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Master of Arts thesis abstract

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Abstract

This master's thesis investigates the use of collaborative design as a facilitation approach for public and policy interaction in climate change mitigation, with the purpose of building social capacity that supports urban climate transition. A collective envisioning process, where young adults and politicians' co-created future scenarios and pathways related to the climate targets in Gothenburg, Sweden, is used to investigate the topic.

Climate change mitigation requires radical structural and lifestyle changes due to the fact that human activity is the main source of impact. Furthermore, it is a highly complex issue, which consists of a system of emerging and interlinked problems. For these reasons, climate change mitigation requires systemic and inclusive management, where diverse societal actors are involved in a collective transition process. In such transition process, citizen participation, through informed debate and action, is argued an important element for building capacity for change. To facilitate such collective change processes, systemic and collaborative design are suitable approaches, due to their ability to enable multidisciplinary collaboration and opportunity seeking. In such processes, co-design activities can build social capacity for change by enabling collective creativity, co-creation and collective envisioning.

The city of Gothenburg, Sweden, aims to be a forerunner in mitigating the problems of climate change, and has formulated a climate program to manage this transition. The climate programme calls for broad engagement in the work towards the vision of reaching fair and sustainable levels of greenhouse gas emissions by the year 2050. In response to this, a co-design process was conducted, with envisioning and backcasting workshops for decision makers and young citizens. The purpose of the project, called "Framtida Göteborg" (FG), was to build social capacity by forming attitudes, knowledge and tools that could support climate transition.

Case study was used as a research method to explore the impact of the co-design activities, in the FG project, regarding their possibility to build *rational*, *emotional* and *operational capacity* for climate transition. The conclusion is that co-design processes between public and policy level, can contribute in climate transition by building social capacity that supports change. This suggests that, first; co-design can build *rational capacity* among citizens and politicians, by enabling an understanding of the problem and possible solutions for climate mitigation. Second, co-design can build *emotional capacity* among citizens and politicians, by enabling empathy for different understandings, positive attitudes, and engagement for these solutions. Finally, co-design can build *operational capacity* among citizens and politicians, by formulating tools for change, which can support the development and implementation of the solutions. However, to successfully build this *rational*, *emotional* and *operational capacity* for change in climate transition, co-design needs to manage the practical challenges with such processes, such as, broad stakeholder involvement, diverse opinions, and envisioning of new futures.

FACILITATING CLIMATE TRANSITION

Co-designing future scenarios and pathways to build capacity for change among citizens and policy makers

CASE STUDY: "FRAMTIDA GÖTEBORG - workshops för en hållbar framtid i vår stad"
(Future Gothenburg - workshops for a sustainable future in our city)

ACKNOWLEDGEMENT

"IT IS NOT ENOUGH FOR PEOPLE TO KNOW ABOUT CLIMATE CHANGE IN ORDER TO BE ENGAGED; THEY ALSO NEED TO CARE ABOUT IT, BE MOTIVATED AND ABLE TO TAKE ACTION"

Lorenzoni et al. 2007, 446;
cited in Wiseman et al. 2009

ABSTRACT

This master's thesis investigates the use of collaborative design as a facilitation approach for public and policy interaction in climate change mitigation, with the purpose of building social capacity that supports urban climate transition. A collective envisioning process, where young adults and politicians' co-created future scenarios and pathways related to the climate targets in Gothenburg, Sweden, is used to investigate the topic.

Climate change mitigation requires radical structural and lifestyle changes due to the fact that human activity is the main source of impact. Furthermore, it is a highly complex issue, which consists of a system of emerging and interlinked problems. For these reasons, climate change mitigation requires systemic and inclusive management, where diverse societal actors are involved in a collective transition process. In such transition process, citizen participation, through informed debate and action, is argued an important element for building capacity for change. To facilitate such collective change processes, systemic and collaborative design are suitable approaches, due to their ability to enable multidisciplinary collaboration and opportunity seeking. In such processes, co-design activities can build social capacity for change by enabling collective creativity, *co-creation* and collective envisioning.

The city of Gothenburg, Sweden, aims to be a forerunner in mitigating the problems of climate change, and has formulated a climate program to manage this transition. The climate programme calls for broad engagement in the work towards the vision of reaching fair and sustainable levels of greenhouse gas emissions by the year 2050. In response to this, a co-design process was conducted, with envisioning and backcasting workshops for decision makers and young citizens. The purpose of the project, called "Framtida Göteborg" (FG), was to build social capacity by forming attitudes, knowledge and tools that could support climate transition.

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"I think about the environment all the time now"

A young adult's reflection after the project

"This type of network is, according to me, very good. To meet between academia, policy, and civil society"

A politician's reflection after the project

Fig. 1 Young adults and politicians co-creating future visions and pathways

PREFACE

During the autumn 2014 I was doing an internship at Ekocentrum in Gothenburg, Sweden. Ekocentrum is a foundation that works with spreading knowledge, inspiration and engagement for sustainability. Their main undertaking is to educate companies, institutions, organisations and the general public through courses, workshops, and an exhibition with good examples. This autumn, Ekocentrum had received money from a municipal fund to conduct collaborative envisioning workshops for young adults and politicians, based on the climate targets for the city. I was assigned project leader for the project that we decided to call "Framtida Göteborg - workshops för en hållbar framtid i vår stad" (Future Gothenburg - workshops for a sustainable future in our city), and worked on the planning and execution together with two educators and the executive leader at Ekocentrum. As a project leader and the only person working full time on the project I recruited all the participants, communicated the project and planned and executed the two workshops together with the educators.

The participants' feedback during the process was very positive, and many of them expressed their belief in collaborative processes and multi-stakeholder dialogue, as a way to tackle sustainability challenges. The positive feedback combined with my own satisfaction after the experience, motivated me to further investigate this topic in my master thesis. My personal objective, in the thesis, is therefore to explore in depth the potentials with design as a facilitator of collaborative processes in sustainable development, especially regarding their potential to build social capacity that can enable systemic social transition. Thus, the aim of the thesis is to reflect in retrospect about our work done in the project "Framtida Göteborg", and, combined with a literature review, build important knowledge regarding how and if collaborative design can build social capacity that support and improve climate transition.

"Children and young adults need to have more influence"

A politician's reflection after the project

"We, as young adults should be heard more often, therefore, I see this as an opportunity to show the politicians what we can do and express our ideas!"

Exert from a young adult's application

"[I gained] trust in the city's politicians"

A young adult's reflection after the project, text in brackets added by the author

Fig. 2 Young adults and politicians presenting future visions and pathways

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1.

INTRODUCTION

This thesis aims at exploring the use of collaborative design as a facilitation approach for public and policy interaction in climate change mitigation, with the purpose of building social capacity for supporting and improving climate transition. To do this, the thesis examines a case study, conducted in the project "Framtida Göteborg" (FG), where citizens and politicians collaboratively created a future scenario of a climate neutral city, as well as pathways regarding how to reach the vision. The purpose of the FG project was to build social capacity by forming attitudes, knowledge and action that support climate transition.

The wider research interest of this thesis is to explore the use of design within the domain of sustainable development, defined by the World Commission on Environment and Development (1987, 43) as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Sustainable development, in this thesis, refers to the highly complex challenges, such as climate change, that can only be dealt with long-term, through specific types of network and decision-making processes (Loorbach 2010). The purpose of this thesis is to examine an example of such societal network processes, and the impact of collaborative design's contribution within it.

Climate change is one of the most critical and complex sustainability challenges currently faced by humanity. Research shows that human activity has the greatest affect on climate change, due to the emission of greenhouse gases (GHG) (Pachauri et al. 2014, 8-11), and that a large part of the emissions originate from cities and urban areas (Nevens & Roorda 2013). At the same time as cities are seen as a problem, they also are considered suitable arenas for innovation for sustainable lifestyles, due to their high concentration of actors, competences and resources, as well as their appropriate scale for implementing change (Ibid). The research in this thesis is situated within this scale of innovation, and focuses on the societal transition process towards climate change mitigation.

Mitigating the risks of climate change requires structural changes in societal systems, such as, energy supply, housing, transportation, and food supply (Loorbach 2010), to lessen the emissions of GHG. In this process, it is argued that technological advancement alone is not a sufficient measure to take for the radical reduction of GHG-emissions needed in climate mitigation. In addition, behavioural and life style changes will need to happen on the level of society, industry, household and individuals (Wiseman et al. 2009; Nevens & Roorda 2013; Larsson & Bolin 2014; Jégou & Manzini 2012; Van Koten & White 2011).

Managing climate mitigation is a great challenge due to the fact that climate change is considered a wicked problem, and requires systemic social processes for mitigating the problems. First of all, climate change is a wicked problem due to the fact that, the phenomenon itself is unpredictable and evolving. Secondly, wickedness is found due to the fact that, climate change mitigation requires social change and, thus, involves a wide range of different opinions, ideas and feelings on how the problem can be solved. Because of this high complexity, climate change mitigation requires systemic opportunity seeking approaches, where decisions, experiments, pilot programmes, prototype tests and so on, are done in an explorative way. Moreover, due to its social nature, climate change mitigation is fundamentally a collective process, where facilitation including a broad range of perspectives is necessary (Conklin 2005; Van Koten & White 2011). This systemic social process of structure and lifestyle change towards a city's lowered GHG emissions is, in this thesis, referred to as climate transition.

Citizen participation, through informed public debate and action, is increasingly investigated as an important element of climate transition strategies. Citizen participation is a process where the public is involved at all levels in all sectors in policy development, planning, decision-making, service delivery and assessment. Furthermore, the aspirations, concerns, needs and values, of the public, are incorporated in the change processes. (Wiseman et al. 2009) Involving citizens can potentially build social capacity that accelerates climate transition. First of all, citizen involvement can build social capacity by increasing the effects of existing forms of governance and planning, as top down governance can catalyst, guide and provide the structure for social transition, while bottom up action can provide feedback, new ideas and solutions for policy alternatives (Loorbach 2010). By involving

different perspectives in the development process, citizen participation can contribute to a better understanding of, and commitment to, possible solutions. This lessens the risk of resistance to change, and creates a shared ownership of the process. This way, transparency and interaction between different societal levels leads to a more sustainable and efficient transition process. (Wiseman et al. 2009) Secondly, empowering and motivating citizens to act increases the resilience and adaptability of a society or community, as it enhances its capacity to mobilize and adapt to necessary changes. As a result, structural and life style change processes are neither completely top-down nor bottom up. Instead, as with most innovation it comes from a creative blend of ideas and actions from multiple sources. Building capacity for such multi action is important in any kind of innovation, and particularly when tackling such a complex and urgent challenge as climate change. (Murray et al. 2010)

Due to the assumed benefits with civic participation, network approaches in which government involves citizens in the policymaking process have become widespread, and the organisation and design of such interactive processes has become a subject of study. In this emerging field of process and network management, more knowledge is needed to advance the thinking and practice of governance for sustainable development (Loorbach 2010). Part of this advancement treats the understanding of how to conduct and organise civic participation in the planning and action of climate transition, to maximise the outcome. Well-designed and well-implemented interaction processes are crucial if the benefits of civic participation are to be realised. The risk, otherwise, is that such processes have reversed effects, and instead develop cynicism and scepticism, as it can be seen as a waste of resources and a way to off-load the responsibility (Wiseman et al. 2009). Because of these risks, mechanisms for involving citizens will need to be developed and tested, to increase the understanding of possible ways to organise such multilevel interaction processes (Van Koten & White 2011). To be successful, such mechanisms need to appreciate the importance of creating engagement for participation, and organise processes that support and build capacity among those taking part. For engagement to be created it is not enough to inform and spread knowledge, people also need to care about the matter, be motivated and able to take action (Wiseman et al. 2009). Thus, for civic participation to effectively and successfully support climate transition, a combination of *emotional*, *rational* and *operational capacity* needs to be facilitated. This thesis aims at contributing to the aforementioned research, by exploring systemic and collaborative design as mechanisms facilitating interaction between citizens and decision makers, and building social capacity for climate transition.

The role and use of design as a profession is expanding, as design thinking is used to address challenges outside its traditional domain. During the last decades, the profession has moved from the design of artefacts, to that of organisations, social interactions, and further into more complex open-ended social systems. Today, systemic design, an approach that integrates systems theory and design practice, is acknowledged a useful approach when dealing with complex problem solving, due to its multidisciplinary

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and opportunity-seeking nature. (Jones 2014) Design traditionally is an opportunity-seeking process, which aims at solving processes by moving between the problem and the solution space (Conklin 2005), through ideating, prototyping and experimenting. Furthermore, design is multidisciplinary in the sense that it can generate *boundary object*s (Jones 2014, 124), which are artefacts that are connected to many disciplines, and thus can aid cross boundary communication and learning, by transferring knowledge and ideation across discipline borders. This way, systemic design can be seen as an *infrastructure* for social innovation (Björnvinsson et al. 2010, 3), by acting as a multidisciplinary platform for collaborative exploration, where short-term innovation can lead to long-term societal transition.

Despite these highlighted potentials, it is important to note that systemic design is in an emerging state, and although scholars do highlight its potentials (Van Koten & White 2011; Soini 2015; Björnvinsson et al. 2010), others do question its effectiveness (Jones 2014). One risk that may be faced when design is used to cope with complex problems is that because the discipline traditionally has dealt with problems of much smaller complexity and shorter time span, it may fail to cope with the vastness of the new systemic social challenges (Ibid). Because of this, further research is needed to better understand the possibilities and limitations of design in coping with large, open-ended social systems, such as climate transition (Soini 2015; Jones 2014). This thesis aims at contributing to this research by exploring systemic design in climate transition. Specifically, it seeks to better understand the impact of systemic design practices in collaborative processes, by investigating the possibility for collaborative design (co-design) activities to build social capacity.

Co-design is a process approach built on a mind-set based on collaboration, which uses tools and facilitation to enable collective problem solving. Co-creation, which often is part of a co-design process, refers to an act of creativity involving two or more persons (Sanders 2001). These approaches can potentially catalyse social transition, because of their ability to build social capacity and support community activism (Van Koten & White 2011). First of all, co-design can enable capacity building through social learning, as it facilitates collective creativity. Collective creativity refers the combination of new ideas, where two or more persons are involved (Sanders 2001). Such interactive processes can create new understandings among its participants that lead to better-informed and more sustainable practices (Robinson 2003). Secondly, co-design can build social capacity by empowering people, with diverse backgrounds and knowledge levels, to participate in co-creation. This is because, co-creation processes are often supported with tangible *design materials*, which can aid cross-disciplinary communication and create a common language among disparate groups (Eriksen 2008, 1). Finally, co-design is often practiced in the beginning of a development process, to collectively envision a desired outcome and, thus, define what, and what not, to design (Sanders & Stappers 2008). Defining an ideal state, that compels action toward a desired outcome, is a systemic process that can catalyst and guide community and society action (Jones 2014). Collective envisioning, as this process is referred to in this thesis, is an active and gen-

erative process that intends to redirect and reimagine future possibilities and actions, that lead and guide sustainable development (Robinson 2003; Loorbach 2010).

Due to the above highlighted potentials with co-design, this thesis argues that the method should be investigated as a facilitation approach for building social capacity in climate transition. Thus, this thesis seeks to explore the impact of collaborative design activities, by investigating their potential for building social capacity. So far, considerate amounts of research has been conducted regarding the shape and execution of collaborative design activities. However, few such processes and methods have been evaluated in terms of their social impact (Soini 2015). This research gap needs to be filled, in order for the design profession to be able to claim itself a useful tool and approach for problem solving in complex social systems and sustainable development.

The primarily aim of this thesis is to investigate if, how and why civic participation through co-design can build social capacity for supporting and improving climate transition. Due to the fact that the research subject is very broad, and lacks a solid research body to build upon, the research is conducted through the use of a single case study. A case study is a useful research method to apply when the research is focused on the space between theory and practice, and can contribute to strengthening the design discipline, by illuminating principles that designers can use in their practice (Breslin & Buchanan 2008). Moreover, a case study is a useful method when 'how' or 'why' questions are being posed in the research, when the investigator has little or no control over the event, and finally when the research focuses on a contemporary phenomenon within a real-life context (Yin 2009). As all of these three criteria apply to this thesis, a case study was chosen as a research method.

The case in this research is an example of a process of conducting citizen and policy interaction in climate transition, and the examination of the facilitative role of collaborative design in it. This process was conducted in the project "Framtida Göteborg" (FG) during September to December 2014, in the city of Gothenburg, Sweden. In the project, politicians and citizens collaboratively envisioned a climate neutral future, and possible pathways to reach it. The FG project's main objective was to enable the participants to engage and collaborate in matters related to climate mitigation and sustainable development. To meet this objective, the FG project aimed at building social capacity on the three previously mentioned levels: *emotional*, *rational* and *operational*. Two co-design workshops were held, including collective envisioning and backcasting exercises, to generate ideas regarding the city's climate targets to reach climate neutrality by the year 2050. The project was conducted by an educational foundation in Gothenburg, called Ekocentrum, with the support of municipal funding.

The figure (fig. 3) depicts the overall research frame, and the position of the case study process, which was conducted in the FG project. The study focuses on the possibility for civic participation through co-design to build

social capacity for effective climate transition, by studying how co-design can influence the three, previously mentioned, aspects of social capacity: *emotional*, *rational*, and *operational capacity*.
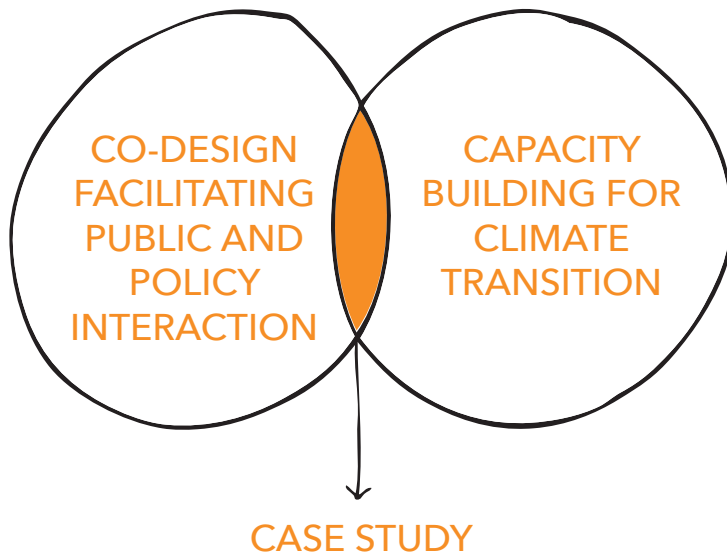
Fig. 3 Framing of the research

To evaluate the impact of the process conducted in the FG project in building *emotional*, *rational* and *operational capacity*, research material was gathered from before, during and after the project. Altogether, the research material includes 26 participant interviews and 29 workshop documents. In total, 81 % (29/36) of all the people involved in the project have contributed to the material included in the research, which secures extensive representation in the analysis. To analyse the collected research material from the FG project, a qualitative analysis was conducted in three stages. This allowed at least two corroborations of the findings, which reduced the risk of biased or false conclusions, and incrementally deepened the understanding of the impact of co-design activities in climate transition.

The general conclusion of this thesis is that co-design processes between public and policy level, can contribute in climate transition by building social capacity that support change. This suggests that, first; co-design can build *rational capacity* among citizens and politicians, by enabling an understanding of the problem and possible solutions for climate mitigation. Second, co-design can build *emotional capacity* among citizens and politicians, by enabling empathy for different understandings, positive attitudes, and engagement for these solutions. Finally, co-design can build *operational capacity* among citizens and politicians, by creating tools for change, such as tangible shared material and multidisciplinary stakeholder networks, which can support the development and implementation of the solutions. By further iteration and feedback such implemented solutions can potentially grow into systemic change that supports climate transition. However, to successfully build this *rational*, *emotional* and *operational capacity* for change in climate transition, co-design needs to manage the practical challenges and complications with such processes, namely, *requisite variety and*

broad stakeholder representation, *fragmentation and social complexity*, *time and resources for co-creation*, as well as, *fixation in the current reality*.

The structure of this thesis is as follows: (1) this first introductory chapter outlines the whole thesis, (2) the second chapter summarizes a literature review that outlines how and why civic participation through co-design potentially can build capacity for effective climate transition, (3) the third chapter introduces the case study research plan, by framing the research and describing the methods used, (4) the forth chapter presents the case study process by introducing the context, the co-design activities undertaken, as well as their immediate impact, (5) the fifth chapter discusses the empirical and theoretical findings and draws conclusions, based on these, and finally, (6) the sixth chapter provides a reference list, as well as an appendix with the translated interview questions.

2.

CO-DESIGN FACILITATING CLIMATE TRANSITION

This chapter presents a literature review outlining how civic participation through co-design could build social capacity for effective climate transition. The research task in this thesis is to explore the use of collaborative design as a facilitation approach for public and policy interaction in climate transition, with the purpose of building social capacity that supports and improves the process.

It has become clear to many that we are in great need of a paradigm shift. Global challenges, such as climate change, have placed the human civilisation at existential risk. The complexity of today's challenges is greater than ever before; economic, social and environmental challenges are intertwined. In short, our current lifestyles cannot be sustained for much longer (Murray et al. 2010; Loorbach 2010; Van Koten & White 2011; Jones 2014; Conklin 2005).

To turn the wheel in a new direction of long-term sustainability, we will need to radically change both our societal structures and lifestyles. In this transition, it has been argued that building resilience and social capacity is important. To do this, scholars suggest that more systemic ways of managing are crucial in the transition process, including more interaction between policy and society level (Wiseman et al. 2009; Loorbach 2010), to build capacity through collaboration.

Similarly, concepts within both systems theory and design thinking emphasize the need for collaboration in tackling wicked problems, such as climate change, to build social capacity for change (Jones 2014). Managing a broad range or stakeholders in collective processes is, however, a complex challenge. Therefore, it is important to develop effective mechanisms where stakeholders can meet, exchange ideas and collaborate, to build social capacity for climate transition (Van Koten & White 2011).

In response to this, this thesis investigates the potentiality of collaborative design as a facilitation approach for interaction between citizens and policy makers, in climate transition. Co-design can potentially build *rational*, *emotional* and *operational capacity*, which can support and improve climate transition, by enabling collective creativity, co-creation and collective envisioning processes. This way, design can act as an *infrastructure* for social innovation (Björnvinsson et al. 2010, 3), where short-term innovation can lead to long-term societal transition.

2.1.
CLIMATE TRANSITION

Climate transition, in this thesis, is referred to the systemic social process of structural and lifestyle change, towards lowered GHG emissions in an urban context. To mitigate the threats of climate change, this process will require rapid, well-informed and broad action on all levels of society. However, because climate change is a highly complex challenge, traditional linear problem solving and decision making processes are not sufficient for managing such transition. Instead, systemic and inclusive change approaches are necessary, where diverse stakeholders work together to create, support and drive the process, to build social capacity for change. (Van Koten & White 2011; Conklin 2005; Loorbach 2010; Wiseman et al. 2009)

Due to the abovementioned reasons, citizen participation, through informed public debate and action, is increasingly investigated as an important element of climate transition strategies. Citizen participation is investigated an important part of the decision-making and implementation process, as it can create attitudes, understandings and commitment that support and improve the process, both on a society and policy level. (Siitonen & Hämäläinen 2004; Wiseman et al 2009). This way, citizen participation can potentially support and improve the process of climate transition, by building social capacity on *emotional*, *rational* and *operational* levels.

This section will outline and discuss some of the main challenges of climate transition, as well as a scale and management approach that are potentially suitable.

2.1.1.
CLIMATE TRANSITION
IN AN URBAN CONTEXT

Climate change is one of the most critical and complex sustainability challenges currently faced by humanity. It is crucial for the health and living condition of both current and future generations that climate change is reduced. Research shows that human activity has the greatest affect on climate change, due to the emission of greenhouse gases (GHG) (Pachauri et al. 2014, 8-11). Increased emissions of GHG in the atmosphere lead to an increase of the natural greenhouse effect, and a rise in the temperature on earth (Wijkman & Rockström 2012, 99). A temperature rise, in turn, leads to a chain of causes with dangerous outcomes, for example melting glaciers, rising sea levels, more extreme weather conditions and spreading of diseases. Thus, according to Pachauri et al. (2014, 14) "continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems". Reducing

the threats of climate change will require rapid, well-informed and broad action on all levels of society, and on a global scale.

While climate change is a global issue, it is important to find an appropriate scale where actions successfully and efficiently can be taken to mitigate the problem. Nevens & Roorda (2013) argues that cities are suitable arenas for addressing sustainability issues, such as climate change. This is due to the fact that cities and urban areas inhabit large parts of the earth's population, and thus stand for a major part of the negative environmental impact posed by humanity (Engström et al. 2011). As an example, urban areas in the developed world are the main source of GHG-emissions, responsible for over 70 % of the energy-related global GHG emissions, from a production-based viewpoint. If considering the consumption based GHG emissions, the numbers would be even higher, as large parts of what is consumed in urban areas is imported. (Ibid) Thus, cities are the locations were the major part of unsustainable issues, such as the emission of GHG, originate.

At the same time as cities can be seen as the main problem, they are also argued to be part of a genuine progress in climate transition. Due to their high concentration of actors, competences and resources, the necessary structural changes for climate transition, such as, energy supply, housing, transportation, and food supply (Loorbach 2010), can efficiently be undertaken. This way, cities could be considered as potential 'motors' in climate transition (Nevens & Roorda 2013), driving rapid and well-informed change actions.

Furthermore, cities and local communities are considered the appropriate scale of which behavioural changes of individuals can be influenced (Ibid). Behavioural changes are important in climate transition, as it is argued that technological advancement alone is not a sufficient measure to take, for the radical reduction of GHG-emissions needed. In addition, behavioural and life style changes will need to happen on the level of society, industry, household and individuals. (Wiseman et al. 2009; Nevens & Roorda 2013; Larsson & Bolin 2014; Jégou & Manzini 2012; Van Koten & White 2011).

This structural and behavioural change process towards lowered GHG emissions, in an urban context, is in this thesis referred to as climate transition. The following section will discuss some of the challenges and possibilities in the management of climate transition.

2.1.2.
MANAGING CLIMATE TRANSITION

Managing the structural and behavioural changes needed for reducing the emissions of GHG, is a challenge related to how to manage the environmental 'commons'. The environmental commons refers to the earth's natural resources and capacities, which we humans use to sustain our lives. The management of these resources, such as the level of GHG emissions, have

mainly been carried out based on "the tendency to assume that decisions reached individually will, in fact, be the best decisions for an entire society" (Hardin 1968, 1244). In other words, this means trusting that each human being is individually best capable of managing his or her own emissions. However, following Hardin's (1968) argumentation, in such a management system each human is locked into a structure that compels the individual to increase the emissions without a limit, in a world that is limited. As there is no direct incentive for individuals to minimize their emissions, they instead maximize them, until the earth's capacity to cope with these emissions has bypassed, and we reach a situation, which Hardin (1968) refers to in his article as the "tragedy of the commons".

To limit the tragedy of the commons, regarding for example the unsustainable level of GHG emissions, Hardin (1968) argues that a mutually agreed coercion is needed. The freedom for every individual to manage their emissions is unsustainable, and instead the situation needs to be controlled through taxation, or other kinds of regulations. Furthermore, he argues that coercion needs to be "mutually agreed upon by the majority of the people affected" (Ibid, 1247). Thus, what he suggests is that broad stakeholder representation is needed, in the decision making process, regarding what measure to take to limit the emissions of GHG.

Today, over 40 years after the article about the tragedy of the commons was written, various scholars agree about the need for broad stakeholder representation in managing the decision-making, and implementation, of measures for lowering the GHG emissions (Van Koten & White 2011; Conklin 2005; Loorbach 2010; Wiseman et al. 2009). The argumentation for including a broad representation of perspectives in this process is two folded.

First of all, the need for broad stakeholder representation in the process is related to increasing the understanding of possible solutions, due to the fact that climate change is a challenge of immense complexity. The complexity of climate change lies in the fact that it is incomplete, contradictory, and has changing requirements that are often difficult to recognize (Jones 2014). This means that it consists of many interlocking and evolving problems, which affect each other in such a way that there is no definitive statement of 'the problem' (Conklin 2005). Furthermore, climate change mitigation is context based and, thus, solutions that have worked in one situation, might not work in another.

Due to this high complexity climate change has been recognized as a persistent (Loorbach 2010, 164) and wicked problem (Conklin 2005, 7). This means that it is difficult or merely impossible to solve, and that defining one single measure for climate change mitigation is impossible. For this reason, it is also impossible for a single societal actor or stakeholder to alone develop and implement successful measures and solutions for climate change mitigation (Conklin 2005). Furthermore, due to this complexity, climate change cannot be reduced and analysed with the techniques of classical problem solving and decision-making. Instead, climate change mitigation requires systemic exploration and experimentation for finding and defining

solutions. It is a matter of collective creativity and judgement to determine which solution should be pursued and implemented in a certain context. Conklin (2005) refers to this as an opportunity-driven approach; where decisions, experiments, pilot programs, prototype tests and so on; are done in an explorative way. In this process it is argued that a broad representation of stakeholders is needed, to build an understanding of possible solutions (Ibid).

Secondly, the importance of broad stakeholder representation in climate change mitigation is related to the implementation and execution of these solutions. Broad stakeholder representation in this process is needed, due to the fact that climate change mitigation requires both structural and lifestyle changes, and thus, is rooted in different societal domains, occurring on varying levels, and involves various actors with dissimilar perspectives, norms and values (Loorbach 2010). Dealing with effective transition of such high complexity requires the engagement and support of a broad range of stakeholders. Because of this, inclusive and interactive management forms are needed, in which, learning, interaction, integration, and experimentation happens both on the level of society and policy (Loorbach 2010), and where a wide range of perspectives are taken into consideration in the decision-making. This way, broad stakeholder representation can build mutual trust, decisiveness and long-term objectives, which can support action on different societal levels.

Thus, following the aforementioned arguments, broad stakeholder representation is needed both for building an understanding of possible measures to take for climate change mitigation, as well as, for supporting the implementation and execution of these measures.

> *"[The issue of climate change] clearly can only be addressed through novel forms of government-society interactions across different levels to address broad complexity of interrelated problems"*
>
> Loorbach 2010, 164; text in brackets added by the author

The idea of broad stakeholder representation is addressed in the article "Transition Management for Sustainable Development", where Derk Loorbach (2010) introduces a management approach called "Transition Management". Transition management is a framework with the aim to influence the drastic long-term changes in culture, structure and practices that are considered necessary for genuine sustainable development solutions (Ibid). In Transition management, the need for more decentralized forms of governance, and broad societal representation, in sustainable development is addressed through an approach that is called "reflexive governance" (Ibid, 162). Reflexive governance aims towards increasing the effect of existing forms of governance, and planning, in the context of normative long-term change in society. In practice, reflexive governance implies a new balance

between state, market and society, by facilitating informal network processes through which alternative ideas and agendas can emerge. Such informal network processes can fuel policy-making processes with new ideas, problems, solutions and agendas, and drive social innovation processes (Ibid). Thus, reflexive governance refers to the management of a mix of bottom-up and top down initiatives in the process towards new, more sustainable practices of managing our commons. Management of such interaction, between different societal levels, can potentially accelerate the climate transition process, as top-down governance can mobilize, guide and accelerate social innovation rapidly, while bottom-up initiatives can provide new ideas, feedback, problems, and solutions for policy initiatives (Ibid).

The following section will focus on the potentials with civic participation in climate transition, and its possibilities for building social capacity that support and improve the process.

2.1.3.
BUILDING SOCIAL CAPACITY FOR CLIMATE TRANSITION THROUGH PARTICIPATION

As part of the importance of broad stakeholder representation in climate mitigation, civic participation is argued a significant part of planning, decision making and action processes in climate transition (Wiseman et al. 2009; Loorbach 2010; Murray et al. 2010). Citizen participation is a process where the public is involved at all levels in all sectors in policy development, planning, decision-making, service delivery and assessment. Furthermore, the aspirations, concerns, needs and values, of the public, are incorporated in the change processes (Wiseman et al. 2009).

Civic participation is considered important in climate transition as it is argued that building capacity for multi action is important when tackling such a complex and urgent challenge as climate change (Murray et al. 2010). Furthermore, it is argued that for building such capacity and engagement, it is not enough to inform and spread knowledge, people also need to care about the matter, be motivated and able to take action (Wiseman et al. 2009). Therefore, participation is investigated an important part of the decision-making and implementation process, as it can create attitudes, understandings and commitment that support and improve the process, both on a society and policy level. Such *emotional*, *rational* and *operational capacity* can be built through participation, for several reasons.

First of all, bringing together citizens and decision makers in dialogical processes is crucial for the engagement and support of the public in the formation of policy, because it is linked with issues of trust, legitimacy and representation. Participatory planning (Siitonen & Hämäläinen 2004, 3) empowers the citizens, as it provides people with a possibility to influence issues affecting their lives. This empowerment, and the feeling that their opinions are being heard, can possibly encourage people to commit to the

decisions taken, and thus support the implementation of them (Ibid). This way civic participation can form positive attitudes and understandings that support the process of climate transition. In this thesis, this notion is referred to as *emotional capacity*.

Secondly, civic participation increases the contributors understanding of the problem, and creates a shared understanding of its possible solutions. Decision makers become better informed and can make more sustainable choices, in line with the citizens. At the same time citizens also gain knowledge, which can support the decisions taken. This way, civic participation can contribute to forming mutual knowledge and understandings, by developing and reframing problems and solutions for climate transition, through social learning (Loorbach 2010). In this thesis, this notion is referred to as *rational capacity*.

Third, civic participation can catalyst social innovation, as it empowers citizens to engage in climate transition, and can provide a setting and the means to do so. Empowering and motivating citizens to participate increases the resilience and adaptability of a society or community, as it enhances its capacity to mobilize and adapt to necessary changes (Murray et al. 2010). As a result, structural and life style change processes can happen on several societal levels and, thus, potentially accelerate the change process. This notion is, in this thesis, referred to as *operational capacity*.

Due to the supposed potentials with civic participation, mechanisms for effective integration and interaction between policy makers and civil society are increasingly investigated as an important part of climate transition strategies (Wiseman et al. 2009). Organising and managing civic participation is, however, a complex task and raises many questions regarding the most effective shape, scale and methods to apply. In addition, the location, facilitation, participants, agenda and outcome of such processes are aspects, which will affect its result. The way in which such interaction is organised will define whether the assumed potentials in climate transition, are to be reached or not. The risk, if organised and managed badly, is that such processes have reversed effects, and instead develop cynicism and scepticism, as it can be seen as a waste of resources and a way to off-load the responsibility (Wiseman et al. 2009). As an example, one important aspect to consider in the organisation of civic participation, with the aim to improve climate transition, is the aspect of broad representation. To build social capacity and enhance change on various levels and parts of a society, broad representation is essential. Organising civic participation with a broad representation of citizens means that not only the previously interested communities should participate, but also those who are less interested to do so. Wiseman et al. (2009, 143) refers to these less interested groups, including for example young adults, as 'hard to reach' groups, which require specific strategies and actions for involvement in climate transition.

Due to the abovementioned arguments, mechanisms for involving citizens will need to be developed and tested, to increase the understanding of possible ways to organise such multilevel interaction processes (Van Koten &

White 2011). This thesis aims at contributing to the aforementioned research, by exploring systemic and collaborative design as mechanisms facilitating interaction between citizens and decision makers, and building social capacity for climate transition. The following section will outline the potentials of design as a facilitation approach in climate transition.

2.2.
DESIGN IN
CLIMATE TRANSITION

The design discipline is evolving and increasingly acknowledged as a useful approach when dealing with challenges of high complexity (Jones 2014). Following this line of thought, this thesis argues that design potentially can contribute in climate transition, a challenge of extremely high complexity. Due to is multidisciplinary and opportunity-seeking nature, design can potentially aid complex problem solving processes, by enabling collaboration and communication between different societal levels, such as policy making and the public. This way, design can act as an *infrastructure* for social innovation (Björnvinsson et al. 2010, 3), where short-term innovation can lead to long-term societal transition. This section will further outline the evolution of design, design dealing with complex challenges, as well as, societal transition.

2.2.1.
THE EVOLUTION OF DESIGN

As the challenges our societies face are changing, so are the methods and approaches used for coping with them. With an increase in complex societal challenges posing existential risks to humanity, new systems oriented approaches have emerged. The design discipline has followed the same development, and moved from the design of individual artefacts into the design of processes and organisations, and further into more complex open-ended systems, and social transformation (Jones 2014). This emergence of the design discipline is illustrated in the article "Systemic Design Principles for Complex Social Systems", where Peter H. Jones (2014, 98-102) outlines four domains of design (Design 1.0 to 4.0). The first stage (Design 1.0), which is referred to as traditional design, deals with the design of artefacts and communications. This stage deals with 'design as making', which involves tangible problem solving with clear limitations and boundaries. The second stage (Design 2.0) deals with service and product design, and entails 'design for value creation' by service design, product innovation, and user experience. This stage is also referred to as 'design as integrating' and includes multichannel problem solving, thus, increasing the complexity by the components involved. The third step (Design 3.0) is referred to as

'organizational transformation', which incorporates change-oriented processes, design of work practices, strategies and organizational structures. The problem solving on this level is significantly more complex, although it is still bounded by the business plan, or organisational strategy in question. Finally, the fourth design stage (Design 4.0) is what Jones (2014) calls 'social transformation'. This stage deals with design for complex societal transformations, social systems, policy-making, and community design. The problem solving on this level is complex and unbounded and, therefore, requires a much higher level of systemic and holistic understanding than any of the other design stages. (Jones 2014) The next section will further discuss the suitability and potentials of design, to deal with such complex challenges.
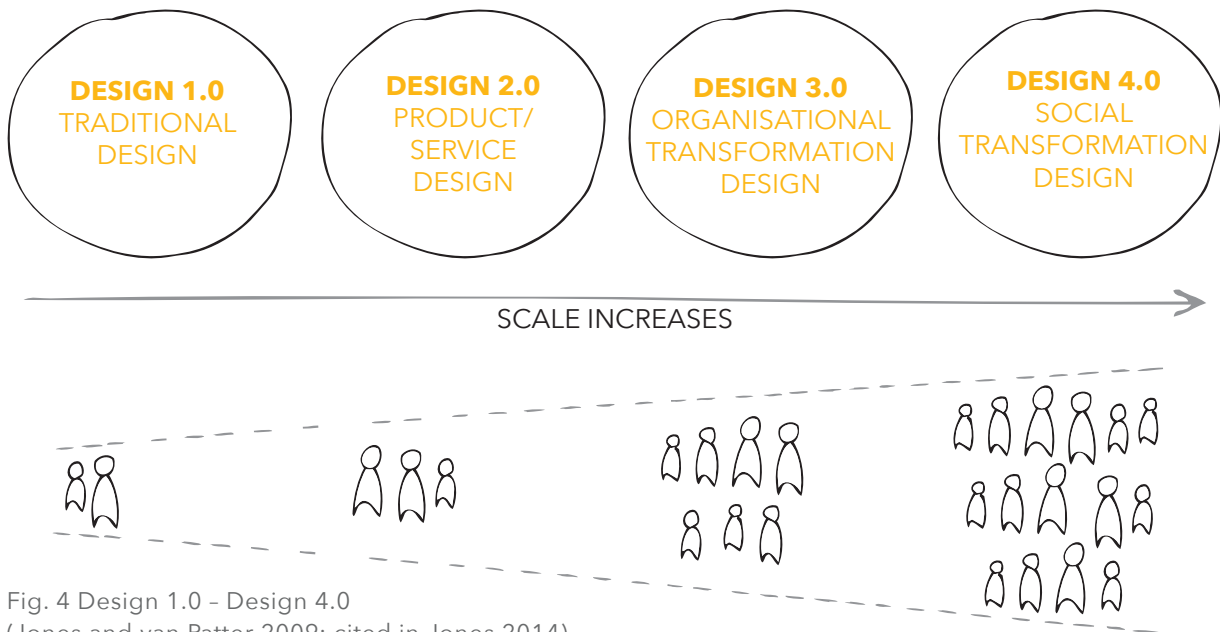
Fig. 4 Design 1.0 – Design 4.0
(Jones and van Patter 2009; cited in Jones 2014)

2.2.2
DESIGN DEALING WITH COMPLEX CHALLENGES

Design thinking, which is understood as a non-linear mode of thinking that enables open-ended exploration, is acknowledged as a method that can enable a systems approach to complex problem solving (Van Kote & White 2011). However, as the challenges faced by design thinking are becoming more complex, the methods used to tackle them also need to develop. One emerging design approach, aiming at addressing the increasing complexity in design, is systemic design (Jones 2014). The purpose of systemic design is to collaboratively design better policies, programs and service systems, by integrating human-centred design in complex, multi-system and multi-stakeholder challenges, in society. To do this, systemic design, which is more a design orientation than a discipline, integrates methods and knowledge from both systems theory and design thinking. (Ibid)

One reason that design thinking is acknowledged a promising approach for tackling complex problems, such as climate change, is due to its opportunity-seeking nature (Conklin 2005, 7). An opportunity-seeking process is an iterative process, where the individual or group aiming at solving a problem constantly moves between the problem and the solution space (Conklin 2005). In such processes, solutions constantly evolve, as they are brought into in the problem space to be evaluated, and then back into the solution space to be further developed. An opportunity-seeking approach enables constant learning (Conklin 2005), and 'learning-by-doing', which, as previously mentioned, is necessary when faced with high complexity, such as in climate transition.

Another reason for why design thinking is argued a strong approach for handling complexity is because of its multidisciplinary nature. Multidisciplinary methods are important in complex problem solving because, as the boundaries and complexity of a problem grow (as previously demonstrated in design 3.0 and design 4.0), the number of stakeholders involved in the process also do. Thus, the design approaches used to tackle challenges of such high complexity require methods for efficiently involving a broad range of diverse stakeholders, into the process. Jones (2014, 124) refers to design as *boundary objects*, meaning that its outcome often is connected to many disciplines, and thus can aid cross boundary communication and learning, by transferring knowledge and ideation across discipline borders. This way, design can aid multidisciplinary collaboration processes by facilitating communication among a wide range of stakeholders. A multidisciplinary approach is especially important in complex problem solving, because such problems do not have right or wrong solutions (Conklin, 2005). Instead, it is a matter of collective judgement to define what solution or strategy to apply when coping with these problems. In such processes of collective judgement, design can thus be a useful facilitator.

Despite the acknowledged potentials with design thinking in complex problem solving, the integration of systems theory and design thinking, into systemic design, is in an emerging state. Therefore, there might still be a significant mismatch between the scale of the addressed problems, and the design method and practice applied to them (Jones 2014). To highlight the possibility that design thinking could fail to meet the complexity and scope of the social and systemic issues involved in challenges, such as, climate transition, Jones (2014, 123) uses the two Greek terms 'hubris' and 'panacea'. First of all, hubris illustrates the notion that many are led to believe that design can be applied to any problem complexity, even a super wicked one that individuals would find impossible to comprehend. Panacea, on the other hand, is used to describe design thinking, which runs the risk of turning into what Jones (2014) calls a 'cure all' methodology adopted not only by design disciplines, but also by business, information, and technology disciplines, with unrealistic expectation for results. One example of this risk is the fact that design thinking is highly influenced by the rapid prototyping culture (Ibid, 122). During the paradigm of design 1.0, when design mainly was applied to tangible industrial processes, the risks of this short-term feedback were minor. However, when design interventions are applied in

complex challenges, the risks increase significantly. Thus, the need for a greater understanding of systems and network processes increases, and calls for rigours theory to guide design practice on this scale (Ibid).

In response to this, Jones (2014, 108-121) provides ten "Shared Systemic Design Principles", which helps to better understand the integration of systems theory and design thinking. The principles are based on a meta-analysis of concepts in both systems theory and design theory, and aim at guiding practitioners in systemic social design. The principles have been integrated in a common model of a generic design process in five stages, as part of three general design phases (fig. 5) and respond to challenges faced in most design projects, whether it relates to the design of a commercial product, a healthcare service or a social transition process. (Ibid)

SHARED SYSTEMIC DESIGN PRINCIPLES

The two first design principles related to the 'strategy' stage, are *idealization* and *appreciating wickedness*, which deal with defining a desired outcome or an ideal state, as well as acknowledging the dynamic complexity and cognitive factors that indicate the problem complexity. Secondly, the 'discover' stage includes the principles *discovering purposes*, which deals with the articulation of frameworks and purposes, and *requisite variety*, which stresses the need for broad representation in decision-making. The third stage, 'design', contains *boundary framing*, which aims at defining the boundaries, *ordering*, which deals with structuring of information and components in in meaningful ways, and *feedback coordination*, which deals with positive and negative feedback loops and evaluative coordination. The forth stage 'develop' includes *generative emergence*, which highlights the non-designable emergent nature of complex adaptive systems, and *continuous adaptation*, which deals with the pacing and duration. Finally, the fifth and last stage, 'deploy', includes *self-organizing & placement*, which refers to the adaption and learning of social systems, and *feedback coordination*, which again deals with managing and monitoring positive and negative feedback. (Jones 2014, 108-121)
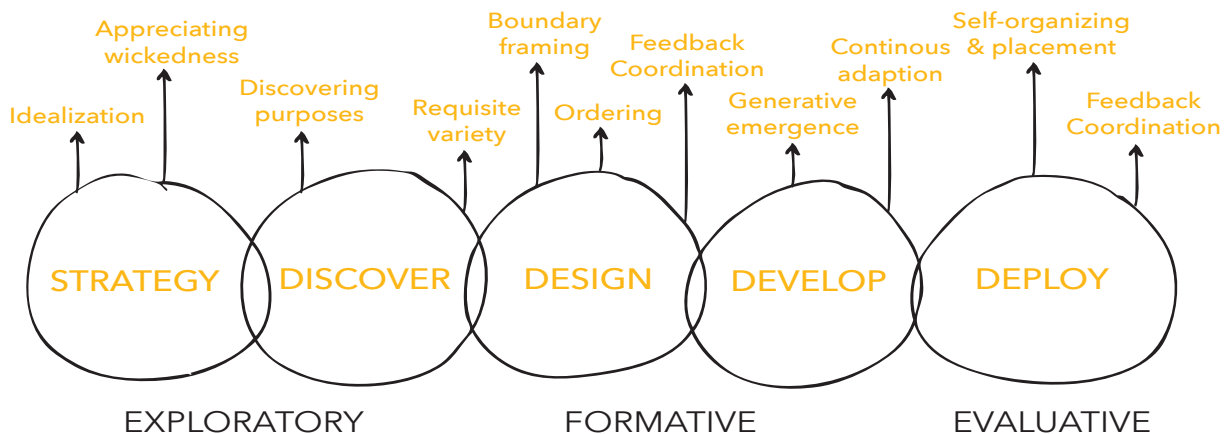
Fig. 5 Shared Systemic Design Principles (Jones 2014, 108-121)

The principles for systemic design offers a strong basis for understanding the integration of systems theory and design, by providing guidelines that can evolve improved practice in complex problem solving, such as climate transition. The theories most relevant to this thesis will be further discussed in latter sections. The next section will focus on systemic design and its position in, and potentials to influence, societal transition.

2.2.3.
DESIGN DEALING WITH
SOCIETAL TRANSITION

As previously outlined, systemic design is a design orientation that has derived from a combination of theories from systems theory and design thinking (Jones 2014). Both systems theory and design thinking orient towards the desired outcomes of complex problems, which are to effect highly leveraged, well-reasoned, and preferred changes in situations of concern (Jones 2014). In this thesis, the area of concern refers to the contemporary (western) urban structures and lifestyles, which have lead to unsustainable levels of GHG-emissions, and the preferred change is the decrease of these emissions, which requires a systemic societal transition. Transitions of societal systems can be seen as specific cases of complex system dynamics. Loorbach (2010, 167) explains that "in a transition, a complex adaptive system is successfully adjusted to change internal and external circumstances, and the system thus arrives at a higher order of organisation and complexity". In the transition of societal systems, such as climate transition, systemic design can act as a catalyser and facilitator of change, by enabling adjustments in the complex system. This way, systemic design could be seen as a platform for design activities, where short-term innovation can lead to long-term societal transition.

Similarly, Björnvinsson et al. (2010, 3) refers to design as an *infrastructure* enabling innovation for societal transition. In such *infrastructure* of innovation, the aspect of broad and long-term collaboration is central, due to the fact that innovation, and especially systemic innovation, demands extensive collaboration over time and among many stakeholders. This way, design can be seen as a facilitator of collaborative explorations for leverage points in a complex system, as well as, the integration of interventions in the system, to create change towards a desired outcome. Central to this view of design is that the *infrastructure* is seen as an integral link between other on-going activities, instead of a separate process or action (Björnvinsson et al. 2010). Thus, it would require that, societal organisations and politics support such multilevel collaboration and transparency. Similarly, Murray et al. (2010) agree that new paradigms tend to flourish in areas where the institutions and organisations are most open to them, and where the forces of the old are weak. Thus, to allow innovation to grow it is important, for societal transition processes, to create the space (Loorbach 2010), as well as allocating sufficient time, energy and resources for it (Sanders & Stappers 2008).

Viewed in the aforementioned way, systemic design could act as a platform for social innovation, which is an approach aiming towards systemic social change, by addressing the way individuals or communities act to solve problems, and generate new opportunities (Murray et al. 2010). Thus, social innovations' are new ideas that are both good for society, and enhance society's capacity to act. Social innovations can be products or services, just like any innovation, but they can also be a principle, an idea, a piece of legislation, a social movement, an intervention, or some combination of them. Social innovation can be an important driving force in climate transition (Jégou & Manzini 2012), where capacity building for systemic social change is an integral part of the process.

In social innovation the process is as important as the innovation itself, and the success of it relies on the participation and involvement of a wide variety of interests (Murray et al. 2010). Similarly, the importance of participation and broad representation in systemic social change is highlighted in the 5th principle for systemic design, *requisite variety* (Jones 2014, 113). *Requisite variety* can be summarized by the statement "getting the whole system in the room", which means that stakeholders should represent every function expected to contribute or participate in a process (Ibid, 113). In other words, it means that the variety in a control system (the governing body) must be greater than or equal to the variety in the system being regulated (a community or society). Thus, for decision-making processes to be valid and lead to systemic change of a social system, *requisite variety* among the stakeholders account for a variety of, for example, perspectives, opinions, positions, feelings and viewpoints about the issue (Ibid, 113).

To summarize this section, design inhibits great potentials in dealing with the adaptation of highly complex systems, such as climate transition, and although new design mechanisms and methods still needs be developed, for coping with the high complexity, useful approaches do already exist. In climate transition, it seems as if design successfully could take on the role of a platform for social innovation, facilitating interactive processes leading to both short- and long-term changes in climate transition. The primary task for such social innovation platform should be to generate new ideas, and to build social capacity for taking these ideas further. On the basis of these conclusions, the following section will outline collaborative design as an approach that potentially can facilitate climate transition, by building social capacity.

2.3.
CO-DESIGNING SOCIAL CAPACITY FOR TRANSITION

Co-design is a process approach built on a mind-set based on collaboration, which uses tools and facilitation to enable collective problem solving. Co-

design can contribute to systemic change (Soini 2015) and catalyse social transformation, because of its ability to build social capacity, and support community activism (Van Koten & White 2011). First of all, co-design can enable capacity building through social learning, as it facilitates collective creativity. Secondly, co-design can build social capacity by facilitating co-creation, which empowers people, with different prior levels of knowledge, to collaborate. Finally, co-design processes often involve collective envisioning of a desired outcome, which can build social capacity by catalysing and guiding community action (Jones 2014). This section will elaborate further on how and why co-design can facilitate climate transition, by building *rational*, *emotional* and *operational capacity* that supports and improves climate transition.

2.3.1.
CO-DESIGN AS A
FACILITATION APPROACH

The design field provides various methods and tools for bringing people together to collaboratively develop solutions, and facilitate change processes. Often, these methods and tools are referred to as collaborative design (co-design) (Murray et al. 2010, 31) and collaborative creation (co-creation) (Sanders & Stappers 2008, 6). Co-design can be seen as an organisational approach bringing together multidisciplinary stakeholders in creative and collaborative problem solving processes, while, the action of co-creation, which can take place within co-design processes, refers to an act of creativity involving two or more persons (Ibid).

Co-design is often conducted in the format of, one or more, co-creation workshops, where multiple stakeholders are participating around a shared matter of interest, or concern. In such co-design workshops, the designer's role becomes one of, a facilitator, which is "an impartial third party providing procedural guidance to group participants to promote constructive communication, information exchange, learning, and collaborative negotiation" (Daniels & Walker 2001, 177).

Co-design has grown out of a design field called participatory design, which started in Scandinavia in the 1970s (Sanders & Stappers 2008, 5), with activities facilitating the participation of workers concerning work place controversies. To do this, strategies were developed to support worker participation, mainly regarding information technology. The ideals of participatory design were then concerned with 'democracy at work' and the support of skilled workers, in the development of their everyday lives (Björnvinsson et al. 2010). Co-design continues on this line of thought, although slightly less political, and emphasizes the importance of empowerment striving for equal participation.

The way co-design is practiced and discussed today takes on quite different manifestations, depending on the expertise and the mind-set of its practi-

tioners (Sanders & Stappers 2008). Interestingly, the best-known proponents of co-design originate from business and marketing, and not from the design discipline (Ibid). Thus, co-design is in itself a truly multidisciplinary and 'co-developed' approach, incorporating theory and practice from different disciplines and schools of thought.

The following section will outline how collective creativity in co-design can build social capacity for climate transition, by enabling social learning.

2.3.2.
COLLECTIVE CREATIVITY
AS SOCIAL LEARNING

In co-creation, one of the basic criteria is embracing the notion that all people are creative, and able to express it in matters that they care about, if provided with the means to do so (Sanders & Stappers 2008). Creativity has been referred to as *bisociation*, which is a process where previously unrelated ideas are connected (Sanders 2001, 1). In contrast, *association*, in a process refers to combinations with previously established connections between ideas, and is thus not an act of creativity. Collective creativity occurs when two or more people share the *bisociation*. (Ibid)

Expressing and performing creativity, both individually and collectively, might be hard for non-designers, or other non-creatively trained persons, because they are not in the habit of expressing it. Thus, their creativity may be latent (Ibid). Because of this, the essential task for co-design is to provide settings were groups of people are able to practice collective creativity. When collective creativity is successfully practiced, new ideas and understandings emerge among the participants, enabling a setting of social learning. This way, co-design processes can be seen as processes supporting *rational capacity* building.

Robinson (2003, 849) introduces a similar approach, "Interactive Social Research", which aims at engaging the 'user' of a research activity in the research process itself, instead of only considering the user a subject of analysis, or consumer of the final product of the research process. Central for this concept, is the notion that the combination of expert knowledge, local sustainability aspects and the public's values, attitudes, preferences and beliefs creates a third understanding, which improves the understanding and practice of sustainability (Ibid), see figure 6.

Similarly, Conklin (2005, 1) refers to this third understanding as collective intelligence. Collective intelligence, according to Conklin, is the creativity and resourcefulness that a group or team can bring to a collaborative problem (Ibid). Following this line of thought, collective creativity in co-design could be seen as an enabler of social learning, through the creation of new understandings and ideas, which increases the *rational capacity* of a group or community to deal with a problem. Likewise, the 8th principle

for systemic design (Jones 2014, 113) *generative emergence*, suggests that a higher, coherent level of organization, in other words the capacity to act, arises from the interaction of system components. He gives the example of large social networks, which can display emergent qualities, such as new understandings and practices, which cannot be designed or planned in the absence of large numbers of active participants. In other words, what Jones (2014) suggests is that collaboration among a large number of stakeholders is a prerequisite for building capacity for systemic change in a social system.

EXPERT UNDERSTANDING

PUBLIC VALUES, ATTITUDES, PREFERENCES AND BELIEFS

CO-CREATION (TOOLS + FACILITATION)

IMPROVED UNDERSTANDING AND PRACTICE OF SUSTAINABILITY
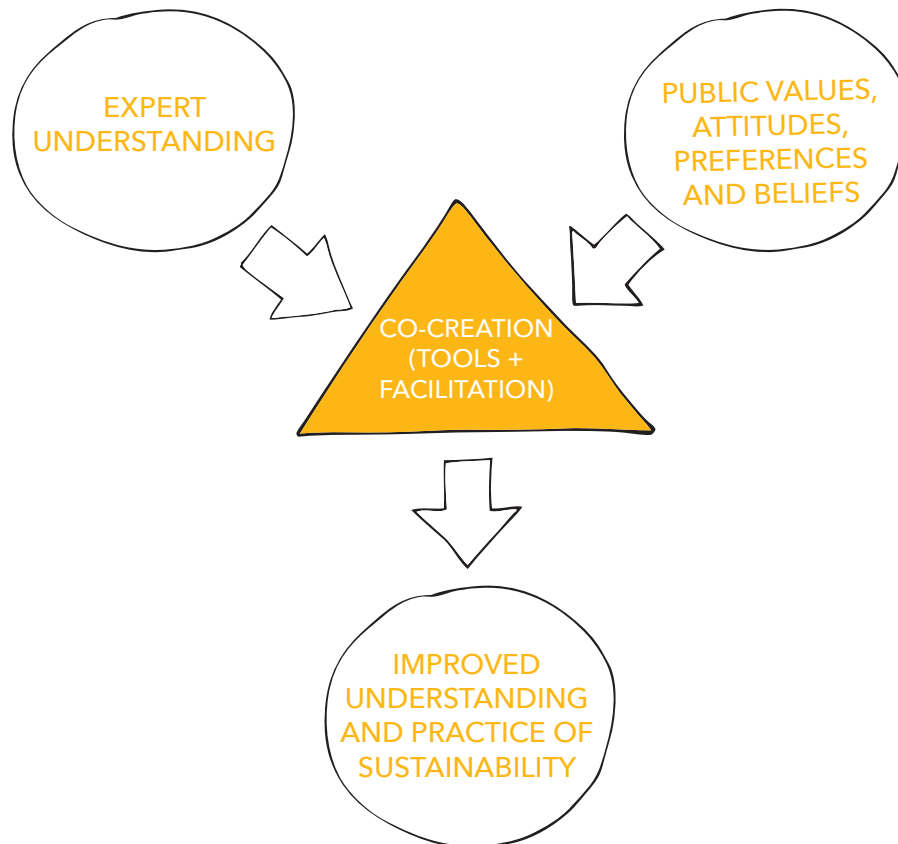
Fig. 6 Combining expert and public knowledge,
in a new form of knowledge (Adaptation of Robinson 2003)

One factor that can disable collaboration, and collective creativity, is *fragmentation* (Conklin 2005, 1), which is a condition where people see themselves as more separate than united, and where information, knowledge, perspectives, understandings and intentions, of the collaborators, are scattered. In practice *fragmentation* is often seen in complex challenges, where the participants often fail to see the systemic nature of the problem and the value of social diversity, and collaboration, in solving it. Instead, the complexity is often seen as disorderly, and participants blame each other for it. The *fragmentation* of a group increases with social complexity, the number of diverse players who are involved in a project. (Ibid) Thus, in complex social transitions such as climate transition, *fragmentation* is one aspect that can limit the possibility to build capacity for systemic change.

To prevent *fragmentation*, co-design activities strive to build empathy for different understandings and perspectives (Soini 2015, 32). *Design empathy* refers to the ability to step into someone else's shoes and understand them through their feelings and ideas, so that the empathic feeling can be applied in the design process (Ibid). The creation of empathy, and an understanding of variety and complexity, creates more patience and compassion in a group, which enables collective creativity and social learning. Thus, with increased empathy and understanding, more capacity is built to deal with change and complexity. This means that, despite social complexity, there is an ability to build shared understandings and negotiate shared meaning. This way, co-design activities can contribute to building *rational capacity* that supports and improves climate transition, by increasing the collective understanding of the problems and the possible solutions

The following section will outline how co-creation in co-design can build social capacity for climate transition, by building ownership and commitment among the participants.

2.3.3.
CO-CREATION FOR
OWNERSHIP AND COMMITMENT

Co-design is based on the idea that all people who touch and are being touched by the 'product' of a design process should play a role in co-creation (Sanders 2001). The product, in this context, could be anything from a physical artefact to a service, an organisation, a social system or a policy. In addition to seeing involvement in the design process as a right of the consumer of the product, co-design is also based on the idea that involvement is crucial for the quality of the final outcome (Ibid).

When the consumer, of a product, is involved in co-creation, the role of the consumer changes from inactive to active. He or she is no longer a passive receiver of products, services and societal systems, but an actor who can influence the outcome of the process. Designing with the general public as 'actors' instead of 'subjects' of a design process can potentially build social capacity for change (Soini 2015), due to the fact that the public are able to influence matters in their lives.

However, the possibility to build social capacity is strongly linked to the role and level of involvement of people in co-creation. In reality not everyone participates and contributes equally in the process. Furthermore, power structures are unavoidably created between the initiator, the designer, the agenda setter, as well as the participants of a co-creation process (Ibid). Depending on these organisational aspects of co-creation, those involved can range from actual co-creators of the process, to more passive participants in the process. This, in turn, will affect the possibilities for such processes to build social capacity among the people taking part, as it influences the possibility to create ownership and commitment to the outcome of the pro-

cess. If the participants are active in the co-creation process, they are likely to take ownership over the produced outcome of it, and thus also to accept it, and commit to it (Ibid). This way, co-creation can potentially build both *emotional* and *operational capacity* that supports systemic change of societal structures and life styles

Due to the abovementioned reasons, the role of the designer, in co-creation aiming at building social capacity, is to organize a process, in which, the participants are empowered to contribute as equally as possible. This way, the designer can be seen as an agent of collaboration, who provides the context and setting for communication between different people. To do this, co-creation often involves the use of different tangible *design materials* (Eriksen 2008, 1). These *design materials* can range from 'raw' and 'metaphorical' materials, such as pen and paper, post-it notes, clay, building blocks and hats, to 'pre-designed' materials, which are more specific and possibly created especially for one workshop (Ibid). Furthermore, different *tools for immersion* can be used to prepare the participants before the co-creation experience (Sanders 2001, 3). Irrespective of which kind, those materials are considered as objects which are explored, combined and added meaning during the co-creation activities, to enhance the collaboration between the stakeholders, by assisting communication and empowering participants to contribute to the process.

Hence, by empowering people to participate in the development process, co-creation can build social capacity that supports and improves climate transition, by building ownership and commitment to the co-created outcome. The following section will outline how collective envisioning processes in co-design can build social capacity for climate transition, by compelling action towards desired futures.

2.3.4.
COLLECTIVE ENVISIONING COMPELLING ACTION TOWARDS DESIRED FUTURES

Exploration of possible and desirable futures is at the core of design thinking (Soini 2015). Such exploration is often conducted through co-creation during the early idea generation or the so-called 'fuzzy front end of a traditional design process. This is also the stage where fundamental decisions are taken regarding what to design and what not to design. (Sanders & Stappers 2008, 7) Co-creation at the early stages of a design process can have an impact with positive, long-term implications (Ibid). Similarly, *idealization*, the first systemic design principle by Jones (2014, 108), highlights the significant potentials with identifying an ideal state, that compels action toward a desirable outcome. Identifying an ideal state, based on ultimate values irrespective of means, is a systemic process, which possesses high organisational accomplishment power. Thus, it is a normative and generative approach aiming at finding pathways for reaching an ideal state. (Ibid) This way, co-creation of visions, namely collective envisioning, can build

rational, *emotional* and *operational capacity* that compels action towards a common goal.

The involvement of the public in envisioning idealized societal scenarios is crucial, as it aims at depicting a desirable common future (Robinson 2003). Hence, without broad representation in the creation of a desired future, it is limited to only including the desires of parts of the society, and thus also limits the possibility to build social capacity for change. A broad range of perspectives and ideas are therefore needed both in the scenarios created, and in the evaluation of them (Ibid), for the scenarios to be representative of, and meaningful for, the society they are aiming at transforming.

Because of the need for broad involvement, envisioning processes are very time and resource consuming. Therefore, in practice collective envisioning processes are often organized through the use of generic methods, such as backcasting (Robinson 2003). Backcasting, is a goal oriented envisioning approach concerned with how desirable futures can be attained (Robinson 2003). It involves working backwards from a defined desirable future end-point to the present, in order to determine the feasibility of, and means necessary for, reaching that future. Backcasts are not intended to reveal what the future will likely be, but instead highlight the implications of current practices, and how they need to change in order for accomplishing the desired future. In such processes, the scenarios and visions created evolve, and are instrumental, as the processes of envisioning are just as important as the ultimate visions themselves (Loorbach 2010). Thus, backcasting is a generative and opportunity seeking method that can be used as a framework and structure for collective envisioning. The use of a framework for co-creation should however be carefully considered to ensure that it enables collective creativity rather than limits it. Furthermore, the structure and frame that backcasting provides should still allow an agenda open enough for the contributors to co-create the outcome.

In backcasting, the future end-point is often chosen for a minimum time of 25 years into the future, to allow futures significantly different from the present to be formed (Loorbach 2010; Robinson 2003). Thus, the possibility to 'dream' about different possible scenarios, detached from current paradigms, values and possibilities, is crucial in backcasting. Similarly, in co-design, dreaming is argued to be important for generating creativity, because it involves *bisociation* at unconscious levels (Sanders, 2001). Dreaming about possible new futures can, however, be difficult for non-creatively trained persons. Jones (2014, 112-113) refers to this, as *fixation*, which he explains, "is a cognitive barrier or bias toward the known, the attachment to a previous idea or course of action".

The barrier of *fixation* is also seen in the way that participation in a design process often is conducted today, where the primarily focus lies on the identification and improvement of negative consequences (Sanders & Stappers 2008), instead of identifying an ideal state of the design. Sanders and Stappers (2008) argue that this perspective is not sufficient when addressing complex and immense challenges, such as climate change. Instead, a combi-

nation of both perspectives is needed. Therefore, collective envisioning is a crucial part of building capacity that improves and supports climate transition, by compelling action towards a desired future. Such active envisioning and generative practices can redirect and reimagine future possibilitie that lead and guide sustainability, and ethical social outcomes (Jones 2014).

2.4.
SUMMARY AND CONCLUSION OF THE LITERATURE REVIEW

This chapter has presented a literature review outlining how and why civic participation through co-design can build social capacity for effective climate transition. The research task in this thesis is to explore the use of collaborative design as a facilitation approach for public and policy interaction in climate transition, with the purpose of building social capacity that supports and improves the process.

Due to the complexity of climate change, climate transition, the structural and behavioural change process of mitigating climate change, requires explorative and opportunity-seeking methods, where a broad range of stakeholders are involved (Conklin 2005). In this process, civic participation is argued an integral part (Wiseman et al. 2009), as it can build social capacity on *rational*, *emotional* and *operational* levels, which support systemic change. Due to these reasons, mechanisms for interaction between policy makers and citizens are increasingly studied.

One potential approach for facilitating such interaction is design thinking. Design thinking is traditionally an opportunity seeking and explorative method that has been argued a suitable approach for dealing with high complexity (Van Kote & White 2011). Furthermore, design can act as a *boundary object* (Jones 2014, 124), by supporting multidisciplinary collaboration and communication. Due to these reasons, design could potentially take on the role of a platform for social innovation, facilitating short-term processes leading to long-term changes in climate transition. The primary task for such a platform should be to generate new ideas, and to build social capacity for taking these ideas further.

For such processes, co-design is specifically argued a suitable facilitator. Co-design is a process approach built on a mind-set based on collaboration, which uses tools and facilitation to enable collective problem solving. By facilitating collective creativity, co-creation and collective envisioning co-design can build *rational*, *emotional* and *operational capacity*. This way, co-design activities can facilitate interaction between diverse stakeholders, and potentially build social capacity that supports and improves the process of climate transition.

However, despite the highlighted potentials with co-design as a facilitation

approach for society and policy interaction in climate transition, the practical implementation of it is a challenge. In practice co-design processes needs to overcome the following hinders for being a successful facilitator of such processes aiming at building *rational*, *emotional* and *operational capacity*:

A.
REQUISITE VARIETY AND BROAD
STAKEHOLDER REPRESENTATION

Requisite variety (Jones 2014, 113) means that for a co-design process to be valid and lead to systemic change, a broad range of stakeholders should be involved, representing all parts of a society or community. Managing this in practice is a challenge.

B.
FRAGMENTATION AND SOCIAL COMPLEXITY

Fragmentation (Conklin 2005, 1) is a condition where people see themselves as more separate than united, and where information, knowledge, perspectives, understandings and intentions, of the collaborators, are scattered. This can disable collaboration in participatory processes. *Fragmentation* increases with social complexity, the numbers of diverse stakeholders participating in a meeting (Conklin 2005, 3).

C.
TIME AND RESOURCES FOR CO-CREATION

Managing time and resources for co-creation is related to managing the commitment of all participants throughout the process. In practice not all participants in a co-creation encounter are equally involved, due to time restrains or other reasons. An unbalance in participation can affect co-creation.

D.
FIXATION IN THE CURRENT REALITY

Fixation (Jones 2014, 112-113) is a cognitive barrier and bias towards the known, which limits people to think beyond the current reality. To deal with the immense complexity that climate transition impose, the focus needs to be shifted from identifying and improving the consequences, towards realizing the ideal state. Managing this shift in mind-set is challenging, and especially regarding non-creatively trained people.

The following chapters of this thesis aims at exploring these barriers, and the possibility for co-design to build social capacity in practice, by studying a process where co-design facilitated interaction between citizens and decision makers, in the carbon neutral future envisioning project FG. The next section will provide the methodological frame for this case study.

3.

CASE STUDY RESEARCH

This chapter outlines the case study research in this thesis, by describing the method, framing and challenges, in it. The research task in this thesis is to explore the use of collaborative design as a facilitation approach for public and policy interaction in climate transition, with the purpose of building social capacity that supports and improves the process. To do this, the thesis studies an example of a co-design process where citizens and politicians collaboratively created a future scenario of a climate neutral city, as well as pathways regarding how to reach the vision. By analysing the co-design activities conducted in this process, and the immediate impacts of them, the study aims at creating an understanding of the potentials of co-design to build social capacity in climate transition.

3.1.
CASE STUDY AS A
RESEARCH METHOD

Case study is used as a research method in this thesis because of its useful application when the research is focused on the space between theory and practice (Breslin & Buchanan 2008). Case studies were first used in law schools, in the beginning of the 1870's, and later expanded into medicine. The method appeared in the design field during the last decade. Breslin & Buchanan (2008, 40) argues that case studies potentially could strengthen the discipline of design by allowing theory to "illuminate principles that designers can use in their practice". This thesis strives towards a deeper understanding of the practical design work conducted in the case, by analysing it retrospectively on the basis of a literature review. This can potentially expose previously unseen connections and values (Breslin & Buchanan 2008), and contribute to the development of the design field. Yin (2009) explains three situations when case studies, generally, are the preferred method to use. First of all case studies are useful when "how" or "why" questions are being posed in the research, secondly when the investigator has little control over the events, and thirdly when the research focuses on a contemporary phenomenon within a real-life context (Yin 2009). As all of these three criteria are applicable to this thesis, the method was chosen for this research.

3.2.
FRAMING OF THE CASE STUDY

The case in this research is an example of the process of conducting citizen and policy interaction in climate transition, and the examination of the facilitative role of collaborative design in it. This process was conducted in the FG project during September to December 2014, in the city of Gothenburg, Sweden. The primarily aim of the study is to examine the impact of collaborative design, by investigating if and how social capacity was built, through the co-design activities in the FG project. To investigate the impact of the co-design activities, the study focuses on the influence the FG project had on its participants. As the scope of this thesis limits any long-term investigations, the study focuses on the immediate impact of the co-design activities in the FG project.

The framing of this research has been strongly influenced by my supervisor Katja Soini's Doctoral Dissertation "Facilitating Change" (Soini 2015). It is influenced by her research in the sense that both our theses are based on retrospective reflection on co-design projects we, as design researchers, have been part of. Furthermore, the aim of both our theses has been to conduct this reflection based on the experience of the people who participated

RATIONAL CAPACITY
Knowledge

EMOTIONAL CAPACITY
Feelings /
Importance

**OPERATONAL
CAPACITY**
Action

Fig. 7 Study criteria

in the projects (Ibid). However, despite the similarities of our theses, they do differ in the time frame used for the impact study. The thesis by Katja Soini (2015) reflects extensive research over a long period of time, including studies on actual systemic change, while my thesis focuses on a shorter time frame, and the immediate impact of the work.

The impact study in this thesis is based on three criteria for capacity building, which were outlined in the literature review, as well as, in the objectives of the FG project, namely *rational, emotional* and *operational capacity* (Fig. 7). The research question for the study is: *(How and Why) Can civic participation through co-design support climate transition, by building social capacity, on a rational, emotional and operational level?*

3.2.1.
RESEARCH MATERIAL FROM BEFORE, DURING AND AFTER THE FG PROJECT

Based on the interest in evaluating the impact of the collaborative design practices in the FG project, research material from before, during and after the project, has been gathered, covering a time span of 8 months. Altogether, the material includes 26 participant interviews and 29 workshop documents. In total 81 % (29/36) of all the people involved in the project has contributed to the material included in this research, through the workshop documents and the interview material, which secures extensive representation in the analysis.

The material from the process of the FG project, include documents and my personal experience in the practical project work, as design researcher and project manager. Hereafter, the workshop documents will be referred to as W (workshop document) plus an identification number (W01-W29). The majority of the workshop material is originally in Swedish. Therefore, I have translated the quoted material in this thesis.

The interview material is a collection of viewpoints from the 26 interviews conducted for this thesis. In total 84 % (26 out of 31) of the invited participants in the FG project responded to the interviews. 15 of the interview respondents represented the young participant group and, 11 the political participant group. Thus, both participant groups were represented with over 80 % (83 % of the young participants and 85 % of the political participants). Hereafter, the interviews are either referred to as Y (young adult), or P (politician) plus an identification number (Y01-Y15; P01-P11). The interview data is presented anonymously in this thesis. This decision was taken to ensure openness and honesty in the responses.

All the interviews were conducted between the 10th of March and the 4th of April 2015. An online questionnaire was created through Google form, and sent to the participants by email. The participants could then choose if they preferred to respond to the questions in written format, or in a telephone

interview. The interview format was standardized with scheduled questions. This is because it was important to collect comparable data from all participants. The amount of interview questions varied from 18-23 questions, depending on the amount of workshops the respondent had participated in. Furthermore, the questions were organized in a way that would help the participants remember the events step by step, and finally relate it to their thoughts after the workshop project. Finally, the interview questions were formulated in a way that did not suggest a plausible or socially more acceptable answer, with the aim to minimize the risk of bias in the answers. (Gorden 1980) (Appendix 1)

3.2.2.
MULTI-METHOD ANALYSIS

To analyse the collected data a qualitative analysis was conducted in three stages. In the first stage a material based analysis was conducted, in the second stage a comprehensive analysis was done on the interview responses, and in the third stage a category analysis was done on the interview responses. These methods were chosen because they provided the opportunity to study the event from different viewpoints and, thus, step by step deepen the understanding of its impact. Furthermore, it allowed at least two corroborations of the findings, which reduced the risks of biased conclusions.

In analysis stage 1 a material based study was conducted on a collection of the workshop documents (W02-W03; W06; W14-W15; W20-W26). The aim of the first research stage was to find indications of the condition before and after the workshop project, to be able to outline some clues regarding the impact of the FG project. To find indications regarding the impact of the workshop project, material was analysed both regarding the participants' experiences before and after, as well as the facilitators' plans before and evaluative reflections after, the workshops. The findings from analysis stage 1 formed the basis for conducting the interviews described in the previous section, which were then studied in analysis stage 2 and 3.

In analysis stage 2 a comprehensive analysis (Holme & Solvang 1991, 119-120) was conducted on the responses from the interviews with the participants (Y01-Y15; P01-P11). The aim with the comprehensive analysis was to understand the value of the event as a whole, and start seeing tendencies and trends among the interview data. The analysis was conducted by reading through the data anonymously, question per question, to prevent bias.

In the analysis stage 3 a categorisation analysis (Holme & Solvang 1991, 119-120) was conducted on the basis of the findings from the previous two analysis stages. The aim with the categorisation analysis was to deepen the analysis by focusing on parts of the whole material. Furthermore, the aim was to compare different parts to be able to find patterns between the detected tendencies. To do this, the findings from the two previous analysis

stages were brought into this analysis, and used as the basis for forming comparable categories, based on the three studied capacity criteria; *rational, emotional* and *operational*. These categories were then used to discuss how the workshop project FG had influenced the participants, as well as, how and why they possibly were influenced differently. Furthermore, the findings from these comparisons were discussed in relation to the participants' expectations before the workshop project and their overall experience in the workshops, to understand how the impact correlates with the facilitation methods and tools used in the project.

3.3.
CHALLENGES OF OBJECTIVITY

In this case study research, one of the major challenges was the fact that I have had two different roles in the FG project. The first of my roles was to design a successful collaborative design process, and the second was to investigate whether or not the success was reached. Evidently, this set up posed major challenges to the ability to conduct an objective investigation. First of all there was a built in bias in my personal understanding of the case, as I had chosen it for this thesis, based on the fact that I believed it was successful. Secondly, the interviewed participants knew me from the event, which might have influenced them to provide information that they thought was favourable for me, instead of their true opinion.

Another challenge in the research, was the fact that the decision to use this co-design process as a case was taken after the project was finished, which meant that no study was conducted on the participants' capacity for climate transition prior to the FG project. Instead, all interviews were made after the project, increasing the risk of biased data, as it was based on the participants' own perception of how their capacity for climate transition had been influenced by the FG project. This set up posed a risk of social pressure and bias towards the more socially accepted answers in the study (Gorden 1980), as well as, a risk that the participants had forgotten essential information, as the study was conducted five months after the project began (Ibid). However, although this set up was challenging, it also provided a big advantage, as all the workshop documents were produced without the knowledge that they would be studied afterwards. This ensured that the data was authentic and genuine, and thus increased the objectivity of the study. The objectivity of the study increased further in the analysis of the data, as it was conducted in three phases to allow at least two corroborations of the findings.

By being aware of, and to the largest possible extent preventing, the study's built in bias I aimed at providing objective findings regarding the impact of the co-design activities conducted in the FG project. These activities and findings are presented in the next chapter.

4.

THE COLLABORATIVE DESIGN PROJECT "FRAMTIDA GÖTEBORG" (FG)

This chapter outlines the case study process of facilitating citizen and policy interaction around urban climate visions and pathways, as it was conducted in the collaborative design project "Framtida Göteborg" (Future Gothenburg, FG) September to December 2014 in the city of Gothenburg, Sweden. The FG project was inspired by "The Climate Programme for Gothenburg", which has the overall objective "to reach a fair and sustainable level of greenhouse gas emissions by the year 2050" (Miljöförvaltningen Göteborgs Stad 2014, 23).

With the aim to generate engagement around this target, the FG project set out to organize an interactive process between citizens and decision makers in Gothenburg. In this process, two workshops were conducted where young adults developed visions for a sustainable and carbon neutral Gothenburg in 2050, and together with politicians created pathways regarding how to reach the visions. Co-design was used to facilitate this collective envisioning process, which aimed at building social capacity for climate transition, among the participants.

A study of the immediate impact of the co-design activities undertaken in the FG project shows that all three capacity aspects (*rational*, *emotional* and *operational*) have increased quite substantially. This suggests that the co-design activities undertaken in the FG project were successful in facilitating interaction between policy makers and citizens, and building social capacity for climate transition.

4.1.
SETTING THE SCENE
OF THE FG PROJECT

This section outlines the context and background of the FG project, which was conducted in Gothenburg, Sweden's second largest city. Gothenburg has high ambitions to become a leading city in tackling climate problems, and has therefore adopted a climate programme, which aims towards climate neutrality by the year 2050. To reach this goal, the city is emphasizing the importance of broad involvement and collaboration. (Miljöförvaltningen Göteborgs Stad 2014) In response to this, an educational foundation working with sustainability matters, decided to conduct workshops for young adults and politicians, regarding the targets of The Climate Programme. The aim of the workshops was to create engagement, and inspire both the young adults and the politicians to participate in the work towards climate neutrality. This section first presents climate transition in Gothenburg, followed by the background and set up of the FG project.

4.1.1.
CLIMATE TRANSITION IN GOTHENBURG

Gothenburg, is situated on the west coast of Sweden, and is the country's second largest city with a population of approximately 550,000 inhabitants, living on 448 square kilometres. Historically, the city has been characterized by a strong industrial heritage, being the home of big industries such as Volvo and SKF, as well as Scandinavia's largest harbour. Since the mid 20th century the tourism of the city has increased substantially, and transformed the city into an event city, making the service sector the fastest growing employment basis of the city (https://sv.wikipedia.org/wiki/G%C3%B6teborg, 2015-06-04). Today, the city is characterized by a strong social and geographical segregation, which poses major challenges for the extensive social and environmental transition the city is aiming for, regarding for example climate change mitigation.

Gothenburg's ambition is to be one of the world's most progressive cities in tackling climate problems. The City of Gothenburg wants to be a forerunner and show that it is possible to live well without contributing to negative climate impact. To do this, the city recently accepted a climate programme, which concerns the long-term climate work of Gothenburg, including the municipal organisation as well as the commercial and industrial sector and all the people living in Gothenburg. (Miljöförvaltningen Göteborgs Stad 2014)

The aim with The Climate Programme is to coordinate the climate work, in the five areas: education, city planning, energy, transportation and con-

sumption, in a way where individual activities support each other rather than compete.

The overall objective of The Climate Programme is "to reach a fair and sustainable level of greenhouse gas emissions by the year 2050" (Miljöförvaltningen Göteborgs Stad 2014, 23). This objective covers GHG emissions that originate within Gothenburg's geographical area. In addition, the programme includes the total impact of the city's consumption, whether the effect is local or global. This means that not only the local GHG emissions are taken into consideration, but also the ones that Gothenburg's consumption causes outside of its geographical boundaries. (Larsson & Bolin 2014)

The sustainable level of GHG emissions, is currently interpreted as 1,9 tonnes of carbon dioxide equivalents per inhabitant per year. At present, the average citizen in Gothenburg emits approximately 7,4 tonnes of carbon dioxide equivalents per year. (Larsson & Bolin 2014) Hence, a reduction of almost 75 % of todays GHG emissions is needed, for the estimated sustainable levels of GHG emissions to be reached, in Gothenburg. For this extensive climate transition to be successful, The Climate Programme emphasizes the significance of broad collaboration and action, as well as the importance of involving citizens, in carbon reduction planning and execution.

Citizen participation in the planning and execution of The Climate Programme has a two-fold argument. First of all, many targets formulated in The Climate Programme, will despite technical improvements and strong regulatory instruments, also demand changes in the behavioural patterns of the citizens (Larsson & Bolin 2014, 19; Miljöförvaltningen Göteborgs Stad 2014, 27). Thus, a combination of top-down and bottom-up actions will be needed, in order for the targets to be reached. Secondly, three of the 24 strategies listed in The Climate Programme directly aim at educating the public, spreading knowledge and decisiveness, and create climate smart citizens (Ibid). Different strategies and mechanisms for how to educate, involve, engage the citizens of Gothenburg therefore need to be developed in order for the targets, in The Climate Programme, to be reached.

In this context, the FG project set out, in September to December 2014, with the aim to organize informal network processes between society and policy level in Gothenburg, to build social capacity for climate transition in Gothenburg.

4.1.2.
THE BACKGROUND OF THE FG PROJECT

The FG project was initiated and conducted by a non-profit foundation called Ekocentrum, which is a politically neutral venue and educator within the sustainability field. Ekocentrum has existed in Gothenburg since 1993, and has a long history in creating engagement, knowledge and networks for environmental causes, such as climate change. Their main undertaking is

to provide and host courses, seminars lectures and workshops, related to sustainability, for industry, government and civil society. (W27)

The FG project was created in an attempt to spread knowledge and engagement, regarding the targets in Gothenburg's Climate Programme. To do this, Ekocentrum decided to conduct visionary citizen dialogues around the overall objective that "Gothenburg has reached a fair and sustainable level of greenhouse gas emissions by the year 2050" (Miljöförvaltningen Göteborgs Stad 2014; W27, 4). The foundation wanted to promote dialogue and participation in carbon reduction by facilitating interaction between young citizens and politicians, two groups, which they felt were underrepresented at the centre. It was the first time that Ekocentrum conducted such an extensive workshop project.

The main objective, with the FG project, was to inspire young adults and politicians to engage and collaborate in matters related to climate mitigation and sustainable development. To meet this objective, the purpose of the FG project was to provide the policy makers with knowledge and a better understanding of how to form a sustainable and carbon neutral city, by learning about the young citizens future visions, and co-create pathways to reach it, in collaboration with them. Furthermore, the purpose of the FG project was to empower the young citizens to make their voices heard and have an opportunity to influence the decision makers in their city (W01).

To conduct the FG project, Ekocentrum applied for funding, from two endowment funds. Unfortunately Ekocentrum only received funding from one of the funds. This forced the foundation to compress the project from the initial plan of five workshops, down to two. (W02) Two workshops were therefore planned, in the name "Framtida Göteborg" (Future Gothenburg, FG); one full day workshop with 20 young adults envisioning the sustainable Gothenburg in 2050, and one evening with the same young adults and decision makers, working in a backcasting exercise to define pathways and actions leading towards the visions (Ibid). To facilitate these workshops, co-creation and co-design methods where used. The workshops were focused around five central challenges derived from The Climate Programme: climate neutral city, sustainable transportation, sustainable resource use, biodiversity, and social sustainability (Miljöförvaltningen Göteborgs Stad 2014).

I came into the project when the pre-planning and application was finished. I was assigned executive project leader for the project, and was planning the project together with the executive leader and two educators at Ekocentrum. Together with one of the educators, I also did most of the facilitation of the actual events. The next section will introduce the co-design activities undertaken in the FG project.

4.2.
CO-DESIGN IN
THE FG PROJECT

This section presents the co-design activities undertaken in the case study process, as it was conducted in the FG project, September to December 2014, in Gothenburg, Sweden. In this process, co-design methods were used to facilitate communication and collaboration between citizens and politicians to create visions and pathways related to the city's climate programme. The co-design process is described in detail, including the intention and actual execution of all co-design activities undertaken. The section is divided in four sub sections outlining the activities undertaken in the recruiting stage, the co-design workshop with the young adults, the co-design workshop with young adults and politicians, as well as the immediate outcomes of the process.

4.2.1.
RECRUITING YOUNG ADULTS
AND POLITICIANS

The first step in setting up the workshops was to recruit the participants. The main aim of the recruitment was to create a group with *requisite variety* (Jones 2014, 113), which means a group with diverse perspectives, interests and experiences. Thus, the aim was to invite a variety of young adults from the whole city, as well as diverse decision makers from all political parties (W27).

A total of 20 young participants were set as a goal to be able to facilitate discussion in one large group, as well as in smaller groups. The selection process was based on three criteria. First, the main aim was to recruit two young participants from each of the city's 10 districts in the age of 16 to 25. Furthermore, diversity would be the second selection criterion, striving towards the largest variety possible regarding gender, age, ethnicity, and background (W01). Third, due to the fact that the amount of workshops had decreased substantially, we had decided to favour the young adults who were already active within some area of sustainability. The decision to bias the recruiting process was taken, because we believed that young adults with previous knowledge in sustainability would need less time to start generating ideas and visions. This way, despite the fact that the time for generating ideas and visions had decreased with 60 % (W02), it was probably going to be possible. No reward was provided to the participants except the possibility to participate in a unique meeting, and free beverage and food during the events.

For the recruitment of the young adults an information sheet and a small poster were designed to communicate the project. The aim was to create something visual that could easily be spread through e-mail, social media, be nailed to pin-boards in the city, and given directly to interested young adults. The information material explained the purpose of the workshop project, practical information such as the time and place, that food was included, as well as how to apply to the project (W04; W05). The project group had decided that the interested young adults would be asked to write a few sentences about themselves and why they wanted to participate in the workshop project (W02). This would inform the project group on the participants, and their expectations on the project. In addition this would be useful when planning the details in the workshop, such as dividing work groups.

The recruitment of the young adults started by contacting city officials working in Gothenburg's 10 district boards. They were asked to spread information about the event locally, and provide contacts to local places where young adults engaged in matters related to sustainability, potentially could be found. This, combined with contacting various schools, visiting youth centres, and talking to private and professional contacts, spread the information about the workshops to interested young adults. Furthermore information was spread through Ekocentrums' online network on Facebook, as well as through private and professional contacts on social media (W27). During the process 27 young adults showed interest in the project and applied either verbally, through the recommendation of someone, or by directly sending an application to Ekocentrum (W06). Of those, 20 young adults were selected to form a group with diverse levels of knowledge and interest in sustainability, as well as a balance in age, gender and ethnicity. The majority had a previous interest in sustainability (approximately 12/20), but some were very new to the subject (approximately 8/20). The young adults represented nine out of 10 city districts. (W07)

An email was sent to welcome the selected participants to the workshop project. The email contained information about the purpose of the workshop, practical information such as dates and time, as well as contact information to the organisers. Furthermore, the email also contained a link to a Facebook group that was created for the project. The idea with the Facebook group was to create an informal forum were the young adults would start getting to know each other and create trust. The Facebook group also worked as a *tool for immersion* (Sanders 2001, 3), by introducing the participants to the subjects that would be dealt with in the workshop project. Furthermore, the creation of an online forum could enable the participants to stay in contact in between and after the two workshops, and thus enable collaboration outside of the actual workshop events. The majority (approximately 14) of the young adults signed up to be a part of the Facebook group before the first workshop (W27). Information about other relevant events and things to read were shared in the group, by us facilitators, before the first workshop started. The Facebook group was also a convenient way for us to send reminders, and practical information about the workshop to the young adults, before and during the project.

Regarding the decision makers the idea was to invite all 10 political parties with current mandate in Gothenburg's city council (W01). The amount of people participating from each party was left open for the party's chancellery to decide as it was considered positive if the parties wanted to send more than one participant. The risk of having too many politicians participating from the parties was considered low. The recruitment of the politicians was initiated by contacting each of the 10 parties' receptions by email. A few days later the email was followed up by a phone call to the receptions. All parties showed an interest in the workshop, and some parties were quick in responding that they would send several participants. This was of course positive for the workshop project. However, it also stressed the need to make sure that a wide range of parties would participate to ensure the diversity of the group. Finally, 13 politicians from nine out of 10 parties were recruited for the second workshop (W22). Out of these, one party sent three participants, two parties sent two participants, and the rest of the participants each came from one party.

The politicians who wanted to participate received a welcoming email, introducing the purpose of the workshop, as well as the practical information and schedule of the workshop. In the email the politicians were also asked to be 'politically anonymous' when participating in the project, which required no pins or symbols belonging to the party, and no one informing anyone which party they represent. This was to avoid debate about different political viewpoints in the workshop, and instead focus on the shared values and visions, for *empathy* (Soini 2015, 32) to be built among the politicians and the young adults (W20).

4.2.2.
CO-DESIGNING FUTURE VISIONS WITH YOUNG ADULTS

The first co-design workshop was held, over the course of one day (9 AM until 4 PM), at Ekocentrum's facilities in central Gothenburg. 18 of the invited young adults attended the workshop (W27). Myself and one other facilitator from Ekocentrum lead the workshop. The co-design activities with the young adults are described in the four sections: (A) setting the tone, (B) co-designing future visions, (C) reviewing the outcomes and (D) planning the presentation.

A.
SETTING THE TONE - BUILDING TRUST, POSITIVE ATTITUDES AND A COMMON FACTUAL GROUND

The beginning of the workshop was planned in detail to enable an open, welcoming and fun atmosphere from the start (W03). To assist us we used the facilities at Ekocentrum, which are designed especially for meetings with larger groups. We welcomed the participants at the entrance, and lead them

to the workshop venue through an area of Ekocentrum's exhibition space that shows the earth's ecological system in an intriguing, and dramatic, way. Outside the workshop venue the participants' could pick up their name-plate, and enter the room were the main part of the workshop was held. The room was arranged with four 'working islands' with a table and five chairs around it. All the tables were arranged in such a way that the participants would be able to see a screen projected on the wall. When entering, the participants could choose where to sit down. Intriguing music was playing in the room and the same image that had been used in the information and invitation material was shown on the screen. This was to create a sense of familiarity, but at the same time maintain the excitement created from the entrance through the exhibition.

The workshop started with a short presentation where we introduced Ekocentrum, the purpose of the project "Framtida Göteborg" and practi-cal information regarding logistics, dates and rights of use of the material produced (W09). We told the participants that the aim of the project was to create visionary ideas for the future of Gothenburg, related to central sustainability challenges, and that this was a unique opportunity to influ-ence the decision makers of the city.

After the presentation an introduction exercise followed to activate the group (W03). Collectively we placed ourselves in the room, based on where in the city we lived. One by one we introduced ourselves based on the fol-lowing questions: "What is your name? Which district do you live in? What do you think about your area? What do you expect from these workshops?" The aim with the exercise was to create trust in the group and enable the participants to introduce themselves and start sharing their thoughts, with-out focusing on their different ages or levels of knowledge. This was to pre-vent *fragmentation* to be created in the group (Conklin 2005, 1). We wrote down the expectations of the young adults on a flip chart board (W15).

After the introduction exercise we held a presentation, which provided the participants with a common factual ground on sustainable development (W09). The aim of the presentation was to strengthen the unity of the group, by providing them with the same starting point.

B.
CO-DESIGNING FUTURE VISIONS
"HOW IS THE SUSTAINABLE CITY OF GOTHENBURG IN 2050?"

After the presentation, two warm up exercises were conducted to activate the participants and start the visionary thinking (W03). First, a physical warm up exercise was held, where a short video with simple dance move-ments, led us and the participants to move together to music. After this, the participants were asked to sit down again and participate in an exercise that would warm up their brains for visionary thinking. To do this, the par-ticipants were asked to set their minds on thinking about Gothenburg in 2050. Questions like "How old are you the year 2050? How do you live there and then? What characterizes Gothenburg in 2050? What do others say

about Gothenburg in 2050? What makes Gothenburg so nice in 2050?" were displayed on the screen together with intriguing images. Then, they were asked to think about these questions and to imagine how the city is, smells, sounds, works, feels, tastes, and so on (W09). After this introduction the exercise started, and some time was given for the participants to individually dream and write down their thoughts. Music was playing, accompanied by optimistic images, and the participants were encouraged to close their eyes. This was to enable emotions to flow and a dreamlike setting to be created, to enhance *bisociation* and creativity (Sanders 2001). After some minutes the participants were asked to share their thoughts with their neighbour at the table, and finally the whole group went through their ideas together. We wrote all the dreams on a flip chart board (W12).

Fig. 8 Warm up exercise

The main part of the envisioning workshop was dedicated to a rotation exercise with four stations where the participants were to discuss, envision and create ideas for Gothenburg in 2050 (W03). The participants were told that they should try to imagine that they are in Gothenburg in 2050, and that the city has reached a fair and sustainable level of greenhouse gas emissions. The task was to generate ideas about the sustainable Gothenburg in 2050 in three thematic workstations: the city environment 2050, the citizens 2050 and the consumption 2050. In addition, there was one inspirational station where we would guide the participants through the exhibition, and give some examples of current innovations, related to the topics discussed in the workstations. The idea was to inspire the participants to think big, by show-

ing good things that were already happening back in the year 2014. The participants had been divided in four groups, each with four or five young adults with different interests and level of knowledge in sustainability, as well as different ages (W08). The group division was based on the application that the participants had submitted before the workshop (W06).

The groups rotated between the four stations so that all of the participants worked with all three themes, and took part in the inspirational exhibition walk. Each of the three thematic workstations was organised into four sub themes, so that every time a new group arrived they would focus the discussion and ideation on a new part of the main theme (W02). This was to ensure that the groups would build on each other's work and amplify the vision, instead of repeating what the previous group had done. The following descriptions explained the themes and the sub themes:

THE CITY ENVIRONMENT 2050:
Housing
Transporting Humans and Goods
Energy
City Scape

THE CITIZENS 2050:
The Gothenburgers
Values
Well being
Occupation

THE CONSUMPTION 2050:
Food
Other Things Than Food
After the Consumption
Consumption Values

Pre designed working material (Eriksen 2008), in the form of a dialogue poster, was prepared for each sub theme, to guide the group discussion (W10). When the groups rotated to the thematic workstations they would encounter the posters that the previous groups had worked on, as well as a new poster that would guide their work. This way, they could get inspiration from what the other groups had produced before them, in that theme. The working posters contained a set of open questions to inspire the participants to start envisioning, and spark creativity. To give an example, some of the questions in the sub theme 'Transportation of Humans and Goods' were "Where do we move? How do we move – rolling, flying, floating, sailing, alone, together? What kind of fuels drive the transportation – air, sweat, forest, animals, height differences? How does it feel, sound, look?" (W10) The participants were asked to fill the posters, with as many post-it notes with ideas as they could, and that no idea was worthless or incorrect. Myself, and the other facilitator, rotated between the three workstations to monitor the work of the groups. Our task was to listen to the discussions in the groups, encourage them, and ask open questions if we noticed that the groups were

Fig. 9 & 10 Dialogue poster & collective envisioning excercise

struggling. Furthermore, we reminded the groups to write down the things they were talking about, to be sure that all the ideas were documented. During the last ten minutes, before it was time to change station, the groups were asked to go through all the ideas and mark the ideas that they thought were the most important to present to the politicians. The groups were told that all the participants' favourite ideas should be marked. Furthermore, the participants were reminded to do the last exercise on the poster, which contained some questions regarding how their ideas and visions could be realized. Questions, such as, "How did it turn out so well? What activated the change – movements, trends, political decisions?" were asked to make the participants think about how their ideas could be realized (W10). This exercise was used as a *tool for immersion* (Sanders 2001, 3) to set the young adult's mind-sets for the second workshop with the politicians, where these questions would be explored further.

Fig 11. Presentation round

C.
REVIEWING OUTCOMES, PLANNING PRESENTATION, AND ROUNDING UP THE DAY

To create an overview of all the ideas and visions created, a presentation round was arranged (W03). The idea was that everyone would hear all the ideas discussed in the groups during the rotational workshop. To do this, the room was arranged so that everyone was sitting in a large half circle, with the dialogue canvases hanging on the walls. The presentation was ar-

ranged in thematic order, with the four sub themes under each of the three themes presented in a row. One person from each group stood up voluntarily and explained what the group had made in that sub theme. When it was time to present a new theme, we suggested that four new persons from the groups would present their groups work in that sub theme. This way all the participants were given the opportunity to present something, but at the same time no one was forced if they did not want to. When all the ideas had been presented, a holistic picture had been created of the participants' collective thoughts and future visions. We asked the participants to thank themselves, and each other, with a big round of applause.

The final step of the workshop was to discuss how to present the ideas and visions, about Gothenburg in 2050, to the politicians in the upcoming workshop (W03). We wanted to let the young adults decide for themselves how much, and if, they wanted to be part of planning the second workshop, by producing presentation material and ideas for the workshop exercises. To inspire the young adults to start thinking about how to best convey their ideas to the politicians, we started to ask open question such as "How would you like to present this material to the politicians? How could you inspire and influence them? What is the best way for this material to be spread?" (W09). Then, we explained the predefined settings of the workshop with the politicians, and gave some ideas and inspiration on how the young adults could present the material. Furthermore, we also explained that all the material they had produced in this workshop would be summarized, and used as the basis for the second workshop, no matter if and what they chose to develop into a presentation.

Many ideas arose in regards to ways of presenting the material, and smaller groups started to form around different presentation concepts. For example, one tangible idea was to create a provoking film about a utopian and dystopian scenario of Gothenburg in 2050 (W13). Several young adults were intrigued by this idea, and started to plan how to execute it. We helped the planning by asking questions about the format, length, equipment needed, and took notes of what the young adults suggested on a flip chart board. Other less tangible ideas came up, that would need more time and work to be realized. This was anticipated, therefore a suggestion was made to the young adults, who were interested in developing these ideas further, that they could meet at Ekocenturm at a few given dates, together with us, and develop the ideas for the next workshop. We suggested to continue the discussion and contact online, either in the Facebook group or by email, and encouraged everyone to become members of the Facebook group.

To end the first workshop a final round of applause was made, to thank everyone for the hard work. The participants were asked to give feedback about the day on a poster hanging outside the workshop space, when they left the room (W14). We also told them that if they had any questions, feedback or other suggestions, they could come talk to us directly, or write an email or message on Facebook. Finally the participants were reminded about the practical information, such as, the upcoming dates and contact information to us the facilitators (W09).

D.
CO-DESIGNING MATERIAL FOR THE SECOND WORKSHOP

After the first workshop, we digitized all the ideas from the first workshop. Following this we sent the summary of all their visions and ideas to all the young participants (W11). The aim was to plan the second workshop in a transparent manner and make it easy for the young adults, who were interested, to participate in the planning. Furthermore, for those who wanted to participate, three planning evenings had been made available (W02). Two young adults showed up in one of these open events, and participated in the planning of the second workshop, with us. However, due to their busy schedules many of the young adults expressed that they did not have the time to meet and work on the presentation, but that if there was any specific task they could help out with, they were willing to do that. Therefore, we decided to suggest an assignment that everyone could do, individually, when they had time. This was to ensure that everyone could contribute, and make their opinion heard, in the presentation to the politicians.

The assignment was to go through the summary of the vision created in the first workshop, and pick out one or two things that they wanted to highlight, as their *matter of the heart*. The young adults were then asked to write two sentences about the *matter of the heart*, and illustrate it with an image (W17). They were asked to describe their *matter of the heart* in such a way that it would inspire the listener to imagine how attractive the sustainable city Gothenburg in 2050 is, in their eyes. This was to motivate the young adults to present their desires and dreams for the future, instead of their concerns or doubts.
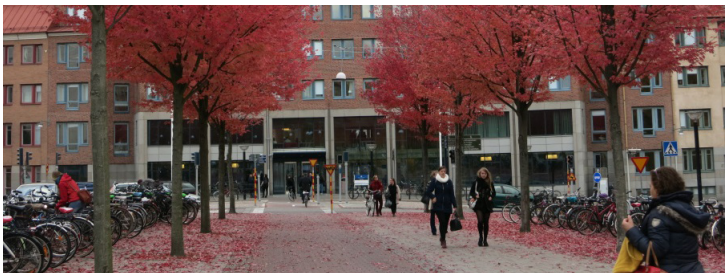
"I exist, live and breathe in Gothenburg where everything around us is part of one big cycle. Food waste is composted and becomes new fertile soil, old clothes are redesigned and given new life, someone's trash becomes another's treasure. The word "waste" is a thing of the past. Nothing, of what Mother Nature has created or what we have refined, is worth being called garbage. The proper name is resources."

Example of a matter of the heart (Y01)

"All the streets I walk on in 2050 feel like my street, because Gothenburg is mine and everyone else's city. Here it is green and you only hear birds, bikes and a bit of tram squeaking, the cars are not left. "

4.2.3.
CO-DESIGNING PATHWAYS AND ACTIONS WITH YOUNG CITIZENS AND POLITICIANS

The second workshop was held at Ekocentrum's facilities in central Gothenburg, Sweden during one evening (5 PM until 8 PM) (W20). 13 politicians and seven of the young adults attended the workshop. Unfortunately, the majority of the young adults had notified that they could not attend due to illness, schoolwork, a sports event or some other reason. Myself and one other facilitator from Ekocentrum lead the workshop, and the executive leader was present to welcome the participants and observe the process. In addition, an external researcher attended the workshop to observe the process (W20). In this section the co-design activities in the second workshop are described in three parts: (A) setting the tone, (B) collaborative backcasting, (C) and reviewing the outcomes.

A.
SETTING THE TONE – BUILDING TRUST, POSITIVE ATTITUDES AND A FEELING OF COMMONALITY

The start of the second workshop was carefully planned to set a good tone, and build trust between the politicians, the young adults and the facilitators (W20). The participants were welcomed in the door by us facilitators and the CEO and guided, through the exhibition, into the same workshop venue as the one used in the first workshop. On the way into the workshop venue, the participants were asked to pick up a nametag. The workshop room was arranged with chairs placed in a half circle with two rows of chairs, and the participants themselves could choose where to sit. Relaxing music was playing in the room, and the image that had been used to communicate the project during the recruiting process was projected on the wall. The dia-

logue posters from the first workshop were hanging on the walls around the participants. The aim of this was to create a sense of familiarity for the young adults, and build curiosity among the politicians (W20).

The workshop started with a short welcoming and introduction about the project by Ekocentrum's executive leader, then we (the facilitators) were introduced and explained the process of the workshop project, as well as practical matters such as the schedule of the evening (W28). The participants were told that the purpose of the evening was to imagine that they were in the year 2050, and that Gothenburg had reached a fair and sustainable level of GHG emissions. The aim was to look back and see what had happened between 2014 and 2050. Thus, we asked them to imagine that the vision created by the young adults had come true, and told them that their task was to collaboratively find out how it had been realized. Furthermore, all participants were reminded to keep their political opinions secret during the whole workshop, to enable an open and collaborative dialogue, rather than an ideological debate.

After the introduction, a warm up exercise was conducted, with the aim to create a sense of commonality between the participants by collaborating and sharing ideas (W20). Again, this was initiated to prevent *fragmentation* in the group (Conklin 2005, 1). To do this, we asked everyone to create a standing circle, facing each other. The task was to throw around a ball of yarn in the group. The person holding the yarn said their name and gave two examples of sustainable things they were doing now. The participants were asked to formulate it in such a way so that what they said related to what sustainable things they did back in 2014. The idea was that this would help them to start thinking that they were in the year 2050, and were looking back at 2014. When one participant had introduced him or herself, the person was asked to hold on to the thread, and throw the yarn to another

Fig. 12 Introduction and warm up excercise

Fig. 13 Dinner

participant. When the whole group had introduced themselves, a visible network had been created between everyone. Finally, we concluded the exercise with a few words, about the importance of networks and sharing in a sustainable society.

After the introduction exercise, the participants were asked to move to another space at Ekocentrum, where they would be served dinner, and continue the discussion about Gothenburg in 2050 (W21). Each participant had been given a symbol on their nametag, which guided them to a table where they would sit during the dinner (W23). This was to make sure that the young adults and politicians were mixed, and started to talk to each other. During the dinner the participants were given the task to talk about Gothenburg in 2050, by telling each other two truths and one lie about how the city is (W21). The aim of this exercise was to help the participants start imagining the future, and dare to think and formulate wild ideas that seem unthinkable, thus, trying to avoid *fixation* (Jones 2014, 112-113).

B.
COLLABORATIVE BACKCASTING
"HOW DID WE REACH A SUSTAINABLE GOTHENBURG IN 2050?"

The main part of the second workshop was dedicated to a backcasting exercise with the young adults vision of Gothenburg in 2050 (W20). The participants were told that the aim was to define important incidents, actions, decisions, trends, and so on, in reaching the vision of a sustainable Gothenburg in 2050. To start, a presentation of the young adults *matters of the heart* was held (W17). Two of the young participants had voluntarily signed up to present the images, and texts, that had been collected from the majority of the participants in the first workshop. One group had made

a video with a scenario of a dystopia and a utopia of Gothenburg in 2050, which was also shown in the presentation (W19).

When the presentation was ready the participants were asked to move to another space where the workshop would be held (W21). While moving, the participants were given a warm up task. They were asked to walk backwards to the entrance, where they came in at the start of the workshop. The idea was to physically act out the experience of doing a 'backcast' – by starting in the room where they had 'travelled' to Gothenburg in 2050, and then to look back and remember how they got there. Thus, the exercise of walking backwards to the workshop space was symbolizing the upcoming backcasting exercise.

Once at the entrance, one of us facilitators met the participants and guided them to five thematic workstations, which were marked with different colours corresponding to the colour on the participants' nametags. The five thematic workstations (see list below) were formulated on the basis of the summarized vision of the young adults.

URBAN ENVIRONMENT
ENERGY AND TRANSPORTATION
SOCIAL WELFARE
PRODUCTION AND CONSUMPTION OF FOOD
PRODUCTION AND CONSUMPTION OF OBJECTS

The participants had been divided in groups with a mix of politicians and young adults (W23). The young adults had been placed in a group corresponding to their *matter of the heart* (W17). They had been informed about which group they belonged to beforehand, so that they were able to prepare themselves by thinking about the topic in advance. The politicians had been placed in the groups on the basis of their main political question, as well as the party they belong to. The purpose was to create a balance of ideologies and interests, as well as a mix of politicians working with environmental, social and economical matters, in all the groups.

A predesigned dialogue poster (Eriksen 2008) had been prepared for the group exercise (W29). The poster explained step by step what the groups were expected to do in the exercise. The first step was to go through the summary of the material created by the young adults. Each group had received one A4 sheet with a part of the vision related to the theme they were working with (W11). The groups were given time to read, discuss and collectively make sense of the vision. Any questions could be directed to the young adults in the group for clarification. When this was done, the groups were asked to create a visualisation of the vision they were working with. To assist them, they were given newspapers, magazines, coloured pens, crayons, tape, and scissors (W20). With this material the politicians and young adults were asked to visualise their understanding of the described vision. The aim with this exercise was to enable the participants to start communicating and collaborating (Eriksen 2008). Furthermore, the aim was for them to deepen the understanding of, and amplifying, the vision,

Fig. 14 Collaborative
backcasting excercise

and to create a sense of ownership also for the politicians who had not been part of formulating it. A hands-on collaborative creation exercise was also thought to open up the conversation, and create a relaxing atmosphere in the group (W20).

When the visualisation of the vision was completed, the groups were asked to do the backcasting exercise, and formulate important happenings that lead to the vision of the sustainable Gothenburg in 2050. The idea was to define concrete examples of happenings, such as trends, political decisions, initiatives, incidents, actors etc. The questions asked to the groups were, for example, "How did the production and consumption of food become sustainable in Gothenburg by the year 2050?" (W29). At the end of the work session the groups were asked to discuss about the potentials of the happenings they had identified, and select the three most important ones. They were also asked to specify when, in the period between 2014 and 2050, it had happened. The idea with this selection was to summarize the discussion, and prepare for a short presentation, to the other groups (W20).

C.
REVIEWING THE OUTCOMES, AND ROUNDING UP THE DAY

After the backcasting exercise was completed, the groups gathered to present their outcome to the rest of the participants (W21). All the groups had worked with different parts of the vision; thus, the idea was that in the presentation, the material from the different groups would complement each other. The participants were asked to stand up in a ring, and present the vision they had worked on with the help of their poster, with a visualisation and a summary of the three most important happenings. The groups decided for themselves who would present the material.

When the presentations were completed, we asked everyone to sit down, for a short reflection session, before the workshop was over for the day (W21). This was to give some time for each participant to reflect over what he or she could bring from the workshop, and continue working for in Gothenburg. To do this, a metaphorical reflection exercise was conducted, based on the same image that had been used to communicate the workshop project from the start. The image showed a young plant that had just appeared through the soil. This was meant to represent the workshop as an opportunity to plant seeds (ideas), which could spread and start to grow. In the exercise, the participants were asked to reflect over the question "What do you take from the workshop? Which seed would you want to spread, and make grow, in Gothenburg?" A small bag with sunflower seeds were handed out to represent the notion of spreading the ideas from the workshop. Each participant was given one bag with seeds, and a card with the image of the little plant. The participants were then encouraged to answer the questions, by writing down a few points on the back of the card. The bag contained 18 seeds, which symbolized the 18 young adults who participated in creating the vision. After a few minutes of silent reflection, the participants were asked to share their thoughts with the rest of the group (W24). The idea with this exercise was that the participants would find it easier to remem-

ber the workshop, and what they got out of it, by taking something physical away (W20).

Fig. 15 Seed bag in the final reflection session

Finally, myself and the other facilitator concluded the workshop with some words about the upcoming process (W28). We explained that the material from both workshops would be summarized in a report and a video, and published through Ekocentrum's network. Furthermore, we asked the participants to share, use and discuss the material to continue spreading knowledge and engagement for climate mitigation in Gothenburg.

4.2.4.
THE IMMEDIATE OUTCOME OF THE CO-DESIGN ACTIVITIES

The outcomes from both the workshops were summarized in a report (W27). The report explained the process of the project, as well as the visions for a sustainable Gothenburg in 2050, and the actions suggested for reaching it. It was published on Ekocentrum's webpage and social media, as well as sent directly to the young adults and politicians who participated in the FG project.

Furthermore, the Facebook group that was created before the workshop project, became more active throughout the project. After the second workshop the politicians were also invited to participate. Two of the politicians became members of the group (P01; P03).

4.3.
THE IMMEDIATE IMPACT OF THE FG PROJECT

This section introduces the immediate impact of the co-design activities conducted in the FG project. The findings are the results of the study regarding the usefulness of co-design as facilitation approach for civic and policy interaction, with the aim to build social capacity.

For the purpose of the study the participants were categorised, on the basis of their *rational* and *operational capacity* level, prior to the FG project. Thus, five categories were formed: young expert, young activist, young novice, environmental politician and social politician (see Appendix 1, question 4 and 5). An overview over the impact on the five participant groups can be seen in the comparison chart (fig. 15). The chart shows how each of the five participant groups replied to the study regarding their current capacity (the white fields), in other words after the workshop project, and how they think their capacity was impacted by the FG project (the light green fields). Furthermore, the graph also shows summaries of the overall impact on each of the five participant groups, and each of the three capacity aspects. Two participants, one politician (P07) and one young adult (Y03), could not identify themselves with only one of the participant groups provided, and have therefore not been included in the comparison study. However, their responses are included in the overall discussion about the impact, and the reasons for it, in the latter part of this section.

This section starts by presenting the findings regarding the overall impact, and then continues into discussing the impact regarding *emotional*, *rational* and *operational capacity*.

4.3.1.
OVERALL IMPACT

The impact chart shows that the overall impact of the FG project has been positive. All participants have been positively influenced, and although some have also been negatively influenced, the positive impact is overall greater. This positive result is supported by the fact that all participants stated that it was worth participating in the workshop project (Y01-Y15; P01-P11).

When comparing the impact between the five different participant groups, it is clear that the young novice participants (Y06; Y02; Y07; Y12; Y10), by far, are the most positively influenced by the workshop project. The impact chart shows that this group has been significantly and positively influenced regarding all the four studied capacity aspects: feelings, importance, knowledge and action (fig. 17). The second most positively influenced participant group is the environmental politicians (P01; P03; P08; P10; P11).

IMPACT CHART

	RATIONAL CAPACITY	EMOTIONAL CAPACITY		OPERATIONAL CAPACITY
	Knowledge	Feelings	Importance	Action

Legend: Current state, Impact

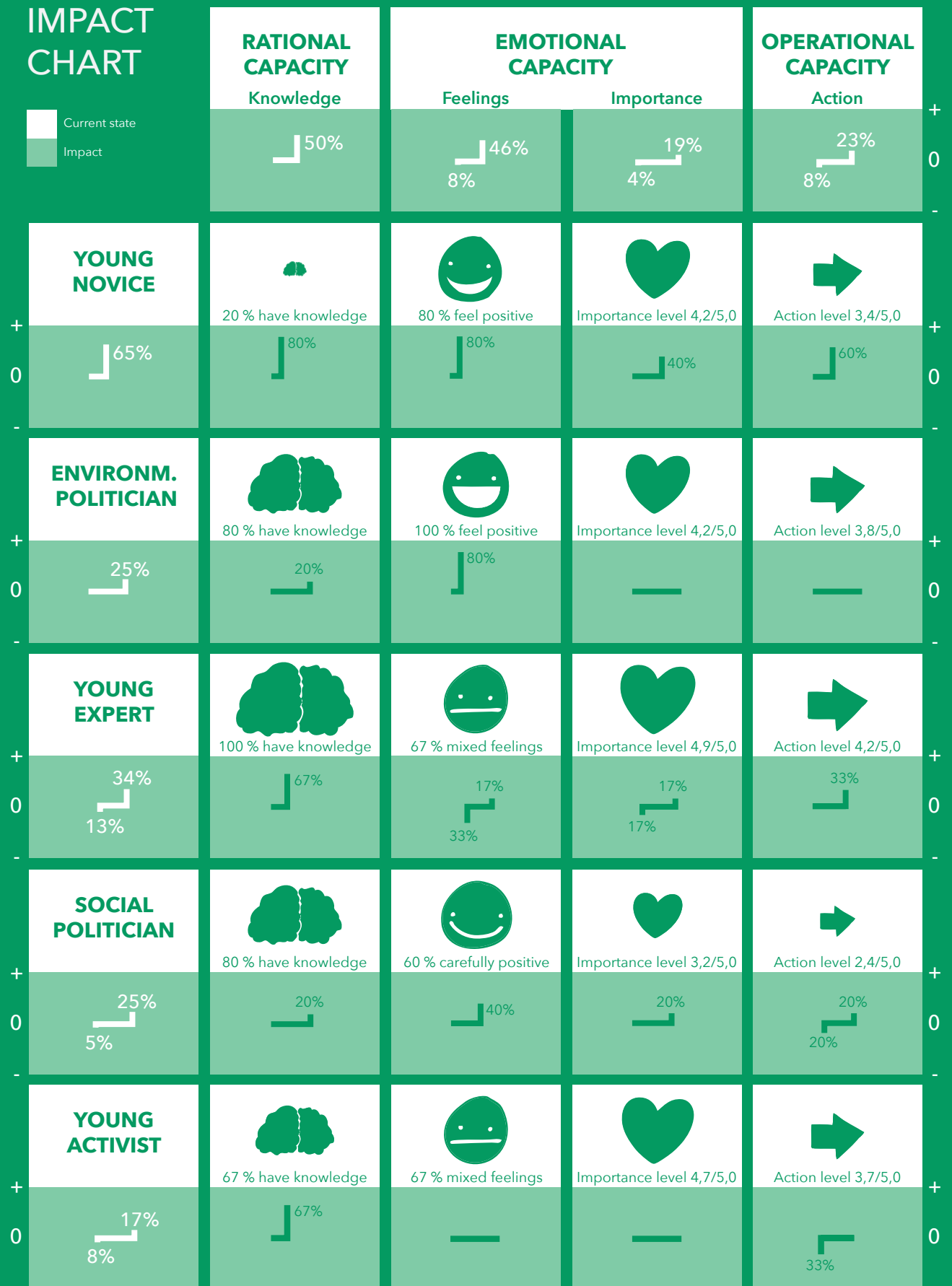|	Knowledge	Feelings	Importance	Action
	50%	46% / 8%	19% / 4%	23% / 8%
YOUNG NOVICE 65%	20 % have knowledge / 80%	80 % feel positive / 80%	Importance level 4,2/5,0 / 40%	Action level 3,4/5,0 / 60%
ENVIRONM. POLITICIAN 25%	80 % have knowledge / 20%	100 % feel positive / 80%	Importance level 4,2/5,0 / —	Action level 3,8/5,0 / —
YOUNG EXPERT 34% / 13%	100 % have knowledge / 67%	67 % mixed feelings / 17% / 33%	Importance level 4,9/5,0 / 17% / 17%	Action level 4,2/5,0 / 33%
SOCIAL POLITICIAN 25% / 5%	80 % have knowledge / 20%	60 % carefully positive / 40%	Importance level 3,2/5,0 / 20%	Action level 2,4/5,0 / 20% / 20%
YOUNG ACTIVIST 17% / 8%	67 % have knowledge / 67%	67 % mixed feelings / —	Importance level 4,7/5,0 / —	Action level 3,7/5,0 / 33%

Fig. 16 Impact chart summarizing the immediate impact of the FG project

This group has been significantly and positively influenced regarding their feelings, and to some degree regarding their knowledge. However, the aspects of importance and action have remained the same before and after the workshop project FG, for this group. The third group on the influence scale are the young experts (Y01; Y04; Y05; Y08; Y13; Y14). The impact on this group has been positive regarding knowledge and action, but a mixture of positive and negative with regards to how they feel, and how important they think climate transition in Gothenburg is. The second least positively impacted group were the social politicians (P02; P04; P05; P06; P09), who were positively influenced by the three aspects feelings, importance and knowledge, but mixed regarding action. Finally, the group that was least positively influenced by the workshop project was the one with the participants who identified themselves as young activists (Y09; Y11; Y15). The only aspect that positively impacted this group was knowledge. Their feelings and the level of importance remained the same, while their level of action decreased.

When comparing the overall impact on the three aspects of social capacity: *emotional*, *rational* and *operational* it is clear that all three of them have been positively increased. *Rational capacity* has the highest positive impact, which shows that the FG project was most successful in enabling the creation of knowledge. The second highest impacted aspect is *emotional capacity*, which includes both the participants' feelings about climate transition in Gothenburg, and their thoughts about its importance. Here, it is clear that the FG project was successful in generating more positive feelings and attitudes about climate transition in Gothenburg, but had less affect on the feelings of its importance. Finally, the least impacted aspect is *operational capacity*, which was also positively influenced, although less than the other two. This means that the FG project, not so surprisingly, was less successful in enabling action in climate transition, immediately after the project. The upcoming sections will elaborate on the reasons for the different impact on the participants, related to the three aspects of capacity (*rational*, *emotional* and *operational*).

The following section will present the impact the FG project had on the participants' *rational capacity*. Thus, it will outline if the participants gained knowledge and understandings about climate transition in Gothenburg, in the FG project.

4.3.2.
RATIONAL IMPACT

The most positive impact created in the FG workshop project was on the participants' *rational capacity*, as 50 % of the participants (13/26) stated that they had learned something during the project (Y02-Y07; Y09-Y11; Y13-Y14; P01; P06). Furthermore, all of the participant groups, including the ones that stated that they had a lot of knowledge previously, indicated that they had gained new knowledge in the workshops. This indicates that the new perspectives gained from the collaborative creation experience,

were valuable to many of the participants, including those who had a high knowledge level prior to the FG project. As an example, 83 % (5/6) of the young experts mentioned the meeting with persons they do not normally speak to, knowledge and new perspectives, as the most important outcome of the workshop project (Y14; Y04; Y08; Y05; Y01). Furthermore, 73 % (11/15) of all the young adults indicated that they have learned something new (Y02-Y07; Y09-Y11; Y13-Y14), and although the number of politicians who learned something was lower (P01; P06), some of them also gained new understandings. One politician said that for him it was very valuable to have the possibility to discuss these matters with people from different societal groups (P11). Thus, it can be concluded that the FG project clearly has been successful in influencing the *rational capacity* of many of the participants, in the form of knowledge, new perspectives and understandings.

The following section will present the impact the FG project had on the participants' *emotional capacity*. Thus, it will outline if the participants felt more positive about climate transition in Gothenburg, and thought that it is more important, after the FG project compared to before.

4.3.1.
EMOTIONAL IMPACT

The second most positively impacted capacity aspect is the participants' *emotional capacity*. The impact chart (fig. 16) shows that 46 % (12/26) of the participants have gained positive feelings from the experience (Y02; Y03; Y06; Y07 Y12; Y13; P01; P03; P04; P06; P08; P10), and that 19 % (5/26) have started to think that climate transition is more important (Y01; Y02; Y03; Y06; P04). However, 8 % (2/26) did gain negative feelings from the experience (Y04; Y14), and 4 % (1/26) stated that he have started to think that climate transition is less important after the FG project, compared to before (Y08). This section will elaborate further on the reasons for this positive and negative impact on the participants' *emotional capacity*.

The positive impact indicates that the FG project generally was successful. The success of the event could depend on several reasons. One reason to why many participants felt more positive after the project seems to be because they thought it was fun, exciting, inspiring and interesting to envision the sustainable future of Gothenburg (Y05; Y13; P03; P07; P10; P02; P05). Similarly, some of the young adults said that it is important to dream and focus on where we want to go, and not only where we are now (Y05; Y07). Furthermore, two politicians stated that learning about the visions of the young adults in the city, was very valuable to them (P05; P07). Another young adult said that generating ideas about the sustainable future gives hope (Y03). Thus, it seems as if the collective envisioning and dreaming exercises conduced in the FG project, contributed to the creation of positive, hopeful and optimistic feelings about the future.

"We have to think about how we want it to be, and less about how it is now"

Y05 about her expectations before the FG project

A second reason for why many participants felt more positive after the workshop project, seems to be that the engagement was infectious, in the sense that meeting engaged persons made some participants feel more positive and hopeful. The most important thing that some of the politicians got out of the FG project was seeing that so many people are engaged, and interested in creating change (P03; P04; P07; P10), which generated positive, hopeful and optimistic feelings (P01; P03; P06; P08; P10). Similarly, it was valuable for some of the young adults to see that others are engaged in these issues (Y03; Y10). Thus, a conclusion that could be drawn from this is that engagement created engagement, and increased interest for these matters, both among the politicians and the young adults who participated in the FG project.

"There is such great interest in sustainability issues, and to develop the city environment in such a direction"

P03 about the most important thing in the FG project

A third reason why many participants felt more positive after the workshop project, seems to be due to the fact that a feeling of coherence was created in the group. The fact that the workshops were deliberately planned to avoid *fragmentation* (Conklin 2005, 1) by, for example, keeping the political ideologies secret, was mentioned as a good strategy (Y13; P05; P06; P07), and enabled a feeling that everyone was working towards the same direction. Similarly, two politicians stated that unprejudiced conversations with the other politicians, outside the political area, were very valuable (P02; P06).

"Feeling that everyone was very interested and engaged, and that the ideological differences were unnoticed. Even thought one could guess [which party someone belonged to] it was very equalized. It was more about the issues than the parties"

P07 about the most important thing in the FG project, text in brackets added by the author

Furthermore, this feeling of coherence seems to have generated empathy among the participants. As an example, 83 % (5/6) of the young adults, who participated in the workshop with the politicians, stated that they had gained more understanding of the challenging position of the politicians (Y04; Y05; Y07; Y13), and that the distance between them and the politicians was smaller than they had initially thought (Y04; Y14). Similarly, many of the young adults showed empathy when talking about the collaboration

with the other young adults, by saying that it was both challenging and fun to learn from each other, and that no one was right or wrong (Y10; Y07; Y09; Y14; Y05). Thus, the young adults showed empathy towards both the other young adults, and the politicians. The politicians, on the other hand, generally did not express empathy in the same way, except one of the politicians, who did say that she was compromising with her opinions in the workshop, to give space for the ideas and opinions of the young adults (P07).

> ### *"I thought that many [participants] were wrong, and they probably thought that I was wrong, so we got a new perspective"*
> Y10 about how it was to collaborate with the other young adults, text in brackets added by the author

Despite the generally positive impact on the participants' *emotional capacity* it is clear that the impact varies between the different groups of participants. The difference in impact seems to be connected to the different expectations the participants had on the FG project. Depending on whether or not these expectations were met, they seemed to have become positively, neutrally or negatively influenced.

First of all, the three participant groups who where most positively influenced regarding their *emotional* impact (the novice participants, the environmental politicians and the social politicians), mainly had open, neutral, or even negative, expectations before the workshop project. The novice participants, for example, all had open (Y12; Y06) or negative (Y02; Y10) expectations before the workshop. Similarly, both groups of politicians had open, mixed, or no, expectations before the workshop project. 80 % (4/5) of the environmental politicians state that their expectations before the workshops were general and open (P03; P08; P10; P11), and 40 % (2/5) that they were interested in learning about Ekocentrum (P08; P11). Only 40 % (2/5) of the environmental politicians mentioned more specifically that they expected to learn how young adults think about the future (P01; P11). Among the social politicians the majority stated that they generally were expecting dialogue and discussion regarding the future, with new people (P09; P05; P06), and that it was exciting that all the political parties would participate (P04). Only, 20 % (1/5) of the social politicians mentioned dialogue with young adults in their expectations (P09). Hence, it seems that these two groups generally did not expect anything specific, but were positively surprised when it was fun and they learned something new.

> ### *"I thought it would be boring but it was something new so that was fun"*
> Y02 about her expectations before the FG project

On the contrary, the two participant groups who were neutrally or negatively influenced, regarding their *emotional capacity* (the young activists and the young experts), had more specific expectations before the FG project. Especially, some of the young experts were expecting to be able to influence

and contribute to a concrete discussion (Y01; Y05; Y14; Y04), and saw this encounter as a unique opportunity to be heard.

"I saw the workshop project as an opportunity to learn how Gothenburg's politicians see sustainable development, to discuss this sustainable development with young adults, and an opportunity to influence the debate through my experience, commitment and knowledge"

Y14 about her expectations before the FG project

Following the previous line of thought, the fact that the young activist and experts were neutrally or negatively influenced seems to be connected to them not feeling that their expectations, to influence and contribute, were met. Studying the answers regarding the young adults feelings about being heard and taken seriously, in the workshops, supports this hypothesis. In the first workshop, with young adults, 80 % (12/15) of the participants stated that they felt that they that had the opportunity to express their opinions, thoughts and ideas and that they were taken seriously (Y01-Y08; Y10-Y12; Y15), while in the second workshop, only 67 % (4/6) of the young participants said so (Y04; Y07; Y13; Y14). The majority of the young participants in the second workshop were young experts (5/6), who had expected to be able to influence the politicians, and seem to have become disappointed because of their insecure possibilities to do so. Thus, a conclusion could be drawn that the different expectations before and focuses during the workshops, among the participants contributed to the differences in the *emotional* impact on the different participants groups.

"Fun but a little bit frustrating. The politicians seemed to, in some cases, only be able to think in a certain thought pattern. Sometimes it seemed as if they did not listen"

Y01 about the collaboration with the politicians

Furthermore, the two young experts (Y04; Y14) who were negatively influenced by the second workshop, both stated that it was related to the way the politicians were speaking about the future. Both of these participants were highly committed to the topics discussed in the workshops, and had high expectations on being able to influence and inspire the politicians. When they heard that the politicians were less committed or visionary they became more pessimistic.

"Yes, I became more sceptical after a comment made from one of the politicians

who basically said; I do not believe that change is possible until we have experienced a collapse or disaster. Firstly, I think it is sad that one thinks that way, but also it is disrespectful to say such a thing in front of young people, who need to grow up knowing that even politicians do not have hope for the future, and the belief that we will be able to adapt to, and prevent, climate change. If not the hope is there, the ambition is neither…"

Y04 about her feelings about the future

The aspect of the importance of climate transition was rather little impacted, if compared to the aspects of the participants' feelings about climate transition, as only 19 % (5/26) started to think that climate transition is more important, after the FG project compared to before (Y01; Y02; Y03; Y06; P04). The reason for the low impact regarding this aspect might be due to the fact that many of the participants were previously active in issues regarding climate transition, and thus already thought that the aspect is very important. 65 % (17/26) of the participants stated that the importance level before the workshop project was between a 4 and a 5 on a scale between 1 and 5, where 1 is very little and 5 is very much (Y04; Y05; Y07-Y15; P01; P03; P05; P07; P08; P11). Thus, it seems as if the FG project's impact on the importance of climate transition was low, because many already thought it was very important. Furthermore, one participant had responded that he had started to think that climate transition is less important after the workshop project, compared to before (Y08). However, after analysing this response it was considered a mistake, as nothing else in his replies indicated that he was negatively influenced by the FG project.

Finally, it can be concluded that the FG project clearly has been successful in influencing the *emotional capacity* of many of the participants, in the form of engagement and positive attitudes and feelings. However, the FG project did not significantly influence the importance of the matter of climate change, due to the fact that many of the participants already were engaged.

The next section will present the impact the workshop project FG had on the participants' *operational capacity*. Thus, it will outline if the participants became more active and engaged in climate transition in Gothenburg, after the FG project compared to before.

4.3.3.
OPERATIONAL IMPACT

The least positively impacted capacity aspect is the participants' *opera-*

tional capacity. Hence, active engagement and action for climate transition in Gothenburg. The impact chart (fig 16.) shows that 23 % (6/26) of the participants became more active (Y02; Y04; Y06; Y07; Y14; P04), after the workshop project compared to before, and that 8 % (2/26) became less active (P05; Y15). The fact that the impact on this aspect is significantly lower than the other two aspects might be due to the fact that many of the participants who took part in the workshop project were already very active in the climate transition. 46 % (12/26) of the participants stated that their activity level before the workshop project was between a 4 and a 5 on a scale between 1 and 5, where 1 is very little and 5 is very much (Y03; Y05; Y08; Y10; Y11; Y13-Y15; P01; P03; P05; P11). Thus, it seems as if the FG project's impact on their *operational capacity* was low, because they were already very active.

However, the FG project may have had a larger effect on the *operational capacity* of some of the participants, than what the study of the immediate impact shows. Following this line of thought, other signals also indicate that the impact that the FG project had on the participants' *operational capacity*, may be larger than the impact study´s numbers show. Two signals have been found regarding this. First of all, some signals of more positive impact can be seen when studying the continuation of interaction, and collaboration, within the network that was created in the FG project. The continuation of this network can, for example, be seen in the increasing use of the Facebook group that was created during the recruitment of the young adults. What was seen is that, after the first workshop the number of young members grew, and after the second workshop, two politicians also became members of the group (P01; P03). During the project we facilitators did most of the sharing and posting. However, when the project finished, we became less active in posting things in the Facebook group, but instead the other group members started to use it more independently, to post invitations to events and to share information. This indicated that the meeting in the co-design encounter enabled a network, which continued to live on its own, even after the project was finished. This definitely is a sign of *operational capacity*.

> *"Yes, I have some ideas and I now know who to turn to if I want to express them in any way!"*
>
> Y03 about her knowledge in climate mitigation

Secondly, another signal regarding how the participants' *operational capacity* was impacted by the FG project is related to the use of the visions and ideas that came out of the process. 33 % (5/15) of the young adults stated that they have used the material after the workshop project by, for example, telling their friends about it, using it in school projects, or in meetings with different organisations (Y03; Y04 Y07; Y12; Y15). Furthermore, 27 % (4/15) of the young adults stated that they would like to use the material, although they still have not done so (Y02; Y06; Y11; Y13). Regarding the politicians 9 % (1/11) stated that he had used the material, by telling others about it (P03). Finally, 18 % (2/11) of the politicians explained that they were

interested in using it, but still had not done so (P07; P08). To summarize, 46 % (12/26) of all the participants had used, or had the intention to use, the material that came out of the workshop project. This finding indicates that, despite the generally low numbers regarding the impact on the participants' *operational capacity*, the FG project managed to strengthen it quite significantly. The fact that this is not represented in the general numbers, of the impact study, might be because of different understandings of the words "active engagement" and "action", which were used in the questionnaire. An example of this can be seen in the fact that four participants said that they had not become more active, although they stated that they had used the workshop material after the FG project (Y03; Y12; Y15; P03). Thus, it seems as if the different understandings of the formulations used in the questionnaire, is one reason for the slightly misleading numbers regarding the *operational capacity*. Hence, to finalize this section it can be concluded that the immediate impact on the participants' *operational capacity,* has been substantially positive.

4.4.
SUMMARY AND CONCLUSION OF THE FG PROJECT

This chapter has outlined the case study process of facilitating citizen and policy interaction around urban climate visions and pathways, as it was conducted in the collaborative design project "Framtida Göteborg" (Future Gothenburg, FG) September to December 2014 in the city of Gothenburg, Sweden.

The FG project was initiated with the aim to generate engagement around The Climate Programme for Gothenburg, which aims towards "a fair and sustainable level of greenhouse gas emissions by the year 2050" (Miljöförvaltningen Göteborgs Stad 2014, 23). To do this, the FG project organized an interactive process between citizens and decision makers in Gothenburg. In this process, two workshops were conducted where young adults developed visions for a sustainable and carbon neutral Gothenburg in 2050, and together with politicians created pathways regarding how to realize the vision. Co-design was used to facilitate this collective envisioning process, which aimed at building social capacity for climate transition.

A study of the immediate impact of the co-design activities undertaken in the FG project shows that all three studied capacity aspects (*rational*, *emotional* and *operational*) have increased quite substantially. These findings, suggests that the co-design activities undertaken in the FG project generally were successful in facilitating interaction between policy makers and citizens, and building social capacity for climate transition.

The next section will discuss theses findings together with the literature review and will outline a conclusion for this thesis.

5.
DISCUSSION

This thesis was aimed at exploring the use of collaborative design as a facilitation approach for public and policy interaction in climate change mitigation, with the purpose of building social capacity for supporting and improving urban climate transition. By conducting this research, this thesis has sought to understand the potentials with design to contribute to sustainable development, by studying the possibility for collaborative design to realise change in complex social systems. Until now research regarding collaborative design has mainly dealt with the methods used in its process, as well as the produced outcomes of it. However, the long-term potentials with collaborative design in systemic change processes, has so far mostly been neglected (Soini 2015; Jones 2014). The thesis aimed at contributing to this research gap by investigating the case study process conducted in FG project, which used collaborative design to facilitate a collective envisioning process, with citizens and decision makers, to build social capacity for climate transition. The findings, which reveal how and why collaborative design can build social capacity for systemic change, stem from a literature review and a multi method analysis process of 29 workshop documents (W01-W29) and 26 interviews (P01-P11; Y01-Y15) from the FG project. The following sections are threefold: first a discussion on co-design as a facilitation approach for capacity building in climate transition, second, a reflection over the research process, and thirdly, outlining future areas for exploration.

5.1.
CO-DESIGNING SOCIAL CAPACITY FOR CLIMATE TRANSITION

In this thesis I have argued that co-design processes between the public and policy makers potentially can contribute in an urban climate transition process, by building social capacity that supports change. This suggests that, first; co-design can contribute by building *rational capacity* among citizens and politicians, which increases their understanding of possible solutions in the transition process. Second, co-design can contribute by building *emotional capacity* among citizens and politicians, by creating attitudes that support and motivate their engagement in the transition process. Finally, co-design can contribute by building *operational capacity* among citizens and politicians, by creating tools, which can enable action and participation in the transition process. This section will elaborate these arguments by discussing the findings regarding the social capacity built in the co-design activities in the FG project, the hinders for co-design to build social capacity, and finally, outline some conclusions regarding the potentials of co-design to build social capacity for climate transition.

5.1.1.
SOCIAL CAPACITY BUILT IN THE FG PROJECT

The overall finding regarding social capacity in the FG project is that it was successfully built regarding all three capacity aspects, namely *rational*, *emotional* and *operational capacity*. This section will outline and discuss how and why this social capacity was built in the co-design activities undertaken in the FG project.

First of all, *rational capacity* was the capacity level that was strongest affected in the co-design activities, as 50 % of the interviewed participants stated that they had gained knowledge, perspectives or ideas during the FG project (Y02-Y07; Y09-Y11; Y13-Y14; P01; P06). Furthermore, the participants who expressed that they had gained knowledge, ideas and perspectives were ranging on a scale from almost no prior knowledge, to a great deal of prior knowledge. Thus, there was no direct correlation between the level of previous *rational capacity*, and the gain of *rational capacity*; instead, participants with all levels of previous knowledge learned something in the co-design activities in the FG project. The fact that many of the interviewed participants did gain *rational capacity*, and that participants with both high and low previous knowledge level did so, supports the notion of co-creation as a social learning process, where tacit knowledge and new perspectives, namely *rational capacity*, can form in collaboration among diverse stake-

holders. Robinson (2003, 849), who refers to this *rational capacity* as a third understanding, states that the combination of expert understanding, in this case the policy makers, and the public values, attitudes, preferences and beliefs, *improves the understanding and practice of sustainability* (Ibid). Thus, it seems as if the FG project was successful in building *rational capacity*, which can support the climate transition process.

Secondly, *emotional capacity* was the subsequent most affected capacity aspect, as 46 % of the interviewed participants stated that they feel more optimistic about Gothenburg's sustainable future (Y02; Y03; Y06; Y07 Y12; Y13; P01; P03; P04; P06; P08; P10), and 19 % that they started to think that climate transition is more important for them now, after the FG project compared to before (Y01; Y02; Y03; Y06; P04). Three reasons were found for this *emotional capacity* to be formed. A first reason for why *emotional capacity* was formed is that the collective envisioning experience was valuable to many of the participants, because it was inspiring, interesting, fun and gave hope (Y03; Y05; Y13; P03; P07; P10; P02; P05; P07). The fact that many of the interviewed participants were positively influenced by the collective envisioning experience, supports the idea that co-creation in the early stages of a development process is valuable, as it can generate *engagement for achieving the goal*. Jones (2014) and Sanders & Stappers (2008) agrees that the process of envisioning an ideal state, regardless of means, is a generative process with high accomplishment power as it can direct and catalyst action towards the goal. A second reason for why *emotional capacity* was formed is that the meeting with people who were engaged in creating change, generated engagement in others (P01; P03; P04; P06; P07; P08; P10; Y03; Y10). Thus, the individual engagement was infectious, and spread to other members of the group. This finding indicates that in collaborative activities, people's attitudes and emotions are transmittable and can, if positively loaded, generate *positive attitudes.* Similarly, a third reason for why *emotional capacity* was formed is because the participants started to build empathy, and an understanding for each other's perspectives. The fact that the workshops focused on the shared aspects and the common goal, something that was appreciated by several participants (Y13; P02; P05; P06; P07), created a feeling of coherence in the group. This feeling of coherence, in turn, enabled, several participants to gain an understanding about the other participants' roles and perspectives (Y04; Y05; Y07; Y09; Y10; Y13; Y14; P07). Thus, a feeling of empathy, shared understanding and coherence was built among many of the participants in the group, although to a greater degree among the young adults than among the politicians.

This notion has been referred to as *reciprocal empathy* (Soini 2015, 195), and is a source of innovation as it enables the possibility for a group to deal with change and complexity (Conklin 2005; Siitonen & Hämäläinen 2004). The focus is shifted from conflict into defining a common goal and innovative ways to reach it, and thus build capacity for tackling the complex problems in climate transition (Ibid). Hence, it seems as if the FG project, for several reasons, also was successful in generating *emotional capacity*, which can support and improve the climate transition process.

Finally, also the aspect of *operational capacity* was positively influenced by the FG project. According to the numbers from the study 23 % of the participants stated that they became more active in climate transition after the FG project, compared to before (Y02; Y04; Y06; Y07; Y14; P04). Furthermore, 46 % of all the participants had used, or had the intention to use, the material that came out of the workshop project (Y03; Y04 Y07; Y12; Y15; Y02; Y06; Y11; Y13; P03; P07; P08). The *operational capacity* in the FG project was built through the creation of *tools for change.* Among those tools was, first, the *tangible shared material*, in the shape of a co-created vision and pathways for realizing it, which expresses one perspective on climate transition in Gothenburg. Soini (2015, 196) refers to this as "experiential material for reflection", and states that this perspective can help to further share ideas between stakeholders, and contribute to holistically making sense of the collective process. Secondly, another tool created was the *multidisciplinary network of stakeholders*, which was built in the co-design process and continued to survive after the official process, by interaction in the Facebook group. Such network enables the continuation of sharing ideas and perspectives and can thus, reinforce the co-creation and capacity building among the participants. In this sense, *operational capacity* is a long-term aspect that contributes to a possible continuation of the change process. Hence, finally, the FG project was also successful in generating *operational capacity*, which can support and improve the transition process.

To conclude this section I would like to argue that the co-design activities conducted in the FG project successfully did facilitate the generation of social capacity within all three capacity aspect, namely rational *emotional* and *operational capacity*. Capacity was built in the following areas:

RATIONAL CAPACITY:
Improved understanding and practice of sustainability

EMOTIONAL CAPACITY:
Engagement for achieving the goal
Positive attitudes and optimism
Reciprocal empathy

OPERATIONAL CAPACITY:
Tangible shared material
Multidisciplinary stakeholders networks

Despite the fact that the co-design activities undertaken in the FG project did build social capacity, the examination of the case study process also revealed some complications and challenges regarding co-design as a facilitation approach for building social capacity for change. By relating these findings to the challenges concluded in the literature review, the next section will outline and discuss possible complications for co-design to build social capacity for climate transition.

5.1.2.
COMPLICATIONS FOR CO-DESIGN
TO BUILD SOCIAL CAPACITY

Although the co-design activities conducted in the FG project were successful in building social capacity, there are challenges and complications, which can prevent its realisation. This chapter outlines and discusses these, based on the concluded challenges in the literature review, namely (1) *requisite variety and broad stakeholder representation*, (2) *fragmentation and social complexity,* (3) *time and resources for co-creation*, as well as, (4) *fixation in the current reality*, and some of the challenges met in the FG project.

A.
REQUISITE VARIETY AND
BROAD STAKEHOLDER REPRESENTATION

A first challenge in co-design processes aiming at building social capacity for change is *requisite variety* (Jones 2014, 113) and broad stakeholder representation. *Requisite variety*, according to Jones (2014, 113), means that for a co-design process to be valid and lead to systemic change, a broad range of stakeholders should be involved, representing all parts of a society or community (Ibid). Thus, what he suggests is that in co-design processes aiming towards capacity building for change, a broad range of stakeholders should participate, to incorporate diverse perspectives into the process. However, managing this in practice is a challenge, and demands some kind of criteria on which to base the notions of 'broad' representation and 'all' parts of society. How can one define what broad means? And which are all parts of the society? Should the invitation be open to anyone who is interested, or should it be closed and limited to ensure some kind of balance? Should uninterested participants be pursued to participate through other kinds of rewards, to ensure broad representation? Questions, such as the ones mentioned here, need to be asked and consciously managed in the recruitment for co-design, as it will affect the outcome of such process as well as the capacity built among the participants.

In the recruitment of the young adults and the politicians in the FG project, 'broad' represented all the 10 parties with mandates is Gothenburg, and young adults from all 10 districts within Gothenburg. Furthermore, the aim was to create a 'broad' representation of aspects such as gender, age and ethnicity, as it could provide different perspectives to the process. However, in the FG project the actual recruitment process was based on two slightly different ideas. First of all, in the recruitment of the politicians an open invitation was sent out to all the parties, stating that they can send as many members of their party as they like. This strategy was taken because we were unsure about how many politicians that would actually have the time and interest to participate. Thus, if the parties wanted to send more than one member, it was considered positive instead of a risk of unbalance in the group. Regarding the young adults, however, the participation was

strictly controlled, by partly selecting the participants based on an applica-tion letter, and partly by handpicking and contacting young adults based on recommendations. Furthermore, the selection process was slightly biased towards young adults with a previous interest in matters related to sustain-ability. This was because it was considered that more time for preparation would have been needed if most of the young adults, who were the ones outlining the visions, would have been completely new to the topic. This strategy resulted in a group with diverse young adults, with a slight bias towards previously active persons (12/20), and a slightly unbalanced group with politicians (three from one party, two from two parties, the remaining from seven parties) (W07; W23).

Whether the strategies used in the FG project were successful is difficult to say. Just as it is a challenge to know which recruitment method to choose for ensuring a group with *requisite variety* (Jones 2014, 113). An open initiation to all would ensure active engagement in the exercises as everyone would be there voluntarily, but could result in a very one-sided process, as fewer perspectives would be involved. A rewarded participation would possibly ensure a greater interest in participation also among people who where not previously interested in the topics discussed, however, it could create problems in the actual co-creation activities if not everyone was equally en-gaged. An application and selection process would ensure that the persons showing up would be very interested, but could again create a bias towards the participants with strong previous interest. To conclude, *requisite variety* is challenging and subjective. In practice, it is very hard to manage and will always be a discussion regarding how to define broad involvement, as well as, how to manage this in practice, in combination with engagement in the actual co-creation. However, being aware of this fact is important, as it will affect the process and outcome of a co-design process, and thus also define the possibilities to build social capacity for change.

B.
TIME AND RESOURCES FOR CO-CREATION

A second challenge in co-design processes aiming at building social capac-ity for change is the fact that co-creation processes are time and resource consuming. First of all, such processes require a great deal of resources due to the fact that co-creation, as mentioned in the previous section re-quires broad stakeholder involvement. Secondly, such processes require time because building social capacity for change takes time. Björnvinsson et al. (2010, 3) refers to such processes as *design as infrastructuring*, where design is seen as a frame for social innovation, and where experiments and pilots can be initiated and grow over time. In such processes, the long-term commitment is essential, as social innovation takes time. Participation in this process is linked to capacity building, as it can affect the participants' level of adoption, commitment and ownership over the process and its out-come. This is because working together is a form of reflection, which gives personal meaning to the material (Soini 2015). Thus, the participants who are more involved in the process may also build more ownership over the

material, and become more committed to the further development and the implementation of the co-created material.

However, in practice the involvement of a broad range of stakeholders, over long time is challenging for practical reasons. Because of this, the co-creation activities in the FG project were arranged so that the young adults participated in two workshops, while the busy politicians only participated in one (W01). Thus, the young adults were more deeply involved in the process than the politicians, as they were involved in setting the agenda and designing the process of the co-creation meeting, while the politicians only participated in it. Because of this, the young adults developed more ownership over the outcome of the co-creation process, and also more empathy to use in it. This is shown by the fact that more young adults than politicians used, or wanted to use, the co-created visions (Y03; Y04 Y07; Y12; Y15; Y02; Y06; Y11; Y13; P03; P07; P08), and that empathy was created to a greated degree among the young adults than among the politicians. Thus, the young adults developed more capacity to use the tools created. This was contradictory, as the primarily aim of the workshop was to empower the politicians by providing them with tools that they could use to create change in climate transition. Thus, because of the way involvement in co-creation was arranged in the FG project the capacity built among the participants was affected.

C.
FRAGMENTATION AND SOCIAL COMPLEXITY

A third challenge in co-design processes aiming at building social capacity for change is *fragmentation* and social complexity (Conklin 2005, 1-3). *Fragmentation* (Ibid) is, as previously mentioned, a condition where people see themselves as more separate than united, and where information, knowledge, perspectives, understandings and intentions, of the collaborators, are scattered. This can disable collaboration in participatory processes, and thus limit the creation of social capacity in such processes. *Fragmentation* increases with social complexity, the numbers of diverse stakeholders participating in a meeting (Ibid). Thus, in a co-design process, with a broad range of stakeholders involved, namely *requisite variety* (Jones 2014, 113), *fragmentation* and social complexity are factors that need to be considered and managed. One way to avoid *fragmentation* is to enable collaboration. If collaboration runs smoothly, between the participants, the feeling of coherence can grow and eliminate *fragmentation*. To enable collaboration the participants needs to be able to communicate, with each other, and contribute to the process. To facilitate this, co-design, is often supported by different tools, such as *design materials* (Eriksen 2008, 1), which aim towards empowering the participants to participate, communicate and contribute in co-creation (Soini 2015).

In the FG project the set up of the co-creation exercises was very open, which means that the exercises were mainly based on the participants own thoughts and ideas. Communication material, and thematic open questions were provided, but other than that the participants themselves stood for

the generation of the future visions. This open set up provided freedom in the process, and allowed the young participants to set the agenda of the workshops, as they created the vision. However, at the same time as it empowered the young participants to outline the vision, it created a pressure on them to be creative and come up with ideas (Y09). Thus, on one hand this set up did empower the young participants to take control over their situation, but on the other hand it created a situation in which the diversity, namely social complexity (Conklin 2005, 3), of the participants made it challenging to collaborate (Y09). Instead of an equal collaboration, the young participants that were stronger tended to dominate the creation of the visions and scenarios (Y13; Y05).

This unbalance in the participation created *fragmentation* in the group, and caused some of the more capable young adults to express a disappointment regarding the differences among the participants (Y13; Y05; Y08; Y14). Furthermore, this might also have been a reason for why some of the less capable young adults lost interest in the project and dropped out before the second workshop, as they might have felt that they could not contribute. Thus, the arrangement of co-creation in the FG project did partly fail to empower the participants enough to enable smooth collaboration, and thus also failed to prevent *fragmentation* in the group. Being aware of the fact that the participants are diverse, and have different needs, is important, as it will affect the process and outcome of a co-design process (Soini 2015), and thus also define the possibilities to build social capacity for change.

D.
FIXATION IN THE CURRENT REALITY

A forth challenge in co-design processes aiming at building social capacity for change is the fact that envisioning possible new futures requires great deal of creativity. Furthermore, working with others to achieve this requires even more. In the FG project, the research showed that many of the participants struggled to be visionary and imagine a sustainable future in Gothenburg by the year 2050 (W26; P01; P04; P06; P08; P09; Y13; Y05; Y04; Y11; Y03; Y12). Many of the participants in the FG project kept the discussion, regarding the future, anchored in the present possibilities and limitations. Jones (2014) refers to this phenomenon as *fixation*, which "is a cognitive barrier or bias toward the known, the attachment to a previous idea or course of action" (Jones 2014, 112-113). *Fixation* is a barrier for creativity, innovation and transformative development as it limits the possibility to think new. *Fixation* also prevents and limits *idealization*, which is an important way for an organisation or society to direct and create change, by identifying an ideal state (Jones 2014).

> *"Do not know, it is difficult to speculate on something one will not experience"*
>
> P02 about his feelings about the future

To limit *fixation*, and instead allow creativity and imagination to flourish, co-design experiences often use *design materials* (Eriksen 2008, 1) as tools for unlocking imagination and *bisociation*. In the FG project, text and speech formulations, movements, pictures, visualisations, sounds and dream exercises were used to unlock creativity (W02; W03). However, it is concluded that because many of the groups failed to detach themselves from the present, more visionary and mind-opening exercises would have been needed, to fully eliminate *fixation* (Jones 2014, 112-113). Thus, being aware of the challenges of envisioning processes is important, as it will determine the possibilities for such processes to build social capacity.

5.1.3.
CONCLUSION

Based on the discussion in this section, the general conclusion of this thesis is that co-design processes between public and policy level, can contribute in climate transition by building social capacity that support change. This means that, first; co-design can build *rational capacity* among citizens and politicians, by enabling an *understanding of the problem and possible solutions* for climate mitigation. Second, co-design can build *emotional capacity* among citizens and politicians, by enabling *empathy* for different understandings, *positive attitudes*, and *engagement for these solutions*. Finally, co-design can build *operational capacity* among citizens and politicians, by formulating *tools for change*, such as *tangible shared material* and *multidisciplinary stakeholder networks*, which can support the development and implementation of the solutions. By further iteration and feedback such implemented solutions can potentially grow into systemic change that supports climate transition.

However, to successfully build this *rational*, *emotional* and *operational capacity* for change in climate transition, co-design needs to manage the practical challenges and hinders with such processes, namely (1) *requisite variety and broad stakeholder representation*, (2) *fragmentation and social complexity*, (3) *time and resources for co-creation, as well as*, (4) *fixation in the current reality*.

RATIONAL CAPACITY
Knowledge

EMOTIONAL CAPACITY
Feelings /
Importance

OPERATONAL
CAPACITY
Action

Fig. 17 The three aspects of social capacity

5.2.
REFLECTION OVER THE
RESEARCH PROCESS

The great research challenge of this thesis has been the fact that the research subject is broad, multidisciplinary and still lacks a solid research body to build on. Due to these reasons, the research process itself has been forced to take on an explorative approach, where theories and literature from multiple fields have been examined in an open way. To provide a structure for this explorative research, a single cases study was chosen as a method. A single case study provided a frame with necessary boundaries for the exploration, and helped to narrow down the scope of the thesis. In addition, it provided a practical example, in which the abstract theories could be understood and analysed. Furthermore, the choice of using a case study that I had previously been working on, allowed me to reflect on and deepen the understanding of the value of my work, and build important knowledge for my professional future.

Regarding the previously mentioned challenges with objectivity in studying a case that I had previously been working on, I think that, thanks to the selected methods, I managed to maintain objective to the material even if I knew the respondents. In analysing the answers of the interview questions, it felt as if the participants generally had been honest. The answers were balanced between positive and negative feedback, and in general very objective. If someone, for example, found it difficult to remember something they had stated this, and if someone else did not want to categorize him or herself, they did not. Thus, I considered the material thrust worthy. However, when analysing the responses I found unasked questions, which would have helped me to further understand the impact of the FG project. For example, on the question regarding if the participants felt that they were heard and taken seriously, it would have been very good to add a "why?" as this could have given many clues in understanding the impact. Furthermore, the way the questions regarding the three capacity aspects were formulated: two written questions and two scale questions (see Appendix 1) turned out to be difficult in the comparison between the aspect. Looking at the responses (fig. 16) it seems as if the scale questions (importance and action) showed much less impact because many of the participants stated that they cared a lot before and, thus, could not go much higher. On the contrary, in the open question they could state "I had a lot of previous knowledge, but I got some new ideas". Thus, as the open question did not have a maximum or limit, it could show smaller increases in capacity, and did thus more accurately show the actual impact. Because of this learning experience, careful planning of the analysis method and data, cannot be stressed enough in such a complex impact study as the one conducted in this thesis.

At the same time as more planning could have been beneficial, on reflection, due to the complex and broad nature of this research project, I strongly

believe that the explorative and open-minded approach was necessary. Therefore, when reflecting over the process in retrospect I find it difficult to say that I could have done anything very differently. In general the research process has been demanding but fruitful, and has enabled me to critically examine my own work by the use of multidisciplinary theories from design, management and systems thinking. Finally, the most successful aspect of the thesis lies in the fact that it has inspired me to explore at greater lengths the intersection between theory and practice in systemic design and sustainable development. The journey has only begun.

5.3.
AREAS OF FURTHER EXPLORATION

This thesis should be seen as an experiment, and a contribution to the discussion, about how and if design can contribute to the development of practices and mechanisms driving systemic change, in sustainable development. This suggests that the thoughts and ideas presented in this thesis are subject to debate. In fact, I believe that it is through societal, policy and academic debate and experimentation upon the issues addressed in this thesis that our understanding and practice for driving sustainable development progresses. In this process designers are useful because by selection and training, most designers have developed skills that are relevant at larger levels of scope and complexity. Most designers are good at visual thinking, conducting creative processes, finding missing information, and making necessary decisions in the absence of complete information (Sanders & Stappers 2008).

The research in this thesis is based on the co-design process in the FG project, which was an experiment to create and support interaction between citizens and decision makers, by facilitating a future envisioning experience. In this process scenarios for a climate neutral city far from the present reality and time, were co-created. Thus, the FG project dealt with a future so far ahead that the policymaking and planning processes, as they are designed today, could not reach. Yet, it is a fact that the decisions made in these processes today, will affect the possibilities of the future citizens to live a healthy life, which with the current planning practices does not seem possible (Larsson & Bolin 2014). Due to this fact, it is crucial that we transform our current decision-making and planning processes into practices generating sustainable structures and life styles, which allow both citizens of today and tomorrow to live a healthy life. This transformation means that we need to develop ways to expand our short-term planning and decision making into more systemic practices, by including more perspectives and long-term thinking (Loorbach 2010). What is produced in the FG project, and this thesis, can therefore be seen as a part of a debate on how to create this transition, by exploring how to create ways for including more long

term thinking into our development processes, and how to include everyone in a democratic formation of a sustainable future. In such transition, this thesis has highlighted the potentials of design as a *boundary object* (Jones 2014, 124), which can assist interaction in multidisciplinary network processes between society, policy and academia. Furthermore, design has been emphasized as an *infrastructure* for social innovation (Björnvinsson et al. 2010, 3), where multidisciplinary network processes can be facilitated and supported on a long-term. This approach to design is still in an emerging stage and requires both practical and theoretical exploration, before it can actually be acclaimed as a useful method.

At the same time as this thesis took on a long-term perspective to societal problem solving, it also focused on the contribution of design in generating immediate engagement for climate transition, by building social capacity for change among citizens and decision makers. Here collaborative design activities were highlighted as potential methods for capacity building, regarding the creation of *rational*, *emotional* and *operational capacity*. In addition, this approach to design requires further research before it can be claimed as a strong method for such application.

In the research of the aforementioned aspects I would like to argue for the importance of applying an explorative, multidisciplinary approach, linking theory and practice, as has been done in this thesis. This is important in order for our current practices and understandings to expand beyond the current paradigm, and allow new sustainable practices to emerge. To do this, I believe that we need to step out of out current societal 'silos' and start building links across disciplines, professions and societal structures. The highly complex and wicked challenges we are facing, which pose major threats to our societies, demand rapid, well-informed and broad action. To achieve this transition we need to have the courage to step out of of traditional modes of conduct, into an open explorative change process.

"NO PROBLEM CAN BE SOLVED FROM THE SAME LEVEL OF CONSCIOUSNESS THAT CREATED IT"

Albert Einstein

6.

REFERENCES
AND APPENDIX

6.1.
WORKSHOP DOCUMENTS (W)

W01   Ekocentrum's funding application
(*Ansökan Wilhelm Röhss Donationsfond)*

W02   Planning document workshop 1 (*Workshop 1 planeringsdokument*)

W03   Schedule workshop 1 (*Körschema WS1*)

W04   1 Promotion flyer (*Framtida Göteborg - flyer*)

W05   1 promotion description *(Framtida Göteborg - infoblad)*

W06   Application texts (*Ungdomarnas intresseanmälan)*

W07   Contact list recruitment young adults
(*Kontaktlista rekrytering ungdomar)*

W08   Group division workshop 1 WS1 (*Gruppindelning WS1*)

W09   Power point presentation WS1

W10   12 Envisioning posters on Gothenburg 2050 WS1

W11   5 pages summary of ideas from posters
(*Ungdomarnas vision i fem delar)*

W12   1 warm-up poster WS1

W13   1 presentation idea poster WS1

W14   1 Feedback poster WS1

W15   1 expectations poster WS1

W16   10 videos with approximately 33,5 minutes of video material WS1

W17   13 matters of the heart (*Ungdomarnas hjärtefrågor*)

W18   6:07 min video with the young adults matter of heart
"Göteborg 2050 -18 ungdomar om en hållbar framtid I vår stad" [On-line], Available: https://www.youtube.com/watch?v=l-y7Dl91JgQ [9 Aug 2015]

W19	1:40 min video made by the young adults "Vilken framtid väljer du?" [Online], Available: https://www.youtube.com/watch?v=Bm4OxORyEU8 [9 Aug 2015]
W20	Planning document workshop 2 (*Workshop 2 planeringsdokument*)
W21	Schedule workshop 2 (*Körschema WS2*)
W22	Contact list recruitment politicians (*Kontaktlista rekrytering politiker*)
W23	Group division workshop 2 – (*Gruppindelning WS2)*
W24	3 videos with approximately 34,5 minutes of video material – WS2
W25	2 pages of impression notes by the facilitators
W26	1 page of observation and reflection notes by the design researcher
W27	Final project report - Framtida Göteborg - 18 ungdomar och 13 politiker i dialog om en hållbar framtid i vår stad, [Online], Available: http://www.ekocentrum.se/om-oss/samverkan/framtida-goteborg/ [9 Aug 2015]
W28	PowerPoint presentation - WS2
W29	5 Back casting posters on Gothenburg 2050 – WS2

6.2.
INTERVIEWS

6.2.1.
INTERVIEWS YOUNG ADULTS (Y)

Y01	10.03.2015, online questionnaire, female, 21 years old, expert
Y02	11.03.2015, telephone interview, female, 16 years old, novice
Y03	12.03.2015, online questionnaire, female, 17 years old, unknown
Y04	12.03.2015, online questionnaire, female, 24 years old, expert
Y05	12.03.2015, telephone interview, female, 21 years old, expert
Y06	12.03.2015, online questionnaire, male, 22 years old, novice
Y07	14.03.2015, online questionnaire, male 19 years old, novice
Y08	14.03.2015, online questionnaire, male 16 years old, expert

Y09	16.03.2015, online questionnaire, female 18 years old, activist
Y10	16.03.2015, telephone interview, male, 17 years old, novice
Y11	16.03.2015, online questionnaire, female, 17 years old, activist
Y12	17.03.2015, telephone interview, male, 18 years old, novice
Y13	17.03.2015, online questionnaire, female, 26 years old, expert
Y14	18.03.2015, online questionnaire, female, 25 years old, expert
Y15	19.03.2015, online questionnaire, female, 19 years old, activist

6.2.2.
INTERVIEWS POLITICIANS (P)

P01	10.03.2015, online questionnaire, male, 51 years old, environm.
P02	11.03.2015, online questionnaire, male, 58 years old, social
P03	11.03.2015, online questionnaire, male, 56 years old, environm.
P04	14.03.2015, online questionnaire, female, 69 years old, social
P05	16.03.2015, online questionnaire, female, 52 years old, social
P06	19.03.2015, online questionnaire, female, 34 years old, social
P07	19.03.2015, telephone interview, female, 58 years old, unknown
P08	19.03.2015, online questionnaire, male, 24 years old, environm.
P09	23.03.2015, online questionnaire, male, 24 years old, social
P10	23.03.2015, online questionnaire, female, 30 years old, environm.
P11	01.04.2015, online questionnaire, male, 31 years old, environm.

6.3.
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6.4.
APPENDIX 1

INTERVIEW QUESTIONS

The 30 interview questions were individualised for the two different participant groups in the project, namely politicians and young adults. Each interviewee was asked between 18 and 23 questions according to the length of their participation in the project. Furthermore, the language formulation of the questions varied slightly depending on which of the participant groups the questions were targeted towards.

UNDERSTANDING OF GOTHENBURG'S SUSAINABILITY TARGETS FOR 2050

1. Write a few words about your understanding of what this goal means in practice: "The year 2050 Gothenburg will have a sustainable and fair level of green house gas emissions."

THOUGHTS BEFORE THE WORKSHOP PROJECT

2. What were your expectations before the workshop project began?

3. Mark the profile that you think best corresponds with you:

Expert in sustainable development: The average expert participant is studying a topic related to social, ecological and / or economic sustainability. She or he is sometimes a bit active in an organization or group that works with any kind of sustainability issues. The majority of the participants in this profile were attending both the first (15/10) and (10/11) workshop in the project "Framtida Göteborg". These participants' primary reasons for attending were to receive and share knowledge, perspectives, tools and ideas within sustainable development. Some other less important reasons was to make their voice heard and to have fun.

Activist in sustainable development: The average activist participant has a keen interest in social, ecological and / or economic sustainability. She or he is very active in an organization or group that works with any kind of sustainability issues. The majority of the participants in this profile participated in the first workshop (15/10) in the project "Framtida Göteborg". These participants' primary reasons for attending were to receive and share knowledge, perspectives, tools and ideas within sustainable development. Further reasons to participate were to make their voices heard, and / or to an adult in the person's environment recommended him to participate.

Novice in sustainable development: The average novice participant is curious about social, ecological and / or economic sustainability. The majority

of the participants in this profile participated in the first workshop (15/10) in the project "Framtida Göteborg". These participants' primary reason for attending was that an adult in their environment, Ekocentrum's staff, or a friend had recommended them. Further reasons to participate were to have fun.

4. Mark the profile that you think best corresponds with you:

Mainly environmental profile: Environmental and climate issues mentioned as priority issues for the majority of politicians in this group. Some of them also sits in networks, groups or committees directly related to environmental and climate issues.

Mainly social profile: Social issues such as employment, integration and immigration, security and safety, geriatric care and education are mentioned as major concerns for the majority of politicians in this group.

EXPERIENCE OF THE CO-DESIGN WORKSHOPS

5. Was it worth attending you think? Yes/No/Other:

6. What was the most important thing you got out of the workshop?

7. What do you think about the workshop set-up? (What worked well/less well with e.g. the exercises, the groups, the place, the tasks, the themes, and the length)?

8. How was the collaboration with the other young adults? (e.g. demanding, smooth, challenging, enriching, fun, boring, easy, difficult, inhibitory, developing)

8. How was the collaboration with the young adults and the politicians? (e.g. demanding, smooth, challenging, enriching, fun, boring, easy, difficult, inhibitory, developing)

9. What was it like to envision and imagine the sustainable Gothenburg 2050? (e.g. easy difficult, fun, boring, challenging, exciting, depressing, inspiring)

10. Did you feel you could express your opinions, thoughts and ideas, and that they were taken seriously? Yes/No/Unsure/Other:

11. Did you also attend the second workshop with politicians 10/11-2014? Yes/No

THOUGHTS AFTER THE WORKSHOP PROJECT

12. Write a few words on how you feel about Gothenburg's sustainable future. (e.g. neutral, positive, negative, unsure, curious, depressed, hopeful, pessimistic, targeted, etc.)

13. Has your feeling on Gothenburg's sustainable future changed if you compare before workshop project with afterwards? (Justify)

14. How much do you care about climate change and sustainability issues? (How important is Gothenburg's sustainable future for you personally?) Indicate on a scale between 1-5, where 1 is 'not at all' and 5 'very much'

16. How much did you care about climate change and sustainability issues before the workshop project? Indicate on a scale between 1-5, where 1 is 'not at all' and 5 'very much'

17. How important is the issue of climate change in your policy work? Indicate on a scale between 1-5, where 1 is 'not at all important' and 5 'very important'

18. How important was the issue of climate change in your policy work before the workshop project? Indicate on a scale between 1-5, where 1 is 'not at all important' and 5 'very important

20. Do you feel that you have knowledge you can use to contribute to sustainable development in Gothenburg? (e.g. facts, ideas, visions, perspectives, arguments, contacts, forums etc.)

21. Has your knowledge about sustainable development in Gothenburg changed if you compare before the workshop project with afterwards? (Justify)

22. Do you feel that you have knowledge you can use to work politically with climate adaptation in Gothenburg? (e.g. facts, ideas, visions, perspectives, arguments, contacts, forums etc.)

23. Has your knowledge about climate adaptation in Gothenburg changed if you compare before the workshop project with afterwards? (Justify)

24. How actively do you contribute to sustainable development in Gothenburg?

(e.g. read, think, discuss, share, organise, demonstrate, write, inform, change behaviour, etc.)

Indicate on a scale between 1-5, where 1 is 'not at all actively' and 5 'very actively'

25. How actively did you contribute to sustainable development in Gothenburg before the workshop project? Indicate on a scale between 1-5, where 1 is 'not at all actively' and 5 'very actively'

26. How actively do you work politically with climate change adaption in Gothenburg?

Indicate on a scale between 1-5, where 1 is 'not at all actively' and 5 'very actively'

27. How actively did you work politically with climate change adaption in Gothenburg before the workshop project? Indicate on a scale between 1-5, where 1 is 'not at all actively' and 5 'very actively'

THE VISION OF A SUSTAINABLE GOTHENBURG 2050

28. What do you think should be done with the ideas and the vision that was produced in the workshop project?

29. Have you already, or have you thought of, using the material produced in the workshop project in any way? (e.g. share online, present, tell someone about, develop, inspire, discuss)

30. Can the material be useful in your policy work? Yes, I think so / Unsure / No, I don´t think so / Other: