



Credit: (Clotheslinetinyhomes.wordpress.com, 2012)

‘A Tiny Denmark?’

A framework for tiny housing as a sustainable niche to reach transition

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Abstract

If tiny housing represents a sustainable housing solution why is this niche not more present in the built environment in Denmark? Tiny housing lacks organizational framework and faces legal and bureaucratic barriers since it is legally not accepted as liveable accommodation. The movement is mainly carried by actors on grassroots level who govern initiatives aside from their professional jobs. Actors embedded in the regime are slowly beginning to integrate housing size into new building projects as a way to provide affordable accommodation. However tiny housing suggests more than just a small housing size. It is an ideology embracing several values, norms and practices. As a general condition Denmark lacks spaces for experimental housing due to the risk they represent. Tiny housing projects suggest similar values as other niches that are already established as well-integrated association. These represent an add-on potential of LØS, LØB and Bofællesskab.dk where tiny housing may be integrated as sub-categories. Through a negotiation framework where tiny housing adapt to ecological building methods and gather in large-scaled communities rather than small-scaled projects. For the niche to achieve transition the most impactful pathways are diffusion by *proactive replication* and *up-scaling*. Diffusion through these pathways demands for tiny housing to manage a strategy of governance where actors define a policy framework that is easier accommodated by government.

Keywords: Tiny housing, transition theory, multi-level perspective, grassroots innovation, governance

Preface

This thesis, *A Tiny Denmark?*, is completed on the 4th semester of the study programme Sustainable Cities MSc at Aalborg University Copenhagen.

The report approaches tiny housing as a sustainable niche in a Danish context by asking of *what* the niche represents and *how* it, as a sustainable housing solution, reaches transition. The baseline of this thesis considers governance of tiny housing and actors involved with protecting the niche.

I have applied the Harvard referencing method where references are created as follows;
(Author/publisher, year)

I would like to thank the many actors who have contributed with their knowledge, experiences and personal stories of why they engage in tiny housing. It is a topic of complexity and legal prohibitions that requires an attitude of surplus to commit to. A special thank to my network who I have been in continuously contact with; Jens Randrup, Jette Østergaard, Dennis Lyth Frederiksen and Frederik Busck.

Additionally I would like to thank my supervisor Jesper Ole Jensen, who patiently has guided me through a process and straighten out bumps on the road.

Introduction

The world population has exceeded 7,5 billion people and is predicted to reach almost 10 billion in 2050 (Ritzau, 2015). At the same time urban areas are rapidly growing and constitute centres of heavy resource flows and consumption. With the increasing amount of people with basic needs such as food, goods, space and housing living tiny is one alternative to meet the global demand for sustainable action since less space = less energy consumption = less material use = less usage of raw material resource = less environmental impact. According to a report developed by the International Energy Agency (IEA) for UN Environment, the building sector in 2017 worldwide accounted for 39% of the total energy related CO₂ emissions (UN Environment, 2017) representing a great potential for energy reduction.

New technologies result in energy efficient solutions for households to consume less energy. This raises a question of how innovative and sustainable solutions could be integrated within the building sector to meet the increasing demand for lowering its energy consumption (U.S. Energy Information, 2013).

Living in tiny houses is not a new concept. Swiss architect, city planner and designer Le Corbusier introduced the 1920-30's functionalism and minimalism where he considered minimalistic architecture to be functional, aesthetic and social. He focused on urban environments wanting better living conditions for people in crowded cities (Renzi, 2013). In 1952 Corbusier completed *The Cabanon* – a microcosm – with only one room inspired by his own mantra; '*a house is a machine for living*' (Le Corbusier, 1986 pp. 107) measuring only 12 x 12 feet, corresponding to approx. 3,6 x 3,6 metres.

Another architect introducing the initial thoughts behind tiny house movement was American architect Frank Lloyd Wright. In the end of the Great Depression in 1936 he introduced the *Usonian House* purposed to provide affordable, simple and small housing for everyone in society (Craven, 2019). In his later work, Wright became more determined to downsize. In his book *The Natural House*' (1954) Wright formulates *Usonian Automatic* clearly describing how

house owners could easily build a small house themselves; small, one-storey, moderately priced houses constructed from natural materials and designed aesthetically pleasant (Wright, 1954)

The modern tiny house movement, as the general denotation of living in tiny houses, began in the late 1980's but it was not until the aftermath of hurricane Katrinas' mass destructions in 2005 the movement got attention since building tiny houses became an emergency tool for people who lost their homes. A couple of years later with the financial and housing crisis in 2007-2008 the movement really gained momentum and presented a viable housing alternative, affordable for regular US citizens (Bradley, 2016).

Downsizing in square metres suddenly became an efficient way of getting rid of the enormous mortgages people found themselves in. *The New Yorker* describes in an article:

'The rhetoric of present day tiny-house living begins with the assertion that big houses, aside from being wasteful and environmentally noxious, are debtors' prisons' (Wilkinson, 2011).

Tiny house movement originates from USA with an ideology based on architectural and social values. For some it may indicate a philosophical approach to life and for others living in tiny houses may be reasoned differently. Today tiny house movement exists through books, articles, YouTube videos and TV-shows and is founded on three pillars: Ecology, Economy and Philosophy/Social philosophy (Ibid).

There is no homogenous definition or requirements for how a tiny house is supposed to be built or look like. The general conception of tiny houses is a mobile construction that may be built on trailer platforms and does typically not exceed approx. 46 m² (UVM, 2019).

Accordingly the movement is both architecturally and socially grounded where simple living plays an important role (Wilkinson, 2011). Living in tiny houses is not merely living small but is also a lifestyle of minimalism and simplicity. Today the movement has grown in popularity and expanded to many other countries around the world.

Living small provides residents with an economic freedom most people do not access when living in a large, expensive house. With tiny housing comes an increasing demand for innovative design solutions where functionality is a key element. Tiny house projects shared

on commercial platforms offer a variety of new and fun ways of designing spaces for multifunctional purposes. Examples of this may be storage room beneath the staircase, foldable furniture or choice of wall paint to make rooms appear bigger.

Problem area

In USA tiny housing is a well-established niche presenting an alternative housing solution to the existing regime. Why has this way of living become so popular in the US and how does it take part in today's planning in Denmark? This thesis explores the phenomenon tiny housing and discusses how tiny housing in Denmark represents a niche proposing a sustainable housing alternative to the existing regime. Numbers from Boliga show how we in Denmark in this decade, 10-20's, has build new housing on a level corresponding to the 60's and 70's building boom (Rebsdorf, 2019). At the same time housing has gone through a transition where the built environment represents much more than just a physical construction. Today's housing is part of a planned environment where architects and planners work with issues as *sustainability, life between buildings, defeating loneliness, optimizing use of space, co-living* etc. (Krausing, 2019). The building sector finds itself in an experimental period approaching this new role of what is demanded for today's housing. Anthropologies have researched in how we consider a home to be a condition created by its residents throughout time. A home is full of feelings and is a big part of our identity (Vacher, 2010). Under this premise my motivational background is rooted in the intersection between what is demanded of today's housing while at the same time attempting to integrate sustainable technologies. Tiny housing is such an example and ever since I was introduced to the phenomenon I wanted to look deeper into this way of living. Through social media and streaming services tiny housing is presented as a romantic way of seeking economic and personal freedom while introducing innovative design solutions. This romanticism I want to address and in some ways accept. If tiny housing really is a sustainable housing solution that additionally represents other life values then why is this niche not more present in new housing projects in Denmark?

As result of the problem area I have developed following research question;

How has tiny house movement been adapted in a Danish context and how may a framework for transition appear as in order to promote this sustainable niche in both an urban and rural context?

Sub questions are indicators structuring the way of how to answer the research question. To answer above research question I have developed following sub questions:

- What is tiny house movement and what does the niche represent?
- How and where is tiny housing present in Denmark?
- What are the main barriers for tiny housing projects to be realized?
- Who are the actors governing tiny housing?
- Where does tiny housing positions according to a niche-regime relation
- How may tiny housing achieve transition?

In order to answer sub questions a literature study states the art of tiny housing in a global context followed by empirical grounded evidence narrowing down into local projects concerned with tiny housing initiatives in Denmark. Looking through the glasses of Geels' (2002) theoretical framework of multi-level-perspective I want to discuss how tiny housing in Denmark represents a niche and how it positions in relation to transition to the regime. For this purpose there are several strategies; *Strategic niche management* (Kemp et al. 1998; Geels & Raven 2006) and *bottom up transition strategies* (Smith 2003 & 2007). Additionally I look into different three different paths of transition formulated by Boyer (2018); *replication, up-scaling and translation*. Lastly I shed light on the role of actors on governance level in order to discuss their functions in these *strategies* and *paths* of transition.

Relevance

The building sector is increasingly demanding for innovative sustainable technologies purposed to minimize CO₂ emissions deriving from the building process where environmental impacts from manufacturing and transportation of building material, demolition and other activities are included. When a house is built, carbon emission from energy for heating and cooling, lighting, appliances and other electric equipment are main components in environmental impacts. Tiny housing offers a sustainable housing alternative that from a multi-level perspective may solve several problems in the built environment. This niche is thereby relevant to explore as a possible solution to a regime of unsustainable building practices.

Background

This chapter presents relevant findings on tiny housing concerned with the technology in an Northern American context.

Tiny housing and sustainability

In Denmark, no remarkable scientific research has been conducted on the topic considering whether people living in tiny houses practise a more sustainable lifestyle than regular homeowners. However, such research has been done by Maria Saxton in her Ph.D. for American tiny house residents. Saxton conducted surveys from 80 owners who had lived in their tiny house for at least a year. From a calculation of the ecological footprints of the residents in the 80 households, before and after moving into their tiny houses, Saxton concluded that they reduced their individual footprints by 45%. Furthermore residents changed to more sustainable behaviour particularly when it came to consumption patterns. The residents purchased less furniture, clothing/footwear, household appliances, electronics, books and magazines (Saxton, 2019).

In Denmark, tiny housing is a rather new concept and for planners and other actors integrated in developing the built environment it is essential to have factual grounded knowledge on whether these new types of dwellings actually *are* sustainable or just promote themselves being sustainable. Research like Saxton's contribute greatly to understand the potential tiny housing presents as a sustainable technology and suggests a tool for planners to work with.

Motives behind living in a tiny house

Why do people want to pack up their lives into a small amount of space?

In her thesis, Mutter (2013) from Lund University examined tiny houses in Northern America. On behalf of research from articles, newspapers, magazines, online blogs and YouTube videos combined with interviews of tiny house owners Mutter (2013) concluded on motivations for this choice of housing. Common for most people she found how living in tiny houses was a way to escape from expectations of society. Mutter discovered following motivational backgrounds for tiny house owners living in tiny housing to be:

- *A simpler life*
- *Sustainability/Environmentalism*
- *Cost*
- *Freedom and Mobility*
- *Alternative Forms of Community*
- *Design and Building*

(Mutter, 2013 Pp. 47)

These motivations present why people want to live in tiny houses and provide an insight of what kinds of forces may support the movement in Denmark. Additionally it offers an idea of the client segment buying into tiny housing.

A niche market that has become mainstream?

In the country of origin USA, the list of building companies selling tailored tiny houses is long (Sisson, 2017). In an article in the acknowledged lifestyle weblog Apartment Therapy, journalist Grace Stetson argues how tiny houses went from being a budget-friendly housing alternative that has become a business for companies building expansive luxury tiny houses. The commercial attention tiny houses within the last decade has achieved has become a disservice for its followers. One of the reasons why is the lack of market transparency where buyers have not been aware of the adequate pricing so they have bought overpriced tiny houses from building companies. This has resulted in inflated prices where companies continuously have been overcharging costumers. Tiny house developer Randy Jones, who started his company due to outrageous market prices, is devoted to build cheap tiny houses for the people. He estimates that there are around 5.000 tiny house building companies in USA, due to an 'internet obsession' creating a great market for builders to exploit. Now the market is oversaturated and companies will continue to build as much as the market allows for (Stetson, 2019).

State of the art

This chapter presents topics related to tiny housing in Denmark in order to understand the regime in which tiny housing as a niche attempts to transit.

Housing size in Denmark

In general housing sizes in Denmark have increased. In the beginning of the 1900's the general housing size pr. person was 12,5 m². In the 50's this number doubled to 25m² and today it redoubled again to approx. 52 m² pr. person which is among the biggest worldwide (Grossman, 2017). In the interwar period some Copenhagen citizens even lived on 1,6 m² pr. person (Gadeberg, 2016).

According to Statistics Denmark (Danmarks Statistik) the number of residents per household has decreased from 2,6 to 2,1 persons. Real Estate economist Morten Skak formulates how people today are more likely to live alone which indicates how singles tend to occupy housing meant for more than just one person (Gadeberg, 2016). When it comes to new housing development, the 98 different municipalities in Denmark have the right to decide size, quantity, type, location etc. (Larsen, 2017). As an example, Copenhagen Municipality decided in 2005 on a rule demanding for new housing to be 95 m² in average size and a minimum of 75² (Herby, 2018). Motivation for this regulation was to attract resourceful families and promote a mixed composition of residents (ibid).

Tiny housing in Denmark

In a podcast by den2radio, architect and professor at Danish Building Research Institute, (SBI, Statens Byggeforskningsinstitut) Claus-Bech Danielsen argues why living in tiny houses seems appealing:

'I think many people are dreaming of a small retreat in nature where you are living all by yourself... it is located deep into the woods, at the ocean, in an old industrial area or maybe even on top of a skyscraper... where you have a tiny retreat. That is something we can see has become

very trendy these days...' (Bech-Danielsen in Grossmann, D. K. 2017. *At bo: 'Tiny houses – mobil, minimalistisk og midlertidig*. Den2radio)

Furthermore Bech-Danielsen argues how architects throughout the past century have worked with minimalism in housing but the actual tiny house movement has just recently entered Denmark by fragmented projects spread around the country. According to him the trend of living smaller is a response to growth in housing size in the 20th century that has exploded and the movement will grow bigger in the following years and gain a greater impact on the way people live (Grossmann, 2017).

Bech-Danielsen has studied housing trends in Europe and during his research he became aware of *micro-housing*. There are different reasons of why people tend to squeeze into less space. In Copenhagen it is more or less a matter of a pressure due to circumstances dominated by expensive housing (Bech-Danielsen, 2019). At the same time big cities become more liveable and trendy reasoning why families want to stay but have to downsize due economic ability. Others actively choose this way of living because of ideology where identity and housing become more attached. Some of these people may afford to live bigger but they want to downsize and question the existing definitions of family values and use of resources (ibid).

Planning for tiny housing?

Tiny housing is not considered as part of the Danish planning paradigm since tiny houses are not characterized as inhabitable (Frederiksen, 2019). Due to a missing definition tiny houses are difficult to implement in structural regulations and zoning reasoning why this alternative housing solution is not implemented in local planning. Hence tiny housing does not take part in planning of the built environment in Denmark. Bureaucratic institutions are not sure of them being mobile homes, motor homes, accessory dwellings, temporary housing etc. Some argue how mobility is part of a tiny house with wheels integrated in the foundation but others do not consider mobility to be important. Whether a tiny house is meant for temporary or permanent use, both constellations come with a set of legislative considerations. All types of houses have to meet the requirements of The Building Regulation (BR), an administrative order that specifies the demands of the Building Act (Byggeloven) (Nielsen, 2018). It defines

standards that buildings are required to accommodate in terms of justifiable craft, technique and safety. The current Building Regulation, (BR18), is frequently revised as a result of new techniques, research and change in politics. This could be in material use, indoor climate, energy loss etc. (Ibid).

Tiny house resident Dennis Lyth Frederiksen, has build his own tiny house and is the author of the book *Mit Tiny House* (2019). Frederiksens' book is an example of how regulations concerned with tiny houses can be interpret and carried out. Fundamentally the legislation lacks an explicit acknowledgement of alternative constructions that are suitable for inhabiting. Neither the Building Act nor Building Regulation address small housing size and since there is no specific definition of tiny housing there are some different categories with belonging legislative commitments that tiny houses may try to fit into. These categorisations are *single-family house, detached house, flats, transportable construction or caravans*. Within these categories lie BR requirements that complicate the small size element. BR requirements specially inhibiting for tiny houses are related to insulation, energy consumption, drainpipes, indoor furnishing and water (Frederiksen, 2019). Frederiksen argues how, as it is today, the most suitable way for a self-builder to accommodate legal requirements, is by categorizing your tiny house as a transportable construction. Even though it permitted to inhabit all year round and is by law required to change location every six weeks this way you achieve a legal construction. It is up to municipalities to enforce legislation, which can be difficult and resourceful (Frederiksen, Facebook correspondence 13/9-2019).

Besides BR requirements a subsequent barrier is where to put your tiny house. The Planning Act is purposed to secure a coherent planning of the Danish landscape accommodating societal, natural and environmental issues while creating a good framework of growth and development (Retsinformation, n.d). In order to create defined boundaries between cities and the open land, Denmark is divided into three zones; *urban zones, rural zones and zones for holiday homes* (Erhvervsstyrelsen, 2018). Zoning is a tool that supports an organised and planned settlement in Denmark and allows for municipal - and local planning authorities to handle city planning according to municipal priorities (Ibid). Plot ratio, distance to boarders, requirements for implementation and suchlike is decided through a combination of legislation for the specific zone and the existing local plan (Sode & Jensen, 2017). These specific

requirements are challenging for tiny houses to accommodate and complicate acquirement of a building permission. Additionally it is for all self-build projects a time demanding and bureaucratic process to overcome all legislative acts with no professional help.

Danish companies occupied with tiny housing

This subsection states the art of companies occupied with tiny housing in Denmark. By presenting building companies and architects who have integrated tiny housing elements in their work it is possible to create an idea of the degree of professional interest in the movement in a Danish context. When addressing tiny housing as a niche it is important to understand what kinds of actors who are professionally invested.

Tiny House Living

Tiny House Living is a Danish entrepreneurship, founded by Michael Hennecke and Lasse Nielsen who specialize in building tiny houses. They launched their first house in 2017 and are one of the only building companies mainly focusing on tiny house building. Hennecke and Nielsen experienced a society where students and refugees were put in poor accommodation and they wanted to change this by creating good quality homes for these people. For them it was important to build year-round residence with kitchen, bathroom and washing machine. They acknowledge the trend of downsizing, something that has also reached seniors, families and busy business people. Officially Tiny House Living 'gave birth' to the first tiny house on wheels in Denmark in 2016 (Mayner, 2017). This was similar to the American mobile construction on wheels with measures allowing for it to be moved as a caravan on the Danish roads. Additionally Tiny House Living has built a tiny house available for Airbnb. It can be picked up in Odder, where the company is located, and transported to whatever location is wanted (tinyhouseliving.dk, n.d)

Add a room

In 2010 the company Add a room was created with the purpose of building small modular and movable housing units of high quality from sustainable materials. Flexibility is an important aspect and the housing units are designed in a way that allows for you to add, remove or move a module so it fits new demands or the natural environment. The houses are

designed by architect Lars Frank Nielsen who focuses on a minimalistic expression where the modules are suited for standing alone or being attached to each other.

(addaroom.dk, n.d.)

BÅKS

This Silkeborg based building company specialises in modular boxes as housing units. Similar to Add a room, BÅKS delivers small units as annexes or as unique detached housing. They are built in correlation to regular housing standards meeting BR18 requirements. BÅKS delivers modules to locations all around Denmark (båks.dk, 2019)

SimplyBoheme

SimplyBoheme is a small company in Dragør specialised in building and designing small mobile houses. Karen Rosendal worked as a stewardess for 23 years before she in 2014 quit her job to become self-employed at SimplyBoheme. Rosendal found the idea of an aesthetic and simple life appealing and wanted to build a small retreat for herself where she could have her own space without husband and children. A re-make of an old caravan of 17 m² was the result that afterwards became a business idea (Vöge, 2015). SimplyBoheme offers four different models of small housing in the size range of 10-21 m² from 128.000 – 268.000 kr. The small caravans are built by few employees of materials from specialised suppliers (simplyboheme.com, n.d.)

Arcgency

Copenhagen based architect company Arcgency occupies with the intersection between architecture and sustainability. They adapt new building methods and techniques into their buildings and integrate re-usability and life-cycle strategies. The manifest of Arcgency is to create architecture in harmony with nature when developing liveable cities. RCA, Resource Conscious Architecture, is a value Arcgency integrate in their work by doing lots of research, dialogue with professionals and testing (arcgency.com, n.d (1)) They have built a luxury micro-house made out of steel for the design company VIPP and is the architects behind CPHVillage Refshaleøen housing students in up-cycled containers (arcgency.com, n.d. (2)).

Tiny housing projects in Denmark

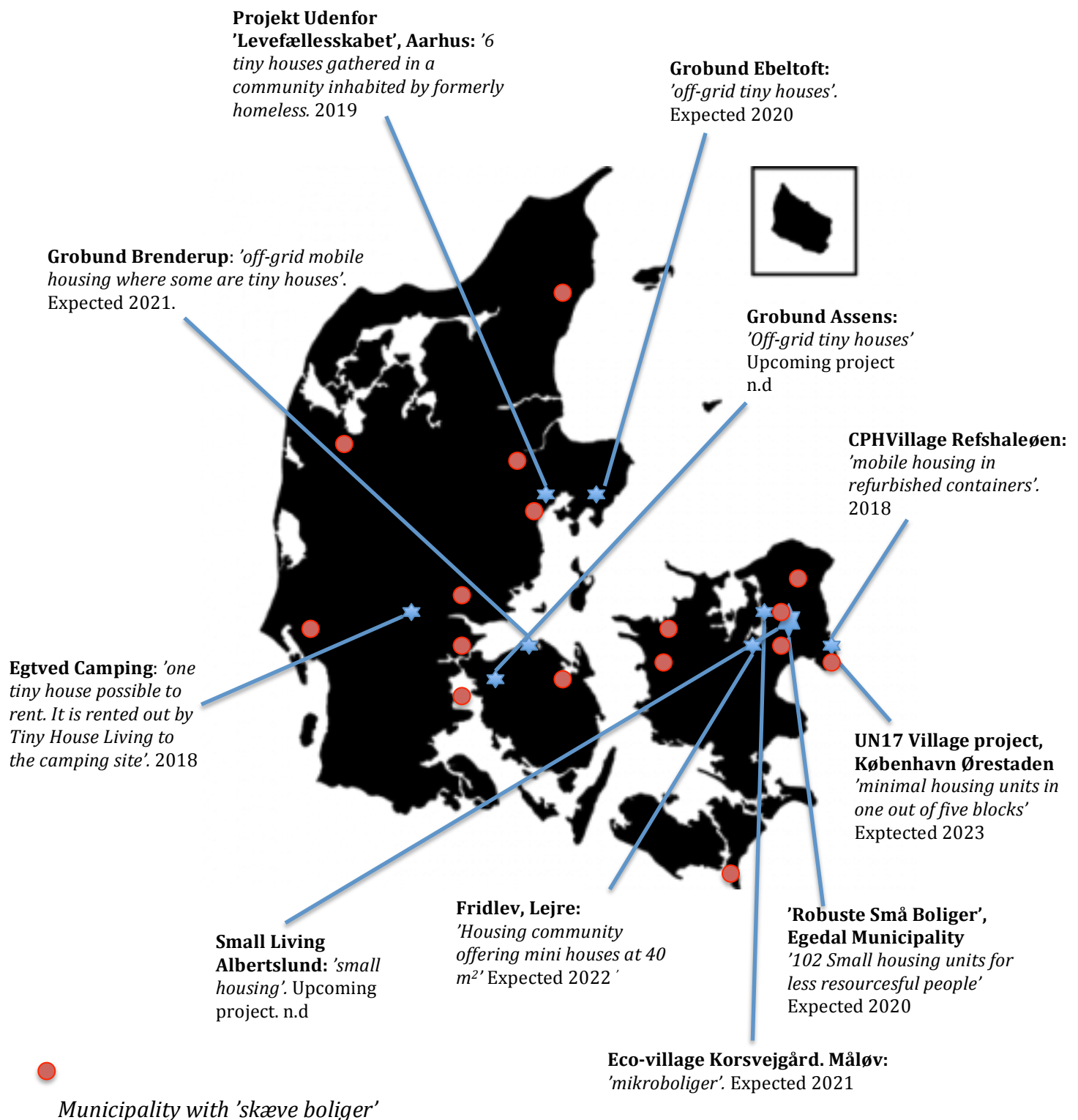
Tiny housing as the American concept may not be adapted 1:1 in building projects but in order to understand the scale of which tiny housing exists in Denmark following is such a suggestion. Some of the following projects will be elaborated on now, some in a later analysis and discussion and rest is pointed out on the map below since these are only recently decided on and lack specified written information. Common for these projects is how they have an articulated vision that correlates with tiny housing. The articulation differs and reasons why the exact articulation of these projects is highlighted on the map.

NREP is a developer company pursuing a more sustainable long-term valued real estate projects in the Nordic countries (nrep.com. n.d). Through a multidisciplinary team NREP seeks to improve the built environment and ensure liveable cities. Together with Lendager, Årstiderne Arkitekter and Moe og Arup, NREP is behind the UN17 Village project in Ørestad South. Based on UN's 17 sustainable development goals the project actively implements a holistic sustainability approach in the new village expected to be habitable in 2023 (Gregersen, 2018). Five different blocks support different housing typologies approaching different kinds of residents from families, singles, students and seniors. Amongst these are *minimal housing units*. Additionally various common areas and facilities are offered such as dining hall, bathing house, garage, common room etc. (ibid).

Fridlev is an upcoming housing community in Hvalsø, experimenting with new ways of living in a social fellowship. It is inspired by older cooperative movements and states to be part of tiny house movement offering small and simple housing at a low cost. The project is developed by AlmenR, a company from 2017 facilitating housing communities on a platform of more than 8.000 members (Sevel, 2020). Fridlev offers mini houses at 40 m² both as rental or ownership. Additionally the community offers three acres of common park area, 300 m² common housing and space for office community (Almenr.dk, n.d). Another current project integrating small housing size is Robuste Små Boliger supplying Egedal Municipality with 106 new housing distributed in four different areas within municipal borders in Måløv, Stenløse and Ølstykke. Housing association 3B and Egedal Municipality initiated the project that is realized by contractor G.V.L Enterprise in cooperation with architects Leth & Gori, Bjerg Arkitektur Lassen Landskab and Advisory engineers EKJ (Adolfson, 2019). Robuste Små

Boliger entails four housing typologies, all semi-detached housing units, in the range of 45 to 60 m². In each of the four areas there will be a community house and green common areas. The vision is to create affordable and sustainable housing available for the weakest in society (Ibid). In same category an initiative housing fragile citizens called 'skæve boliger' was introduced in 2009 with the purpose of allowing for municipalities to be subsidised when developing these types of housing. In 2017, 504 'skæve boliger' were erected in 16 Danish municipalities with a housing size in the range 22-53 m² (Transport-, Bygnings – og Boligudvalget, 2017). Currently architect Leth & Gori together with building association 3B, Copenhagen Municipality and Egen Vinding og Datter are developing 34 'skæve boliger' in Amager and København Nordvest (Blindkilde, 2018). A similar project is the Aarhus based Projekt UDENFOR. Housing for homeless is a societal issue that can be answered by downsizing and Projekt UDENFOR builds tiny houses together with the homeless who inhabit them. Six tiny mobile constructions currently constitute a housing community where inclusion, sustainable architecture, diversity, respect and care are key values. The project is supported by Den Europæiske Fond for Bistand til de Social Dårligst Stillede (FEAD) and realized by various contributors and collaborators amongst others Arkitekter Uden Grænser (udenfor.dk, 2019)

The map beneath visualizes the presented Danish tiny housing projects:



Figur 1: Shows housing projects in Denmark with an integrated vision of tiny housing

These projects indicate how tiny housing is present in Denmark both as a tool of *necessity* providing affordable housing but also as a sustainable an attractive housing alternative developed to people *choosing* this way of living.

Literature review

Academic literature on tiny housing is sparse. Literature is mainly concerned with articles, blogs, non-academic books and YouTube videos. However this does not indicate that this type of literature is not relevant. This chapter includes literature written on tiny house as an ideology rooted in a Northern American context followed by examples outside American borders in order to get an idea of the movements' foothold globally.

'The Not So Big' philosophy

The US architect Sarah Susanka, is founder of the 'Not So Big' philosophy. In her book 'The Not So Big House' from 1998, she expresses a resistance towards the way of thinking that bigger is better. The 'Not So Big' approach equals the individual with sustainability by phrasing the motto:

"Sustainability begins at home. It begins with you." (Susanka, S. & Obolensky, K. 1998: *The not so big house*. Pp. 2)

According to Susanka it is not the amount of space that constitutes a liveable house but the design that fits today's more informal lifestyle (Susanka & Obolensky, 1998). She translates architecture into how we inhabit our lives. Living small in itself is of no value if we do not slow down and live in the moment, cultivating things in our life that makes us happy. Susanka believes how there is a connection between the 'Not So Big Life' philosophy and green living (Vouchilas, 2015). According to Susanka, a house should only have spaces that are used daily and not irregularly. In 2007 Susanka published yet another book 'Not So Big Life' that does not only focus on the architectural aspect of downsizing but also targets goals in life. This philosophy transforms the equation, where 'life' becomes the medium instead of 'house' and reconsider 'time' instead of 'space' (Abrams, 2015). It is not just about building a smaller house for you and your family; it is the concept of concretizing the essence of what makes you happy and stress-free. The strong ties between architecture and well-being is articulated by Susanka as a product of today's housing market:

“With all the challenges in the housing market, it’s clear we need a new vision for the way we design our homes, our communities, and even our lives” (Susanka, S. in Schwolsky, 2011)

Additionally, Susanka defines this new vision as a *life design* and how she explores the underlying order of how to ensure a good life design. Building small is a key factor because it promotes a life design beginning with the individual and their homes and not the other way around (Vouchilas, 2015). Susanke wishes for everyone and not just the few to recognise values of living smaller. Her recipe is simple:

“The more of us who lives this way, the more the message will spread. It’s contagious.” (Susanka, S. 2008. Pp. 3)

Pioneering tiny housing in USA

Environmental Consultant Jay Shafer is considered to pioneer tiny house movement in USA. He moved into his own tiny house eighteen years ago in Iowa and ever since he has built and



Picture 1: Jay Shafer outside his tiny house.
Credit: (Langston, 2018)

designed tiny homes for others. Today he owns the design – and building company ‘Tumbleweed Tiny House Company’ and lives with his wife in California in his third tiny house. Shafer wrote his first article already in 1999 and today his CV resume of publishes includes a number of books. Shafer has a master’s degree in fine arts painting and through painting he began caring more about form and proportion rather than subject matter.

This became the kick-off to his ideology of living with less materialistic stuff, giving up his apartment sleeping on a mattress covered by a piece of plastic. Giving up painting Shafer devoted himself to explore this way of living with an idea of being able to fall asleep wherever feeling tired. He bought a 1964 Airstream travel trailer and renovated it so it became liveable for permanent accommodation. This became the beginning of Shafers’ hobby of drawing and designing small houses (Wilkinson, 2011). Thus he soon became familiar with the International Code Council’s building codes considering these small houses illegal according

to its recommendations. Now Shafer became dedicated to figure out how to design a suitable solution that would be legal to inhabit despite its tiny size (Shafer, 2010).

Tiny housing as temporary solution to urbanization

The second largest city in the Netherlands is about to build up to 3.000 mobile tiny houses as a response to the city's housing crisis. While Rotterdam is in a process of building permanent common housing, these tiny houses are designed to reduce the pressure on the housing market as a temporary solution. The prefabricated houses are 39 m² in size and provide housing for low-income residents only for approximately a decade while permanent housing



Picture 2: Temporary tiny houses in Rotterdam. Credit: (O'Sullivan, 2018)

is built. This example is not unique in the Netherlands where many cities experiment in temporary micro-neighbourhoods of mobile prefabricated housing. In general, cities around the country address sizing requirements for new housing in order to accommodate the increasing housing demand. In Nijerk, a small city an hour away from Rotterdam a tiny house community of 28 housing units are already

established and illustrates how future temporary communities in the future may look like (O'Sullivan, 2018).

Tiny housing as research object

In 2016 architect Van Bo-Le Mentzel founded the NGO-association Tiny House University (tinyU) located in front of the museum Bauhaus Archiv in Berlin. Together with a team of designers, education activists and refugees he challenges the way we live today (Gyulai-Gaal, 2018). The project is rooted in beliefs of new architectural models as tools for creating social and diverse neighbourhoods downsizing in space. TinyU is an educational research project fighting for justice, participation, social equality, integration, democracy, sustainability and right to housing. The organisation is inspired by Bauhaus as a utopian radical philosophy and socio-critic political scientist Leopold Korh who phrased 'Small is Beautiful' and reasons why building small, beautiful and movable housing is key value for tinyU.

Mentzel argues how *we have to define living in a city as a contribution to society* (Di Chiara,



Picture 3: *Tiny House University*. Credit: (Di Chiara, n.d)

n.d). Besides building they research on themes as *tiny living, temporary living in the urban scene, mobile structures, strategies for affordable housing, legal aspects of tiny houses, permaculture design, transformable furniture* (Di Chiara, n.d). Prototype testing is integrated in the learning process and is a way of experimenting with different designs.

‘Space for possibility’ is a term embedded in the ideology which appreciates the value of small

spaces even just at 10 m². Volunteers and members of the NGO are allowed to sleep in the houses as long as they are gone by 9 am when the museum opens (Ibid).

Tiny housing as culture

Japan has a fascination of everything small and cute. Including homes. *Kawaii* is the Japanese word for cuteness and is part of Japanese culture since 1970’s where the trend was introduced through Japanese pop culture (Chey, 2017). Overpopulated cities and scarce living space is nothing new in Japan and the population has already since the aftermath of WWII



Picture 4: *Two different designs of kyosho jutaku*. Credit: (CNN, 2017)

been living small. The 70’s recovery from the war came with a building boom demanding for small urban housing. Tiny and flexible housing became a trend in the bigger cities such as Tokyo. *Kyosho jutaku* is the Japanese term for micro home and represents an experimental architecture that re-thinks purposes of the spaces we inhabit. Award winning architect Yasuhiro Yamashita is known for his micro-

house designs and explains his minimalistic approach to be rooted in Zen Buddhism saying that ‘*you don’t need more than half a tatami mat to stand and a full mat to sleep*’ (CNN, 2017). This ideology has inspired Yamashita’s futuristic micro-houses front running in aesthetic 3-D designs to fully exploit indoor space as functional living space. New designs and technology has only made these quirky tiny homes more popular in Japan and today there are countless

architects occupied with minimalistic housing design. Not only as response to high dense cities but also as cultural and religious way of thinking of how a home should be. (Ibid)

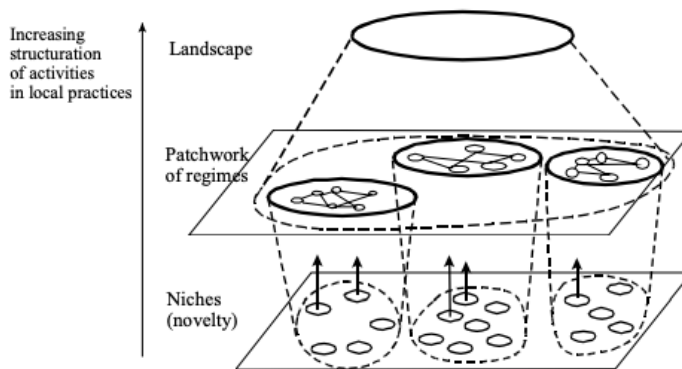
Theoretical framework

This chapter presents the theoretical framework applied to understand tiny housing as a niche in Denmark through a multi-level perspective.

Technological Transition (TT) through Multi-Level Perspective (MLP)

Technological Transition is by Geels (2002) described as *major technological transformation in the way social functions are fulfilled* (Geels, 2002. Pp.1257). Such as housing, transportation, communication e.g. Additionally Geels proposes social dimensions of TT as *change in user practices, regulation, industrial networks, infrastructure and symbolic meaning or culture* (ibid). Today we experience a greater focus on transition due to the increased awareness on sustainable issues demanding for policy makers, companies and NGO's to support innovative solutions. Multi-level perspective (MLP) is an analytic tool integrated in TT applied for understanding the complexity and dynamics of sociotechnical change. The different analytic levels are divided into niches, regimes and landscapes. The socio technical landscape (macro-level) is rooted in profound structural trends and heterogeneous factors such as political conditions, economic growth, oil prices, immigration etc. that can not easily be changed. The socio technological regime (meso-level) is easier changed than the existing landscape and contains network of actors and societal groups, rules of formal and informal character, technical and material components. It includes technologies, institutions and actors. Rules are not autonomous units but organise and link together within a social rule system (Geels, 2005). Lastly comes niche (micro-level) where radical innovation is generated and alternative solutions are created. Niches challenge the existing regime and offer a place for learning processes. If a niche is well-established and strong enough it will intervene with the regime and substitute current practises. When the landscape experiences societal change it puts the regime under pressure asking for innovation occurring when niches are developed. Niches have different ways of entering the regime where it may be integrated within the regime without necessarily competing or replacing it (Schot & Geels, 2008).

Following figure visualizes the different levels of MLP;



Figur 2: Shows the three hierarchically analytic levels of multi-level perspective (Geels, 2002. Pp. 1261)

The increasing focus on climate is a topic that has reached political conditions in the socio-technical landscape pressuring national political agendas manifested in various regimes also the building sector and premises the research question of this thesis.

Bottom up transition strategies

Transition within sectors moving towards more sustainable production and consumption patterns is highly motivated by alternative movements (Smith, 2003). Alternative housing experiments are driven by social actors who are involved in alternative movements fighting for material and social sustainability (ibid). In order to comprehend how transition of alternative socio-technological niches may reach transition it is beneficial to understand what kinds of alternative norms, values and practises they suggest (Holm et al, 2014).

This approach understands transition through governance. When political programs and planning initiatives are developed in order to support alternative technology niches, an analytical framework has to be included to successfully integrate the alternative variations to the regime. This interaction between the niche and regime comes with a complex process where values and knowledge of the alternative niche to a certain extent is adapted to the regime. Smith (2007) addresses bottom up transition strategies of alternative technological movements and presents two issues in the relation between alternative niches and the regime:

- *Add-on* → when alternative niches are integrated in other niche practises
- *Negotiation framework* → compromises made in order to facilitate a common ground for the alternative technology and the established sector. Alternative niches find tensions in the regime to navigate by and seek to narrow their ideologies down to pieces that may be integrated in specific political agendas.

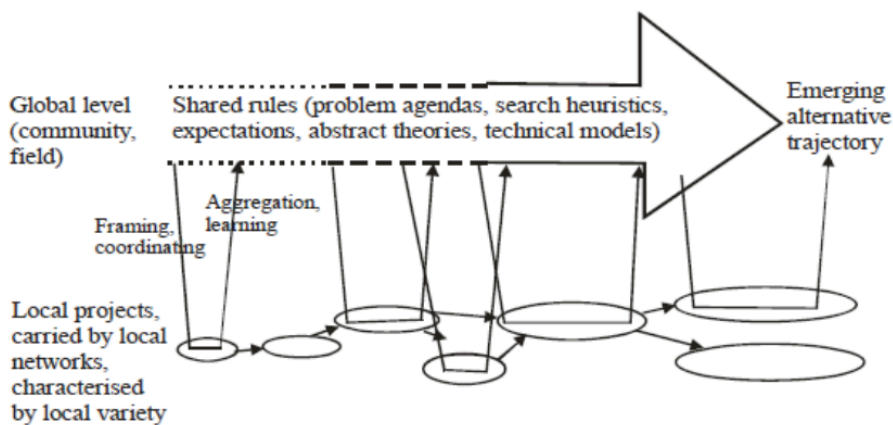
Strategic Niche Management (SNM)

Strategic niche management comprehends technology in a sociological perspective where niches are leading the way to a sustainable transition of the future regime (Schot & Geels, 2008). SNM considers transformation to be an evolutionary process, taking place over several years through governance and business. Main object is for SNM to integrate a sustainable development vision into the transformation process and approaches a forward-looking policy for this to happen. Governance allows for niche experiments and Kemp et al. (1998) describe main goal for these experiments:

- *To articulate changes in technology and in the institutional framework that are necessary for the economic success of the new technology*
- *To build a constituency behind a product – of firms, researchers, public authorities – whose semi-coordinated actions are necessary to bring about substantial shift in interconnected technologies and practices.*

(Kemp et al. 1998, pp. 186)

Interaction between new incentives, social organisations, consumption patterns and alternative technologies are crucial if transition is to be carried out successfully. The following model is developed by Geels & Raven (2006) and visualises interaction between local experimental projects and how experiences and various elements of these stabilize on a global niche level. These fragmented experiments gather in sequences and accumulate knowledge;



Figur 3: *Emerging technical trajectory carried by local projects* (Geels & Raven, 2006. Pp. 379)

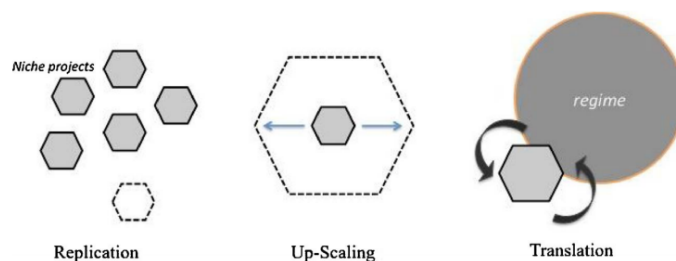
Bergman et al. (2008) define niche actors as '*individuals or small groups of actors, with local practices which differ from the regime*' (Bergman et al, 2008. Pp.3). When managing a niche strategically, actors embedded in the process are required to manage experiments by providing location and facilitate learning processes (Geels, 2004). However actors who manage governance of a niche depend on policy makers and institutions at government to accommodate changes.

Three pathways of transition

Accepting the premise of tiny housing in Denmark being a sustainable alternative housing technology carried out by niche actors on governance level there are different approaches towards transition. Boyer (2018) presents how grassroots innovation diffuse into three paths of transition; *translation, replication and up-scaling*. Certain conditions of the grassroots innovation encourage different paths of transition and intermediacy differently. Intermediacy is a status dissolving boundaries between niche and regime. Additionally Boyer (2018) refers to 'pragmatic utopias' as movements proposing a socio-environmental critique seeking to involve individuals and institutions embedded in the mainstream. *Translation* is the foremost researched pathways by scholars. Through a *thick* translation the regime accommodates niche practices and values and changes dominant social, physical and regulatory structures e.g. new land use regulations. *Thin* translation processes occur when the regime changes some elements of the niche and transplant others. The pathway of *replication* is when more local initiatives are developed and spread out information concerned with values and practices of the niche. This can be through conferences, workshops, education and mouth-to-mouth

communication inside of the network. Replication appears in three ways; *reactively* with no connection to the global niche, *proactively* when guided and supported by the global niche or *managed* through approval of actors in the global niche network. These categories imply different relations between actors on grassroots level and actors on global niche level. Lastly, diffusing through *up-scaling* is a pathway where local projects expand and reach outside the activist core to individuals with no prior connection to the niche. Expansion involves more participants, activity and/or a higher degree of impact. Do-it-yourself projects are a way to reach a bigger audience. Within an up-scaling process are both internal and external factors measurements for success of a project. Internal factors may be accessibility to resources and external factors may be the socio-environmental framework of a project.

Following figure illustrates the three different pathways of transition of grassroots innovations;



Figur 4: Shows three pathways of transition of grassroots innovations; replication, up-scaling and translation (Boyer, 2018. Pp. 33)

Methodology

This chapter presents methods applied in this thesis with the purpose of uncover tiny housing as a sustainable alternative niche.

Research Design

By raising philosophical questions of *what* parts of reality to accept followed by questioning *how* to collect this knowledge, this thesis evolves around an epistemological and ontological perspective (Kirkeby, 2011). Epistemology is by definition the nature of knowledge and seeks to conclude what true knowledge is and how to obtain it. For this purpose there are two methodological approaches; *induction and deduction*. Research of this thesis remains explorative towards the subject of tiny housing, when inductively observing the phenomenon

in the real world. The research question seeks to explore tiny housing with the baseline of being open towards disambiguate findings. Andersen (1999) describes the main target of explorative methods as; '*a social scientific method to explore circumstances or phenomenon that are less known*' (Andersen, 1999. Pp. 22). This rather open approach towards the research question reasons the non-linear path of knowledge collection. New findings have emerged through a snowball effect where actors in my established network have put me in contact with new actors who have contributed with new insight and knowledge on the topic.

Qualitative method

This thesis is based on qualitative methods where knowledge is achieved through research, literature study and interviews of various kinds. Qualitative research provides insights into a topic within different contexts that are difficult to measure and gives a deeper understanding of motives, opinions and potential discrepancy (Roald & K ppe, 2008). Qualitative research is a method allowing interpretations of empirical generated knowledge. A qualitative approach towards the research question allows for examples to be analysed in order to make generalizations. Some of this empirical generated knowledge can be carried out as case studies. A case study is a method to describe tangible and practical examples on a topic (Flyvbjerg, 2006). It is a method where you understand a phenomenon within different contexts depending on the specific case. In '*Five Misunderstandings About Case-Study Research*' (2006) Flyvbjerg argues how case studies can be used when inductively approaching a topic. Furthermore he argues how case studies can be considered as scientific qualitative products applied for generalization. With the purpose of exploring tiny housing in Denmark as phenomenon, three subcases are presented in respectively a rural (Grobund, Ebeltoft), suburban (Small Living Albertslund) an urban context (CPH Village Refshale en). They are chosen on behalf of their housing type correlating with elements of tiny housing, because of their different geographical location and scale.

Literature study

A literature study as documentary method is a way of including indirect observances of a social phenomenon. Using literature as source of exploration the researcher gets to understand the landscape, history, challenges and visions that constitutes the phenomenon (Andersen & Gamdrup, 2011). The foundation of my qualitative approach towards the

phenomenon is grounded on behalf of research conducted on Ebscohost, gathering most popular research databases, Google research and knowledge collected through interviews. Search terms included 'tiny housing', 'tiny house movement', 'tiny house*' purposed to only choose hits containing this specific wording. This was a choice made on behalf of understanding what specifically *tiny house movement* represents when stating the art of the phenomenon and providing accurate background knowledge as foundation.

Tiny housing is a rather new concept lacking academic research and reasons why some literature presented in this thesis is of more informal character of various blogs and articles from smaller less familiar magazines. Validity of these informal research sources has been evaluated by certain criteria questioning the motivational backgrounds of authors involved. In the beginning of my research process it became quite obvious how tiny housing is mainly carried by individuals who are not necessarily professionally involved and the validity criteria is measured by the motivation for and degree of involvement. There are numerous articles, blogs etc. written by individuals who find interest in this way of living, but their knowledge is not supported by background knowledge or familiarity towards the topic. These literature sources do not take part of this literature study. Contrary, individuals who do express to have a knowledge foundation on tiny housing either from own experiences or profession do contribute with their opinions on the topic and take part in literature presented.

Semi-structured interviews

In order to collect knowledge on tiny housing in Denmark, interviews with actors of relevance have been conducted; both life world and expert interviews and in some interviews the balance between these two different types of interviews is delicate. It is due to the many actors being both experts on the topic but at the same time they are the ones living in tiny housing or dedicated to promote tiny housing or alternative/experimental ways of living. Where expert interviews seek to achieve qualified knowledge on complicated issues life world interviews provide insight in how a phenomenon carries out in the life world of the interviewee (Kvale & Brinkmann, 2009). Commonly is how they remain descriptive towards the topic. According to Kvale & Brinkmann (2009) qualitative interviews are often characterized as unstandardized and open towards new paths occurring during the interview, demanding great skills for the interviewer. With the purpose of not excluding relevant

information interviews remain semi-structured. When performing a semi-structured interview a guideline for questions is essential in order to maintain some degree of control. There is a fine balance of staying open for new dimensions that contribute with unpredictable information but still focus the questions to ensure certain issues covered. Semi-structured interviews as method benefits the qualitative approach when informants get the possibility to elaborating on their interpretations and opinions (ibid). Themes ensure answer *why* this interview is relevant to the research question, *what* kind of knowledge the interviewer wants to achieve from the interview and *how* the interviewer accesses this knowledge. It has not been possible to access face-to-face interviews with all interviewees reasoning why some are conducted over telephone and others by mail. These types of communication imply with limitations, which I am aware of. However these have been expert interviews purposed to achieve information of more formal character, and for this reason limitations have not been as significant. If these interviews sought to capture emotions or more personal expressions limitations would have been more inhibiting for the analytical process. Some interviews conducted by mail are followed by a process of correspondence allowing for elaboration of specific statements that I have needed further explanation for. Additionally, informal correspondence with actors by mail or Facebook are not directly applied in the thesis but have been a great tool to acquire background information on topic specially concerning regulations, bureaucracy and inside knowledge on new projects and other actors embedded with tiny housing projects. See appendix 1-13 for interviewguides.

Interviewees

An explorative approach towards answering the research question considers the movement as a sustainable alternative niche. I seek to examine governance of this niche and this approach has put me in contact with actors mainly working at the grassroots level. They are chosen on behalf of their role in initiatives all representing elements of tiny housing.

Following actors embedded in the field of tiny house movement have contributed to this thesis through various interviews:

Jens Randrup, co-founder of Grobund: *Face-to-face interview and 'follow-up' telephone conversations*

Steen Møller, co-founder of Grobund: *Interview by telephone*

Hans Christian Eskildsen, member of Grobund: *Face-to-face interview*

Peter Friis, founder of Small Living Albertslund : *Face-to-face interview*

Frederik Noltenius Busck, co-founder and partner of CPHVillage: *Interview by telephone*

Michael Plesner, co-founder and partner of CPHVillage: *Interview by mail and 'follow-up' correspondences*

Charlie McPhilips, resident at CPHVillage Refshaleøen: *Face-to-face interview*

Jette Østergaard, co-founder of Facebook group Dansk Tiny House Gruppe: *Interview by telephone*

Kristiane Ravn Frost, initiator behind lawdraft on green zone: *Interview by telephone*

Michael Øhrberg, self-build tiny house resident: *Interview by telephone*

Dennis Lyth Frederiksen, author of the book Mit Tiny House: *Facebook correspondence*

Katarina Michelsen, anthropology student at KU: *Mail and Facebook correspondence*

Michael Hennecke, co-founder and partner of 'Tiny House Living': *Mail correspondence*

Mads Møller, founding partner of Arcgency: *Interview by mail*

Scaling

Without pursuing a quantitative approach towards the research question I do seek to suggest the scale of tiny housing in Denmark. Working from a theoretical perspective that explores governance of tiny housing and its role towards transitions to the regime it is relevant to provide a foundation for understanding the extent of presence of tiny housing in Denmark. Research provided insight in how social media, particularly Facebook, is a well-used platform for people with interest in tiny housing to share experiences. *Dansk Tiny House Gruppe* is the largest group, gathering people who are interested in this way of living. On behalf of a survey I conducted on this group and looking through all posts from the beginning of the timeline, I created a number of who actually lives in tiny houses from this group. This number I choose as indication of an approximately scale of isolated tiny house owners who are not attached to any projects, but live by themselves and/or their family in a tiny house around the country. Secondly as part of the scaling I have examined how many actual tiny house projects there are in Denmark. These provide an approximate idea of the extent of which tiny housing is projected onto projects around the country. These are found on behalf of an Internet research,

knowledge shared by members of *Dansk Tiny House Gruppe* and through my network of interviewees.

Presentation of empirical findings

This chapter presents empirical findings relevant to tiny housing in Denmark and is divided into three sections. Firstly a scaling of isolated tiny houses in Denmark, secondly initiatives governed on grassroots level and thirdly three physical tiny housing projects in a rural, suburban and urban context are presented.

Scale

Previously in the chapter stating the art, projects involved with tiny housing were presented and mapped out. Thus it is additionally relevant to examine the extent to which tiny housing exists as individuals living by themselves with no attachments to actual projects.

There are undoubtedly people living this way without awareness of being part of a movement. This thesis accepts tiny housing as part of the niche regardless of it being articulated or not. However this premise does make a mapping quite difficult and reasons why most of individuals included in this scaling are people who define and express themselves as tiny house owners. Since tiny housing face legal impediments in Denmark I am aware of not all tiny house owners want to take part of this examination. I have received messages from tiny house owners expressing their concerns with being part of this thesis, which I respect.

On behalf of a survey on and screening of posts in *Dansk Tiny House Gruppe* 59 individual tiny house owners are found. The number 59 should not be ascribed a conclusive measurement but I find it relevant when addressing if the movement is seen manifested in Denmark by isolated tiny houses unattached to the regime. And it is. The 59 houses are spread around the country both on Sealand, Funen and Jutland. Thus a general observation from respondents is how majority are located in rural areas and only one out of the in Copenhagen.

Interview with a tiny house owner

For the benefit of getting a glimpse of insight in how it is to be an individual unattached to the regime who has chosen to live in a tiny house following interview allows for this. The

interview is not an attempt to make a generalization of every tiny house owner but it is a story contributing to the narrative of why some *may* choose this way of living and how they make it work practically.

‘Living in a circus’

Michael Øhrberg lives by himself in a 28 m² container in his friends’ backyard in Northern Jutland. Despite of the fact that he lives there illegally Michael is not afraid of the municipality



Picture 5: *The facade of Michael's tiny house.*
Credit: (Øhrberg, n.d)

throwing him away any day soon; *‘municipalities turn the blind eye to this’*. In December 2017 the container was ready to be inhabited after a process of digging out the area, plan the surface ground and installing necessary living equipment such as kitchen, bathroom and a bed inside the container. Michael is an initiative craftsman and if he was not experienced in more technical aspects of construction work he would have found this process extremely difficult; *‘you have to be a*

bit entrepreneurial to do this’. Due to a divorce Michael needed a new place to live and tried out buying an apartment too expensive so he worked way too hard at his job until he hit rock bottom. With inspiration from his daughter he wanted to live in a container with less material goods and perform another way of living. So he

bought a container from Danish Container Supply for 12.000 + VAT and a spiritual journey began. Michael did not really experience any difficulties living on less spaces and saw lots of design possibilities – both with inspiration of Pinterest but also his own ideas. He is quite a handyman and adjusted technical solutions into the container. For the bed he used a height adjustable table to create a flexible interpose plan. It is important to think of multiple plans in height when

the ground floor is only few square metres. There are 72 m³ to exploit so why do not consider all of them instead of only the ground floor? It can be expensive to buy custom made furniture



Picture 6: *Inside Michael's tiny house.* Credit: (Øhrberg, n.d)

which may be problematic in a tiny house since they do not have standard measurements. He bought a couch too long but simply just removed one of the sides and cut it until it fitted into his room. Michael has even built himself a music room since he loves playing music and also works as a DJ sometimes. Purposed to bring the nature inside he integrated big windows allowing him to look out on the field and absorb the sunlight. Not much material stuff is brought into his house since he does not need them. They do not have any value of happiness. Time is a valuable resource though; *'people are being more aware of how they spend their time'*. An advice from him is to think of multi-functionality in the design. He associates a tiny house with a circus. For a circus travelling around its essential for everything they take with them to have more than only one function. The same goes for a tiny house. If you take something into your tiny house it needs at least two functions in order to stay. According to Michael you really need to ask yourself why you need all of your stuff. What value does it bring you? (Ørhberg, October 24th 2019)

Tiny house initiatives on grassroots level

Following section presents initiatives carried out on grassroots level. They contribute with an understanding of what kinds of initiatives take part of the niche, motives behind and actors involved.

Dansk Tiny House Gruppe

Tiny house movement gathers people on social media platform Facebook in the public group *Dansk Tiny House Gruppe* (Danish Tiny House Group). Co-founder of the group Jette Østergaard, who is also a member of Danish Association of Ecological Building (LØB) and lives in a tiny house herself initiated the group as *Dansk Tiny House Forening* (Danish Tiny House Association). The association suggested a high degree of involvement and administration from members who could not contribute with time demanded so the association never really became a reality. Hence the group changed into a more informal platform and so did the name and purpose. Members are people who are interested in tiny housing, people who are living in tiny houses or people who wants to build and live in a tiny house but are unsure of

legal requirements or technical solutions. The group counts for 2021 members (09/02-2020) and was founded in October 2018 with the formal purpose to:

- *'To spread out knowledge on tiny house living'*
- *'To collect, develop and share knowledge that concerns Tiny Houses'*
- *'To be a place where everyone who wants to build or live in a Tiny House may apply for counselling that concerns rules, legislation, design, accommodation etc.'*
- *'To start up and initiate projects that may develop and adjust the concept of Tiny House to Danish conditions.'*

(Facebook, 2019: *Dansk Tiny House Gruppe: Om denne gruppe. Beskrivelse*)

Posts shared on the wall by members include ideas, articles and questions of various kinds related to tiny housing. Other members share more specific posts related to BR requirements they have come across and would like to share, areas in the country that may be suitable as location for (a) tiny house(s) or sales posts of caravans e.g. that may be transformable into tiny houses.

Two examples from the group illustrate very well the type of posts shared amongst members;

'I have been following this group for a couple of time since I am very interested in this way of living. And now I have a question. How do you Tiny House people want to live? Close to the city or in the country ?? In communities or by yourself?? The reason I am asking is because after a divorce I am alone with a farm at 8 acres of land where I would like to create a community, but I do not know if it's of any interest?

(Pilgaard. M, 1/5-2019)

and

'Hot water heating systems in tiny houses? Anything from gas to air: What do you recommend for 4 people where 2 of these are still less than 3 years old.'

(Bank, J. 25/6-2019)

Tiny house conference

In August 2019 the first ever tiny house conference in Denmark took place. The conference was organised by 'Conveniently Green' founded by tiny house enthusiast Elisabeth Sidenius Nordentoft and included a panel of four panellists;

- Morten Bøgedal: *Department of Centre for City Planning in Copenhagen Municipality, Byplan Vest.*
- Michael Hennecke: *Co-founder of building company 'Tiny House Living'*
- Camilla Nielsen-Englyst: *Consultant at Bofællesskab.dk for Bærebo and member of Danish Association of Eco-Communities (LØS)*
- Michael Øhrberg: *Self-build tiny house resident*

The conference gathered more than 70 participants who engaged in dialogue with the panellists. (Conveniently Green, 2019)

Main purpose of the conference was to gather people of interest, share knowledge and insights in order to stimulate the movement. Since many projects are fragmented around the country, this conference created a platform for knowledge accumulation. Both actors on grassroots levels contributing with governance of tiny housing and actors attached to the regime presenting authorities at government level contributed with opinions and knowledge (Ibid)

Lawdraft on green zone

Kristiane Ravn Frost is a member of LØS and initiator behind a lawdraft proposition to municipalities that involves a green zone as part of a frikommuneforsøg. The lawdraft is supported by LØS, Permaculture Denmark and Practical Ecology (Praktisk Økologi) (Frost, September 9th 2019). Ministry of Social Affairs and the Interior (2017) defines 'frikommuneforsøg' as an attempt to allow for municipalities to challenge existing rules and practices in a period of four years. Municipalities taking part of the experiment may be exempted from certain governmental rules and regulations that inhibit the experiment (Social – og Indenrigsministeriet, 2017).

In an interview Frost describes how the lawdraft proposition is developed as a result of today's complicated and non-transparent legislation when it comes to settlement and experimental construction (Frost, September 9th 2019). Within municipal regions the administrative employees are additionally subjected to lack of insight in legislation and justification to provide legal exemption to alternative sustainable projects. The proposition is developed together with former municipal employee in Gribskov Municipality and member of Permakultur Danmark, Tanja Condrea, and suggests three solutions to meet abovementioned problem areas:

1. The Planning Act: *Development of a green zone*
2. The Building Regulation: *Simplifying with focus on the total embedded energy consumption*
3. Handling of wastewater and human deposits: *Restoring the natural cycle*

(From lawdraft, see Appendix 14)

A green zone should be added to the existing city, rural and holiday house zone in the Planning Act. According to Frost, many of today's new green buildings and communities find themselves in a limbo where legislative requirements for city – or rural zone do not accommodate special needs that comes with these projects. They demand for a combination of city, rural and business areas. The proposition asks for an exemption from §11a(1) in the Planning Act stating how municipalities only can define rural, city – and holiday house zones. With the purpose of providing municipalities with the possibility of establishing more experimental buildings and settlements the proposition additionally asks for an exemption from §13a(2). This paragraph requires for municipalities to develop a new local plan whenever new and larger subdivisions, buildings or construction work is planned (Appendix 14). Additionally new buildings in green zones should be exempted from certain BR requirements too complicated and difficult to accommodate when building simple constructions of nature material. The proposition asks for a simplification of several requirements to ease sustainable and experimental building projects.

Unfortunately the lawdraft was not submitted to the government by any of the 16 approached municipalities (Telephone conversation with Randrup, October 24th 2019)

Physical tiny housing projects

Following projects present tiny housing in different contexts; *rural, suburban and urban*. They represent cases chosen on behalf of their visions corresponding to what this thesis accepts as tiny housing. These case studies enable in-depth understanding of how tiny housing projects suggest a sustainable alternative niche using land sufficiently in different physical contexts. Additionally what kinds of actors are involved and where they positions in a multi-level perspective.

Rural: Grobund in Ebeltoft

Grobund is a societal organisation and entrepreneurial community in the process of developing a tiny house eco-community in Ebeltoft with the ideology being waste – and debt free. In 2018 the fund of Grobund, Gældfri, bought a 10.000 m² steel factory near the ferry harbour (Heilskov, 2018). The factory is the centre of rotation for the future village, making room for residents to establish business, containing a large common kitchen and space for events for the community and is bought by 160 members each paying 50.000 for the project ensuring them a future building plot. The initial idea behind Grobund comes from Steen Møller who is also founder of another eco-village; Friland on Djursland, Jutland and the association holds approx. 700 members paying a fee of 200 kr. These members are potentially interested in living at Grobund and the membership allows for them to participate in events and assemblies (Jensen, 2019). The overall ideology of Grobund is to have a closed resource loop supported by cradle-to-cradle technologies. It is a criteria for houses to be off-grid and even though housing size is not yet written into the manifest, members have so far only build this type of mobile tiny housing solution waiting to be taken in use. Houses are self-build and residents are more or less free to experiment in different solutions. A group of members who are experienced in building techniques started a company called Tiny house Grobund. They offer to build or guide future residents in how to build off-grid tiny houses accommodating individual needs (Bofællesskab.dk, 2019). At the moment 10 out of the 28 acres of land surrounding the factory belongs to Grobund, although building is not possible before Syddjurs Municipality develops the local plan for 2020. Rest of the area is municipally owned.

Suburban: Small Living Albertslund

Small Living Albertslund is an association looking for a place to start up a housing community of smaller and sustainable housing units. The association has not yet managed to find a building ground for the future community. Small Living Albertslund is looking for residents who buy into one or more of following ideologies; *'are you dreaming of living small; in a sustainable wooden house; in urban nature; in a community with other people... then Small Living Albertslund is the place for you'* (Bofaellesskab.dk, n.d).

Small Living Albertslund is founded on three pillar stones:

- 1) *Living smaller: But functional and being present with other residents of the house*
- 2) *Living simpler: With less possession, use of resources and greater overview*
- 3) *Living affordable: Expenses for housing and consumption does not create any stress and every day concerns.*

(ibid)

Ensuring economic sustainability intermediaries such as contractors, architects and consultants are cut out of the process. The association is in direct contact with a building company specialized in construction of wooden houses. The current plan is for Small Living Albertslund to offer housing of different sizes with an average of gross 70 m² equivalent to net 56 m². The smallest is planned to be 40 m². (Friis, August 7th 2019) It is yet uncertain whether it is going to be detached or semi-detached housing. The housing community entails a fellowship sharing common areas such as a kitchen garden, fireplace, playground and recreational areas. The association of Small Living Albertslund will own the land but houses are owner occupied with individual credit loans and the community house will be commonly owned. To become a member you have to be credit-approved. Initiator behind the project Peter Friis, used to live in Lange Eng, another housing community in Albertslund so he is experienced in this way of living together. In May 2017 the association Small Living Albertslund were created and today (August 2019) it contains of 17 members and 100 people on the list of interests (ibid). The building plot the association seeks to buy requires a capacity of 20 small housing units. The project allows for co-build possibilities and when a location is found the association gathers to discuss exact size, typology and general policy framework.

Urban: CPHVillage Refshaleøen

CPH Village is a Danish company working on new and sustainable ways of living in urban environments. It targets an increasing demand for housing for young people in Copenhagen. CPH Village was founded in 2017 by economist Michael Plesner and Frederik Busck, who has a degree in Politics of Sustainability. Circular economy is the foundation of CPHVillage targeting the building sectors' high environmental impact. There are approx. 20 million shipping containers out in the ocean representing a great resource as building material and reasons why the first CPHVillage at Refshaleøen is made of old containers (Koefoed, 2018). CPHVillage Refshaleøen consists of 88 containers at 20 m² separated into two rooms so each container is shared by two people having their own room of 11m². Each resident has a small tea kitchen where the two residents sharing a container also share bathroom. Additionally all residents in the village share a big industrial kitchen. The monthly rent including consumption is 4.250 kr. and only demand is for residents to be studying (ibid). The village is located on a 'perspective area' designated by Copenhagen Municipality for future planning. Due to an exemption from §19 in the Planning Act it was made possible to build temporary student housing of 10 years in these perspective areas (Busck, October 20th 2019). The area is owned by Refshaleøens Ejendomsselskab and rented out to CPHVillage in a 10-year period. CPHVillage has obtained loans through the governmental financing fund Vækstfonden and andelskassen Fælleskassen (Busck et al. 2019). Co-living is key element in the ideology where the built environment facilitates common areas and spaces for activities. Additionally the village contains a kiosk 'Molevitten' run by residents and a common dinner initiative 'Madklubben' where two residents are cooking dinner for the rest of the village each Sunday. A central place promoting co-living is the 'Community Space', frequently used for different events arranged by residents. The 'Community Space' facilitates meetings between people with different opinions and backgrounds. The second CPHVillage is under development and will be located at the old DSB garage in Vesterbro. Housing units will be made out of wood instead of containers (Thomsen, 2019). The vision is for CPHVillage to also provide Amager, Sydhavn and Nordhavn with affordable and sustainable student housing (cphvillage.com, n.d)

Interview with resident from CPHVillage

CPHVillage is the only physical project that is build as accommodation for others than initiators behind the project. Where both Grobund and Small Living Albertslund are created on behalf of entrepreneurs wanting this way of living for themselves CPHVillage provides housing for others. In order to get an idea of how it is to live in a small container I have visited the village and interviewed one of the residents:

'Living in an experiment'

The 22 year old biology and biotechnology student from Copenhagen University Charlie McPhilips has lived in a container in CPHVillage Refshaleøen for a year. He was moving from



Picture 7: Inside Charlie's room. Credit: (McPhilips, 2019)

Odense to study in Copenhagen and needed a place to live and stumbled upon this project. He did not really want to live at a dorm but was intrigued by the ideology of CPHVillage. Intentionally he thought of it as a temporary solution but began to like this way of living. When Charlie first moved in he designed the room in a way that has later been re-done many times. As he argues it is a learning process to adjust to the space you find yourself in.

But he would have gone through the same process even though the place was bigger. Before he had closets and drawers for storage use,



Picture 8: Inside Charlie's room. Credit: (McPhilips, 2019)

something he got rid off and everything is now out in the open. He likes that he has control over his stuff and can see them. It calms him. He figured that he actually did not need that much space for storage. Now Charlie has his clothes hanging on a rack attached to the ceiling to create more floor space. A challenge has been the steel walls impossible to drill anything into; *'if you want to hang something you have to use magnets or hooks'*.

But that is just something you find out and adjust to; *'it is a project and an exercise... everyone*

has found a way that works for them'. Charlie does not mind the small living space but it is at the same time not something he practises. This ideology. The social life in the village is what really has made him think of living in a community as something he would like to carry on with him when he eventually moves away; *'without the social it would not be as great. It is really important to me*'. People in the village really take responsibility and it results in lots of activities and small projects. *'We wanted a small kitchen garden in the corner. So we just build it. Because we can. It really provides a sense of ownership*'. Being a part of an experiment is not something he really thinks about only when tourists who read about CPHVillage come and peak into windows without asking and just walks into the area. And when someone (like me) make an academic research project (McPhilips, October 1st 2019)

Analysis I: Accumulation of knowledge

Geels & Raven (2006) present the model of *emerging technical trajectory* as a process where local projects gather at a global niche level. One of the steps in this process is accumulation of knowledge. Tiny housing is not represented in Denmark as a homogenous movement but as fragmented projects more or less independent from each other and reasons why there is no global level of shared rules. However empirical findings propose a set of general barriers of which actors governing tiny housing struggle to overcome. These take part of a process of accumulating knowledge and propose issues to consider at a global niche level. This first analysis seeks to answer the subquestion of the research question; *what kinds of barriers are tiny housing in Denmark subjected to?*

Legislation and rules

A general observation is how legislation and rules inhibit tiny housing projects. From a survey made on the Facebook group *Dansk Tiny House Gruppe* 98 out of 169 answered how legislation and rules is the biggest challenge for them to be able to build and live in a tiny house (Gravesen, 2019 on *Dansk Tiny House Gruppe*, Facebook). In his book Frederiksen argues how it, as a self-builder, is highly time consuming and difficult to fully grasp what kind of legislation and rules to overcome. Both according to BR requirements but also other planning regulations such as zoning in urban and rural areas (Frederiksen, 2019). For self-builders this puzzle may be impossible to overcome. *'I am sure that all the requirements are*

developed with good intentions but for a self-builder who just wants a roof over his head you are met with a documentary burden that makes you want to quit it' (Frederiksen, Facebook correspondence 15/9 2019)

Initiator behind Grobund, Steen Møller describes a clash between tiny housing and today's legislations accordingly;

'the legislation is so outdated that it maintains societal patterns... the system is structured by so many rules and legislations that you can not even turn around without it being wrong' (Møller, September 4th 2019)

Co-founder of Tiny House Living Hennecke agrees on BR requirements being difficult to overcome but from the perspective of a building company it is not impossible or unreasonable:

'The building regulations are clear but there are no problems in meeting the requirements, it just takes a longer time and is more expensive to build a small house after rules on tract houses (typehuse ed.)' (Hennecke, August 12th 2019).

Bureaucracy plays an equally inhibiting role for experimental housing projects. Initiator behind lawdraft on *green zones*, Frost, discovered during the process the degree of bureaucracy she was exposed to. It has to go through several municipal departments which is time demanding and intransparent, which is difficult to determine whether obstacles meeting experimental housing are of statutory character or lie within municipal regi (Frost, September 9th 2019). Another problem involved with bureaucracy is how some municipalities lack time to accommodate governance. Slagelse Municipality was positive towards the proposition but the Planning Department did not have resources to work on the lawdraft themselves:

'They (Planning Department, ed.) called me and said that if I wanted to go further with this proposition I would have to send them something more specific because they did not have the time for it right now'. (Frost, September 9th 2019)

Another aspect for pioneering experimental housing is how legislation by municipal caseworkers is equally new for them to work with. The process of adaptation comes with uncertainty both from caseworkers and clients. CPHVillage exemplifies such a process. The revision of Planning Act §19, allowed for perspective areas to be temporary used for student housing up to ten years. This is the first ever project that Copenhagen Municipality is subjected to having this possibility. Pioneering projects are often involved with uncertainty and CPHVillage exemplifies this presumption. With no precedent to draw experiences from, caseworkers have been challenged by various decisive circumstances such as capacity, connection to district heating, smell – and noise zones (Plesner, August 30th 2019). Additionally the project attracted massive public attention putting caseworkers under pressure when trying to please higher levels in the department and city hall while at the same time enforcing new law rightfully. Under these circumstances the collaboration has been demanding. Co-founder Plesner argues how caseworkers have their professionally reputation to consider, so it is easier for them not to deviate from business as usual:

'It is a general challenge for innovation in the built environment as I see it' (Plesner, August 30th 2019)

Risk that comes with being the first to experimenting in innovative sustainable housing has equally been inhibiting for the lawdraft proposition, that was not carried any further by neither of the 16 approached municipalities.

Lack of experimental space

Grobund is an example of a visionary project that experiments with sustainable housing solutions. Off-grid and tiny housing take part in this vision. Since all properties are required to be attached to the municipal sewage system it has been problematic for Grobund to overcome this legislation (Miljø – og Fødevareministeriet, n.d). Through dialogue with Syddjurs Municipality who owned the land it has been changed from land designated to enterprise to land of developing purposes. These types of areas are less restricted. Furthermore the cost for the respective land recently bought by Grobund and is designated for developing purposes costs 11 kr./m² and the land remaining still put out for tender by the municipality costs 40 kr/m² due to the connection fee. According to co-founder Randrup that is too expensive for

Grobund to acquire even though they may be exempted from the connection fee in another way (Randrup, October 24th 2019). Affordable spaces for experimental housing are likewise requested through the lawdraft on green zones. Frost who is a member of LØS argues how eco-villages experiment in new sustainable solutions and request for locations to perform such kinds of experiments (Frost, September 9th 2019). Temporary use of spaces is a strategic tool that enables experiments such as tiny housing projects. Temporary use of spaces is purposed to breathe life into spaces not being used (Udlændinge-, Integrations – og Boligministeriet, 2016). CPHVillage at Refshaleøen exemplify this. Temporality is used in urban areas and constitutes a great potential for experimental housing projects (Busck, October 20th 2019). According to Busck it makes no sense to plan too permanent housing solutions since the future is highly uncertain. That is why temporary experiments are so important in urban planning;

‘actually we don’t know shit about what happens in society just in 5 years’ (Busck.October 20th).

Definition

Neither through literature nor interviews is a homogenous definition for tiny housing specified. At the conference where main actors of tiny house movement debated they all contributed with different definitions of what constitutes a tiny house from their point of view:

Bofællesskab.dk represented by Nielsen-Englyst

Living in a tiny house is a lifestyle attempting to limit resource consumption. The size of the house is not everything, it is just a part of the ideology (Nielsen-Englyst, August 20th 2019).

Tiny House Living represented by Hennecke

Defines a tiny house according to the American definition. These are mobile constructions on wheels with the maximum measures 2.55 m. in width, 10 m. in length and 4 m. in height (Hennecke, August 20th 2019).

LØB represented by Østergaard

A small mobile construction as primary residence with the maximum size of 35 m² (Østergaard, August 20th 2019).

Planning department of Copenhagen Municipality represented by Bøgedal

Uncertain of what constitutes a tiny house and argues how it is difficult from municipal side to work with before a definition is clarified. Bøgedal asks for other types of housing to be included in the definition. It may be apartments with shared facilities and common areas or the many houseboats lying in the water in Copenhagen that could also be defined as tiny houses (Bøgedal, August 20th 2019).

Being grassroots

Anthropology student at KU, Katarina Michelsen, is currently writing her thesis on tiny housing in USA, Oregon where she has completed fieldwork. Michelsen attended the conference and told how the lack of definition leads to an insufficient framework for tiny housing. Something the movement likewise struggle with in the US. Even though tiny housing has become a mainstreamed niche carried by building companies the phenomenon is still facing legislative barriers attempted to be overcome through governance. Michelsen argues that in order to develop a framework, professionals such as architects and engineers must be included in the process (Michelsen, August 20th 2019). The American Tiny House Association is in working process where volunteer members collect knowledge concerned with tiny house living in order to present it to respective legislators. This is done by including a team of professionals. This type of tangible knowledge is somewhat easier for governmental institutions to work with and defend in future planning (Michelsen, August 20th 2019).

Lack of organizational framework and up-scaling

A tiny house association was in 2018 created as a Facebook group *Dansk Tiny House Forening* co-founded by LØB member Østergaard. Due to lack of dedicated involvement the movement failed to reach momentum. In an interview she argues:

'It might be that eventually there is breeding ground for creating an association again... and then we just have to start over again...because there is power in being an association when working on projects.' (Østergaard, September 18th 2019)

Today the group *Dansk Tiny House Gruppe* is the largest platform for sharing projects, ideas and other topics of relevance but it do not represent a gathered organisation. Tiny house projects exist more or less unattached to each other.

Another way of strengthen the organisational framework is presented by Nielsen-Englyst who believes that self-build and small scaled projects fail to achieve impact (Nielsen-Englyst, August 20th 2019). She works at Bofællesskab.dk and charges process facilitation, communication and citizen involvement at Bærebo – an organization creating sustainable housing communities around the country (Baerebo.org, 2018). Bærebo entered a market on behalf of unsuccessful sustainable housing communities unable to organise and upscale in a way that achieved getting attention from municipal authorities. Nielsen-Englyst argues how self-build and small-scaled projects spread around the country do not achieve municipal attention nor do they contribute to a gathered organizational framework (Nielsen-Englyst, August 20th 2019). Strong and organised movement are taken much more serious in public hearings and municipalities become more eager to engage in housing experiments that differ from the normal. Additionally municipalities will have more incentive and support to apply for becoming a 'frikommune'. Projects involved with tiny housing benefit from creating a unison voice. This is a process suggesting tiny towns rather than isolated tiny housing projects (Nielsen-Englyst, 2019). According to Nielsen-Englyst tiny housing may seem as a new radical way of living but in reality the niche do not diverge much from more established niches such as eco-villages and other sustainable housing communities:

'There are many of these movements who are actually fighting for the same' (Nielsen-Englyst, August 20th 2019)

LØS and LØB are such movements and are already known by most municipalities. Hence Nielsen-Englyst suggests how tiny housing would benefit from being supported by these associations.

Municipal interests

Municipal agendas may be difficult to overcome when presenting experimental housing projects since they are often associated with uncertainty and are risky for municipalities to engage in. Small Living Albertslund exemplifies this problem in its attempt to reach municipal attention. Albertslund is a Climate Municipality (Klimakommune), which is an agreement with The Danish Society for Nature Conservation (Danmark Naturfredningsforening) demanding for a yearly 2% CO₂ reduction (Danmarks Naturfredningsforening, n.d). Even though dialogue with Albertslund Municipality has been constructive and the municipality is highly concerned with local initiatives assisting to lower its CO₂ consumption (Albertslund Kommune, n.d) the demand for senior housing is prioritized over Small Living Albertslund as a small-scaled experimental sustainable housing community. The older municipal population is currently living in detached houses and soon to move out. Since Albertslund Municipality is interested in retaining this resourceful older generation, they want to offer attractive senior housing communities, so they do not move to bordered municipalities as Vallensbæk and Glostrup (Friis, August 7th 2019). This has resulted in the few municipal owned building grounds that are left are now reserved for senior housing.

Another aspect when presenting experimental housing projects is how they are branded and pitched to the municipality. Nielsen-Englyst argues that it is vital how tiny housing projects articulate themselves in a way that accommodate the respective municipal agenda:

'If I say eco village. Then they think hippie. If I say tiny house. They think hippie. They think unemployment income, and no tax money in the cashier. They think so many things. But then if I call it a sustainable community, then it all of a sudden sounds totally different. And if I say micro-living it sounds really cool. Much cooler than tiny house even though it is actually the same' (Nielsen-Englyst, August 20th, 2019).

CPHVillage is an example of a project talking into the municipal agenda. Copenhagen Municipality lacks student housing and this loophole in the regime Busck and Plesner saw potential in. The increasing focus on climate is a political issue that has reached Copenhagen Municipality wanting to be considered as a green municipality (Københavns Kommune, n.d). The container village at Refshaleøen talks into both of these municipal focus areas and

reasoned why this project was easier to get the municipality on board with (Busck, October 20th 2019).

Economy and affordability

Choosing to live in a tiny house has been suggested by all physical projects to be motivated by economic reasons in some degree. Tiny house living is besides the sustainable aspect also a way of seeking economic freedom. A key factor in the total housing cost is cost of the land. There is a paradox for self-builders seeking affordable housing and then pursuing this in urban areas and reasons why isolated tiny houses in general are considered in a rural environment. An economic challenge for tiny house owners is how it is impossible to obtain mortgage in these tiny mobile constructions since they are not considered as liveable accommodation (Hennecke, mail correspondence August 12th 2019). This asks for different complimentary financial options for tiny housing projects. Grobund demands for residents to be debt-free and provide money up front when buying into the community. The cost for housing is equally low due to cost of land and self/co-build. CPHVillage is an investment only made possible due to external investors and support from financial institutions. The project is realised through the financial institutes Fælleskassen and Vækstfonden, lending money to CPHVillage, and Refshaleøens Ejendomsselskab A/S who rents out the property. A win-win for Refshaleøens Ejendomsselskab A/S since the village cultivates the area and makes it more attractive for future investments (Busck, October 20th 2019). Since Small Living Albertslund is non-mobile constructions of permanent character it is possible for residents to obtain mortgages in the house. Members are required to be credit approved in order to guarantee a financial security for the project. Housing will be home ownership where the association owns the ground and the common house is commonly owned (Friis, August 7th 2019)

The physical projects have different strategies to offer affordable housing. Small Living Albertslund skips intermediaries and is in direct dialogue with a building company specialized in wooden constructions. Besides the low cost for land Grobund targets self-build tiny houses as affordable solution. Due to many of the members being skilled in handicraft the idea is to share knowledge so external professionals are unnecessary. Øhrberg who designed his own container argues how self-build is a way of lowering the cost but demands for the resident to be skilled in handicraft (Øhrberg, October 24th 2019). CPHVillage is a company

seeking financial expansion through the village at Refshaleøen as a pilotproject attracting new investors. External support has been necessary for the economic success of the project. Opposite to Grobund the economic incentive for self-builders disappears in urban areas such as Copenhagen where property prices are sky high.

Analysis II: Transition through local projects

This chapter applies theoretical framework on to empirical findings with the purpose of understanding where the niche of tiny housing in Denmark positions in order to reach technological transition. This analysis considers empirical findings according to Geels & Ravens' (2006) local projects governed by niche actors that are *individuals or small groups of actors with local practices, which differ from the regime* (Bergman et al. 2008). In a later discussion transition of tiny house movement as a wholesome will be discussed on behalf of Analysis I and II.

Values, norms and practises in local projects

Bottom-up transition strategies suggest how alternative movements motivate technological transition (Smith, 2003). Similar to all empirical findings is how they are carried by actors who govern the ideology and want to move the general perception of how it is normal to live. *Dansk Tiny House Gruppe* is an example of a group of people who challenge norms in society by questioning how to live. They represent a target group who are looking for alternatives to their regular housing situation. Something that tiny housing offers. Tiny housing projects represent a set of *values, norms and practices* that according to Holm et al. (2014) are important to comprehend for understanding how transition could be reached. In order to understand what kinds of values, norms and practices tiny housing projects represent following table elaborates on these on behalf of the three physical projects. Norms are listed in a ranking of most important to least, estimated on behalf of interviews with founders of the projects:

	Values	Norms	Practices
Grobund	<i>Living in harmony with nature with minimal CO₂ footprints by experimenting in new housing technologies</i>	<ul style="list-style-type: none"> -Self-sufficiency -Circular economy -Economic freedom -Living a simple life -Co-living 	<ul style="list-style-type: none"> -Building off-grid tiny houses -Advanced waste sorting -Making space for permaculture -Promoting local businesses -Share spaces and facilities
Small Living Albertslund	<i>Living as environmentally and economically sustainable as possible in a normal housing constellation</i>	<ul style="list-style-type: none"> -Reducing ecological footprints -Economic freedom -Functionality -Living a simple life -Co-living 	<ul style="list-style-type: none"> -Building wooden housing -Building with least possible interference with biodiversity -Share spaces and facilities
CPHVillage	<i>Efficient use of spaces in Copenhagen allowing for affordable and sustainable housing for students</i>	<ul style="list-style-type: none"> -Circular economy -Affordability -Co-living -Temporality -Urban life 	<ul style="list-style-type: none"> -Share spaces and facilities -Up-cycle containers -Social events

Table 1: Shows values, norms and practices represented by the three physical projects

Drawing parallels between the three different projects the table above shows how they all express interest in sustainability but have different ways of achieving it. They all address housing size as part of their strategy thus their experimental degree differs. Grobund is highly experimental and radical in its ethos where tiny housing is a way to support values and norms. Eskildsen who is a member of Grobund and was part of realizing the purchase of the factory, expresses how he as a future resident considers how to carry out practices together with his co-residents;

'it is also a learning process. We have workshops where we learn, what kinds of solutions that

are available and what it takes. And then some also just go try and error' (Eskildsen, July 9th, 2019)

Since Grobund targets a specific group of people who share above values and norms they are more free to experiment in solutions of getting there. Randrup does not believe of people with a dissimilar ideology to inhabit Grobund and thereby values and norms are subjacent believed to be carried out in residents' practices (Randrup, July 9th 2019).

Small Living Albertslund is also concerned with reducing use of resources but not radically. Housing size is intended to be larger than in Grobund and CPHVillage. The small housing size is a way to achieve sustainability, affordability and a simple life with less possession. Small Living Albertslund is the only project highly focused on integrating a flexible design into housing. This is a tool to accommodate the small size while making it liveable. The ideological framework of norms and values mainly support practices attached to the built environment when pursuing sustainable material and reduced housing size. According to Friis co-living will come naturally and he does not believe that anyone without a desire for living in a community would want to become a resident (Friis, August 7th 2019). This equally suggests how residents themselves are supposed to govern an ideology of tiny housing. Main value for CPHVillage is to house students as affordable as possible. Sustainability is a value but is mainly manifested through up-cycling of containers. The small housing size is a way to lower the cost for students and a result of an up-cycling strategy. Geels (2002) argues how individuals interpret values and norms differently and thereby behavioural practices follow. Since above table is developed on behalf of interviews with actors behind the three local projects there must assumingly be a gap in interpretation of values and norms between initiators and residents of CPHVillage. Initiators behind both Grobund and Small Living Albertslund are future residents of the housing projects but initiators behind CPHVillage, Plesner and Busck, are distanced from the people actually carrying out the practices. The distance is exemplified through interviewing McPhilips who lives in the village. He did not move into tiny containers as a result of his own values but because of the price and location by the ocean. The built environment was already there for him and over time he learned how to adapt to the few squaremetres. McPhilips prioritize the social life and activities that includes his hobby of kayaking. This role of actors will be elaborated on in a later discussion.

Strategic management of physical projects

Kemp et al (1998) argue how governance allows for niche experiments. Experiments that take part in a process of shaping a global niche level. The three physical projects contribute with different approaches towards governance that can be considered as a framework for strategic niche management. To comprehend the degree of success for SNM for the physical projects there are some main goals of indication. Following table outlines these main goals developed by Kemp et al (1998):

	Change in technology	Economic feasibility	Constituency behind product
Grobund	<p>Off-grid housing</p> <p>Mobile single housing units of minimal size.</p> <p>Factory as common area providing space for business, shared kitchen and dining hall</p> <p>Common outdoor space cultivated for permaculture</p>	<p>Circular economy:</p> <ul style="list-style-type: none"> -Off-grid housing with minimal energy demand -Factory open for residents' business -Permaculture as complimentary food supply <p>Reduction in price of land due to exemption of attachment to sewage system. Færgedgården + 10 acres of land 1,95 mio. kr. Price pr. Square metre of 11 kr. (Randrup October 24th 2019)</p> <p>*General land tax for a single family house in Syddjurs is 9.894 kr. (Rasmussen, 2019)</p> <p>'Tiny House Grobund' provides affordable counselling to residents. Majority of residents have a budget of 100.000-300.000 saved up (Møller, September 4th 2019)</p>	<p>Møller is experienced in starting this type of experimental sustainable housing projects. He plays an important role in governing the project contributing with process facilitation</p> <p>Grobund experienced rapid growth in members. There has been a great interest for the project (Randrup, July 9th 2019)</p> <p>Both Randrup and Møller have many contacts to access external knowledge from</p> <p>Syddjurs Municipality has been the most significant supporting actor</p>

Small Living Albertslund	Small housing size integrated in normal types of housing (non-mobile)	Skipping intermediaries such as contractors, architects and external consultants.	The project has no constituency behind it as external support. Friis is currently charging dialogue with Albertslund Municipality and building companies by himself. Main supporter of the project, Albertslund Municipality, has an agenda of developing senior housing as first priority and represent a conflict of interest.
	Different sizing standards with minimum size of 40 m ² . Focus on functional interior design Community house with shared kitchen and dining hall Outdoor common area	Direct dialogue with building companies Small housing size as affordable solution Both municipal and private building grounds for sale in Albertslund are very sparse (Friis, August 7 th 2019). *General land tax for a single family house is 25.693 kr.in Albertslund (Rasmussen, 2019)	
CPHVillage	Containers as housing solution (semi-mobile)	CPHVillage Refshaleøen is an investment supported by external financial institutions	Busck and Plesner did a comprehensive preparatory work on looking for support at pension funds, political student organisations and Dansk Byggeri (Busk, October 20 th 2019) On behalf of this support and a clearly framed project Copenhagen Municipality entered the project and worked on a revision of §19 in the Planning Act. The municipality has played a central role for realizing the project
	Temporary housing Outdoor common areas Community house Shared industrial kitchen Kiosk <i>Molevitten</i>	Mobile constructions do not allow mortgages. This has been a financial challenge since containers are characterized as being mobile Using the 10 year project period to up-scale and develop the concept in order to attract new investors (SBI, 2018) *General land tax for a single family house is 41.435 kr. in Copenhagen (Rasmussen, 2019)	

Table 2: Main goals for physical projects as indications for success developed by Kemp et al (1998)

**Land tax is calculated on behalf of a public assessment of the cost of the land and land tax per mille decided by the municipal. It indicates how valuable land in the three different municipalities is. Main purpose is to suggest how urban areas are more expensive than rural (boligejer.dk, 2019)*

From above main goals of successful niche experiments it is noticeable how they all represent different models for achieving economic feasibility. Something that is manifested in change in technology and demand for constituency. Most radical changes in technology are presented by Grobund, even though this project presents a simple economic model and a constituency that does not ask for much external support. On the contrary CPHVillage, as a large investment, do not ask for equally radical technological changes but demands for a great constituency and external economic support in order to succeed. This constituency consist of student political organisations, Dansk Byggeri, 3F and other companies. Actors with great impact. These indicators suggest how tiny housing projects as niche experiments have different measures of success in urban and rural contexts. Grobund as a rural project allows a higher degree of experimentation and radicalness where CPHVillage is subjected to lower experimental capacity but is required much external support both from political and financial organisations in order to reach an economically feasible model. Both of these projects are large-scaled. Small Living Albertslund is a small-scaled project where change in technology does not correlate with political or economic constituency behind the project. Main goals for success are not accommodated and the project still seeks to be realized.

The three projects represent different economic plausible models that are not inseparable to *norms, values* and *practices* previously outlined (See table 1). Where Grobund and Small Living Albertslund suggest economic freedom achieved through the physical built environment these projects, that are not financial supported by external investment, seek low-cost solutions. The building processes entail a strategy of self-build and skipping unnecessary intermediaries. All empirical findings suggest how actors behind tiny housing initiatives are equally motivated by economic freedom because they inhabit their own projects. Hence they develop a framework based on low-cost solutions. Residents at Grobund are not allowed any mortgage, and pay up front leaving them in a higher risk. CPHVillage is an investment depended on investors but residents themselves are not economically risking anything. These two economic models for feasibility are differently approaching tiny housing projects, either as internal or external. The built environment in CPHVillage supports their values of up-cycling but refurbishment of purchased MÆRSK containers cost 0,5 million kr. reassuring for Norisol to provide as mobile solution as possible (Johansen & Busck, 2018). An expensive solution for projects with no financial support as Grobund and Small Living

Albertslund. Under the premise of being a temporary project CPHVillage depends of this pilot project to attract new investors. CPHVillage presents a paradox in how economic freedom is strategized. Tiny housing represents economic freedom where CPHVillage depends on attracting economic support. Although this paradox allows for residents at CPHVillage to live affordable in the most expensive city in Denmark.

Providing location for experiment

Geels (2004) argues how niche actors are subjected to fulfil a set of functions in order to achieve a higher degree of agency. One of these, which I find significant for tiny housing projects, is to provide location for experiment. A general observation found through several interviews is how local projects struggle to find sufficient space to carry out their niche experiment. This argument was presented in Analysis I and now I seek to understand how actors who govern tiny housing overcome this barrier. This section involves actors presented not only in the physical projects but in all empirical findings. For individual tiny house owners finding a location is legally nearly impossible. There is the activists approach towards it, as Øhrberg represents:

'Just do it for Christ sake. I do not want to wait for it...I am an activist and I do it myself...I was lucky to find a backyard where I could be...we never got a building permission but were told that the municipalities had received all of the documentation to fulfil it. And we are abiding by the building regulations. But I never got it (ed. building permission). (Ørhberg, August 20th 2019)

For the ones who seek to obey by the rules there are various half hearted solutions meeting incontrovertible BR requirements in addition to the Building Act and respective local plans. From a planning perspective this activist approach dispute against a Danish planning paradigm that tries to organize and control the physical landscape. Without this control infrastructural systems of waste, water, energy etc. would not be possible to plan or manage. Bøgedal from the Planning Department in Copenhagen expresses this counter argument;

'I think it is cool that you are just doing it. But it makes no sense if we are all doing like that. Because the municipality has an obligation to inspect housing for sustainability, waste sorting and lots of other practical things. Some may find it stupid but others argue how this it what

makes a city work. That we are burning our waste and producing energy. And how do you control this in the municipality? It is by asking the municipality so you actually have an address.'
(Bøgedal, August 20th 2019)

CPHVillage founders, Plesner and Busck, worked from a premise of using urban areas more sufficiently and consider empty spaces as great potential for development. Temporary use of the space at Refshaleøen became a tool for them to realize their temporary project. Grobund as a rural project is not exposed to lack of spaces available in the municipality (Syddjurs Kommune, 2020). For Møller and Randrup other problem areas complicated the process of finding a suitable location. Without investors behind the project Grobund has a small financial leeway. With the requirement for housing to be off-grid comes both an economic and legislative barrier. According to the Environmental Protection Act all housing are obligated to be connected to the public sewage system unless it from municipal side is exempted (Miljø – og Fødevarerministeriet, 2018). The area Grobund was interested in was beforehand designated for enterprise and subjected to sewage connection obligation, which increased the price remarkably due to a connection fee. Syddjurs Municipality revised the categorization of the area so it became a developing area exempted from the connection obligation. The other half of the area that Grobund is interested in is still municipally owned since it remains designated for enterprise and thereby unaffordable for Grobund. In general Grobund would not be a reality without municipal support since Syddjurs Municipality owns the land. First step was for Møller and Randrup to enter a dialogue with the municipality, which has been constructive from the beginning and the municipality saw potential in the project. So much that the municipality prioritized Grobund over all of the other proposals (Randrup, October 24th 2019). Additionally Randrup together with other members have done a preparatory work on inviting the local population of Ebeltøft to community dinners and other events. In the beginning they were a bit sceptical towards the project associating it with a new Christiania but now they have met people behind the project and are not sceptical anymore but support it (Randrup, July 9th 2019).

Initiator behind Small Living Albertslund, Friis is yet to succeed in providing location for the project and argues why:

'There is not much available land in Albertslund. It is a well-developed municipality. There are few places left but not really any private plots... in the end it is because, the piece of land we are going to buy will be owned by the municipality... these are probably the last pieces of building plots the municipality can sell' (Friis, August 7th 2019)

Friis stands alone with the job of providing location and even though dialogue with Albertslund Municipality is very positive the municipality focuses on housing communities for seniors.

The role of actors

An aspect represented in the three physical projects is how the role of actors differs. Holm et al (2014) argue how grassroots innovations are highly carried by actors on governance level and thereby it is relevant to understand the role of actors involved in the three local projects. Where CPHVillage is a project with many actors involved in the process; builder (CPHVillage), contractor (Norisol A/S), enterprise company (CENTO A/S), supplier of containers (MÆRSK), supplier of windows (VELUX), realtor company (Lejerbo) and architect company (Arcgency). Additionally Copenhagen Municipality has equally played a big role in realizing this project by developing a draft for a revised §19 in the Planning Act. These many actors can be difficult to navigate between mainly in the dialogue, which demand for a strict coordination framework. Actors involved are already established in the building sector and take part of the existing regime. In opposition Grobund is a grassroots project with short distance between actors involved. This is a general condition for projects carried out on grassroots level (Jensen, December 11th 2019). Actors involved in Grobund have multiple roles since they are developers, manufacturers, users and designers of the product. This benefits the dialogue with a short feedback process and decisions are quickly made. It also leads to a process of 'learning by doing' since no professionals are involved. These two different building processes symbolize how tiny housing projects can be carried out dually. In the urban area of Copenhagen the process is in a higher degree top-down controlled where the process for Grobund as a rural project is governed from the bottom-up. Small Living Alberslund exemplifies a sub-urban tiny housing project on grassroots level with no external actors involved and a bottom-up controlled process. This project suggests how involvement of more actors cf. *constituency behind project* would strengthen a governance framework in order to

attract actors on government level. As the project manifests the distance between the few actors involved is too significant. Friis as a single actor governing a niche that differs from the regime has not yet achieved impact on policy makers. Members of the association have met once but are not involved with the process of accessing land, which is a main goal for its success. A shorter distance between members may initiate a process facilitation that clarifies roles and focus areas for future development of the project.

Niche vs. regime?

Looking through the glasses of Geels' (2002) theory of multi-level perspective it is relevant to address where tiny housing as a niche positions. Throughout the analysis empirical findings contribute with different ways to approach tiny housing. These constitute a foundation for understanding the relation between niche and regime purposed to lead the way for a later discussion on how to reach transition.

Tiny housing represents a sustainable alternative housing technology that in other parts of the world is more practiced than it is in Denmark. Introductory companies occupied with building tiny houses and architects were presented. They are not many but represent how the established building sector is slowly beginning to integrate tiny housing in projects. However tiny housing projects with values, norms and practices that represent a strong ideology as part of the technology is only seen carried out on grassroots level. Empirical findings are indicators showing how there is an interest in tiny housing in Denmark but the technology takes form differently. Thus this interest is largely manifested in people talking about tiny housing in a higher degree than people are actually living in tiny housing. *Dansk Tiny House Gruppe* exemplifies this argument. Additionally Hennecke from Tiny House Living expresses how he is exposed to people of interest on a daily basis writing the company;

'We are receiving approximately five to ten requests daily with questions concerning how to legalize our things (ed. tiny house). Often they ask if they may try to live in a tiny house. That is why we now Airbnb some houses.... so they get the chance to know if it is something for them'
(Hennecke, August 13th 2019)

Tiny House Living is currently on standby building tiny houses due to other projects related to real estate companies (Hennecke, June 3rd 2019). These other projects Tiny House Living is occupied with symbolize very well how actors embedded in tiny housing finds themselves one footed on niche and regime level. On niche level they work on promoting tiny housing as a hobby while professionally working in the regime to secure financial income. Tiny House Living has one foot in building tiny houses and another foot in other building projects securing a financial income and minimizing the risk that comes with building tiny housing to a market not yet mature to this technology. CPHVillage is somewhere close to the regime level represented by the existing building sector. Actors involved in the project are profound players well integrated in the regime. Co-founder Plesner argues how he believes that it is these profound actors including himself responsible of showing how living tiny is not only nicheworthy:

'We consider it as our job to show how it can be cool to live tiny. Partly by showing that small housing can be functional and cool but also to emphasize what individuals and society can win by limiting ourselves. It is important that the mind-set follows the housing.' (Plesner, August 30th 2019)

This responsibility will according to Plesner result in more tiny housing projects around the country and allow for people to see alternative and sustainable ways of living that are equally attractive. Because how do you expect people wanting to live differently if they do not know of any alternatives to the traditional? (Plesner, August 30th 2019). CPHVillage exemplifies how living tiny come with innovative design solutions and as Busck argues, tiny housing have to be considered as an attractive alternative in order to create a market that may be integrated in the regime. Or in his own words; *'it needs to be made sexy'* (Busck, October 20th 2019)

The three physical projects represent difficult levels of involvement of its residents.

Grobund mainly focuses on self-build but has started up a building company 'Tiny House Grobund' ready to supervise or build houses for future residents. This company is owned and run by residents themselves and does not require external building companies or architects to supervise the building process. This closed loop exclude interference from regime level. Small Living Albertslund allows for co-build in corporation with the chosen building company

specialized in wooden construction. Skipping intermediaries is an attempt to excluding regime actors that comes with high costs (Friis, August 7th 2019).

In order to visualise the rather complex picture of tiny housing in a multi-level perspective following figure is such an attempt. It is developed on behalf of empirical findings where projects presented in the chapter 'state of the art' are not included since it would suggest an in depth examination of these. The size of circles indicates whether projects are large – or small-scaled.

Focus on: International political climate commitments, globalisation, urbanization, sustainable technologies

Underlying structures in the regime :

Mutual dependencies between actors embedded in the building industry interacting within a complex system; *material, products and solutions have to operate across the industry.*

Global niche level for tiny housing:

- A homogenous definition
- Shared values and norms
- Framework for organisation
- Accumulation of knowledge and experiences of local projects

Experimental local projects: Carried out through local networks characterized by local variety.

Actors embedded in the regime:

- Authorities
- Property developers
- Contractors
- Building companies
- Consultants
- Architects
- Craftsmen
- Engineers

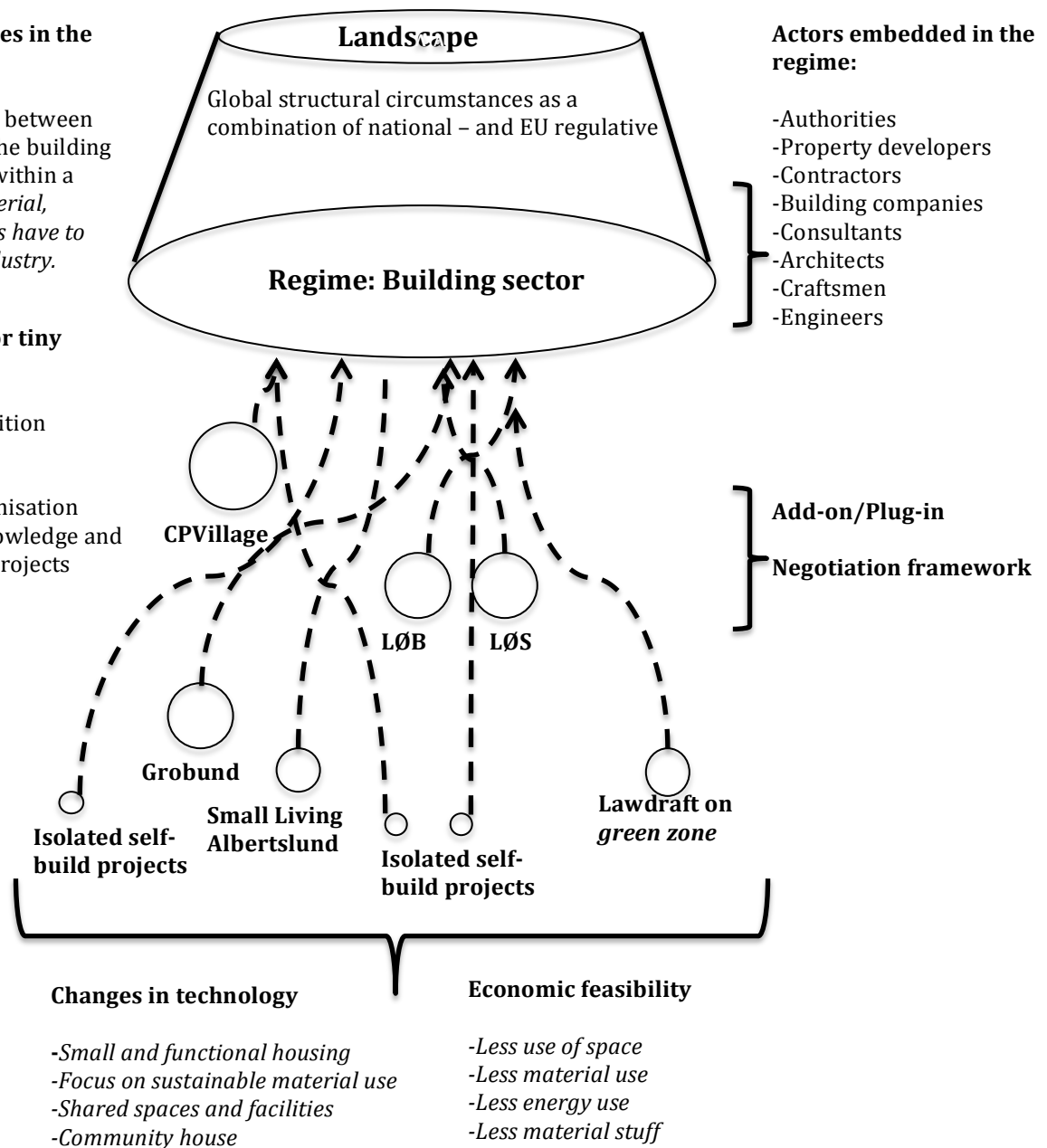


Figure 5: Tiny housing in multi-level perspective (Geels, 2002) developed on behalf of empirical findings

Above figure illustrates how projects involved with tiny housing position differently in relation to the existing regime. CPHVillage is a large-scaled project almost at regime level where small-scaled isolated tiny housing projects evolve long distanced from regime level. Dotted lines indicate different paths of transitions that tiny housing may diffuse into in order to reach regime level. Figure 1 is starting point for the analytical discussion presented in following chapter.

Discussion

This chapter seeks to answer subquestion: *How may tiny housing achieve transition?* In order to reach a conclusion of this, the movement as a wholesome is discussed on behalf of all presented literature and empirical evidence of this thesis. With the purpose of including supportive arguments following discussion does include analysed statements from actors ensuring a platform created on evidence.

Governance vs. Government

Alternative movements have had a big role in the Danish development of sustainable building alternatives (Holm et al. 2014). These alternative movements are able to push actors on government level and change structures embedded in the existing regimes. New technologies have seemed utopian but have transitioned over time. Møller, founder of Grobund argues how he believes in tiny – and off grid housing may seem utopian for some but is on the verge to become more acceptable just as other profound niche technologies;

‘windmills and biogas in the 70’s. Back then it was also impossible. It is reality now. Ecological agriculture in the 80’s. Back then it was impossible. And it is a reality now’ (Møller, September 4th 2019).

Alternative technologies can not achieve transition if they are only carried out by governance but are required for actors on government level to accommodate technological changes (Holm et al. 2014). This approach is supported by Hennecke who represents a building company not far from regime level;

‘It takes change in attitude from municipal side’ (Hennecke, August 20th 2019).

Tiny housing projects are today met with a legislative puzzle that almost makes it impossible for the movement to develop. BR-requirements are difficult for tiny housing to accommodate and the same goes for requirements necessary for pursuing a building permission. In other words; tiny housing is not suited for today's planning paradigm. Analysis II uncovered how the urban and suburban local project had less experimental freedom from what the rural project was subjected to. This is an expression of how lack of space inhibits tiny housing projects and demands for a higher degree of governmental support to prioritize tiny housing. As Bøgedal from the Planning Department of Copenhagen Municipality argues;

'tiny housing is simply not ranked high on the list. That is our children. Schools. So whenever we have an empty space we sell it to developing projects of schools or other institution. Because that is an acute municipal need.' (Bøgedal, August 20th 2019)

Friis is subjected to lack of government support and expresses how he considers the relationship between governance and government:

'If we were a chess game, it may be that you have the chess pieces. But the municipality also has theirs. And it is by the way them who decides on how the chessboard looks like.' (Friis, August 7th 2019).

Tiny housing as a movement lacks an organisational framework and as a result it fails to attract interest from government. For government authorities tiny housing is undefined and difficult to implement in planning practices due to lack of knowledge on what tiny housing offers both in terms of sustainability but also as an attractive way to live. In order for tiny housing in Denmark to develop a framework it takes inclusion of professionals to attract governmental interest. Professionals beyond grassroots level contribute with knowledge that strengthens a framework easily comprehended by authorities. As it is now several isolated tiny houses exist around the country and projects do not have a unison platform to share and accumulate knowledge. This complicates the development of a framework.

The demand for governmental willingness to prioritize more radical housing innovations is yet inhibiting for tiny housing. Lawdraft on 'frikommuneforsøg' introduces a green zone and

support above argument. The lawdraft was sent to 16 municipalities where some of these e.g. Slagelse and Syddjurs Municipality had shown interest. However, due to lack of coordination between municipalities neither of them wanted to take the risk of committing to the experiment since they required support from other municipalities to enter this project together (Frost, September 9th 2019). This suggests a denotation of a higher government level that mediates a platform for municipalities to communicate. This mediator may be the regions gathering and facilitating coordination for experimental housing projects such as tiny housing. Michelsen provides insight in how American Tiny House Association is run by volunteers both on national and state level. In Denmark that may be equivalent to Hovedstaden, Sealand, Funen and Jutland (Michelsen, August 20th 2019). As it is now tiny housing is governed by volunteers weakly attached to each other a side from government. Initiatives as the conference and *Dansk Tiny House Gruppe* are steps towards unifying a strategy of governance that in the future may be easier for government to accommodate.

Add-on potential

All empirical findings indicate how tiny housing is an ideology of more than just living on few squaremetres. *Sustainability, economic freedom, innovative design solutions, simplicity* and *co-living* are aspects represented in physical projects. Last-mentioned is a way of living integrated in housing communities; an already existing niche suggesting an add-on potential for tiny housing. Smith (2007) presents two issues unfolding a niche-regime relation: *Add-on* and *negotiation framework*. Former addresses the relation between niche and a global niche level and second a niche to regime relation. I suggest how this theory is not directly applicable since niches adding-on to other niches equally demand for a negotiation framework. Tiny housing is not yet established as a global niche. In order to create a global niche level tiny housing benefits from adding on to already existing housing movements. Both Østergaard (LØB) and Nielsen-Englyst (Bofællesskab.dk) argue how other alternative housing movements propose similar norms and values as tiny housing. Both LØB and LØS are well-established movements with an organizational structure and clearly defined framework. Over the years they have already done a great preparatory work on creating constructive dialogue with municipalities and other actors on government level (Østergaard, September 18th 2019). Similarly does Bofællesskab.dk suggest a supportive role for housing communities around the

country. Add-on potential that strengthens the organizational framework of tiny housing potentially diffuse into:

The Danish Association of Ecological Building (LØB): *'Purposed to promote environmental friendly construction. The association represents a variety of contributors and manufacturers of sustainable building material, craftsmen, and architects etc. who are interested in sharing knowledge on the topic. LØB communicates knowledge on environmentally friendly building through open debates, journals, exhibitions and excursions. Members get the opportunity to share products and services'* (lob.dk. n.d)

Add-on: Integrate tiny housing as a subgroup of LØB and facilitate knowledge generation on tiny housing amongst different professions engaged in the association.

Negotiation framework: Tiny housing integrates a vision of more environmental friendly building material into articulated values, norms and practices.

The Danish Association of Eco-Communities (LØS): *'Provides a framework for sharing experiences and knowledge, and is politically engaged in promoting the establishment of eco-communities in Denmark and encouraging society at large to become engaged in living more sustainably... Our purpose is effectuated by: Representing eco-communities, interacting with politicians and public authorities, cooperating with other organizations on the basis of our common interests...'* (okosamfund.dk, n.d)

Add-on: Integrate tiny housing as part of the sustainable vision of eco-communities when mediating with politicians and public authorities

Negotiation framework: Tiny housing integrates in eco-villages and adapt values, norms and practices carried out in eco-village projects. Tiny houses are offered as a subdivision of future eco-villages aside wit other housing solutions

Bofællesskab.dk: *'A non-profit association, primarily tasked to support and promote community oriented ways of living... the association facilitates events and material subjected to alternative ways of living together... Bofaellesskab.dk adds knowledge, advisement and tools as a start-up-package...'* (bofaellesskab.dk, n.d)

Add-on: Integrate knowledge on tiny housing in the start-up-package in order to expand this type of housing to communities that are in the developing process.

Negotiation framework: Tiny housing enters bofællesskb.dk on behalf of an ideology that integrates a focus area evolved around creating up-scaled attractive communities

Initiator behind lawdraft Frost and Nielsen-Englyst consultant at Bofællesskab.dk are both members of LØS where Østergaard, initiator behind *Dansk Tiny House Gruppe* is a member of LØB. This exemplifies how actors embedded in tiny housing projects are equally occupied in other movements and have several roles all purposed to promoting sustainable and alternative housing solutions. These actors are already experienced in how to organize projects and equally interested in implementing values and norms of tiny housing. Tiny housing as a global niche may be developed through LØB and LØS. Not as a tiny house movement but as something else; a sub-groups or subcategory etc.

A niche-to-regime negotiation framework is more difficult proposed since it demands for a global niche level to unify a platform for negotiation. However it is possible to comment on already existing trends integrated in projects carried out by the regime. Introducing, projects integrating tiny housing elements were presented. Just as empirical findings presented a vision of living together so did these projects. Usually a discussion does not present new literature but for this I make an exception. In order to provide evidence for a niche-to-regime negotiation framework new housing trends carried out by the regime indicates such. The trend of living together in housing communities has become a trend on a higher societal level rather than an ideology only integrated in grassroots movements. SBI professor and architect Bech-Danielsen has researched in housing communities and argues how living together is a trend that only becomes bigger with the younger generation. It is a response to today's individualization and lack of sustainability that suggests shared responsibility, practical tasks and economy (Bech-Danielsen, 2018). This social aspect of what housing today is moving towards is correspondingly expressed by architect behind CPHVillage, Mads Møller from Arcgency, who experiences more focus on shared spaces in the built environment. Thus we should not think of it as a new trend. More of an expression of old practices that have become attractive again. In an interview he argues:

'Common spaces focusing on the social aspect. It is not a new thing taking back qualities from the 60's and 70' architecture'. (Møller, August 15th 2019)

Additionally Møller expresses how tiny housing is one answer towards a more sustainable building sector. He considers tiny housing as a technology that follows this societal trend of re-defining what a house today should represent. Møller argues;

'It is a possibility for building more rational and using resources in a better way. The possibility of redefining what a good home is. (Møller, August 15th 2019)

Hence a negotiation framework amongst niche and regime equally addresses how tiny housing and housing communities may find a common ground in new projects. Focusing on the 'something else' tiny housing brings to the table being *sense of fellowship*. Particularly in urban areas tiny housing is a beneficial tool accommodating the increased demand for new housing. A negotiation framework with public authorities is highly place specific since municipalities are entitled to decide on size, quantity, type, location etc. when developing new housing (Larsen, J. 2017). An urban negotiation scenario carried out in Copenhagen would demand for municipal attention towards new legislative planning acts. In order to facilitate tiny housing communities Copenhagen Municipality would have to revise the 95m² rule developed in 2005 purposed to promote better facilities for families with children (Ekeroth, 2019). This rule demands for an average size of 95m² in new housing and a minimum at 75m² for each residence and exemplifies a place specific negotiation framework demanding for government.

Three pathways of transition

Tiny housing presents a radical niche with an ideology differing from the general way of living trying to answer social and environmental issues in society. How this niche achieves transition into regime level can be proposed by applying Boyers' (2018) three pathways of transition. Following presents how tiny housing currently diffuse by these pathways followed by a suggestion of how to strategies these. The movement is continuously experimenting in new technologies of building material, insulation, functional and aesthetic design. Technologies that attempt to make it more appealing to live tiny. Tiny housing in Denmark is inspired by the American movement through TV-shows, blogs and YouTube channels. Undoubtedly this romanticized vision of tiny housing has encouraged the movements way to Denmark. Thus the phenomenon has not entered the market quite the similar way; tiny

housing in Denmark is not part of the mainstream. In some degree the movement has passively emerged as a hobby for people both embedded in the grassroots movement but also for the elite. Difference between these two groups is how grassroots actively work on protecting the niche while people of the elite build for themselves as a fun experiment. Regardless of how tiny housing is carried out it represents a 'pragmatic utopia' when attempting to accommodate socio-environmental issues in society by targeting residents and institutions both inside and outside the mainstream. Issues demanding for the building sector to reduce its CO₂ emissions and social concerns seeking to integrate sense of fellowship in the built environment.

Through three pathways *translation*, *up-scaling* and *replication* it can be understood how tiny housing as a grassroots innovation carries out and attempts to achieve transition. Diffusion by translation is similar to the negation framework presented as an add-on potential. This pathway is the least efficient for tiny housing.

Translation: Thin translation focusing on small housing size in new building

Where tiny housing struggle to diffuse by a pathway of translation is due to its radicalism. Grobund represents a technology demanding for structural changes of the incumbent system. Translation involves changes in regulatory structures such as land use regulations as one of the main barriers for tiny housing as it is now. Lawdraft on *green zone* was an attempt to achieve such changes but due to the radicalness of the proposition demanding for thick translation it failed. In Copenhagen housing shortage is an urgent problem. CPHVillage is a successful project but it should not directly be considered as result of a translation of tiny housing more as a result of lack of student housing. CPHVillage represents how tiny housing achieved thick translation by focusing on the add-on potential of current housing trends as *student housing*, *co-living* and *up-cycling*. Intermediacy is an important condition in a translation process but becomes unreachable if tiny housing demands for too many changes. Tiny housing would advantage by strategically use pragmatism in a translation process as a solution for socio-environmental issues in society; demand for affordable housing in big cities in Denmark and reduction of carbon emissions from the building sector.

Suggestion: Focus on add-on potential of tiny housing through diffusion by thin translation. Tiny housing has not matured and represents a radical technology that suggests structural changes of established regime not willing/ready to accommodate such. Advantage of pragmatism suggesting for housing size to solve socio-environmental issues in society.

Up-scaling: Understanding tiny housing as an experimental developing process rather than a completed product

Tiny housing movement is currently in a developing process trying to figure out what product the niche represents. Hence diffusion by up-scaling of tiny houses should be considered as a process rather than a product. The process involves local experimental projects contributing with different interpretations of what the phenomenon represents. There is an increasing interest for tiny housing, which suggests an up-scaling by recruitment of new members and growing activity. Since tiny housing appeals to do-it-yourself project the niche is easily approachable to individuals outside the niche also the elite who are part of the mainstream. However the impact of an up-scaling process is not corresponding with growth in impact of the movement. An internal factor necessary for tiny housing is the access to space, something projects struggle to achieve. A general characteristic of grassroots innovations is how they depend on volunteers devoted to years of unpaid work (Boyer, 2018). Tiny housing is mainly carried by actors who voluntarily spend their spare time on various initiatives. These actors both exist inside and outside the niche. Up-scaling advantages of this intermediate status by mitigating risky investments since individuals are not fully depending on income from tiny housing projects. On the contrary the intermediacy slows down the movement by members having fewer resources, mostly time, to focus a strategy for expansion. Tiny House Living is such an example. The building company occupies with building tiny houses but also with other building projects as financial security minimizing the financial risk. Grobund is financed by a small fee from members at 200 kr. This fee allows for members to take part in meetings and other social events that enable potential residents to test the waters before fully committing financially. Later in the process a higher investment, 50.000 kr., is required for members in order to realize the project. It takes a successfully framed project to maintain interest of members so they are willing to deposit a higher amount of money in a project. There is a great difference on expanding tiny housing to an audience that just find it

interesting and those who actively want to realize this way of living. Hence up-scaling requires an audience committed to governance. Many of these projects are implied with uncertainty due to bureaucratic and legal barriers. These uncertainties inhibit both do-it-yourself and larger project to be realized and makes it difficult to recruit members who may only find tiny housing fascinating but not thinks of it as a realistic housing solution.

Suggestion: Exploit intermediacy more efficiently by attracting professionals who voluntarily contribute to frame coordination of both projects but also the movement as a wholesome. Due to the low risk they have less to loose but contribute with professional grounded evidence easing dialogue with actors on government level. Uncertainties behind tiny housing projects are inhibiting to recruit members and these have to be addressed by higher authorities. Particularly demand for space and more see-through BR regulations are necessary in order to expand the movement.

Proactive replication: *Understanding tiny housing as; innovative and flexible design, simplicity, sustainability and affordability while distancing from a radical perception of self-sufficiency and breaking free from society.*

More small scaled local initiatives are beginning to integrate tiny housing. This growth is mainly diffusing by a proactive replication. People seek information and fellow tiny house enthusiasts to share ideas and thoughts with and want to acquire new knowledge. Through conferences, books (*Mit Tiny House*), social media platform (*Dansk Tiny House Gruppe*) and person-to-person communication people seek guidance of how to approach new projects both self-build and larger scaled. Tiny House Living exemplifies a mediator between niche and regime contributing with professional insights mainly on BR requirements. Since there is no central management of tiny housing the intermediate status of replication proceed proactively where people act upon ideas and inspiration without seeking permission from the global niche. Reactive replication does also occur, as self-build projects, with no connection to other actors involved in the movement. On the upside the intermediacy status encourage projects to arise around the country rapidly but on the contrary the informal relationship between niche projects and other actors in the movement suggests less coordination and accumulating of knowledge across people and projects. Since the global niche level is not yet

organized there is not much help to access and new tiny housing projects lack guidance from actors who are experienced in process facilitation. Hence diffusion of tiny housing through proactive and reactive replication becomes problematic when replication allows for many different types of projects speaking different languages. Transition through replication allows for more tiny housing projects to develop around the country and makes this way of living more visible for people in the mainstream. In order for tiny housing to appeal to the mainstream replication advantage from an intermediate imagery by articulating an innovative housing solution offering flexible design, simplicity, sustainability and affordability. This image distances from a radical perception comparing tiny housing to a desire of wanting to seek away from society and become self-sufficient. This radicalness does not appeal to the mainstream.

Suggestion: Accumulate communication (conference, books and other written/mouth-to-mouth information) in order to coordinate a framework for tiny housing that is easier adapted in future projects. This will strengthen relationships between actors involved in projects on different scales and levels and unite a more homogenous expression of what tiny housing in Denmark represents. An expression that distances from a radical intermediate imagery.

Closing remark

1:1 American Tiny House Movement in Denmark?

Lastly as a closing remark I want to go back to the beginning where tiny housing was presented in an American context. Because how does tiny housing in Denmark differ from the American? Projects involved with tiny housing can be found around the country either as an affordable solution of need, housing people with less resources or as an active choice to people wanting this way of living regardless of economic capacity. The American Tiny House Movement indicates a liberation process from society and building companies are in direct contact to clients who are also residents of the house themselves. This mainstreamed American implementation of tiny housing is not directly translatable into how the movement operates in Denmark. There are some tiny houses spread around the country seeking away

from society and searching for a peaceful environment with no attachment to other houses. This is quite similar to the American interpretation of the phenomenon. However majority of projects from empirical findings include tiny housing as part of a vision for a community that share spaces, facilities and have some degree of co-living. The sense of community where living side by side with others sharing similar living preferences is considered equally important as just living in a tiny house. This conception seeks a wholesome where tiny housing is just a part of it and differs from the American perception. It has been interesting to uncover how the perception most similar to the American is the one struggling the most in breaking through to the established sector. These small grassroots projects live on social media platforms such as *Dansk Tiny House Gruppe*. In order to reach a successful path on transition tiny house movement must be adapted into a Danish context where other aspects are taken into consideration. This adjusting process comes with some conditions where tiny housing has to be rethought as an add-on to other niches instead of pursuing the American dream.

Conclusion

How has tiny house movement been adapted in a Danish context and how may a framework for transition appear like in order to promote this sustainable niche in both an urban and rural context?

Tiny house movement in Denmark is present in two ways; as a tool provided for necessity achieving affordable housing *and* as an ideology actively chosen as a way of living. Empirical findings suggest a set of values integrated in tiny housing projects; *less consumption, sustainable building material, simplicity, co-living, circular economy, flexible/innovative design and affordability*. Barriers for tiny housing are predominantly *BR requirements, the Planning Act, local plans* and *bureaucracy* inhibiting acceptance of tiny housing as liveable accommodation. Commonly for self-builders and tiny housing projects is how providing spaces for experiment is main pitfall due to above barriers. As a movement tiny housing mainly carries out through the Facebook group; *Dansk Tiny House Gruppe* joined by members of interest in this way of living. Through the glasses of Geels' (2002) multi-level perspective tiny housing represents a niche carried out through several local projects and initiatives

realized by actors on grassroots level who govern tiny housing as a hobby aside from their professional work, which minimizes economic risks. Tiny housing represents an experimental housing alternative and empirical findings show that the degree of experimental freedom is higher in rural areas rather than urban. More radical changes in technology are accepted by government in rural areas where space is not a scarce resource. Tiny housing projects must find a loophole in the regime answering other municipal issues.

Common for local projects and the movement as a whole is how the niche advantages of adding onto other niches with similar values. Add-on potential that suggests a negotiation framework where tiny housing integrates as communities (LØS & Bofællesskab.dk) and adapt to more ecological building methods (LØB). Tiny housing as a movement lacks organisational framework that unifies projects and facilitate a platform to strengthen dialogue with authorities in future projects. This is something LØS and LØB may contribute with by integrating tiny housing as a subsection. These associations are already defined at a global niche level and are well-known by municipalities countrywide.

A niche to regime negotiation framework develop through finding a common ground where tiny housing adapt to the societal trend of increasing demand for housing communities. Empirical findings show how many tiny housing projects equally find co-living as an important aspect and suggest platform for negotiation with a regime that seeks to reduce its carbon footprints. This process initiates a *thin translation* of tiny housing, a pathway least efficient since it implies with changes and replacement of many elements. Transition of tiny housing benefits from diffusing by two pathways; *up-scaling* and *proactive replication*.

Perspectivation

Inspired by self-builders who experiment in different sustainable building techniques and material it would be interesting to examine the potential of these in terms of promoting sustainable housing. Could it be that residents engaged in the building process would choose to build more sustainable? Particularly in urban areas where the experimental freedom is not very high an business as usual is more present in the built environment.

In an article in Politikens' section 'Byrum' from 2019 Anne Romme and Morten Birk Jørgensen both professors at institute for Building art and Culture, KADK argue how new housing in Copenhagen are similar in type, technique, size amongst other and question why everything have to look alike. At KADK they have explored how residents building their own house may contribute to the prevalent type of housing. Self-build projects have potential in experimenting and challenge the current homogenous developer dominated housing landscape. Furthermore it shows how self-builders have a tendency to experiment with more sustainable solutions rather than developers. In Copenhagen By & Havn together with Copenhagen Municipality are main decision makers when pushing a developer dominated new housing market building for the largest and strongest buyers – upper class families. According to Romme and Jørgensen this approach gives no room for citizens participating in experimental and alternative ways of living where they are equally part of the developing process. In order to do so, space is required for the municipality to reserve areas for this purpose. Today By & Havn is required selling building lots to highest paying proposal. Why not divide these big lots into smaller properties that enable citizens of Copenhagen to buy these together in small groups? (Romme & Jørgensen, 2019)

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