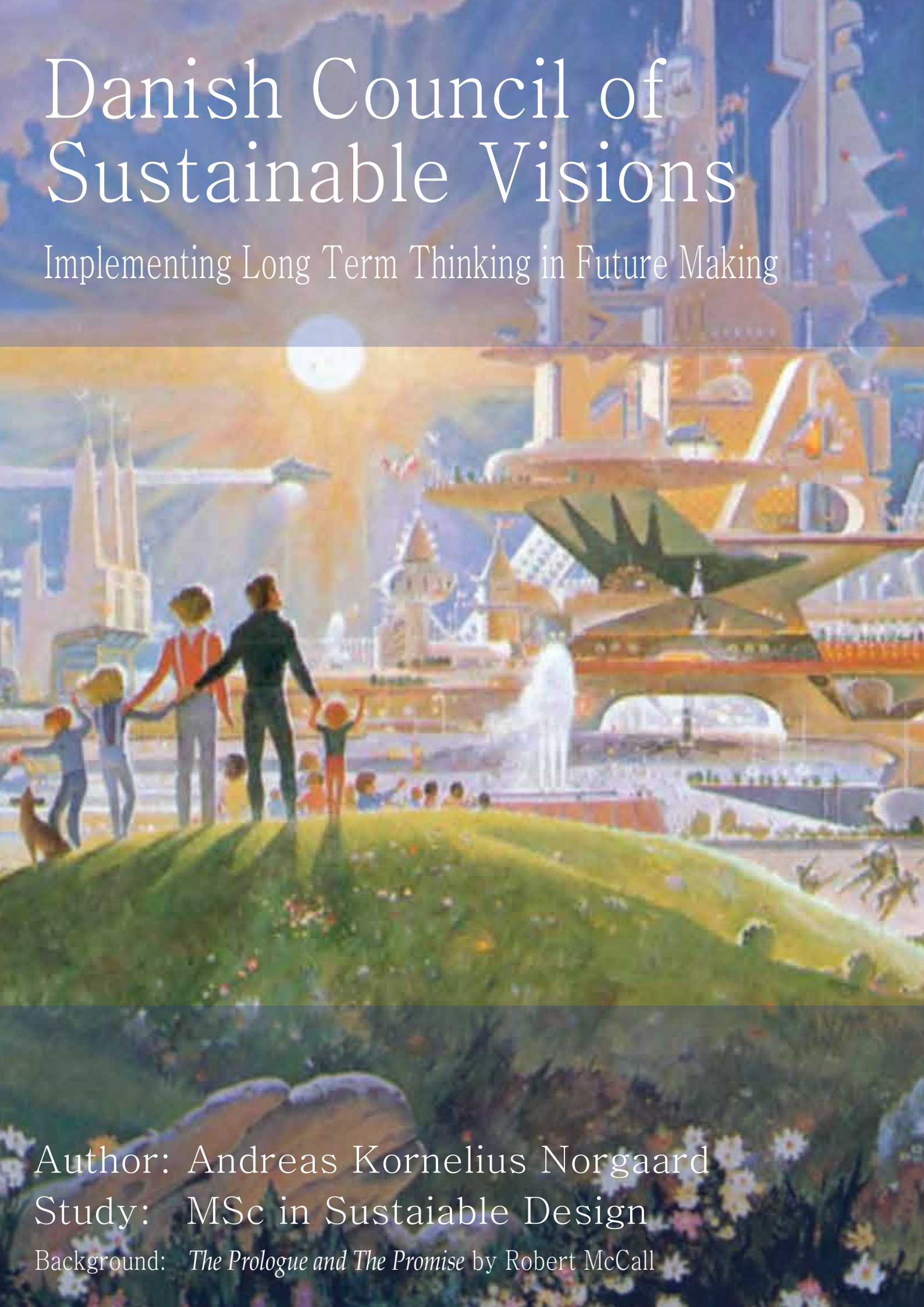
Danish Council of Sustainable Visions

Implementing Long Term Thinking in Future Making



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Abstract

Due to the escalating climate change, during the last two decades scholars from different fields have engaged in investigating how to enable transitions, to make sustainable transitions possible. Together these insights and academic texts make a loose field known as transitions theories. Within transitions theories, the idea of visioning, the act of envisioning long-term visions, is proposed as one of multiple elements in enabling transitions, as visioning can have a coordinating and aligning effect on climate efforts in the present, towards a desirable future.
However, due to the immaturity of the field, there are still vague areas in unconsolidated areas. Some of these is what form visioning should take, and how it can be implemented in an institutionalized way, as part of 'future making' in society.

In this thesis, I investigate how to design a visioning practice that can be implemented in such an institutionalized way, and part of this design is the use of fictional practices. This is due to the fact that methods of imagining the future in decision making, is at present based on projection of the future based on the present, not visions. These methods are bound to the society as it is, and have difficulties imagining something radically different, and thereby sustainable transitions. And fictional practices can help to break this limitation, by using a method of more open imagination. The design outcome is an advisory council called the Danish Council of Sustainable Visions, and is a practice of visioning through methods of 'world building', workshops, speculative documentaries and speculative fiction. The aim of the Danish Council of Sustainable Visions is not to plan or decide on specific futures, but to open up conversation and debate on what futures are more desired than others, as well as how they could look.

In other words, in the present societal structures in Denmark, there seems to be a great lack of actors engaged in imagining and developing futures for the society. This leads to development of the society, and hereunder technology, to be based on random chance. The aim of this thesis is to counter this, by designing implementable abilities to imagine and develop desirable futures of the Danish society.

Table of Content

Prologue

The world is changing
Humanity faces a challenge in size and complexity as never before

Some lose hope

Others cling to magic properties of technology
In the hope it will save us
while we do nothing

But nothing will save us
but ourselves

We need to start to ponder
on what we want the world to become
We need to start imagine
futures we want to live in.
But in order to do so,
we need to reimagine imagining.
Find new ways of imagining futures
The finding of futures available to us

The only thing that exists is the present around you.

The past existed once, but no more
Left is the stories and memories of what where
Edited to look like we think it was
The past is now an imagination

The Future does not exist and never have
We have no way of knowing what will happen
as it is yet to be decided

But if we do not start to imagine more futures
and fight for the futures we imagine
the future is out of our hands.

– Andreas Kornelius Nørgaard

1 Introduction

There is an evident mismatch between the escalating climate change and the limited action to counter it.

It has become a largely uncontested fact, at least in Denmark, that climate change is a consequence of human production and consumption *(videnskab.dk, 2019)*. Within governance, the Paris agreement has been signed and emission reduction goals have been set. In the private sector, an increasing number of green products hit the market. And individuals start to consume in a more sustainable way *(Kristeligt Dagblad, 2019)*

However, if you look at the curves of CO2 emissions up till now, and the expected CO2 emissions in the future, you will find that our current path of development is not compatible with the goals and agreements *(Klimarådet, 2021)*. This could indicate a systemic problem in the work for change. That the current efforts in society to implement sustainable production and consumption is not effective enough, for a fast green development that will keep the global temperatures within the Paris agreement *(Klimarådet, 2021; politiken.dk, 2019; berlingske.dk, 2018; information, 2018; videnskab.dk, 2019)*.

1.1 Design for Sustainable Transitions

In the field of Sustainable Design, this inefficiency has caused a slowly moving shift in focus. Where the focus earlier was almost solely on making products more sustainable, or replacing them with services, there is now an increasing focus on the larger systems that these products and production are placed in *(Gaziulusoy and Erdoğan Öztekin, 2019)*.

These systems are known as socio-technical systems. They consist of both technical objects like physical objects and technologies, but also social aspects like habits, expectations and relations. The technical and social elements are interconnected *(Smith and Stirling, 2007)*.

The number of interconnections is endless, and mapping them all is both impossible and irrelevant. But the knowledge of their existence, and the mapping of some of them, are key aspects in working with socio-technical systems.

This way of thinking in systems, instead of products, is known as *systems thinking*. The systems thinking perspective makes it possible to evaluate to what extent socio-technical systems can be expected to become *sustainable enough* in their present form to be compatible with the Paris agreement *(Loorbach, 2010)*.

When *systems thinking* is implemented in a *sustainable design* context, socio-technical systems are viewed as ‘objects’ that can be designed or redesigned, in order to increase the level of sustainability. The field of systems thinking within Sustainable Design is also known as *Design for Sustainable*

Transitions (DfST), and is a rather new, but growing, field. *Transitions* in this context are *radical* shifts in the system's setup or infrastructure. With radical meaning that it challenges the system on a basic level, instead of merely having smaller incremental changes in elements over time. Research within DfST investigates how design can *enable* such transitions, as well as how to design what the socio-technical systems should transition into *(Gaziulusoy and Erdoğan Öztekin, 2019)*.

An example of a sociotechnical system could be the personal transportation in cities, and the problem could be that cars pollute. A product-focused redesign could be better filters for the car's exhaustion, also known as an 'end-of-pipe' solution. Or a redesign of the traffic flows, to lower the driving time.

A redesign on a system level, a transition design, could be a city based on bike transport instead of cars altogether. As a transition is a larger and more overall change, it contains a wide range of smaller changes. For example a 'car free city' would require new traffic systems, new currier systems, new laws and regulations, new habits, and new technology. New ways of doing everything related to transportation.

This makes 'transitions' as design objects both complex and multifaceted, making them challenging to both comprehend and work with as a whole *(Gaziulusoy and Erdoğan Öztekin, 2019)*.

1.2 New fields emerging

DfST is a new and emerging field. It is still in development as its own field with stabilised ideas and methods. While DfST is of course a part of the overall field of design, it is also part of the overall research on sustainable transitions *(Gaziulusoy, İ., 2021)*.

But the field of research on sustainable transitions is *also* an emerging field in itself *(Gaziulusoy, İ., 2021*). As the need for sustainable transitions is growing, during the last one to two decades, scholars from different fields have engaged in the investigations on how transitions happen, and what activities can be done to enable them. I will from here on refer to this field of research on sustainable transitions as *transitions theories (Gaziulusoy, İ., 2021)*.

As the field of *transitions theories* is new however, and most scholars involved still attach themselves to their original field, there are still gaps between findings, and it is a much more chaotic field than many others *(Gaziulusoy, İ., 2021)*.

But while there are still some different directions in transitions theories, due to the newness and chaotic nature, there are also some common understandings being established. One such is a common understanding of the socio-technical systems of markets and industries as very rigid and hard to change. And that existing governance practices are in themself part of stabilising these socio-technical systems. Stabilising means making them behave more consistently, and thereby increasing the rigidity. *(Loorbach, 2010)*.

In transitions theories there are different suggested methods to loosening this rigidity, as well as approaches to increase the pressure for change in the socio-technical systems. And some of these

suggested methods have moved from theory stage, to the experimental stage, with pilot projects investigating the effectiveness of the theorised methods in smaller setups *(Ceschin, F., 2014)*.

1.3 Scope

Due to the fields of DfST and sustainable transition being new and immature, I have experienced some gaps and areas of vagueness that made me ponder. These gaps and areas of vagueness became the scope of my thesis.

Large scale future transitions, rather than short scale present transitions

Through the theories of transitions I have encountered, the focus of experimentations was mainly on the implementation of smaller elements or setups. Examples of this could be bicycle taxis in Cape Town *(Ceschin, F., 2014)* or water quality in the harbour of Copenhagen *(Jensen, et al., 2015)*.

While these might give insights into some of the dynamics in transitions, it is not necessarily translatable to projects with a societal scope, as part of enabling more large-scale societal transitions.

A transition scholar much used in this thesis, Loorbach, even argues that if small scale projects are not aligned and coordinated towards a long term vision, they will work in different directions, and not be part of enabling large scale transitions *(Loorbach, 2010)*.

But how can you integrate the ideas from transitions theories, in a way that can be part of enabling large-scale transitions in the far future?

Visioning

Within transitions theories there are different activities that could be part of enabling transitions. One such enabling activity is visioning. The process of creating long term visions 30 years from now *(Loorbach, 2010)*. However, I have found the ideas of visioning to be vague and unconsolidated through the theories. Aspects like who should facilitate the making, what format they should have, and how they should be implemented, is not specified to any large degree *(Loorbach, 2010)*. But how can you conceptualise the different potential roles and formats of visioning, into a more consolidated entity? And how to design a visioning practice that can have a chance of implementation?

Governmental Bureaucracy

In transitions theories working with visions, the efforts from the governmental bureaucracy to enable sustainable development is largely ignored. Common practice is to equate the governance of the governmental bureaucracy with governance from companies and interest groups *(Loorbach, 2010)*.

However, I regard the governmental bureaucracy as an important part of integrating the ideas from transitions theories as it is a constant governing practice. But how to design a visioning practice that can be implemented in relation to governmental bureaucracy?

Artistic Methods

Through my study of visions, I found many of the approaches to point towards an increased use of artistic methods. *(García, C. and Gaziulusoy, İ., 2021; Barber, J. 2018; Nikoleris, A, 2018)* Artistic methods are methods working with a free imagination, like science fiction, and thereby being different from scientific modelling. However, I experienced a vagueness around the subject, and how to implement them in the context of efforts of enabling transitions. How can fictional practices become part of transition enabling efforts, as these are typically very scientifically based?

Location covered

The location covered in the investigation is Denmark. And thereby it will not investigate how transitions can be enabled through international collaborations or agreements.

1.4 Problem Formulation

This scope let to the following problem formulation:

Through a Sustainable Design perspective, in what way can a visioning practice with a societal scope be designed? And how should this design look, to enable visioning to be implemented and positioned as a governance entity for coordination of, and problem solving in, sustainable transition efforts? And in what way can such a design benefit from artistic methods, and how can they be included in the design?

1.5 Reading Guide

Chapter 1: ***Theories on Sustainable Transitions and Future Making***
To understand sustainable transitions I will use the *Multi Level Perspective*. In order to find out what efforts can enable them, I will use *Transition Management*. From *Transition Management* I find the importance of using long term visioning, and through multiple transitions theories I will consolidate the roles of visioning, as well as requirements to content and facilitation. Furthermore, in order to design a visioning practice able to be implemented, I will use the concept of ‘future objects' to make visioning comparable with existing efforts in the governmental bureaucracy.

Chapter 2: ***Analysis of Infrastructure of Future Making in Denmark***
To find ways to implement visioning, I will use the insights, concepts and framework from chapter 1, to evaluate current efforts in governance and visioning to enable sustainable transitions. Here I will focus on the governmental bureaucracy, and practices that can be said to connect to this. The investigation of the governmental bureaucracy itself will mainly be based on two interviews, with a civil servant in the *Ministry of Finances*, and a civil servant in *Center for System Analysis*. Investigations on connected practices is based on publicly available online material.

Chapter 3: ***Design Part I: Design Synthesis***
I combine the insights from theories and analysis to gather a range of design criterias for the design of a visioning practice, capable of both enabling transition but also able to be implemented.

Chapter 4: ***Design Part II: Methodology***
To make a design capable of meeting the criterias, I will engage in a design process. This design process is based on mix and matching elements. In order to find potential elements I will evaluate existing experimental visioning practices, *Future Tours Travel Agency* and *Narrating Climate Futures* as well as gather possible elements for the design through research. These are then conceptualised into a design, through mixing and matching them, and a continuous evaluation through developing an evaluation tool.

Chapter 5: ***Design III: The Danish Council of Sustainable Visions***
I show the design itself, the Danish Council of Visions. Through explanations, illustrations and implementation examples, I will show the structure and possibilities of the design.

Chapter 6: ***Discussion***
I discuss the design, design process and the sustainable transitions in general.

Chapter 7: ***Conclusion***
I then conclude the work and the thesis as a whole.

APPENDIX I-III:
Available in other document

Prologue II

There is a race going on

On one side, the escalation of climate change

On the other side, the development of humanity's ability to change

- *Andreas Kornelius Nørgaard*

2 Theories on Sustainable Transitions and Future Making

In order to be able to engage in sustainable transitions through design, I will in this section use the Multi Level Perspective to investigate how you can perceive transitions, and understand how they work.

As this is mainly useful to evaluate already happened transitions, I will afterwards introduce Transition Management, as this provides a framework to understand what activities can be introduced to *enable* transitions, as well as how these activities need to be coordinated or governed.

This investigation leads to visioning as a governance tool in transitions, and to be able to use them as a design object I will therefore make a deeper investigation of different possible roles of visioning in sustainable transitions, and from there conceptualise how a visioning practice should look.

To compare them with existing governance practices, I will investigate how you can perceive visioning as an object that makes decision making for the future possible, and can be compared with objects in existing governance practices. This will also allow visioning to become more stabilised as a design object.

All of the above will be done through theoretical texts, and an interview with a scholar.

Reading guide

Section 2.1: I use the Multi-Level Perspective to categorize activities and actors involved in transitions, and how they relate.

Section 2.2: I react to the fact that MLP is better for evaluating transitions than enabling them, by using Transition Management for further investigation. This shows what types of activities enable transitions, as well as how these activities can be governed, coordinated and aligned. .

Section 2.3: As visioning is an important element in Transition management, I consolidate the different perspectives of roles and format of visioning. This in order to start the design criterias for the design of visioning practices.

Section 2.4: Then I place visioning in a perspective of future objects, objects that enable decision making of the future. This will allow me to make them into design objects, as well as make them comparable to objects that existing governance practices are based on.

2.1 Understanding Transitions

As society-scale socio-technical systems are very complex to comprehend, so are transition processes. This complexity includes politics, policies, technologies, habits, and much more. In order to categorise activities and dynamics involved in transitions, I will use the Multi Level Perspective (MLP).

The Multi Level Perspective

MLP is a tool developed to investigate change, and the lack thereof, in what it calls *regimes*. These *regimes* are *networks of elements part of providing a societal need*. The societal needs could be housing, transportation, food production etc. And the elements are the interconnected entities that are part of this provision, as laws, companies, natural resources needed, an available service, consumers, interest groups, etc.

The model used in MLP has three levels. The *regime*, as is already mentioned, the *landscape* and the *niches*. (see fig. 1) The landscape is all the things outside the regime, the world at large, that affects the regime. This could be climate change, or the political winds. The niches are pockets inside the regime that enable different innovations to develop, than what is possible in the regime at large.

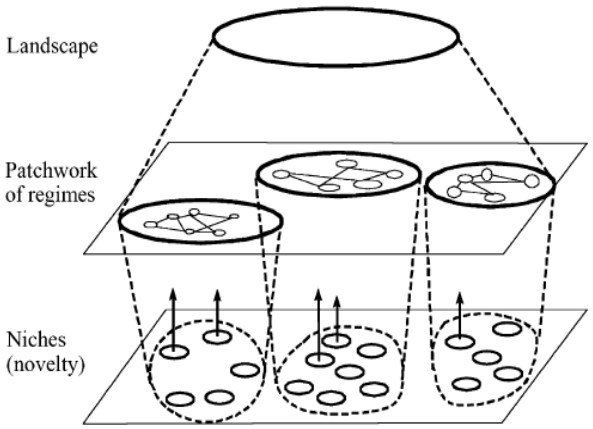


Fig. 1: The three layers: Landscape, Regimes, Niches (Geels, 2002)

Regimes

In short, the MLP is inspired by the ideas of evolution and natural selection by Charles Darwin. But instead of the development of species, it is used to explain the development of innovation and change, here under transitions *(Geels, 2002)*.

The MLP model is based on the idea that through the years regime elements will react and adjust to each other. This will make the regime slowly more and more stable and streamlined, with standardised ways of doing things, codependency between the elements in the regime, and long term investments made in the existing setup.

This process is in MLP defined as a *co-evolutionary* process. And this process will increase the effectiveness of the regime, and at the same time make it easier for specific elements that are *compatible* with these standardized ways, to be successful. These elements could for example be technological innovations. This co-evolutionary process is seen as the *selection environment* of a regime. An environment that favors some elements, and disfavor others, and thereby the chances for these elements to become successful in the regime. And besides becoming more efficient through this co-evolutionary process, the regimes will also become more rigid and hard to change *(Geels, 2002)*.

As a consequence, the selection environment will become *hostile to radical change*. R*adical* change is change that is by default incompatible with the selection environment, and often most elements in sustainable transitions would go under this category, as sustainable transitions will require larger shifts, and fast.

In general you could say that across all selection environments in regimes, the selection environment is in favor of things close to status quo or common practice. This effect is also known as *path dependency*, as it will be easier in regimes to follow the path, the existing direction, than making another. When this effect is at work specifically with technologies, making currently used technology hard to exchange, it is often referred to as *lock-in* to a specific technology *(Geels, 2002)*.

An example of this hostility to radical change could be the access and affordability of certain resources. If a new product or innovation is based on resources that are already widely used in the regime, these resources will be cheap and accessible, and so will the product or innovation. Resources not already widely used in the regime will be more expensive, and thereby new products based on these.

But understanding the regimes as static would be wrong, as regimes have *adaptive capacities*. Adaptive capacities are elements inside the regime that enable change. Enable adaptation. These could be economical resources, flexibility in decision making, or abilities of regime actors to learn something new *(Geels and Schot, 2007)*.

When the regime experiences pressure from outside the regime like climate change (also called landscape pressure), the balance between the selection pressure and the adaptive capacity will determine how much the regime will be able to change. If able, the regime will adapt to the pressure, if not, the pressure will rise. If the pressure gets large enough, the regime will have to open for external elements *(Geels and Schot, 2007)*.

In a transition context, adaptive capacities can both hinder and help transitions, depending on whether they are used for stabilising the regime, or used to transition it.

Niches

As said, radical innovations are most often not compatible with the regime due to the selection environment. But inside the regimes there will be pockets where the general selection environment, or selection pressure (pressure from the selection environment), does not apply. These pockets are

called *niches* (see fig 1). In the niches there will be an *alternative* selection environment, and thereby the niches will favor other elements than the regimes at large. Therefore this is where radical innovations can be further developed, before they are (if they are) truly integrated in the regime *(Geels, 2002)*. These alternative selection environments will be possible, if the niches are sheltered from the selection pressure of the regime. The sheltering could in practice be subsidies, funded research and pilot projects, as these efforts will shelter the niche from the market dynamics to some extent.

The aim is to get a network to grow around a niche, alternative to the regime although it should include some regime actors. This network will be developing the innovation further, as well as allowing new network elements to be created, like new standards, regulations, knowledge creation or investments. As the network grows the niche will get stronger, and might become part of the co-evolutionary process of the regime at large, and thereby change the regime selection environment so it becomes compatible with the innovations (see fig. 2) *(Geels, 2002)*.

An example of a niche story is the danish windmill adventure. Starting as a state funded project, a niche, now being part of the energy regime in Denmark. But while the niche perspective is often used in small, very technology based pilot projects, you can easily widen the scope. For example, Copenhagen is a niche for biking culture. And on an even larger scale, Denmark is a niche for green energy, by generating a large and increasing amount of power from windmills.

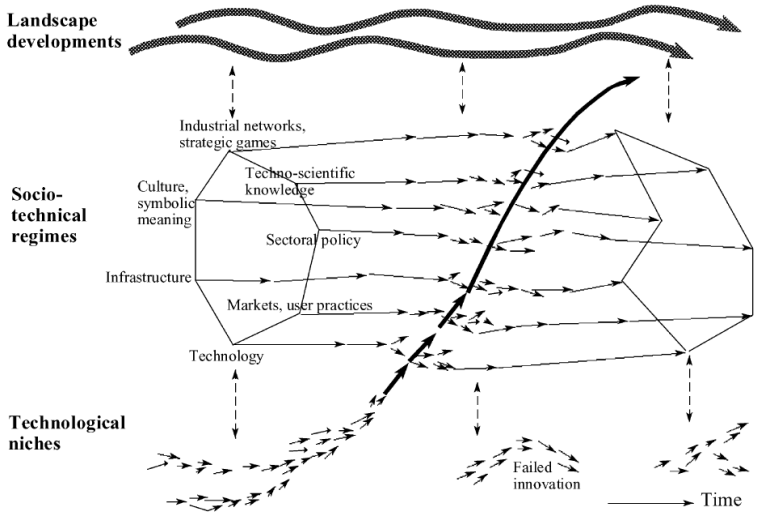


Fig. 2: Niches changing the regimes (Geels, 2002)

Landscape

The last level is the *landscape* level. This is the society and world at large, relevant to the regimes because it can put pressure on the regimes to change direction. Elements of the landscape could be anything from the political winds, climate change, new discourses, general development etc. The landscape produces its own pressure, the *landscape pressure*, on the regime, making change a necessity *(Geels, 2002)*.

2.2 Enabling Transitions

While MLP is good for understanding what *causes* changes or stability in regimes, it can be harder to use if you want to *enable* change, as it is not very prescriptive. But other parts of transitions theories are more prescriptive, and formulate suggestions for efforts and activities that can be part of enabling sustainable transitions. Three of these theories, or concepts, are *articulation of landscape pressure*, *Strategic Niche Management* and *Transition Managemen*t. I will briefly touch the first two, but while all three are used to some extent in the thesis, Transition Management is one of the main theories used, and will be further elaborated.

Articulating Landscape Pressure

According to Smith et al *(2005)*, elements that make up the landscape pressure on a regime, will push in different, sometimes opposite, directions. A way to make the landscape pressure have more influence, is through an *articulation of landscape pressure.* It is the process of consolidating different landscape pressure elements into a single pressure, and then translating into something that is easy for the regime to understand. And thereby more easy to see what changes need to be made, leading to an increased pressure for it to happen *(Smith et al, 2005)*. An example of this could be to consolidate many different elements related to climate change, and translate them into a suggested transition for a regime.

Strategic Niche Management

Strategic Niche Management (SNM) is a field evaluating in what ways niches can thrive, and most easily be integrated into the regime at large. And it is one of the most common approaches in MLP related theories to enable transitions, as well as in existing societal efforts. Besides conceptualising different ways of sheltering, an important factor in SNM is the network creation around niches. Niches should not just prove the feasibility of an innovation, but include regime actors in the network to make the niches become part of the co-evolutionary process of the regime *(Schot and Geels, 2008)*.

Transition Management

Transition Management works from the premise that one of the main obstacles in enabling transitions is that activities within sustainable development are not aligned towards a desirable future. And thus making the activities uncoordinated and working in different directions. To counter this, Transition Management has a framework that includes different activities working with different time scales, and ways to create coordination and alignment between them through transition governance *(Loorbach, 2010)*.

Transition Management

According to Loorbach *(2010)*, one of the reasons that potential sustainable transitions are not succeeding in breaking the path dependency in the regimes, is that sustainable transitions lack *governance*, and due to that, *coordination*. When transitions *do* happen on rare occasions in the regimes, it is *not* through a coordinated effort towards a specific desired future, but simply the outcome of market dynamics. In MLP wording you could say it mainly happens through uncoordinated co-evolutionary processes *(Loorbach, 2010)*.

Earlier there have been some rare large interventions from the state to help transitions, like when nuclear power was implemented in the US. But this now happens to a very limited degree in most countries, and anyway, Loorback (ref) does not believe this top-down approach will work with the complexity of the markets of today, or the complexity of the climate crisis. It is not a single object, or technology, that needs to be changed. It is across all types of production and consumption.

As regimes have no board, and as top-down governmental governance supposedly cannot handle the complexity, Loorback introduces a framework Transition Management (TM). This is based on the idea that instead of having a single entity in place to govern transitions, governance will happen through the coordination of different types of governance activities *(Loorbach, 2010)*.

Long Term Thinking

In the perspective of Transition Manegement, if you want to coordinate transitions governance activities, you first of all need to engage in *Long Term Thinking*. Long Term Thinking is about thinking very far ahead in time, to understand how sustainable transitions should look and come about. This is needed to align the transition-related activities of today with a desired future, instead of just making short and temporary solutions. And thereby coordinate distributed governance activities.

But besides making alignment to a desired future, it also enables alignment *between* transition enabling activities in the *present*, so they work together instead of in multiple directions. However, long term thinking is not part of the present state of governance *(Loorbach, 2010)*.

"Long term concerns and governance have no institutionalised place in regular policymaking, which is generally focused on the short and mid term because of political cycles, individual interest, and public pressure" *(Loorbach, 2010, p.*169)

While institutionalised governance activities happen at present, they do not engage in long term thinking. And while long term thinking might happen at present, it does not do so in an institutionalised, and thereby continuous, manner.

Types of Governance Activities

In order to understand how to align and coordinate governance activities, and what governance activities are missing to enable long term thinking, the TM framework introduces the concept of

different *types of governance activities*, working within different time scales. These *types of governance activities* are activities governing different kinds of transition enabling efforts (see fig.3).

The first three types of governance activities and their time scales are *Strategic* with a timescale of 30 years, *Tactical* with timescales between 5-15 years, and *Operational* with time scales between 0-5 years. Besides these, there is a fourth needed type of governance activities, the *Reflexive*. This type engages in evaluations of processes and methods.

TABLE 1
Transition Management Types and Their Focus (Loorbach 2007)

Transition Management Types	Focus	Problem Scope	Time Scale	Level of Activities
Strategic	Culture	Abstract/societal system	Long term (30 years)	System
Tactical	Structures	Institutions/regime	Mid term (5–15 years)	Subsystem
Operational	Practices	Concrete/project	Short term (0–5 years)	Concrete

Fig. 3: Types of activities and time scales (Loorbach, 2010).

Strategic Activities

Strategic activities are engaged in long term thinking, through reflections about desired futures and the making of long term visions. And therefore the timeframe of this type of activity is set to 30 years. According to Loorbach, while visions for futures do appear in society, they do so in an unstructured manner, and not institutionalised.

"The way in which future visions, structural reflection on ongoing and future trends and development, and debate on how innovation should contribute to desired changes is often more implicit than systematically structured" *(Loorbach, 2010, p 169).*

So while reflections about desired futures exist, they are not structured or have outcome or influence.

In Transition Management, more institutionalised long-term thinking processes should be enabled through making a 'space' where key actors related to a specific regime can debate, and envision future visions. Through this process they will also be able to become what he calls a *transition network*. A network gathered around a vision of a transition.

As visions of transitions will naturally be in opposition to the visions or expectations of regime actors in general, they will naturally seek conflict with the existing regime. This will enable debate and conversation about what futures we, as a society, want. Besides, the long term visions will enable problem solving on problems that will first arise in the future *(Loorbach, 2010).*

The actors included in this process should be the forerunners, the visionary entrepreneurs, and visionary political figures within a given regime. Actors that at present mostly interact through public debates or other unstructured consensus building activities *(Loorbach, 2010)*.

Tactical Activities

Tactical activities are engaged in the way a regime is structured and regulated. They are set to have time frames between 5 and 15 years, and are a broad category of activities, including goal settings, creating new networks, and new regulations. The actors are organisations, companies or political entities that try to plan a way to push through an agenda, or make structures that fit a specific purpose *(Loorbach, 2010)*.

Operational Activities

Operational activities are specific concrete activities and projects. Often projects with relative high risk, but large potential. Operational activities would often be referred to as innovation. Operational activities could be the funding of research on universities, research and development in companies, pilot projects, or a test period with subsidies to a promising green technology. Many of these activities are related to niche developments *(Loorbach, 2010)*.

Reflexive activities

The *reflexive* activities include monitoring and evaluations. It is the learning of experiments and processes, as well as the overall evaluation of transition processes. Actors doing these activities could be scientific research projects and commissions. According to Transition Management, the reflexive activities need to be continuous. And the reflexive activities need to be done within each of the other activity types, and not externally to them *(Loorbach, 2010)*.

Aligning the Activities

While especially tactical, operational and reflexive activities are part of existing governance of transition enabling efforts, they do so in an *uncoordinated* manner, and are therefore not aligned towards a shared desirable future or each other. But according to Transition Management they need to work in the same direction to ensure that pilot projects will lead to network creation, that will lead towards a vision. This alignment requires *coordination*.

There are different processes involved in this alignment and coordination. One is that a strong and widespread vision will naturally align actors and activities towards it, as it will be a point in the future that actors can aim for when engaging in tactical and operational activities.

This process will not only align activities towards a desired future, but also align operational activities to each other, tactical activities to each other, and operational activities to tactical activities. This will not only require a vision, but also a strong transition network around it. And as the vision gets spread, and more actors engage in it, the transition network will grow.

In order to align strategic activities, and hereunder the visioning, to the other types, as well as, there is a need for clear *transition paths* to connect the dots. A timeline from the present to the vision, where it is clear what steps and activities should happen, and when, in order for the vision to become reality. This requires a continuous back- and forth casting between the present and the future vision.

An important aspect of making a contentious coordination and alignment possible, is to ensure that each governing activity is both flexible enough to be aligned to the other activities, but also clear and stable enough so the other activities can be aligned towards it. But to continuously develop and redevelop activities to a level where they are clear and stable is a large task *(Loorbach, 2010)*.

A PROCESS EXAMPLE OF TRANSITION MANAGEMENT CAN BE SEEN IN
APPENDIX I

2.3 Visioning

Visioning can be seen as the combination of *envisioning* a future, and making that future into a *vision*. Besides visioning being a key element in Transition Management, it is an element present through many parts of transitions theories, although with slightly different roles and requirements. (*Loorbach, 2010;Smith et al, 2005;Nikoleris, A 2018;Schot and Geels, 2008;García and Gaziulusoy, 2021; Gaziulusoy, İ., 2021;Gaziulusoy, A. and Ryan, C., 2017).*

In this section I will try to consolidate the different *roles of visioning*, and the different requirements to the *content of visions* and the *facilitation of envisioning*. This in order to enable a later development of design criterias, that a visioning practice can be designed from (see DESIGN I).

This is an extremely short version of a more thorough consolidation I made, that can be seen in ***APPENDIX II*.** It is the outcome of quite extensive research in transitions theories, and I see it as one of the main contributions from this thesis to transitions theories, as I found no consolidated overview of the role of visioning in sustainable transitions, based on a wider amount of transitions theories. And therefore had to construct one.

The first category is possible *roles of visions*, that are either mentioned directly in theories on transitions, or roles mentioned that I see visioning could fulfill. These are structured into five categories. The same I will do with requirements to the *content of the visions,* structured into three categories. And again with requirements to the *facilitation of visioning*, structured into two categories

Roles of Visioning in Enabling Transitions

Coordination and alignment
As visioning can be part of strategic governance activity, two of its roles are to cause alignment of governance activities, and to enable the creation of transition networks. And these roles are both fulfilled though the envisioning process itself, as well as when sharing the vision with regime actores *(Loorbach, 2010)*.

Articulation of landscape pressure
Another way to look at visioning, is as articulation of landscape pressure. Visioning can articulate landscape pressure by for example translating climate change into an imagined future transition, that is easy for the regime to understand. And thereby make it harder for the regime not to act on its impact on climate change *(Smith et al, 2005)*.

Evaluate the desirability of futures
By imagining different futures, it can be investigated what possibilities are available and which would be beneficial for society (*Smith et al, 2005)*.

Making futures possible
Visioning makes different futures available. By imagining them, they can be spread amongst actors, and thereby be developed. *(Nikoleris, A 2018)*.

Proactive problem solving, instead of reactive problem solving
Visioning gives opportunities to evaluate what problems will arise ahead of us, and start solving them proactively instead of reactively. It can also be used in the early phases of design for solutions, as imagining an implementation of a solution or system enables the spotting of technical or institutional issues, or incompatibilities *(Smith, et al., 2005)*

Format and Content of VISIONS

Should be broad and flexible, and narrow and rigid

- The vision needs to be broad enough to contain many different activities and actors, and be flexible enough to be translated for use in different contexts *(Smith, et al., 2005)*.
- However, if it is too wide and flexible, and can be interpreted in too many ways, it will not have an aligning effect *(Smith, et al., 2005)*.

Contain different knowledge types

- Different types of knowledge will engage actors, and enable proactive problem solving within different areas. Technical specifications and calculations, expert knowledge you

might call it, will enable the engagement of expert regime actors such as companies, civil servants, investors etc *(Nikoleris, A 2018)*.

- This type of knowledge will enable proactive problem solving of needed technical and systematic development in order to reach the vision, as well as prove their feasibility *(Schot and Geels, 2008).*

- Citizens at large are also part of regimes, being consumers and having political power in democracies. Citizens at large are typically not engaged in visions through technical specifications or calculations, but through stories from the future and depictions of the everyday in the future *(García and Gaziulusoy, 2021; Gaziulusoy, İ., 2021).*

- Including stories of the everyday in visioning will enable proactive problem solving within the desirability of futures. An evaluation of which developments lead to a more desired future society, as well of discussion on what a desired future is and to whom *(Nikoleris, A 2018)*

Visualisations

- As sustainable transitions are complex, illustrations or other visualisations should be part of visions (*Gaziulusoy, A. and Ryan, C., 2017)*
- Further, not only visualisations, but also interactive setups representing the future can increase the effectiveness of a vision *(GarduñoG arcía and Gaziulusoy, 2021).*

Facilitation of ENVISIONING

Roles of facilitation actors

- The facilitation should be done either fully or partly by regime external actors *(Smith, et al., 2005)*.
- Should not be gatekeepers of who can become part of envisioning or the transition network, but facilitate through a more open format *(Loorbach, 2010).*
- The facilitation should include actors with experience in process design and sustainable transitions *(Loorbach, 2010).*
- Their tasks is to create a space where actors can envision *(Loorbach, 2010).*
- Designers should be part of facilitating the envisioning to sketch and design during the meetings, the workshops. And between workshops they should further unfold, and illustrate, the concept and idea *(Gaziulusoy, A., 2019)*.

Actors included in envisioning

- Should partly consist of expert regime actors, like decision makers, scientists, or developers. And these should be regime actors with room to maneuver in the regime, and some political power in the regime *(Loorbach, 2010) (Smith, et al., 2005)* .
- There should be representation of an even wider range of actor types like citizens at large, for a stabilizing effect on the vision, and to enable envisioning a 'desired', as well as likely future *(Gaziulusoy, İ., 2021;GarduñoG arcía and Gaziulusoy, 2021;Nikoleris, A 2018)* .

SEE FULL CONSOLIDATION OF VISIONING IN
APPENDIX II

2.4 Visioning as Future objects

TM does not regard existing governmental governance to be more than just a part of the co-evolutionary process of development. And while Loorbach encourages strategic governance activities to be implemented in an institutionalised and continuous manner, they are portrayed as these fluffy processes that happen between the most visionary regime actors, and cannot have gatekeepers *(Loorbach, 2010)*. So by solely using TM, it is hard to see implementation possibilities for visioning as a strategic activity.

Therefore, I will introduce a new theoretical perspective, that of *future objects (Esguerra, A., 2019).* This perspective enables me to compare *visioning* to objects that existing practices in policy making are based on. And further, as being an object based perspective, by evaluating visioning through this process, visioning becomes more stabilised as a design object.

It should be clarified, that while earlier mentioned theories all work within the same field of transitions theories, and thereby share common language and understandings, the idea of future objects does not specifically attach itself to this field, although being very compatible.

Future Objects

In the perspective made available by Esguerra *(2009)*, decisions for the future are based on *future objects*. These are objects that make it possible to *evaluate how decisions will affect the direction of development*. These decisions could be, but are not constricted to, policy making.

There are three different types of future objects. And the type of object used in decision making will influence what futures can be imagined, and thereby what decisions can be made *(Esguerra, A., 2019).*.

Type 1 future objects

Type 1 future objects are objects that use what is considered ‘objective science’ to make *projections* of the future. Projections are mathematically and statistically based predictions of what will happen in the future, based on established facts and tendencies, as well as already made decisions. But exclude policies that will *probably* be made soon, or any other effects that cannot be proven in the present.

By using scientific and peer-reviewed methods, Type 1 future objects are largely uncontested, as they do not come across as obviously normative. And would often take the form of statistics, science briefs, or reports with calculated values. An example of a Type 1 object could be a report with a projection of future CO2 emissions from an industry, based on measurements of existing CO2 emissions, combined with tendencies and expected effects of existing policies.

Because of their perceived ‘objectivity’ they make great objects to base decisions on if your decisions might be challenged. They make it possible to make the narrative that some politics or policies are ‘evidence-based’ *(Esguerra, A., 2019)*.

But as they will only envision staying with the existing system, they are a stabilizer of the status quo. They will work well as an input to adjusting regulations, or form new ones, but they do not produce any new ideas. In an MLP perspective, they don't challenge the regime selection environment, but work within it.

Type 2 future objects

Type 2 future objects are process-designs, and thereby their knowledge is not readily available. They are designs of processes that enable imagination of a future with an *openness to the surprising*. This could be a guide or setup for scenario workshops that stimulate the ability to imagine different futures. Where a type 1 object would try to *predict ‘The Future’* through stabilized methods and formats, type 2 future objects enable the *imagination of a future* through more open and innovative processes. The design of type 2 future objects will determine what outcomes they can have. The type of actors invited and what methods they use to envision futures, will make some futures possible to imagine and others not *(Esguerra, A., 2019).*.

Type 3 future objects

Type 3 future objects are fluid embodyments of a future, that new knowledge can be gathered around. They can for example be imaginations of future setups or outcomes. They are objects that become the center of discussions and negotiations about future possibilities, and through these discussions and negotiations, new knowledge, insights, and perspectives are produced. They should be seen as fluid, as they through this process continuously will be “still in the making” *(Esguerra, A., 2019, p. 964)*

Because they are more speculative in nature than type 1 future objects, their ‘objectivity’ can to a higher degree be contested. While type 1 future objects work to stabilise the future, type 3 objects encourage this contestation and debate, as it is part of the contentious making of the object. And thereby making futures into something you can talk and think about.

A type 3 future object can be the result of a type 2 future object, a visioning process. However it can also just be based on a political decision, or another more bound process *(Esguerra, A., 2019).*

Visioning as future objects

By investigating visioning through the perspective of future objects, two design objects appear. One is a type 2 future object, being the design of the envisioning process. So instead of focusing on the *role of the envisioning* itself, the focus is moved to the *role of the setup* for this envisioning process. And the design object therefore becomes a “practices for generating surprises”(ref#), which makes good sense in the context of radical innovation and transitions.

The other object is a type 3 future object, the visions themselves. A main input from using this perspective, is the focus on the objects as center points for discussions. This makes it easier to

envision how to distribute the vision throughout the regime. Besides, seeing visions as type 3 future objects, objects that make decision making for the future possible, makes them comparable to existing future objects in decision making.

Another input from the concept of *future visions* is the idea of type 1 future objects. This enables one to see existing governmental governance in another perspective than from the perspective of co-evolutionary regime processes, without losing their status quo oriented nature. As type 1 future objects are merely predicting based on the present, they are working within the regime selection environment.

2.5 Summary of Theories on Sustainable Transitions and Future Making

This chapter has first investigated how you can understand and enable sustainable transitions.

Through the perspective of Multi Level Perspective, transitions are radical changes in regimes, socio-technical networks that provide a societal need, like housing or farming. The regimes are stabilised through standards and codependencies, creating an 'selection environment' in the regimes that are hostile to radical changes, as sustainable transitions are. The regimes are path dependent, and instead of transitions, the regimes develop though smaller incremental steps in a co-evolutionary process.

Inside the regimes are pockets sheltered from the selection environment, where radical innovations can develop. And outside the regimes is the landscape, the happenings in the world at large, that put a 'landscape pressure' on the regimes to change. This could be climate change.

In order to break the path dependency, and enable sustainable transitions, the Transition Management framework suggests to align and coordinate between transition enabling activities, towards a desired long term direction. This requires visionary actors to engage in long term thinking through reflections about desired futures and the making of long term visions. And by creating a transition network, a network of actors supporting the vision of transition.

The idea of visioning is common through theories on transitions, however visioning can inhabit more roles than that of alignment. These include translating the landscape pressure into something the regimes can understand, and thereby increase the pressure on the regimes. And to engage in proactive problem solving, as you can envision the problems before they appear.

To do so, visions need to live up to some requirements, and as well do the facilitation of the envisioning. These requirements will not be repeated in full here, but include aspects like that the visions should contain both technical and narrative knowledge, and the facilitation should include graphic designers and process designers.

But the transitions theories does not enable easy comparison between visioning and existing governance efforts, and to make that possible it helps to see the visions and envisioning as ‘future objects’. Objects that in some way make it possible to evaluate the consequence of decision making. Using this perspective moves the focus away from the envisioning itself, to the process-design of a process of envisioning. As well as highlight the importance of visions to become the centerpoint of discussions and knowledge creation. And the perspective of future objects allows visioning to be compared to objects used in existing governance efforts.

3 Analysis of Infrastructure of Future Making in Denmark

In the former chapter I presented a governance approach for sustainable transitions, based on *visioning* as a *coordination too*l. And I consolidated visioning from transitions theories, and conceptualised it as two *future object*s.
In this section I will compare the theoretical findings of how to enable sustainable transitions, to what I perceive as current practice in governance of sustainable development.

Mapping future making infrastructure

In the context of sustainable development, I will try to map the *infrastructure* of the future making in Denmark related to governmental policy making.
The term *infrastructure* is used for the combination of actors, activities and practices that together form a system that as a whole is performing a function. In this context the function of future making, the process of making certain futures possible, through the creation of expectations, policies, investments etc. One might argue that this could be called the *regime* of future making, but as I find it can be slightly messy to talk about the regime of governing regimes, I will mainly stick with the term infrastructure, unless highlighting specific behavior typical to regimes.

I will focus specifically on future making related to governmental policy making. I see the state, and the tactical and operational activities within, as a constant. And I find the connection to the governmental bureaucracy to be a needed element in the implementation of institutionalised visioning.

This said, the visioning does not have to be internal to the governmental bureaucracy, and I will look at both future making processes within, but also external but related, to the governmental bureaucracy. And focus specifically on future making related to sustainable development.

The infrastructure of future making is both vast and ‘unknowable’, as there are no clear boundaries to what is, and what is not, included. The aim of this section is not to map the entire *future making infrastructure around the governmental bureaucracy,* but to make samples of the infrastructure, and from these find patterns. This will leave a lot uninvestigated, but I have tried to research if the practices included here mirror other similar practices. And to the extent of this research this was the case.
The aim for the analysis is to analyse the current governance of sustainability, through the perspectives of transition theories. Some of the things investigated are: Future object types used, types of governance activities used, visioning practices present or missing, articulations of landscape pressure, available adaptive capacities

Reading Guide

Section 3.1: I will look inside the governmental bureaucracy. More specifically on processes in climate politics and policies, and what objects they are based on. I will do this primarily through two interviews.

Section 3.2: Then I will investigate how organisations external to the governmental bureaucracy can still have a formalised and institutionalised role. I will use the Danish Council on Climate Change as a case. This investigation will be based on publicly available material.

Section 3.3: Further I will investigate how visioning is used in the public in relation to development and sustainable transitions. Here I will use the Energy Island as a case.

3.1 Future Making in the Governmental Planning Bureaucracy

In the theory section it was explained how change to a large degree happens through a co-evolutionary process in a regime. In this perspective, laws and regulations are merely seen as types of governance activities, but not transition governance as such *(Loorbach, 2010)*. They are elements in the regime network, and as such part of the co-evolutionary process and not able to enable transitions.

Although this can be true from a transition perspective, I find it would be naive to say that the governmental planning bureaucracy does not perform governance in general, or hold a great power in future making. But seen in the perspective of future objects, it is likely that this future making is based on type 1 future objects, and thereby not open to radical change, as transitions to a large degree can be considered as.

In order to investigate the future making processes in the governmental planning bureaucracy, I started out with the two questions:

> How are climate politics and policies developed?
> What type of future objects are the processes based on?

This section is based on interviews with actors within the governmental planning bureaucracy, an civil servant in the Ministry of Finances, and an civil servant in Center for System Analysis. Interviews were used in order to find out, not only the infrastructure of future making processes, but also what adaptive capacity might be present.

Climate Politics in the Governmental Bureaucracy

My contact M is a former civil servant in the Danish Ministry of Climate, Energy and Utilities, now working with climate related politics in the Danish Ministry of Finance. And he proved to have a quite good overview of the infrastructure of climate related policy making.

According to M, the way climate related policies are developed has changed a lot, due to the increased focus and political importance.

> *"At present, there is no standard way of dealing with sustainable transitions, as a lot has changed in the last 4-5 years. If you go back 6-7 years, climate politics was not really on the agenda. There were agreements related to the energy sector, where renewable energy was very present. But climate politics as such was not a focus for governments at that time."(K, 2021)*

So policymaking within sustainability in general is new to the governmental bureaucracy.

The Distinction Between Climate Politics and Green Energy Politics

According to M, in Danish politics, you often work with a distinction between 'climate politics' and 'green energy politics'. Wind energy has in many years been a large business venture in Denmark, and the transition to renewable energy is quite far in Denmark compared to many other european countries. This originates from large support from the state in the earlier days of the windmill development. Both through state funded research and facilities, and through subsidies.

Because of this history, 'climate politics' in a danish policy making context mostly refers to non-energy sectors, where green transitions will be harder and more costly. Like transportation and farming. Typically this type of 'climate politics' has been governed by the EU, and then Denmark has had some goals to live up to. According to M, this setup has not led to much transition really *(M, 2021)*.

Infrastructure in Flux

But the last danish general election in 2019 was influenced a lot by discussion on climate politics, and the government and its supporting parties have now made a tentative agreement to lower the CO2 emission with 70% from 1990 levels by 2030*(Regeringen.dk. 2019)*. From here on mentioned as the *70 percent goal*. This has placed a whole new range of requirements to the way policy making and governance within this area is made,

"So, many of the decisions within this field have been made during the last year. You could say that 2019 was used to make the climate-law. Then 2020 have been the year where you for the first time starts the process of how to reach them" *(M, 2021)*

According to M, processes of making climate related policies and plans are therefore in flux, as new ways, methods and processes need to be found and developed, in order to reach the *70 percent goal*.

According to M, the way most climate related policies are decided through one or several of three councils. The Green Committee deals with green policy making, mainly related to the EU set targets. The Finance Committee deals with policies or initiatives that either will require state finances to implement, or will effect danish economy. And the Coordination Committee deals with policies and initiatives that are expected to get public attention. A proposal can go through not only one, but several of the committees, without a clear idea of the added benefit from more committees being involved. And according to M, it is confusing for actors in governmental bureaucracy formulating the proposals, not really knowing which council will be the receiver. (see fig 4)

The proposals can come from several places, but mainly from the ministries. The serving right will be at the Ministry of Climate, Energy and Utilities, but it is evident talking to M, that that ministry does not hold much power, and there is a process of moving employees with climate expertise from here to the Ministry of Finance. The ministries will have some calculating and engineering resources, but are mostly generalists that will gather relevant information and external investigations, and write it into a proposal. (see fig 4)

The input to the ministries can be various, but one of the main inputs are the agencies. And as climate politics in Denmark has been dominated by energy, the Danish Energy Agency is still the only department with capacity to calculate future CO2 emissions, across fields. So they also calculate it for farming, housing etc. (see fig 4)

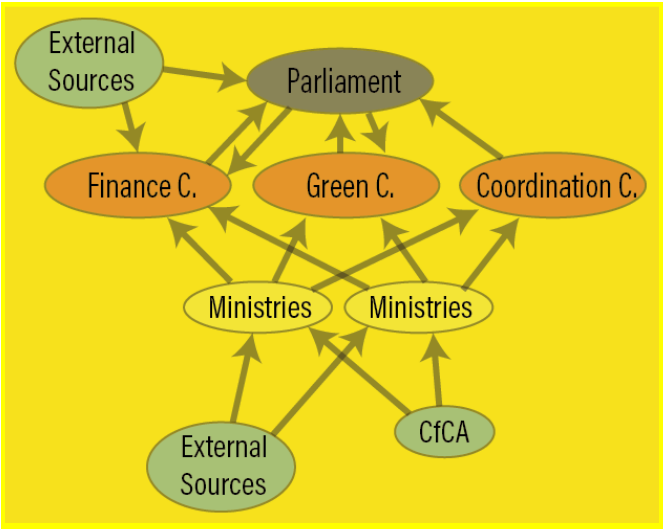


Fig 4: Paths for climate policy making

Future Thinking, Visions and Future Objects in the Governmental Bureaucracy

Ministry of Finances

Asked about future thinking, M said that future thinking, and to some extent visioning, is present in the Ministry of Finances.

"The Ministry of Finances is one of the entities in the governmental bureaucracy with most focus on the future. Here we generally have the responsibility on how society looks in 50 years. … The economy, how is it holding up? The demography, how is it evolving? But also development of the public sector. How will it accommodate the challenges of the future?"

And asked to how visionary their work is, versus how much it is a prediction based on the present, he said

"It is relatively visionary, in the sense that there are constantly suggested ideas on how to optimise and reach the set goals. It can come from a political side, and the present government does that a lot. Earlier, a lot of the idea generation was done internally in the Ministry of Finances. As an example I see the privatisation of Dong as a project that was primarily created and driven by the Ministry of Finances, that politicians then joined. " *(M, 2021)*

The work in the Ministry of Finance is relevant to sustainable development, as they, as mentioned, are handling an increasing amount of climate related policy making. Due to that, one of the more radical ideas is the development of a new green evaluation tool for evaluating policies, that instead of just calculation of price and economy, also includes expected CO2 emissions of suggested policies. It is being developed outside the Ministry of Finances, but expected to be implemented here. *(M, 2021)*

Center for System Analysis

Talking about working with futures, M repeatedly mentioned the Baseline Scenario Projection. Developed in the Center for System Analysis [Center for Systemanalyse], it is a projection of CO2 emissions based on a frozen policy. Frozen policy meaning that while it takes existing policies into account, it exclude things like the 70%# goal. It is used broadly and across ministries as a common reference for planning for the future.

So I contacted K, a leading figure in the Center for System Analysis (CfSA)to discuss their work in relation to the prediction/visioning conflict. According to K, the work in CfSA is in general very projection based, and tries to be as little normative and political as possible. Their main product is the mentioned Baseline Scenario Projection, and the main element here is the projected CO2 emissions in Denmark. *(K, 2021)* And according to K, the accuracy of this projection will always be low

“It is of course not very accurate, which we use a lot of time to try to communicate. The only thing we can say for sure is that the future will *no*t look like we predict. Looking 10 years to the future, it's easy to move some millions of tons of CO2. But it does say something about tendencies and what scale we will be dealing with” *(K, 2021)*

But in CfSA they also produce other future objects, with a slightly more speculative character. In their work for Energinet, they make expected futures in a report called Analytical Assumptions [Analyseforudsætninger], that is *not* based on frozen policy. Here they acknowledge that there are actually some political goals set.

“This Analytical Assumptions has a different setup, more ‘this is what a future could look like, in case of more political activities’. Here we acknowledge that there are actually some political goals. The 70% goal is the primary driver at the moment, and it is evident when looking at the Baseline Scenario Projection that something has to happen along the way. So here we have to make some assumptions, because this product is a foundation for the planning of infrastructure, power network and gas network. And it wont work to plan on the basis that nothing is going to happen” *(K, 2021)*

So when it really matters, the CfSA is able to work differently.

When I asked K in the CfSA if there were other entities or actors in the governmental bureaucracy that engaged in visioning practices, he said that was not the case. They were the entity in charge of imagining the future, and what was not by them he doubted was done anywhere in the governmental bureaucracy. *(K, 2021)*

Besides the two mentioned actors, I have also interviewed a civil servant in the Ministry of Foreign Affairs and one in the Ministry of Health. A thing that was repeated from all four, is the fact that civil servants in the governmental bureaucracy, besides politicians, are not allowed to be normative in any way, and therefore all normative activities need to be done in close corporations with ministers, in the parliament, or outside the governmental bureaucracy altogether. *(K, 2021)*

Governance in the Governmental Bureaucracy in the Perspective of Transitions Theories

Now I will place the inputs from the two interviews into the context of transitions theories.

Articulation of Landscape Pressure and Adaptive Capacities

Generally the infrastructure of policy making within climate politics in the governmental bureaucracy is in flux. The *70 percent goal* is an articulation of the landscape pressure - a translation of climate change into a CO2 emission goal, that the regime can understand and react to. This articulation increases the pressure on the regime, hereunder the governmental bureaucracy, to find solutions to reach the goal. And as a consequence changes and chaotic processes are very present in the infrastructure of policy making in the governmental bureaucracy.

According to Geels and Schot *(2007)*, when a regime experiences a sudden increase in landscape pressure, the outcome will depend on two things: the amount of adaptive capacities and to what level

relevant niches are developed. If the adaptive capacity is low, and there is a strong relevant niche, the niche will be able to be integrated in the regime.

Therefore, in this period of chaos in the governmental bureaucracy, it might be easier to integrate elements of visioning or long term thinking. However, this requires it to be developed as a strong niche and fast.

One element in the present adaptive capacity is the CfSA. They already have the ability to imagine futures without frozen policy, as they use it in the Analytical Assumptions. And furthermore K explains that there is initial work in developing their methods, as there does not seem to be any entity in the governmental bureaucracy capable of finding a path to reach the decided *70 percent goal*.

Another such increase in adaptive capacity is the development in the Ministry of Finances, drawing resources from other ministries and the possible inclusion of a green calculator. Thereby they are slowly building adaptive capacity to meet the landscape pressure, by being able to compare policies in a climate perspective, as well as develop their own.

At present, policies, and thereby decisions, are primarily based on type 1 future objects. And this is both the case in the Ministry of Finances and CfSA, using either economic models or statistical projections of the future. But CfSA also has objects with a slightly speculative approach, with the Analytical Assumptions as the best example. Here they work with the understanding that the 70% degree goal *will* be met, and how that would affect the energy sector.

It is, however, not done through a type 2 future object. Neither is it really a type 3 future object, as it is not commonly shared, and thereby not able to gather external knowledge.

K was open to the idea of working on transition paths, as long as they were towards multiple different ideas, so the politicians could make the decision on which to aim for. A transition catalogue you might call it. This, however, leads to the question of where they should get the visions of transitions, if these transition paths should not solely be based on potential implementation of cutting edge technology.

One area where a transition did happen was in the energy sector, where niche development, and a growing network around it, has enabled windmills to be implemented on a large scale.

3.2 Future Making in Advisory Councils

The internal actors in the governmental bureaucracy are limited by the fact that they work under shifting governments, and by them being careful around activities that could be seen as normative or political. But, and maybe because of this, there are entities that work independent from the governmental bureaucracy, but still with a more formalised role, and giving advice and suggestions to the ministries, government and parliament.

There is a range of more independent entities, but very common is the use of advisory councils, working continuously within a specific field. Examples of such, and within sustainable development, are Green Transition Denmark [Rådet for Grøn Omstilling], Danish Board of Technology [Teknologirådet] and the Danish Council on Climate Change [Klimarådet]

In this section, I use the Danish Council on Climate Change [Klimarådet] (DCoCC) as a case, because I think they are very relevant to sustainable transitions, and as I find them to have a particularly formalized role and presence. In my, not presented, investigations on other councils, I have not found evidence that they work in a very different manner, not saying it does not exist outside what I have found. I investigate how they work and how they influence the governmental bureaucracy, through the perspective of transitions theories.

The Danish Council on Climate Change

DCoCC is funded by the state, but independent of party political interests. It was primarily founded to give council to the Minister for Climate, Energy and Utilities on climate efforts. Therefore it now investigates how to reach the *70 percent goal*, as well as the net-zero emission goal of 2050. And as part of this, possible transitions paths toward them.

The main tasks and work of the Dansih Council on Climate Change can generally be divided into three categories. One part of their work is to evaluate the current politics and efforts by the government, compared to the projected CO2 emissions and the 2030 and 2050 goals. Another is to select and gather potential mechanisms and transition scenarios that would make it possible to reach the goals. And a third is to inform the public debate on climate efforts, sharing its expertise and insight *(klimaraadet.dk)*.

The suggestions and evaluations come in a range of different reports. Some evaluate a specific technology or mechanism, while others look at the combined picture. Here I will describe their two main reports, and their work in the perspective of transitions theories.

Status Outlook 2021

The report Status Outlook is a yearly evaluation of the governmental climate efforts, compared to the reduction goals of 2030 and 2050. It is a rather strict format, where it evaluates how new efforts like proposed policies, combined with the Baseline Scenario Projection mentioned earlier, relates primarily to the *70 percent goal*. Therefore its methods and approach are very similar to the Center for System Analysis. However, on top of this it does give normative recommendations to the

government, in terms of new political initiatives needed *(klimaraadet.dk[2])*. In the 2021 version these were to

- Make a transition plan between the present and the 2030 goal*#.
- To develop a national strategy for carbon harvest and storing.
- To introduce a carbon tax
- To take initiatives for (vådlægning af kulstofrige lavbundsjorder)#
- To use a higher price of climate effects in socioeconomic calculations *(klimaraadet.dk[2])*

Known Paths and New Tracks to 70% Reduction

The report 'Known Paths and New Tracks to 70% Reduction' is the 2021 version of an, also yearly, evaluation of what mechanisms and technologies could enable the fulfillment of the 2030 goal *#. The aim with the report is to make suggestions on what implementations of technologies or mechanisms, and to what level of implementation, should be part of reaching the goal. Their newest main suggestions are

- Introduce carbon tax
- Phase out coal
- More renewable energy
- Regulations to limit fossil fuels in heating
- More electric cars
- Change use of lowland fields
- Push for more reuse of plastic
- More use of biogas
- More sustainable consumption of the public sector *(klimaraadet.dk[3])*

Their Work in the Perspective of Transitions Theories

In the perspective of future objects, I would argue that the Danish Council on Climate Change primarily *uses* type 1 objects in their work. It is primarily based on scientific peer-reviewed methods, like projections of CO2 emissions. And while the choice of technologies and mechanisms to investigate is of course based on choice, the possible effects of them are again based on scientific and peer-reviewed methods.

I would argue that they produce both type 1 and 3 objects. The part of Status Outlook 2021 that is their assessment of current politics and proposed policies is in its own a type 1 object, as it is mainly adding suggested policies to the Baseline Scenario Projection, a type 1 future object with similar methods. It does not embody a future, even though it enables the discussion of politics.

But their *recommendations* are more openly normative, and their reports *Status Outlook 2021* and *Known Paths and New Tracks to 70% Reduction* are type 3 future objects that open up discussions about futures by embodying futures through their suggested implementations.

The work done by the Danish Council of Climate Change is to a high degree an articulation of landscape pressure. The Danish Council on Climate Change further articulates the *70 percent goal* into something regimes can understand, as they suggest regime changes. They thereby increase the pressure on regimes, and also back at the government that agreed to the *70 percent goal*.

As they do not use type 2 future objects, and as they are bound to specific methods, they are still mainly working within the regime selection environment. Although a few of their suggestions stick out, like the carbon tax, most of their proposals are based on speeding up existing development, rather than redesigning the socio-technical systems more radically.

As they are evaluating the present and making 10 year plans, their work is *tactical* activities. It is the planning of reaching a goal, not the imagination of a future. And not *strategic* activities, from a TM perspective. And they also do *reflexive* activities, as they evaluate the present efforts of enabling sustainable transitions, and deem them to be insufficient.
Even though being external to governmental bureaucracy allows them to be more normative and critical, the government can ignore their proposals, as they have to a high degree done so far. On the other hand the activities give a reference to the supporting parties of the government, when they push for more climate efforts, due to their expert driven process and thereby perceived ‘objectivity’ *(dr.dk)*.

3.3 Visioning Practices in Relation to Sustainable Transitions

During my research on visioning in Denmark, while I found no continuous institutionalised visioning practices within the field I investigated, I did find visioning. They were made in either formalized or unformalized collaborations between different entities, and not controlled or steered by a single entity engaging in a continuous visioning practice. But they were often *driven* by state funded entities.

My main case of investigation is the Energy Island, as it is a very present vision in the public debate, and as the implementation of it has been finally decided by parliament in 2020.

The Energy Island

The Energy Island is a vision of building offshore transformer stations, or islands, to collect electricity from windmill farms placed next to them. The energy is both expected to be transported to shore, but also to be transformed into shipping fuel by power-to-x facilities on the island itself.

Visioning Process of the Energy Island

The visioning process has included a range of entities through the years, from 2017 when the idea was presented, to 2020 when the implementation of it was decided. And even further, as the discussions of implementation methods keep rising.
The original idea was made by a dutch transmission system operator (TSO) called TenneT in 2017. *(portesbjerg.dk[1])*. It was then established as a collaboration between the dutch TSO, a german TSO, and the danish TSO Energinet *(energinet.dk[1])*. Energinet is an independent organisation in charge of transmission systems of gas and electricity, but owned by the Danish Ministry of Climate, Energy and Utilities.
From this point, online mentions of the Energi Island are increasing, and multiple organisations engaged with the vision, and started further development. An Example of this is the port of Esbjerg, who started the further development not long after the first vision was released (portesbjerg.dk[2]). Another example is the Technical University of Denmark who led a project called North Sea Energy Hub starting in 2019, and in collaboration with multiple private partners, including suppliers and engineering consultant companies *(elektro.dtu.dk)*.
In 2019 it became part of a tentative agreement between political parties,(ref)# and in 2020 the implementation was decided *(kefm.dk)*. After this, the discussion continues however. Like in january 2021 where the energy company Ørsted, criticised the choice of using dammed soil to make an island, instead of using the proven method of a steel construction (ing.dk).

Already from the beginning, visualisation and even videos of the project were released, and since then, different entities have made visualisations of their own suggested adaptations, as can be seen in fig. 5.

Fig. 5. Development of vision of the Energy Island. On the left, original version from Energinet (energinet.dk[1]), on the right, developed version from the Port of Esbjerg (portesbjerg.dk[1])

The Energy Island in the Perspective of Transitions Theories

In the perspective of future objects, the Energi Island has from the very beginning been a type 3 future object. It embodies a future in a way that enables futures to be talked about, and is a centerpoint of discussion and knowledge creation, made by larger organisations in the energy regime.

Combined with the insights from the governmental bureaucracy, with green energy politics and climate politics being separated, it makes it clear that there is a very large and stabilised transition network around windmills. And the transition network has been capable of not only producing, but also further developing, a vision.

This vision enables alignment between actors and activities, and the making of a transition network including most larger energy related organisations. And not only does it contain windmills, but power-to-x technology for producing shipping fuel, and therefore have the possibility to increase the transition network further into the shipping industry, and be part of enabling a transition to sustainable fuel types.
However, the visioning cannot be regarded as a strategic activity, but merely tactical, as the time span is too short, and it is more planning and implementation, than it is reflections about desired futures.

It is a purely technology focused development and presentation, and includes solely regime experts. There are no narratives, no stories, no imagination of a life around it. And thereby it is hard to

evaluate the desirability of the world it will be part of. As well as how compatible it will be with developments in other regimes in the time it takes to implement.
And further, there is no evidence of type 2 future objects, where ‘surprising’ solutions could have been made, and the vision works strictly within the regime selection environment.

The visioning has not been enabled by an institutionalised practice, an entity engaged in the continued development of visions. The idea does not even originate from Denmark. This is not an issue within the context of this vision itself, as it is clearly working well. But in the aim of using visioning more consistently in governance, the random appearance of aligning visions will not be sufficient.

3.4 Summary of Infrastructure of

3.5 Future Making in Denmark

The *70 percent goal* has, as an articulation of landscape pressure, increased the pressure on the regime of governmental decision making in order to find solutions to reach the goal. This has created a level of chaos in governmental bureaucracy, and processes of increasing the adaptive capacities have been initiated.

At present the decision making in governmental bureaucracy is based on type 1 future objects. And the government does not engage much in strategic activities, as it is focused on 10 year goals, quite far from the 30 years perspective of TM and more broad visions.

As the civil servants in the governmental bureaucracy cannot be normative in their work, there are external but formalised entities with future making practices, working within specific fields, and often in the format of councils. On such a council is the Dansih Council on Climate Change. As part of their work, they produce type 3 future objects, in the format of suggested implementations of technologies and mechanisms. Their work, however, is not visioning or strategic activities, but tactical activities, with suggestions of implementations within a shorter time frame.

But there exists visioning outside of these councils, shared in the public. These are often collaborations between different organisations, and often led by state funded organisations. However, these visions are still not strategic activities, as they have a too short time scale. And they are not institutionalised, and thereby not ensuring a continuous development of visions. Furthermore, they are very technology based and expert driven, and thereby they can only engage very specific actors in their development.

So in conclusion, there is a lack of visioning practices that are: (1) Institutionalised, (2) narrative based, (3) focused on long term, and (4) type two object (generating surprises)

4 Design Part I: Design Synthesis

But before I engage in the design of such a visioning practice, I need to bring the insights from the theory and analysis together in a range of design criterias. In the analysis I found that the current practices around future making does not contain institutionalised visioning, capable of making ‘surprising’, long term and narrative based visions.

Choices based on the analysis

As one of the roles of visioning is to articulate landscape pressure elements, the facilitation needs to include actors and resources external to the regime. Therefore the facilitation of a visioning process should be external to the governmental bureaucracy. In the analysis I found advisory councils to be a way to place facilitation of future making practices external to the governmental bureaucracy, while still holding influence on governmental matters. And with more freedom to be normative, to use different methods, and the inclusion of more types of actors.

However, the councils primarily give counsel to the government and parliament, and are thereby not connected with the adaptive capacities in the governmental bureaucracy. By including the adaptive capacities in the process of envisioning, they can be influenced by the visioning and possibly integrate the visions in their work.

These two aspects will be part of the design criterias.

4.1 Design Criterias

I translated my insights from section 2.3 (visioning), and the just mentioned *choices based on the analysis* into a range of design criterias. These looks as follows:

Role of visioning:

- Coordination and alignment of transition enabling activities and actors
- Articulation of the landscape pressure
- Make more futures possible
- Enable proactive problem finding

Requirements to the type 3 future object, the vision.
The visions should:

- Be broad and flexible enough to engage many actors and activities, but narrow enough to make alignment in a common direction possible
- Contain technical and systematic knowledge
- Contain stories and depictions of the everyday
- Include visualisations and interactive setups

Requirements to the type 2 future object, the facilitation of the envisioning
The facilitation team should include:

- Actors external to the regime selection environment as part of facilitation
- Actors capable of facilitation participatory knowledge creation
- Designers capable of visualising and conceptualising the vision

The envisioning process should include:

- Classic regime actors, like decision makers and experts
- A wide range of other actors, like citizens

Placement in Relation to Existing Infrastructure Of Future Making
The visioning practice should:

- Be institutionalised in a likely manner as councils
- Engage adaptive capacities in the regime in question, hereunder from within the governmental bureaucracy.

5 Design Part II: Methodology

In order to meet the design criterias, and to understand how a design could look, I needed to find elements that could be part of the design, a way to evaluate them, and a way to structure them into a design. This was done by first interviewing actors engaged in experimental visioning practices, and then making a list of potential elements gathered from transitions theories, the experimental practices and my own suggestions. These elements are referred to as *visioning elements* from here on.

I then developed a tool for evaluating different aspects and behaviors of the visioning elements, existing practices in future making, and potential visioning design made by myself. Using the visioning elements and the evaluation tool, I had a rapid prototyping process that ended up with the end design.

Thereby the design process included explanatory design as in using theoretical and own conceptualisations to design and evaluate, as I was walking unthread paths. This in contrast to presenting it to potential actors for validation. I used experimental design by making an evaluation tool I could place elements in to investigate correlations. And rapid prototyping to try a lot of different possibilities out.

This process is described through the following sections.

Section 5.1: I interview actors engaged in experimental practices within visioning, that can inspire the design process, and explain how to engage participants in long term thinking.

Section 5.2: Based on insight from these practices, the theories earlier investigated and further research, I select visionary elements that could be part of the design.

Section 5.3: To investigate correlations and to enable rapid prototyping, I develop a design tool for fast evaluations of designs or design elements.

Section 5.4: Then I mix and match the elements into new combined elements, and use the evaluation tool to evaluate their performance. And thereby create a tentative outline of the design.

5.1 Experimental Practices

To answer the question on how to enable actors to engage in long term thinking and visioning, and how to facilitate it, I made two interviews with actors engaged in experimental practices of visioning. In relation to the design criterias, requirements for the choice of interviews was that they should work locally so their knowledge was relevant, they should work in a way that included more narrative or storytelling elements as these are missing in present visioning, and they should work in a way that was inclusive to classic regime actors like decision makers and experts, as well as citizens at large.

The Practices I Found

I found two practices, or projects, that lived up to these requirements. One project is called *Future Tours Travel Agency*, and are two designers investigating how speculative design and interdisciplinary cocreating can be merged. And this is done through workshop settings. *Specular design* is design practices engaged in speculations about how the future could look. And use this approach to design objects either from the future, or portraying a future. The interview was made with both designers facilitating the workshops, Jocelyn and Sofia.
The other was a research project called *Narrating Climate Futures* at Lund University. The project *Narrating Climate Futures* makes academic research in long term thinking and visioning. And in particular how fictional practices can be combined with more classic future making objects like climate scenarios. Most of their work is workshop based as well. The interview was made with co-coordinator Alexandra Nikoleris.

Examples of Their Work
One of the main projects of Future Tours Travel Agency is the development of an interdisciplinary workshop placed in a future. In the first workshop of this format, the actors involved were a wide scope of people with different backgrounds. And they were placed in a future through a narrative and few set design objects of a future where all labor was distributed by a computer system. From this future, the participants should try to find imagined problems in the system, and solve them from the perspective of the future, through fast prototyping *(Jocelyn, Sofia, 2020)*
Narrating Climate Futures have a range of both ongoing and finished projects. One of these was an speculative exhibition placed after the world reached net-zero emissions, and was an exhibition of objects of ‘the everyday’ related to the transition. The exhibition was made through workshops with experts from different regimes and researchers in sustainable transitions. The public was then invited, and in particular politicians and civil servants. Besides this specific project, we also discussed two other types of workshops. One type was to make workshops where people engaged in fictional novelists and people engaged in

techno economic modelling would cocreate visions. This with the aim of making cross pollination between methods in the disciplines, that could be brought back to their normal context.
Another type of workshop was where civil servants from municipalities were invited. Here Narrating Climate Futures facilitated workshops that made the participants engage in long term thinking. The aim was to enable the civil servants to engage in long term thinking as part of problem solving in their own context *(Nikoleris, 2021)*.

How do they engage participants in long term thinking
Both practices highlighted the use of fiction as a way to enable long term thinking. In Future Tours Travel Agency this was done by the facilitators, making the narrative and setup, with the aim of making the participants feel like they were actually placed in the future envisioned. However, they experienced the participants having a hard time leaving logic based on the present, and really engaging in thinking from the future, although the narrative and setup helped *(Jocelyn, Sofia, 2020)* In Narrating Climate Futures, it was done by having fictional practitioners as part of the participants, so they could share methods and perspectives. *(Nikoleris, 2021),*

5.2 Collection and Evaluation of Visioning Elements

Based on direct suggestions from the theory and the experimental practices, added with my own idea, I selected objects that had the potential to be type 2 or type 3 future objects in a visioning setup, that I call *visionary elements*. After locating the visioning elements, I made more theoretical research on the potential abilities of the different visioning elements, in the context of sustainable transitions. The elements I found was:

- **Techno economic models and scenarios**
  Already a part of decision making, and an element in both the theory and experimental practices.
- **Speculative fiction like science fiction novels.**
  Based both on insights from the theory chapter, as well as the experimental practices, I found fictional elements, and speculative fiction in particular, to be of interest.
- **World Building methods in fictional practices**
  From my research in speculative fiction, and looking for type 2 future objects, the concept of world building was brought to my attention, as a tool that enables mixing a range of elements in a vision.
- **Documentaries**
  From the very beginning of this thesis, I had the idea that documentaries would be good at showcasing different aspects, and types of content, from a vision. Where other elements

were bound to either narrative based or expert based knowledge, documentaries might have the ability to contain both. And further, they have a very wide potential reach.

In order to evaluate their potential role in a visioning setup, I answered the following questions in relation to each visioning element.

- **What types of actors can they engage?**
  Are they focused on experts or citizens? This both in the envisioning, and as a vision.
- **What part of futures are they able to imagine and problem solve within?**
  How much of a future can they imagine? Technical aspects, social aspects, connections between elements etc.
- **How can they coordinate, or be coordinated with, other activities or objects.**
  Can they be coordinated and aligned to other governing activities? And can they coordinate and align other governing activities.
- **Flexibility**
  As they will be part of a design containing mixed elements, the flexibility of *content and format* is important. As the visioning process should continuously adapt to actual development, the flexibility, or *reactivity*, is important.

Techno economic models and scenarios
The most commonly used in governance related to sustainable development are techno economic models, like climate models and scenarios. This category includes different approaches that are expert driven and based on technical data like physics, economic models and technical innovation. Examples could be the work in the Council of Climate Change or the Energy Island.
What part of futures are they able to imagine and problem solve within? ● Technical solutions to technical problems like the emission of CO2 ● Sociotechnical solutions to technical problems like the emission of CO2 *(Nikoleris, A 2018)*.
What types of actors can they engage? ● Primarily able to engage ‘experts’. This could be engineers, civil servants, modellers, interest organisations, mathematicians etc. **But** ● According to the interview with Alexandra Nikoleris *(Nikoleris, 2021),* their limited reach to a broader audience is a typical complaint from the people making them.
How can they coordinate, or be coordinated with, other activities or objects? ● *Coordinating:* Good at coordinating actors and governing activities, as long as these are actors actively engaged in development already.

- *Being coordinated:* As long as the coordination comes from an entity with regime authority, they are good at being coordinated. However, they will not easily be coordinated to activities outside the regime selection environment. *(K., 2021)*

Flexibility

- *Content and format:* Both content and format are quite rigid. There is a range of standards that is expected, and they are often placed in a rigid network in the regime.
- *Reactivity:* They are to some extent flexible to further development, as they are considered a temporary evaluation, and the remake of them yearly is considered normal practice. (García and Gaziulusoy, 2021; K, 2021))

Speculative fiction

Speculative fiction is a category for fiction placed in a speculative future of the existing world. Most common and known is science fiction, but it also includes other genres. The most common format for these objects is novels, but it can also be films, games etc.

What part of futures are they able to imagine and problem solve within?

- Can envision the social in the sociotechnical systems. How a given future will *feel*, and what will *motivate* actors in engaging with a given transition *(Nikoleris, A 2018)*.
- Through the imagination of how a given setup would affect humans and the world at large, it can evaluate the desirability of a range of imagined futures *(Nikoleris, A 2018)*.
- Besides, when an invention is proposed by science, speculative fiction can imagine the implementation of such an invention on a bigger scale and in different setups *(Kirby, D., 2009)*

But

- There is a general tendency for speculative fiction to engage more in dystopias than utopias. Hindering them imagining utopias, or desired futures *(Barber, J. 2018)*

What types of actors can they engage?

- In envisioning: In the process of envisioning these elements are rather closed *(Nikoleris, 2021),*
- As visions: They are able to engage citizens, and to some limited degree also science and technology *(García and Gaziulusoy, 2021)*

How can they coordinate, or be coordinated with, other activities or objects?

- *Coordinating:* Their coordination abilities specifically towards other governing activities are limited , but by making expectations in society, they will have an aligning effect in society at large *(Kirkby, 2010)*

- *Being coordinated:* For the most part, speculative fiction is created for entertainment, and thereby not focused on coordination to other governing activities. But when tried, they are easy to use and implement in collaborations *(Nikoleris, 2021),*

Flexibility

- *Content and format:* Both format and content of speculative fiction are very flexible.
- *Reactivity:* They are not continuously reactive to development, as most have a release date, whereafter the development of them stops.

World Building

World building is a term used in a range of different fictional practices, mainly to make either fantasy or science fiction universes. There are different ways this world can come about. Some are made by a single author, and then possibly further developed by multiple other book writers, filmmakers and games. This is the case in the Star Wars Universe. Others are made though more structured practices, like when playing Dungeons and Dragons, as the world building is something that happens repeatedly, but needs to work within a given ruleset *(Zaidi, L., 2018)*
The use of world building in sustainable transitions is rare, but described by Zaidi, L. (2018) as a promising combination.

What part of futures are they able to imagine and problem solve within?

- Some world building practices enable the design of whole socio-technical systems. Thereby it enables a broad scope for investigating relations between technical, social and societal elements *(Zaidi, L., 2018)*

What types of actors can they engage?

- If the origin is a single author, other actors can be engaged in world building by exploring unexplored parts of the world, thereby enlarging it.
- If the origin is in for example a game development setup, it can be a collaboration between many actors to begin with.
  (Zaidi, L., 2018)

World Building should mainly be regarded as a Type 2 future object, as they are rarely in themselves the product, but the frame through which other products can be produced.

How can they coordinate, or be coordinated with, other activities or objects?

- *Coordinating:* Their coordination abilities specifically towards other governing activities are limited, but they do hold coordinating capabilities in their very nature, as it is in many cases their role. One world can coordinate multiple book series, video games etc, with very different formats and content.
- *Being coordinated:* As with speculative fiction they are normally not related to governance activities as such.. But according to Zaidi, L. (201*8)*, they do hold the possibility to be used in a transition context.

Flexibility
n worlds made though worldbuilding it is not uncommon that elements, rules or content changes ontinuously. Besides, they can be presented in a range of different formats.

Documentaries

Documentaries are typically not really future objects at all. They portray the present, and very rarely look further than that. Sometimes they investigate the potential of a cutting edge technology but typically by documenting actors engaged in the development in present time (ref: interviews). I added them because, as they have a much wider reach than some of the other elements, as well as being able to combine narrative and expert knowledge.

What part of futures are they able to imagine and problem solve within?

- Historically they have not been able to imagine any futures. However, this is slowly changing. Documentaries like Tomorrow (2015), portray possibilities for sustainable futures, based on experimental setups. But these futures will most often be existing imagined futures of the actors they portray.
- They do have problem solving abilities, as they will be able to spread information from a niche, to the world at large, and thereby between actors *(Schot, J. and Geels, F., 2008)*..

What types of actors can they engage?

- In envisioning: More wide and open than the other practices mentioned, in the sense that they can include everyone from experts, citizens or even nature.
- As visions: Although rarely being actual visions, they still generate debate on the future, better than the other visioning elements. They have a wide reach in numbers, they can speak to different types of actors by having a storytelling element, and at the same time be able to contain technical information. And furthermore, they are often regarded as objective.

How can they coordinate, or be coordinated with, other activities or objects?

- By combining different views and insights with a larger audience, they can have a coordinating effect in the sense that actors will become aware of each other *(Kirby, D., 2009)*. And some can be seen as transition-aligning activities, as they create widespread opinions on eg. meatconsumption like was the case with Cowspiracy *(2014)*.

- On the subject of being coordinated themselves, as they map the current state, and try to be inclusive to different positions, they are quite coordinated with present state actors.

Flexibility
Content and format: As they have a wide range of possible inputs, their format in itself is rather flexible.

Reactivity: As they will freeze at the release date, and they will not be able to include either further development or general critique.

5.3 Evaluating and Combining

The Evaluation Tool

As the design task was large, and possibly many different aspects, I first developed an evaluation tool. This was quite simply a range of coordinate systems, where I could evaluate the relation between different aspects. This could be the relation between their direct relation to sustainable transitions and the type of knowledge they produce. Or the relation between regime authority and how bound they were to specific methods. I will not include them all here, as I have half a notebook full of different ones used, but explain two of them.

Coordinate systems on offset for imagination

One of the aspects I investigated was, where they take offset. If they started in the present, making projections into the future, and then correcting the present. Or started in a future, backcasting to the present, and adjusting the future.

In the left side of fig 6, there is a coordinate system displaying the relation between this offset and who they influence. And on the right the relation between how coordinated they are to transition enabling activities, and the offset.

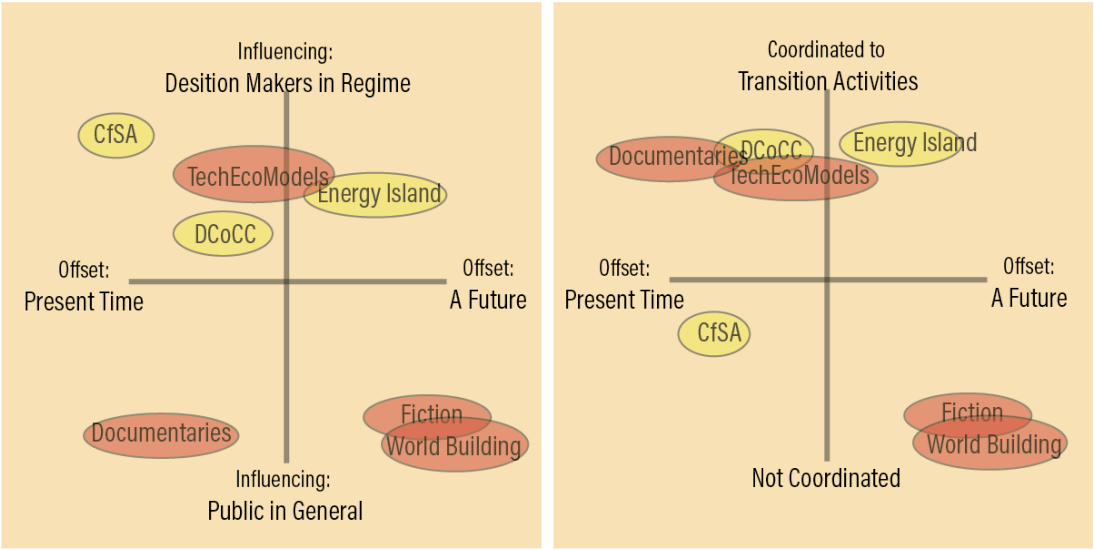
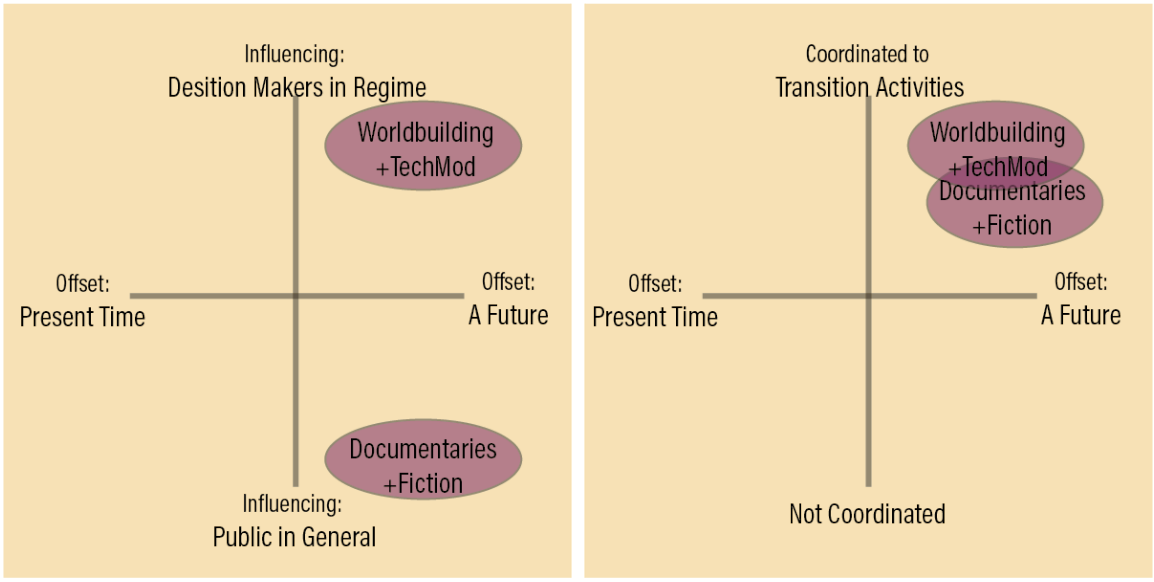


Fig. 6: Part of evaluation tool, investigating the relationship between offset and other aspects

Then I first placed the practices found in the analysis in the coordinate system, and then the visioning elements found in the design part 1. I did this on a long range of coordinate systems, evaluating relationships between different behaviors, and where the elements placed themselves.

From the insights based on these coordinate systems, I started combining vision elements into design outlines. This could be the combination of a documentary and a science fiction film. Or the combination of world building and techno economic models. These were evaluated with the same evaluation tool (see fig 7. After using rapid prototyping to generate a range of ideas, and evaluating them to see behaviors, I made the outlines of the design explained in the conclusion here under.



5.4 Fig. 7: Part of evaluation tool, investigating the relationship between offset and other aspects

5.5 Conclusion of Methodology

Through a mix of explanatory design, experimental design, and rapid prototyping, I designed the outline of the design. From this the design was further developed freely.
This was done by first investigating how to engage participants in long term visioning by interviewing actors engaged in experimental visioning practices. And then further research in potential *visioning elements* of a design.
Hereafter I created an evaluation tool. First to find correlations between aspects and behaviors in existing governmental practices, and in the visioning elements. Based on these insights, and constructed by the visioning elements, I made design outlines.
Design Outlines the End Design is Based On
The first is the idea of making world building the center of the visioning practice, to contain fiction, as well as techno economic models. (ref til master). Instead of making visions for each regime, the idea was to slowly build a whole world of Denmark in the future. And the development of the world happening through both workshops with regime actors, and speculative fiction practices.

The other idea was to combine the visioning elements of documentaries, techno economic models, and speculative fiction. This led to the idea of the Imagimentory. A speculative documentary about the future, based both on techno economic models and fictional practices. So a mix of a documentary and a science fiction about a specific future.

6 Design III: The Danish Council of Sustainable Visions

Based on the design criterias and the methodology chapter, I made a design of a visioning process for implementation. This design is the Danish Council of Sustainable Visions. In this chapter I will present council through following sections:

Section X: I will present the overall organisation of the council, and its funding model.

Section X: Then I present the three main product types of the council: the worlds of visions, the imagimentories, and the future-insights reports.

Section X: In this section I will present the workflow of the council of visions, and describe the four activity teams: Team Workshop, Team World Building, Team Colab, Team Imagmentory, and Team Reflexivity.

6.1 Organisation Model

The Danish Council of Sustainable Visions (CSV), is an advisory council external to the governmental bureaucracy. It both gives aid and counsel to decision makers and companies, but also has its own visioning practice and products.

The organisation is led by a board, and the work is distributed between five different activity teams (see fig 8). The board should consist of a mix of regime internal and external actors. The five activity teams in total require at least nine employees, unless some employees work in more than one activity team (which is possible). In order to facilitate the visioning it has a studio with minimum four work rooms (see fig 8.

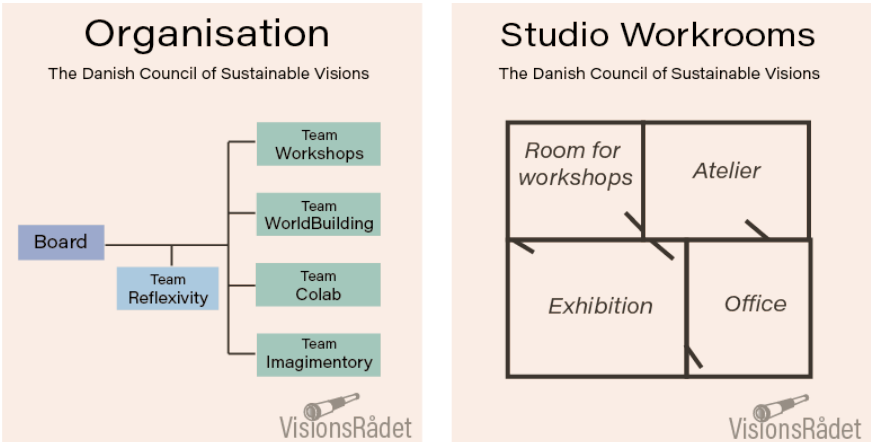


Fig 8: Organisation setup and studio workrooms of DSV.

Funding

The funding model is threefold.
First of all, it distributes much coordination and visioning to external entities from the council itself. Secondly, it is partly funded by state and grants. And thirdly, it is able to perform services for either the state, municipalities or companies needing visioning practices. This can either be through: (1) Making future thinking workshops with them, (2) extracting knowledge relevant to the customers from the worlds of visions, (3) further development of specific part of the world of visions, of particular interest for the client (see “Examples on areas to develop”).

6.2 Main Products

The Council of Sustainable Visions has three main types of products. The worlds of visions, the imagimentories, and the future workshops. Besides a range of smaller products.

Worlds of Visions

The worlds of visions (WoV) are the center of the work of the CSV. The world of visions is a combination of a vision and a world, and will be made through world building methods. And is made from a combination of visions and visionary elements from all regimes into one world (see fig 9). There is only one world of visions at the time, and for the first many years this will be World of Visions 2050 (WoV2050), based on the zero-net emission goal in Denmark.

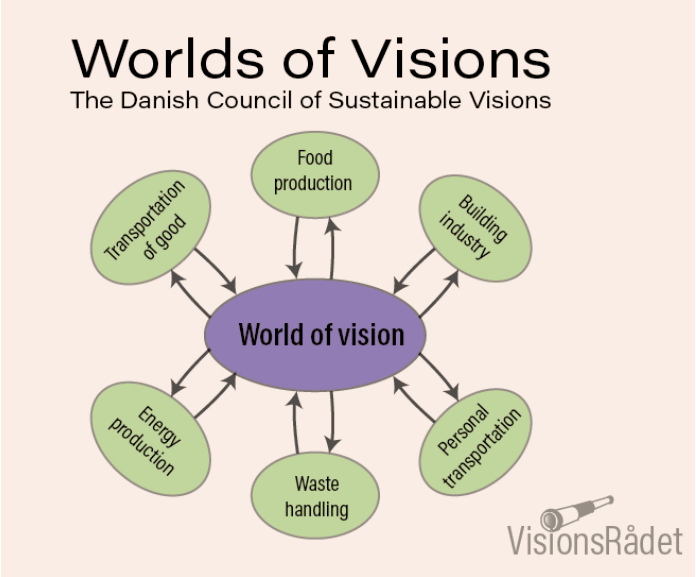


Fig. 9: The world of visions collaborate with all regimes

Inputs

The inputs to the development of the worlds of visions are many and different. First of all, there is a continuous update based on general development in society, and politically set goals. The first of these being the zero-net emission goal. *#

The main development will come from workshops with regime actors and citizens (see fig 10). Each of these workshops are based on the current development of the world of visions, and then further develop it (see fig 10).

A second important input is from external practices of speculative fiction. By making the WoV available to these practices, and actively engaging them, they will be able to place their stories or art in the WoV, and thereby adding elements (see fig 10).

And lastly, the WoV will be available to the public through a database (see xxx), where citizens can add and debate elements of the WoV, and be part of the development of it (see fig 10).

Structure

The aim of the WoV is to make connections between visions and visionary elements, and become compatible. In order to do so, the WoV first of all develops rules and facts, that is governing the

WoV. This could be that the zero-net emission goal being achieved, or the expected temperature in Denmark. But also to some extent what governing structure has been developed or similar, that is more speculative.

But besides these sums of inputs, the WoV is embodied by a range of objects, like maps, 3D computer models, technical evaluations, prototypes, science fiction novels etc. Some of these will be made through the workshops or external practices and just gathered by CSV. Others are made by Team Worldbuilding to connect the dots.

The WoV is mainly available to the public and involved actors through an online database (see fig 10), external practices (see fig 10) and the imagimentories (see fig 10).

Width and Disagreements

There are always disagreements between some actors involved on what should be included and excluded. These disagreements are not a problem, as they are part of the role of the WoV; to be able to discuss and talk about futures. Where goals are meant to be achieved, the world of visions is a place to imagine, and find connections between elements. As well as highlight incompatibility between elements.

Therefore the WoV to some extent allows competing visionary elements, as long as they are compatible to the world of visions, and hopefully to each other. As an example, in the WoV electricity in Denmark can be covered entirely by windmills, but also entirely by solar cells. The main aim is to make sure the systems work within the same type of infrastructure. And if not possible to highlight the issue, and make proactive problem solving possible.

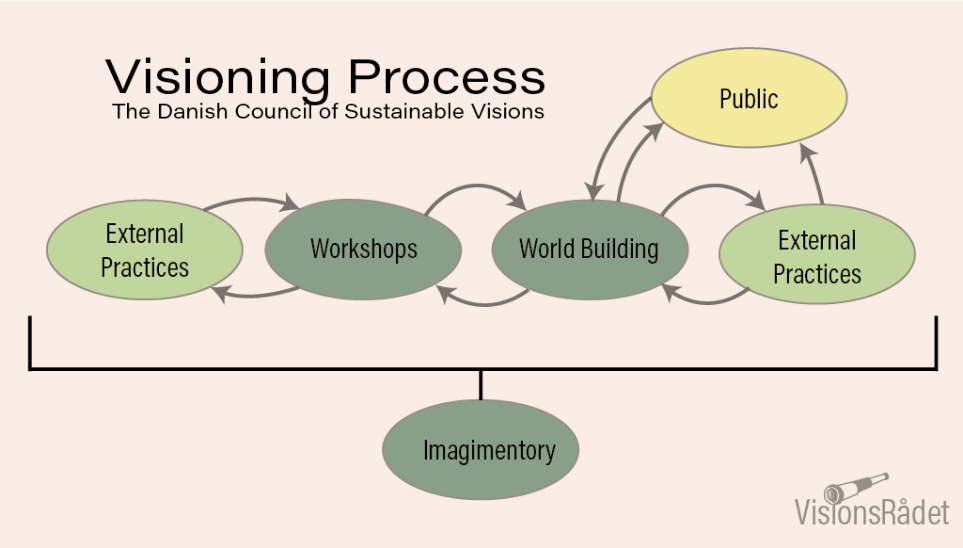


Fig 10: Process of developing the worlds of visions and the imagimentories

Future Workshops

The workshops are the main driver, both in terms of envisioning, but also in terms of creating and expanding transition networks. The workshops furthermore enables method and knowledge sharing

between participants, and educating the participants in long term thinking. The design of the workshops consists of two things: the set design around the workshop, and the design of the co-creative process.

Set Designs

The set design for each workshop helps the participants to engage in future thinking. It will most often include some kind of narrative of being placed in the world of visions, some physical set design to make the participants feel like they are in the WoV, and an obstacle to solve.

Design of Co Creative Processes

For each workshop, a co-design needs to be developed or fine tuned. As one of the aims of the workshops is to make co creative processes possible between different actor types, for example science fiction novelists and climate modellers, particular care is on how different knowledge types work, and how they can be merged.

Imagimentories

The imagimentories are speculative documentaries that both document the work of the Council of Visions, and portray the World of Visions through science fiction stories.

They have two functions. First is to showcase the world of visions, and thereby align the audience towards it. As the world of visions will never be completely consolidated, this is evident in the imagimentories.

Secondly it is part of enabling the audience to engage in long term thinking in their own context. And thirdly they include actors that cannot participate in the general development of the world of visions, like busy farmers or nature.

Process

The aim of Team Imagimentory is to release a new imagimentory every third year (H). Each with a slightly different scope. The main challenge of this format is to have a continuous process of development. Therefore, after their first release, and presentation in cinemas and film festivals, they are continuously updated if elements become incompatible with the world of visions. And available on the database.

Other Products

Besides the described products, two other products hold importance. The first is the future-insights reports. These are collected insights from the WoV within a specific interest of a paying client. This could be a collection of energy related elements and visions that is part of the WoV.

The second is the WoV database. This is a structured collecting of elements and rules from the WoV, to enable actors to understand and engage with it. This can be a list of rules, climate predictions, list of imagined technologies, and list of compatibilities. But also lists of books and podcasts placed in the WoV, future prototypes, or art pieces.

6.3 Work Structure

Activity Teams

The Danish Council of Visions is divided into five teams (see fig 11).

- **Team Workshops** is developing and facilitating workshops with actors of interest
- **Team World Building** is in charge of the continuous development of the worlds of visions
- **Team Colab** is in charge of making collaborations with external fictional practices
- **Team Imagmentory** is in charge of documenting the work, as well as portraying the World of Visions.
- **Team Reflexivity** has the task of a continuous evaluation of the processes in The Danish Council of Visions, and comparing and collaborating with other visioning practices.

Following is a shortened version of the description of the teams. For full version see **APPENDIX III**

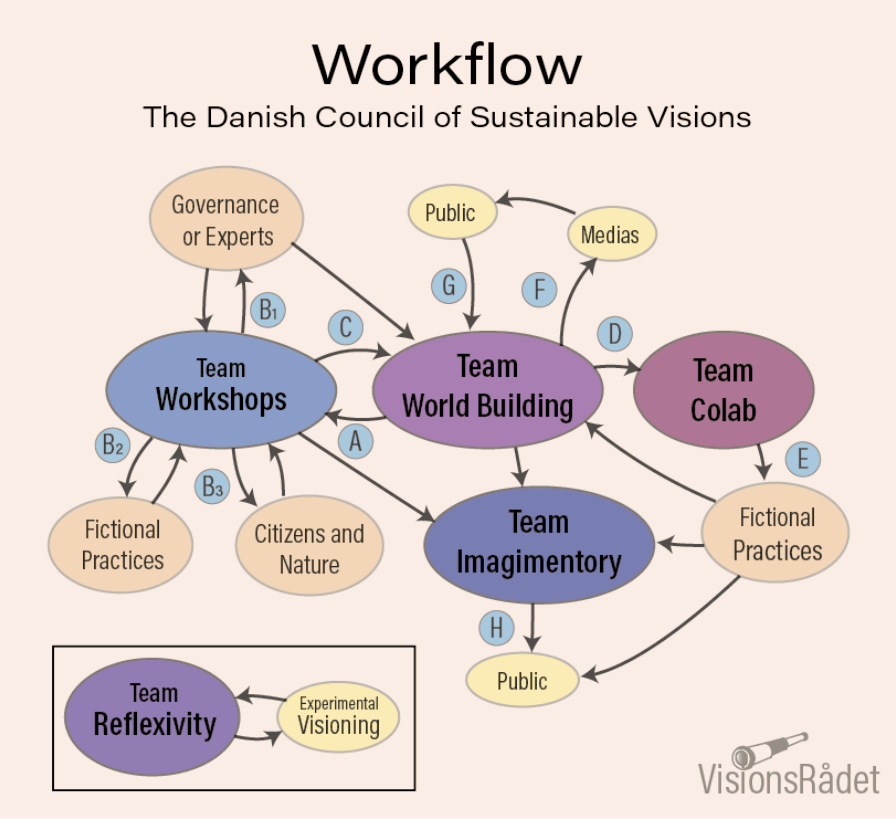


Fig. 11: Workflow of DSV and the five teams

Team Workshops

The Team Workshops (see fig 11) are responsible for the workshops. A continuous task of Team Workshop is the development of new visioning workshops. This contains two aspects. The design of the collaborative process for their participants, and the translation of the World of Visions into something manageable for the participants.

Actor Types
Actor types included in the workshops are (ref til billede):

- *Governance and Experts:* This could be civil servants, employees in larger organisations, or experts or scientists.
- *Fictional Practices:* This could be science fiction novelists, film makers, or architects and speculative designers.
- *Citizens:* Representations from diverse types of people.
- *Nature:* Represented through videos and pictures, or the placement of the workshop in nature.

The Facilitators
The actors facilitating the workshops should have:

- Knowledge and experience with process design, prototyping, design games and scenography.
- Understanding about sustainability and transitions.

Team World Building

This team has two roles. The first is to gather a range of different input and input formats, and combine and translate these into the continuous development of the world of visions. The second role is to make the world of visions available to a range of different actors, and thereby in different formats.

The Facilitators
The Team World Building will require a range of different disciplines:

- People knowledgeable about world building in general.
- Designers capable of making prototypes and visualisations.
- People with knowledge within dynamics of sustainable transitions.

Team Colab

The role of Team Colab is to establish collaborations with organisations within art, design and architecture. The aim is to create programs to involve actors working with fictional or speculative practices with the World of Vision, and place their fictional tellings in it.

The Facilitators
There are both internal and external actors involved:
- External organisations like art schools, funding programs and publishers.
- Small internal team to coordinate the process

Team Imagimentory

The role of Team Imaginmentory is the development of Imagimentories. The Imagimentories are the main platform through which the work of the Council of Sustainable Visions is shared, as well as the world of visions.

The Facilitators
The Team Imagimentory should be a collaborative process, including:
- A science fiction film director
- A documentarist
- A person with an understanding of sustainable design
- (Occasionally there is a need for a full film team, as well as graphics designers)

Team Reflexivity

Team reflexivity in a way is external to the other processes. It will be a collaborative team, with members from all the other teams. Their role is to consistently keep updated to the progress of the research within transition governance, as this is a new field, and engage in international knowledge sharing and collaborations in the community. From this they should evaluate the processes and setup of the Council of Sustainable Visions.

Inventory of objects that should be designed, redesign and maintained:
See fig. 11
(A): Format for translating the world of visions into workshop inputs
(B): Design of the workshops
(C): Format for translating the outcome of the workshops into the world of visions
(D): Format (part of online platform) for making the world of visions accessible for fictional practices
(E): Formulation of projects fictional practices can apply to become part of
(F): Interviews about, and illustrations of, the world of visions.
(G): Format (on online platform) for inputs from the public at large to the world of visions
(H): The Imagimentory

6.4 Examples on areas to develop

Some transitions are already ongoing, like renewable energy, and can therefore work within tactical activities, like planning an implementation. However, other potential transitions will need a much longer time scale, and need to start with imagining it, to evaluate potential and desirability. While this is not the sole purpose of the CSV, it is one of the main purposes and tasks. And a service that can be provided for clients. Here are three examples of such possible transitions.

Food production without external inputs

As the availability of phosphorus and other resources is decreasing, and as danish farming today import soy beans etc. from former rainforest, this could be an area where a transition could be developed through CSV. Technical solutions investigated though CSV could be both hydroponics, permaculture or something 'surprising'. And the initial rule implemented in WoV would be the rule of closed circuit food production.

Production in seas

While land use is nearing its maximum, and as seas have nutrients available, moving part of food and material production to the seas could be an answer to this. Examples could be seaweed for food, or seaweed insulation material. And as biologists in Denmark are wishing for more seaweed for marine health . However, at present the rules around sea production are vague, and there is much needed technology that needs to be developed. And what would production influence the citizens in Denmark, as the danish beaches are at present public?

Houses as carbon sinks

Where current production of building material emits a lot of CO2, using organic material has the opposite effect. Therefore, a building industry using solely organic materials would be regarded as a carbon sink. However, where should all the materials come from, and how will that affect the land use? And how will this affect living, or other activities, in these buildings?

6.5 Tentative Implementation Plan

The last part of the design is a tentative implementation plan. I see this happening through three processes that should of course be aligned to each other. Developing the method for visioning, developing the imagimentory format, and creating a transition network. These three processes should be combined on the website visionsraadet.dk.

Developing the method:
In small corners and pockets of society, there is a range of smaller projects on imagining and decision making in new ways. Examples on this could be the mentioned Future Tours Travel

Agency, but also Worldperfect, a project to involve danish artists in climate efforts. These capacities should be gathered, and start co creating, so new methods can be developed and tested.

Developing the imagimentory format

In this area, interviewed two documentarists, Mads Ellesøe and Anita Beikpour, a sci fi director, Sofia Due Rosenzweig, and Søren Tarp from the Danish Film Institute.. All located in Copenhagen. It was evident through these interviews, that one of the main issues in a potential implementation is that there are few funds for experimental formats.

So here I believe the first important step is to make sure there is established funding. Either through DFI or new sources. DFI has earlier funded collaborations between documentarists and scientists, as a way to make science more available to the public. Based on the insights from this project, I believe there could be developed a similar format for the imagimentories.

Creating a transition network

There is a strong disappointment with some actors with the governmental climate efforts. This disappointment is to some extent already institutionalised, through multiple organisations fighting for climate action. As they seek new ways of influencing politics I believe they would be willing to participate in a workshop or seminar, where they could become part of the transition network around the CSV. This could be organised further through a collaborative project, or by allowing them positions in the board of CSV.

7 Discussion

This thesis in the perspective as visioning

In many ways this thesis has been a visioning process in itself. It is an envisioning of a possible future, and radical to the regime of future making. It uses theoretical approaches to showcase the need and realism of the project, and then a more speculative design approach to open the imagination, and to widen the visions.
It has been very controlled by a 'gatekeeper', me. This is not in line with the TM approach where it should be a more open process, and few people can be said to be part of the transition network, if any but me really. But while this thesis investigates how to design a visioning process that can be implemented, much more work needs to be done on how to make the elements work in practice. This should be done through the implementation, with the involved actors. Seen in this perspective, the visioning of the Danish Council of Sustainable Visions is a continuous process.

In the regard of what the methods used allows to be imagined, this thesis, being part of an academic master, has worked within the selection environment of academic literature and writing. Therefore it is based on the theory-analysis-synthesis-design approach, where an approach based more on storytelling and speculative fiction would have looked different. As part of an engineering program, the design is presented in schematics and bullet points. But what if the design was instead a fictional story from within the Council of Sustainable Visions? If I followed employees in the Council of Visions through their day, and what they experienced. What it would feel to work there, and what projects they were involved in. This approach would have opened up entire new areas of the vision, and also made it easier to share with non-expert actors outside academia.

It is, however, an articulation of landscape pressure. It translates the need for new ways of enabling transitions, into a format understandable to the regime of future making; a ???? #council. Thereby it has the possibility (if anybody reads it) to increase the pressure on the regime of future making to engage in long term thinking and visioning.

Anthropocentric Perspective

A possible critique with this thesis, and possibly the whole field of transitions theories, is the continuation of an anthropocentric perspective. Placing humans, their needs and their ways in the center of everything. Nature, plants and animals, have a very small role in the design. I was aware of this through the work, but as I already deem this suggestion a large transition in the regime of future making, and I wanted the design to be understandable to the regime, I gave it a very small part. However, I do believe the open format and the world building element, can enable a larger role of the voice of nature in the further development of the vision of the Council of Sustainable Visions

8 Conclusion

In society there is a lot of talk of transitions. The climate changes are accelerating, and there is a common understanding that more efforts to slow it are needed.

This has led to the slow development of the academic field known as transition theories. And in one of these theories, Transition Management, it is argued that in order to enable sustainable transitions there needs to be developed an institutionalised and continuous visioning practice. And this should be producing long term visions in order to align and coordinate present efforts of sustainable development.

With this offset, this thesis first consolidated diverting perspectives on visioning related to sustainable transitions. It took me around, and beyond, transitions theories, as it is still a quite immature field. And beside finding how visioning should look, I found that in order to compare visiong with current efforts of sustainability, and thereby be able to integrate it, you need to see it in another perspective. By seeing visioning as future objects, objects that decisions about the future can be based on, one can more easily compare it with the objects present governmental efforts are based on.

Using the perspectives of transitions theories and future objects in an analysis of the governmental bureaucracy showed me four things. First of all, the future objects used inside the governmental bureaucracy did not open up new possibilities, or were able to evaluate what futures are more desirable than others. Secondly, in order to be normative and imaginative, the work needs to be done external to the governmental bureaucracy, and here advisory councils are a good way to have both freedom and influence. And thirdly, visioning happening in society is not institutionalised, but happens more randomly. And fourthly, policymaking in the governmental bureaucracy, external advisory councils, and visioning do not look very far into the future.

Insights from the theory and analysis allowed me to meet my problem formulation:

Through a Sustainable Design perspective, in what way can a visioning practice with a societal scope be designed? And how should this design look, to enable visioning to be implemented and positioned as a governance entity for coordination of, and problem solving in, sustainable transition efforts? And in what way can such a design benefit from artistic methods, and how can they be included in the design?

To enable visioning to be positioned as a governance entity for coordination and problem solving, the design in this thesis is the Danish Council of Sustainable Visions (CSV). This is an advisory council producing worlds of visions, visions created through world building methods, to align and coordinate present climate efforts towards more desirable futures. And it benefits from artistics methods, as speculative fiction allows the more open imagination unbound by present day logic,

that is some of the problems in scenario modelling and technical development. These are shared with the public through speculative fiction, and the imagimentories, speculative documentaries.

It is important to understand that the aim for the CSV is *not* to make a goal. It is *not* to plan the future. But first it enables a more continuous production of visions and visionary elements, that can then be further developed into plans and implementations later. The original ideas have to come from somewhere. And second, it opens up futures as something that can be talked about and discussed, and to see how our actions in the present affect what future we will have.

What I found in this thesis is that, at present, seemingly no institution of larger influence is developing the far future of Denmark. The political 'isms' are not at work anymore, and all planning happens within a ten year scale.

But where do we then have our expectations and understanding of what the future will bring? According to some *(Kirby, D., 2009)* we get it from science fiction. But science fiction is almost solely portraying dystopias *(Barber, J. 2018)*. So how can we then move towards a desirable future in Denmark if we have no idea how it looks? I argue in this thesis that we can't, and that there is a great need for institutionalised imagination and development of the futures of Denmark, if we want to have a say in what world we are going to live in.

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