., integrative areas of inquiry that strive towards developing understandings of the measurability, natures, levels and scales of transformations, and how transformation processes happen(ed); and *transformative science(s)*, i.e., areas of inquiry, especially transdisciplinary and with an important strategic, normative and political element, that pursue the question of how transformations *can* happen (i.e. a more *ex ante* approach), but also strive towards (co-)developing, investigating and suggesting strategies, methods and tools that would aid in the instigation and furthering of transformation processes and involve and empower a wide range of societal actors (based on WBGU, 2011; see also Singer-Brodowski & Augenstein 2016; Göpel, 2016; Scholz, 2017).

Questions regarding what approaches and instruments are necessary to »both assist transformation and help understand when transformation has occured« (Fazey et al., 2017: 4) are still much debated and ongoing. That said, recent literature has indicated some key characteristics and crucial questions regarding the measuring and assessment of transformations. In the following (Table 4), I outline some of these, which are based off a more comprehensive list proposed in a recent article by Fazey et al. (2017).

Table 4: Key characteristics of and critical questions regarding forms of monitoring and evaluating transformations (Fazey et al., 2017: 6, 15)

Key characteristics	Questions regarding M&E for transformations
Identification of triggers and thresholds Long-term vision and outlook Identification of behavioural and institutional barriers and enabling conditions Participatory approaches that assist co-learning Effective knowledge exchange and co-production of learning Appropriate methods for quick iterations and that can support innovation Measurement and assessment as a tool for learning and improvement not just a mechanism for reporting and accounting Innovative data sources and mechanisms (e.g. open access data and tools)	What ideology is transformation moving away from, what ideology is it moving to, and how is transformation normalized by existing ideologies? How can the multi-scale nature of transformation be captured, e.g. causal links or feedback loops? What are the appropriate measurements/indices/metrics for assessing transformational change and why? What are the inappropriate ones? How context-specific are such measurements, and what are the implications of that for transferability, scaling-up (or down)? How do the current ways of monitoring and evaluation limit what is known, can be known, or can be achieved? How important is it to know what is aimed for to develop appropriate measures? What are the different approaches to monitoring, evaluation and learning that are best suited to facilitating rapid and significant changes at scale?

4.3 Foresight & Transformations

In this section, I first introduce the area of foresight and lay out an overview of the traditions and trends in foresight practice, also with regard to such epistemological questions as relating to the knowability of, and the range of possibility in influencing, 'the future'. Following this is an outlining of some key concepts as regards the future/futures. I then move on to outline a few key methods in foresight, which is followed by a more explicit account of the potential uses of games in foresight. Here I also examine literature and practice that deals with questions around new and potentially useful ways of codification and operationalization of socio-economic and governance alternatives, for non-expert use, in games. I conclude the chapter with several considerations regarding the politics of foresight practice and games (complementing previous inquiries into the politics of transformations), and a relating of foresight to the notions of transformative capacity and transformative change; also as a more institutional(ised/ising) practice – i.e. by envoking and critically examining the term and as of yet largely speculative practice of 'anticipatory governance'.

4.3.1 Traditions & trends in foresight

It has been asserted that rather than ascribing to a singular, wholly knowable and predictable future, stakeholders (or, people generally) should rather approach the questions of change, visions of 'the good life', desirable pathways, et cetera, through the lens of a range of 'alternative *futures*'. As Rowland & Spaniol (2015: 556) describe the relation between ideas of 'the future' and 'futures' in futures studies, »(f)or 'futures' to be conceptually potent, 'the future' must be at least provisionally believable and occasionally useful. Otherwise, if 'the future' were so prepostorous an idea, then 'futures' would cease to be a critical alternative to it. Futures needs the future; they are relationally bound together in a multiplicity«.

Foresight has a long and rich history of applications ranging from government and business consultancy to military applications. Markedly, today foresight practice finds itself challenged with the issues and imperatives of transformations towards sustainability (as outlined in previous sections). Rather than supporting the future-oriented strateges and ambitions of incumbent institutional actors leaning towards the 'status quo', calls have been made for a more radical foresight practice that places conflicts and knowledge gaps centre stage (e.g., Vervoort et al., 2015). According to Ramos (2017), the ideal role of foresight is "to inform and inspire social transformation toward ethical goals", and that enable people from many walks of life to "plant the seeds of change and create social innovations, alternatives, and experiments that provide new pathways and strategies that can lead to alternative and desirable futures. Foresight can inspire a sense of social responsibility and impetus for social action, at both political and personal levels" (Ramos, 2017: 824). Inayatullah (2009) argues that 'used' or 'default' futures offered by dominant narrratives around possibilities should be fundamentally questioned.

Reflecting on historical and more recent trends in foresight, Ramos (2017) and Fazey et al. (2017) have put forward systematic overviews of a range of foresight approaches and methods and the epistemological and ontological assumptions found therein. **Table 5** serves as an overview of these, leaning heavily on the above two works.

Table 5: The modes and characteristics of different foresight approaches (Ramos, 2017; Fazey et al., 2017

Mode of Foresight Practice	Characteristics
Predictive, Deterministic	• Predictability of the future • Linear change • Macro-economic forecasting • Limited complexity
Systemic	• Complex models, causal loops and interactions between variables • Open sets of possibilities • Scenarios & simulations • Contradictory modeling
Critical, Deconstructive	• Centrality of perspective, discourse and culture • Combining futures inquiry with critical theory and political economy • How are power dynamics expressed in different images of the future (i.e. 'default' or 'used' futures)
Participatory, Action	• Participatory engagement, involving different (contrasting) perspectives • Group-based generative conversations about futures and pathways, co-exploration of new narratives, visions and strategies, • Seeks a common understanding of challenges and grounds for visions • Uses combinations of other modes/approaches • How can tensions and discomforts be made productive?
Design-oriented, Experiential	• Combined with design approaches (e.g. service co-design, speculative design, design futures), social innovation, and embodied and experiential processes • The future is seen as shaped, and change driven, mostly from intention and intervention by purposefully acting individuals who (are able/in a position to) look beyond the status quo
Hybrid/Combinations	• Approaches that combine some of the above

In this formulation, it is important to note that these modes are not at all exclusive, and many different foresight practices may in fact employ combinations these in various (empistemo-logically conflicutal, or, conversely, complementary or synergetic) ways.

4.3.2 Select key concepts

In this section I briefly outline some central concepts that have been articulated in futures studies and foresight scholarship (Table 6), and which may in fact offer useful heuristic mod-els in endeavours of commensurating different imaginaries and interests in the context of transformations towards alternative and sustainable socio-economic and governance models.

Table 6: Four key foundational conceptual frames in futures studies and foresight

Used Future	Have you purchased a used future? Is your image of the future, your desired future, yours or is it unconsciously borrowed from someone else? Questioning the future entails unpacking and deconstructing the default future (a "used future") – i.e., our unquestioned image or assumption about the future, whether for our world, organization, or ourselves. (Inayatullah, 2008)
Possible, Probable & Preferred Futures	Roy Amara's model of the probable (evoking history or deep structural patterns); the preferred (individual agency and growth); and the possible (the unknown). This also fits into grand sociological discussions of individual agency versus structural determinism, with the unknown, the transcendental, being the third most important factor. (Amara, 1991)
Alternative Futures	We often believe that there is only one future. But by looking for alternatives, we may see something new. Alternative futures thinking reminds us that while we cannot predict a particular future always accurately; by focusing on a range of alternatives, we can contour the scope of possibility, better prepare for uncertainty, and indeed, to some extent embrace uncertainty. (Ramos, 2017)
Futures literacy	'Postnormal times', according to Kuzmanovic & Gaffney (2016), call for a greater emphasis on fostering people's 'futures literacy', i.e. the ability to 'pre-imagine' possible alternative futures, and the dynamics of change associated with realizing such potential futures.

4.2.3 Foresight methods

In this section I outline some of the most used, as well as more recently articulated and still developing foresight methods, namely: backcasting, scenarios, transition scenarios, experiential scenarios, games, and network-enabled foresight.

Table 7: Overview of most used and recently developed (and still developing) foresight methods/tools

Method	Description
Backcasting	Denotes a process that involves "generating a desirable future, and then looking backwards from that future to the present in order to strategize and to plan how it could be achieved" (Vergragt & Quist 2011: 747).

Method	Description
Scenarios	Scenarios are stories "with plausible cause and effect links that connects a future condition with the present, while illustrating key decisions, events, and consequences throughout the narrative" (Glenn 2009). According to Angheloiu, Chaudhuri & Sheldrick (2017: 9) scenarios can be used to "encourage speculation across a widely varied set of alternative futures, and secondly, they enable a backcasting approach that begins with the assumption of radical long-term change".
Transition scenarios	Transition scenarios are the outcomes of "participatory explorations of possible long-term development trajectories that incorporate a structural systems change towards a desired, sustainable future state of the system" (Sondeijker 2009: 18).
Experiential scenarios	Experiential scenarios are "the manifestation of one or more fragments of an ostensible future world in any medium or combination of media including image, artifact, and performance. It involves designing and staging interventions that exploit the continuum of human experience, the full array of sensory and semiotic vectors, in order to enable a different and deeper engagement in thought and discussion about one or more futures, than has traditionally been possible through textual and statistical means of representing scenarios."(Candy, 2010, p. 3).
Games	Games may be used as playful engagements with potential futures which develop thinking around alternative possibilities (Davies et al. 2012). Games usually take the form of a simulation, which may be characterized as an experimental and experiential, rule-based, interactive environment in which players take actions, and experience their effects though feedback mechanisms built into and around the game (Mayer, 2009: 825).
Network-enabled foresight	New information and communication technologies have ushered new possibilities of network-based, crowd-sourcing and participatory forms of foresight, which include "online scenario development and planning approaches; crowd-sourced scenario analysis; scenario gaming platforms; online scanning systems (e.g. 'iKnow futures'); and the use of social software in environmental scanning processes" (McGrail & Gaziulusoy, 2014: 6; see also Raford, 2014). Notably, repositories of social innovations (see, for example, the 'Seeds of a good Anthropocene project': Bennett et al., 2016) offer new ways of generating creative scenarios that are more informed in terms of the global scope of new initiatives and possibilities and can (thus) facilitate visions of transition /transformations pathways beyond incrementalist approaches (Bennett et al., 2016).

4.3.4 Games & 'city-making'

Games have had a prominent, if sometimes overlooked role in recent history as tools for learning and experimentation, spanning applications in policymaking, urban planning to military (Mayer, 2009). In recent years, there has been a notable rise in interest in the transformative potential of games, as ways for stakeholders to imagine possible alternatives and reflect on the future of their cities (Flanagan, 2009). Pioneering work in this regard has been undertaken, for example, by *Play the City*, a city-gaming project based in Amsterdam, the Netherlands (https://www.playthecity.nl/). Their work notably focuses on the potential uses of games in 'city-making', engaging stakeholders in questions, for example, around circular economy, smart cities, and common-pool resource management. Another similar platform, *Games4Sustainability*, is offered by the Centre for Systems Solutions based in Wrocław, Poland (https://games4sustainability.org/).

In a recent article, Tan (2016) proposes that games »can serve as a method for collaborative decisionmaking and the co-creation of urban environments«, in attempting to begin to answer the following questions (2016: 274):

- Can gaming be harnessed to guide planning from the seeding of ideas to implementing the plans on the ground?
- Beyond feeding decision-making, can gaming become operational in the producing and implementation of collaborative urban schemes?
- Can games bridge the gap between a theoretical understanding of cities as nonlinear, unpredictable and complex processes, and their treatment in practice as linearly produced?
- Could the direct implementation of game outcomes work in practice, as a new form of complex yet socially engaged city-making?

Ekim (2016) calls the scarce, but increasingly proliferating and evolving practice of using games for city-making purposes (i.e. going beyond mere teachning, training, strategizing and prediction tools, and forms of entertainment) 'Generative City Gaming' (Ibid.). He proposes that Generative City Gaming can integrate »the design and decision making dimensions, the social and political structures of cities, and the topological context in the design of the game. The game thus becomes a generative medium for making and maintaining (real) cities, because by mapping the city's particularities, it gains the capacity to respond to the quirks and needs of its users and spaces; (...) As long as there are multiple stakeholders with clashing interests involved«, games can offer » a way to resolve these and develop a cohesive plan collaboratively. Real urban urgencies define the narrative of each game, while existing power balances between politicians, technocrats, the market and community will determine each game outcome's potential for implementation.«

Schouten et al. (2017: 41) have similarly recently proposed "experimental game-making" as a promising method that can probe complex issues and make them "visible, sharable, and debatable." They argue that more participatory methods are needed that could bring content experts, designers and stakeholders together in order to foster better understandings of urban sustainability issues. However in the absence of a solid amount of such applications of games, Schouten et al., 2017: 24) recognize an urgent need for "more in-depth reports on how these playful or gameful interventions actually "work" across the full gamut of research, conceptual, and design considerations; prototyping and testing; evaluation; portability and scaling up."

4.3.5 The politics of foresight & games

Fazey et al. (2017:12) have recently pointed out that in foresight scholarship and practice, there are problematic "assumptions regarding the ontological nature of the future, assumptions which are not usually questioned". Karlsen et al. (2010: 61), in their attempt to offer some contributions from sociology to futures theory, poignantly characterize the state of most foresight practice today with the following statement:

> "*Contemporary foresight activities are dominated by commitment to research methods, almost as an end in itself, resulting in abstracting modes of futures empiricism based on both quantitative and qualitative methods. Arguably, there has been a general failure to examine and explicate the relationship between theory and method. The application of a particular method has been seen as sufficient requirement or justification for a foresight study, seemingly loosely coupled to the wider issues the study is designed to address*."

In this regard, Vervoort et al. (2015) have recently proposed '*scenario worldmaking*', notably an attempted rehabilitation of Nelson Goodman's (1967) mode of social constrictivism, as a theoretical and methodological framework for visioning and scenario practice. Grounded in the notion that realities are at their fundamental level socially constructed, and that humans in effect inhabit a multiplicity of (intertwining) worlds, which shape and are shaped by our (social, economic, political, cultural, etc.) imaginaries, Vervoort et al. (2015) introduce the notion of facilitating ontological agency as the core mission of collaborative scenario practice. Instead of having questions of probability and plausibility of scenarios take center stage (Ramirez & Selin 2014), Vervoort et al. (2015) stipulate that „engaging with discomfort and ignorance as guidelines for scenario practice (...) may not only help produce truly novel insights on potential futures, but may also help produce deeper insights about the individuals or organizations involved in the exercise—at least reveal what they find discomforting and why" (Vervoort et al. 2015: 63). Such engagements might facilitate a break with 'consensual

presents' (Ibid.), or 'flatlands of the future' (Slaughter 1998a; 1998b), and make for a more radical foresight practice engaging with more normative and deeply political questions.

Additionally, some authors, such as McGrail & Gaziulusoy (2014), see new opportunities in using foresight methods and tools to address the question of politics of transformations more explicitly: e.g. by drawing on cultural and poltical theory during vision/scenario development, analysis, and/or communication processes; and by using methodologies that can »'unpack' perspectives on the future and key circulating images or visions« (McGrail & Gaziulusoy, 2014: 8). With regard to the roles facilitators of foresight might take up, Irwin et al. (2015) identify a need for a new generation of 'transition designers', i.e. designers that 1.) Develop powerful narratives and visions of the future; 2.) Amplify and connect grassroots efforts undertaken by local communities and organiations, and; 3.) Work in transdisciplinary teams to design new, innovative and place-based solutions rooted in and guided by transition visions (2015: 6). That said, an important strategic element of foreisght is notably in the ability of facilitators or content experts to balance normative claims/imperatives/models and the need for developing co-ownership of an (actionable) vision and/or transition pathway. In other words, 'doing' transformations may be seen as a »process of iterating between understanding and influencing« (Avelino & Grin, 2016: 2). There is a notably a tension here between 'novel attractors' (for example, normative claims with regards to possible alternative instiutions); and the co-development of such new attractors with stakeholders in participatory and deliberative settings (Avelino & Wittmayer, 2016).

Elaborating more explicitly on the potential uses of games as tools and interfaces to foster and facilitate transformations; while games may represent formats through which stakeholders could playfully suspend their everyday roles and routines and engage with more alternative social and instiututional possibilities, roles and futures, a pivotal question remains with regard to applying the insights gained into the real world, as policy, as shifts in roles, responibilities, and the shifts in power that these entail. In other words, while games may offer ways to integrate existing power relations into dynamics of play, however accurate and relevant an oucome of a game may be, the existing power relations found in urban dynamics are a pivotal factor that influences whether a game outcome can have a tangible impact (Ekim, 2016: 287). Ekim (2016) notes on the subject of Generative City Gaming that, when using such formats to foster and facilitate multi-stakeholder urban transitions, it is important to note that »(s)haring information is sharing power, which both diffuses and creates tension; all collaborative city generation methods require special attention in the implementation phases to negotiate the new balance of power« (Ibid.).

Through the method of gaming, Ekim (2016: 287) argues, "(m)atters usually determined by experts behind closed doors« can »become negotiated and even generated by other parties; information that is normally limited to circulating within the walls of the municipality buil-

dings reaches a wider public—most importantly the population of that municipality—helping them make better informed decisions on matters of public importance.« Such a 'co-design' approach may be a useful bridge between normativity and co-ownership, in terms of co-production of knowledge, but also in order to generate new insights that may then inform subsequent 'intervention' designs, such as games. On that note, it is interesting to think about facilitators, designers, or experts, and even games themselves, in terms of a kind of 'boundary object'. Vines et al. (2013) phrase this sentiment as follows: "people are resourceful and skillful, and researchers should establish ways for this knowledge to be shared, communicated and embodied in technology design. By cooperating and forming boundary objects we provide spaces for knowledge and skills to be shared and inspire preferable future states."

Thus, in the above I have attempted to show that the question of politics of foresight and gaming is not only about how politics might be integrated into a particuclar foresight method per se (e.g. a game mechanic), but also entails deeper reflections on the deeper political implications of foresight practice as such; and deeper reflections on potential strategic uses of new methods such as games and/or game co-design.

4.3.6 Towards anticipatory governance?

This section concerns the question of the governance of transformations, as related to foresight; i.e. what may be the roles of foresight methods and tools as a more institution-al(ised/ising) practice (meaning, a practice that is at once a constitutive part, or modality of governing and design institions, as well as serves as methods, interfaces, tools and protocols to articulate and experiment with new institutions). Several authors have in recent years, partially building upon the notion of 'adaptive governance' from resilience thinking (Folke et al. 2010), outlined the concept and potential practice of 'anticipatory governance'. One of the aims of anticipatory governance is outlined as to make "values explicit through foresight tools and techniques that deal with social complexity, perception, values and worldviews" (Ramos, 2014; see also Bezold, 2006; 2010). Fuerth (2011) defines anticipatory governance as "a system of institutions, rules and norms that provides a way to use foresight, networks, and feedback for the purpose of reducing risk and increasing capacity". In outlining a research agenda for transformative science, Fazey et al. (2017: 12) note that more "anticipatory forms of governance (are) required for the Anthropocene era". Boyd et al. (2015) have noted in this context that 'polycentric governance' approaches (4.1.1.3) may lend themselves to applications of network foresight.

In the following, I zoom in on a particular scholarly articulation of the institutional and design possibilities of 'anticipatory governance', namely, Ramos (2014). Ramos (2014) traces the evolution of the discourse around and practice of anticipatory governance around the de-

velopments of: 1.) the notion of anticipatory democracy; 2.) science, technology and innovation foresight; 3.) futures commissions; 4.) foresight informed strategic planning; 5.) transition management; 6.) integrated governmental foresight; 7.) network foresight. On the basis of this comprehensive review, he proposes four (notably, as of yet largely speculative) 'synthesis proposals' of modalities of anticipatory governance, relating to different levels and scales of, and rationales behind institutional (governance and 'strategic design') operations (from Ramos, 2014: 46–49):

- **Foresight-enabled nimble community**: This system addresses the needs of small regional towns which face sustainability challenges. It enables the 'nimble' adaptation to change, rater than being overwhelmed by it.
- **User-led state foresight system**: Young people seem to be more engaged with social change than the government. This is a tool for generating cross-departmental intelligence, as well as including and engaging citizens in issue identification and local problem-solving.
- **National liquid foresight system**: A robust interactive system designed to facilitate interactivity, collective intelligence making and collaborative problem solving; a national web platform that allows citizens, among other things, to establish pop up town hall style meetings.
- **Global foresight commons**: A transnational cooperative system between governments, businesses, community and research organizations around the world; an 'anticipatory democracy' platform that allows people to interact and self-organize, create and enact new possible futures.

Notably, the concept of a 'global foresight commons' had previously been employed by other scholars (see Dumaine, 2010; Priday, Mansfield & Ramos, 2012; Ramos, 2013; Priday, Mansfield & Ramos, 2014), with the basic premise being an identified need for a more active role of foresight in empowered futures-making, and a greater institutional uptake of such methods and tools. It may also be argued that the notion represents a contemporary 'reincarnation' of Buckminster Fuller's idea for a 'world game' as a kind of global interactive resource utilization and planning tool (Fuller, 1971). Such a conception of 'commons' markedly departs substantially from what has hitherto normally been considered a commons (except for, perhaps, the concept of a 'knowledge commons'). However, at least in terms of the proposed definition of commons by Michel Bauwens (in Araya, 2015; see Figure 1 in this thesis), such an articulation of a global 'foresight commons' may be seen as corresponding to material and immaterial produced commons; or, what I might term, risking futher conceptual confusion, a 'tool-commons', which I propose could be regarded as an institutional(ised/ising) (e.g. digital tool/infrastructure) public resource that is collectively and openly maintained, enriched, and co-evolutionary by design, and which may serve to support and guide the govern-

ance of other resources, e.g. what are in the Ostromian tradition understood as ‘common-pool resources’.

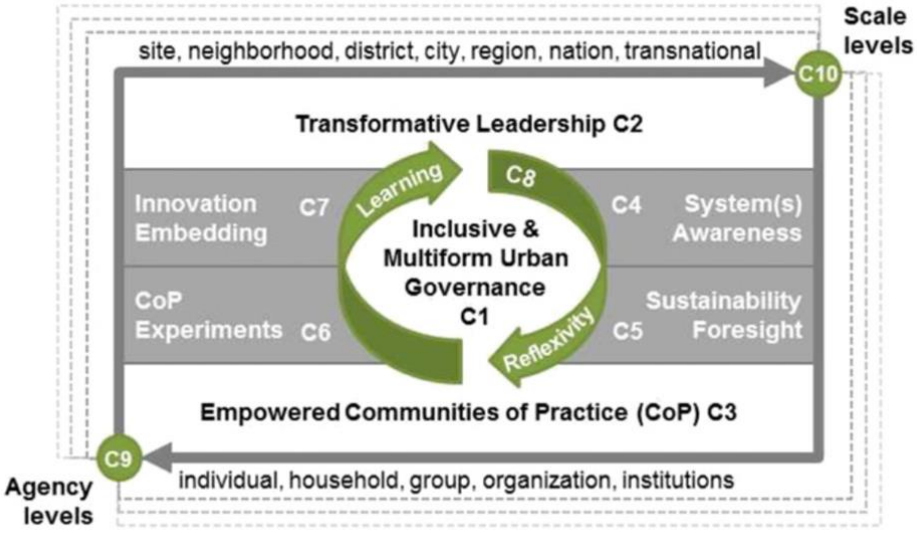
4.3.6 Foresight & transformative change

Foresight at its best is a deeply transdisciplinary effort, which necessarily entails collaborations between various actors. Scholz (2017) has outlined the goals of transdiciplinary, which I argue just as well apply to foresight more particularly, as the following:

- capacity building between science and practice by mutual learning and the capacity building of all stakeholder groups;
- consensus building (particularly in the problem-definition phase) among scientists and practitioners;
- finding strategies of mitigation among winners and losers of transitions; and
- the legitimization of certain actions by politicians who may refer to a balanced process of finding socially robust orientations.

Wolfram (2016) has recently proposed an elaborate model of what influences the development of transformative capacity of actors, which is seen as a pivotal driver of transformative change (see Figure 7). Wolfram (2016: 126) defines urban transformative capacity as the collective ability of stakeholders to »conceive of, prepare for, initiate and perform path-deviant change towards sustianability within and across multiple complex systems.« More recently, Wolfram, Frantzeskaki & Maschmeyer (2017: 22) have defined the components, or drivers of transformative capacity as »the diverse forms of institutions, resources, skills and interactions required to effectively empower actors individually and collectively for effectuating systemic change«.

Figure 7: Overview of interdependent components of (urban) transformative capacity (Wolfram 2016, 126)



Wolfram (2016) and Wolfram et al. (2017) notably identify foresight one of the core and deeply interrelated elements in fostering transformative capacity (for a comprehensive overview of these elements and their proposed synergies, see Wolfram, 2016). Wolfram (et al., 2017) maintain that such »a transformative capacity perspective can offer differentiated orientation concerning specific stakeholder needs (place-based!) and potentials, as well as regarding the use of sustainability foresight and practical experimentation, or (novel) institutional designs and governance modes to develop such capacity. As an action-oriented and empowering concept, it may thus help to identify requirements, design policies and devise purposive interventions to guide urban transformations.« Notably, with transformations towards sustainability being unavoidably political and in various ways also normative, the notion of transformative capacities also implies a deeply normative and political dimension.

5 Synthesis & Final Reflections

In this section, I offer a synthesis summary of the theoretical investigation above. While I cluster these following the initial guiding questions posed and the three respective subchapters that have attempted to offer an answer to them, in this section I also relate the chapters more thoroughly between and among one another, and offer some concluding reflections and remarks that may offer at least partial answers to the questions posed. This synthesis is followed by a validation section, where interviews conducted with various experts in relevant fields are used to validate my synthesis and general understanding of the literature. Notably, this systhesis, as a representation of my understanding of the literature,

then serves as a framework to approach the practical part of this thesis project (i.e. experimental game prototype design and testing and co-design with non-experts).

5.1 Socio-economic & governance alternatives

The emerging socio-economic and governance models (and narratives associated) outlined in this thesis (Ch. 4.1) are to varied degrees still quite theoretical and lacking in practical experimentaiton and empirical assessment. Notably, this may be due to an effective lack of genuine opportunities and spaces to conduct such experimentation, if one follows, for example, the postulates of 'post-politics' (Ch. 4.2.2) and 'path dependency' or capture dynamics (Ch. 4.2.4). That said, the 'path-deviant' and alternatives-oriented scholarship and practice has arguably matured in terms of criticism, to a limited extent, practice, and (largely speculative) design, and has begun to, according to my assessment, cumulatively outline the contours of a rich, varied, and potentially viable alternative, open-ended, pluralistic, co-evolutionary and 'commons-oriented' *socio-technical-political-economic-ecological* institutional architecture. That said, I assess that such models and their proponents would do well in taking closer account of the recent scholarly developments captured with the notion of 'transformations towards sustainability'; i.e. by closely and reflexively re-examining their models in terms of recent developments in theories of change and conceptual heuristics (Ch. 4.2) and the intertwined political and governance dimensions of transformations (Ch. 4.2.7).

For example, the model put forward by Sheila Foster and Christian Iaione (Ch. 4.1.1.2) remains a rare example of real-world experimentation to date with 'the urban commons'. Furthermore, the authors' insistence on a 'quintuple helix' model does not yet explicitly address the questions of how roles and responsibilities of (incumbent/innovation) actors might qualitatively transform over time with such forms of collaboration; i.e. the question if these models represent a (process/strategy of?) 'transformations *in* governance', 'governance *of* transformations', 'governance *for* transformations', or indeed hybrid forms of these (Ch. 4.2.7), remains a critical one. Such a lack of empirical studies on how such innovative socio-economic and governance models would in practice "help or hinder the innovativeness, learning, adapting, trustworthiness, levels of cooperation of participants, and the achievement of more effective, equitable, and sustainable outcomes at multiple scales" (Ostrom, 2010: 9) is a key knowledge gap identified. While such outlined institutional designs and 'prefigurative' experiments may offer some basis for 'commons-oriented' normative claims and deliberations on their possible applications in various locales and institutional contexts, much work with such models is thus still deemed needed. However, it is important to note that the notion of 'prefiguration' here may not necessarily entail a 'counter-position' or 'counter-narrative' to capitalism, but can and should embody 'alter-positions/narratives' in terms of being explicitly

oriented towards creating new models, and thereby, fostering new (social, political, economic, etc.) paradigms, imaginaries, sensibilities, and culturics, and (perhaps) ‘ways of being’.

Systems of governance modified, transfomed and/or created anew in the name of ‘transformations towards sustainability’ will arguably necessitate both models that are consciously transitory by design (Irwin, 2015), to very much 'future-fit' (Ch. 4.2.6); that range from the small and partial, to wider-instiutional and systemic; from urgent here-now pragmatic solutions, to effectively emancipated spaces and places for radical experimentation and experiention. Another key insight is that fundamentally antagonistic interests and ways of knowing may exist, which call for new approaches that engage with such frictions and discomforts in novel and productive ways (Ch. 4.3.5).

At this point I would like to note that, at their best, novel institutional models and designs such as those indicated in (Ch. 4.1) should be taking into account the full range of actants and intertwined cognitive and institutitonal structures that comprise what today we call ‘economy’, of which I here attempt to offer a partial list: humans, non-humans, species-being, institutions of knowledge, technology, data, common-pool resources, property systems, infrastructure, currencies, indexes, modes of/valuations of work, welfare models & subsistence pooling and deliberative provision/distribution systems, governmentalities, polities, ‘meta-polities’ (i.e. meta-polity-structures through which humans might collaboratively (re-)construct new polities), ecological capacities & planetary boundaries.

To briefly outline one critique of basic income discourse, I would personally view fiat-capital based basic income as one possible, yet necessarily consciously ‘transitory empowerment’ model; to be replaced by, for example, (compound?) resource-value-based currencies (e.g. based on values of energy, water, labour time, and/or combinations; or, conversely, based on gift economy principles in areas of socio-economic production and exchange where wanted and appropriate) and basic guarantees of welfare/subsistence via some kinds of welfare schemes based on ‘commons-based’ resource pooling and deliberative distribution (via digital, on-the-ground, hybrid) institutional platforms. On that note I would also care to acknowledge that there are at least two issues that must be acknowledged in employing the term ‘commons’ in discoursive, political and institutional (design) practice; 1.) the concept and definition of commons is in itself contested; 2.) rigid conceptual boundaries may be counter-productive in dealing with different institutional/societal actors in transdisciplinary settings, perhaps especially those concerning non-experts.

Finally, I would care to point out that the distinction made initially and throughout this thesis between ‘socio-economic’ and ‘governance’ models may in fact be counter-productive; in terms of such terminology (re-)producing a ‘janus faced’ view of political economy. That said, the distinction may be still found useful in some contexts.

5.2 Theories of change & conceptual heuristics

In critically examining the theories of change literature, I came to the conclusion that these may indeed represent crucial heuristic tools that would enable experts and non-experts alike to structure their thinking and inform their (strategic) agency with regard to transformations; and enable them to operate with emerging alternative socio-economic and governance models in ways that take into account, to the extent possible, of the politics of transformations. While no theory can ever fully account for all real-world contingencies, recent strides show a great level of reflexivity and holism with respect to immensely complex worldy (and, social 'inter-worldly'; Ch. 4.3.5) phenomena and associated problematiques.

One critical argument that I would raise with regard to the theories of change discussed is that Pel's (2015) dialectical perspective may hold a certain danger in implicitly denouncing the idea of a 'radical transformation' (strategy and/or dynamic), following Wright's formula (Ch. 4.2.1). Indeed, the notion of a dialectics as a totalizing concept may in fact create an epistemological framework that leaves little room for the theoretical (and practical) possibility of, using the terminology outlined in the chapters, 'social innovations' acting as 'game-changers' (Ch. 4.2.3), i.e. a social innovation or several innovations constuting a 'rupture' in consensual political economics of the neoliberal status quo. Reflecting on the notion of ruptural transformations in particular, I deem that this theoretical sentiment may be fruitfully complemented with Slavoj Žižek's assertion that the 'political proper' may, in fact, imply just such a ruptural break, i.e. in terms of a symbolic moment in a collective and futuro-historical socio-political imaginary. A genuine politics is, for Žižek (1999: 208), a "moment in which a particular demand is not simply part of the negotiation of interests but aims at something more, and starts to function as the metaphoric condensation of the global restructuring of the entire social space."

With regard to the question of scaling, I would note that while the scaling up, out and deep framework offered by Moore & Ridell (2015) indeed offers a very much needed nuanced heuristic model and understanding of the relationships between agency and structure, or, more precisely, between social innovations, instiutitons, and imaginaries, some pivotal questions still remain – namely, by what means (e.g. 'collaborative platforms', interfaces, tools, 'wiki's', ...) can such scaling be facilitated, and the knowledge about social innovations pooled and employed (e.g. through online repositories of social innovations; Bennett et al., 2016; and collaborative 'foresight commoning' platforms; Ramos, 2014).

I theorize here a few possibilities that may be crucially left out by the dialectical perspective on the institutionalization of (path-deviant) alternatives/social innovations, which might be characterized with the term '*subversive, disruptive and generative innovation*':

a.) 'strategic interventions' (e.g. experiential, aesthetic, 'situationism', 'real-utopian' film)

b.) strategic design of new 'socio-technologies', as new interfaces and/or tools to facilitate cooperative ventures and behaviours (e.g. game-as-interface, game-as-tool; Ch. 4.3.4), especially when considerations of the politics and power-plays of transformations are (strategically) taken into account in the design processes itself (and may also be applied as the 'mechanics' of the tools themselves) (Ch. 4.3.5)

c.) 'virtually emancipated' (or, deregulated) (temporary or relatively permanent) places and spaces (e.g. 'innovation spaces', 'urban laboratories', festivals, 'foresight commoning' platforms) for the purposes of co- generation, radical experimentation with and experiention of various fundamentally alternative socio-economic models (and/or scenarios) and various combinations/configurations thereof (e.g. basic income, alternative currencies and indexes, or 'currencies-as-indexes', co-governance models, new social, cultural, technical, ethico-political and pedagogic practices around food production and consumption, …), which point to plural and qualitatively different possible ways of living and instiutitonal configurations.

That said, such 'interventions' or experiments may in fact in many instances (especially in times of 'transitions towards transformations', or 'transformations *in* governance', and 'governance *for* transformations' (Ch. 4.2.7) function as rather something between 'ruptural' and' interstitial' transformation; i.e. while such alternatives are experimented with, they would expectedly still (at their beginnings) operate within a (near-)hegemonic global political economic climate, with 'dialectics' in one sense indeed occurring between such structures and associated actors and power dynamics. Importantly, however, in these contexts it is crucial for one to also step outside theoretical frames and consider the possible ranges of contingent agencies that may be disruptive (in the negative) in quite profound (and potentially devastating) ways (e.g. nuclear war); contingencies which must be taken into account in designing and employing 'interventionist' approaches.

Notably, due to time constraints some theories of change were not considered, but are seen as potentially crucially complimentary lines of inquiry, namely: 1.) socio-ecological transformations, i.e. "the need to better understand the processes of transformation and innovation and marry that knowledge with our growing understanding of complex social-ecological interactions to build the capacity to both respond to new disturbances and risks and to move toward sustainable pathways" (Olson et al., 2017: 2), and 2.) socio-technical transitions (e.g. Geels & Schot, 2007) perspectives, while considered through the multi-level perspective heuristic; the literature undoubtedly has more to offer other than this heuristic model, and a (problematic) 'evolutionary economics' perspective, alone.

5.3 Foresight & transformations

One prominent question concerning the uses of foresight to facilitate transformations is the question of (necessary?) trade-offs between needs of normativity (e.g. 'new attractors' as normative institutional designs) and co-production and co-ownership fostered in participatory and collaborative settings (Ch. 4.3.5). I would problematize the conception of these two crucial needs as necessarily in a trade-off relationship, as not leaving room for the possibility of 'strategic design interventions' as 'boundary objects', in the shape of, for example, new interfaces, tools, and city-making protocols (e.g., generative gaming; Ch. 4.3.4), which care to take particular account of, and attempt to commensurate by design, the normativities and politics of transformations on one hand, and multiple ways of knowing on the other (Ch. 4.2.7), and which strategically (enable to) 'hack' institutional lock-ins.

That said, it is important to restate here that any 'design intervention' may in today's political economic climate bring with it unintended conequences; and the notion itself also necessitates the profound question of the actual processes of uptake and/or institutionalization of such tools and interfaces on a (initially, highly likely, and particular) place-basis. Indeed a crucial component of any strategic tool, such as a game as a city-making boundary object; is in thinking about the context in which the game is played, who is included and who is not; and what are the shifts in power, roles and responsibilities implied (Ch. 4.3.5)

With regard to the interconnectivities between foresight, transformative capacity development, and transformative change, I will work with the assumption, based on the literature, that pre-imagining possible socio-economic and governance models and configurations, and the transformation dynamics, strategies and pathways associated; enhances the transformative capacities of stakeholders, in the sense of enhancing their 'futures literacy' and understanding of path-deviant institutional alternatives, which open up imaginaries concerning possibilities, which may be then be applied to strategy, agency, social innovations, design interventions, etc. In this sense, I would frame the enhancement of understanding of path-deviant socio-economic and governance models as a crucial strategic imperative of contemporary foresight practice; i.e. in the wake of looming and profound existential threats to our and other species of this planet.

Importantly, in my view, the question of developing transformative capacities should not take on a mere co-evolutionary, co-production perspective in the sense of, for example, participatory workshops, but should also take greater account of the normative dimensions implied with the urgency of path-deviant transformations towards sustainability. The notions of 'tools', I would argue, brings to the table an interesting prospect, that is, that transformative capacities not only depend on the specific content that stakeholders deliberate on, but also, and perhaps more importantly, the structured modalities through which such content is shared.

In other words, while place-based inquiries and solutions are indeed in important focus; in is not adequate as a sole focus, as such approaches may be overlooking the prospects of more globally-oriented or transnational interventions and collaborations, implied for example by the models of 'global foresight commons' outlined by Ramos (2014). On the basis of my understanding of the problematique, I would here extend the formulation to both place- AND space-based interventions (meaning discoursive space, digital space, virtual space, etc.). While I do not have sufficient time to fully develop this idea, it is a sentiment I take into account in the game design process. In the following I outline some potential roles of fore-sight in supporting 'path-deviant' transformative change:

a.) As small-scale, participatory workshop practice that strives to enhance *futures literacy* in terms of capacities to 'pre-imagine' alternative futures and pathways; *enhance critical understanding* of alternative institutional models; and foster and/or strengthen (new) *communities of practice*; while strategically accounting for the politics of transformations, and the politics of games (and game (co-)design processes), and thus maximizing the *actionability* of pre-imagined visions and pathways

b.) As upscaled/upscalable instiutional(ised/ising) practice (i.e. particular tools, interfaces, protocols and combinations as particular 'modalities of anticipatory governance'); supported in part by such methods as network-foresight, (generative) gaming, collaborative scenario-making, and combinations of such methods; that may foster collective planning, strategy, policymaking and 'future-fit' design and innovation/experimentation

c.) As 'socio-economic experiential scenarios'; the idea of socio-economic experiements-as-experiential-scenarios, for example, in the area of food systems transformation, combining social, institutional and cultural design techniques around food production and consumption, experimenting with alternative currencies, aesthetic and politico-ethical engagements with questions around food production, animal welfare, sustainability, unvalued/invisible work, and monitoring and evaluation (on both social and ecological grounds) of such experimental configurations.

5.4 Validation: Interview Results

During and after the process of the theoretical literature review and writing of this thesis, of which the results have been presented above, I sought to validate my understanding of the literature by means of interviews with (four) experts in the relevant fields. Overall, the interview input is assessed as generally congruent with the theoretical understanding. I should note however that, as the interviews had been conducted also during the formation of my theoretical underestanding (and hence, at a time where some aspects of the research had not been yet fully developed), in some instances I had trouble communicating adequately to the interviewees the final scope and focus of my research project, and hence articulating appropriate or most useful questions; which resulted in a rather incomplete validation of the theoretical framework.

Thus, it may be more appropriate to view the interviews as method not (only) as a validation of my understanding of the literature, but indeed as an element which offered a pivotal method of reflexivity to my approach to the literature, and in some cases fundamentally complemented, or altered, the content of and style in which the results have been presented in the above sections (and, in some cases, were applied to the game design in Phase Two of the project). With this in mind, I present the experts (i.e. scholars) interviewed in an interviewee matrix (Table 8), and present the results in three clusters, namely:

a.) Socio-economic & governance alternatives
b.) Theories of change & conceptual heuristics
c.) Foresight-based multi-stakeholder engagements

Wherever the input from the interviews in any way shaped my theoretical understanding and the written text in the above chapters (and, subsequently, shaped the practical part of this thesis explicated in the next chapters), this is clearly indicated. While I recognize this may not be an ideal way of presenting the reflexive process involved in structuring my theoretical understanding, it is the best approximation I am able to make given constraints in time.

Table 8: Interviewee matrix (validation of theoretical underestanding)

Name	Expertise	Affiliation
Jennifer Hinton	Post-growth economy, Theories of change	Stockholm Resilience Centre (PhD researcher); Post-Growth Institute (co-director)
Michiel de Lange	Civic media, Smart Cities, Foresight, Games	Utrecht University, The Hackable City (research project co-founder), The Mobile City ()
Heleen Mees	Urban governance, Bottom-up initiatives, Foresight	Utrecht University, City Deal Project (researcher)
Tine de Moor	Historical formations & regulations of institutions for collective action	Utrecht University, Institutions for Collective Action (principal investigator)

5.4.1 Socio-economic & governance alternatives

In an interview with commons scholar Tine de Moor, she expressed concern over her observation that the term commons is today being "stretched up, to mean basically anything you want to claim on a stage." Furthermore, she notes that there are "a lot of scholars who describe the historical situation as a romantic working together, co-creation, peace, that they all lived happily together." This problematization is noted as a key insight, and which shaped my thinking with regard to issues connected with conceptual boundaries (Ch. 5.1) and the issue of an 'ontologized commons' (Ch. 4.1.1.1).

She also outlined the problem that many discussions around commons today are "not always connected to an empirical basis", which can give a "utopian perspective." She notes that much of the contemporary scholarship takes on a rather theoretical "political philosophical" and "political ecological" view. Her observation drove my thinking with regards to tensions between narratives or visions, or utopian sensibilities on the one hand, and 'pragmatic' (political) institutional models and practice on the other.

I asked Tine de Moor about how particularities of an overarching political economic system may hinder or enable the setting up of instiutitons for collective action, to which she replied: "Of course the context today is slightly different, with digitization, the extreme importance of globalization and free trade. There are different contexts in which it operates, but the mechanisms behind the formation of new institutions for collective action are very similar."I assess her however that both imaginaries and practices are fundamentally shaped by current (near-hegemonic) capitalist institutional and societal structures, and that there are somewhat specific reasons as to why more radical models are to a large extend 'speculative designs' rather

than fully-fledged radical experiments (Ch. 5.1) which may be empirically assessed. That said, her observation of the need on "how commons really work (...) based on empirical evidence" is seen as a crucial one (Ch. 5.1), albeit not the full picture of social and political transformations.

Tine de Moor characterizes the "popularity of commons" today, from a citizens' perpective, as a corrective mechanism for market and state failure.« (W)e are in a sort of paradigm shift in the sense that people are starting to see that the government and the private sector don't always work in these circumstances. (...) Citizens are sort of filling this gap, but the question for the future is, how can we avoid a reiteration of this situation, (...) where we are constantly reinventing that whole part between state and market.« Tine de Moor notes that in current political institutions, »the privatization option, the public-private partnership option, is taken as the easiest solution to build houses, roads, etc. ... (It is) seen as the deus ex machina, as the quick resolution of societal problems.« This critique notably falls well with Christian Iaione, Sheila Foster's and Tommaso Fattori's pleas for public-commons partnerships (Ch. 4.1.1.3)

Lastly, Tine de Moor shared with me one profound finding with regard to her recent studies of historical 'institutions for collective action', namely that "there is an inverse correlation between the longevity of a commons, and the degree to which they (people, commoners) invested in sanctioning. In the case of commons we studied we find that (...) they didn't use sanctions to avoid free-riding, but they came up with alternative ways to make sure that people were thinking for the common good. The way in which they do it is essentially by convening more (...) It's more important to sanction people who are not attending meetings, than sanctioning them for not applying the rules. Because when you don't come to the meeting, they you don't know what the rules are, and why the rules are as such." While a notable insight, I have not managed to integrate this insight into my theoretical framework; partially because the focus of the project is, in retrospect, somewhat different from such a line of inquiry.

As my conceptual understanding of commons had only begun to form at the time of this interview, I had failed to ask more specific questions about her views on such concepts as 'urban commons' or 'digital commons'; which, in retrospect, may have yielded interesting and pertinent insights.

In the context of innovation, and specifically with regard to the notion of smart cities, scholar Michiel de Lange noted that it is crucial to consider »media technologies or ICT's (Information and Communication Technologies) as not merely comprised of the technologies themselves, a simplistic solutionism, but also importantly the social practices, and the institutional arrangements associated with them." This is congruent with my assessment that more

socio-economic alternatives need to be sought across levels (e.g. social, cultural, technological, political) (Ch. 4.1.2)

Another notable imput from my interview with Michiel de Lange had been the recognition that "it is interesting to focus on words that have a certain performative quality – experiments, safe spaces, urban playgrounds, and so on". This influenced my understanding of the prominence of of discourse or 'narrative', rather than a sole focus on empirical analytics, in transformation dynamics (Ch. 4.2.3)

5.4.2 Theories of change

I spoke with alternative economy scholar, Jennifer Hinton, about the theory of change that she uses in her work regarding a »post-growth economic model, based on a transition from for-profit to not-for-profit business«, taking cue from »different sustainability oriented economies that already exist; transition towns, eco-villages, circular economy, etc.«. She described what her and her colleague and director of the Post-Growth Institute, Donnie MacLurcan, describe as the »six layers approach to social change«, i.e. "behaviors, feelings, conditions, frameworks, values, and constructs"; in effect a conceptual heuristic and analytical tool. The formulation is used for exploring »how the layers affect each other and co-evolve. And nothing is static. It's about finding the ways in which you can align all of the layers.«

We then spoke about »radical vs. incremental« transformation, and radical incrementalism; »Do we need radical change, or incremental change. We need both. Incremental change is great as long as there is an ambitious and radical vision behind it.«. While I had engaged with the concept of incrementalism prior to the interview (e.g. Patterson et al., 2016), and indeed it constituted one of my questions, her explication of the notion of "radial incrementalism" and reference to the work of Maya Gopel (2016) solidified this choice as a heuristic and thesis sub-chapter; and the reference to Gopel's (2016) work was a welcome source of inspiring ideas. Subsequently, we spoke through examples of Uber and Airbnb, and agreed that while these models surely do not represent the end goal as concerns 'sharing' and/or 'circular economy'; the fact that these models are "now more in the open", they may contribute to change in the long run; thus offering a meaningful validation of the Trojan horse metaphor found in Pel's (2015) work on the dialectical perspective on social innovation institutionalization. In terms of path-dependencies as barriers, Jennifer Hinton also noted that "there's often the assumption, and it goes unspoken, that there are these path-dependencies. (...) (I)t is important to look at path-dependencies, but also in the context of the weaknesses, internal weaknesses of the system, and why we are seeing these (social, economic) crises in the first place.« This

observation notably alludes to having a more nuanced approach towards the dialectical perspective (Ch. 5.2).

Finally, we spoke about conscious interventions and creation of visions, models and designs serving as 'new attractors'. She generally agreed with this statement, citing Buckminster Fuller's theory of change that »you never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete«.This in effect may be seen as the ‘thread’ that runs through my research project; and her assertion of this sentiment solidified some of my choices and articulations throughout the thesis – especially with regards to the designing of the game as intervention.

5.4.3 Foresight-based multi-stakeholder engagements

In efforts in getting different stakeholders to co-develop a shared agenda and build knowledge as regards the future of their city, based on his experiences in participatory foresight and civic media Michiel de Lange proposed the some crucial factors of success: 1.) Presenting best practices and appealing cases; 2.) Framing the(ir) project as a possibly exemplary case; 3.) Including institutional partners; 4.) Creating online platforms for knowledge pooling and exchange, such as “wiki-s”, with particular mind to differences between “generic information” and “tailor-made, location specific knowledge”; 5.) Face to face, playful, “almost situationist” approaches; i.e. “workshops, people co-design, and share their knowledge”, and/or “play games, people collaboratively gamestorm, that is, brainstorm through games, like about how they want to create a circular neighbourhood”; here, the replay value of games, and their potential scalability, were outlined as potentially useful characteristics of a game to tackle urban-scale challenges. A simple board game was used for collaborative scenario building with people, as a way to allow them to voice their own ideas about circular living. The success of the game was assessed as partical; participants “were enthusiastic and that worked to some degree, people were enthusiastic, but it was difficult to scale up, not useful for any more than five people at the table. The replayability was also not that big.”

This input notably confirmed a lot of the investigations into the possible uses and (political) roles of games to facilitate multi-stakeholder communication (Ch. 4.3.4; Ch. 4.3.5). The recognition of ‘wiki’s’ or knowledge pooling platforms is also congruent with Christian Iaione’s proposed characteristics of urban polycentricity (Ch. 4.1.1.3). Lastly, I noted the possible needs in designing games that may be ‘scaled’ and have ‘replay value’, criteria which became important in designing my game prototype in Phase Two of this research.

Based on her recent experiences with participatory foresight, scholar Heleen Mees noted that “some people were only thinking in terms of barriers, restraints. And then there are also these visionary people, who actually do get the picture, who understand what you want to do with

them, but these are usually few. (…) We tried to do a backcasting; but they were more inclined to think from the other side, from the present moment towards the future; In the end what we did is just plot actions, let them brainstorm about intermediate actions, and then later on plot them in a timeframe." While this input in itself may not serve as to validate my theoretical understanding, it none the less serves as an important observation in that it is generally very hard for non-experts to engage with questions regarding 'alternative futures' (Ch. 4.3.2).

6 Phase Two: Game Prototyping & (Co-)Design

This part/phase of the research is intended to, in an experimental way, begin to codify and operationalize my understanding of path-deviant alternative models and theories of change gained in the previous chapters, in the form of a game prototype. On the basis of the findings and critical reflections (see Ch. 5), I have formulated a main question and sub questions, the answers to which are pursued through interviews, in a practical experiment involving the prototyping of a game, and in a game testing and co-design workshop with non-expert multi-level practitioners based in the Dutch city of Eindhoven. In the following sections, these components are outlined, beginning with a description of the developmental and testing case study context, and the rationales for choosing this place-based case study in particular.

One disclaimer I should put at the outset of this section of the project is that some of the theoretical understanding as outlined above in synthesis of Part One, while to an extent had been part of the mental framework with which I approached the practical experiment, had only been fully developed in written (and mental) form during and after the interviews and workshop conducted. The nature of these developed understandings I felt warranted that I somewhat re-approach the data gained through interview and the workshop, according to these developed understandings. An explication of these is outlined in the research questions section of this part of the thesis.

6.1 Case Study Context

The city of Eindhoven was chosen as a case study on the following grounds. In Eindhoven (the fifth largest city of the Netherlands), a series of visioning workshops involving multiple stakeholders (e.g. local government representatives, businesses, smaller initiatives, ordinary citizens) had recently been conducted, where a vision for the city (i.e. 'Visie Stadslandbouw') was developed with regard to the future of Eindhoven's food system (see Hebinck & Villarreal, 2016). During the workshops, the concept of a circular economy, among others, was integrated as part of this vision (see Proeftuin040, 2016). The workshop was facilitated

by local design and knowledge hub Proeftuin040, and TRANSMANGO, an international research project around food security and foresight methods.

Notably, the stakeholders involved in this visioning process at the start of this thesis project still faced several critical questions, specifically with concern to 1.) Rendering the (radical) vision for Eindhoven's food system actionable; 2.) Possible roles of civil society in a sustainability transition; and generally the future of more collaborative forms of city-making and urban governance, and; 3.) Fostering effective communication, trust and understanding among stakeholders, as well as shared responsibility and problem ownership for the implementation of the vision (Andre Cools, Interview).

As my thesis project concerned the potential uses of game-type foresight methods and tools to enhance communication around emerging alternative socio-economic and governance models, and the complexities of transformation dynamics and pathways, including stakeholders forming a new 'transition arena' in Eindhoven seemed a particularly fruitful ground for experimentation with and testing of such methods and tools. As part of the scoping out of a potential case study, I initially contacted the director of the local design and knowledge hub Proeftuin040, Andre Cools, to discuss the prospects of collaboration. This initial meeting gave more context to the particular developments and dynamics with concern to the vision, and the different city stakeholders' ambitions towards sustainability and the discourses they employ. The (co-)development and testing of a game as a tool was seen as an opportunity to support the practical execution of the generated vision. Director Andre Cools was also able to provide initial contacts to other stakeholders active in the area, as potential interviewees and/or workshop participants. In speaking with director Andre Cools, the idea had been initially to contact and engage practitioners from the local government who had not been part of the visioning process. However, I had not received any positive response from such indiviudals, and ultimately, the choice was made to interview and include in the workshop local practitioners who had been part of the visioning process. Notably, these individuals stem from different backgrounds (namely, government officials, designer and knowledge broker, social designer); yet have relatively compatible ideologies and visions with regard to the city, as well as are familiar and feel comfortable enough with each other to share and discuss the barriers they face in pursuing their transformative ambitions, and possible pathways forward.

Interviewing one of the leading researchers that facilitated the visioning process, Aniek Hebinck (TRANSMANGO), further deepened my understanding of the local specificities, including the institutional context, key actors, and state of the local debates concerning socio-economic and governance alternatives, which was then taken into account in approaching potential interviewees. The preliminary findings from interviews with Andre Cools and Aniek Hebinck are the following:

1.) ‘Circular economy’ and ‘smart cities’ are prominent narratives used by actors in Eindhoven, as confirmed by key informant Andre Cools; circular economy was one of the core concepts used in the visioning process conducted prior to this thesis project by Proeftuin040 and TRANSMANGO;

2.) I had also been informed by Andre Cools that the '(triple) helix' concept is (rather coincidentally) used by local government officials to denote the (seen as desirable) cooperation between government, businesses and knowledge institutions such as universities in policy and urban planning, and reportedly new directions for the local government concern the concept of a 'quadruple helix' – i.e., questions regarding how civil society may be better integrated into local governance processes.

3.) Based on input from Aniek Hebinck, concepts such as circular economy are generally employed rather loosely by local actors, with it being unclear how circular economy infrastructures may look like and/or combine with other prominent models, such as sharing economy, and commons-based urban co-governance.

6.2 Research Questions

In applying the research conducted and understanding gained through Phase One of this thesis project, I have formulated a guiding main question and two sub questions. Notably, these questions work with some particular assumptions, which I attempt to outline in detail below:

1.) Path-deviant alternative socio-economic and governance models are currently by and large not understandable and available in formats that would allow their uptake in pursuing (path-deviant) transformative ambitions for change.

2.) The above is in part due to the current and particular (near-)hegemonic social and political economic conditions unfavourable towards radical change; and due to the inadequacy of existing (foresight-based and other) tools and methods in bringing together disparate ‘worlds’ or ways of knowing of different stakeholders (i.e. an argument following the ‘post normal turn’ in foresight practice; Vervoort et al., 2015), and develop their capacities in such a way as to ‘properly politicize’ the endeavors of transformations towards sustainability (i.e. addressing the predicament of ‘post-politics’; e.g. Swyngedouw, 2016).

3.) Games as a critical practice are well positioned to serve as ‘design interventions’ and/or ‘boundary objects’ between the worlds of path-deviant alternatives (e.g. theoretical models, instiutitonal designs, novel governance modes, radical experiments) on the one hand, and non-expert practitioners on the other; acting potentially as new tools and protocols for

(cosmopolitan and path-deviant) 'city-making'. All the while, the element of scalability of a game (e.g. it's potential applications in network-foresight) is deemed a crucial one for facilitating wider-scale (and urgently needed) transformations.

4.) Such games notably do not yet exist, or exist in limited forms, and much experimentation is urgently needed (Ekim, 2016; Schouten et al., 2017). Such initial experimentation with game designs should be conducted with the direct involvement of non-experts, so that the use-value of the mechanics and content of games, and their effects and outcomes, can be reflected and iterated upon, according to the imperatives of balancing the needs of normativity with co-production of (actionable) visions and pathways; and according to the need to make such games relatively intuitive, dynamic, fun, and engaging experiences/tools.

Main research question

What are the tools and capacities that non-expert practitioners identify they need, and what sorts of capacities, and (e.g. game-type) tools to develop such capacities, may be necessary in 'post-normal' and 'post-political' times where path-deviant change is urgently needed, yet systemically hard to realise?

Sub-question 1

What are the current disconnects between (my understandings of) emerging (path-deviant) alternative socio-economic and governance models on the one hand, and the understandings of (alternative & non-expert) practitioners on the other?

Sub question 2

What insights can be gained as to how effective games for' cosmopolitan city-making' might look like, by involving non-expert practitioners in a game co-design process (as research and design method)?

In my understanding, as I pose these questions; tools and capacities practitioners identify are related to their (normative) interests and understandings of alternatives. On the other hand, my research has indicated that practitioners may not be familiar with the full scope of possibility concerning such alternatives, and by extension, the scope of possible tools that might help them. This also implies the normative dimension of transformative capacities; i.e., what are the tools that can address the challenges of 'post-normal' and 'post-political' times in due time frames posed by climate change. By inquiring into the disconnects between my understanding of alternatives and tools needed, and practitioners' undersstandings of these matters; also by means of a game testing and co-design workshop with non-experts; I hoped to gain insights as to what strategic tools can be developed that can develop capacities of stakeholders (capacities here designating also normative questions about the capacity to work with

others who may have fundamentally different ways of knowing, and the capacity to strategically address the post-political predicament generated by near-hegemony of capitalism; in light of the imperative for radical change).

In the following, I outline the research methods used to approach answering the above questions. This is followed by an outlining of the results based on interviews with alternative and local non-expert practitioners. I then describe the game prototype design process (i.e. the design process prior to the workshop) and the respective elements of the game, and the game prototype testing and co-design workshop results.

Notably, for the game design itself I made the early decision to include a particular mechanic – namely, facilitating a backcasting exercise through the use of 'Barrier' and 'Transition Ingredient' cars (which correspond to barriers to, and drivers of transformations respectively). Input for creating these cards was gathered from interviews with local non-expert practitioners, alternative practitioners, as well as experts. Asking all interviewees about the barriers to and drivers of change they see formed a basis where I could codify this input and operationalize it as facilitation cards. This mix of different stakeholders' input allowed in my view for game content that would serve to inspire 'out-of-the-box' thinking; but also, and importantly, engaging the non-expert practitioner players of the game with different understandings of the sustainability problematique at different levels and areas of agency.

6.3 Research Methods

In order to answer the above research questions, the research steps taken were as follows:

1.) Exploration of the current gaps between (my understanding of) path-deviant socio-economic and governance alternatives on the one hand, and the current thinking and work of city practitioners on the other, by means of interviews conducted with on-the-ground (alternatives & local non-expert) practitioners (Ch. 7.1 - Answering sub-question 1)

2.) Gathering input from all interviewees (experts & practitioners) on perceived barriers to and drivers of transformative change – to be codified and used as facilitative tools (i.e. cards) in the game prototype (Ch. 8.1.3); the input on barriers and drivers from practitioners also served to highlight their transformative ambitions and the theories of change associated

3.) Experimental codification and operationalization of alternatives and theories of change in a foresight-based game prototype, along with the input from interviewees on barriers to and drivers of change, and testing the prototype with local practitioners in a workshop. During playtesting, iteratations on the game prototype elements are made and new

elements are co-designed, corresponding to the practitioners' expressed needs and ideas, yet feeding into my understanding of what might constitute effective tools that can facilitate more radical change (Ch. 8 – 8.1; Answering sub-question 2)

On the basis of the results of the above, in the discussion I will offer the practice-informed follow-up on the theoretical section, as to how games may contribute to developing transformative capacity of stakeholders (and indeed reflect on the contested and normative dimensions of conceptions of transformative capacity itself), and reflect further on the transformative potential roles of games in 'post-normal' and 'post-political' times (Ch. 9), and the implications of this line of enquiry.

Further methodological clarifications with regard to this practical part of the thesis are outlined below.

a) Selection of interviewees

b) The method of establishing disconnects between (my understandings of) alternatives, needed tools and capacities, and the understandings of practitioners

c) The method of, or influences on the design of the game prototype prior to the participatory workshop

a.) Selection of interviewees

Besides local informants Andre Cools and Aniek Hebinck, and the experts interviewed to support a reflexive research and a validation of my understanding of the literature, I had interviewed also two 'alternative practitioners', and thee 'local non-expert practitioners'.

The alternative practitoners are notably a knowledge broker with a local government institution, while the other is a social entrepreneur. The selection of these two alternative practitioners offered a way to contrast the views between actors who in their work deal in some way with socio-economic and governance alternaitves, yet come from different backgrounds and represent different interests. For this project, only these two alternative practitioners were contacted, and both agreed to interviews.

As stated in the case study context section above, the idea for this project was to involve actors from the local government who had not been part of the visioning process prior to this thesis project. 8 such individuals were contacted. However, due to a lack of (positive) response, the focus of the practical part and the game itself shifted towards local practitioners who have worked with each other and feel comfortable with each other enough to share barriers to them effectuating their transformative ambitions. 3 such local practitioners responded

positively to invitation for interview, while 2 of these agreed to attend the game testing and co-design workshop.

Table 9: Interviewee matrix (full)

Role	Name	Profession	Expertise/Interest	Affiliation
Local informant	Andre Cools	Designer, Knowledge broker	Sustainability	Proeftuin040 (director)
Local informant	Aniek Hebinck	Scholar	Participatory foresight	TRANSMANGO, Stockholm Resilience Centre (PhD researcher)
Expert	Jennifer Hinton	Scholar	Post-growth economy, Theories of change	Stockholm Resilience Centre (PhD researcher); Post-Growth Institute (co-director)
Expert	Michiel de Lange	Scholar	Civic media, Smart Cities, Foresight, Games	Utrecht University, The Hackable City (research project co-founder)
Expert	Heleen Mees	Scholar	Urban governance, Bottom-up initiatives, Foresight	Utrecht University
Expert	Tine de Moor	Scholar	Commons in historical perspective, Formation & regulation of institutions for collective action	Utrecht University, Institutions for Collective Action (principal investigator)
Alternative practitioner	Alternative practitioner 1	Social enterpreneur	Sharing economy (mobility); Smart cities; Urban commons	/
Alternative pracititoner	Alternative pracititoner 2	Knowledge broker	Circular economy, Smart cities	Municipality of Amsterdam
Local non-expert practitioner	Local practitioner 1	Social designer	Food system sustainability, Transition	/
Local non-expert practitioner	Local practitioner 2	City Councelor	Sustainability	Municipality of Eindhoven
Local non-expert practitioner	Local practitioner 3	Civil Servant (District initiative coordinator)	Food system sustainability, Bottom-up initiatives	Municipality of Eindhoven

Interview dates (in order from first to last):

a.) Andre Cools (28.2.2017)
b.) Aniek Hebinck (5.5.2017)
c.) Heleen Mees (10.5.2017)
d.) Michiel de Lange (18.5.2017)
e.) Local practitioner 1 (7.6.2017)
f.) Alternative practitioner 1 (13.6.2017)
g.) Local practitioner 3 (16.6.2017)
h.) Jennifer Hinton (19.6.2017)
i.) Alternative practitioner 2 (19.6.2017)
j.) Tine de Moor (20.6.2017)
k.) Local practitioner 2 (27.6.2017)

b.) The method of establishing disconnects between (my understandings of) alternatives, needed tools and capacities, and the understandings of practitioners

I approachd assessing disconnects between my understanding of path-deviant alternative models (as outlined throughout and in the synthesis of Part One) and the understandings of practitioners by means of semi-structured interviews. The most prominent ways in which this assessment is made is the following:

- Inquiring directly about the current familiarity with, understandings and sources of information regarding socio-economic and governance alternatives; Using 'framing devices' (described below) to probe additional knowledge gaps and discomforts about alternatives
- Inquiring about their identification of the barriers to and drivers of change in pursuing their transformative ambitions
- Inquiring about their needs in terms of tools and/or capacities

The literature review, and the information on the local specificities and actors in Eindhoven provided by key local informant Andre Cools, were used to formulate the following 'performative concepts' or strategic 'framing devices' that were used in the interviews with alternative and non-expert practitioners, so as to prompt and probe views on and potential knowledge gaps and discomforts concerning socio-economic and governance alternatives. These were:

1.) The framing on my part of business models of Airbnb and Uber to interviewees as status-quo prone, corporativist models, or appropriations of the 'true' sharing economy; this framing was used to prompt a response and subsequent discussion around the 'true'

meanings of ‘sharing economy’ and other alternative socio-economic models explored in this thesis.

2.) In some cases, the framing device concerned the problematization on my part of technology-oriented thinking embedded within alternative economy discourse and practice; the purpose of this framing device is identical to the above.

3.) The introduction, during interview, of the urban co-governance model as a ‘quintuple helix’; notably, the notion of a ‘quintuple helix’ as employed by Iaione & Foster (2016) implies the need for the inclusion of civil society (the ‘fourth element’ in the ‘helix’) in ‘city-making’ and urban governance, as well as to make a clearer distinction between incumbent for-profit businesses and social entrepreneurs/innovators (the ‘fifth element’ in the ‘helix’), a distinction that addresses the need for critical thinking with regard to transformation pathways towards sustainability, and the fundamental rethinking of power, roles and responsibilities that these imply.

In one case, in addition to using the above framing devices, I asked the interviewee explicitly about what their definition of a circular economy is (Alternative practitioner 2). I also discussed with most practitioner interviewees their sources of information as regards socio-economic and governance alternatives.

Notably, by asking practitioners about the barriers to and drivers of transformative change in terms of their own transformative aspirations, I could also get a sense of their interests, priorities and convictions as regards socio-economic and governance alternatives, which partially informed the assessment of their interpretations of such models, and their convictions and theories of change associated. Another purpose of this particular question was notably to gather input for creating ‘Barrier’ and ‘Transition Ingredient’ (or ‘driver’) cards as part of the game design, and was posed not only to practitioners, but experts as well.

By asking practitioners about their needs, in terms of tools and capacities, I got a sense of what is their understanding of the capacities they need, as contrasted to my own understanding of the imperatives of more radical transformations towards sustainability and the capacities and tools that such imperatives imply.

c.) The method of, or influences on designing the game prototype prior to the participatory workshop

As such game-based experimentation has only recently emerged in literature (e.g. Ekim, 2016) and practice (i.e. the examples of the Games for Cities and Games4Sustainability platforms), most of the game design on my part was intuitive and based on the literature review and development of my own understanding of the problematique and potential solutions in terms of game uses.

That said, the design of the game was also partly influenced by my recent experiences with playing and co-designing games (Table 10);

Table 10: My recent experiences in gameplay and game design

Activity	Date	Link to Event
Assisted in a role-playing scenario game workshop organized by Games for Cities Training School, which investigated how play and games can be used to engage and activate citizens around the advent of a 'circular economy', with a particular focus on food and food waste.	10 October 2016	http://www.coniecto.org/wordpress/2016/10/games-for-cities-training-school/ (12.9.2017)
Co-developed a computer game around the notions of commoning and circular economy with relation to food systems with a team of students of Games and Interaction at Hogeschool voor de Kunsten Utrecht (HKU);	8-10 February 2017	https://www.hku.nl/Home/AboutHKU/HKUNews/HKUNewsitem/HKUAndTRANSMANGOOrganiseInternationalGameJamOnFoodSecurity.htm (12.9.2017)
Attended Games for Cities conference in Rotterdam exploring the role of games in citymaking strategies. Playtested a latest iteration of 'The Water Game', a scenario-based game around urban water management.	21 April 2017	http://www.gamesforcities.com/challenges/conference/ (12.9.2017)

The game design process, based on the case study selection and particular developmental context and willing participants, revolved foremostly around the question of what kinds of (game-based, or 'gamified') tools would be useful for practitioners who stem from different backgrounds, yet have relatively compatible ideologies, as well as are familiar and feel comfortable enough with each other to share and discuss the barriers they face in pursuing their transformative ambitions, and possible pathways forward. The 'game-as-tool(box)' was thus initially designed to help such practitioners articulate an alternative future for the city (based on path-deviant socio-economic and governance models) and the roles they themselves might inhabit in such a future; also by means of discussing barriers to and drivers of transformations as a way to structure discussions in terms of a backcast, i.e. "looking backwards from that future to the present in order to strategize and to plan how it could be achieved" (Vergragt & Quist 2011: 747). This context drove the process of designing the game, which ultimately became a 'gamified backcasting' prototype, complemented with two developed discussion-provoking scenarios, an element of roleplay, and various supportive elements, mainly in the

form of conceptual heuristics that were meant to be used to reflect on the results of the gamified backcast.

Notably, who is involved in a particular game testing and (co-)design and what are their interests, and who the design is geared towards, as fundamentally influencing the outcome, is a fairly straightforward idea, but with profound implications. In the process of my designing of the gamefied backcast prototype, I sought to balance two somewhat distinct aims. *Firsly* – the practitioners' more immediate interests concerning a game-as-tool(box); one that facilitates the co-creation of strategies/pathways (with respect to their own goals and visions) and how they can be realised/achieved. *Secondly* – what I thought could prove to be a more valuable game-as-tool(box) in the longer run for these practitioners, as well as practitioners in other urban contexts; i.e., not only addressing the immediate challenges the practitioners see and face, but also addressing more persisting (normative and political) challenges associated with transformations towards sustainability, as I saw them on the basis of my theoretical investigation as Part One of this thesis. One important criterion in the latter regard became the potential *scalability* and *replay value* of the game (Michiel de Lange, interview), and its potential applications in network-based foresight (Priday, Mansfield & Ramos, 2012) in terms of constituting a 'boundary object' tool for 'global foresight commoning'; a tool that could facilitate discussions around politically sensitive issues around barriers to change, yet at the same time open up such discussions to a wider participative communitiy.

The rather simple game prototype I developed was tested prior to the workshop in Eindhoven during a brief 30-minute session with my mentor, dr. Joost Vervoort, and a fellow MSc student of Sustainable Development at Utrecht University, Astrid Mangnus.

7 Assesment of the State of Alternatives-Oriented Thought & Practice

In this section I lay out the results of the interviews with non-expert and alternative practitioners. In the case of barriers and drivers, the interview results from experts are also included.

7.1 Current understandings of alternatives: interview results

I have divided the interview results here into two segments – the results from interviews with local non-expert practitioners, and the results from interviews with alternative practitioners who are actively working, in one way or another, with new socio-economic and governance narratives and models.

7.1.1 Local non-expert practitioners

The interview findings suggest that the ‘triple helix’ terminology is very prominent among local practitioners. The 'triple helix' model is notably seen by the practitioners as a local advantage. Currently, a ‘quadruple helix’ (i.e. a collaborative model which entails a more prominent role of civil society) is being currently discussed within the government. However, they indicate that while there are some initial endeavours in this direction, they are unsure of how such an involvement of civil society would look like in practice; it is seen as »very challenging, but it is the way forward« (Local practitioner 3). Or as Local Practitioner 2 notes: »we're not there yet, that's the challenge with new forms of democracy, the challenge we have now«.

Notably, new combinations of both ‘bottom-up’ and ‘top-down’ approaches are seen as necessary. Fostering collective ownership and responsibility for sustainability challenges is recognized as a priority (Local practitioner 3). One related issue regarded the question of scaling initiatives; “to scale or not to scale, that is the question” (Local practitioner 2). Local practitioner 2 maintains that "sometimes it's not so much what the government should do, but what it should not do". In other words, a big question concerns what the dynamic between initiatives and governments may look like; in a way where initiatives themselves can take a more prominent and self-governing role. Local Practitioner 3 notes that they would “like the government to be a co-creator, to really be with us”.

There is a recognition among all the local practitioners interviewed that business-as-usual will not present long-term solutions to sustainability challenges; for example, there is a recognition that innovations do not entail only technological innovation, but call for a rethinking of the social practices and institutional frames associated. With regard to sources of information about city initiatives, Local practitioner 2 notes that the city council currently maintains a space for and regularly speaks with initiators (e.g. enterpreneurs) and discuss solutions. One challenge associated with this is a lack of space to accommodate all potential start-up initiatives (Local practitioner 3). Local practitioner 3 cited a number of local and more inter-city oriented organizations and online platforms that represent sources of knowledge about alternatives. However, what systemic alternatives might actually look like, and what roles the respective practitioners may play in the future, are questions that as of yet they do not have clear-cut answers for. A general observation of all the practitioners interviewed is however that governance and the economy will, in the contexts/imperatives of social inclusivity and environmental sustainability, in the future have to look very different than their current forms.

The current understanding of local government practice is succinctly put by Local practitioner 3 in the form of several critical questions, which are outlined below. Notably, some of these are direct quotations from the interview – others were slightly modified purely

so that the sentiment is clearer to the reader.

- How can you connect local initiatives to international movements and initiatives?
- How can you make space for a kind of laboratory where you can experience and experiment with new solutions for urban living?
- How would a quadruple helix model work, how can people living here contribute, and how to create trust in such a system; a system where these stakeholders can "grow together"?
- How do/can initiatives affect institutions?
- What are the exemplary cases, in other cities, other countries? Where can you find them? What are the success stories, and what are the failures? What can you learn from them? What are the factors (of success or failure)? What are the do-s and don't-s?

For Local practitioner 3, it is important that local initiatives:

- know about each other, and can learn from each other
- share their experiences, methods, and models
- can say what they would they do differently, based on their experience
- share the effects, positive and negative, and know for whom these effects are positive or negative
- find common targets

I thus assess that while the particular practitioners interviewed are apparently deeply reflexive about the futures of local governance and economy of the city, there are still many questions and challenges that they face with regard to how such futures might look like in terms of collaborative socio-economic and governance models. Furthermore, while I cannot confirm this hypothesis, this result is likely reflective of a minority of local non-expert practitioners.

7.1.2 Alternative practitioners

Alternative practitioner 2 notes that currently, the city of Amsterdam uses 'Amsterdam Smart City' (https://amsterdamsmartcity.com/) as a platform for the local "triple helix", in the form of a "public-private partnership that provides a platform for projects to contribute to sustainability goals of Amsterdam«. The platform entails cooperation among government, private and civic actors (i.e. for-profit businesses & start-ups), and, among others, a new knowledge institution consortium, namely, the Amsterdam Institute for Advanced Metropolitan Solutions. Some of the major foci of the platform are currently 'circular Amsterdam', smart city data solutions, and sustainable mobility.

When asked regarding how they see the roles of civil society (i.e. 'quadruple helix'), Alternative practitioner 2 noted that it is mainly in the role of »giving feedback«. Civil society is

notably currently involved with the Amsterdam Smart City platform through local knowledge platforms such as Pakhuis de Zwijger and Waag Society; additionally, ideas and opinions may be voiced through the Amsterdam Smart City platform, or directly by contacting a municipal knowledge broker who may then connect them with another worker, a company, or research institution.

When asked about the future roles of the municipality, Alternative practitioner 2 replied that »the municipality itself has to change, how you legislate, etc. (...) The co-creation between government, companies, knowledge institutions, it sounds easy but it's a new way of working (...) The question is, how can we make it work, how will it happen (...) We need to see, okay that's circular economy, how would that look like, and how do I earn money.« As to the understanding of the concept of circular economy, Alternative practitioner 2 states that » »it's the whole chain of design, production, consumption, reuse, and everything between and beyond (...) For us it's really big system change that needs to happen (...) We shouldnt think in blocks, but be flexible, and reflexive. The goal is always to help the Amsterdammer. We tell ourselves that, but maybe we don't act the part just yet.«

Alternative practitioner 2 reports that there are spaces in the city where regulations are loosened, and »where experimentation can be done.« Notably, the main such area is currently the area of Buiksloterham. Reportedly, the circular economy program of Amsterdam is in very early stages. The 'Circular Innovation Program' aims to accelerate instights in the transition towards a circular economy by supporting pilot/start-up projects, which will be evaluated in 2018 (Alternative practitioner 2). In these efforts, there are several support mechanisms provided by the city, such as calls and funding competitions for innovative solutions (e.g. digital infrastructure around circular economy activities); and mathcfunding, which reportedly provide »recognition and prestige by working with the municipality«, which enables start-ups to »get on their feet.« In asking about the differences between cooperating with larger businesses on the one hand, and start-up projects on the other (i.e. 'quintuple helix'), it was acknowledged that »companies are not thinking the same as the startups.«

A barrier identified by Alternative practitioner 2 concerns the (lack of) profitability of start-ups; »when you start up a project around circular economy (...) the profit isn't there yet.« Financial viability, in terms of for-profit business, is thus seen as a key priority of the cities' circular economy innovation strategy. This is, based on my understanding of sustainability imperatives and path-deviant alternative socio-economic models, quite problematic. My concern was reflected by Alternative practitioner 1: some cities are "looking for business opportunities, they are not looking for change. Maybe they want to, but they find it difficult to change" (Alternative practitioner 1). City officials falling back on public-private partnerships as the main way to tackle cities' social and sustainability issues are thus seen (by myself) as problematic. Conversely, Alternative practitioner 1 sees his entrepreneurial initiative in the

area of a ‘sharing economy’ for mobility ideally as a “stepping stone”, or small part in a much larger and more systemic instiutional (socio-economic, governance) transformation.

Lastly, I asked Alternative pracititoner 2 with regard to the question of scaling, to which they replied: “Projects are not normally considered as scalable. A question is how does scaling work; it's not just about scaling up, like copy paste.” On this note I shared with them the heuristic of scaling up, out and deep, which had gained some interest with the interviewee. Notably, what they phrased as ‘scaling up’, would correspond to the ‘scaling out’ concept in the three-part heuristic of Moore & Riddel (2015).

7.2 Barriers to and drivers of change: interview results

All interviewees (i.e. experts, local and alternative practitioners) were asked with regard to the barriers to and drivers of transformations they see, either with regard to their own transformative ambitions, or with regard to more generally identified needs.

7.2.1 Local non-expert practitioners

One of the crucial and more complex barriers identified by Local practitioners 1 & 2 concerns the compartmental, or fragmented structure of the city's departments. Vested interests and different ways of approaching and thinking about change by different offices, and different political parties, was here a common highlighted issue. In other words, the fragmented mandates of the departments, not seeing connections between different topics, and clashes concerning financing that stem from such fragmented structures are seen as big problems.

Alternative practitioner 1 here identifies a lack of or inefficient communication; e.g. projects that people from civil society or knowledge instiuttions discuss with city officials are not connected to ongoing projects that may otherwise be highly related. Relatedly, Alternative practitioner 1 maintains that “the co-creation, being equal partners, working on it together, it is still difficult for the government to think that way. It is still a bit top-down thinking” (…) “people from the government are always listening, and taking notes. What was missing was, taking it seriously, really being with us, as partners.” Alternative practitioner 1 notes that this may have to do with “fear, and it has to do with responsibilities, and with money. They don't know how to take responsibility for these actions towards their co-workers, and, the government is still strucutured with someone above you.” With regard to Local practitioner 1’s own transformative ambitions, they note that “we are so dependent on financing, automaticallly dependent on the older system somehow. But I know a lot of people want to live more self-suffficient lives, more in nature, more the community way.”

One of the main barriers Local Pracititoner 3 identifies is a lack of spaces for new initiatives. Reportedly, as “the economy is growing, and the number of people”, more space will be necessary for businesses and housing, and there are currently already very limited spaces where new initiatives can start up.

With regard to drivers of change, Alternative practitioner 1 puts forward the notion that “the stress has to get bigger, so the provinces, governments feel this is really starting to hurt.” Alternative practitioner 1 also notes that their colleagues are currently working on alternative metrics to measure successes of initiatives (e.g. happiness): “they are trying to make a measure, to give it back to the government, so they can assess if (an initiative) succeeded or not. But that feels a bit like, oh god. On the other hand, maybe it's needed.«

Local practitioner 2 outlines two possible drivers of change. One pertains to a recent court case of civil society against the Dutch state for not having high enough ambitions with regard to carbon reduction and climate change mitigation plans (for an overview of the court case, see, for example, Loth, 2016). Another potential key driver in transformations is identified by Local practitioner 2 as a local legislation named “Article 5”, which enables civil servants to “look the other way so that things can happen”; i.e., a local regulation which protects civil servants in handing responsibilities (e.g. self-governance) to citizen-led initiatives.

7.2.2 Alternative practitioners

Alternative practitioner 1 recognizes one pivotal barrier as the unaccesability and unavailability of regulatory frameworks that are relevant in designing and starting up an initiative: »every simple idea is very difficult to implement, because of all kinds of regulations that I'm not aware of when I start, or that I am forgetting to be able to advance.« A barrier mentioned in the previos section raised by Alternative practitioner 1 also concerns that some cities are “looking for business opportunities”, rather than looking for more path-deviant and (alternative) systemic solutions. Another issue raised by Alternative practitioner 1 is the co-optation of alter-/counter-narratives by incumbent business actors, as well as government actors; »everybody (then) thinks, oh so that's what they mean by circular economy, or smart cities, which is a big problem.«

The latter issue is also identified by Alternative practitioner 2: »we do not all speak the same language (...) (S)ame words don't mean the same things.« Another barrier identified by Alternative practitioner 2 is that the concept of circular economy is » a bit unknown, and we don't know the business cases yet.« The final barrier identified by Alternative practitioner 2 concerns the lack of transparency of companies regarding their material flows, citing their fear that such data may then be used by competing businesses as a main driver of this problem.

While I asked if a focus on profitability as an end in itself may be a problem as well, the question was somewhat sidetracked and conversation flowed towards other topics.

As a main driver of change, Alternative practitioner 1 identified the "need to have people working at the municipality who believe in you and want to follow you, work with you, (…) those people with a vision, (…) (I)n the end you need the alderman, and you need the other people working for them to get it done.«

7.2.3 Experts

Speaking from experience with studying and engaging with bottom-up initiatives, scholar Heleen Mees stated that »some citizens, the more active, social entrepreneurs etc., they really want ownership and responsibility, but they are not getting it.« Using the example of a roof-top park project in Rotterdam; »the city is very hesitant to give them (citizens) responsibility to maintain the park … (A)n argument from the public official side is that there is now a group of active citizens, but maybe next year they are gone«; the »fear of letting go« of the municipal officials; that if they transfer responsibilities to citizens, all kinds of things will go wrong; »feeling responsible for something, but then having it delegated to these initiatives, that may go wrong". The very same issue was raised independently by two other interviewees, namely Tine de Moor, and Local Practitioner 1. As Tine de Moor put the issue: »(o)ne of the biggest challenges is that local governments (don't) give trust to local citizens to develop new paths, and to actually also continue them. (…) We're in a situation whereby this has to be taken as step further. And it has to be developed into a solid system. And that demands not just the applaud of local government and national government, but also the trust of government. And that's a huge step forward, if we could manage to create that.«

On the topic of barriers to change, scholar Jennifer Hinton cited:

- 'social inertia'; the example of initiatives saying "most people don't know that our initiative exists, or even that there is anything wrong with the status quo or the mainstream economy"
- 'political and economic inertia'; the example of "policies, subsidies, lobbysts, the mainstream large corporations have an easier path paved for them"
- 'inertia of a paradigm'; the example of "there are a lot of internal inconsistencies of organizations. While they are in some way trying to go beyond capitalism, or growth-based system ... (they) are perfectly fine with seeing profit as a goal in itself, or the private ownership of business«.

Scholar Heleen Mees raised concerns over the difficulty for non-experts to engage with long-term thinking: »It's very difficult for them to envision anything beyond yesterday, or tomor-

row, to think ahead in terms of the future (…) (I)t is very difficult for them to think in the more abstract, to think out of the box". With regards to drivers of change, Heleen Mees notes that one one needs is "schaap met vijf potje" (eng. sheep with five legs), i.e. "people (in government) with high political skills" that are genuinely enthusiastic about initiatives.

Scholar Michiel de Lange's view on barriers to change, coming from a background in critical discourse around smart cities, and using games to engage stakeholders in such critical questions, was that, in innovation, »if you twist one knob, let's say the bottom-up civic knob, then it automatically means that somewhere (...) you are also twisting the other knob, which is the more institutional, governmental one. (...) As soon as there is a chance to upscale, people are hastily retreating. Saying, the old way, that's actually much more secure, we like it that way, let's not innovate. That also goes for the capacity to really break out of the frames«. Another crucial barrier identified by Michiel de Lange that concerns the notion of path-dependency in social innoation is that "civic innovators are usually professionals, operating under the guise of bottom-up civic innovation, but have their own financial stakes as well. This also reinforces the traditional knowledge that architects and urban planners have, and their legitimacy for city-making"

7.3 Needs and tools: interview results

I asked local non-expert and alternative practitioner interviewees about the needs and/or tools that they identify as crucial for facilitating transformations. These are explicated below.

7.3.1 Local non-expert practitioners

When asked about the needs and/or tools they would think would help their transformative ambitions, Local practitioner 1 noted: "If I come up with a plan, or a vision, create it with others, being ready to get started to build it, to make it real, together with others. What's needed is for institutions like the government to have more faith, somehow, faith in these new ways, and also faiith to be part of it, to be involved in it, not just on the sidelines, but being with it, with us, a co-creator.« »Create faith, communication. (…) (T)hat people know where they come from, what they work for, what their role is.«

Local practitioner 2 expressed their needs in the form of two critical questions: How can we address the financial gap for supporting civic infrastructure and inovation? And; How can you train employees of the government to see sustainability as the core of the city's activities?

I spoke with Local practitioners 2 & 3 about the prospects of tools that could inform decisionmaking with regards to approving and/or scaling an initiative. We spoke of a need for a

framework “where you can see, in what areas this initiative is active, what is it producing, what are the effects (…) and for who the effects are positive and for who negative” (Local practitioner 3). An important element I had outlined is the need for a tool for a way of knowing how such effects may reverberate through social-ecological systems at different scales; and the need for ways in which citizens could contribute to the pooling of such data. »And these effects, positive or negative, it is also interesting to see what are the positive effects, which would make it far more interesting for other partners to participate in a project« (Local practitioner 2).

7.3.2 Alternative practitioners

Alternative practitioner 1 identifies a great need for having a kind of “reflection laboratory, where people with ideas can spend some time, (...) develop ideas” that are “judged by other participants (...) (I)f there is an idea that we all think is a good idea, then we make a small team, and that team gets an actual budget to develop it further.” Based on Alternative practitioner 1’s identified barrier to change (i.e. unclarity of regulatory frameworks), I stipulate that a tool design may address this problem by somehow enabling learning about existing regulations, and how they relate to (i.e. constrain or drive) transformative ambitions and social innovation models.

8 Game Prototype (Co-)Design & Testing

In the following, I outline the elements of the game, how they were designed, for what purposes, and how those purposes relate to parts of the theoretical investigation in Stage One of this thesis. In short, the game guide prototype includes mechanics involving role-play elements, backcasting, two scenarios, the use of cards (Barrier, Transition Ingredient or Driver, Seeds, and Alliances; of which the former two were mainly tested), and a structured reflection stage involving theories of change and conceptual heuristics concerning transformations, as well as optional ‘retroactive futuring’ on the basis of the completed backcast, where players can retroactively modify choices made in the backcast, informed by that backcast and the reflective tools. As several elements of the theoretical investigation are not included in the game design, I explain which elements are absent and why.

8.1 Game Prototype Design Process (Pre-Workshop)

In the following sections I describe each element of the game prototype. I also describe more in detail their purposes, also as relating to the two (somewhat conflictual) aims outlined above, and the theoretical investigation and interview-based validation/input. Table 11 below

offers an overview of all the game elements & reflection tools, the elements tested in the workshop, new and/or modified (tested) elements created in the worksop; elements recommended by participants in the workshop, and elements which were not tested (notably, due to time constraints of the workshop itself).

Table 11: An overview of the designed, tested, untested, and proposed game elements

All game elements & reflection tools	Tested elements	New, modified or recommended elements	Untested elements
Scenario 1 (Open End(ed)-vision The World in Common)	Scenario 1	Roleplay	Scenario 2
Scenario 2 (Mid-range milestone; Co-Cities Everywhere)	Roleplay	Compound scenario / vision	'Alliances cards'
Roleplay	Backcasting	Connecting the dots	Reflection tool: barriers and solutions (viability point system)
Backcasting (i.e. 'direction' of the game)	Barrier & driver cards	Point system	Reflection tool: connecting the dots
'Barrier' and Driver (or, 'Transition Ingredient') cards	Seeds cards		Reflection tool: layers of social change heuristic
'Seeds' and 'Alliances cards'			Reflection tool: roles and responsibilities
Reflection tool: barriers and solutions (viability point system)			Reflection tool: models of change
Reflection tool: connecting the dots			Reflection tool: multi-tier scaling
Reflection tool: layers of social change heuristic			Reflection tool: politics and terminology
Reflection tool: roles and responsibilities			
Reflection tool: models of change			
Reflection tool: multi-tier scaling			
Reflection tool: politics and terminology			
Reflection tool: 'reverse backcasting' / 'retroactive futuring'			

8.1.1 Future world scenario & creating a collective vision for the city

A backcasting foresight exercise normally begins with a scenario and/or vision of a (possible, desirable, etc.) future. This is also the case in this game prototype. Building on my observations through the interviews that it is hard for the practitioners to imagine a radically different future instiutitonal structure, I attempted to operationalize my understanding of 'path-deviant' alternative socio-economic and governance models by means of creating a rather normative, or 'interventionist' scenario. The scenario (Appendix 1) was developed so as to create a mental image of a particular vision of how the world in the future (the exact year of this future was left unspecified) might look like (i.e. a 'possible future'), based on my review of emerging socio-economic and governance models. After a read-out of this scenario by a facilitator or a player, the players discuss their impressions of the scenario, and deliberatively create their own collective vision for a city (e.g., Eindhoven) within such a world. While the players listen to the scenario read-out, they may write down throughts and impressions. Coloured notes are used to write down the collectively decided-upon main features of this future city.

Notably, the normative scenario is the only way in which I have operationalized my understanding of alternative socio-economic and governance models in this game. Despite having some (limited) recent experiences in game testing and (co-)design, I could not think of another way to operationalize the alternative models, such as in a game mechanic. I recognize that such an operationalization may have some drawbacks, but I should note that it also has at least one, to my knowledge, rather compelling rationale. A major notable drawback may be in the danger that a singular pre-developed normative or prescriptive scenario as a 'wishful' 'novel attractor' (Avelino & Wittmayer, 2016) may not foster a sense of co-ownership of a scenario/vision by a wider range of participants/players. That said, the 'pluralist' nature of the world presented in the scenario, and the element of co-creating a collective vision for a future city within that world by the participants themselves, were elements meant to foster such a collective ownership of the scenario and/or vision. Notably, for me this also seemed the only way in which a more radical vision for the future could be 'inscribed' into the gamified backcasting process, in order to expand an imaginary space of possibility, and (thus) limit the possibility of a 'flatland of the future' (Slaughter, 1998a; 1998b) based on 'consensual presents' (Vervoort et al., 2015) emerging and fundamentally shaping (i.e. limiting) the developed 'backcast storyline'.

The scenario reflects a combination of a wide range of socio-economic and governance alternatives studies, codified and operationalized as a particular scenario narrative, that describes the scenario world both in everyday experiential, as well as more instiutitonal terms. Notably, in the scenario I also codified the notion of anticipatory governance, or global foresight commons, as stating that, in the future, games and various futures-making platforms have

become more prominent ways of collaboration and decisionmaking. A backcasting approach, rather than starting from the present and working towards a future, was used because that seemed to be a way to infuse the debate from the outset with an enlarged scope of possibility; the scenario acting as a tool to spark 'out-of-the-box' thinking with regard to (a more radical and informed) vision for the city.

8.1.2 Roleplay element

The players assign roles to themselves or blind-draw a role from a pre-developed set of multi-level actors (adjusted to the focus of the game set prior to its commencement). Examples of possible roles include: government representative (e.g. city councelor, district coordinator), "big" business owner, social innovator or enterpreneur, knowledge institution representative (e.g. professor, dean, researcher), media outlet representative (e.g. journalist, television spokesperson), citizen (e.g. manual worker, Uber driver).

Before the read-out of the scenario, the players are encouraged to think for a few minutes about what their position and role in the world and/or city looks like today, and the positions and/or roles they would like to see themselves in in the future (a suggestion would be around 10-15 years from the present moment – so as to allow for fairly radical departures from present conditions, but not too far in terms of the future so as not to create a too 'radical' – e.g. 'transhuman' – or too abstract future). Having listened to the scenario read-out, and in collectively shaping the vision for their city, players discuss these roles among each other. The players also discuss how these roles may fit together within a future institutional structure; asking, for example, in what kinds of daily situations do these actors meet, and/or how do they cooperate or co-create in terms of 'city-making'.

One of the rationales for this roleplay element of the game is to foster a more embodied experience of the future (i.e., positioning oneself in this future, rather than it being an 'abstract future', or a vague/abstract goal, such as a 'circular city'), and as a way to reveal to other players their ambitions and visions for the future (be it as themselves, or as embodying a different type of actor). However, there is a profound challenge in thinking that generally with moving back in time in the backcast, the more the roles and positions should become conventional, or reflective of the present situation, which may be a shortcoming of this approach.

8.1.3 Facilitation Cards (Barriers, Transition Ingredients, Seeds, Alliances)

At this point, the backcasting commences, starting from this co-articulated future city vision and the roles that the players inhabit in this future. The backcasting is structured mainly through the use of 'Barrier' and 'Transition Ingredient' (or, 'Driver'/'Solution') cards, which

are based on the interview input from non-expert practitioners, alternative practitioners, and experts. This mix of input in a game with non-expert practitioners was created so that players may engage with different perspectives and ways of knowing with regard to the dynamics of transformations, and (thus) inspire more out of the box and reflexive thinking. In addition, 'Seeds' and 'Alliances' cards were conceptualized to support the backcast; 'Seeds' being real-world or speculative design initiatives; and 'Alliances' being potential parners (i.e. organizations, actors; real-world based or fictional) in various stages of the backcast (i.e. the pre-imagined 'sustainability transition').

The players move back in time from the vision of the future world/city, to the current situation. The facilitator gradually introduces 'Barrier Cards' to the players. The barriers generally go from what are expected to be more persistent long-term barriers, to mid-range, to more present-oriented pressing issues. The facilitator decides when to introduce which barrier cards. The players may contest where/when the barriers, in their opinon, really would come into play in the backcast, and deliberatively place them on the timeline. Once the barriers are introduced, players may discuss the individual barrier or combinations of barriers (and extract perhaps hidden assumptions, or barriers that underlie those barriers, using coloured notes to write them down). The players may deliberatively reflect on the barriers as they go along, using the 'Six Layers of Engagement' scheme of Behaviours; Feelings; Conditions; Frameworks; Values; Constructs. The formulation is borrowed the heuristic formulation developed by Jennifer Hinton (expert interviewee) and Donnie Maclurcan, with the permission of the authors. The heuristic was offered by Jennifer Hinton in my interview as part of the validation part of my theoretical understanding.

This Barrier and Driver/Solution mechanic, based on interview input, was also designed particularly with mind to the potential scalability of the game. My understanding of the notion of scalability here is twofold:

- The potential of a game to offer a useful tool not only for stakeholders of one particular locale facing one particular challenge; but the design of the game so as to leaving the possibility open for its application for other stakeholders in different locales tackling similar problems (such as approaching the question of what a circular economy for the city might look like)
- The potential of a game to be used as a digital resource for network-based foresight; exponentially increasing its ability to gather input from players in different locations and contexts around the world; which may also breed various iterations of the game, various (compound) visions or scenarios to be used, and/or reflecttve (e.g. heuristic) tools.

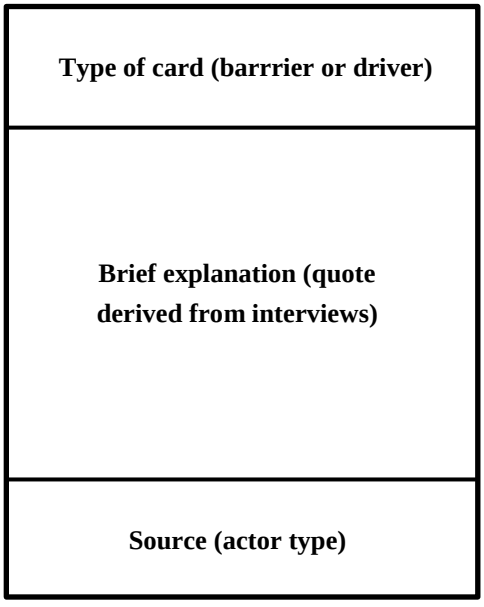
With this design I amed to simultaneously fulfil three identified desirable criterions of a game for citymaking and/or engagement with alternative socio-economic and governance models, namely:

1.) tuning a game to local specifics; i.e. designing a game in such a way that it engages with players with issues they identify and deem pertinent for their transformative ambitions
2.) introducing other views on the same issues, which may spark more "out of the box" and reflexive thinking as regards barriers and potential solutions
3.) it enabled myself and the game to be a kind of 'boundary object', in terms of a moderator between different sources of knowledge and ways of knowing

I hypothesize that an upscalable digital model of the backcasting game, or the barrier, driver, seeds and alliances elements of the game in particular, can address some of the persistent institutional lock-ins, specifically with regard to the issue of local government and other stakeholders being afraid to voice true opinions in multi-stakeholder settings as regards the deep barriers to change they identify. This however needs to be complimented with a way in which persons giving input on the digital platform in terms of barriers and drivers can be guaranteed to stay anonymous, if desired; and a mechanism through which input can be moderated to form playable cards (such as moderators transparently editing content for clarity purposes, grammatical correctness, imbuing the input with an element of 'play', etc.).

Below I outline the layout of the game cards. A few examples of the developed cards may be found in Appendix 3.

Figure 8: Game card layout



The source to which the quote (i.e. the explication of a barrier or driver) is ascribed is indicated in terms of an actor type. In cases where several actors of different actor types identified an identical problem, the quotes were in some instances creatively merged on my part as moderator of the content, and all the actor types that mentioned this barrier or driver were indicated on the bottom of the card.

8.1.4 Reflection stage

The reflection stage may follow the developed three-tier framework (barriers & drivers; roles & responsibilitis; visions & models of change)

Barriers & Solutions: Players revisit what were identified as the barriers and drivers, or solutions (i.e. 'transition ingredients') that defined the overall generated backcast pathway/storyline in most significant ways. Players may do this by two means:

a) Scoring system: the drivers that address, or solutions for (or, alternatively, ways of bypassing) the barriers proposed by the players/actors are assessed for their viability and feasibility in a deliberative way by using a simple scoring system (for example, from 1 to 4). The exercise aims to generate discussion and build consensus around what solutions and barriers are plausible or realistic, and which are not. It may also result in the formulation of new cards by players to be used in the next iteration.

b) Connecting the dots: the barriers and solutions that have been identified to have a strong influence on each other in the overall continuum of the generated story/timeline are connected across spatial and temporal scales (for example, by drawing lines or arrows between them). The exercise aims to help understand how limitations, strategies and actions relate to and build on top of each other through time and across geographical scales.

Roles & Responsibilities: In this step players reflect upon the roles and responsibilities of the played actors, and how those changed through in time. Starting from the future and working back to the present, it is not so easy to imagine at the outset the natures and scopes of these changes. Looking back, players may ask the following critical questions: Do the changes of my roles through time observed correspond to what might be expected? Were the roles of the future very different from, or more tied to, the roles we I find myself in in the present? How do we as different actors meet in our daily lives, throughout the different stages of the backcast? What interfaces and tools do these actors use to cooperate today, and what might those look like in the future?

***Visions & Models of Change*:** Players may take a moment to reflect on how the provided commons scenario corresponded to respective players' own visions and assumptions about

how change happens, and what sort of change they would like to see in the world. Players may structure their thinking and deliberation with the scheme (Table 12) below. This is also a chance to reflect on assumptions about probable, plausible and possible futures, knowledge gaps, sources of unease and discomfort, etc. Reflections may also ensue on how these theories/models of change correspond to particular Barriers and Transition Ingredients, (and 'Seeds' and 'Alliances'), and how, putting them together in the context of transformation strategy, build with and on top of each other.

Table 12: Models of change

Model of Change	Description
Ruptural Change	Revolution, a sharp break.
Interstitial Change	Building the new in niches and margins of the old.
Symbiotic	Achieving social empowerment, and deep collaboration, solving practical problems associated with dominant classes/"elites".
Incremental Change	Close to the notion of interstitial change above, incremental change assumes a cumulative, stepping-stone approach towards change, but not necessarily with a clear overarching vision.
Radical Incrementalism	Incremental change, working with an overarching, co-evolving vision.
Hybrid	Combinations of the above at various spatial and temporal scales.

At this stage of discussion, the players are introduced to the notion of a ‘Mid-way Milestone’. The questions that might be asked to players are: Do you think we can see from this pattern we have generated, a profound moment in history, a big milestone, that for example reframed how people see themselves and the world, their roles, responsibilities, and actions (e.g., that most of the world's cities have become ‘quadruple’, or ‘quintuple helix’ co-cities). May we think about this milestone as a kind of inauguration of a new collaborative suite of tools, and/or a symbolic inauguration, a social event based milestone where it has solidified in people's consciousness the idea that from now on we are all “really working as partners” in the conscious “great transformation.” Is it possible to imagine a (symbolic and/or concrete institutional) moment in (future) history of deep collective rethinking of roles, responsibilities,

institutions, and related possibilities, an entering of a new co-evolving cycle of co-visioning, co-design, and co-venturing? Is such a vision viable? This exercise also offers a chance for the players to reflect on the theories and practices of change, considering important milestones in history. For subsequent playthroughs, and in creating their own scenarios for the game, the players may operationalize this as a model of change, with a scenario vision/story in between the present moment and the World in Common scenario. An example mid-way milestone is provided to aid thinking in this direction (Appendix 2). Additionally, it should be possible to have several 'Milestones' within the game, in a form of kind of semi-permeable stages of transformation – building on one another, yet perhaps with the introduction of new contingencies.

Reverse-backcasting – A Retroactive Visioning

Players are faced with two choices. Either they take the lessons learned, and perhaps new cards generated, into a new backcasting process, or take the existing setup/storyline, with lessons learned from the reflections, in a retroactive visioning exercise, where players now go from the present conditions towards the future vision, and may change the course of history as they see fit.

Scaling(Up, Out, Deep & Future-fit)

Various initiatives and socio-economic models may evolve through time, resonating either in policy, other locations, and/or impacting cultural roots, norms and values. Some may also be consciously transitory by design, while others follow us, in various forms, into the future. Did the generated pathway entail any dynamics of such scaling of various innovations (articulated as 'Seeds', 'Drivers//'Solutions' or otherwise)? What innovations were scaled, in what ways, and by what means? Players use the framework of scaling up, out, deep, and future-fit scaling, to aid in their thinking (Figure 6). A critical question here concerns, what sort of frameworks, tools, interfaces and actor configurations would enable such scaling?

Final reflections

Lastly, an issue that may be discussed is also the use of terminology, and its normative, performative, and political-strategic aspects. Notions such as commons, quadruple helix, quintuple helix, circular economy, sharing economy, transition (as a process with an implied open-ended transformed state), and transformation(s) (as both process and goal) are usually highly politically charged and used in sometimes very conflictive ways, and deserve explicit attention, when trying to transpose the lessons from the game into real-world tools and strategies.

Notably, major elements from the theoretical investigation absent from the game and supportive reflective tool design are notably the multi-level perspective, and transfomative social innovation theory. This is mainly due to time constraints in designing the game in time for

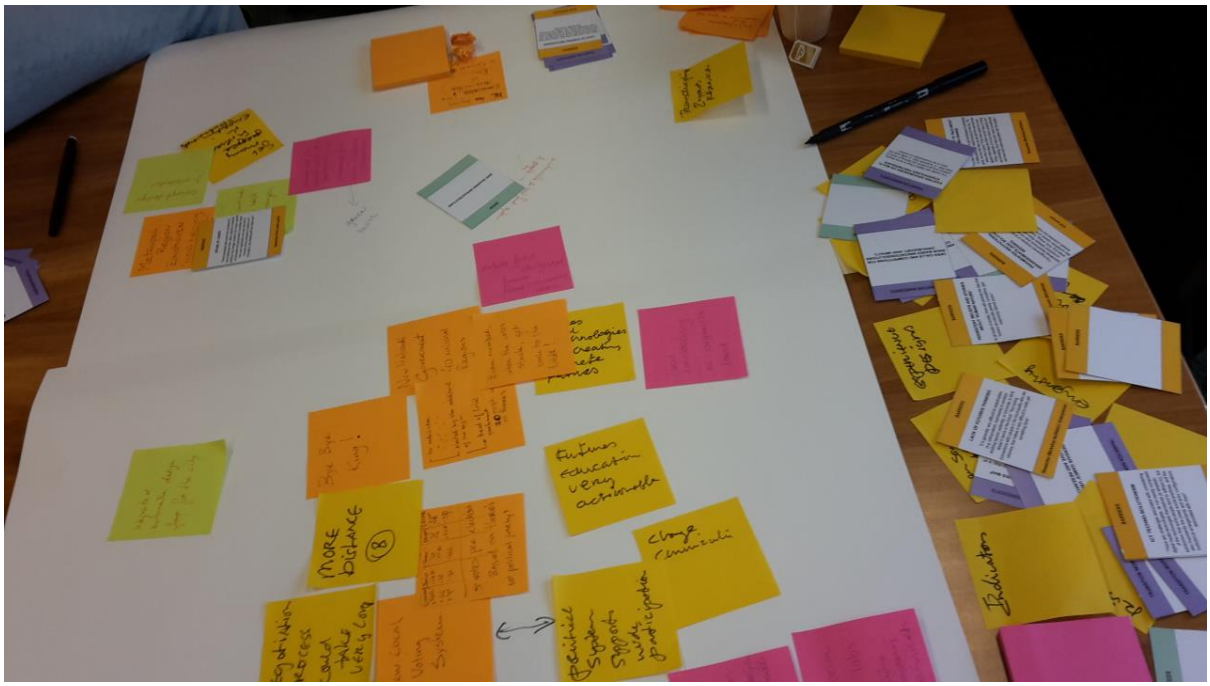
testing in the worksop. In retrospect I recognize potentially fruitful applications of the heuristic models in combinations with the barriers & drivers approach. I would indicate here that offering tools for players to inquire about these constructs (social innovation, system innovation, game-changers, narratives of change) and levels (niche, regime, landscape), and their potential interconnectivities, may be a potentially fruitful way of operationalization.

8.2 Workshop Results

Out of the 3 local practitioners, 2 agreed to participate in the game playtesting and co-design workshop (i.e. Local practitioner 1 & 2). The final workshop participants included also Andre Cools (Proeftuin040), and my thesis supervisor, dr. Joost Vervoort (a foresight practice specialist),the latter being in a dual role of participant and co-facilitator. I acted as (co-)facilitator, to the best of my ability. The workshop was conducted on July 13th 2017 for a duration of 3 hours in the afternoon in the spaces of Eindhoven City Hall. As the proceedings of the workshop dealt with some rather sensitive subjects, and permission to publish the transcript of the workshop was not gained from all participants, it is not provided in this thesis.

The session began with the reading out of the pre-developed scenario ('World in Common'), during which the players were encouraged to write down notes on subjects they pick up on that they find interesting (or, conversely, problematic), and write preliminary notes regarding what a desirable city might look like in such a world, and what roles they would inhabit. After the read-out, the players were assigned roles (i.e., playing their future selves), and were dealt out pre-developed 'Barrier' and 'Transition Ingredient' cards that corresponded to these roles. The backcasting began, and players were encouraged to articulate new barriers and drivers (as per their roles), and relate each other's barriers and drivers to one another. These ultimately comprised the main points of discussion, as they went from the far future, towards the present moment. However, much of the session revolved around questions about the game design itself, and a substantial amount of pre-developed game elements (especially reflective heuristic tools) were left untested. However, various new elements were co-developed, which were either based on the pre-developed and proposed game mechanics, or constituted new elements entirely (e.g. a point system). The session generated many insights, for example, 1.) how the game elements might better balance out normativity and co-production (and co-ownership) of a scenario or vision, 2.) what kinds of incentive schemes would encourage more engaging and cooperative gameplay, 3.) the pros and cons with regard to the temporal direction of gameplay (i.e. backcast vs. futuring), 4.) how the elements of 'fun' and 'play' could be made more prominent features of the game, and 5.) potential (other) application contexts for the game.

Image 1: Gamified backcasting testing and co-design workshop proceedings



In analyzing the transcript made of the workshop discussions, I have structured the insights from participatory game co-development into the following clusters/elements:

- Target Users & Aims of the Game
- Scenario & Creating a collective vision
- Roles & Incentives
- Barrier and Driver (‘Transition Ingredient’) Cards
- Direction (Backcast vs. forecast)
- The element of Fun / Play

Following this are my reflections, based on the process, as to the success of the game in communicating alternatives to practitioners, and other critical issues identified.

Target Users & Aims of the Game

The aims of the game and target users were discussed both with respect to the researcher's stated goals of the game, as well as the participant's expressed ideas and needs as potential end-users. These were expressed by the participants as the following. Andre Cools (Proeftuin040) interpreted the target users as being practitioner 'changemakers' (e.g., within governments, larger organizations) working with different social and political economic paradigms, who face certain barriers in their transformative ambitions. The goal he expressed was to offer a way for internal barriers and restricting issues of organizations to be openly expressed and dealt with by participants. Joost (Utrecht University) expressed the target users as being individuals, working in different parts of the city (e.g., government, private sector) who

know and feel comfortable enough with each other enough to talk openly about the issues they are running into in pursuing their transformative ambitions, and find together potential solutions. In discussing the game's aims and target users, Local practitioner 2 proposed the possibility of the game process involving civil society actors. However, other participants (Andre Cools, Joost Vervoort) noted in response that this would entail a risk that more internal issues of organizations would then likely not be openly discussed by practitioners, and that while the opinions of civil society should always be valued, this should likely take the form of a different, complimentary process, such as in the form of a game for a more public-oriented engagement. That said, a subsequently proposed idea (Local practitioner 2) was that although it may indeed be undesirable to include civil society actors into such sensitive internal organizational deliberations, a game could 'simulate' that perspective, by having one or more players play a clearly defined role of a 'citizen', giving the example of a sanitary worker with a below-average salary.

This articulation of the aim of the game exemplifies the frictions between the need to share more sensitive information about the barriers municipal actors face, and the need for wider public participation in such debates (Ekim, 2016: 287). I have hypothesised here that if the game were turned into a digital tool, and anonymity could be guaranteed to those who give input, this kind of operationalization could bridge such a gap.

Scenario & Creating a collective vision

In the workshop, there were many constructive comments regarding a pre-made (normative) versus a co-developed scenario and/or vision. A pre-made scenario or vision was seen on the one hand as useful, as »there are a lot of people who would like to create a vision, but need some help with some out of the box ideas« (participant 1); Participant 2 commented that »some people who are good at going far in visioning, some people who play it safe«. However, on the other hand a co-developed scenario or vision is importnat for a sense of ownership of that vision. One proposal that was agreed to be a worthy line of future inquiry is how research into alternatives might be translated into ‘fragments’ or ‘ingredients’, out of which participants can create a compound vision, and debate around these elements.

The scenario presented – a narrative around a 'possible or ' 'alternative future' world – was introduced at the beginning of the playtesting and co-design session. The participants were encouraged to make notes during the reading of the scenario, to serve as a basis for the subsequent visioning (a 'desirable', or 'preferred' future) for the city of Eindhoven. Local practitioner 1 responded very favorably to the scenario vision. However, they as well the rest of the participants immediately expressed concerns over the scenario being presented as a "vision in the name of …" (Local practitioner 1), and the importance of giving "people the feeling that they are gearing towards a future that they would actually like to see happen" (Andre Cools).

This exemplified the tensions between a pre-given (normative) scenario and the need for co-ownership of a vision. As the scenario was in part a way to introduce to players some facets of the research into political economic alternatives conducted, participants sought to achieve a middle ground methodologically. One suggestion by a participant (Andre Cools) to address this tension was that players might be given a set of cards to choose from, each with one small part or element of the overall scenario context, in order to build a kind of composite image of the future. Joost Vervoort stated that such a composite vision may still be used with a pre-given scenario, for example on the condition that the fundamentally pluralist aspect of that scenario narrative future is made very clear to participants. The participants generally agreed that a "utopian point on the horizon" (Andre Cools) is desirable to inform thinking and action.

“How you should see this future” was a question raised by Joost Vervoort. Local practitioner 1 commented that the different participants may interpret various aspects of the pre-given scenario differently, “in this whole story I pick up on other words than you did.” This exemplified that different stakeholders with different ways of knowing, and different visions of desirable futures, will see a pre-given scenario very differently, which again points to the need for co-generation.

Local practitioner 2 commented that “some things that are given now are completely forgotten there,” such as crime, and the question of inclusivity in this scenario vision. Joost Vervoort commented that this depends on “how long this is in the future”, and also pointed out that participants may have some preconceived notions about “at what speed and intensity” people in this future do these new, more co-creation oriented jobs laid out in the scenario. Furthermore, he pointed out that “maybe it is true that in this future there are problems with inclusivity”, and that the scenario may be seen as a kind of meritocracy world where “only the people who can, count.” Who may be left out in this future scenario was thus a key question outlined, or, conversely, how have the issues concerning inclusivity, participation and/or empowerment been dealt with before this future vision. Local practitioner 2 commented that he was fond of the idea that “the helping part, that that was the base of success,” and that it combines the “global and local” orientations.

A reflection here is that perhaps if a pre-given scenario indeed represents a starting point for the game, such a scenario approach should emphasize that it is up to the players then to decide how perhaps persisting issues have been resolved; and may represent first ideas that would guide the backcast process.

Roles & Incentives

The players were encouraged to think about the roles or positions that they would occupy within this future vision of the city and world, and what goals these roles may have looking from the present moment, towards the future. Instead of selecting the roles arbitrarily, during the co-design it was suggested that it would be best for the participants to "play themselves, but then think about their future roles" (Joost Vervoort). The following goals for the future, with respect to already thinking about their desired future roles, were articulated by the participants:

- Andre Cools: "The city contributes to people's health, instead of endangering it"
- Local practitioner 1: "Working with and in nature, with communities; community farm, nature and culture connection
- Joost Vervoort: "Get many people involved in empowered future making"
- Local practitioner 2: "Make metropolotan region Eindhoven the most helpful part of the world"

Discussion then ensued on what is meant by "health", and what is meant by "helpful". The participants spontaneously started to 'fertilize' each other's goals, or visions, with their own interpretations of what was meant by the respective statements. Regarding health, the issues of sport and recreation, and psychological health were raised. Concerns were raised over "helpful" being something that may also resemble more a standard practice "business model" (Andre Cools).

Local practitioner 1 commented that while the other expressed roles were not so much personal ambitions as general goals for the city. She encouraged the participants to explain more in detail how these expressed goals relate to personal ideals. However, Rih Thijs was of the opinion that "I don't want to know what's the personal agenda, if the vision is to be sustainable, or circular." Andre Cools expressed that he interpreted the task as explicating "actually your professional goal (…) not your personal." Local practitioner 2 commented that he wrote down his goal "as goal of Eindhoven."

Discussion ensued on the more concrete roles of each player in this future vision:

- Andre Cools: Concept developer
- Joost Vervoort: Impact researcher
- Local practitioner 1: Ecological food designer / Designer and farmer / Community creator / Communicator
- Local practitioner 2: Amb-Minister (a combination of ambassador and minister) of the new wider region of Eindhoven, within the national government

Some of the participants thought that it was not so much their role that was different in the future, but more so the overall institutional context or substratum surrounding that role; “I can be just myself, but my surroundings have to change” (Andre Cools). Such discussions around the changes necessary in the institutional context, rather than the role per se, led to the identification of first barriers articulated by the participants themselves, as barriers towards achieving that “position”, rather than perhaps a “role” (Joost Vervoort).

At this stage, I began introducing to the players the pre-developed Barrier and Transition Ingredients cards, along with some Seed cards. These were hand-picked for the players, in response to the future roles or positions that the players defined for themselves. The players were also encouraged to come up with their own barriers, for which blank cards were provided. This general mix of pre-made and user-generated content was notably received well by all the participants, “ it’s also to get people inspired by what kind of barriers are we talking about. And if you let people decide for their own they will probably be very pragmatic” (Andre Cools).

Discussion then ensued on the question if players should define barriers for themselves, each other, or a mix of both. A point system that would incentivize both the creation of barriers and possible solutions that would work towards overcoming the barriers was also discussed. A general comment was that “most barriers will apply closer to the present” (Andre Cools), while Joost Vervoort noted that “some barriers (…) take a lot of time to be resolved, and some can be resolved earlier.” Joost Vervoort also commented that “talking about your role, and the barriers, and how to overcome these barriers” while “ making structured plans over time is quite difficult, especially if you are working back” from the future towards the present moment.

Several possible solutions were proposed for this. One suggestion was that the backcast scenario could be first split into several phases, “to achieve that role, what steps do there need to be” (Local practitioner 2). The idea was then that each participant does a quick backcast for themselves, and explains it to the other players, which would then be followed by working with one backcast at a time in 'seeding' the backcast with barriers and ways of overcoming them. Generally, in that context one idea was that the identification of one's role and goal could be done as “homework beforehand” (Andre Cools). Another issue then concerned how this splitting of the pathways would then enable finding common goals (a desirable purpose of the game, as expressed by the participants). One proposal by Joost Vervoort was to work “on your own goals, but you are thinking together about them, trying to help each other”, i.e. “you are trying to achieve these individual things, but you are trying to help each other achieve them.“ Andre Cools suggested that might work well if the players of the game “are ideologically on the same page,” but even in that situation, during playtesting in this session the goals were expressed at radically different scales and with regard to different topics. An

idea to address that issue was to agree beforehand on, rather than fundamentally separate goals, one common overarching goal, by making a composite goal though seeing how the different goals and roles articulated might relate to each other – at different levels and scales.

One common overarching goal as part of that endeavor to make a composite goal was proposed as "the city has to be circular" by "2050" (Local practitioner 2). Andre Cools added that "you can still do different things and make connections, because maybe you can have this goal, Eindhoven circular by 2050, and then make it a little bit more practical," saying "what are the four things you would like to do most, within that Eindhoven circular (vision). So one person maybe says 'I want to have an experimentation lab here in the city square, which makes the circular design completely visible', and then you (...) all these barriers why..."

As a summarization of the game co-design process, Joost Vervoort stated the following layout: "what do we want to achieve, what is the step just before that, (...) what are the things that need to be in place for that to be achieved, (...) and then you can let that be guided by some ideas about what are the challenges (are) … (T)hen you create roles, and then you do the backcasting, and help each other achieve those (positions)." Andre Cools added that "for the sake of simplicity, (...) divide (the backcast) up into for example four or five phases, so don't let people think about every little step they need to take, (...) (Y)ou have these phases, and then everyone can have a turn to put a barrier before phase one, because the thing you want to do is make it really clear to the people playing this that they know what they want to do, but maybe even more importantly, what are the things that are causing it that it is so hard to for us to accomplish (…) (T)he message should be (...) crystal clear, (...) phase one we have five or six, and these are the most important barriers, they are probably not all the barriers, but they are the most important ones." Local practitioner 2 commented that that layout would make it "easier to connect (the barriers)." In another attempt at summarization, Andre Cools said "(s) it is just one common goal, a few building blocks how to reach it, (...) roles associated with it, and the building blocks to be organized in different phases. Actually, transitioning from phase one to phase two to phase three, is a game mechanic."

Barrier & Driver ('Transition ingredient') Cards

The participants of the workshop agreed that this pre-developed material (barriers and drivers) was helpful to support more imaginative and out of the box thinking; but also had some comments on how the card content (namely, the element of playfulness and fun were rather absent from most cards, and some card content was writeen in rather inaccessible language). This points toward potentials in using such an approach, but at the same time the need to make the content more engaging.

Direction

One prominent discussion was with regards to questioning the direction in which the foresight exercise should be conducted, i.e. a backcast (from the future towards the present moment), or going from the present moment towards the future. Andre Cools commented that starting from the present moment „could also be nice because if you can't overcome some barriers, then you can get stuck. So you have this goal here, and then you start building your tree, with options and barriers that you overcome, and if you get stuck then, well … You can't reach your goal." Joost Vervoort agreed generally, but noticed that „this then also makes it difficult in another way. Because if I'm thinking (...) I want to achieve that everyone can participate in future-making", Andre Cools finishing the sentence „what is going to be your first step". Joost Vervoort continued that that is „difficult to say (...) if I don't know what my longer term steps are. So in that sense the backcasting is actually better."

The Element of Fun/Play

As regards the element of fun, with connection to the respective roles, one suggestion by Joost Vervoort was to "create a kind of 'super team'. So you say this is the goal that we want to achieve" and you "have roles in different positions, how do we create an Avengers-like team where we are all in the roles that we think are necessary, together as a team (...) achieve that. And then you work together, help each other achieve those role changes. Because then the role changes are integrated by this idea of creating a team." Local practitioner 2 added that "in that way you are also focusing because then you know, okay if we go back or we start, we need to communicate, but how are we going to communicate - we make a laboratory, in the city centre of Eindhoven. And it also needs the super communicator, you need the new economist, you need the new... And then you can define those roles, and work back.

Reflections

Overall, one of the major reflections on the connections, or disconnect between the theoretical basis and practical execution concerns the limited (or rather, no explicit) use of theories and/or heuristics concerning change in the game co-design session. This is mainly due to a lack of time. A lot of the workshop time was dedicated to questioning the use of a predeveloped scenario, which however yielded interesting results which are indicated below.

I also recognize that in the end the vision toward the players aspired during playtesting, had essentially become "the city being circular by 2050". Such an abstract conception of a goal is notably problematic, and it is precisely such abstractions that the scenario and co-visioning method were developed. That said, one key lesson here is that workshops such as these will often not go according to how the researcher/designer had envisioned it (i.e. a testing and slight modification of elements), especially when in the form of a more ad hoc game co-

design such as this. I recognize that if I were able to facilitate the workshop more strongly, and introduced the reflective tools, some interesting insights might have been gained in terms of how those are or are not useful for practitioners to structure and/or reflect on their thinking processes with regards to sustainability transformations and alterantives. However, in all the game co-design session yielded some very interesting and fruitful insights, particularly how to foster a greater co-ownership of a future vision, without sacrificing much of research into path-deviant alternatives. Another prominent element was that of fun or play, which had been somewhat overlooked in the initial design of the game, and is recognized to be a crucial component in opening up discussions around more creative solutions and pathways.

On the basis of the above input, I assess that alternative socio-economic and governance models may be operationalized in foresight approaches in the following (and expectedly also various other) ways:

- Rather than pre-developed visions, be employed as 'Ingredients' (e.g., sharing systems, circular production, basic income, complimantary currencies) that may be assembled by the participants to form 'compound' visions (an important element here may be reflective tools through which players might critically assess their understandings of these systems and their combinations)
- Be used as game mechanics and incentive systems (e.g. modes of cooperative gameplay, such as a point system)

9 Discussion

I began this thesis project with the assumption that fundamental systemic change is necessary for the long-term survival and prosperity of Earth's stakeholders. While on the one hand there seem to be interesting new models emerging with regard to how we as a species might (re-) organize our social, economic and political systems, on the other there seems to be a disconnect between such strands of throught, and the implementation of this knowledge by non-experts (Schouten et al., 2017). This to me indicated a lack of methods, tools and/or mechanisms that could bridge this fundamental gap. In this thesis project, I looked towards emerging alternatives (e.g. commons, sharing economy), and the ways in which change may be brought about (i.e. theories of change), as crucial knowledges for (non-expert) actors to effactuate strategic, responsible and socially, ecologically and politically attuned systemic change. Additionally, I suspected that foresight methods and tools (such as backcasting and games) may offer a particularly useful way of rendering alternative models, and the theories of change that might better inform agency as regards realizing such models, available to non-experts.

In chapter one of Part One of the thesis (**Ch. 4.1**), I thus first sought to understand what kinds of alternative socio-economic and governance narratives and models are being articulated in scholarship and, to various degrees, in practical experimentation. Notably, my focus was on narratives and models that point beyond 'status quo' and incrementalist approaches (Biermann et al., 2012). This had been identified early on in the research as a necessary and strategic imperative, in light of the generally recognized urgency for new approaches to economics and governance (Longhurst et al., 2017) that are more attuned to the critical time frames associated with sustainability challenges (Steffen et al., 2015); to societal plights for more 'humanized' and egalitarian socio-economic systems (Kemp et al. 2016) and more collaborative forms of governance; and to the fundamentally coupled nature of social, cultural, economic, technological and political systems.

Here, narratives and models outlined in scholarship that employ a 'commons-oriented' approach (e.g. Foster & Iaione, 2016; Bauwens et al., 2017) emerged as particularly prominent. While remaining critical and reflexive with regards to conceptual boundaries and ontological assumptions and claims, such scholarship, in my assessment, holds great promise in terms of viable alternative socio-economic and governance configurations, as well as offers much needed critiques, at the theoretical and practical level, of dominant (neoliberal) discourses around 'new economy', and the 'incumbent' models and practices associated with such discourses. As such, I deem that these 'commons-oriented' alternative models, and other strands of thought that equally critically and reflexively (re-)examine conventional status quo practices and attempt to generate models and visions outside these coordinates, should be particularly useful to non-experts aspiring towards more fundamental and systemic change.

Throughout the research into these alternatives I have also come to recognize the pivotal roles of discourse (or 'narrative'), normativity, and socio-political performativity (operating at the level of 'imaginaries'), and that perhaps more attention should be paid in scholarship to such elements. However, deemed equally important, if not perhaps in some ways even more important, are rigorous, multi-faceted and socio-ecological systems (e.g. material metabolism) oriented empirical investigations, in terms of assessing the real-world (social, ecological, social-ecological) dynamics and viability of alternative models, as they may be developed and experimented with.

Notably, articulating a possible alternative institutional model or vision represents only a first step in actualizing such models in the real world. Importantly, one must look towards the dynamics between agency and structure, or between innovation and institutionalization, to understand how the (social, cultural, economic, political, institutional, of-imaginary, ontological) changes implied by such models may be brought about from within particular instiutitonal arrangements and societal structures that are notably unfavourable to more radical and systemic change. However, this is not to say that solutions should not be sought at

the level of fundamentally de-regulated spaces opened up for radical experimentation and experiention. While some of the models examined in the first section do contain, either explicitly or implicitly, various theories of change and conceptualizations of transformation pathways, these have to date largely remained disconnected from the diverse and rich scholarship that deals precisely with the questions of the dynamics of (socio-political, socio-technical, socio-ecological, etc.) transformations.

Thus, in chapter two of this thesis (**Ch. 4.2**) I sought to engage with various scholarship from different (inter-)disciplinary fields that has articulated various theories and conceptual heuristics that attempt to aid in the structuring of actors' thinking around the complexities and strategies of (social, institutional) transformations (towards sustainability). Here, I found that these theories and heuristic frameworks, while in modes of constant (re-)development and (potential) cross-fertilization (of which some potential new avenues of inquiry were indicated; see Synthesis), may indeed present useful 'tools' to facilitate deeper thinking about and strategy around the complexities of transformations, specifically as regards realizing alternative socio-economic and governance models. Theoretical concepts such as 'transformative social innovation', 'path-dependency', 'radical incrementalism', and 'scaling up, out and deep', will likely prove crucial to understanding how transformative change can be brought about; as well as, as conceptual heuristics, offer the bases for, and inform the designs of, various tools, interfaces and platforms (e.g. databases of alternatives/initiatives) to facilitate such transformations.

In this chapter I also sought to consider more in detail the questions of the politics and governance of transformations. Deeper considerations of, for example, questions of power and (dis)empowerment (Avelino et al., 2017), and the forms of cooperation that can facilitate transformations in governance itself (Patterson et al., 2016) are deemed pivotal for actualizing alternative models, yet remain to-date critically underutilized or underexplored in much of the transitions / transformations literature. Indeed, in some cases it would seem that unaccounting deeply for the politics of transformations may have profound consequences in terms of creating epistemological bases that embed within their discoursive and praxical frames 'post-political' tendencies (e.g. Kenis et al., 2016) that may ultimately serve to solidify 'path-dependencies' (Arthur, 2009), as well as overlook potentially important avenues and strategies concerning 'influencing', or facilitating transformations.

All the while, I note that such debates around alternative models, and theories of change, have for the most part been restricted to 'niches' in academia, and often times in forms of inaccessable and somewhat self-servicing jargon. As many scholars today would maintain, the challenges associated with transformations towards sustainability imply a much greater emphasis on cooperation between different institutional and other societal actors as communities of practice in more transdisciplinary settings (e.g., Scholz, 2017). Furthermore,

it is important to recognize in these contexts that actors have and will operate with fundamentally different epistemologies, or ways of knowing and evaluating the world (Vervoort et al., 2015: 63; Funtowicz & Ravetz, 1993), a notion which has profound implications for articulating modalities through which engagements with 'better worlds' (e.g. via possible alternative socio-economic and governance models) can be made engaging, meaningful and productive.

In the third chapter of this thesis (**Ch. 4.3**) I pursued the area of foresight as a potentially particularly fruitful field of study and practice in terms of offering the methods, tools, and interfaces that could facilitate communication and strategy around, and (thus) enhance the understanding and availability of, alternative socio-economic and governance models, and theories of change. Here I sought to understand how foresight theory and practice had developed through time in terms of epistemological and ontological orientations towards 'the future', what sorts of methods and tools have been developed, and how more recent developments such as experiential scenarios (Candy, 2010), network-based foresight (Priday, Mansfield & Ramos, 2014), and 'generative gaming' in particular (Ekim, 2016) might outline new avenues of inquiry and practice. I also explored the notion of 'anticipatory' governance, and results of my investigation showed that the notion and developments under that name may present important ideas and designs in terms of more institutionalized forms of foresight practice for the purposes of enhancing the collective capacities of actors; i.e. communicating around and instigating transformative change. An important finding is that new (and old) methods of foresight also entail various political implications, in terms of shifts of power, roles and responsibilities (Ekim, 2016), which might be in conflict with certain incumbent interests, and which demands strategic solutions, of which I have attempted to outline some.

The interviews conducted with experts (**Ch. 5.4**) that enabled a more reflexive approach to my research and validate my understanding of the literature, yielded an interesting if rather incomplete set of results. Much of the input from the interviews with experts was in line with my understandings of the literature, the problematiques of transformations towards sustainability, and possible tools, strategies and pathways forward. Notable take-aways from the input were in terms of more nuanced understandings of theories of change and how those may or may not reflect processes in the real world; a more nuanced approach toward the question of 'commons-oriented' solutions as they have been suggested in the literature; and, to a certain extent, understandings of how games can develop transformative capacities of actors, and what are the political implications, and limitations of such practices, as they involve societal actors with very real and immediate personal stakes.

The theoretical insights gained helped shape the formulation of a research question that would run through and interpret the practical part of the research (**Ch. 6**). One of the greatest challenges for me in this project was in applying the quite nuanced and complex developed

theoretical understanding of the (longer-term) problematique and potential solutions in the form of 'generative intervention designs/games', and engaging with local non-expert practitioners in a way that was attuned to their more immediate needs and interests. In line with current understandings of needs in foresight for more active engagements with knowledge gaps and discomforts, and the needs for radical transformations, I took up a rather risky yet deemed crucial normative approach in assessing the dissonances between my understanding of ('path-deviant'!) alternative socio-economic and governance possibilities, and the possible capacity-development tools to realize them, and the understandings of capacity-developing tools and socio-economic and governance alternatives of practitioners.

Notably, the designations and confluences of 'post-normal' and 'post-political' times in the final main research question for me implies the urgent tasks of bringing together actors with fundamentally different ways of knowing (Vervoort et al., 2015) into virtuous cycles of co-creation, within particular and near-hegemonic and path-dependent social and political economic conditions (and, by extension, ingrained social, economic and political imaginaries around possible, desirable or viable alternatives/futures), which notably require strategic solutions (i.e. tools, methods, cooperative and co-creative modalities, protocols), given the realities of the urgencies posed by climate change (and persistent and systemic human and non-human suffering) and the general recognition of the profound inadequacies of incremental, 'evolutionary economic' change.

The results of this particular enquiry (**Ch. 7**) showed that there are indeed serious gaps, but also that, at least in the case of the practitioners interviewed, that practitioners are reflexive and open to new ideas, even if such ideas are hard to make actionable, especially with regard to cooperation with other actors, such as incumbent businesses. Some ideas with regards to alternative models, such as persistent ideas around the profit imperative, are notably problematic. However, such ideas are unlikely to be disembedded from desirable futures visions any time soon; especially in the absence of compelling, salient and systems-oriented models and narratives that may point towards different ways of valuating, capturing and structuring economic activity. The practitioners' articulations of tools needed were also very much in line with my investigation, in terms of the need for tools that may enable scaling, and co-production of knowledge regarding alternatives; albeit, for rather obvious reasons, such tools were not immediately seen as in the potential form of games, and not sought at the scales that I saw may be necessary given the time-sensitivity of climate change and the imperatives and strategies of radical transformations needed in 'post-political times'. I note that while such a 'grand' focus may be somewhat overly ambitious at this time in light of the fact that the literature does not yet offer clear guidelines in terms of (integrative) theory, exemplary methods and designs, ways to realize them, account for the question of politics, and various real-world contingencies and reverberations. However, in this thesis I regarded it as my mission and responsibility to keep a broader outlook on the immense complexities of

the challenges of transformations towards sustainability, as a strategic imperative on my part as an actor in this world. This broad outlook notably produced some tensions in trying to operationalize such a vast and varied literature (with often conflictual epistemological bases in their own right) in a game and game co-design practice.

The game testing, iteration and co-design process (**Ch. 8.2**) produced many new insights with regard to how a game design might be better received by practitioners, in terms of a learning and communication environment. Two key insights from the practitioners' side has been in how to use the critical exploration of alternatives that I conducted in a way that can better facilitate the co-production and co-ownership of a vision – namely, by creating 'ingredients' that the practitioners themselves can then combine to form a guiding scenario vision. Another key insight was with regard to making the 'play' and 'fun' elements of the game more prominent, which they identified as key to creating an atmosphere where more radical ideas would be accepted, and should apply also in the context of an upscaled and modified versions of the game. In retrospect, I may have done well to have conducted a follow-up interview or survey with participants about their impressions, as we ran out of time for reflections in the workshop (indeed both with respect to the reflective tools prepared, and general reflections on the whole process). Such a follow up may have generated a more thorough view of the possible transformative potential of the game prototype design as such, and the game co-design process as method.

I assess that the interview-based 'boundary object' approach (i.e. researcher, and game, as boundary object) as conducted in this research lends itself to applications to the issues of communicating sensitive information rather well, and creating momentum for more radical change. I also assess that his format lends itself to applications in network-based foresight, as a digital tool, to be used digitally or in on-the-ground settings. However, such discussions were not part of the debate and indeed were not presented as a focus of the game development to participants, which I recognize as a limitation. However, to expound on the prospects of upscaling, and/or using such methods in other on-the-ground workshop processes; one element has found to be crucial during the practical part of resarch. That is, the element of anonymity. When requested, anonymity of the inputs should always be guaranteed to interviewees and participants of such inquiries, which are notably politically and personally sensitive. In further engagements with methodologies such as the one outlined in this thesis, especially with concern to upscaling digitally, it is worthwhile to think about the ways in which anonymity of interviewees can be assured, while at the same time having such crucial debates opened up to larger collaborative forms of enquiry. Perhaps indeed digitization can offer a way to pool such sensitive data, which I assess to be a potentially powerful tool for more radical change is to be realized, and serious barriers becoming more open and discussed. The question however remains of 'moderating' such input; one would need not only boundary object tools, but also boundary object persons as moderators.

I acknowledge that in this thesis, a substantial amount of depth has been sacrificed in favour of breadth, to various degrees. An attempt at synthesis of such a vast literature, especially in the format of an MSc thesis, is a difficult task, especially when considering that much of the areas of research and practice explored here are theoretically and methodologically underdeveloped. The thesis work certainly does not present a fully-fledged framework operable in and practice. Indeed much of the scholarship reviewed and (partially) employed here is based on different and more often than not conflictual epistemological and ontological orientations, which has been quite a source of frustrations. However I have attempted to produce at least one clear finding: that is, that there is an immediate strategic imperative with concern to sustaiability to engage more actively and in new and creative ways with alternative socio-economic and governance models, in ways that can address the post-political predicament that seems to be prelevant in today's world. I have argued that there is a crucial need for new methods, tools, and mechanisms that would foster and facilitate the imagining, social salience and political grounding and legitimacy of new possible systemic configurations and ways of living, grounded in emerging models of and discourses around radical socio-economic and governance alternatives. I have attempted to establish the roles of foresight and games with regard to fulfilling such a (proposed) imperative, by means of developing a comprehensive theoretical understanding through literature review, interviews with actors operating with these ideas in practce, and by means of (limited) practical experimentation. I recognize that much more research is needed to discern the full scope of possibility as concerns the roles of games in facilitating transformation towards sustainability, and indeed the actual effects, and possible contingencies arising from such endeavors in practice.

To conclude, as my theoretical understandings sharpened and became more nuanced; and ideas engaged through the literature gestated and settled in; as I had been conducting the interviews; at the same time as the complexity of approaching the topic in my mind grew (and I would maintain that such levels of complexity are crucial to informing strategic agency today), so did the articulations of how such theoretical understandings and proposals may be applied in settings involving societal actors with certain and relatively rigid interests; and indeed how might one strategically address the profoundly political and normative questions of transformations towards sustainability. I have come to view the main result of my investigation as a highlighting of the pivotal question concerning normativity. Normativity is deeply embedded in the challenges of transformations towards sustainability; i.e. with the crucial time-sensitivity of the challenges we as a species face, and the (ecological, social and moral) inadequacies of incrementalism; it is implied within the conviction that runs through this thesis that the status quo is immensely resilient (in the negative) yet incommensurable with a meaningful long term survival of our species and the planet as we know it; it is implied within the conviction that the notions of transformative agency and capacity may themselves be subject in practice and in the literature to post-political epistemological tendencies which

leave little to no room for the possibility of arguably possible radical experimentation with profoundly different systems; and it is implied in the conviction that serious reconsiderations have to be made with regard to the existing modalities of (a status quo) politics, and how to facilitate an urgently necessary, and to my theoretical understanding, possible, break with such a (post-)politics.

10 Conclusion

The aims of this thesis project were notably manifold, and rather ambitious. I sought to understand some of the more notable socio-economic and governance models in the literature that fundamentally challenge existing institutional arrangements and modes of cooperative engagement. I explored and critically related theories of change as concerning such alternative models; and conceptual heuristics that have been developed with the purposes to help structure actors‘ thinking about and strategic action regarding the dynamics and pathways of transformative change. At the outset I suspected foresight methods and tools may play a key role in making such models, theories and heuristics more accessible, and explored how games specifically have recently been used to engage stakeholders with such challenging questions. I sought to take explicit account in these contexts of the political and normative dimensions of transformations towards sustainability. Consulting with experts in the relevant fields offered much needed reflexivity in engaging with these topics.

The practical part of this thesis revolved around two main questions. One concerned the current state of thinking of practitioners as regards ‚new economy‘ narratives and practices, the barrers to change as they see them, and the capacities they would need. I contrasted these with my own generated understandings of alternatives, and in terms of capacities and (strategic) tools that could address the fundamental challenges implied by calls for ‚post-normal‘ science; markedly situated in ‚post-political‘ times. The second question regarded how to operationalize in a game-based tool path-deviant socio-economic and governance models, and theories of change and conceptual heuristics, in a way that creates a basis for collective and playful learning, communication, and strategy building. The developed prototype was created with mind to both immediate interests of practitioners, as well as to my understandings of what kinds of strategic tools might be necessary to faciliate a radical break with neoliberal conensual politics. Here a prominent question regarded the balancing of the normativities implied with such alternative models, with the needs for co-production of knowledge and the fostering of co-ownership of sustainability challenges in terms of more radical pathways and experiments; and how to make such pathways and experiments actionable both in the long-run, and in the here-and-now.

Further insights as to the ways of operationalizing alternatives in games were sought in the applied case study with local practitioners, and the insights gained were convincing in that more cross-level cooperations between experts and non-experts are required in order to tease out the possible elements and contours of such ‚generative interventionist games.' Reflecting on the whole process, I acknowledge that my theory of change in terms of ‚influencing' transformation dynamics within certain identified near-hegemonic conditions with tool- and experience- based generative interventions is a very particular one, yet I deem the line of inquiry a productive input that may offer a small contribution to the emerging field of ‚transformative science(s)'.

11 Future directions

The line of inquiry in this thesis has given me (and hopefully, the reader) a wider basis for understanding the (possible) dynamics and strategies of instigating transformative change; in terms of experimentation with radically alternative socio-economic and governance models, be it as pre-imagining through foresight approaches, and games specifically, and in terms of making such models and visions actionable in on-the-ground practical experimentation and experiention. One of the pertinent lines of enquiry I believe concern the uses of games as 'boundary objects'; the ways in which they might connect disparate sources of and ways of knowing; and the ways in which these might confront and facilitate breaks with path-dependencies of status quo prone instiutional structures and ingrained imaginaries associated. In the future, I should like to explore these avenues of thinking and practice in the area of strategic tool and experiential design. Specifically, I am most interested in expanding and applying knowledge in pursuing such questions as: How can various tools and games aid users in considering innovations not merely as social OR ecological innovations, but as models and/or initiatives that concern profoundly coupled social-ecological systems? How can they engage users in thinking about innovative solutions that go beyond path-dependencies, insituitonal lock-ins, and the status quo, and how can they foster creative combinations of existing and new models and ideas? How can interfaces be designed on the basis of conceptual heuristics, to offer fundamentally new types of knowledge exchange, cooperation, and co-creation? What may be the contours of a 'global foresight commoning' system, such as co-generation and co-maintenance of 'libraries' of subversive and generative experience designs, scenarios, new instiutional and service models? How can experiences be fostered with regard to ethical concerns, such as towards future generations, or animal welfare? And perhaps most importantly, how can such tools and interfaces be fostered in place-based settings and in virtual spaces, and in between, and how can these cumulatively and strategically constitue a new kind of politics, through which we as people might co-

generate and experiment with visions of ‘the good life’, with mind to the necessities of social-ecological resilience, recuperation, and multi-species flourishing.

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Appendixes:

Appendix 1: The World in Common Scenario

‘The World in Common’

The Earth is filled with different, rich, and exciting social realities/worlds and practices in harmony with the natural world. There are societies and communities that choose to have very digitally-oriented interactions with each other and the city, with „big data“ and „co-mapping“, for example, becoming commonplace terms, and practices, which inform a more cosmopolitan, globally-minded city-making, and convivial/artful place-making. On the other hand there are communities, and whole societies, that rely on more on-the-ground forms of cooperation, such as meetings of neighbourhoods, cities, and interest- and challenge-based 'transdisciplinary communities of practice', some taking the form of eco-village, or ecosystem restoration camp type arrangements. Then there are also hybrid communities, with mixes of the digital and on-the-ground. One of the most crucial and respected jobs becomes that of the broker, mediator, catalyser, artist, facilitating interaction and co-evolution between these worlds. Collaboration has become generally very cross scale. These various interfaces among people, and between peoples and cities, are much more openly designed („open-source“), shared across scales, and applied to local contexts and conditions.

Whole industries have been reformulated, reoriented, using principles of circularity and deep collaboration, a lot of goods (such as transportation vehicles) are now shared, co-owned and maintained, rather than privately owned. Global design has become more commoplace, with many 'micro-factories' that then produce those things locally, and adjusted to local wants, needs, and preferences. The decision-making structures are very different than they used to be, completely open, transparent, based on cooperative platforms where people can put up and integrate visions, designs, and experiment with them, on the practical, experiential level (i.e. 'design', 'knowledge' and 'foresight' platforms). Many cities become living laboratories, generative of new worlds and experiences.

Measures such as the Happiness Index, pioneered by places such as Bhutan, have evolved and become a lot more important and commonplace in the grand scheme of things. Global trade, rather than based on traditional GDP, has been replaced by solidarity-based carbon and resource trading, coupled with open knowledge circulation. Currencies have switched to be reflective of resources and values attached to them, as well as ethical considerations. Time has also become a more popular mode of exchange, especially in skill-sharing ventures, however many now operate under a gift principle as well. People have generally become a lot more aware of how even the smallest everyday practices, and also ways of using resources

and manufacturing things (e.g. what goes into food production, and electronic equipment), reverberate across social and ecological systems, and across spatial and temporal scales, so, from local to global, from immediate, to long-term effects. This has been partly due to the reconceptualization of what we traditionally would call „media“, which are now more akin to what one might call „experience-designs“ (probing values, ethical norms, states of mind, ways of living, and experiencing material flows), via art installations, and also, not surprisingly, through augmented and virtual reality, and games, which have become quite the popular mediums in their own right, and which may be found in many cities around the world, accessible for everyone in public spaces, and neo-arcades.

These interfaces allow people to put themselves in the shoes of others (including even animals, plants, and inanimate objects), experience other cultural (and socio-linguistic) forms and solidarities. New conscious rituals have arisen, and which have by now become almost semi-conscious, that serve to 'reinforce' a (global) community spirit, the idea that each has and still is playing their part in the great transformation(s), which is in stark contrast to old socio-economic practices that tended to atomize people at both imaginary and institutional/material levels. This, for example, is very much reflected in local food systems, where ensembles of actors, ranging from farmers, to chefs, traditional horticulture specialists, seed-keepers, recipemakers, nutritionists, to sustainability experts and storytellers, and to everyday users/people, together decide what they would like to grow, or see grown locally, where and how, what nutritious and exciting meals they could make, and how to minimize any waste and uses of unsustainable methods such as plastics packaging. That is not to say that there is not regional and global exchange of foodstuffs. For example, some food ambassadors, recognized for their expertise, travel through regions/countries with their local specialty items, and cities all over the world hold festivals to celebrate these peoples, these crops and foods, and associated peculiar cultural practices and traditions, and share embodied and tactile knowledge.

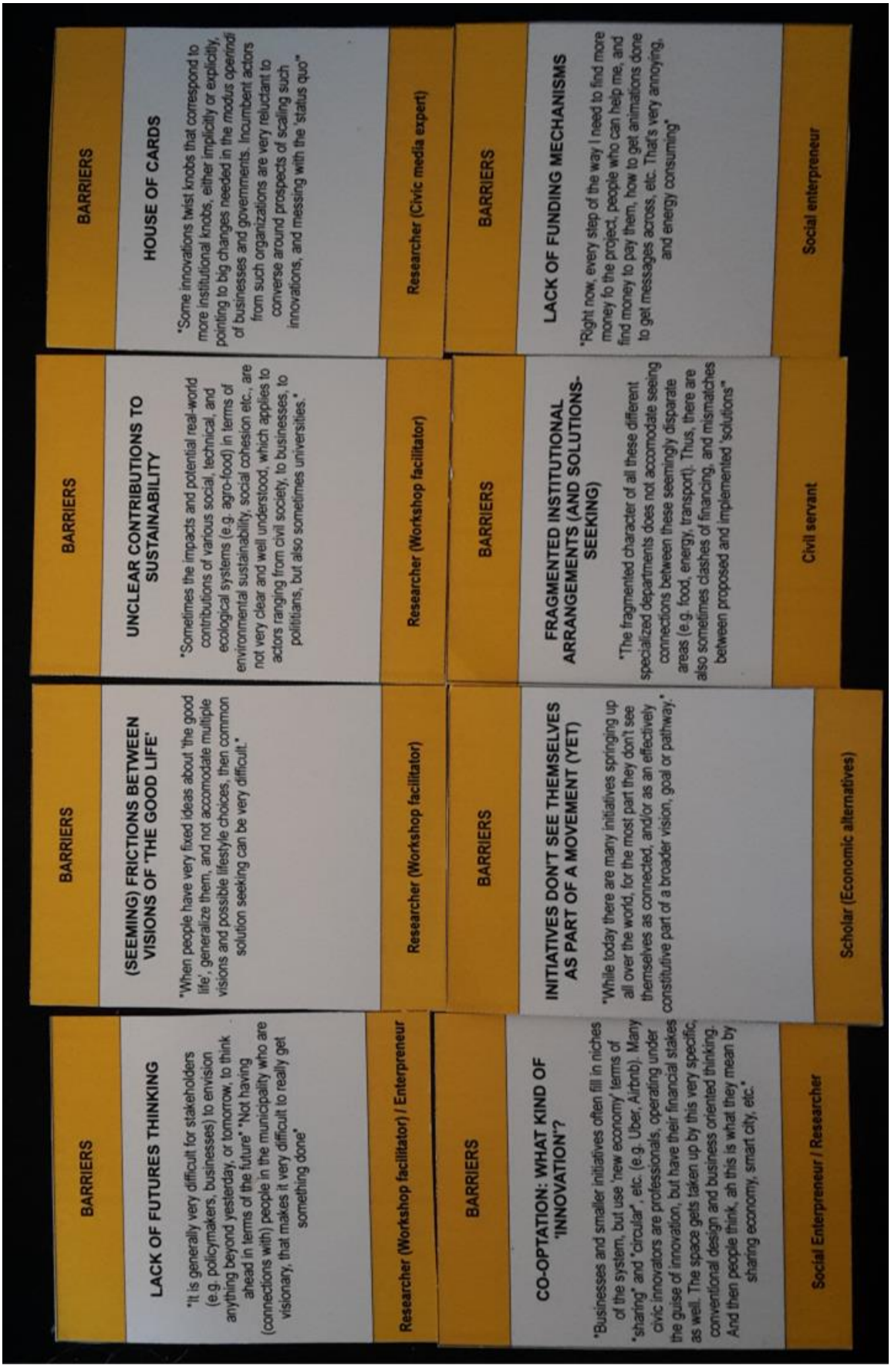
The traditional roles and responsibilities of government, industry and business, media, and education, have become a lot more blurred and intertwined. People do many different jobs, or social and ecological services, within a given week, month, or year. Of course jobs themselves have been deeply rethought, and rather than money as the measure of success, success has become synonymous with helping community, the world, and the environment and animals to get back on their feet.

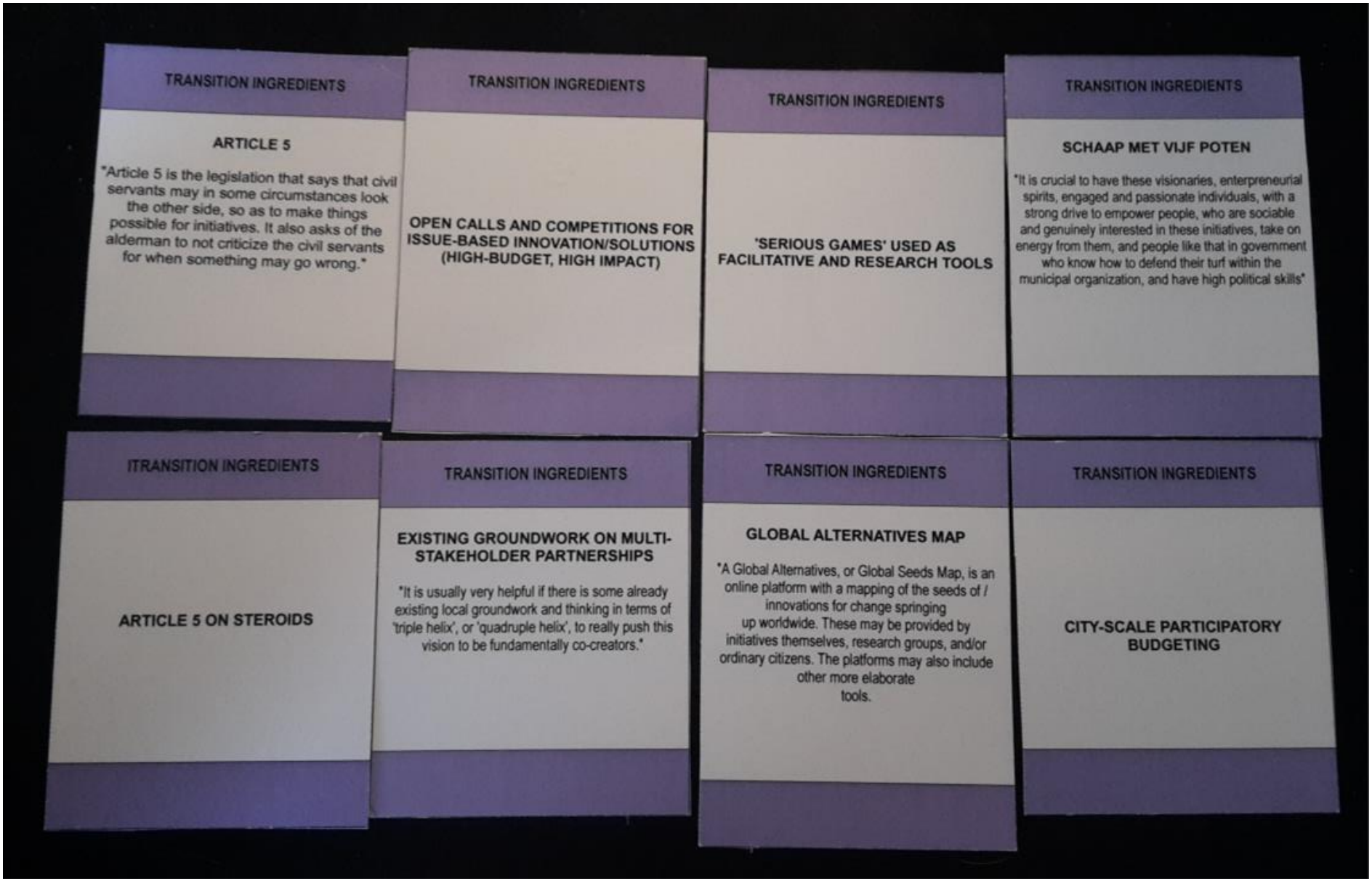
Appendix 2: The Co-Cities Everywhere Scenario

‘Co-Cities Everywhere’

We have entered a new cycle of co-creation, where people and institutions are deeply redefining their roles together in an emerging ‘new economy’. Regulation is consciously loosened and areas in the city are mapped and used to enable (radical) experimentation. The first fully-fledged cooperative platforms (digital, on-the-ground, hybrid) pop up that enable open and inclusive city-making; the multi-level scaling of innovation; and people are using more and more various foresight methods as tools to co-design, co-create, and strategize with the future in mind. For example, some solutions, such as (social-ecological) business around recycling, is consciously transitory and gradually becomes obsolete, that is, is ‘replaced’ by the whole-scale redesign of material cycles of production, use, re-use, and so forth). Such tools are also used to build and experience futures derived from peoples’ values, aspirations, and images of the ‘the good life’ and the world (e.g. experiential scenarios & games-as-tools become more commonplace). Some pressing issues still remain, such as inclusivity and (dis)empowerment, and not all parts of the world have entered this model of co-creation. Indeed, some consciously choose to live in other (old/new) ways. People in many cities have been empowered with a fiat-capital based basic income, as a consciously transitory welfare-guarantee scheme, while at the same time there are parallel experiments with direct access to goods and services without the need for money as such, which is fostering new, non-commoditized relationships between people, and between humans and non-humans.

Appendix 3: Playing cards – barries & transition ingredients (examples)




TRANSITION INGREDIENTS
ARTICLE 5
"Article 5 is the legislation that says that civil servants may in some circumstances look the other side, so as to make things possible for initiatives. It also asks of the alderman to not criticize the civil servants for when something may go wrong."
TRANSITION INGREDIENTS
OPEN CALLS AND COMPETITIONS FOR ISSUE-BASED INNOVATION/SOLUTIONS (HIGH-BUDGET, HIGH IMPACT)
TRANSITION INGREDIENTS
'SERIOUS GAMES' USED AS FACILITATIVE AND RESEARCH TOOLS
TRANSITION INGREDIENTS
SCHAAP MET VIJF POTEN
"It is crucial to have these visionaries, enterpreneurial spirits, engaged and passionate individuals, with a strong drive to empower people, who are sociable and genuinely interested in these initiatives, take on energy from them, and people like that in government who know how to defend their turf within the municipal organization, and have high political skills"
ITRANSITION INGREDIENTS
ARTICLE 5 ON STEROIDS
TRANSITION INGREDIENTS
EXISTING GROUNDWORK ON MULTI-STAKEHOLDER PARTNERSHIPS
"It is usually very helpful if there is some already existing local groundwork and thinking in terms of 'triple helix', or 'quadruple helix', to really push this vision to be fundamentally co-creators."
TRANSITION INGREDIENTS
GLOBAL ALTERNATIVES MAP
"A Global Alternatives, or Global Seeds Map, is an online platform with a mapping of the seeds of / innovations for change springing up worldwide. These may be provided by initiatives themselves, research groups, and/or ordinary citizens. The platforms may also include other more elaborate tools.
TRANSITION INGREDIENTS
CITY-SCALE PARTICIPATORY BUDGETING