Under Pressure

An investigation of rural quality of life and how to enhance, nurture and protect it in areas where renewable energy facilities are planned and built

00 *Prologue*

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Laura Gaarde Fisker

Reading guidance

This report contains my master thesis in Urban Design. It is structured and handed in in one report consisting of eight chapters.

The initial 00 Prologue chapter presents my motivation for writing present thesis. In 01 Foundation I present the aim and objectives, as well as my methodology and process. Then follows 02 Context in which I explore the context of the renewable energy facility planning. In 03 Position I explore urban design theory regarding rural quality of life, the human/nature relationship and placemaking, which I use to formulate my professional position. In 04 Deconstruct I apply urban design and planning methods to study a specific case regarding the planning of a new solar power facility in Gestenge in Ringkøbing-Skjern Municipality. In 05 Synthesis I formulate strategies for rural development in light of renewable energy planning based on my position and my findings through the analysis of the Gestenge Project. In 06 Intervene I experiment with the physical manifestation of the strategies. And In 07 Epilouge I present my conclusion and reflect on the thesis project.

All illustrations not specifically listed in the illustration list are my own. Through the report I have decided to include all citations in the language of the source, thus Danish will appear in several sections of the report. The Harvard reference method has been used for source citation. All maps not provided with a north arrow are truth north.

Abstract

This thesis investigates how to protect, nurture and enhance rural quality of life in areas with renewable energy facilities within the scope of urban design and planning.

Through an exploration of the broader context of contemporary land use in Denmark, the thesis highlights the many ways in which the rural districts are under pressure. The thesis underscores the importance of landscape democracy and citizen involvement in light of all these changes, here among the rapid planning of renewable energy facilities, since changes to the landscape can disrupt local identity and sense of place.

Through an integration of theory on rural quality of life, human-nature relationships, and placemaking, the thesis identifies landscape as a mediator between humans and nature. Landscape is further identified as an identity carrier, and as an important element in making up rural quality of life. Utilising urban design and planning methods to study the renewable energy case, Gestenge, a future solar power facility in Ringkøbing-Skjern Municipality, reveals that meaningful rural development in the context of renewable energy can occur through place-based strategies at various scales. The findings affirm that rural quality of life can not only be preserved but also enhanced by creating places that connect renewable energy with local landscapes and communities.

Through the theoretical exploration and the case study of the solar power facility in Gestenge, two strategies are proposed for developing rural areas in light of renewable energy planning. I suggest either adding value on site or off site. Within each strategy I propose five different actions to drive rural development - Connect, Target, Multifunctionality, Nature and Recreation. All five approaches add value through placemaking, nature and landscape.

Tabel of content

04 Deconstruct

05 Synthesis

06 Intervene

07 Epilouge

Motivation

Academic motivation

Through my years at Aalborg University the projects I've been most engaged in have been those dealing with the physical environment outside of big cities. Especially two courses – Byrummets Formgivning III-B: Landskab og bygning in the spring semester of 2022 during my bachelor and Site Morphology: Advanced Analysis & Design in the spring semester of 2023 during my master – have been important for me in realising what Urban Design can look like when not dealing with the dense city. The two courses have both rural sites, analysis, landscape and small architectural interventions in common – apparently that is my sweet spot. So, when I had to decide on the focus of my thesis it made sense to look towards the Danish countryside.

Personal motivation

I've grown up in West Jutland, and even though I haven't lived there the last ten years, it is perhaps the landscape that I feel the most at home in. I spent my childhood in a small village by Ringkøbing Fjord with its shallow waters and have grown up surrounded by a flat and open landscape, where almost all the sandy soil is cultivated, and where the wind that blows in from west makes all the trees lean towards east. As part of one of the aforementioned courses I wrote an essay about this connection between me and my childhood landscape, and even though it might be a bit highbrow to cite yourself in your thesis, something I wrote still resonates with me. I wrote: "I believe that that secret conversation between a person and a landscape is both very rooted in the mind that perceive and the body that feels, as well as in myth and heritage.". I still do believe that, and I think it is a quite important piece of the puzzle when trying to communicate my motivation for writing this exact thesis. Because while I might be inclined towards painting a rosy picture of the landscape in West Jutland, because of who I am, who my parents are, who my grandparents are, and the stories that we have told and still tell about our lives. But the landscape in West Jutland where I've grown up is also a symptom of the human depletion of our land that has been a national tradition since forever. It is intensely cultivated, it is poor on protected nature and wildlife and the fjord is slowly dying because of eutrophication. And then there are the wind turbines, that define the horizon in whatever direction you look. To me it is one of the positive things to come out of the open and windy landscape, as well as a pure necessity, to others it is an eyesore, a foreign element, a noise polluter, an omen of change. My interest in energy landscapes have subconsciously been present my entire life – I'm interested in their form and design (I have a clear childhood memory of lying on my back at the foot of a, at that time, big wind turbine, letting it's size, sound, movement take over my sense), in the energy they produce, their impact on the green transition, their impact on the people who live close to them, the communities that fight against them, their impact on the surrounding physical environment, and I could go on. And now this interest in energy landscapes and the landscapes of rural Denmark (both the good and bad), has gone from personal, to professional and academic, to highly topical. Because our rural landscapes, districts and villages are under pressure. They play a crucial part in both national and global agendas such as the energy crisis, the climate crisis and the biodiversity crisis, which point toward a total reorganisation of the land use in rural Denmark, which in turn are challenging the lived lives – the attractiveness, identity and everyday life – of the affected areas.

Universal motivation

Climate, war, conflict, natural disasters, economy, health, pandemics, biodiversity, energy – crises come in many forms, and these years they seem to have no end. Crisis is in many ways the overarching theme of contemporary life. Not necessarily because there are more crises now than previously. More so because of the constant flow of news, easier access to knowledge, and the broader globalisation of society. And with a global citizenship comes a global responsibility that trickles from the level of federal unions to national governments to local politics and lastly down to the individual – you, me, us – who then has to navigate a very complex web of agendas and information on their own.

This thesis will not be able to solve all present crises, nice as that would be – in all honesty it will not even solve one. What it will do though is work with a theme – energy landscapes – that is born of one crisis, the energy crisis, and directly touch on another crisis, the climate crisis, and through its design might even touch on several more such as the biodiversity crisis.

Ill. 1 Observing the landscape

01 *Foundation*

Ill. 2 Dirt roads at Gestenge

This thesis aims to investigate how to protect, nurture and enhance rural quality of life in areas that experience the addition of renewable energy facilities to their landscape within the scope of urban design and planning.

The thesis will...

1. ***Explore the context of contemporary land use with a special focus on energy landscapes.***

2. ***Explore research on rural quality of life, the theoretical relationship between human and nature and sense of place.***

3. ***Explore how urban design methods can read and translate site specific structures, landscapes and qualities through a case specific study to inform the understanding of the "rural and renewable energy" assemblage.***

4. ***Create strategies for creating energy landscapes that are meaningful to local communities***

Process

A subjective design process

Assemblage theory and the actor-network-theory goes hand in hand with the idea of design problems being wicked. A wicked problem is a many ended problem – both regarding the problem itself and the solution(s) to it.

"It is also now widely recognized that design problems are ill-defined, ill-structured, or 'wicked'. They are not the same as the 'puzzles' that scientists, mathematicians and other scholars set themselves. They are not problems for which all the necessary information is, or ever can be, available to the problem-solver. They are therefore not susceptible to exhaustive analysis, and there can never be a guarantee that 'correct' solutions can be found for them" (Cross, 1982, p. 224)

When working with wicked problems the process is not linear – in fact, it is endless – when a problem defies a comprehensible number of descriptions and solutions the design process can't have a finite and objective end (Lawson, 2005).

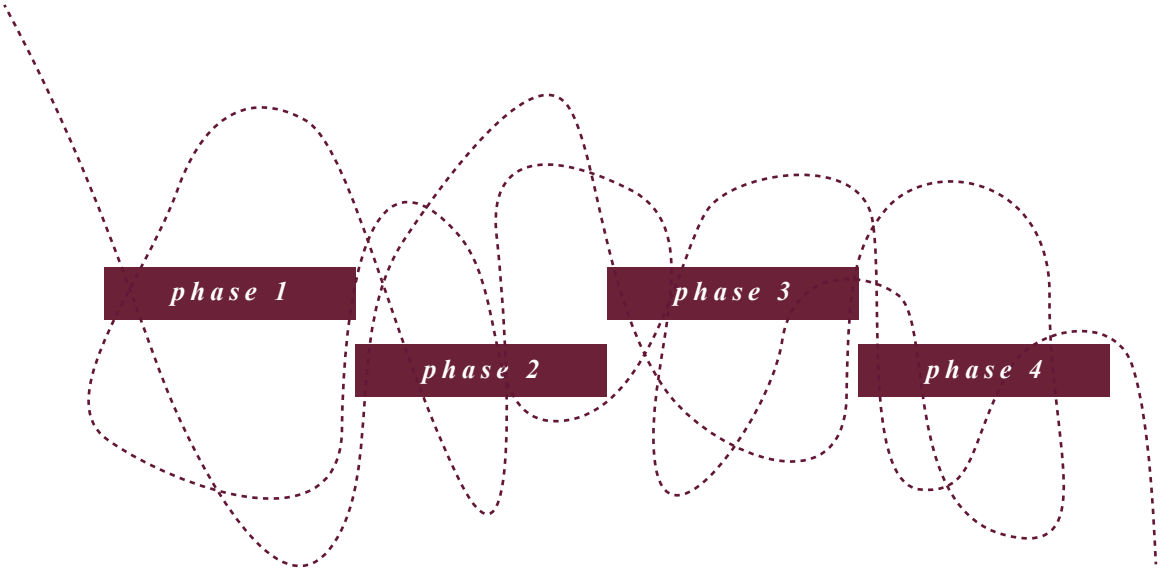
Wicked problems are complex and often involve multiple stakeholders with diverse perspectives and interests (Lawson, 2005). This sentiment is very much in line with the core of assemblage theory – the idea that the social sphere is a network of traceable associations generated between actors of both human and non-humankind. When talking about actor-network-theory in relation to design processes I would like to cite Latour (2005) once again: *"The solution, once again, is to learn how to feed off uncertainties instead of deciding in advance what the furniture of the worlds should look like."* (Latour, 2005, p.128)

The citation relates to Latour's distinction between matters of fact and matters of concern. Matters of fact refer to the traditional understanding of facts as objective, universal and independent of their context – in Latour's line of thought this is a simplified understanding. He is more interested in matters of concern – the complex network of relations, conflicts, values and interest that affect a subject.

Since the world can't be understood as an objective and universal entity neither can design problems, design solutions or design processes be that – objective and universal. They are in fact very subjective and depend very much on the eyes that see them. Through my studies at Aalborg University, I've always found great joy in pin-ups because they highlight just that – all groups get the same assignment, but somehow end up with different solutions. Present thesis is just as much an example of just that. It is I who have interpretated the discourse of contemporary land use and renewable energy planning. It is I who have patched together the theoretical background from which this project understands the world. It is I who have analysed the problems within the theme of renewable energy development that relate to urban design and planning. It is I who have formulated the problem that I seek to find a solution for. It is I who have conducted the analyses and created the strategies and design proposals. So, even though I might work with themes and things and structures that are visible to all, I, the designer and researcher, am still at the centre of the project.

I have tried to make this fact transparent through the presentation of my personal motivation, my position within our field and my approach to the present design problem.

To broaden the scope of the project I analyse all the things that are visible to us all – all things objective – but within the act of analysing there is also an interpretation, a reading, that again is subjective. I decide what to analyse and I highlight the themes that I find relevant to the problem.



Ill. 3 Process diagram

An iterative design process

As stated earlier a design process isn't linear. This is encompassed in the Integrated Design Process formulated by Knudstrup (2014). The framework of the Integrated Design Process includes five phases: problem identification, analysis, sketching, synthesis and presentation. Even though the process is divided into five phases that move you closer to a finished project it is not linear, it is iterative, meaning that the phases inform each other in a constant feedback loop – the design solutions inform the design problem so to speak. Knudstrup (2014) highlights the Integrated Design Process as a way of ensuring both design and engineering concerns. In the present thesis I would rather relate it as way of organising my design process to reach a conclusion. One of Bryan Lawson's (2005) main points in his book How Designers Think is that a right solution to a design problem doesn't exist and that one solution to a design problem can perform just as well as the next. A design process can therefore continue forever. By being aware of the phases of the design process and the objectives you can push beyond the process and actually end at a solution – having phases in your design process make you able to understand how you think, when you think, which in turn can help us to navigate the many potentials and challenges that arise in a design process. When we know what we don't know we are aware of the tools we need to utilise to gain the yet unknown knowledge.

Each phase in the design process calls for different approaches and tools to gain the knowledge from which you are able formulate a design problem and a design solution. The phases in turn inform each other, and so the feedback loop continues, making the design process an iterative process.

The present thesis consists of four phases – that one way or another relate to Knudstrup's (2014) five design phases. The four phases are connected to the thesis' four objectives. All phases have run simultaneously, making the design problem a product of the design solution and vice versa. For explanatory reasons I will present the phases separately here.

Phase 1 – explore the context

The theme of the thesis is highly topical. Both in its own right, but also in connection to the broader theme of future land use. By understanding the context of new renewable energy facilities, I was able to research and prioritise parts of the broader theme. Through site visits and analysis and research of theory the opportunity space of the thesis manifested and became easier to focus. By exploring the context from several angles – planning, history, politics, legislation, nature and the human perspective – the complexity and connectedness of the context was revealed, which in turn informed the next phases.

Phase 2 – explore research

The exploration of the context revealed certain themes that could inform the theoretical core of the project, and the findings in the case specific study supported and focused it. The theoretical core both informed the approach and the aim of the project – setting a tone for the case specific study as well as the synthesis.

Phase 3 – urban design methods

The urban design toolbox is extensive. Which tools to use when and why can't be known beforehand – the other phases of the project informed the case specific study both in terms of which knowledge I needed to gain, but also how one might gain it. The urban design elements of the project have thus been clarified along the process.

Phase 4 – strategize & intervene

The last phase of the project ties together the findings from the three priorities phases in strategies and preliminary design proposals. It is the design solution to the design problem.

Methodology

Urban design methods will be used to deconstruct and explore the case of Gestenge. The urban design methods must contribute to broaden the perception of renewable energy facilities in rural areas. The point is to understand how renewable energy facilities affect the landscape, both the natural and the manmade, and the well-being of local communities, but also to reveal existing potentials on site and in the area around it that can be generate rural development despite new renewable energy facilities. So, when we apply urban design methods, we both do it to understand and to develop landscapes.

To deconstruct the landscape I use cross-sections, field trips, photo registration and mapping. Furthermore, I use mapping and cross sections to illustrate how the proposed strategies could manifest in physical forms in the case of Gestenge.

In general site analysis in urban design is used to build knowledge of a specific site through a systematic approach. The scale of the site can differ – the scale can be global, national, regional, municipality based and all the down to a specific plot. Some analyses show overall connections while others zoom in on details. Urban planners and designers use the knowledge that they gain to read and interpret a site, which in turn informs a possible physical intervention.

Urban design methods can be more or less objective or subjective. I would however always argue that what we select to analyse and how we present it hold a subjectivity that we never must forget – we are the eyes that see, and the minds that understand, and hands that create.

Mapping

Maps are translations of worlds; they are not objective nor universals, they are projections of the world through the eyes of humans. James Corner (1999) differs between tracings and maps in his essay The Agency of Mapping (Corner, 1997), and writes:

"The distinction here is between mapping as equal to what is ('tracing') and mapping as equal to what is and to what is not yet. In other words, the unfolding agency of mapping is most effective when its capacity for description also sets the conditions for new eidetic and physical worlds to emerge. Unlike tracings, which propagate redundancies, mappings discover new worlds within past and present ones; they inaugurate new grounds upon the hidden traces of a living context." (Corner, 1999, p.214)

Corner defines the act of mapping as a creative process, in which we can both gain knowledge about landscape and uncover its potentials – in this sense maps are representations of reality. When we allow mappings to exceed the mere act of tracing reality they gain agency. Corner outlines three operations that are integral to mapping as a creative and transformative process – fields, extracts and plotting. Together the operations moves mapping beyond the simple representation of reality. Fields refer to the creation of underlying structure or frameworks that organise information. In a landscape fields can be represented as the topography, infrastructure or the structure of the built environment. Extracts involve identifying and isolating elements or patterns from the broader fields. The extracts can be specific structures, spaces, pathways, landscape elements etc. The extracts help to foreground the important elements or relationships at play. Lastly, plotting is the act of projecting the extracted elements back onto the field and recomposing them into new spatial configurations. The act of plotting moves maps from analysis to invention. (Corner, 1999)

Mappings can be objective and data-driven however they are very often subjective, because of what they show and how they show it. If we are aware of this, we can utilise the power that lies within mapping as a creative driver in our design process, where we use them as boards for dreaming up new realities based on the structures and elements already available in the landscape.

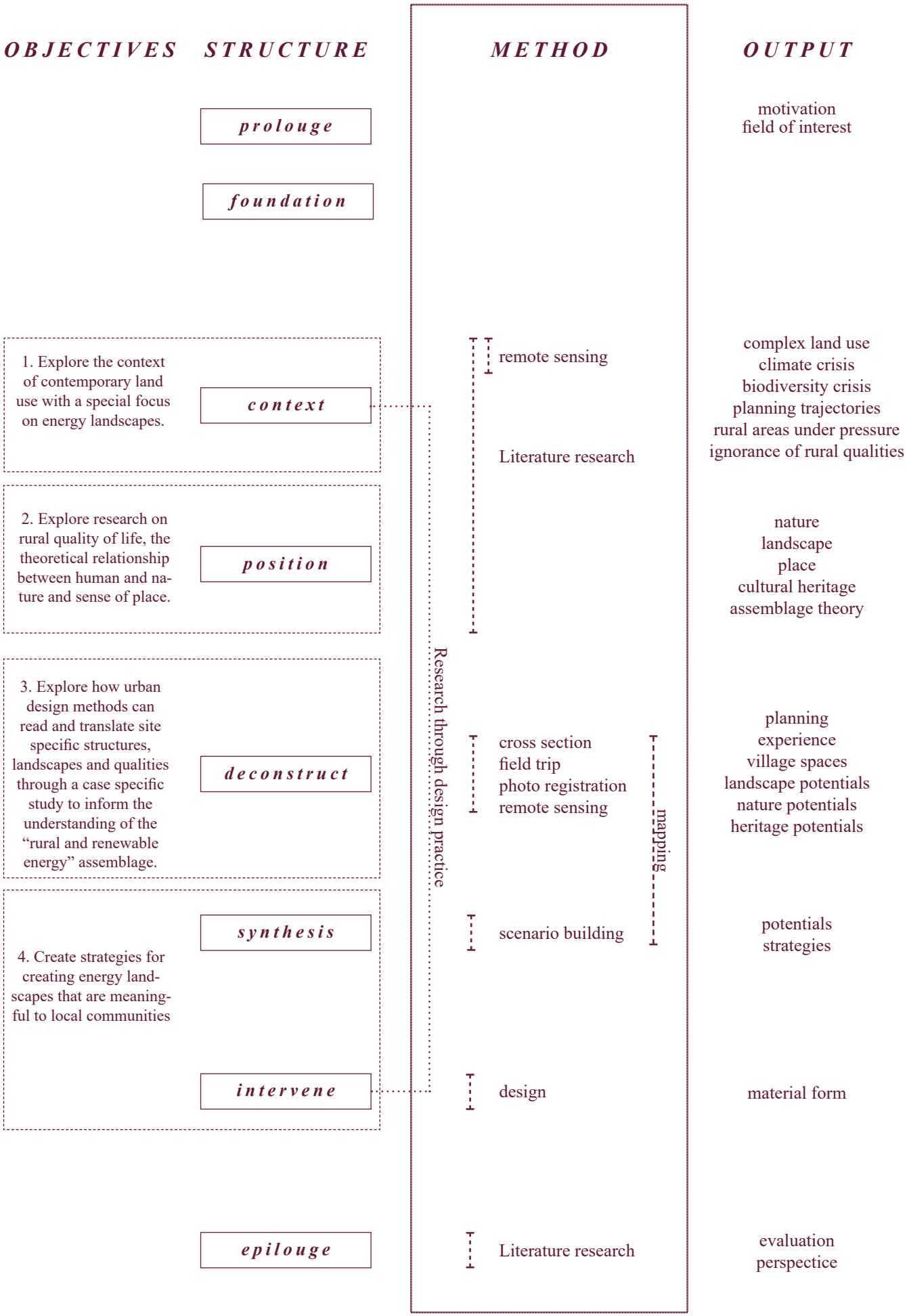
In this thesis the mappings have been based on two approaches – field research and remote sensing.

Field research

I have situated myself at site and in the surrounding area to sense the place. I have applied a phenomenological approach and have researched the experience of living in an area where new renewable energy facilities are put up. I have walked around in the villages, photo registered, talked to people informally and registered the places that hold importance. Furthermore, I've visited existing renewable energy facilities to experience them and the spaces that they create up close.

Remote sensing

I have gained knowledge about the site, the local communities and the municipality through GIS data. GIS data has given me the opportunity to extract, divide and isolate the structures of the project area, thus gaining knowledge about the prioritising in planning and the physical and structural characteristics of the site and area. Literature research has also been essential both in formulating the theoretical position and in researching the many levels of the context.



Ill. 4 Process and methodology organised

01 *Context*

In this chapter I explore the context of renewable energy landscapes to focus my thesis. To see which simultaneous process that are happening, and why the Danish land use situation is as it is. By doing so I try to broaden my perspectives on renewable energy planning, thus finding both synergies, potential and challenges.

Ill. 5 Tracks in the soil at Gestenge

A *brief* introduction to Danish *energy* history

The industrial revolutions meant that production became mechanised. The steam engine was the most important invention at the time, it produced energy locally and was powered by coal, thus marking the start of the utilisation of fossil fuels in energy production. During the second industrial revolution in the end of the 18th century energy transformed into a network between factories, workshops and private homes. This period also marked the introduction of first gas and then electricity to power lightning and industry – which in turn prompted the erection of first gas plants and then power stations. Gas and electricity slowly went from being a modern and exclusive commodity to being a necessity even in small towns – alternatively, progress and future possibilities would pass by. The end of World War II was significant – politicians attached importance to planning and rationalisation. The many restrictions during the war had showed that it was possible to regulate society for the benefit of the majority, and top-down planning was seen as a means to transform Denmark into a modern society that exploited the automation and mechanisation of both industry and agriculture to the fullest. Gas consumption was pressured on many fronts, and electricity became the modern energy choice – we became better at harnessing electricity more efficiently and high-voltage transmission networks were planned. In the 1950's and 60's energy stopped being a restricted commodity due to the import of cheap oil, which in turn was one of the defining conditions of the development of our welfare society. The cheap oil revolutionised the heating of the homes – oil burners became normal, and the central heating system was developed. In the 1970's 90% of the Danish energy consumption was based on oil, which was imported from the Middle East. By 1973 the electricity supply had gone through an extensive centralisation – 12 plants now produced 99,9% of the electricity – and energy had revolutionised both the industry that was in constant development and our private lives. (Rüdiger, 2011)

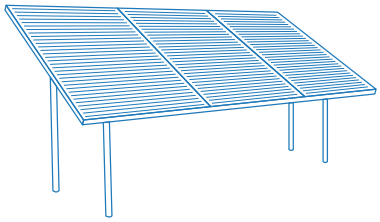
The oil supply crisis of the 1970's became a turning point in Danish energy consumption, production and legislation. The main theme in the 1970's was the security of supply – it was simply unsustainable to be dependent on only one source of energy – and in the 1980's climate and environment started headlining the agenda. (Rüdiger, 2011)

To make the Danish energy supply multi-pronged nuclear power and natural gas was discussed as options – nuclear power was outvoted but natural gas gained ground, and a natural gas network based on gas from the North Sea was established. (Rüdiger, 2011)

In the 1980's climate changes and environmental decline started affecting the Danish energy policy – instead of basing the energy production on fossil fuels, we had to look towards renewable energy production. Wind power became the spear head in Danish energy policy – the state supported the wind power industry financially and through legislation. Since then, the fossil energy network is slowly being replaced by the renewable energy network. (Rüdiger, 2011)

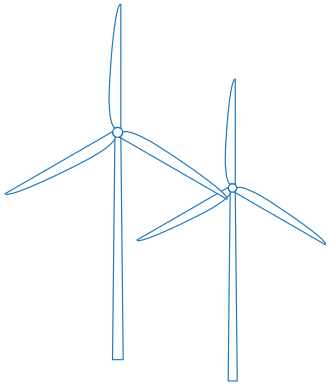
Contemporary energy landscapes

But… what is an energy landscape? In this thesis energy landscapes are defined as a production landscape – a landscape that is changed and/or defined by our need for energy and energy production now and in the future. There are many ways of producing energy. As illustrated above the Danish energy production was and to some extent still is based on fossil fuels. Placing the extraction of energy – coal, oil, gas etc. – outside our borders, which in turn has limited Danish energy landscapes to underground tubes, high voltage transmissions lines, a few offshore oil platforms and power plants. With the green transition comes wind turbines, solar panels and biogas facilities – all placed locally within our borders, thus making energy production more visible and tangible in our everyday life. Renewable energy is a collective name for bio energy, wind energy, solar energy, geothermal energy, and other technologies that instead of using fossil fuels utilize natural and renewable processes to create energy (Klima-, Energi- & Forsyningsministeriet, n.d.(a)). Hereafter the project will limit the scope of renewable energy types to wind power and solar power.



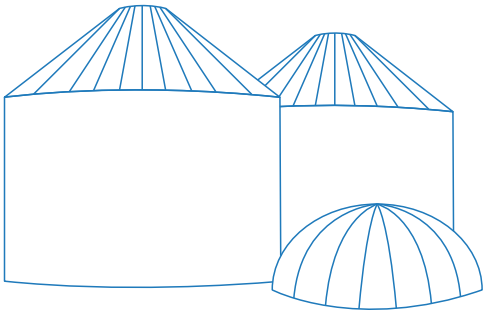
Solar energy

In Denmark solar power can be utilised in two ways – to produce energy through solar panels or to produce heating through sun catchers. In 2022 6,1% of the collected Danish energy production came from solar energy (Klima-, Energi- & Forsyningsministeriet, n.d.(a)).



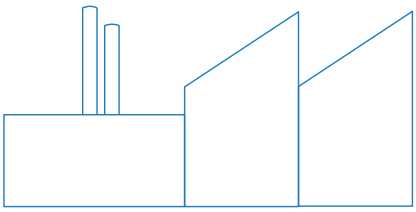
Wind energy

Wind energy is produced through wind turbines that can be placed both on land and offshore. Today, wind turbines have an average life span of 25 years, but often function for 30 years and more. More that 47% of the Danish energy production comes from wind turbines (Klima-, Energi- & Forsyningsministeriet, n.d.(a)). The wind turbines being erected today are 200-300 meters tall. Wind turbines need a distance equivalent to 4x its height to housing and 1,7x its height to big roads and railways (Naturstyrelsen, 2015).



Bio energy

Bioenergy is the power stored in organic material. Some biomass is plant based such as hay, wood and alga, while other biomass is animal, such as manure and fat. The production of biogas takes place at specialised facilities, where the biomass is heated to extract biogas, which in turn is used to produce heat and electricity. The biogas industry is growing and in 2021 the percentage of biogas in the collected Danish gas consumption reached 22%. (Klima-, Energi- & Forsyningsministeriet, n.d.(a))



Geothermal energy

In a Danish context geothermal energy is found in our unground as hot saline water, which is pumped up and utilised in district heating. Today, there is only few geothermal facilities in Denmark. (Klima-, Energi- & Forsyningsministeriet, n.d.(a))

Ill. 6 Different kinds of green energy

Energy landscapes in a *political* context

A legally binding climate law with legally binding climate goals across different sectors adopted by all member of the European Union in 2019-2021. The aim of the European Green Deal is to reach climate neutrality by 2050 for all 27 members, and for all members to reduce their emission with at least 55% by 2030 compared to the levels in 1990. (The European Climate Law, 2021)

The European Green Deal
2019-2021

The Paris Agreement
2015

A legally binding international treaty on climate change adopted by 196 parties, including Denmark, at the UN Climate Change Conference in Paris in 2015.

The aim of the Paris Agreement is to hold the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursue efforts to limit the temperature increase to 1,5 degrees Celsius above pre-industrial levels. (The Paris Agreement, 2015)

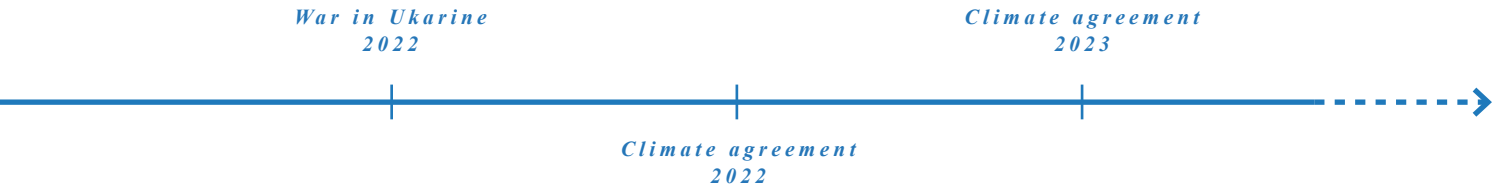
The Danish Climate Law
2020

A national binding climate law to hold Denmark to their international responsibilities. The aim of the Danish climate law is to reduce the emission of greenhouse gasses with 50-54% in 2025 compared to the levels in 1990, to reduce the emission of greenhouse gasses with 70% in 2030 compared to the levels in 1990, to be climate neutral by 2050, and to be proactive in limiting the global rise in temperature to 1,5 degrees Celsius. (Klimaloven, 2021)

“Med klimaforandringerne of krigen i Ukraine har vi mere end nogensinde brug for, at strømmen bliver grøn, så vi kan vende ryggen til sort energi.” (Klimaaftale, 2023)

The climate crisis and the political agreements to limit it aren’t the only reason for the rapid expansion of the Danish reneawable energy production. Geopolitics, the war in Ukraine and the energy crisis in 2021 also pushed the agenda..

In 2023 the agreement was supplemented by an agreement on more green energy from land-based sun and wind. The 2023 agreement prepares the ground for the state playing an active role in the planning of big energy parks and holds general actions that will support the expansion of renewable energy production on land, such as expedited processes regarding the impact on nature and environment. Lastly, the agreement holds decisions on increased financial compensations for neighbours to land-based energy facilities. (Klimaaftale, 2023)



In 2022 the Danish parliament approved a climate agreement regarding green energy and heating. The ambition of the agreement was to procure at least 4GW additional offshore energy by 2030 at the latest and to increase the collected energy production from solar and land-based wind power fourfold towards 2030. The significant expansion of the renewable energy network will cover the direct Danish energy consumption, deliver renewable energy for the production of green fuel through power-to-x, be exported to the rest of Europe and secure the independence of Russian energy reserves. (Klimaaftale, 2022)

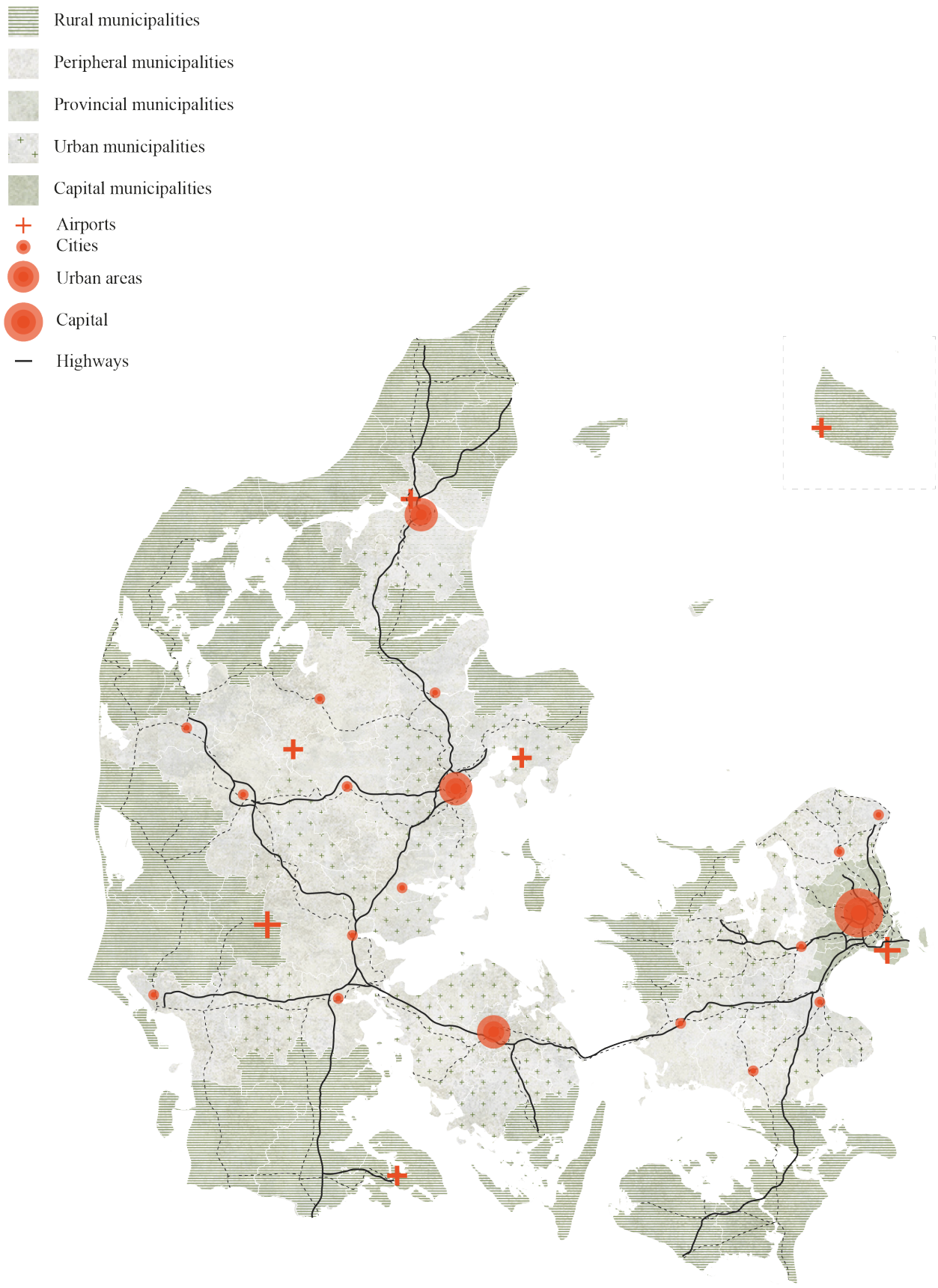
The *Danish* context

The Danish area is approximately 43.000 square kilometres, which is divided into five regions and 98 municipalities. Denmark is a fairly small country area wise compared to the neighbouring countries such as Germany, Sweden and Norway – the Danish area only amounts to 9,5-12% of the areas of said countries. Despite its small area, the Danish coastline amounts to 7.300 kilometres. Denmark lies between two big bodies of water – the North Sea and the Baltic – and is characterised by a large number of islands, 391 to be exact, of which most are situated in the Baltic. (Danmarks Statistik, n.d.)

The Danish population amounts to 5.982.117 people as of September 2024. According to the newest population projection the population will expectedly surpass 6 million by 2028. Since 1901 the Danish population has increased with 145%. (Danmarks Statistik, n.d.) If you compare the area of Denmark to the current population, each person has an area equivalent to 7.200 square kilometres.

Denmark has 1380 urban areas. In a Danish context the concept of urban areas must be understood in the broadest terms, since only one city exceeds one million inhabitants, Copenhagen, and only three cities exceed 100.000 inhabitants, Aarhus, Odense and Aalborg. The increase and decrease in cities and rural areas in Denmark follow the global trend of urbanisation – people migrate from rural areas to urban areas. (Danmarks Statistik, n.d.)

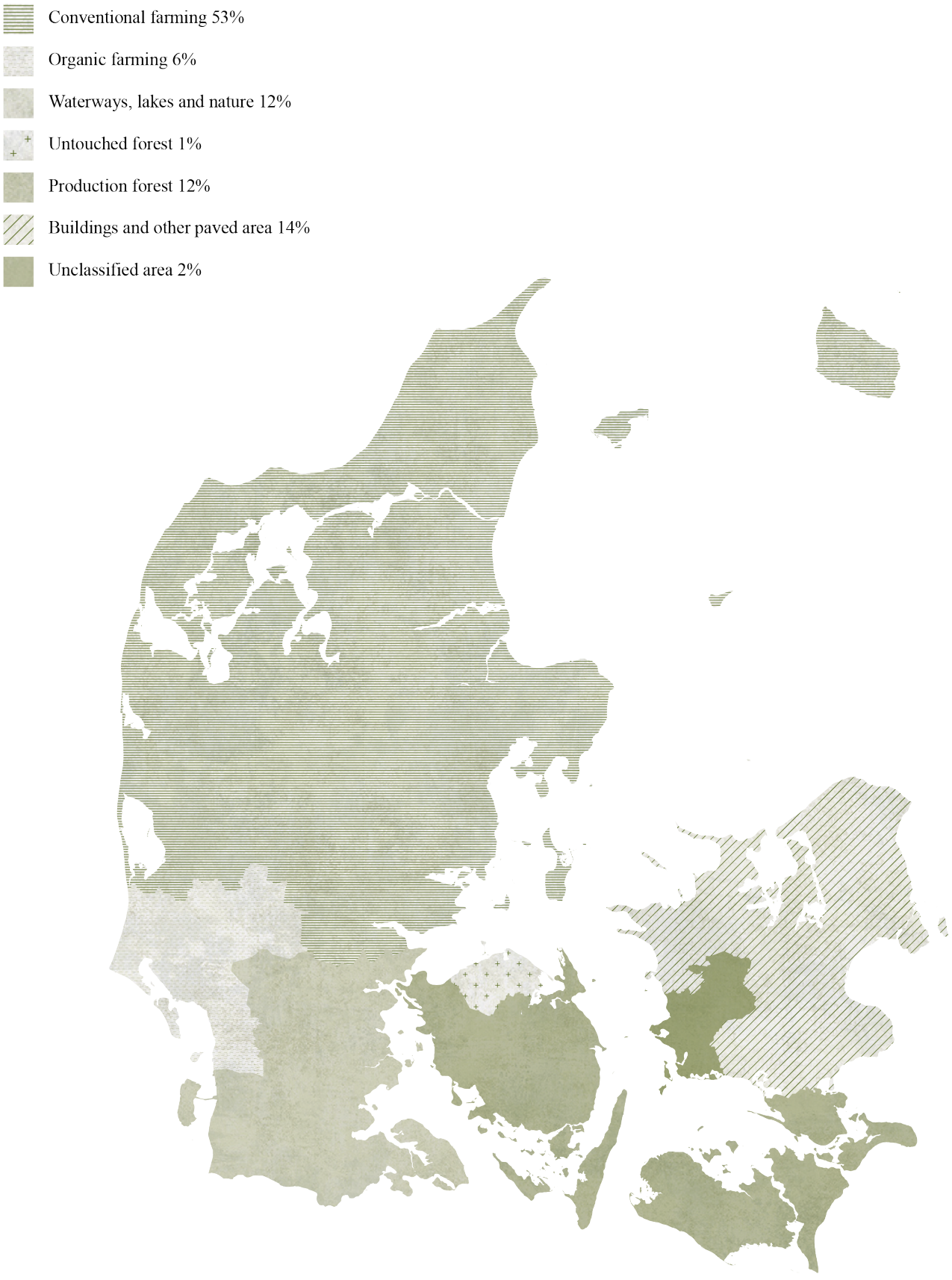
The Danish municipalities can be divided into five groups depending on accessibility to jobs and the number of inhabitants in the largest city of the municipality (Danmarks Statistik, n.d.). When mapping out the five groups you see a clear division between east and west Denmark – the western municipalities are mostly categorised as rural or peripheral, whereas the municipalities towards East are either categorised as provincial, urban or capital municipalities, with exceptions off course. This tendency is only emphasised if you map out the national infrastructure – Denmark is mainly connected with highways from north to south, over Fyn and last Sjælland, with only two connections towards west. A simple mapping like this indicates a national planning that favour cities over rural areas and east Denmark over west Denmark.



Ill. 7 Danish infrastructure and municipality structure

Contemporary *l a n d u s e* . . . and why something has to change

The Danish area can be divided into seven land uses – conventional agriculture, ecological agriculture, production forest, untouched forest, nature, lakes and waterways, buildings and other impermeable areas and non-classified areas. When you look at the distribution of the area you see that cultivated land (agriculture and production forest) cover 71% of Denmark, and nature (untouched forest, nature, lakes and waterways) only amount to 13% of the total area. Denmark is in fact one of the European countries with least forest per citizen and least protected nature. Simultaneously, Denmark is the country with most cultivated area in Europa – by far. Denmark is rich on areas with a high cultivation value, which of course explains the land use distribution. But the intensive and effective cultivation doesn't stand alone, Denmark also takes first place regarding the production of meat and third place regarding production of milk – both per citizen – in the world. In Denmark 59% of the land is used for intensive agricultural production – the average in Europe is 25%. Intensive agricultural production entail frequent treatment of the soil through ploughing and harrowing. Denmark has one of the largest emissions of greenhouse gases related to land use – the Danish emission is more three times larger than the average in the European Union. (Klimarådet, 2024) The current land use in Denmark tells the story of a traditional agricultural nation, where land reclamation for agriculture and settlements has been put before nature, environment and climate. In the following I will look into how our current land use affect the climate, biodiversity and marine environment.



Ill. 8 Contemporary Danish land use - numbers based om Klimarådet (2024)

Climate

Ill. 9 Danish agricultural tradition

The Danish land use is characterised by being highly efficient within both agriculture and forestry. Disregarding animal production the emissions related to cultivation of land constitute around 11% of the collected Danish emissions. The emission of greenhouse gases related to the cultivation of land comes from fertiliser and the soil itself – fertiliser releases nitrous oxide and the soil releases carbon dioxide that previously has been stored in the now reclaimed land. Trees captures carbon dioxide and stores it in the roots, trunk and branches, thus making forests carbon pools.

Denmark needs to decrease the national emission of greenhouse gases due to the commitment to both the Paris Agreement and the European Climate Law, as well as the Danish Climate Law. Natural carbon sequestration in e.g. forests is shown to be the cheapest and most effective way of binding atmospheric carbon. The restoration of carbon-rich lowlands that are or previously were wet nature such as meadows and moors is also a quick fix – if we stop cultivating them, cut the drains and reflood them – the carbon that is stored in the soil will stay in the soil, thus reducing the emission of carbon dioxide into the atmosphere.

To decrease the emission of carbon dioxide land must be reorganised from cultivated land to wet nature areas, and to increase the sequestration of carbon dioxide cultivated land must be reorganised into forest. (Klimaråd-det, 2024)

The marine environment

Ill. 10 Local angler at Stauning Havn

The biodiversity in the marine environment is in decline. The Danish marine environment is characterized by deoxygenation, reduced areas with eelgrass, large amount of alga near the coast and a generally reduced fauna on the seabed. (Klimarådet, 2024)

The deoxygenation happens when the oxygen consumption is bigger than the oxygen supply. The deoxygenation of the Danish waters has increased in frequency, extension, duration and intensity during the last 100 years due to eutrophication and climate changes. Eutrophication is the addition of nitrogen and organic matter, which lead to an increased production of phytoplankton, that sink and degrades. This process makes the oxygen consumption rise, and deoxygenation of the water happens. Climate changes enhance the effect of eutrophication since rising temperatures stimulate deoxygenation – rising temperatures result in hotter water, and hot water hold less oxygen and increases the oxygen consumption. Long periods of deoxygenation of the bilge-water can kill benthic animals and plants. Additionally, the deoxygenation influences the chemical and biological processes of the seabed such as the seabed's ability to withhold nitrogen and hydrogen sulfide, which in turn can kill benthic animals and fish. (Hansen & Rytter, 2024)

The Danish emission of nitrogen must be reduced by 13.000 ton by 2027 at the latest to strengthen the ecological condition of the marine environment. The goal follows from the European Union's Water Framework Directive that became effective in 2000 and instructed all members to ensure good ecological and chemical conditions in their saline water, freshwater and ground water resources. The original deadline was in 2015, but Denmark got an extension and must be able to reach the goal in 2027. (Klimarådet, 2024) To secure the condition of the marine environment the emission of nitrogen must be limited drastically, which will be supplemented by catch crops, fallow fields, energy crops, precision farming and collective nitrogen measures such as nitrogen wetland, mini wetlands, private forestation and lowland projects. Measures that either require an alternated way of farming or land.

Biodiversity

The biodiversity in Denmark is in decline, and studies repeatedly show that the negative development doesn't turn. Half of our land-based nature is in continued decline and 17% of Danish species are under threat of extinction. In fact, Denmark takes last place together with Belgium in the European Union regarding the condition of our nature – only 5% of the land-based nature types are in good ecological condition, and in a screening of the amount of protected nature across the members of the European Union Denmark came last. (Klimarådet, 2024) The overshadowing cause of the continuous biodiversity crisis is that we don't reserve areas for efficiently protected wild nature. The Danish Nature Protection Law's paragraph 3 lists lakes, moors, meadows, open grassing land, heaths, beach meadows and waterways as protected nature types. Meadows, heaths, beach meadows and moors are however still eligible for agricultural purpose and are seldom treated in a way that restore or allow natural processes, that in turn would benefit the biodiversity. Forests aren't protected by the Nature Protection Act, the most notable protection of the Danish forest environment is the appointment of so-called untouched forest, which only constitute 1% of the Danish area. Untouched forests are protected against forestry, but the restoration of natural processes and the exemption from recreational use and hunting aren't ensured. Terrestrial lakes and waterways are still heavily influenced by the agricultural modification of the hydrological cycle, and in many cases, they act as drainage canals in practise. Lastly, our terrestrial and marine ecosystems are negatively affected by the eutrophication with nitrogen from the atmosphere and nitrogen and phosphor that leach out from the cultivated fields. (Erjnæs et al., 2021)

Denmark has committed to international agreements on biodiversity – both under the auspices of the United Nations and the European Union. Both agreements entail an extensive restoration of our nature areas by 2030, as well as the protection of 30% of the area, both terrestrial and aquatic, by 2030. In 2023 Denmark registered that 15% of the Danish area is protected in its current state. (Klimarådet, 2024) However, the Danish biodiversity council has estimated that only 1,6% of the Danish land, including waterways and lakes, and 1,9% of the Danish marine area qualify as protected areas in their current state (Biodiversitetsrådet, 2023).
But how do we reach the goals for biodiversity that we have committed to?

Petersen et al. (2024) aim to investigate whether and where we can create big and connected nature areas (500 acres or bigger), that representatively and complementary protect the majority of the terrestrial and fresh biodiversity in Denmark. The analysis identifies 239 areas big (>500 acres) and continuous areas that are equivalent to 20% of the Danish area. Out of the 239 areas Petersen et al. (2024) prioritise 141 areas that include at least three populations of 96% of the analysied species from both terrestrial and fresh ecosystems. Eight additional areas are identified as good alternatives to the 141 areas. Lastly, the analysis identifies 80 places in the country where smaller nature areas can cover the remaining 104 rare and endangered species. (Petersen et al., 2024)

Ejrnæs et al. (2022) creates two scenarios based on different principles for the reorganization of areas into nature. The two scenarios overlap by 96%. The first scenario is based on a collected bioscore for the realized and potential biodiversity value across Denmark. The second scenario is based on areas that already are protected under §3 in the Nature Protection Act, Natura 2000 and areas that are defined as untouched forest or biodiversity forest. If it is possible to create big and connected areas of nature the areas are supplemented by either carbon-rich lowlands, public areas, the most important nature areas, and areas for better round off. Ejrnæs et al. (2022) focuses on the second scenario. (Ejrnæs et al., 2022)

The two analysis have big areas in common Ejrnæs et al. (2022) have identified 78% of the same areas as Petersen et al. (2024). The Danish Biodiversity Council has also conducted an analysis, and their resulting areas overlap with 79% when compared to Petersen et al. (2024). The overlapping results have made the Biodiversity Council conclude that there is an agreement across the professions dealing with biodiversity on how to increase the biodiversity in Denmark and which areas should be restored so they can count as protected nature. Beyond the 20% of the Danish area identified by Petersen et al. (2024), Ejrnæs et al. (2022) and the Biodiversity Council collectively identify 9,8% of Denmark's area – leaving the collected area at 29,8% of Denmark. (Biodiversitetsrådet, 2024)

Ill. 11 Mapping of a 30% protected nature scenario based on Petersen et al. (2024)

Ill. 12 Mapping of a 30% protected nature scenario based on Ejrnæs et al. (2022)

Renewable energy

The Danish energy sector needs to accelerate and be restructured to support the green transition and contribute to the goals set in the Danish Climate Law. Additionally, the war against Ukraine, the sanctions against Russia and the energy crisis that followed highlighted the importance of becoming independent of Russian gas – we need to reduce our gas consumption, increase the green gas production and develop the renewable energy sector. (Statsministeriet, 2022)

Compared to 1990 the Danish gross energy consumption has decreased with 15,1%. In 2023 the carbon dioxide emission related to our gross energy consumption amounted to 25,8 million ton – compared to 2022 the number decreased with 2,1 million ton and compared to 1990 the emission decreased with 51,4%. The production of power based on renewable energy accounted for 82,1% of the domestic power supply – wind energy contributed with 53,8%, biomass with 16,4%, solar energy with 9,3% and biogas with 2,5%. The Danish production of petroleum and natural gas decreased with 8,3% and 8,4% compared to 2022, whereas the production of renewable energy increased with 5,3% and constitute over half the collected domestic energy production. Lastly the degree of self-sufficiency – the portion of over energy consumption that we produce domestically across all energy forms – was 59% in 2023 compared to 60% in 2022. (Energistyrelsen, 2024)

The Danish ambition is to increase their output from offshore wind with 1-4GW extra by the end of 2030 and increase the collected output from solar power and land-based wind power fourfold towards 2030 (Statsministeriet, 2022). The increased renewable energy production is set to support our current gross energy consumption but should also hold the capacity of powering the production of green fuel – an industry often mentioned as power to X – the transition from fossil fuels to green fuel, such as hydrogen, is equally as important as the mere production of renewable energy to push the green transition.

But how will the land-based expansion of the Danish renewable energy portfolio influence the collected land use? Referencing an example from 2021 the ambition could be realised by increasing the capacity of solar energy tenfold – from 2GW to 20GW – and almost double the capacity of land-based wind energy from 4,7GW to 8,2GW ultimo 2030. This scenario would in turn entail that Denmark would produce energy equivalent to 27TWh through solar power and 23TWh through wind power in 2030. However, both solar panels and wind turbines take up space – in 2021 solar panels and wind turbines respectively took up 1600 acres and 18.400 acres equivalent to 0,1% and 1,2% of the total Danish area. Sticking to the scenario above solar panels will take up 24.500 acres and wind turbines will take up 32.100 acres equivalent to 0,9 and 1,2% of the total area. Thus, increasing the land requirements for renewable energy with 36.600 acres in total. (Klima-, Energi- & Forsyningsministeriet, n.d.(b))

In conclusion

Ill. 13 Collage interpretating the complexity of future land use

I think it is safe to say that the demand of the Danish land is many – the climate crisis demand more renewable energy, the biodiversity needs more untouched forest and thriving light open landscapes, the marine environment will despair if the agricultural production don't restructure and become more restricted. Meanwhile, the population is growing, which in turn increases the national and global need for food, housing and infrastructure. I repeat – the demands are many, but all of Denmark's area is already in use, and the country doesn't become bigger, if anything it becomes smaller due to climate changes. In a research project Arler, Jørgensen & Sørensen (2017) calculated how much space we need if all the plans and goals for Danish land use at that time were put together with predictions about future development and the wishes for improvement of our nature and landscape and their recreational potentials, the total area needed where equal to 140% of Denmark's total area. It seems like a puzzle that is impossible to put together, still it is a conundrum that we must resolve to do our planet, natural environment and future generations justice.

Energy landscapes in a *political* context 2.0

The European Biodiversity Strategy is a legally binding agreement that require all members of the European Union to legally protect a minimum of 30% of the land area and 30% of the marine area and integrate ecological corridors, to strictly protect at least a third of the protected areas, and effectively manage all protected areas, defining clear conservation objectives and measure and monitoring them appropriately. (The European Commission, 2020)

The European Biodiversity Strategy 2019

The European Water Framework Directive 2000

The Water Framework Directive is an agreement that legally binds the members to protect, and where necessary, restore water bodies in order to reach good status and to prevent deterioration of Europe's rivers, lakes and groundwater. Denmark has been granted an extension to reach the goal, and must thus fulfil their commitment by 2027. (The European Parliament and the Council of the European Union, 2000)

An agreement between the Danish government, Landbrug og Fødevarer, Danmarks Naturfredningsforening, Fødevareforbundet NNF, Dansk Metal, Dansk Industri and Kommunernes Landsforening, approved on by a broad majority of the Danish Parliament in 2024. With the agreement 43 milliard Danish crowns is allocated for a thorough restructuring of the Danish landscape. With the agreement the parties strive to plant 250.000 acres of new forest, and reorganising 140.000 acres cultivated lowlands into wet nature. Apart from rearranging the current land use the agreement will improve the marine environment, reduce the negative climate impact and strengthen the biodiversity and protection of our drinking water. (Ministeriet for Grøn Trepart, 2024)

Den Grønne Trepart 2024

The Convention on Biological Diversity 2022

A legally binding international framework adopted by 196 parties, including Denmark, at the UN Biodiversity Conference in Montreal in 2022. The framework holds four goals for 2050 and 23 targets to be achieved by 2030. Among other objectives the framework aims to maintain, enhance or restore the integrity, connectivity and resilience of all ecosystems, substantially increasing the area of natural ecosystems, halt human induced extinction of threatened species, and maintain the genetic diversity within populations of wild and domesticated species and safeguard their adaptive potential – all by 2050. (The UN Convention on Biological Diversity, 2022)

P l a c i n g wind turbines and solar power facilities

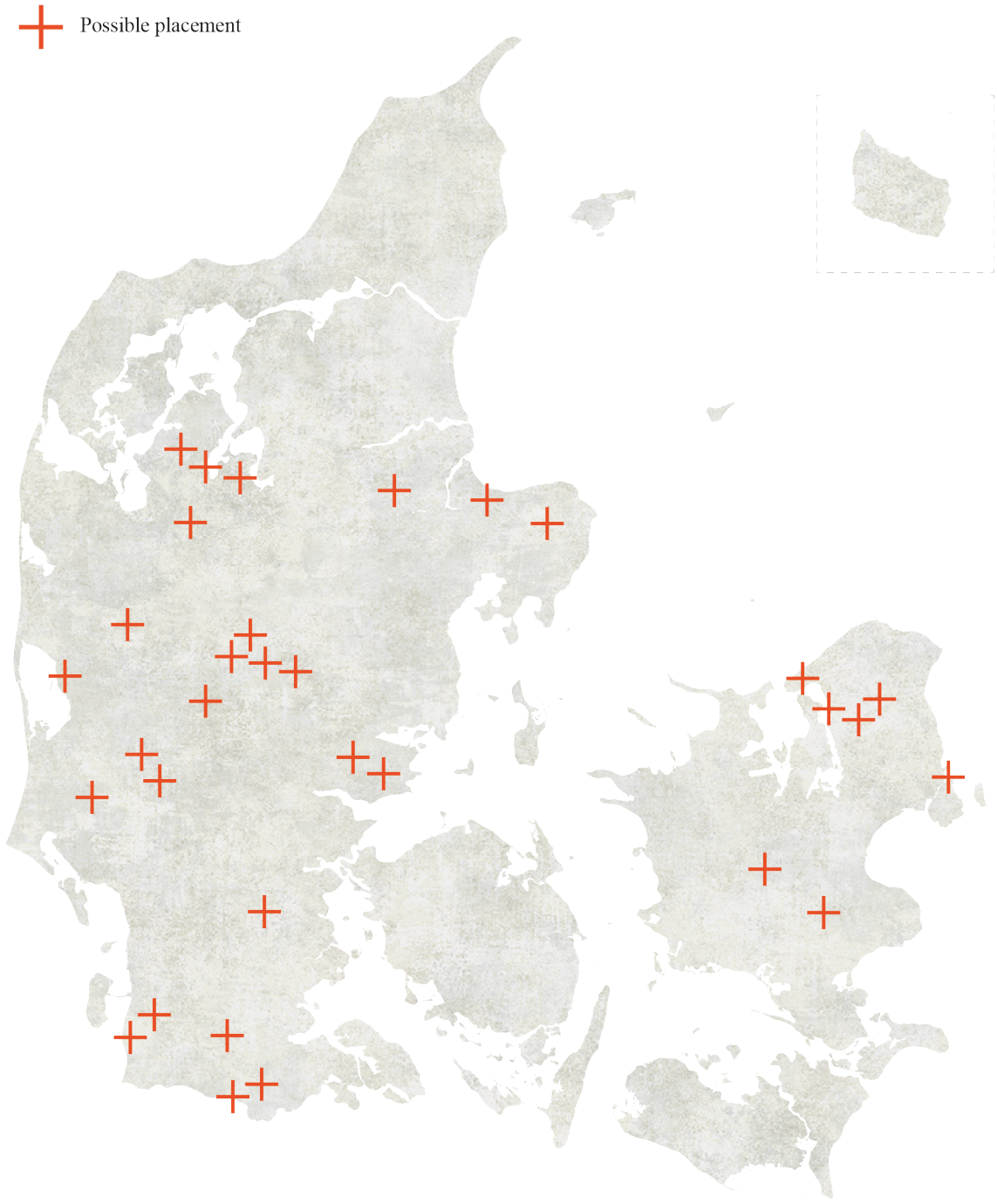
The planning of renewable energy projects mainly happens within the municipalities and is regulated by the Danish Planning Act and supplementary acts regarding renewable energy facilities and the specific renewable energy technology.

Landscapes are stated as a national interest in municipality planning. To preserve and develop characteristic landscape values the open land must be kept free of buildings and technical facilities that aren't vital to society. It is the responsibility of each municipality to balance and appoint the local landscape that are worth preserving due to their characteristic. The municipalities are encouraged to use Landskabskaraktermetoden (hereafter LKM) to analyse the landscape and map out the characteristic landscape worth experiencing. The LKM holds three criteria to assess the quality of a given landscape – the nature (terrain, soil, nature types etc.), the culture (buildings, forest, agriculture etc. and lastly the spatial and visual appearance. The municipality is divided into sections that are evaluate based on the strength of the landscape (how distinct are the characteristic part of the landscape?), the visual experience (are there any views, particular architecture. Culture historic patterns or a historic mark?), the condition (how intact and undisturbed are the landscape?) and the vulnerability (how sensitive is the landscape to changes?). (Styrelsen for Grøn Arealomlægning og Vandmiljø, n.d.)

To safeguard our valuable landscapes the Planning Act emphasises three considerations – the protection of characteristic landscapes, the protection of big and interconnected landscapes, and a more general sensibility to landscapes in the light of urban developments and technical facilities. It is the municipality that asses which landscapes are vulnerable or has the capacity to hold renewable energy facilities. However, the municipalities are still limited by national regulations on land use, protection and preservation. (Bolig- of Planstyrelsen, 2022)

With the climate agreement 2023 it became possible to disregard certain national rules regarding nature, environment and areas with cultural and historical importance to museums if it can bring big and coherent areas into play, that would otherwise be disregarded for renewable energy projects because of preservation and protection demands. The regulations that are relaxed revolves around nature conservation areas, forest reserves, lake and waterway protection lines, forest protection lines, the protection of ancient monuments, church protection lines and regulations on stone and earth dikes. (Klimaaftale, 2023)

Major energy parks

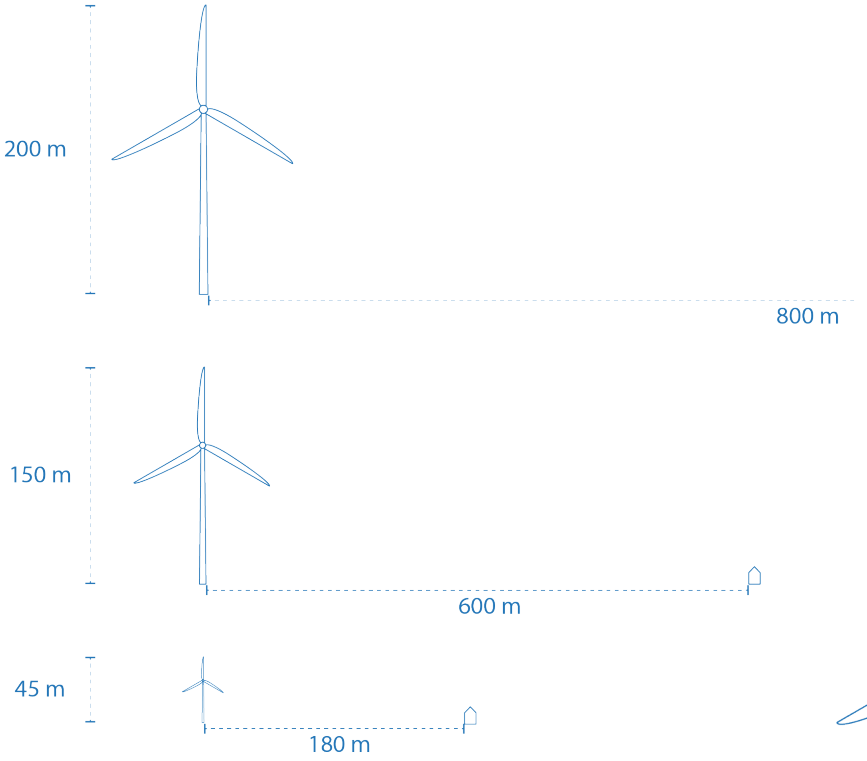


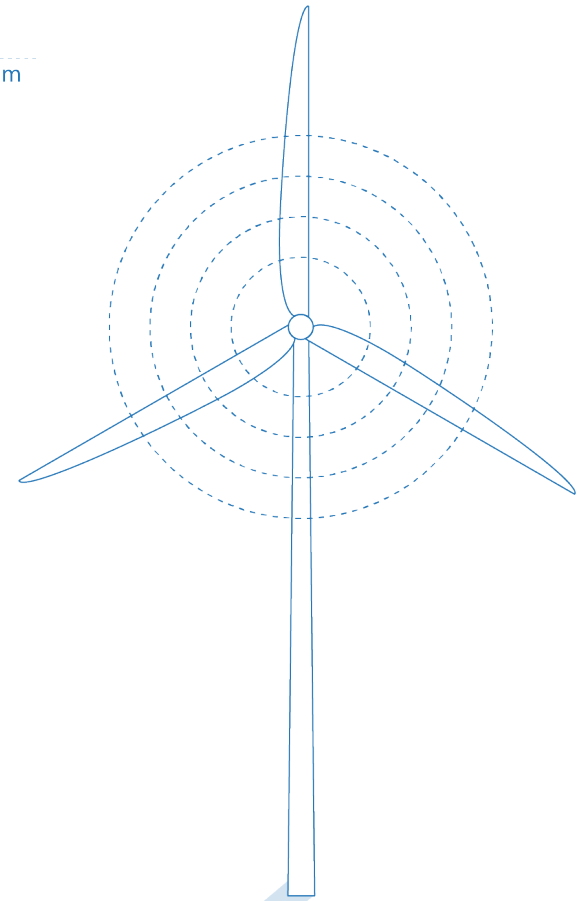
With their two climate agreements on renewable energy in 2022 and 2023 the state paved the way for increasing the amount of renewable energy produced on land via wind turbines and solar panels, for scaling up the energy parks and for the state themselves to play an active role in the planning of renewable energy facilities

In 2023 the state completed a screening of possible areas for major energy parks based on reports from the municipalities and the renewable energy industry. 32 areas where identified located in 19 different municipalities and range between 170-1011 acres. The state, the municipalities and the renewable energy industry have entered into dialogue to assess the eligibility of the areas, and whether the municipalities can handle the planning on their own. The government promises quick and straightforward authorities processing regarding nature and environment, as well as consultancy, if the municipalities go through with the major energy projects. (Klima-, Energi- og Forsyningsministeriet, 2023)

Ill. 14 Proposed placement of major energy parks

Special considerations when placing wind turbines





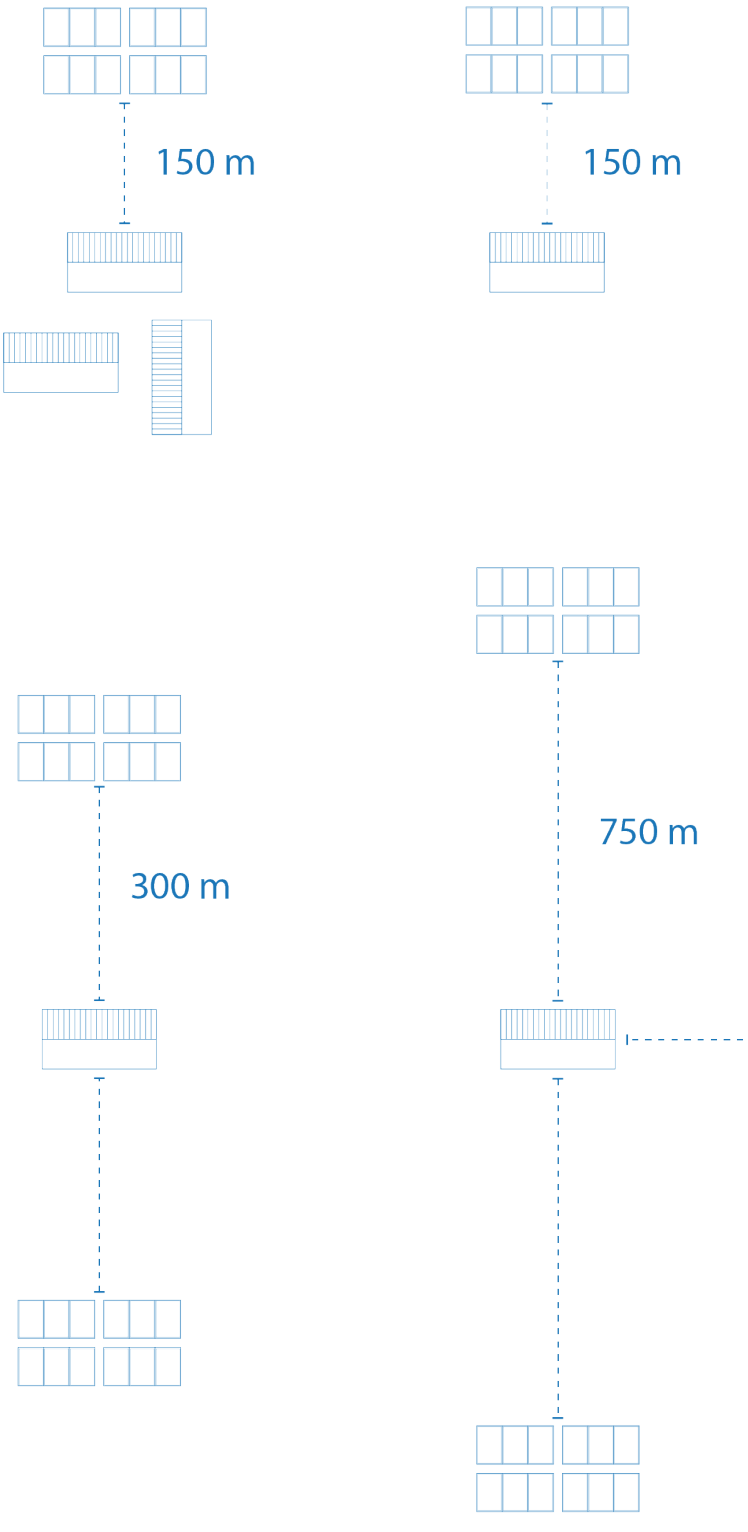
Wind turbines that are collected in groups must be placed in a geometric pattern that is easy to perceive in the specific landscape context and are usually placed with a mutual distance equivalent to 3-5 times the rotor diameter.

Wind turbines must not be placed in the vicinity to households, where the distance between household and wind turbine is closer than four times the total height of the wind turbine. Households within the demanded distance to neighbours to potential areas for wind turbines can be either voluntarily purchased or expropriated whereupon the homes registered on the land can be abolished.

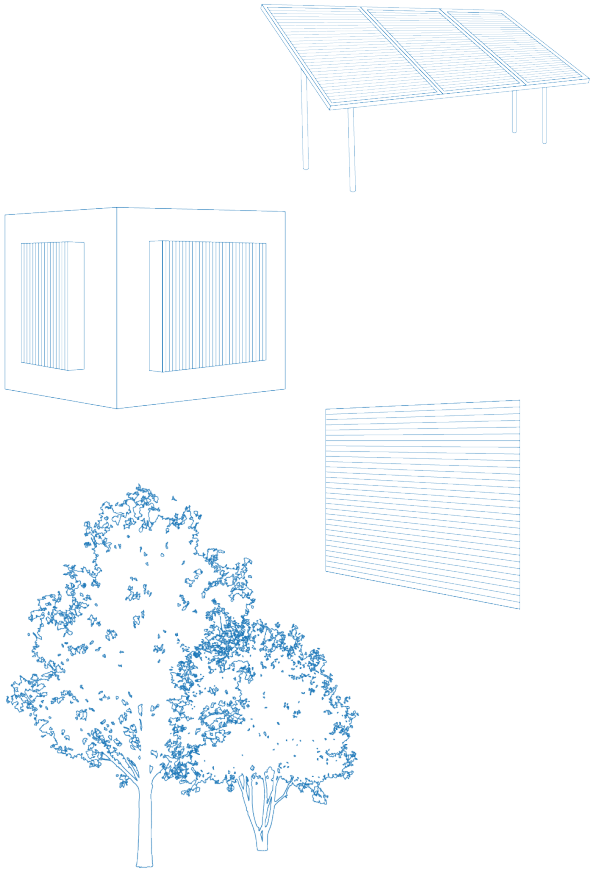
Wind turbines should as far as possible not throw shadow over neighbouring household for more than 10 hours each year. There are rules regarding noise emitted from wind turbines – for concrete wind turbine projects the calculated noise pollution acts as a significant condition for the possible placement of wind turbines.

Ill. 15 Consideretions when placing wind turbines

Special considerations when placing solar power facilities



Ill. 16 Consideration when placing solar panels



Ill. 17 Elements of a solar power facility

The municipality plan ought to secure that the minimal distance between a solar power project and a village, vacation housing area or an area with allotments is 150m. For solitaire buildings approved for living the consideration distance is a bit more complex. If the solar power project only one side of the house, the minimum consideration distance should be 150m, if the erection of solar panels is planned on two side of the building the consideration distance should be 300m, and lastly if solar panels are planned on three or more sides of the building the consideration distance between the building and the project side should be 750m. The demands regarding the consideration distance can be overlooked if the owner has understood and accepted the deviation or if the household is purchased in preparation for demolition.

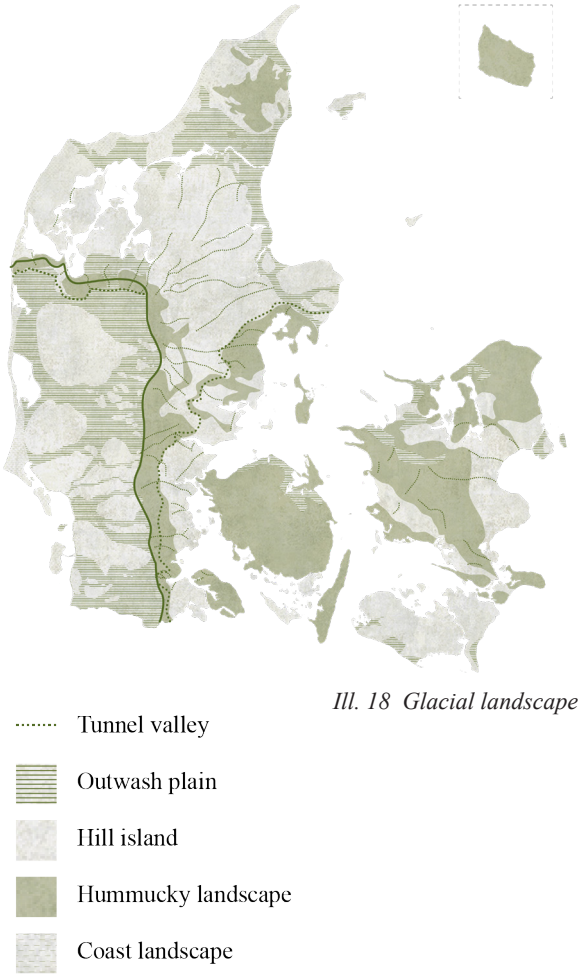
As a paramount principle shielding vegetation should be planted if a solar power project lies in the vicinity of housing.

Sol over land

Where wind turbines have been an if not loved then more or less stable element in the Danish landscape the last 30 years or more, renewable energy projects based on solar power is a more foreign in a Danish context. Solar energy has become a crucial element in the green transition due to the climate agreements in 2022 and 2023. At best solar power facilities fit into the greater context, contributing with a crucial renewable energy production. At worst, solar power facilities end up being land-occupying technical facilities that damage natural, experiential, and recreational resources. Furthermore, solar power demand a large capacity in the power network – the expansion of the solar power industry entails an expansion of the energy infrastructure.

In October this year Urland, a consultancy firm specializing in the planning of energy landscapes and rural district planning, and Plan 22+, project initiated by Plan- og Landdistriktsstyrelsen and Realdania to support the municipalities' work regarding climate changes and adaption, released the report Sol over Land (2024), that functions as a guide for planning solar power facilities from a landscape perspective – the report is meant as an guide, not an official instruction. Urland bases their recommendations on the diverse Danish landscape types formed by the several glacial periods. They argue that we have plenty of space for solar power facilities, we just need to develop a sensitivity towards the way solar panels – their form and aesthetic and the size of the facility – fit into specific landscapes. (Plan22+, 2024)

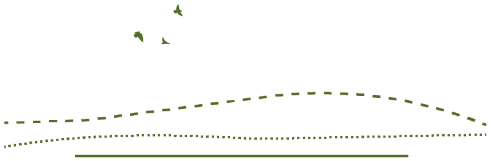
Solar power panels aren't tall – the tallest variants reach 3-5 meters – they do however take up a big area. A technical structure like that can disappear out of sight when you watch it at a distance. If instead, you stand in the midst of it, it can be experienced as a technical monster completely ignorant to the human scale. The size of a solar power facility is significant to the experience of it – and the projects that are being planned these years are big – just look at the major energy parks proposed by the state. Facilities the reach a size between 50-100 acres starts influencing the local community and environment, and facilities between 200-250 acres or more have the potential of changing landscape and nature locally drastically. According to Urland, there are parts of the Danish landscape that can hold very large solar power projects without extensive consequences to the experience of the landscape – with sensitivity towards the landscape characteristics, nature (amount and condition) and the population density it is possible to find places well suited for solar power facilities. (Plan22+, 2024)



Ill. 18 Glacial landscape

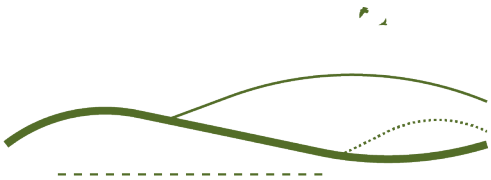
Plain landscape

Outwash landscapes with their plains and valleys lie end to end with lateral moraine landscapes. The plains have a slight tilting terrain towards the coast and the sea. The landscape was shaped during the last glacial period where the ice cap didn't cover all of Denmark – when the temperatures rose the melt water deposited sand and gravel over the landscape, leaving it flat and open. You most often find the landscape in Mid, West, North and South-West Jutland and on Lolland. The areas are often sparsely populated. Urland characterises the landscape as big and robust, with the capacity for technical facilities in sizes up to 500-750 acres. (Plan22+, 2024)



Rolling moraine landscape

The rolling moraine landscape consist of clay, sand, gravel and stone that was pushed and left by the ice cap during the glacial period. The terrain runs in smooth and big hills and valleys and is oriented in various directions. It is the most common landscape in East and Central Jutland, Himmerland and big parts of Seeland and Lolland-Falster. Where the scale of the landscape is big with large and smooth hillsides, and where there are few nature, urban and recreational potentials, Urland estimates that the landscape has the capacity to hold medium sized facilities ranging between 200-250 acres. (Plan22+, 2024)

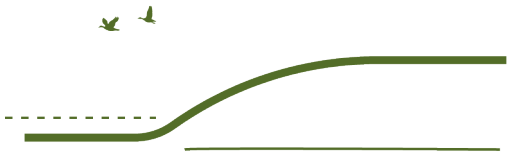


Hummocky moraine landscape

Hummocky landscapes are created under a static glacier. When the glacier melts the material, it holds be deposited at random creating a stagnant ice landscape, characterised by numerous small hills, small ravines, depressions, lake bottoms and out-wash valleys. The landscape is primarily found in parts of East Jutland, Seeland, Funen and many of the small Danish islands. The landscape has a small scale and a hilly terrain that makes it vulnerable to solar power facilities. Urland advises that facilities placed in this landscape type should be small (50-75 acres), and they should be placed where the visual consequences are limited, thus only influencing the experience of the surrounding landscape less. (Plan22+, 2024)

Valley landscape

Valleys are well-defined, oblong depressions in the landscape – they vary in both dimension and origin. Most of the valleys were created during the glacial period, where the moving ice formed the existing low-lying areas into smooth U-shaped profiles. Some valleys were created as deep rain and outwash ravines eroded by fast moving water. The valley landscapes are vulnerable to changes such as the erection of a solar power facility, since the landscape holds views that holds special value. If a facility can't be avoided, it must be placed with great sensitivity towards view, landscape and nature. (Plan22+, 2024)

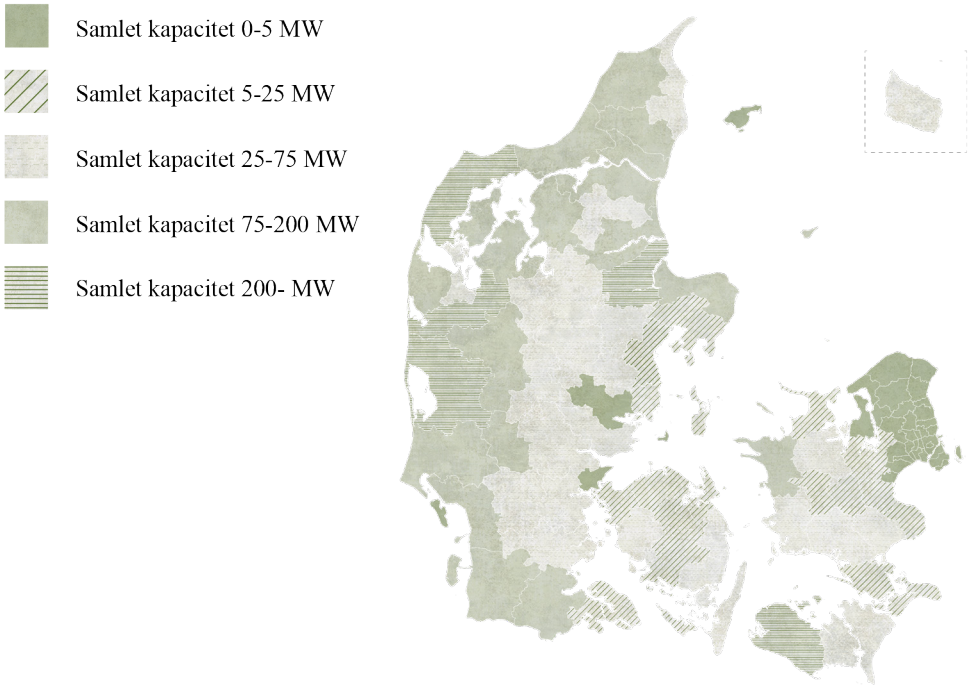


Coastal landscape

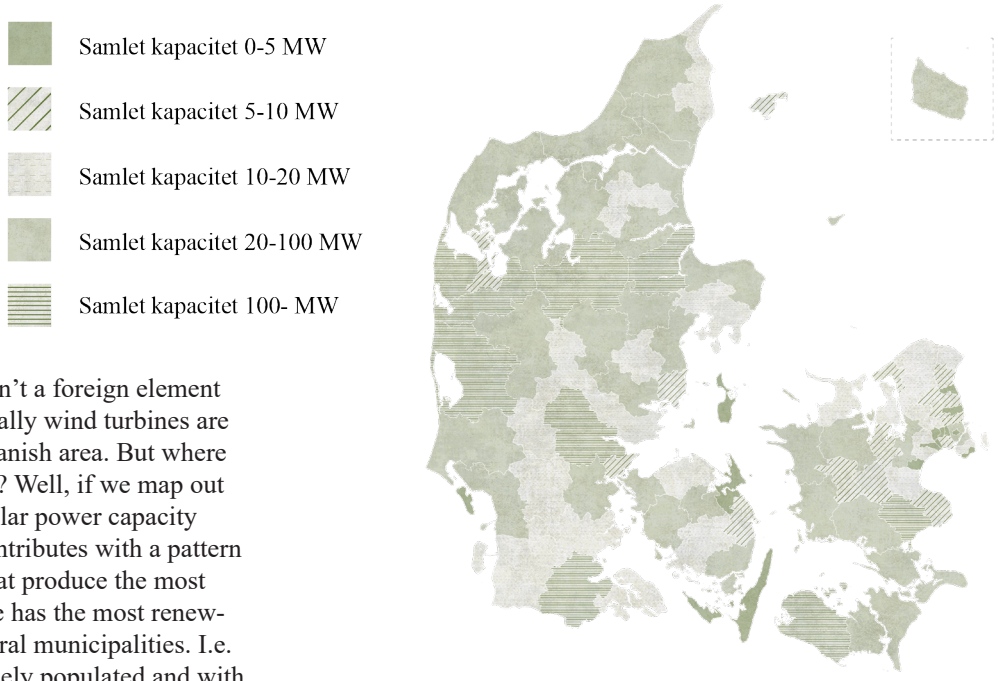
The coastal landscapes have unique and wide view that hold great value. Solar power facilities should not be placed where there is a direct visual connection to the coast, beaches, beach meadows and other open areas. (Plan22+, 2024)

Ill. 19 Danish landscapes and their capacity for solar power facilities

Existing energy landscapes



Ill. 20 Municipality capacity regarding wind power



Ill. 21 Municipality capacity regarding solar power

Renewable energy facilities aren't a foreign element in the Danish landscape, especially wind turbines are spread out through the entire Danish area. But where have we placed them until now? Well, if we map out the wind power capacity and solar power capacity each municipality holds and contributes with a pattern emerges – the municipalities that produce the most renewable energy, and therefore has the most renewable energy facilities, are the rural municipalities. I.e. the municipalities that are sparsely populated and with landscapes that has the capacity to hold major energy parks due to the openness and flatness. So, the areas of Denmark that are ideal for renewable energy facilities, already has a lot of land set aside for renewable energy production.

In conclusion...

Ill. 22 Collage illustrating the complex task of placing renewable energy

Renewable energy facilities affect the experience of the landscape – wind turbines are visible from afar and solar power facilities take up a lot of space and can close of entire areas. When placing the facilities one must prioritize the amenity values of the landscape – both locally and in a bigger scale. It is a weighing out of what landscapes are worth protecting and nurturing and which landscapes that can be sacrificed in the name of the green transition. A lot of the responsibility for planning the renewable energy facilities lies with the municipality – they know their local environment best. When mapping out the placement of existing renewable energy facilities it is clear that there is an imbalance in the amount of renewable energy that the municipalities produce. In light hereof one can perhaps better understand that citizens in some regions of the country voice their dissatisfaction with the planning of the many additional facilities in their areas. That dissatisfaction however is difficult to accommodate when all analysis shows that the best areas to place renewable energy facilities are in the open land in the rural districts especially when you hold it together with the strategic best placement of all the other functions that the land must hold.

We are busy if we are to meet the national goals and commitments. To pressure the realisation of renewable energy facilities the government has made political decisions driven by techno-rational logics compromising on the protection of nature and cultural heritage.

Placing renewable energy facilities could be a thesis in itself. In the present project however the placement of both existing and future renewable energy facilities is a way of zooming in on the communities that live with renewable energy technology in their backyard. When we understand why certain renewable energy facilities are placed where they are, we can also understand who and what the planning involves and affects – nature, cultural heritage and local communities in rural districts.

Rural districts are under *p r e s s u r e*

Until now, we have primarily looked at the challenges of our current land use and the demands of future land use, and which considerations and regulations you must have in mind when planning renewable energy facilities. By now it is clear that our rural districts are crucial if we want to succeed in creating big, undisturbed and interconnected nature areas, plant new forest, rewet our lowlands, secure the marine environment and establish facilities and infrastructure for renewable energy. The areas that are in high demand are sparsely populated, they are rich on land currently designated for cultivation and agriculture and has landscapes with the capacity for change – all characteristics of the areas in rural Denmark. So, we know where to place the new forests, wetlands and renewable energy facilities – rural areas – we know who has the responsibility of planning – the municipality – and we have eager investors – the renewable energy developers, and their likes. It seems like a plan ready to be executed. There's just one problem… local endorsement is lacking – especially regarding renewable energy facilities.

The opposition to renewable energy projects is often explained as the NIMBY effect – "not in my backyard" – the idea that local citizens are unsatisfied with renewable energy facilities, because they are placed in their backyard. That, however, is a gross reduction of actual concerns. Research and experience show that the resistance towards renewable energy facilities to a still larger extend is about the fairness and transparency of the planning process. (Palsberg, Schou & Tjelle Holm, 2024) Studies show that people distrust the process and feel that they aren't involved in the decision-making. They feel that they are deceived and have little to no change of influencing the process, because the decision already has been made and the deal between the landowner, the developer and the municipality already has been signed when the project is announced, and people are invited to public hearings. (DTU, 2023) Historically, wind turbines were put up by local coops. The rapid development of the industry has however pushed out the small actors, and today it's mainly big international companies that have the funds to build renewable energy facilities. Which leads us to another reason for local opposition – the big projects seldom add value back to the local communities. (DTU, 2023)

Ill. 23 Impressins from the site

National planning& political trajectories

To understand the distrust of the local communities in rural municipalities we must look towards the history of national planning in Denmark. Through history we have seen that political agendas and shifting trajectories influence the physical layout of the country.

The planning discipline is closely connected to the prevailing political agendas and trajectories in the society. On one hand planning reflects and serves the public interests, on the other hand it steers the development of the society – it can both strengthen and reduce the development influenced by economic, technologic and social powers. (Gaardmand, 1993)

Denmark got its first workable urban planning act in 1938 (Gaardmand, 1993). The years before 1900 were characterised by a geographical disproportion of the Danish territory where the capital was prioritised – Denmark was a geographical whole, but was developed unequally (Carter, Larsen & Olesen, 2015). The approach to state intervention was liberalist, and economic priorities took precedence. With the industrialisation the Danish cities grew both physically and population-wise. The rapidly expanding cities and the problems that they ensued increased the interest in political planning of our cities. From around 1900 cautious measures towards state intervention started to blend with the otherwise liberalist ideology of that time – a process that culminated with the welfare state in the years after World War II. (Carter, Larsen & Olesen, 2015)

In the period after World War II spatial planning became an important policy field. The welfare state project at first upscaled the scope of planning, so now the entire Danish area was taken into account. But the economic development and associated spatial problems accelerated the need for national spatial planning regarding infrastructure, urban developments, housing, industry etc. The Danish government introduced the model know as the Big H, where infrastructure investments supported the existing urban structure, rather than addressing the spatial inequality. Thus, making the Danish planning trajectory more centralistic once again. (Carter, Larsen & Olesen, 2015)

The 1970's was influenced by a modernisation and rationalisation of the planning system. In 1970 the municipality structure was reformed – the number of municipalities were reduced from 1098 to 275 and the number of counties were reduced from 25 to 14. Denmark was to be transformed from an agriculture society to an industrial society. The planning reform placed far-reaching planning powers with municipalities and counties, that in turn would be regulated by national planning interests. (Gaardmand, 1993) The reform entailed a decentralisation of both political and administrative responsibilities. Provincial towns suddenly grew through big public investments, new areas with single family houses, social housing and industry. (Dybvad, 2015)

In 2007 a new municipality reform was implemented. This time the municipalities were reduced from 275 to 98 and the counties were dissolved into five regions. The municipalities should handle most of the public welfare benefits, and the regions should handle the public health service. The reform was presented as decentralisation of society, to make municipality-based management of public welfare stronger, thus moving social benefits closer to the citizens. Though, if you look at the effects of the reform, it actually had a

centralising effect – the old municipalities were merged into new larger municipalities, the counties were restructured into new and bigger regions and responsibilities were moved from both municipalities and counties to the state. (Dybvad, 2015) The municipality reform initiated a historic big centralisation of our democracy and public sector. It wasn't necessarily the reform itself more than the reforms that followed, that centralised public functions and collected public administration, educations, jobs, police etc. in big geographical units oriented around the big cities. When we move educations and jobs, people move as well. Dybvad (2015) argues that even though urbanisation is a global trend it is enhanced in Denmark because of the municipality reform in 2007 – statistics show that the increase in population in Copenhagen is much bigger than the numbers we see in other European cities. Furthermore – with the centralisation of society, we also centralise power, which in turn makes basic political priorities into administrative decisions, that are made based on the world view that dominates in Copenhagen. (Dybvad, 2015).

In the light of the greater centralisation and the neo-liberal trajectory in politics, national planning became more concerned with national affairs, focusing on promoting economic development and competitiveness. The prosperity that the parts of Denmark outside the big cities had experienced after the municipality reform in 1970 turned into recession and population decline. (Carter, Larsen & Olesen, 2015) The structural reform in 2007 made the big cities in Denmark into engines of growth, while life was pulled out of both nature, marine environment and the local communities in our rural districts (Grønnegaard, 2024).

The myth of the rural fringe

During the 2000's the continuous urbanisation pressured the small communities. Many rural districts struggled with a decreasing population as well as economy. A decline that manifested in closing schools and shops, and buildings left empty because of a smaller population. (Laursen 2020)

In 2010 the Danish Dictionary admitted the word Udkantsdanmark – the rural fringe of Denmark. 2010 also marks the year where the use of the word grew rapidly. An analysis of eight Danish newspapers showed that the word was used almost 1000 times in 2010 compared to only 31 times in 2009 (Svendsen, 2015). In the analysis Svendsen (2015) operates with three categorises for naming the rural districts – negative, neutral and positive. The negative descriptions include Udkantsdanmark and Den Rådne Banen, the neutral descriptions include på landet, landdistrikter and landområder and the positive descriptions include Vandkantsdanmark, Forkantsdanmark, Ressourcedanmark and den grønne agurk. An analysis shows that the negative descriptions were used 30 times as much as the positive descriptions in 2014 (Svendsen, 2015).

Even though some of the narrative about rural Denmark that gained ground in 2010 did hold some truth – the population did decrease, the schools and shops did close, and some houses was empty and was not taken care of – most of the story that was told was just that – a story. Through the 2000's the rural districts of Denmark were painted as an uncivilised province in contrast to the civilised life in the city. In his defence of rural Denmark Dybvad (2015) highlights the role of media, literature, entertainment and documentaries in the downfall of rural Denmark. The cultural elite depicted the people living in rural Denmark as stupid, violent, criminals, small-minded, negligent and so on, and the picture of rural living became main streets full of boarded up building fronts and houses in general disrepair (Dybvad, 2015) The media didn't lie (in most cases), they just didn't tell the whole truth either, thus marginalising rural districts. Though, rural Denmark has its problems, it is also an area that is rich on people that invest in their local community – they are active and dedicated members of society.

Landscape democracy

I think it is easier to understand the rural opposition towards the change of their physical environment, when you see it in the light of the general centralisation of society through the last 30 years and the medias depiction of the rural fringe. After many years as second choice, the rural districts have suddenly become first choice, but at the expense of their own interests and values. Categorising people living in rural areas as opposed to renewable energy is to overlook blatantly processual shortcomings and depriving the local communities their legitimacy regarding future land use. In many ways we can talk about landscape democracy. Arler, Sperling and Borch (2023) work with three sets of values related to democracy and institutional setups – personal freedom and private self-determination, co-determination and participatory rights and objectivity and respect for arguments. They argue that if landscape democracy is to be established, then all three values must be taken into account.

All experience shows that local people's attitude towards introducing renewable energy facilities into their home landscape depends on whether they are involved in the process or not. The earlier a general involvement is established the better. One solution regarding involvement is to offer the local community co-determination and to be co-investors, or at least to establish a benefit-sharing scheme that can strengthen the local community. Furthermore, an earlier and more thorough involvement occurs when the initiative starts in the local community and its institutions. (Arler, Sperling and Borch, 2023)

If local communities and municipalities enter into dialogue before specific projects are suggested. This way local communities assume responsibility and agency regarding renewable energy facilities. It is important that members of local communities are involved very early if not as co-owners, then as co-responsible partners. This can be done through organised interest groups, focus groups and/or interviews. The participatory and deliberative measure are required, and inclusion, factuality and respect for arguments must be given high priority. It is important that landscape issues are included from the beginning of the participatory and deliberative processes – case analysis show that people care about landscape values, which often are identity carriers, and that they are willing to block a process if landscape qualities are ignored. It is however worth noticing that the Danish cases show that local people often support renewable energy and the placing hereof in their local area if they have been involved early in the process and are promised local benefits from the implementation. (Arler, Sperling and Borch, 2023)

Compensation

Within the Danish Act on Renewable Energy there are a number of compensation schemes.

Værditabsordningen – The value loss scheme
Residents in the vicinity of a renewable energy facility can file for compensation regarding the value of their residential property. The value of the residential property is estimated by an appraisal authority – if the loss of value amount to 1% or less the claim for a settlement ceases. (Viden om vind, n.d.)

Salgsoptionsordningen – The sales option scheme
Neighbours within 4-6 times the height of wind turbines and within 200 metres of a big solar power facility can sell their residential property to the developer of the facility. The value of the residential property is estimated by an autonomous appraisal authority. Only residential property that lost value over 1% can sell the property with the scheme. (Viden om vind, n.d.)

VE-bonusordningen – The RE bonus scheme
Neighbours within 4-8 times the height of wind turbines and within 200 metres of big solar power facilities are entitled to a RE bonus. The amount of money that can be gained through the RE bonus scheme match a share of the collected production of the facility equivalent to 9,75kW. (Viden om vind, n.d.)

Grøn Pulje – The Green Pool scheme
The developers of renewable energy facilities are committed to deposit a one-off payment into Grøn Pulje administered by the municipality for local development. The size of the tariff depends on the type of renewable energy technology. For land-based wind turbines the developer must pay 313.000 kr per MW energy produced, for solar power facilities the developer must pay 125.000 kr per MW energy produced, and for offshore wind turbines the developer must pay 418.000 kr per MW energy produced. To really understand how much money that are put into Grøn Pulje, I'll make an example – the case that I will analyse later in the report is a solar power facility with a capacity of 193,5 MW, which in turn will equal 24.187.500 kr deposited into Grøn Pulje. (Viden om vind, n.d.)

It is the responsibility of the municipality to allocate the funds. It is also the municipality that prioritises the applications and decides who can apply for funds and what they can be used for under certain regulations.

Who can apply?
+ Neighbours within 6 times the height of wind turbines
+ Neighbours within 200 meters of solar power facilities
+ Inhabitants in the municipality in general – the municipality decides who belongs in this group

The municipality can prioritise applications based on…
+ The distance between the project and the neighbours of the renewable energy facility
+ Whether the applications come from neighbours of a renewable energy facility
+ Whether the project can be categorised as a green initiative
+ Whether the project is categorised as a general initiative in the municipality

Grøn Pulje does NOT have to be allocated for…
+ Green initiatives
+ Initiatives that impact the common good
+ Projects near renewable energy facilities

The municipality decides…
+ What a green initiative is and how big a part of the project the green initiative has to be for the project to be categorised as a green initiative
+ Which applications are prioritised, and which criteria they base their prioritisation on

(Energistyrelsen, 2024)

in conclusion...

Ill. 24 An interpretative collage

The opposition to renewable energy facilities in rural districts must be understood in the light of national planning and political trajectories – both contemporary and historically. The structural reforms to our municipalities have made the big cities into engines of growth, while life has been pulled out of local communities and their surroundings in rural areas. Now however, rural district and their open land is talk of the town, and everyone wants a slice of the cake. The citizens in rural districts are in turn opposed to the many changes to their landscape. This dissatisfaction is not a sign of opposition to the green transition or renewable energy facilities. It is in fact a result of feeling that they aren't heard when we introduce renewable energy technology into their landscape. Research shows that landscapes are identity carriers, and if landscape qualities aren't taken into account projects are often blocked. Research however also shows that people often will support projects if they are involved in process and if the local community benefits from the project. These two points hold potential in an urban design perspective – we need to understand the landscape of a specific renewable energy site e.g. through mapping and design interventions, and we need to heighten the well-being of the local community despite the changes that happen to their landscapes. In this light the funds within Grøn Pulje holds potential for urban development and placemaking in connection to renewable energy facilities.

Tying the knot

The topic of energy landscapes is broad and multi-faceted – it touches on planning, landscape, nature, community, democracy, identity, culture, local agency, ownership, aesthetics and form, economy, climate, infrastructure, mobility and… well, I could go on because the list really is inexhaustible. And on top of that we can add the many other demands on the open land as well including new forest, the re-establishment of former wetlands, the demand for 30% protected nature etc. One thing is the practical part of restructuring the land use of the open land – the actual placement, the infrastructure, the ownership – another thing is the local communities whose physical environments will be completely altered. When we introduce a new landscape element a landscape that might not be objectively valuable but carries the identity of those who live in it, look at it and sense it, will get a new character. Arler, Sperling and Borch (2023) write about the introduction of renewable energy facilities and their impact:

"Some impacts will be negative, such as noise, smell, blocked views, undesired light effects, impact on landscape composition and biodiversity, etc. Others are positive, such as revenues for the local community, increased job opportunities, and, not least, pride in participating in the much-needed global green transition. For some, RE technologies are beautiful or fascinating; the view is inspiring and leads to pride or even awe. For others, the technologies may appear, at least initially, as unwanted foreign elements that disturb and ruin the well-known or pristine landscape." (Arler, Sperling & Borch, 2023, p.21)

Just as we couldn't lump everyone living in the rural fringe of Denmark together in the national discussion of the region in the 2000's and 2010's, we can't label all people living in rural districts as opponents to renewable energy today. Especially not, when all research on the matter highlights the lack of involvement in the process as the key factor for opposing renewable energy facilities.

This thesis will not deal with the strategic placement of renewable energy facilities more than it has already done. It will neither deal with the participatory measures that must be taken when introducing renewable energy facilities into landscapes. I think it is important to recognise the significance of both elements in the discussion about the expansion of the Danish renewable energy network – both themes could however be thesis projects in their own right.

This will be an investigate of how to protect, nurture and enhance rural quality of life in areas with renewable energy facilities within the scope of urban design and planning. I want to investigate how urban design methods and theory can give another perspective on the planning of renewable energy facilities, and explore whether a community and landscape-based approach can increase the local acceptance of renewable energy facilities.

This thesis aims to investigate how to protect, nurture and enhance rural quality of life in areas that experience the addition of renewable energy facilities to their landscape within the scope of urban design and planning.

The thesis will...

1. *Explore the context of contemporary land use with a special focus on energy landscapes.*

2. *Explore research on rural quality of life, the theoretical relationship between human and nature and sense of place.*

3. *Explore how urban design methods can read and translate site specific structures, landscapes and qualities through a case specific study to inform the understanding of the "rural and renewable energy" assemblage.*

4. *Create strategies for creating energy landscapes that are meaningful to local communities*

02 *Position*

The context chapter introduced several perspectives on renewable energy landscapes in more general terms. In the present chapter I will unfold selected theoretical themes to inform my investigation of rural quality of life in light of renewable energy facilities. I've selected to research different perspectives on what makes rural quality of life, the human and nature interrelationship and placemaking. The themes will help me formulate my academic position within urban design – in general, but especially regarding the complex relationship between local communities, renewable energy facilities and landscape and nature. By doing so I hope to inform my approach to understand and act within the complex connection between local community well-being and renewable energy facilities.

Ill. 25 Impressions from Gestenge

Rural *quality* of life

The continuous urbanisation of society pressures rural communities. Many rural districts struggle with a decreasing population as well as economy. The decline of the rural district's manifests in closing schools, empty stores and empty houses. (Laursen, 2020) This decline influences the quality of life of those staying in rural areas – or so you would think.

If you use an objective definition of quality of life – when quality of life is measured based on income, health, education etc. – studies show that the average quality of life is higher with people living in cities – just as expected. But when we instead look into the subjective quality of life – when quality of life is measured by asking people about their sense of happiness or satisfaction with life – studies show that the average quality of life is higher with people living in rural districts in high-income countries. (Lolle, 2022)

There is a paradoxical difference between the rural-to-urban migration of the last decade and the consistently high subjective rural quality of life – why move to the city if life is more satisfactory in the countryside? This is the Rural Happiness Paradox. (Lolle, 2022)

The rural happiness paradox

The rural happiness paradox is not only a thing outside of Denmark, also in Denmark data shows a significant higher average of subjective quality of life in the rural municipalities compared to the urban municipalities – the difference is small, but still significant. (Lolle, 2022)

When focusing on the satisfaction regarding different themes instead of the overall quality of life, data shows that people in rural municipalities score higher than people in urban municipalities when asked about their satisfaction with their financial situation, family life, social relations, work, travel time to work, leisure time, everyday life and housing situation. In only one of the researched instances, the one regarding potential leisure activities, people in urban municipalities score higher than people in rural municipalities. (Lolle, 2022)

People in rural municipalities lie above average when you study their answers regarding their feelings, opinions and attitudes, which indicates that life is experienced as more meaningful in rural areas – there is more happiness and less worries and stress. This in turn might explain the significant difference in reported subjective quality of life between rural and urban areas. (Lolle, 2022)

Participation in civic society

The participation in activities related to civic society seems to matter for individual quality of life – being engaged in leisure activities seems to build up a strong joint identity within a community which in turn can affect the quality of life positively. There are three mechanisms at play in this causal relation. Firstly, it is rewarding to create possibilities for others especially on the long run. Secondly, it is rewarding to be part of civic society and the relation to other locals. And thirdly, it is rewarding that your efforts are needed, that they are even necessary, as part of the fight to keep possibilities open in your local community. Especially, the first and the third point seems to be distinct for rural areas. (Iversen, Fehsenfeld & Ibsen, 2022)

The natural rhythms of rural everyday life

Historically, rural life was characterised by the non-existing separation of work and leisure, and traditional rural life was characterised by a close connection between the people and the natural and social environment:

"Place attachment and community-based identities grew out of a shared set of rhythms and practices which also gave shape to rural landscapes and sociability. Rural dwellers, in this sense, were key producers of the places in which they lived and worked." (Johansen, Fisker & Phillips, 2022, p.17)

Today however, very few jobs require people being close to either their landscape or their neighbours. Contemporary rural life is however still tinged by its heritage. The ideal of living a life where one plays an active role in creating the landscape and cultivating the community is widely maintained – rural dwellers take pride in it and those who immigrate from urban to rural areas move for just that. (Johansen, Fisker & Phillips, 2022)

Even though the rhythms and practices of rural life aren't the same as they once were, some of the explanation of the rural happiness paradox might in fact lie within the difference between rural and urban everyday life, and thus the rhythms and practices of contemporary rural life.

A research project that is based on Hartmut Rosa, a German sociologist and political scientist, and his theory of social acceleration and his notion of resonance in his sociology of the good life (Johansen & Fisker, 2022) in combination with Henri Lefebvre, a French philosopher and sociologist, and his theorisation of rhythms (Johansen & Fisker, 2022) explores just that. The study hypothesise that rural residents live in resonance in spite of the social acceleration of society because of the particular rhythm of rural everyday life. (Johansen & Fisker, 2022)

Informants especially emphasised how the interaction with landscape gave meaning to their everyday life. The growing of vegetable and foraging reconnected their bodily rhythm with those of the non-human world, and it calibrated their connection to the rhythms of landscape around them. Also, the frequent social interactions, both organised and informal, made everyday life meaningful in a rural context. The frequent interactions awakened a sense of belonging to a community and of being accepted and respected because of your person, not because of your profession, social status or income. (Johansen & Fisker, 2022) Johansen and Fisker (2020) conclude:

"What our informants do in their everyday life may allow them to deal with social acceleration, but this is not why they do what they do. They are not merely coping but living. (...) we also believe that when it comes to everyday rural life, rhythm is what makes the difference in the pursuit of resonance." (Johansen & Fisker, 2022, p.53)

The research highlights both natural processes and landscape as well as social interactions as important elements in the rural everyday life. These themes hold potential in an urban design perspective as they all touch on elements in our field of work – the well-being of nature, the shaping of landscape the making of places to meet each other.

Physical placemaking & local anchoring

Anne Tietjen and Gertrud Jørgensen (2022) have researched the connection between placemaking, rural development and community well-being. They've found that common places are essential for relationship-building within rural communities, but that the very act of creating said common places is just as important to sustain community well-being (Tietjen & Jørgensen, 2022).

Tietjen and Jørgensen (2022) have identified 4 strategies for placemaking in rural districts. The four strategies embrace both built structures that gather people beyond the local community, innovative use of cultural heritage, strengthened access to landscapes and nature and new connections that expand the realm of the local sphere to forge new mental and tangible connections and new understandings of place. (Tietjen & Jørgensen, 2022)

The different projects presented in the research paper highlights how we can create meeting places within contemporary rurality. But beyond the meeting place itself, the four strategies also emphasise what we like to meet around – activities, functions, cultural heritage and nature. They also highlight the many different forms rural development and placemaking can adopt. (Tietjen & Jørgensen, 2022)

The first strategy transforms existing built spaces for activities or public functions. The projects aim to reach beyond the local community. The projects have strengthened the local community, as well as generated social relationships beyond the village and expanded the boundaries of where they feel a sense of belonging. The second strategy uses cultural heritage as a driver. The projects are based on the environments' existing qualities and potentials to preserve, strengthen or develop community well-being through the renovation or transformation of existing built structures or landscapes. The strategy utilises traces of cultural heritage to nurture a sense of place. Traditions and local culture link the past and the present and creates a space for new life. The third strategy strengthens the access to landscape and nature to increase the rural quality of life. New green meeting places use landscapes as a connecting and identity-forming element within and between villages. The individual interventions can be small and still define a larger spatial context and evoke nature physically and psychologically. The fourth strategy totally reshapes places by making new connections and nodes in villages or landscapes. The spatial structure of a site is rethought to forge new mental and tangible connections and understandings of place. The strategy is large scale and utilises the spatial potential in demolishing houses, changing paths and creating larger public spaces. (Tietjen & Jørgensen, 2022)
Tietjen and Jørgensen (2022) end their research paper with:

"Rural communities that build places together for sustained community well-being and quality of life are competent and energetic, reaching out to wider society in relational built structures. They are aware of local amenities in the form of heritage and nature; they look for place-based solutions to problems caused by general urban-rural development and centralisation policies; they are able to develop large, complex spatial innovation projects." (Tietjen & Jørgensen, 2022)

The research illustrates all the different configurations of place, as well as the importance of having spaces that cater the need for social interactions.

Ill. 26 Village space in Stauning

in conclusion

Rural quality of life is closely connected to the rhythm of rural everyday life, relationships and civic participation. Community well-being is strengthened by having places to meet and interact both formally and informally. Meeting places that prove successful in a contemporary setting are places that broaden the scope of the local setting, that increases the accessibility to nature, that highlight special landscape features or cultural heritage or simply connects two places in a new and inspiring way. Placemaking increases the community well-being of rural communities, and the connection to nature and cultivation of land in small scale seems to have a grounding effect in an otherwise accelerated life. Lastly, the active participation in the local community is rewarding – rural life is something to fight for and protect. All of the knowledge above can be instrumentalised in rural settings with future renewable energy facilities.

The *theoretical* relationship between *human & nature*

Nature and landscape are mentioned as qualities and as valuable to humans both physically and mentally – not only in a rural context, but in general. They carry identity and meaning for many. But nature and landscape are not only pretty things. They are also storms, floods, cloudbursts and heatwaves – they are processes that all are interconnected. This has become tangible in light of the climate crisis, the changes to the climate and the biodiversity crisis. But how do humans fit into the planetary processes? Is human a part of nature? And what is nature beyond the things that we can measure and sense? To better understand how nature and landscape affect the rural quality of life I try to understand the human/nature relationship on a more theoretical basis.

Human & nature

In his text Man and Environment (1963) landscape architect Ian McHarg describes two opposing views of the human and nature relationship:

"Conceptions of man and nature range between two wide extremes. The first, central to the Western tradition, is man-oriented. The cosmos is but a pyramid erected to support man on its pinnacle, reality exists only because man can observe it, indeed God is made in the image of man. The opposing view, identified with the Orient, postulates a unitary and all-encompassing nature within which man exist, man in nature." (McHarg, 1963, p.12)

The first view implies that humans are outside of nature and even dominate nature. The opposing view describes humans and nature as co-tenants that share a cosmic role and potential. (Mcharg, 1963)

In the text Et Mangfoldigt Naturbegreb (Fink, 2003) Danish philosopher Hans Fink (2003) discuss our common understanding of nature, and argues that if we are to understand whether humans are part of nature or not, we must clarify the notion of nature. Fink's point of departure is that we don't have an unambiguous concept of nature. In line with McHarg (1963) Fink (2003) distinguishes between those who understand the natural world as counterpart to the one of humans, where human's free will, sense, art, morale is either superior to or different from nature, and those who understand human life as an integral part of the natural world. Fink (2003) argues that the way we define the human/nature relationship is important to nature governance – what is considered either good or bad for nature or humans depends on the eyes that see, thus it depends on the prevalent conception of nature. Fink (2003) distinguishes between seven different understandings of nature – The Untouched, The Wild, The Rural, The

Green, The Physical, The Earthly and The Everything. The first six conceptions all place humans outside of nature in different ways (Fink, 2003). The untouched nature is the nature that has been kept free of cultural influence. The wild nature is the nature that hasn't been cultivated. The rural nature is the nature you find in rural districts, both the wild and the cultivated. In this instance nature is conceived as the difference between rural and urban areas. The green nature is everything living, organic and low-tech as opposed to everything mechanic, synthetic and high-tech. The physical nature is everything that follows the laws of physics – time and space, particles and spheres, mass and energy. The earthly nature encompasses everything physical – human and nature stand as one in opposition to the supernatural and divine God-figure. The last of Fink's (2003) seven concepts is that nature is everything. In this conception humans are fully a part of nature: "Naturen er det, der er på begge sider af enhver tænkelig grænse. Naturen er den sammenhæng, som forbinder selv det mest forskelligartede, som også omfatter alt det menneskelige, og som det ideale og guddommelige ikke kan være selvstændiggjort i forhold til." (Fink, 2003, p.35)

The seven understandings of nature intertwine, compliment, and contradict each other, and still, they are all visible in a Danish context. The different conceptions of nature are dependent on subject, cultural perspective and time.

The many successes of modern science during the last three decades have made us expect that further advances in technology will continue to solve all humankind's problems. The simultaneous market-driven progression of the economy has strengthened the belief that human in fact can control nature. The landscape architect James Corner (1997) perceives nature and culture as interconnected – he simply doesn't agree with prevalent distinguishment of the human and non-human sphere. In the essay Ecology and Landscape as Agents for Creativity (Corner, 1997) he describes the consequences of the unbalanced human/nature relationship as follows:

"In sum, the belief in human progress and mastery over Nature, for all of its good intensions and successes, has at the same time promoted an often brutally mechanistic, materialistic, and impersonal world, a domain in which the potential creativity of both Nature and culture is diminished to dull equations of utility, production, commodity, and consumption." (Corner, 1997, p.264)

The human dominance of nature has degraded nature to a simple reserve – a material that supports human life – an ideology that completely deprives nature of all agency. Subsequently, the polarisation of the relationship between the cultural and the natural sphere has robbed human culture of the creativity that lie within nature – the larger-than-life-ness that nature holds. The gross reduction of nature has prompted an increasingly homogenous and impoverished lifeworld. The tendency to construct binary oppositions stems from the Enlightenment in which objective and subjective worlds were absolutely distinguished and separate. This dualistic thinking has taught us to distinguish between subject and object, thus conceiving concepts of environment as external to humans. (Corner, 1997)

The prevalent understanding of the human/nature relationship is that they are entities not a whole. This has placed a sense of superiority with humans, that believe they can control nature. A sentiment that has only been reinforced through the technical advances of the last decades. This perspective on nature is what has led us to the Anthropocene.

Nature is a social construct

"Humans' survival as a species depends upon adapting ourselves and our landscapes – settlements, buildings, rivers, fields, forests – in new, life-sustaining ways, shaping contexts that acknowledge connections to air, earth, water, life, and to each other, and that help us feel and understand these connections, landscapes that are functional, sustainable, meaningful, and artful." (Spirn, 1998, p.26)

For many years the city, or settlements in general, was believed to belong outside and apart from nature. This attitude has provoked or even caused many of the city's environmental problems. About the distinction between city and nature Spirn (2012) writes:

"At the root of this failure to recognize the city as part of nature is the notion that nature is a place (wilderness and countryside, but not city) or a thing (mountain, river and tree, but no things made by humans). But nature is and idea, not a place or a thing (...)" (Spirn, 2012, p.7-8)

This way of describing nature as an idea, resonates with James Corners description of landscapes as a cultural construct in his essay Ecology and Landscape as Agents for Creativity (Corner, 1997). Corner (1997) challenges the idea of nature as being removed from the human realm. He argues that our understanding of nature is highly influenced by cultural, aesthetic preferences and historic interpretations. Corner (1997) argues that culture and nature are entangled and interdependent, and cultural practise influence how we experience and appreciate nature. Natures aesthetic and value are closely connected to narratives and symbolism that are culturally constructed. Thus, nature becomes a narrative that reflect human opinions and ideologies. Corner (1997) writes:

"The realization that nature and culture are constructions, woven together as a network of relationships, has led some to argue that any development of social behaviour belongs to a critical revitalization of the powers of signification – to the poetics of worldmaking and transfiguration." (Corner, 1997, p.270-271)

The purpose of the essay is to advocate for a more animate appropriation of ecology – an understanding that goes beyond the object-centred advocacy of nature and culture, that instead points toward the interactive processes and relationships that are life itself, that is both a specific and autonomous system of networks, forces, combinations, events and transformations (Corner, 1997, p.279). Corner (1997) continues:

"What is important in this view is how creative practices of ecology and landscape architecture construct – or, more precisely, enable – alternative forms of relationship and hybridization between people, place, material, and Earth. Echoing evolutionary principles, these enabling strategies function less as instruments and ameliorants and more as agents, as processes, as active imbroglios and ever emerging networks of potential." (Corner, 1997, p.279)

According to Spirn (2012) and Corner (1998) nature is only understandable to humans through conceptualisation – through language and metaphor. Otherwise, we simply can't fathom the vastness of nature.

Landscape as mediator between human and nature

Nature is a piece of constructed culture just as much as it is a cultural construction. To exemplify this sentiment Fink (2003) writes about the Untouched Nature as follows:

"Før vi mennesker dukkede op som redskabsbrugende kulturvæsner, var alt natur. Langsomt og gradvist begyndte vi at beherske både vores omgivelser og os selv mere og mere systematisk i kraft af vores voksende indsigt i tingenes natur og vores mere og mere magtfulde redskaber. (...) Grænsen mellem kultur og uberørt natur er i løbet af denne proces blevet skubbet meget langt frem. I et land som Danmark findes der inden del af jordoverfladen, som ikke er under opsyn." (Fink, 2003, p.30-31)

Nature is constructed culture meaning that humankind has cultivated, influenced and changed nature to such an extent that there is little to no untouched nature left in a context as the Danish. In continuation hereof, what we define as nature today, however reminiscent of the untouched nature it is, is actually man-made. This notion either makes the concept of nature redundant, or emphasizes the interdependency of the cultural sphere and the natural sphere.

The notion of landscape acknowledges that nature is a cultural landscape formed by human interference, as it covers both human and non-human features of an area. In her book The Language of Landscape American landscape architect Anne Whiston Spirn (1998) writes:

"Landscape associates people and place. (...) Landscape connotes a sense of the purposefully shaped, the sensual and aesthetic, the embeddedness in culture. The language of landscape recovers the dynamic connection between place and those who dwell there." (Spirn, 1998, p.16-17)

Spirn (1998) describes landscapes as continuous processes – rather than evolving linear landscapes – that are under constant influence of external factors. Spirn (1998) emphasise the importance of acknowledging the dynamic and complexity within landscape, as well as how human interaction and influence contributes to its development and modification over time. Spirn (1998) continues:

"Humans are not the sole authors of landscape. Volcanos spew lava, remaking land; rain falls, carving valleys. Mountains, gardens, and cities are shaped by volcanoes and rain, plants and animals, human hands and minds. (...) People mold landscape with hands, tools, and machines, through law, public policy and actions undertaken hundreds, even thousands, of miles away. All living things share the same space, all make landscape, and all landscapes, wild or domesticated, have co-authors, all are phenomena of nature and culture." (Spirn, 1998, p.17-18)

Landscape is phenomena of both nature and culture – landscape connects ecological and social systems in one structure. Landscape connects people and place and ties the idea of nature to the physical realm. Landscape also lends itself as a strategic tool to balance the intertwining ecological and social structures.

Nature in the Anthropocene

Humans have become a geophysical force – human-induced activities have become a pivotal factor in our planet's ecosystems, which in turn influences nature's conditions for development and survival. (Tønder, 2020) We see it in the rising temperatures due to climate change, which in turn is caused by the accelerated emission of greenhouse gases from the extraction and burning of fossil fuels and the administration of our land areas, as well as the biodiversity crisis.

When we talk about the Anthropocene it is important to understand it as a constant assemblage of the human and the non-human sphere e.g. the cultural and the natural sphere. In previous geological times humans were either subjects to the natural forces or masters of the natural forces. Today however, we live in a world characterised by infinite and complex assemblages across the cultural and natural sphere. With the emergence of the Anthropocene, we must abandon the modern idea of distinguishing culture and nature. (Tønder, 2020)

The Anthropocene must not be used to define a static zero-sum game, where the increase in human power is synonymous with a corresponding decrease in the power of everything non-human. Such a sentiment would be problematic if we are to actually care for the non-human world. Instead, we must prepare ourselves for a much more complex situation where the cultural sphere and the natural sphere evolve side by side and where the result amount to more than the sum of the isolated parts – a situation where both the human and the non-human sphere evolves in a mutual but also unpredictable collaboration. So, what happens on one side of the culture/nature-relationship will without a doubt have actual and material consequences to the other side of the culture/nature-relationship. (Tønder, 2020)

The view on the Anthropocene as presented above relies on the presentation of the phenomena in the book Om Magt i den Antropocæne Tidsalder by Lars Tønder (2020) – professor at Institute for Political Science at the University of Copenhagen. Tønder (2020) seeks to introduce a new way of analysing power in the context of the Anthropocene. In light of just the Anthropocene, Tønder argues that a new analysis of power must include more actors and multiple levels – the view on power must be displaced from a sole human-social perspective to an analytic framework that include life in general. (Tønder, 2020)

Agency within the non-human sphere

American political theorist and philosopher Jane Bennett writes about thing-power which *"(...) is a force exercised by that which is not specifically human (or even organic) upon humans."* (Bennett, 2004, p.351). When thinking about thing-power it is essential to acknowledge that a material body always exists in some assemblage or other, and its thing-power is a function because of that grouping. So, a thing has power only by virtue of its relationship with other things. Thing-power is, as a kind of agency, the property of an assemblage, and thing-power materialism presumes that matter has an inclination to make connections and form networks of relations with varying degree of stability (Bennett, 2004). Bennett (2004) sees a parallel between thing-power materialism and ecology thinking. She writes:

"(...) both advocate the cultivation of an enhanced sense of the extent to which all things are spun together in a dense web, and both warn of the self-destructive character of human actions that are reckless with the other nodes of the web." (Bennett, 2004, p.354)

Bennett (2004) describes the human/nature relationship as a dense web, an assemblage, where one part, the humans, has acted reckless at the expense of the rest of the group. Humankind has completely forgotten about or ignored the vitality of the material world. However, in light of the Anthropocene, the material world has gained momentum, to such an extent that the power within it can't be disregarded as inferior to the human agency anymore. The material sphere has mutated in a way that involve a materialisation of the material – an evolution of the material that happens gradually on the material worlds own terms. It is in this process that the power within the material world manifests itself as an internal and complex power that continuously create new entanglements of the human and non-human lives. (Tønder, 2020)

When we acknowledge the vitality of the material world, we can both explain the problems of the Anthropocene and set out the course for the future human/nature relationship (Tønder, 2020).

Bennett's (2004) theory of thing-power and assemblages is closely connected to French sociological theorist Bruno Latour's actor-network-theory.

Latour (2005) argues for a new approach to understand the social sphere as a network of connections between heterogenic actors. He challenges the classic understanding of the social sphere – instead of seeing it as a stable and independent force that ties society together, he argues that the social sphere should rather be understood as the result of connections and interactions between different actors (Latour, 2005). Latour (2005) introduces the notion of actors and actants to describe all active elements, both human and non-human, in a network, and writes as follows:

"(...) if we stick to our decision to start from the controversies about actors and agencies, then any thing that does modify a state of affairs by making a difference is an actor – or, if it has no figuration yet, an actant. Thus, the questions to ask about any agent are simply the following: Does it make a difference in the course of some other agent's actions or not? Is there some trial that allows someone to detect this difference?" (Latour, 2005, p.71)

So, both material and immaterial and human and non-human elements have agency and are equally important. Which totally breaks with the traditional socio-centric worldview that define the social sphere equal to the human sphere, placing everything else as a backdrop to human activity.

Latour (2005) challenges the traditional dualisms in our culture and dissolves the separation of subject and object, human and technology and nature and culture completely. To categorise things as each other's opposites simply doesn't make sense in an ANT approach, since all actants act in the same network. (Latour, 2005) This takes us back to the agency of things in a network, which can explain Latour's (2005) relational and complex understanding of the world. Latour (2005) differentiates between matters of fact and matters of concern. Matters of fact refer to the traditional understanding of facts as objective, universal and independent of their context. Latour argues that this is a simplified understanding, since facts don't emerge isolated, they are produced through complex networks of research, technology, humans, ideology etc. In other words, facts are social constructions dependent on actors and processes. Latour (2005) focuses on matters of concern to embrace these complex networks of relations, conflicts, values and interests that all affect a subject. If we look for matters of concern rather than matters of fact, we will experience the world as dynamic, alive and relational because of different actors' agency. (Latour, 2005) To illustrate this point, Latour (2005) writes: *"The solution, once again, is to learn how to feed off uncertainties instead of deciding in advance what the furniture of the worlds should look like."* (Latour, 2005, p.115)

At last, we must understand the origin of the network in the actor-network-theory. Latour (2005) writes: *"A good ANT account is a narrative or a description or a proposition where all the actors do something and don't just sit there. (...) As soon as actors are treated not as intermediaries but as mediators, they render the movement of the social visible to the reader."* (Latour, 2005, p.128)

Actors must be mediators not only intermediaries. If they are intermediaries nothing is translated since the actions simply are carried through them. If an actor makes no difference, it's not an actor. If actors however act as mediators, their actions go from simply being transmitted to being translated, thus altering the mere form of the network. Latour (2005) writes: *"(...) there is no society, no social realm, and no social ties, but there exist translations between mediators that may generate traceable associations."* (Latour, 2004, p.106)

Latour (2005) reassembles the social sphere as networks – traceable associations generated between actors of both human and non-humankind.

in conclusion

The relationship between nature and human is long and complicated. This section of the thesis has exemplified the human/nature relationship from multiple angles. The overall finding is that humans have come to believe that they are superior to nature, and that nature and culture are entities not a whole. This socio-centric approach to society has led to what we know as the Anthropocene – humans have become a geophysical factor and has exploited the planet to such an extent that nature now reacts. This reaction is tangible – it is the climate crisis, and it is the biodiversity crisis. The situation is dire. I believe that some of the solution lie in acknowledging that nature and culture are one, and nature and other non-human actors hold power and agency. By understanding the world through the lens of the actor-network-theory, I believe we can create a more holistic social and physical world. To phrase in a very pop cultural way, we must go from EGO to ECO, also within spatial planning and design. This idea can be used as both the basis for understanding the world but also as a guide to design. When we need to understand a site, we must understand and take the point of view of both human and non-human entities. When we design our physical environment, we must think about solutions that makes both human and non-human entities prosper.

Ill. 27 Culture or nature? Landsacpe!

Sense of *place*

Human geography studies the relationship between humans and their surroundings – a study of how cultural, economic and political processes shape people's interaction with environment and each other. The development of human geography can be seen as a reaction to the focus on space in spatial sciences. Place became a concept that expressed an attitude towards the world – place was subjective rather than the objective space. (Cresswell,2005)

The idea of place has historically been approached in three ways – the ideographic approach, the social constructionist approach and the phenomenological approach. The ideographic approach to place is descriptive, and the concern is with the distinctiveness and particularity of places. The social constructionist approach is interested in the particularity of a place but only because the uniqueness of a place exposes the structural conditions – capitalism, patriarchy, colonialism etc. – that has constructed them. The phenomenological approach is interested in the relationship between human and place. Place is constructed only in relation to humans. (Cresswell, 2005)

To better understand how landscape, and thus place, can carry identity, and make people oppose the actions that are essential of the green transition, I want to understand what place is. This in turn will inform possible interventions, the making of new places, in the landscape.

Local and global sense of place

The Chinese American geographer Yi-Fu Tuan approaches place from a humanistic and phenomenological point of view. In Tuans reading of place, place is stable and individually experienced (Cresswell, 2005). He writes: *"Place may be said to have 'spirit' or 'personality', but only human beings can have a sense of place"* (Tuan, 1979, p.410) In Tuans reading of place the human/place relationship is central to the differentiation between space and place – space becomes place only when it is experienced and sensed by humans. Tuan works with the notion of fields of care to emphasise that places are not simple physical connections – they hold both emotional significance and personal attachment. Tuan argues that places are shaped by human interaction and care – when people engage with places they invest time, energy and emotion. When a place is cared for it becomes a source of security, memory and heritage, which in turn makes places significant carriers of both personal and collective identities. The notion of fields of care moves places from being purely spatial to becoming homes over time. (Tuan, 1979) Tuan's theory of place is very romantic – place is created through subjectivity, sensing and emotions. But it also an understanding that freezes places in time. Change reconfigures places, which in turn must be experienced, sensed and cared for anew. (Cresswell, 2005)

In comparison Doreen Massey (1994) is critical of the understanding of place as something static and isolated. The British geographer Doreen Massey wrote the highly influential text A Global Sense of Place in 1991, that sought to redefine place as a much more open and

progressive force in the world. She wrote the text in the light of the rapid globalisation of the time. Globalisation has compressed space and time, which in turn has radically transformed the experience of place. Massey (1994) argues that the time-space compression isn't the end of place – globalisation doesn't make places irrelevant, globalisation makes the interconnections between the local and the global more complex, which in turn means that local places increasingly are being shaped by global forces. Local places are not isolated, they are interconnected through global processes. (Massey, 1994) Massey (1994) describes the characteristics of a global sense of place as:

"First of all, it is absolutely not static. If places can be conceptualized in terms of the social interactions which they tie together, then it is also the case that these interactions themselves are not motionless things, frozen in time. (...) Second, places do not have boundaries in the sense of divisions which frame simple enclosures. (...) Definition in this sense does not have to through simple counterposition to the outside; it can come, in part, precisely through the particularity of linkage to that 'outside' which is therefore itself part of what constitutes the place. (...) Third, clearly places do not have single, unique 'identities'; they are full of internal conflicts. Fourth, and finally, none of this denies place nor the importance of the uniqueness of place. (...) On the contrary, the globalization of social relation is yet another source of (the reproduction of) geographical uneven development, and thus the uniqueness of place." (Massey, 1994, p.155-156).

Massey's (1994) definition of place is extroverted, progressive and global – place is characterised by being a process, as being defined by the outside, as holding multiple identities and histories and by being unique because of the interactions that happen there (Cresswell, 2005).

Massey (1994) and Tuan (1979) have very different approaches to place.

Where Massey applies a constructivist approach to place, Tuan applies a phenomenological approach – where Massey thinks of the identity of place as open, multiple and fluid, Tuan thinks of the identity of place as rooted, singular and emotional – where Massey defines place as dynamic and constructed by relational and global processes, Tuan defines place as static and meaningful places that are created through human experience.

Even though the list of differences is long I believe that the two ideas of place can be reconciled. Tuan (1979) provides a local oriented, intimate and subjective understanding of place, while Massey (1991) offers a globalised, relational and structural perspective on place. They reflect two critical dimensions of place – both perspectives are valuable for understanding the complexity of place. Tuan (1979) makes us understand why people care about places, while Massey (1994) makes us understand why places aren't static entities but rather dynamic processes.

Placemaking

Architectural historian and theorist Mari Hvattum discuss the relationship between place and architecture and design in her article Stedets Tyranni (2010). Hvattum (2010) argues that modern architecture puts place on a pedestal – the profession grants place an almost authoritarian value that is seen as authentic and unchangeable. This excessive idolisation of what once were can make us blind to the complexity and the dynamics of place. Hvattum writes:

"Kun allerede eksisterende karaktertræk anses som legitime formgivningsreferencer. Muligheden for, at noget nyt kan finde sted, er tilsyneladende udelukket. (...) Identitet er ikke noget, der kan graves op af jorden som en garanti for ægte rødder og autenticitet. Identitet er noget konstrueret, bogstaveligt taget noget bygget, som aldrig står i et direkte eller et oplagt forhold til det, som findes fra tidligere, hverken det naturgivne eller det kulturelle der har aflejret sig gennem tiden." (Hvattum, 2010, p.42)

Loyalty to place obstructs creativity and innovation if the resulting design just passively reflects what once were. Instead Hvattum (2010) encourages architects to acknowledge places as dynamic not static. If the existing place and architecture enter into dialogue the future configuration of place can develop in a way that both respect, challenge and enrich what once were and what are to come (Hvattum, 2010).

Hvattum's (2010) main points are that place is a construct and place is dynamic. So, when we make changes to physical environments it is neither unnatural nor wrong. If we understand places as dynamic rather than static, a design process can be set free. Hvattum (2010) argues that such a practice would inspire reinterpretations of places, rather than a rejection of place specific qualities, which in turn would enhance the dynamic of place.

Kim Dovey (2010) writes about this process as follows: *"(...) the task for place theory is to move from conceptions of place as stabilized being towards places of becoming."* (Dovey, 2010, p.13). Dovey (2010) aims to construct a theory of place as assemblage. We might remember the notion of assemblages from Bennett (2004) who uses assemblages to understand how things participate actively in networks especially in an ecological context (Bennett, 2004). By applying the notion of assemblages to place understanding and making, Dovey (2010) seeks to link phenomenology, spatial analysis and discourse analysis since place is both experienced, structured and logical constructed (Dovey, 2010).

"(...) a street is not a thing nor is it just a collection a collection of discrete things. The buildings, trees, cars, sidewalks, goods, people, signs, etc. all come together to become the street, but is is the connection between them that makes it an assemblage or a place. It is the relations of buildings-sidewalks-roadway; the flows of traffic, people and goods; the interconnections of public to private space, and of this street to the city, that make it a 'street' and distinguish it from other place assemblages such as parks, plazas, freeways, shopping malls and marketplaces." (Dovey, 2010, p.17)

A place assemblage is a collection of the qualities that emerge from the interaction and the relationships between the parts. It is a way of being rather than a thing or a collection of things. It has agency. By understanding places as just that, we avoid reducing a place to something static or subjective. Place assemblages are complex compositions with material qualities that constantly rearrange when impacted by social, material, political and design influences. Place assemblages are dynamic and temporary conditions in space – they are situations. (Dovey, 2010)

Ill. 28 Gestenge seen from Dejbjerg

in conclusion

Place theory is a tool to understand why we care about our physical environment also beyond the land that we own ourselves – the distinction between space and place highlights the emotional relationship between subject and place – places carry identity. In light of globalisation, we however also need to acknowledge the need for a global sense of place, that is dynamic, fluid and relational. Places change – their composition, their purpose, their meaning – thus their physical attributes must also change. This change must happen within the understanding that places are dynamic, situational and alive. A preserving strategy is therefore not always the right answer when we work with placemaking. We must understand both what is and what are to come as place assemblages.

Condensing the theory

The three different theoretical sections have unfolded varied concepts, perspectives, approaches and concepts that all can be related to rural development in areas with renewable energy facilities.

Research shows that rural quality of life and community well-being are closely linked to nature, the landscape and the places we meet. All belong to the physical realm and thus adhere to design and planning. But the two things also have emotional dimensions – both in terms of world view and in terms of personal and communal identity. This explains the many concerns that people in local communities have when facing radical changes in the landscape that they think of as theirs, but it also paves the way for future rural development. Instead, of mourning the change, it can be seen as a catalyst for developing new places within the old – for adding value instead of removing it – for creating nature - for creating landscapes – for creating places to meet – and for doing it together.

The theoretical concepts of rural quality of life, nature and placemaking have a potential to help planners and designer understand and work with the development of local communities that experience the addition of renewable energy facilities in their immediate area. By instrumentalising them in an analytic way of thinking I hope to link theory and practice.

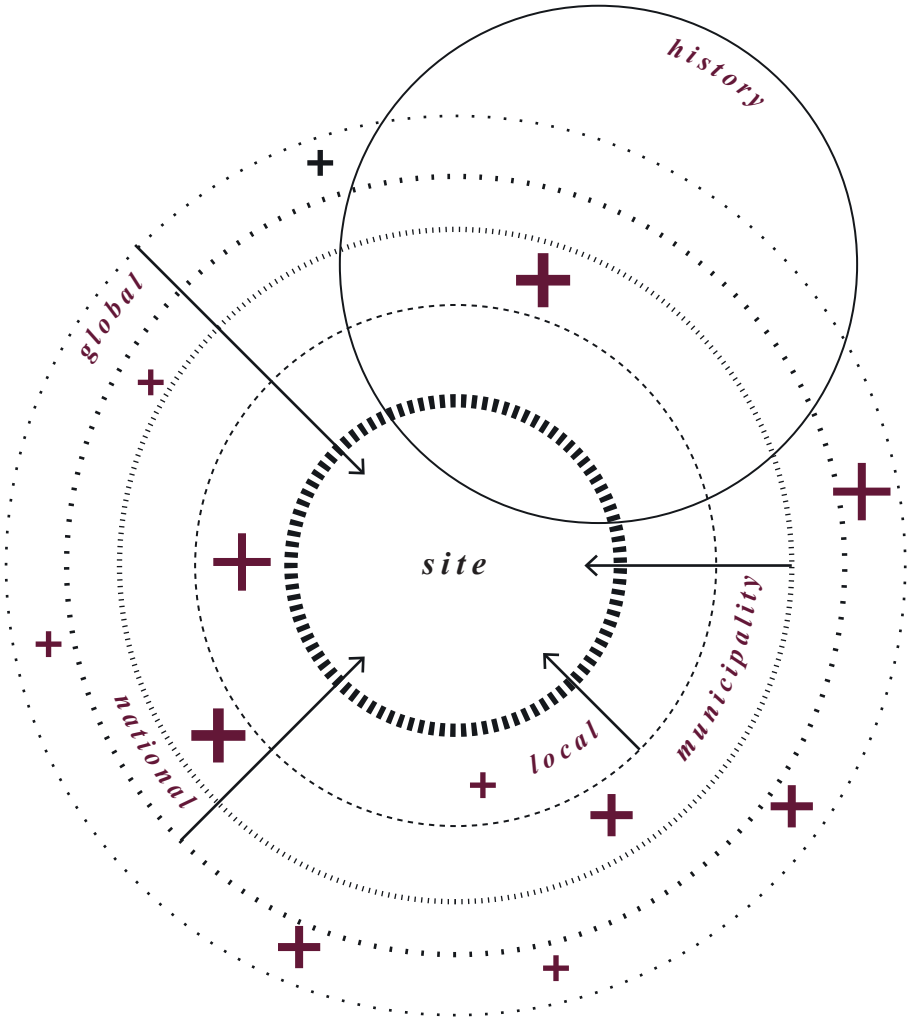
The approach must be understood in light of Bruno Latour's (2005) actor-network theory and his dissolvement of the social sphere as an independent, pre-existing category.

"(...) there is no society, no social realm, and no social ties, but there exist translations between mediators that may generate traceable associations." (Latour, 2004, p.106)

The actor-network-theory reframes the concept of the social as a web of relations – including both human, technology, institutions, nature, animals, plants, tools, documents etc. This rearrangement of the social breaks down the traditional dualisms – the traditional division and hierarchy between spheres, things, actors etc. – which is replaced by an emphasis on the interconnectedness of entities.

This is the worldview that my approach to analysing renewable energy facilities built on. The main aim of the approach is thus to enter into an analysis of the context within which a renewable energy facility is erected with open eyes – with an awareness of the interconnectedness of things across the material and immaterial world.

By utilising classic urban design methods, the approach to analysing energy landscapes aims to reveal the relational connections of specific "rural and renewable energy"-assemblages, which in turn will inform the space of opportunities for quality enhancing development of local communities in rural areas that exposed to the rapid expansion of renewable energy facilities within the scope of urban design and planning.
In line with Doreen Massey's (1994) idea of a global sense of place this approach to analysis holds a scale sensitivity. Even though the "rural and renewable energy"-assemblage only manifests physically in a local context, it is shaped by global, national and municipal governance and agendas. To understand what really is at stake locally we must understand the global context. Thus, analysis must be carried out on multiple scales.



Ill. 29 An illustrative explanation of the analytic approach

04 *Deconstruct*

This chapter holds the analysis part of my thesis. I focus on a case in Ringkøbing-Skjern Municipality called Gestenge. I analyse the case in three scales – the municipality scale, the site scale and the local scale. The analyses I conduct focus on mapping, understanding and finding potential in planning, places, cultural heritage, landscape and nature in conduct with my findings in the two prior chapters.

Ill. 30 The fields of Gestenge

Introducing the analysis

Gestenge is situated in Ringkøbing-Skjern Municipality close to the fjord. The solar power facility is developed by the company GreenGo Energy. The facility will take up 322 acres and will have a capacity of 193,5 MWp and is expected to produce 250.000 MWp each year. 250.000 MWp is equal to the energy consumption of 60.000 households. The area is today used for agricultural purposes and technical facilities in form of wind turbines. The solar power facility will include solar panels, step-up transformers, connection equipment, technical buildings and a lightening conductor. The solar panels will be 3,2 metres high. The area will be fenced in, and hedgerows will be planted where necessary to limit the visual nuisance of the project. (Ringkøbing-Skjern Kommune, 2022)

I will conduct my analysis of the Gestenge solar power project in three scales – the municipal scale, the site scale and the local scale. I will do so with the theory in mind – looking for special landscape characteristics, nature values and places that hold value for the local communities. Within 4,5 kilometres of Gestenge you find five villages, who are organised in a village cluster, Friskvind. The villages and the landscape that connects them will be the focus of the local scale analysis.

1. municipality

Focus: vision, mission, planning, case study

2. site

Focus: plan, nature, cultural heritage, experience

3. local area

Focus: landscape, nature, village places

Ill. 31 Analysis order and focus

Ringkøbing-Skjern Municipality

The municipality's vision

"Alle skal have frihed til at skabe sig et godt liv

Her skal være fællesskaber for alle

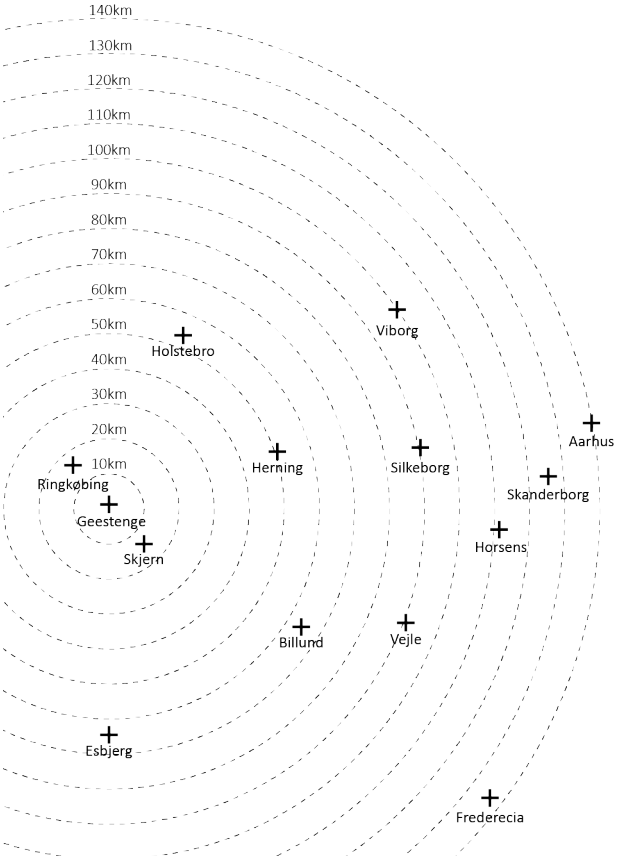
Vi tænker bæredygtighed ind i alt, hvad vi gør"

(Naturens Rige, 2023, p.4)

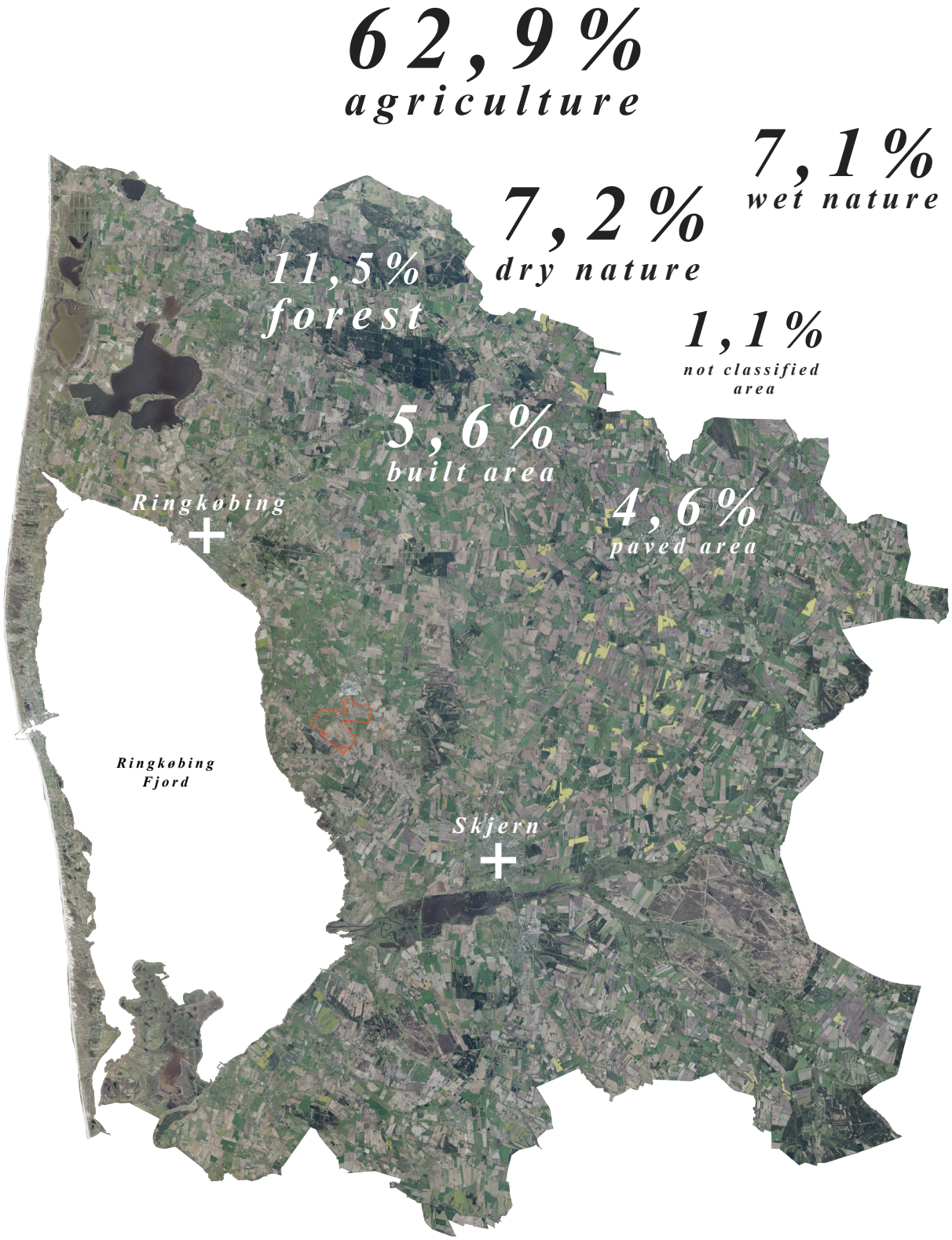
Ringkøbing-Skjern Municipality is located in West Jutland, and is categorized as a rural municipality (Danmarks Statistik, n.d.). It is the largest municipality in Denmark if you measure solely based on area – the municipality is 1.489 square kilometres. The municipality is connected to the neighbouring municipalities by well established infrastructure. The closest highway is in Herning. Even though the municipality is well connected to the rest of the country, the distances are long. The municipality is geographically isolated with over 135 kilometres to the closest large city, Aarhus.

The municipality has a population of 56.350 people. The municipality expects the population to decrease 920 people by 2035. The majority of the population is between 50-80+ years old – and the municipality expects that the group will grow. In addition, statistics show that the sections of the population between 0-5 years old, 6-24 years old and 25-39 years old all are decreasing – a development the municipality expects to continue. (Naturens Rige, 2023) The development indicates that the municipality is struggling to attract and keep families. The numbers furthermore indicate that young people that are in the age group under higher education moves away from and don't return to the municipality.

Ringkøbing-Skjern is a municipality where most of the area is cultivated. Besides agriculture, the municipality is known for their coast, Skjern Enge, Borris Sønderland and the nature around Ringkøbing Fjord. Ringkøbing has a old city centre, that together with the coast attract tourists.



Ill. 32 Distances from Gestenge



Ill. 33 Land use Ringkøbing-Skjern Kommune (Statistikbanken, 2021)

Renewable energy policy in the municipality

Sustainability goals

+ The municipality is fossil free by 2040
+ The municipality is 100% selfsufficient with renewable energy by 2024
+ The municipality must reduce emission of greenhouse gas with 70% between 1990-2023
+ The municipality is climate neutral and climate robust by 2050 at the latest.
(Naturens Rige, 2023)

Ambitions for renewable energy

+ The municipality wants to support Power-to-X facilities and the ancillary industry. A big part of the energy produced through the wind turbines and solar panels in the municipality can and must be used in Power-to-X facilities.
+ If possible the municipality wants to replace some of the existing wind turbines with new and bigger models.
+ The municipality doesn't have large amounts of bio mass, which limits the potential of bio gas facilities
+ The municipality will pave the way for both small and big solar power facilities.
(Naturens Rige, 2023)

Goals regarding solar power

+ To utilise the potential of placing solar panels on buildings in the municipality.
+ To support the municipalities green profile through the placement of bigger, terrain based solar power facilities.
+ To utilise the renewable energy from solar panels efficiently and locally through Power-to-X.
+ To place and adapt solar plants with consideration of citizens in the area and in a way where nature is enhanced, and the facility is adapted to the landscape's characteristics.
+ To support multifunctionality in renewable energy projects, where solar power facilities can be combined with other climate initiatives such as the rewetting of former lowlands.
+ To increase biodiversity in areas with solar panels and cultivate nature.
(Ringkøbing-Skjern Kommune, 2021)

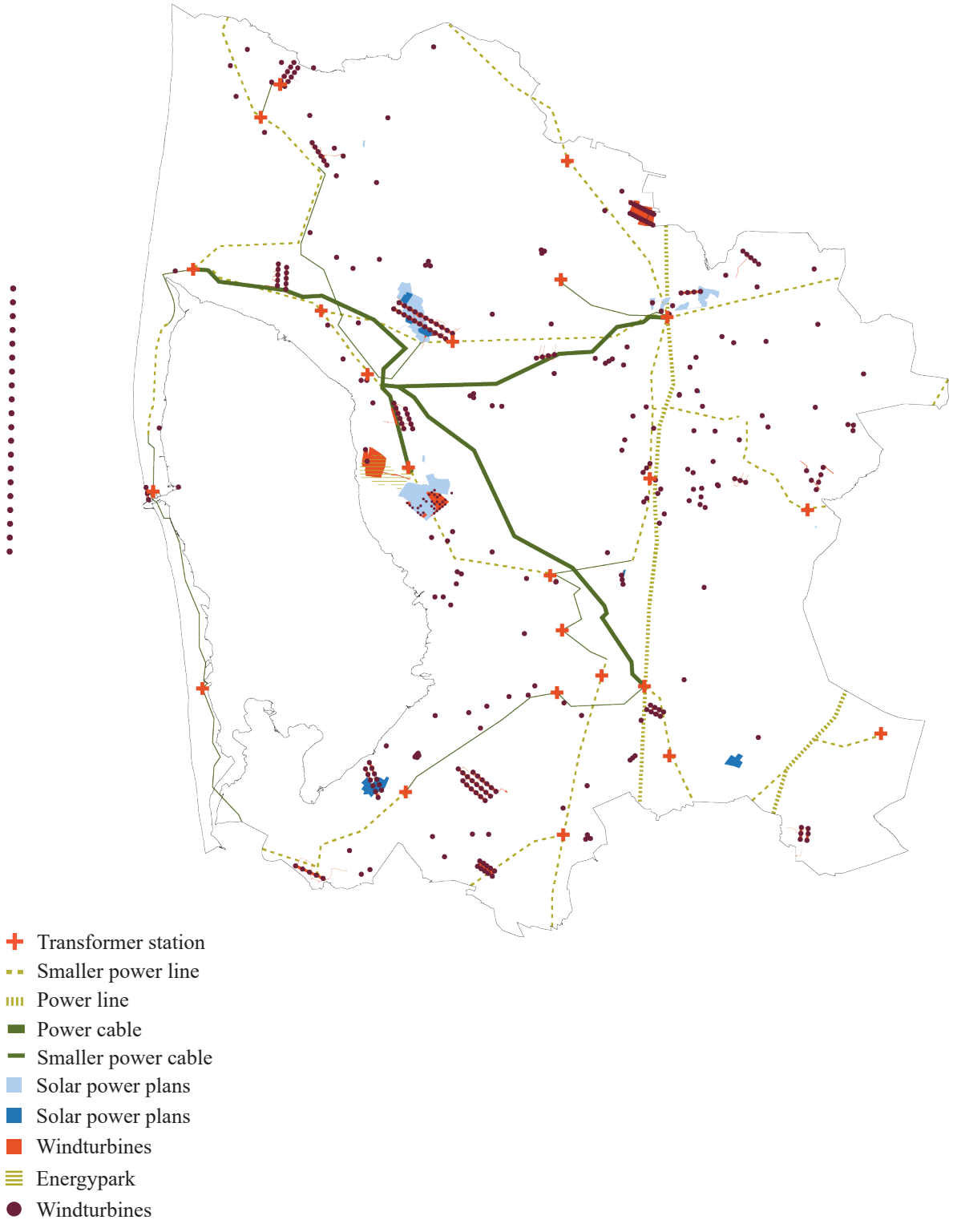
Goals regarding wind power

+ To create a basis for optimal utilisation of the wind resources in the municipality.
+ To promote local ownership of wind turbines.
+ To utilise the renewable energy from wind turbines efficiently and locally through Power-to-X.
+ To support the development and testing of wind turbines and related technology, the testing of wind turbine parts and of technology for storage and transformation of power and renewable energy.
+ To minimise the discomfort of the neighbouring citizens of wind turbines.
+ To consider the landscape, including the exemption of the most spectacular and vulnerable landscapes from wind turbines, as well as minimising the influence on cultural heritage.
+ To collect wind turbines in groups as big as possible so as few as possible areas are affected.
+ To support multifunctionality of projects regarding wind turbines by combining them with other climate initiatives such as the rewetting of drained lowlands, biodiversity initiatives, new nature and/or solar panels.
(Municipality Plan, 2023)

”Vi vil se på muligheden for enkelte nye vindmølleområder, men der skal være lokal opbakning til projekterne og stort fokus på borgerinddragelse, lokal accept og medejerskab.”
(Naturens Rige, 2023, p.27)

“I Ringkøbing-Skjern Kommune er vi ambitiøse på klimaets vegne. Med de store åbne vidder og den friske vestenvind har vi både muligheden for og pligten til at tage ansvar og producere langt mere vedvarende energi, end vi selv bruger. Den mulighed skal vi udnytte. Derfor skal der fortsat være mulighed for at etablere varierede typer af vedvarende energianlæg i det åbne land. I samarbejde med borgere og erhvervsliv vil vi arbejde for at sikre lokal indflydelse og medejerskab.”
(Naturens Rige, 2023, p.26)

Municipality planning regarding renewable energy



Ill. 34 Local plans for solar power and wind power facilities in the municipality

Megaton

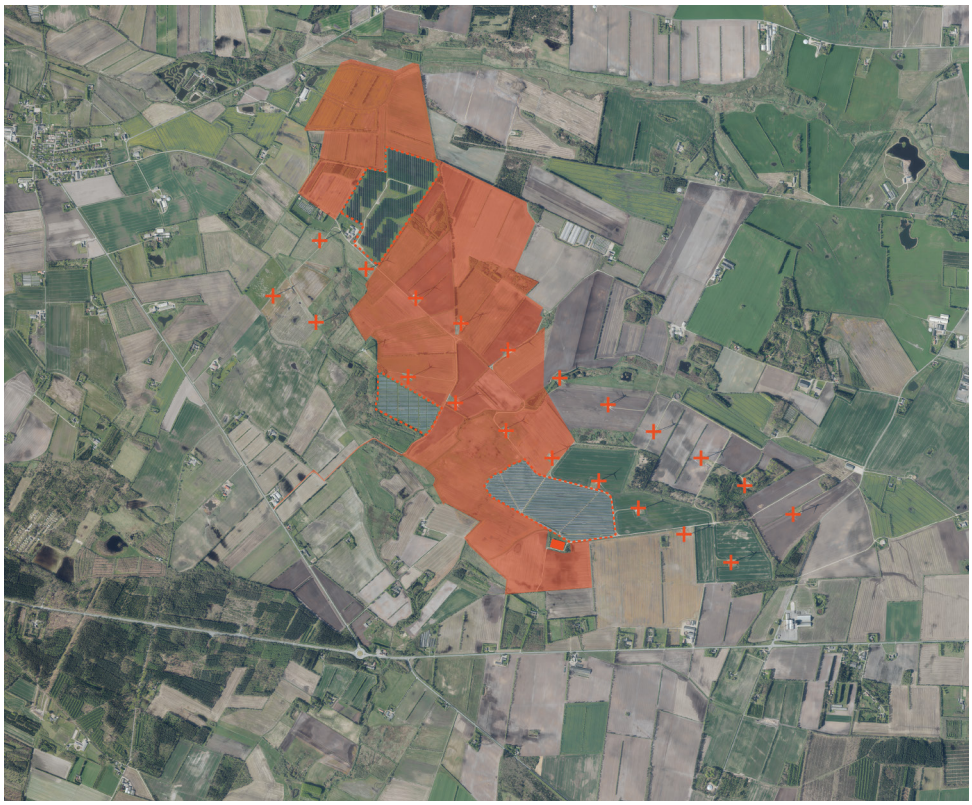
Ill. 35 Megatons connection to the surrounding landscape

GreenGo Energy and Ringkøbing-Skjern Municipality is developing a Power-to-X facility – Megaton. The facility will produce hydrogen utilising renewable energy from wind and sun power. The electrolysis capacity of Megaton will be 2GW, and the goal is to produce one-million-ton green fuel, hydrogen, each year by 2030 and forward.

Megaton will be placed in Stovstrup just east of Tarm, and beside the facility a new 400kV transformer station is being build.

A P2X-facility like Megaton needs to be fed 4GW, which in this case will be secured through GreenGo Energy's renewable energy portfolio, that will consist of 4.000 hectares land-based sun panels and wind turbines at different locations in the municipality, combined with 2GW energy from offshore wind turbine. The total investment in Megaton is expected to amount to 60 billion kroner. In addition, it is expected that 300-500 permanent jobs will be generated in connection to the energy park, the associated production of renewable energy and in affiliated industries. (Greengo Energy, n.d.)

A case study
Nørhede-Hjortmose Energy Park



Ill. 36 Nørhede-Hjortmose Energy Park

+ Windturbines
■ Potentiel Solar power plans

What: Denmark's biggest energy park with solar panels and wind turbines

Where: Nørhede-Hjortmose in Ringkøbing-Skjern Municipality

Total area: 57 acres

Solar power area: 25,64 acres with solar panels distributed on 35 acres of land

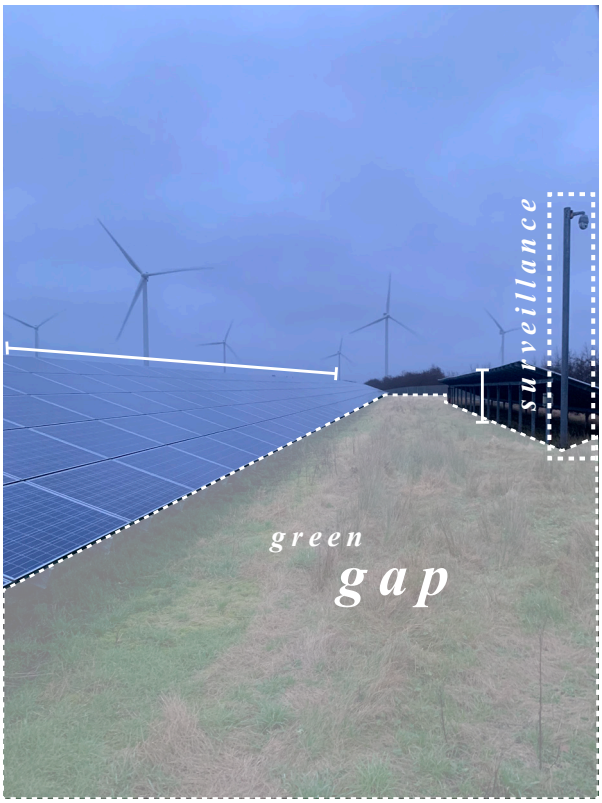
Wind power area: 22 wind turbines distributed on 22 acres of land

Planned total area: 453 acres

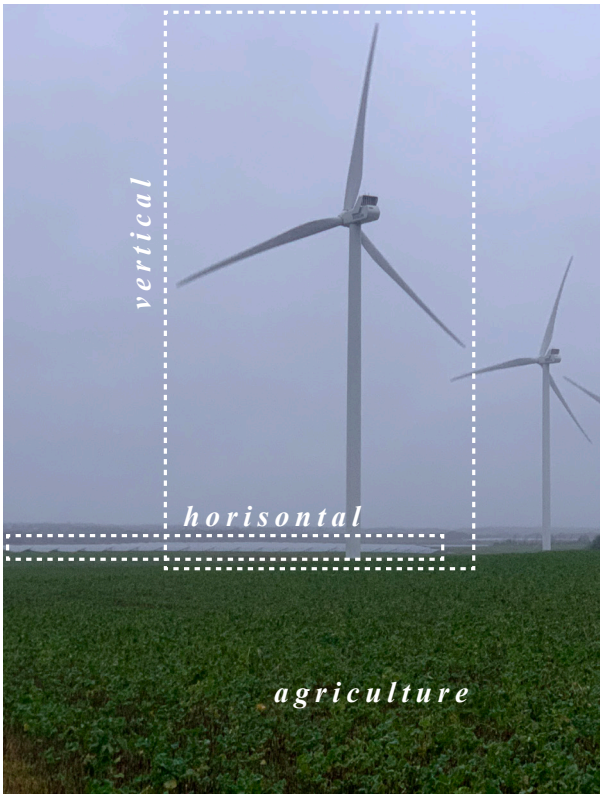
The energy park is experienced as hostile and uninviting. The solar panels are fenced off, there is surveillance, and the transformer station is captured in electric fence and barbed wire. When entering the area there are signs that ask you to turn around. When you observe the park from a distance the difference between solar panels and wind turbines is distinct – the wind turbines might not take up a lot of space, but they are visible from afar, while the solar panels lie horizontal and close the ground. With their black and grey materials, the solar panels are foreign elements in an otherwise green agricultural landscape, where the wind turbines blend in with the sky (especially on a dark and rainy December day). When you stand close to the solar panels, you'll find out that they are actually quite big – both horizontally and vertically – and they obstruct the visual connection to the surrounding landscape. Between the long rows of solar panels, you find broad green and uncultivated gaps.

There is potential in especially the green gaps between solar panels. They could either be functional – as for lowland restoration if the soil has the right properties – or for biodiversity purposes – they gaps could be treated as light open nature and big grassers could be introduced as nature care. There is also a potential in making the experience of the park more inviting.

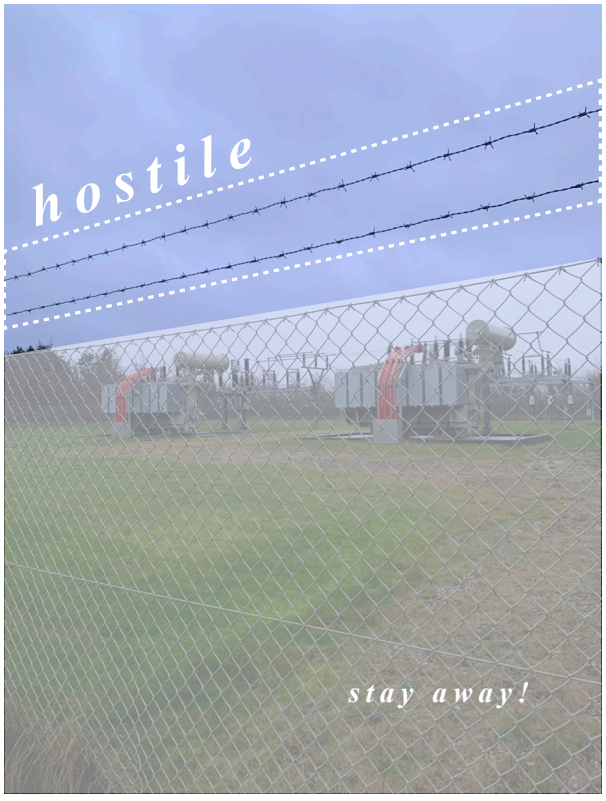
Ill. 37 Fences at Nørhede-Hjortmose



Ill. 38 Gaps between solar panels



Ill. 39 An overview over the energy park



Ill. 40 The transformer station

What is the plan?

Ill. 41 The Gestenge project site

The solar power facility in Gestenge will consist of 6 areas.

Area Ia, Ib and Ic

The areas will hold solar panels with accompanying technical installations, such as inverters, transformers, step-up transformers, connection stations, lightening conductors, weather stations and technical buildings. (Ringkøbing-Kommune, 2022)

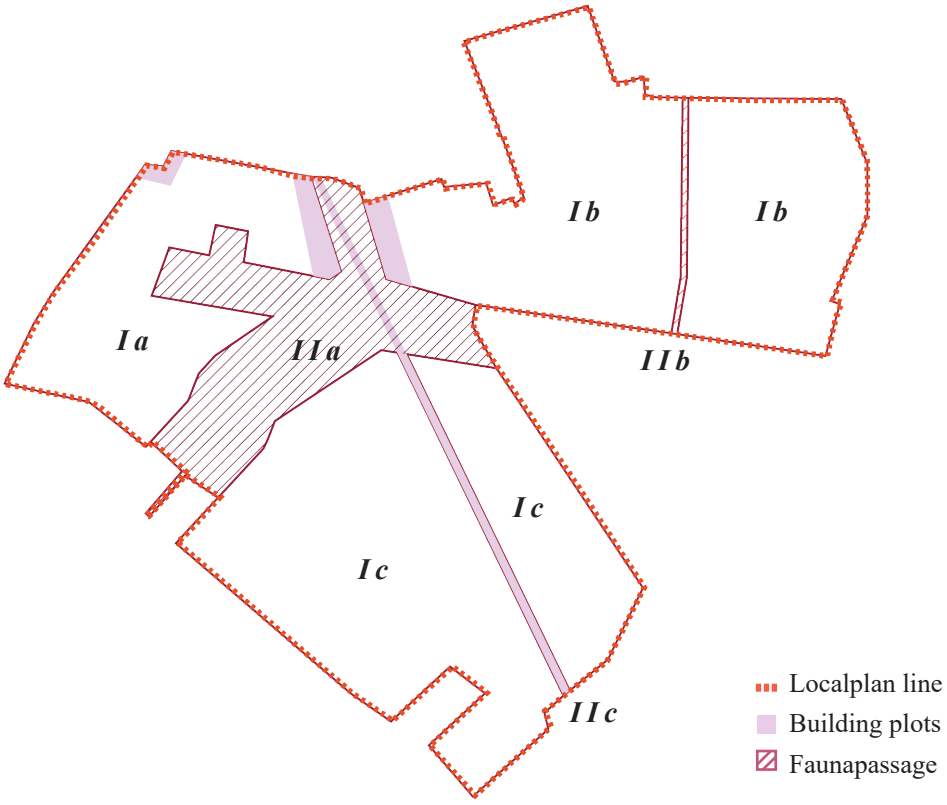
Area IIa

The area is reserved for fauna passage and continued agricultural cultivation of the land. The area must be kept free of solar panels and other technical equipment. (Ringkøbing-Kommune, 2022)

Area IIb and IIc

The areas are reserved for fauna passage, and must be kept free of solar panels, buildings, fence and roads. The areas with technical equipment will be fenced in. To minimise the visual nuisance of the facility the developer plans to keep existing hedgerows in the perimeter of the project site, and plant new hedgerows where there is non today. The new hedgerows will have a height of 7-8 metres when the trees are fully grown. The existing hedgerows in the areas with solar panels will be cut down.
(Ringkøbing-Kommune, 2022)

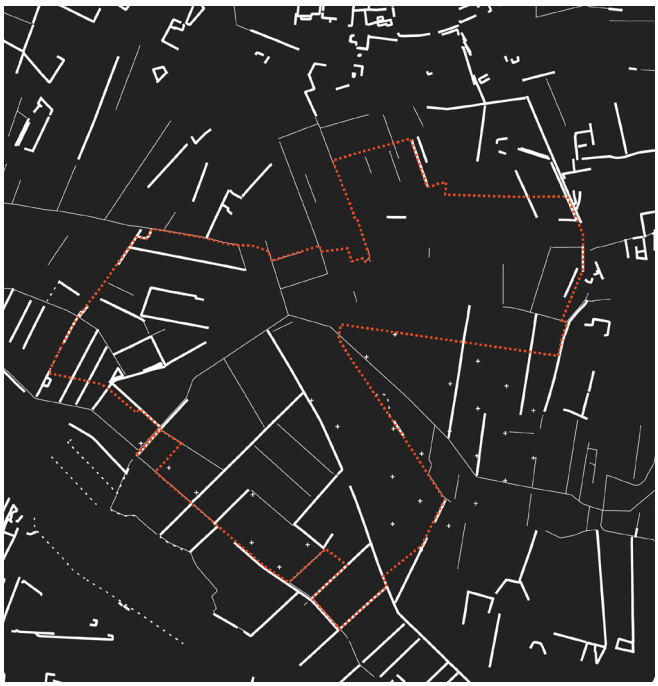
There are multiple potentials in the plan for the future solar power facility. First of there is area IIa which is minimum 30 metres wide. The plan allows agricultural practice, there is however a huge potential in just letting it be, and instead adding a corridor of nature value to the site. The width of the fauna passage is non-negotiable – it is set in respect of a water way protection line. By restoring the water way and caring for the nature value around it, it could act as a ecological corridor. There is also potential in letting the culture historic elements like the hedgerow and the old wind turbines stay, thus connecting the energy landscape to what once was.



Ill. 42 Areas in the Gestenge Project

Ill. 43 Hedgerows around the future solar power facility

Experiencing Gestenge



Ill. 44 The traces of present and former use isolated

Notes from fieldtrip

Gestenge lies in flat terrain, and the fields spread out in big open areas. It is windy, and hard to find shelter. The trees in the hedgerows tilt because of the wind. Most of the fields have been harvested. Most of them held corn. Some patches of corn still stand. The soil underneath is wet. Perhaps, to wet to harvest in? Dirt tracks run along the straightened-out waterway. There are traces after big vehicles – tractors probably and big machines for taking care of the old wind turbines. The sky over the fields is big, and the horizon is cut straight. Over the top of my head comes gigantic flocks of geese, they overpower the noise from the wind turbines. Here and there small trees and plants sprout up between the cultivated areas. The hedgerows frame the fields and cuts the view when you come close. The wind turbines act as the only vertical element in the landscape. Otherwise, everything is flat, big and stretched out.

The landscape is a production landscape – it produces crops and wind power. In that line it makes sense that it will become an energy landscape – it is just the next step in the landscape's evolution. The culture historic traces are strong – you have the hedgerows, the drain ditches, the wind turbines and the open and visually accessible landscape. There is landscape value in these elements, and there is a big potential in including traces of what once was and is now in the future landscape. This way the landscape acts as a storyteller supporting the local communities identity.

Ill. 45 The road to Gestenge

Ill. 46 Deer prints in the soil

Ill. 47 Small bushes popping up

Ill. 48 The horison

Ill. 49 The straighened water wat

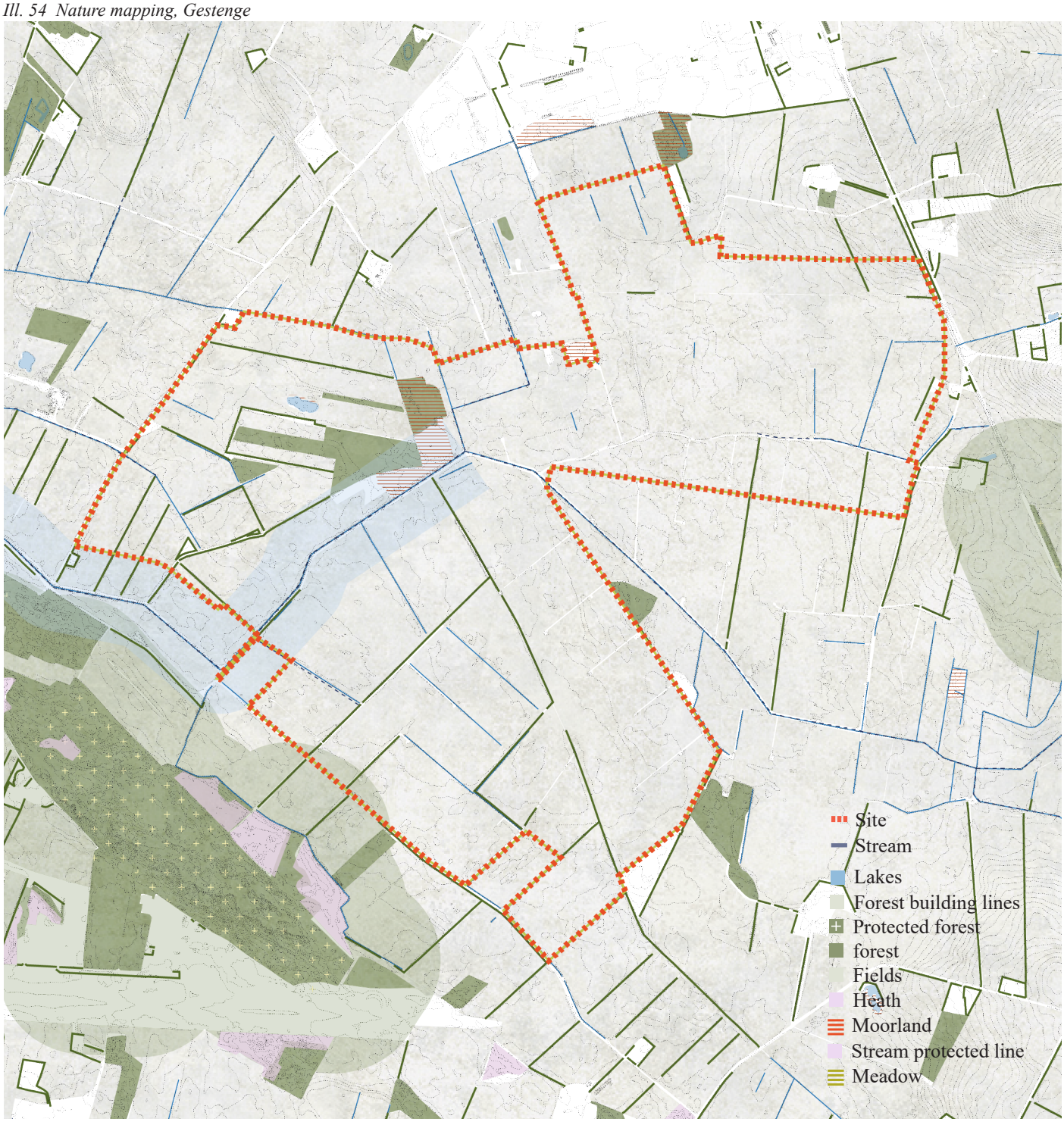
Ill. 50 Lines of Gestenge

Ill. 51 Windswept hedgerows

Ill. 52 Geese in the sky

Ill. 53 Deep tractor tracks in the mud

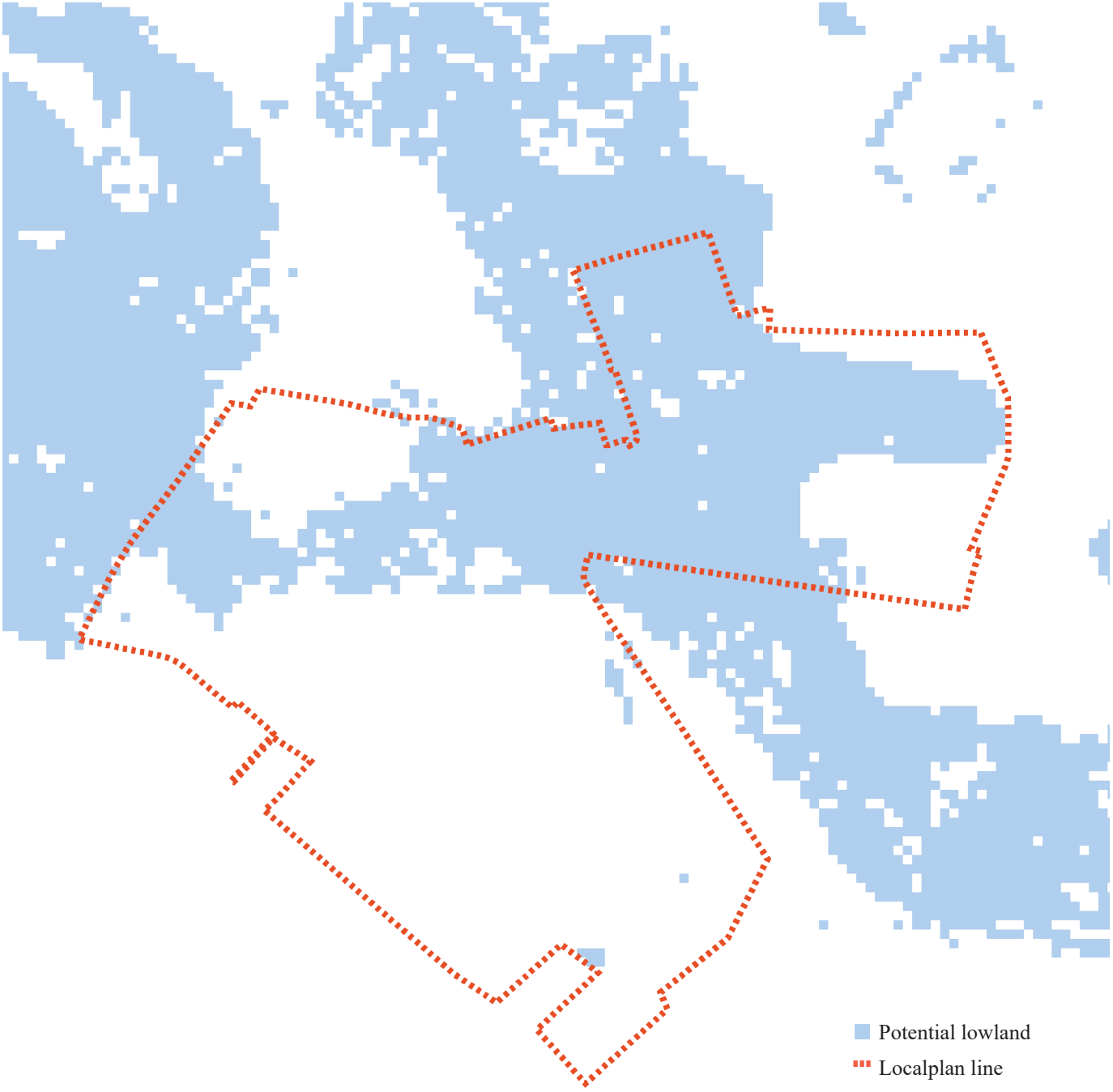
Ill. 54 Nature mapping, Gestenge



Gestenge lies at the foot of the hill islands. The terrain is flat. When I map out the traces of nature in the landscape, it stands out as fragmented pieces scattered over a vast area of cultivated fields. South-west of the site there is a small plantation with patches of heath. On the site there is a protected water way, and a small moorland area, as well as small groups of trees. The area is drained into small drain ditches, and the hedgerows line the fields – both are elements of the agricultural industry but also lend some nature value to the site. There is a potential in cultivating the small patches of nature on site. If we prioritise nature, the sites nature value would increase, which in turn would affect the biodiversity of the site and the surrounding nature areas positively.

A former lowland

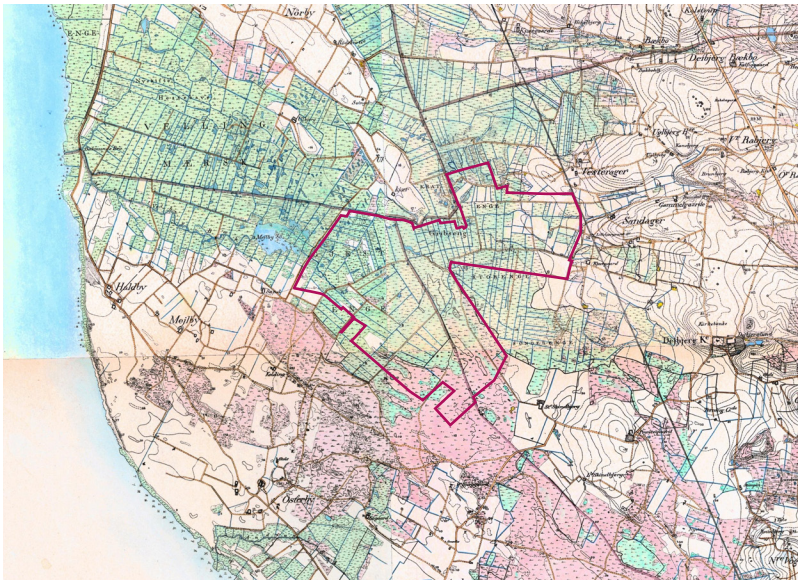
Ill. 55 Lowland restoration potential, Gestenge



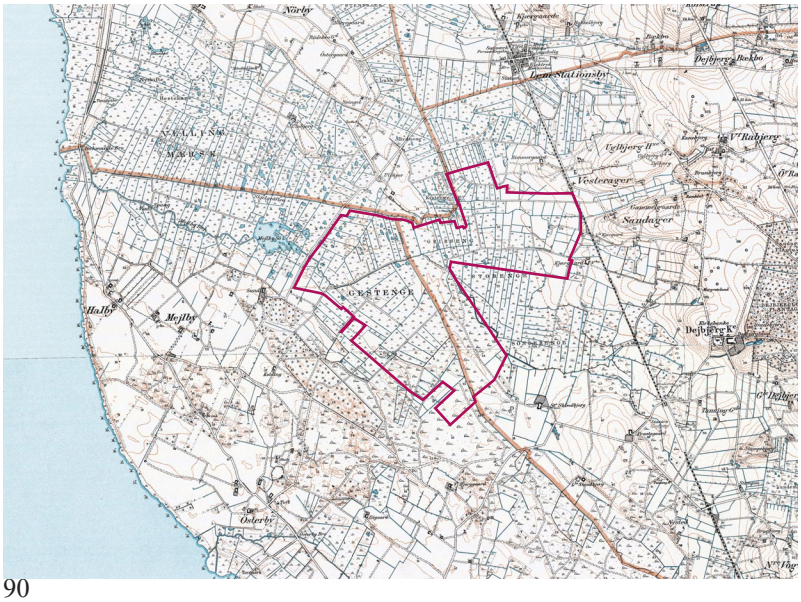
To accommodate the many other demands of the Danish land I have screened the area for its potential of becoming a restored lowland, that can sequester CO2 if the drains are cut – the many drain ditches and pump houses in the surrounding area as well as the mere name of the area - Gestenge - suggested that it might be a relevant analysis. Data shows that parts of the land that holds the project site contains peat, and therefore could a rewetting of the soil be relevant. There is a huge potential in creating a multifunctional landscape – both in terms of the climate crisis and the experience and identity of the landscape it self.

Historic mapping

Ill. 56 Videnskabernes Selskabskort (Jylland Vest (Ringkøbing), Videnskabernes selvskabskort, CC BY 4.0, Klimadatastyrelsen)



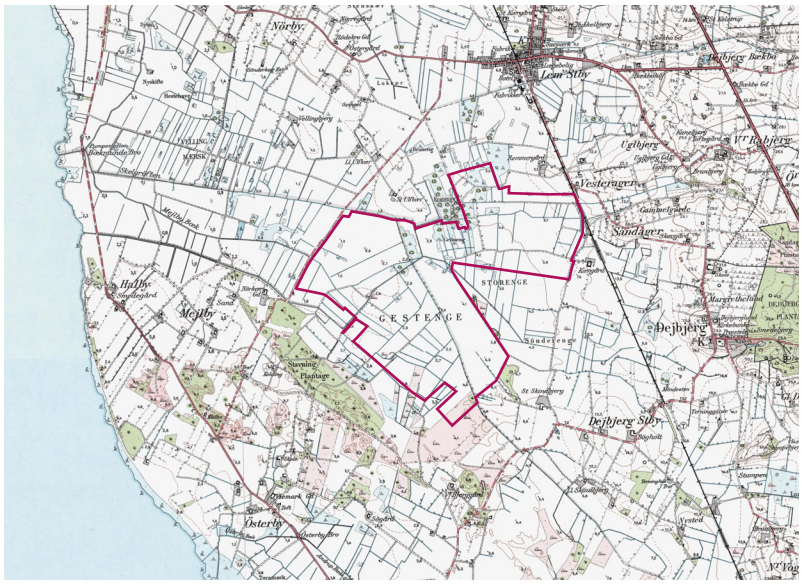
Ill. 57 Høje Målebordsplader 1862-1899 (Høje målebordsblade fra perioden 1862–1899, CC BY 4.0, Klimadatastyrelsen)



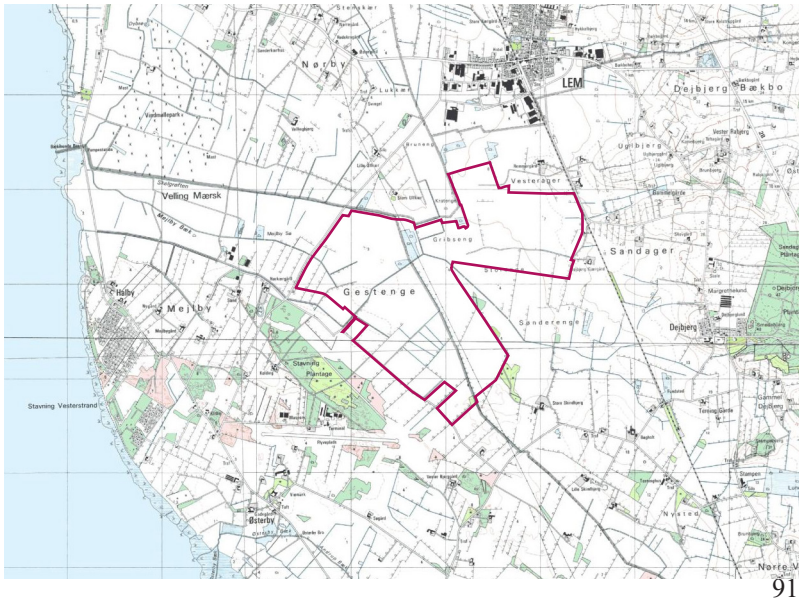
Ill. 58 Lave Målebordsplader 1901-1971 (Lave målebordsblade fra perioden 1901-1971, CC BY 4.0, Klimadatastyrelsen)

When comparing maps from different time periods, it is easy to see how the landscape went from having a high nature value to becoming an agricultural landscape. On Videnskabernes Selskabskort the area is mainly registered as meadow and moorland. Just north of the area you find Mejlbysø. Which perhaps is the best indicator of how the landscape has evolved. From map to map the lake becomes smaller and smaller until it is completely gone. It is also visible how the agricultural industry has evolved by – as the years go the number of drain ditches becomes smaller and smaller. When looking at the maps it is clear that it is not only Gestenge that is being drained it is in fact the entire area that once maninly consisted of wet nature types.

There is potential in learning from the past, both in terms of landscape value and nature cultivation. It is clear which nature types are natural to the land, and thus fits the area the best. By learning from past mappings of the landscape you can base landscape development on both existing characteristics and past qualities, thus tying the future energy landscape together with what is and what once was.



Ill. 59 Danmarks topografiske kortværk 1953-1976 (Danmarks Topografiske Kortværk (1953 - 1976), CC BY 4.0, Klimadatastyrelsen)



Ill. 60 Danmarks topografiske kortværk 1980-2001 (Danmarks Topografiske Kortværk (1980 - 2001), CC BY 4.0, Klimadatastyrelsen)

Remarks and objections regarding Geestenge

In connection with the approval of the local plan for the solar power project in Geestenge citizens have had the opportunity for submitting remarks and objections as a matter of standard local plan procedure. The municipality received 9 remarks from citizens (Ringkøbing-Skjern Kommune, 2022) – marked with crosses on the illustration to the right. I have read all the remarks and categorised the themes that kept recurring.

Valuable farmland
Biodiversity and nature
Property value
Ownership
User involvement
Community well-being
(categorization based on Ringkøbing-Skjern Kommune, 2022)

The citizens who have sent in remarks regarding the local plan are generally unsatisfied with the project. They are especially concerned with the loss of valuable farmland and their properties decreasing in value. When reading the remarks it is unmistakable that the process has been long, and the citizens have participated in multiple public meetings and have engaged in the process but have felt that their opinions, concerns and feelings haven't been taken seriously.

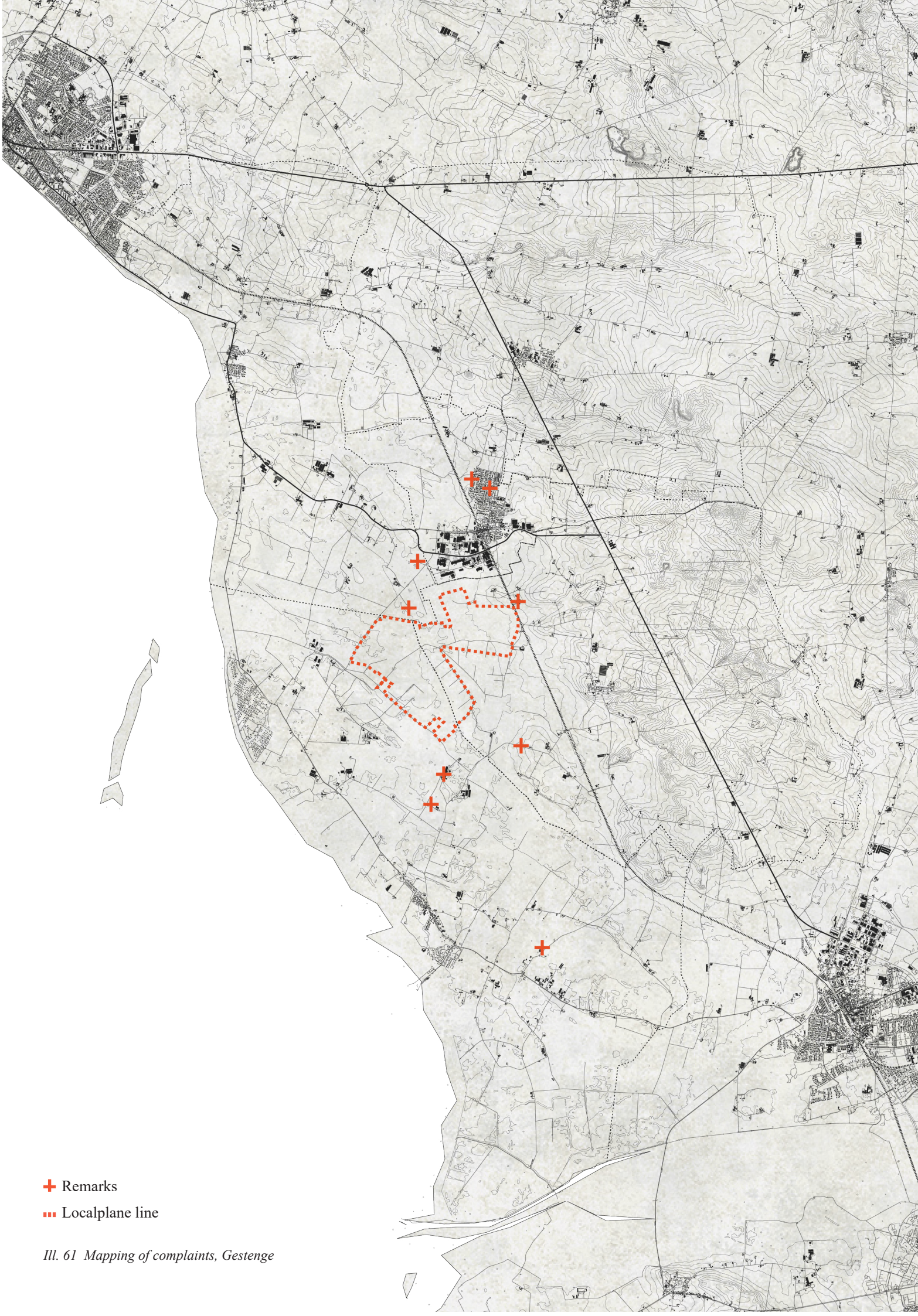
"*For anden gang laver vi nu et høringssvar ang. gestenge solcellepark. Sidst blev det til to lange høringssvar fra vores side. Vi har også lavet læserbrev til dagbladet i løbet de par år, hvor processen har været igang. Hvad skal man så nu skrive denne gang? Følelsen af at løbet er kørt og folk i lokalområdet er blevet metaltrætte ovenpå en lang trættende proces er stor. At føle ikke at blive hørt, at føle at dette projekt fra byråd og projektmagere bare skal køres igennem, at føle have lavet en masse lokal fodarbejde uden at føle sig hørt, at føle at processen på bagsiden har været meget uskøn.*"
(Written by the citizens living at Dejbjergvej 18 (Ringkøbing-Skjern Kommune, 2022))

The sentiment above recurs multiple times in other remarks. Some people are also concerned about the well-being of the communities:

"Er der overhovedet plads til flere grønne projekter i vores område, lem kjær -tændpibe, når vi gerne vil styrke lokalområdet og ikke skabe splid?"
(Written by the citizens living at Dejbjergvej 7 (Ringkøbing-Skjern Kommune, 2022))

The process that precedes the actual erection of renewable energy facilities is long and often emotionally charged – some land owners earn a lot of money, some people earn nothing but has to deal with the visual nuisances, some people fear for nature, some people fear for agriculture and food production – the list is long and also quite specific to the people that live in the vicinity of renewable energy productions. The loss of good farming land would for example not occur on my list of concerns if I was in the same situation.

A lot of damage has already been done – especially when it comes to the involvement of the local communities. Many of the things that are mentioned in the remarks lie beyond the scope of this thesis. The comments on nature, however, holds potential. The municipality and developer promise wildlife passages and focus on nature protection and biodiversity but hasn't gone into detail beyond the allocation of areas. Also, the concern for the common well-being of the community holds potential. Not because of the discord itself of course – that is terrible – but urban design, placemaking and a common goal could perhaps salvage some of the damage that has been done.



Ill. 61 Mapping of complaints, Gestenge

Friskvind
A village cluster

If you offset the outline of the solar power project in Gestenge corresponding to the 4,5 kilometres dictated by the municipality, you'll be able to see which local communities will be prioritised when applying for the funds available through Grøn Pulje. Within the 4,5 kilometres radius you find five villages – Lem, Velling, Højmark, Dejbjerg and Stauning – as well as an area with vacation houses – Halby. The five villages are coincidentally organised in a village cluster called Friskvind.

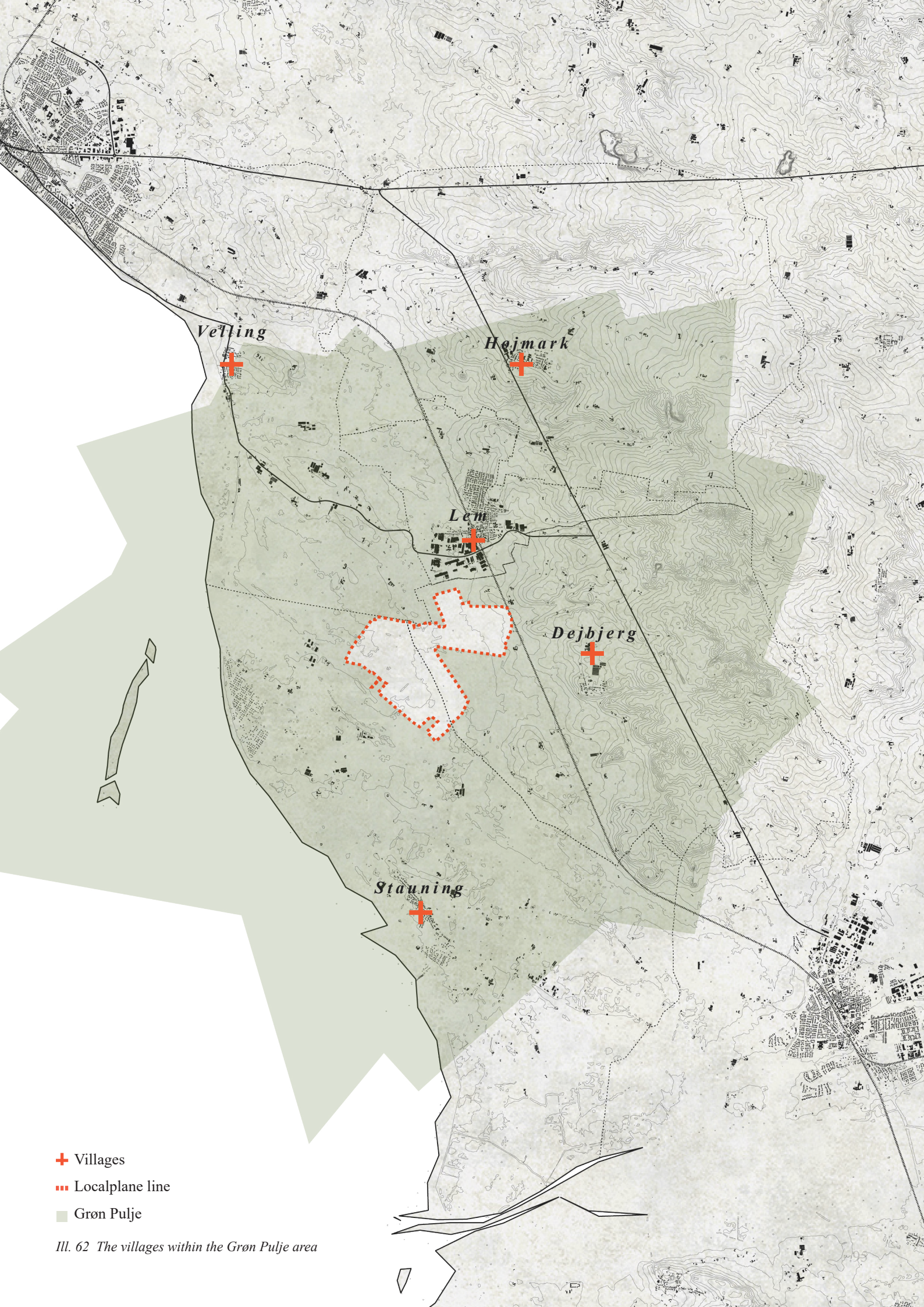
A village cluster is a way of organising the collaboration between villages in the same area. This way, the small communities become collaborators instead of competitors and are able to support each other regarding the challenges of living in rural areas. Laurasen, Frølund & Johansen describe village cluster as

"*Et antal landsbyer, i relativ nærhed af hinanden, der har en form for fælles stedsidentitet og socialt fællesskab, og som samarbejder på flere områder, i en netværksstruktur, der ikke udelukkende er del af den kommunale organisation, hvor de benytter hinandens styrker og udfordringer, samt borgernes evner, viden og erfaring, til at udvikle den individuelle landsby udover dens egne potentialer, og hele klyngen."* (Laursen, Frølund, Johansen & Christiansen, 2015, p.8)

A village cluster is thus a strategy within rural development, where focus is on the interdependency between neighbouring villages.

The five villages in Friskvind where prior to their engagement in the village cluster relatively well-established and autonomous. The village cluster collaboration has strengthened and maintained the positive development across the villages. Friskvind has worked with different initiatives relating to sport, recreation, culture, events, nature, infrastructure etc. The village cluster has tried to connect the villages through nature paths, but landowners haven't been willing to give consent. Instead, the village cluster has created events with pop-up routes with great success. (Laursen & Hald, 2023)

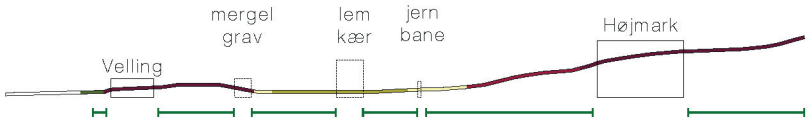
The village cluster has several existing and well-established meeting places in the different villages. Instead of creating a new common village cluster meeting place they have funded what they have dubbed the Rolling Meeting Place, that consist of 3 trailers – one trailer with a kitchen, another trailer can transform into a toilet and the last trailer can be utilized as a stage. The mobile meeting place allow the village cluster to create events in nature and in the different villages. On the next pages I will first investigate the village cluster as a whole, and second, I will zoom in on each village to map out their village spaces and the landscape spaces closely connected to the villages. The analysis of the villages is inspired by the methods applied by Olsen & Lanng (2023) in their report on villages spaces.



Ill. 62 The villages within the Grøn Pulje area

Friskvind
Terrain & geology

The landscape was formed by the glacial periods. During the last glacial period the icecap didn't cover the entire country – to see the lines go to page x and look at illustration x. As the ice began to melt the meltwater washed over the area and dispersed sand creating a landscape consisting of outwash plains and hill islands. The different landscapes are evident within the area of the village cluster – depending on whether the cross section runs along the fjord (north-south) or cuts through the fjord (west-east) two totally different landscapes are revealed. Dejbjerg and Højmark are both situated on top of the hill island, Lem lies just at the foot of the hill island and Velling and Stauning are situated in very low-lying terrain just at the edge of the fjord.



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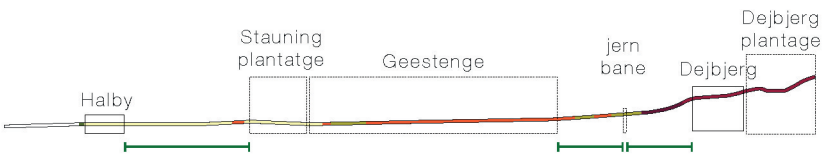
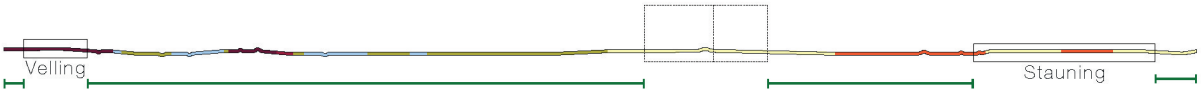
Ill. 64 Section BB 1:80000



Ill. 65 Section CC 1:80000



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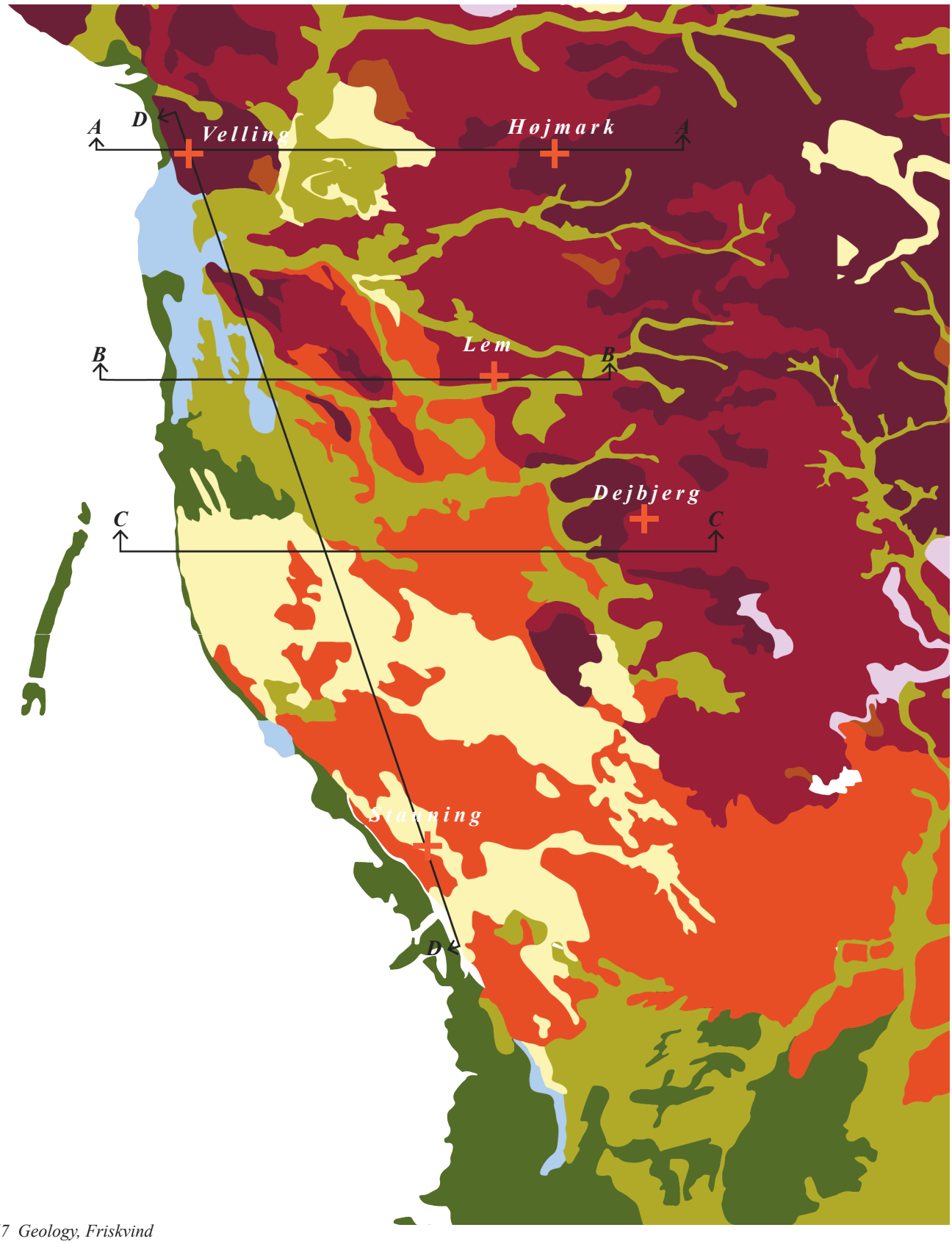
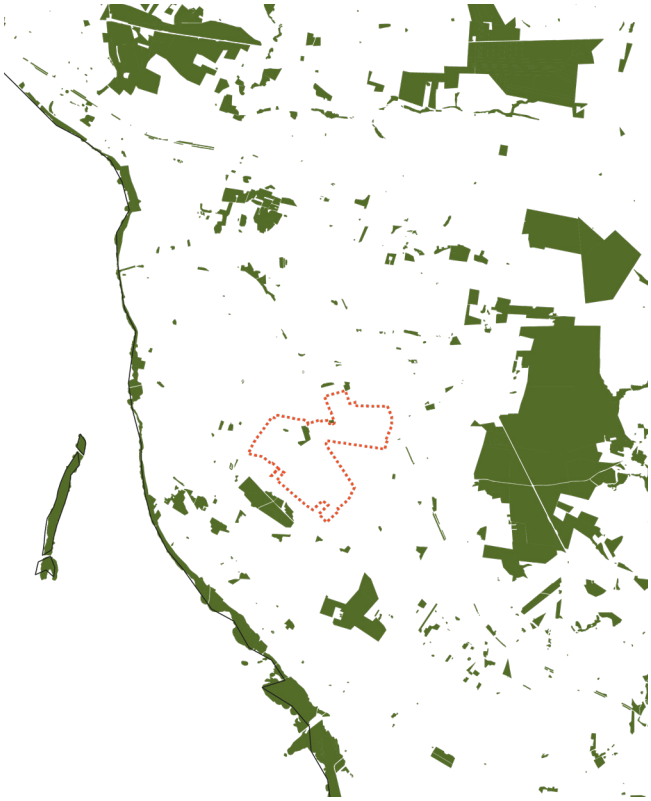


Ill. 67 Geology, Friskvind

Friskvind
nature & landscape

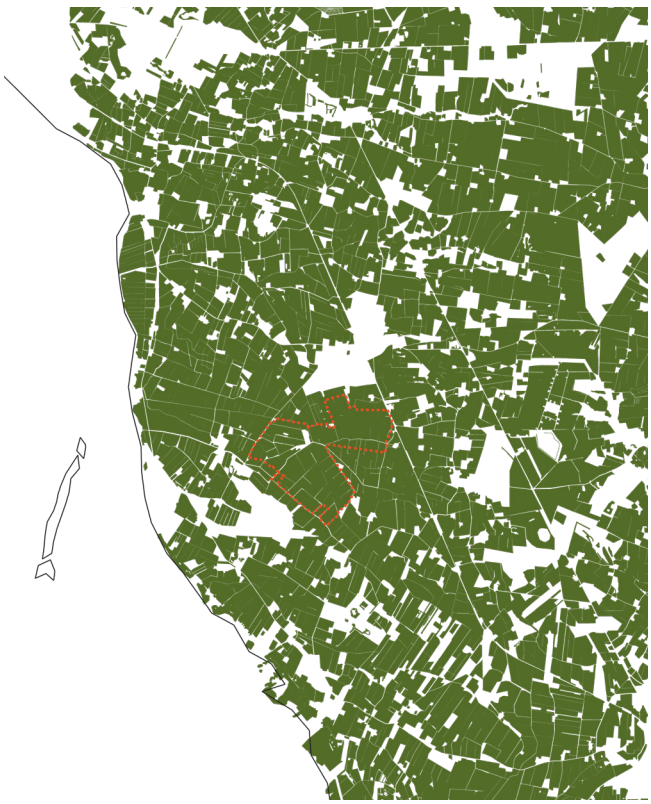


Ill. 68 Protected nature isolated, Friskvind

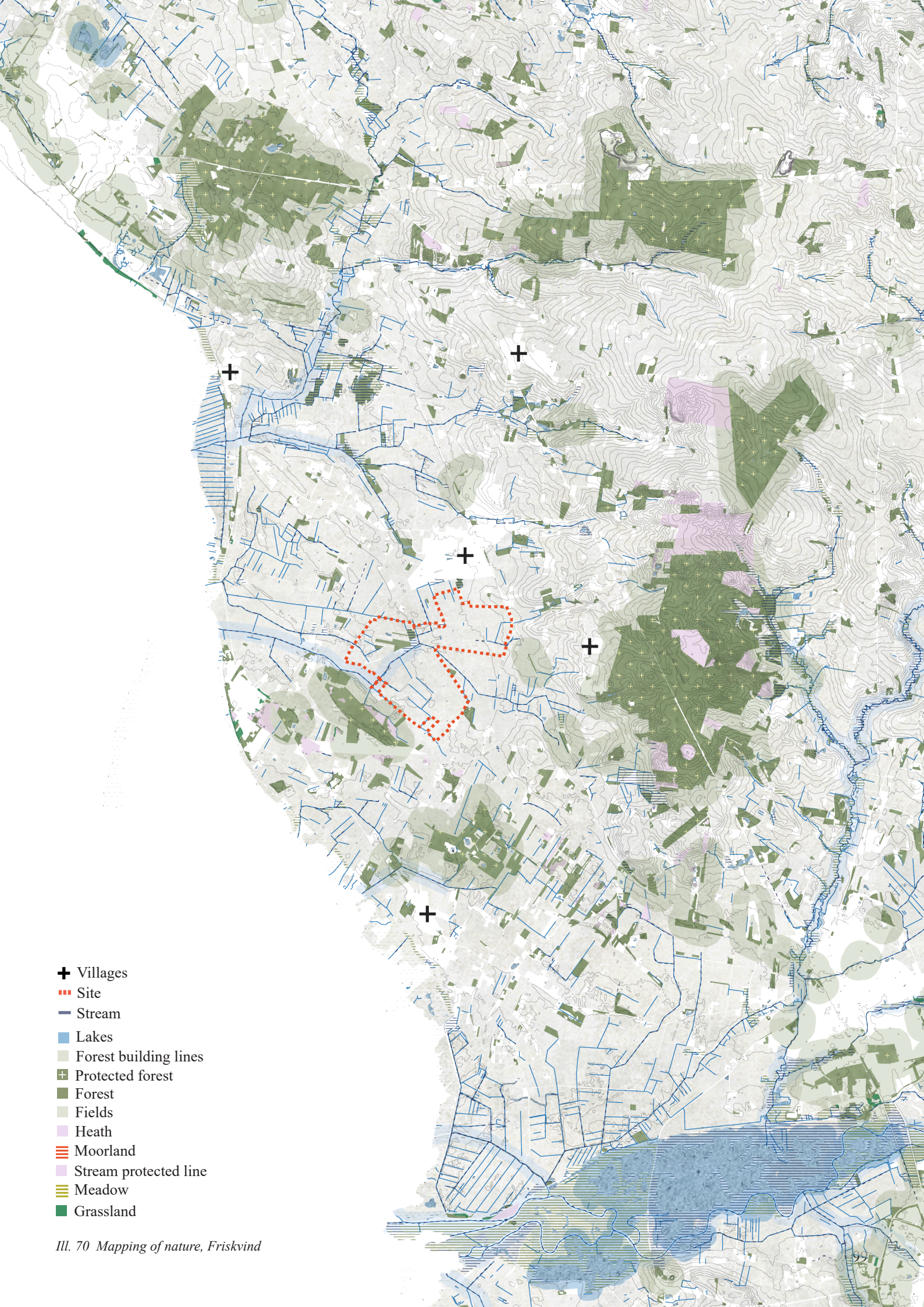
The landscape around Ringkøbing Fjord has high value. Large parts of the fjord and the coastline is protected as NATURA 2000 habitat areas as well as NATURA 2000 bird protection areas. Both Velling and Stauning are situated by the coast and have the nature quality of the fjord just outside the village border. Dejbjerg and Højmark are both situated on higher terrain and therefore have a visual connection to the fjord from selected points. The landscape down towards the fjord is mainly classified as beach-meadow, which many places are covered by canebrakes. The nature type is wet, and the fjord is only accessible at certain spots along the coast. There is a development strategy in increasing the accessibility of fjord through different recreational initiatives both between and in Velling and Stauning.

The area is characterized by plantations in various sizes – Velling Plantage, Mourier Petersens Plantage, Løvstrup Plantage, Stauning Plantage and Dejbjerg Plantage are all categorized as fredskov. Especially Dejbjerg Plantage holds big natural and recreational value because of the connected heath areas. The plantations are a cultural trace just as well as a nature and landscape element, due to the history of the cultivation of the heath.

When you move inland from the fjord most of the landscape is cultivated. Only small patches of §3-nature are scattered around the area. If you isolate §3-nature and fredskov and compare it to fields marked as cultivated the difference is stark. The §3-nature is fragmented and there is a potential in connecting the blue and green structures. Connecting the nature patches would benefit biodiversity, but could also utilize as a recreational connection, thus activating the existing nature values for people to enjoy.



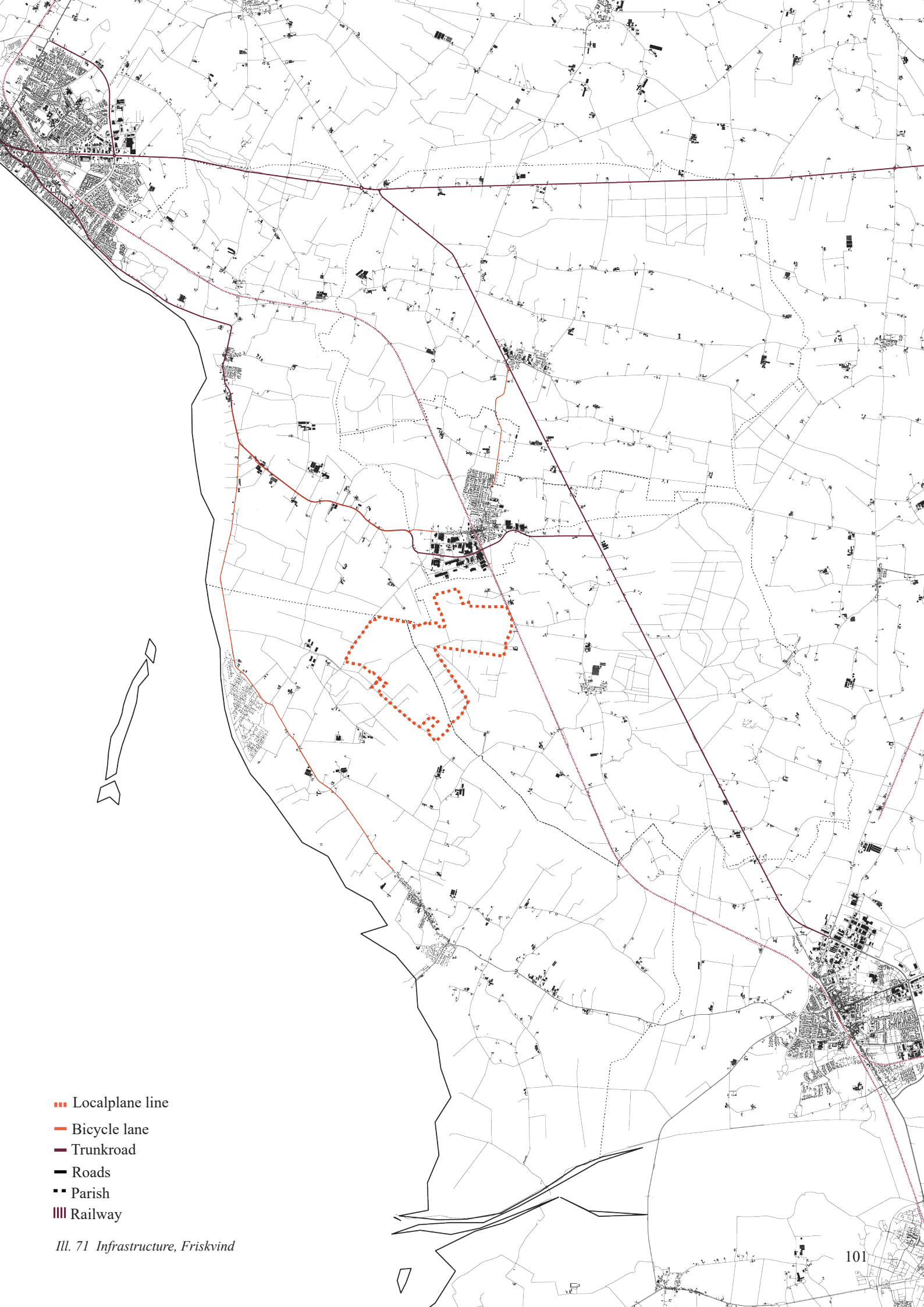
Ill. 69 Agricultural fields isolated, Friskvind



Ill. 70 Mapping of nature, Friskvind

Friskvind Infrastructure

The villages are well connected within the village cluster through an extensive network of small country roads. Højmark, Lem and Dejbjerg all lie connected to or in the vicinity of the trunk road (statsvej red.) that connect Ringkøbing and Skjern. The railroad that runs between Ringkøbing and Skjern cuts the area in two and runs through Lem, where there is a station still in function. All villages have bus stops that are still in operation. The area doesn't have an extensive network of paths for recreational purposes. Velling and Stauning are connected by a bike path that is part of a bigger bike network that runs around the fjord. Velling and Lem are also connected by a bike lane. Both bike routes run beside the roads. There might be a potential in connecting the village cluster through recreational connections that are connected closer to the nature qualities in the area



Ill. 71 Infrastructure, Friskvind

Friskvind
Renewable energy facilities

Ill. 72 Lem Kær Møllerne

Ill. 73 Gestenge Møllerne

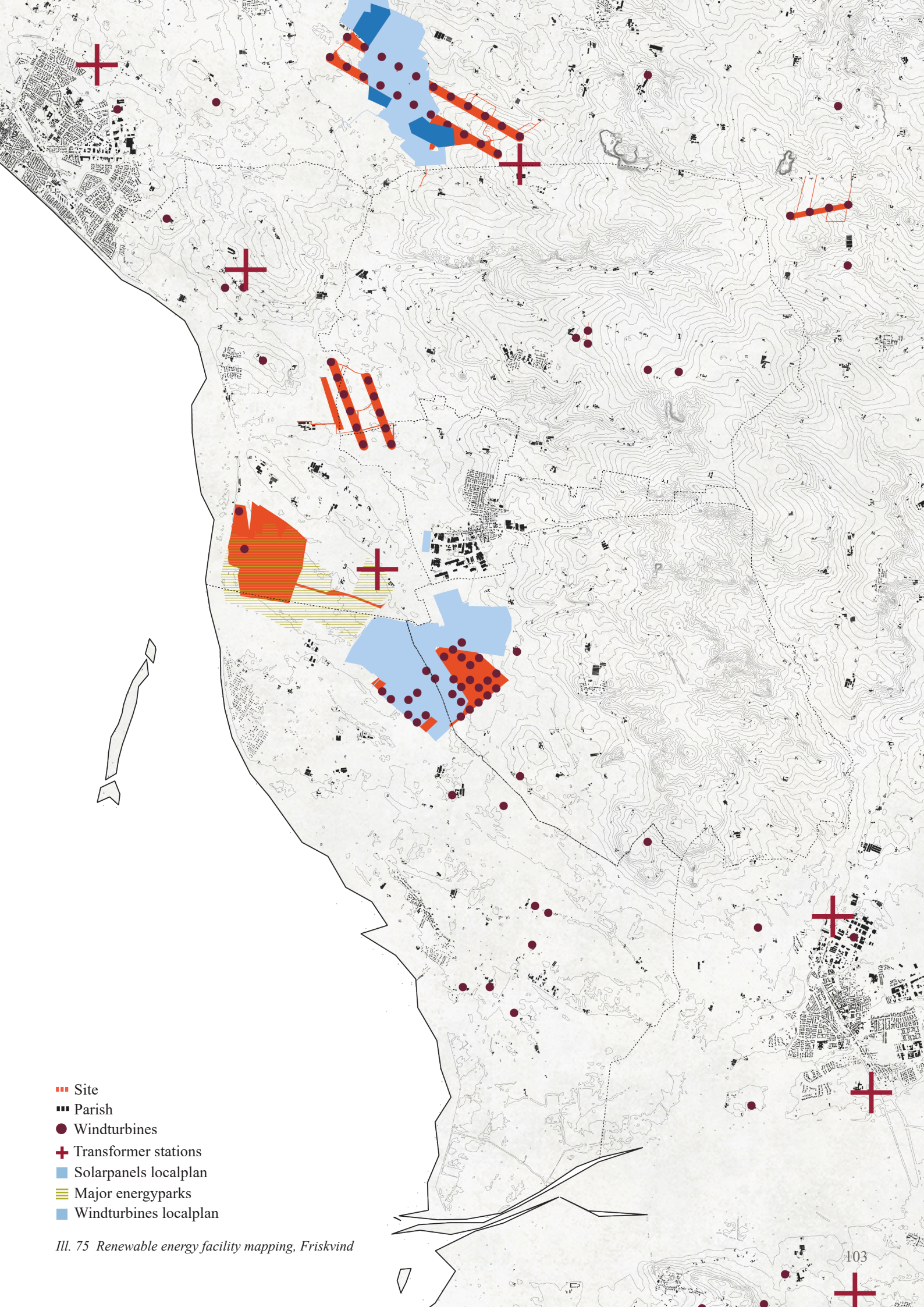
Ill. 74 Tændpibe møllerne

The inhabitants in the village cluster aren't strangers to renewable energy facilities. In fact, wind turbines have been a stable part of the landscape in the area for many years. Most notable are the two groups of wind turbines – Lem Kær Møller and Tændpibe Møllerne. The wind turbines erected in these areas are all wind turbines put up for testing. In Lem Kær the wind turbines are around 150 metres tall while the wind turbines by Tændpibe are 200 metres tall – all of them are visible from afar.

In the area where the Gestenge solar power facility are planned you find wind turbines of an older model today. The wind turbines were put up in 1997 and are only around 45 metres tall.

When you compare the wind turbines you get an understanding of the rapid development of the technology – in under 30 years the wind turbines have grown 150 metres or more. Last month, they put up a wind turbine in Thy that was 300 metres. In a region like West Jutland wind turbines are just as much a piece of cultural heritage as pump houses and hedgerows. Perhaps there is a potential in the wind turbines in Gestenge that are worn out and will be taken down when the solar power facility is put up?

Just north of the area you find Nørhede-Hjortmose energy park mentioned earlier in this chapter.
When you map out the occurrence of renewable energy in the area it is quite obvious that whereas wind turbines are normal solar powers are foreign. It is a new element added to the landscape. Which might affect the opinions of the local communities.



Ill. 75 Renewable energy facility mapping, Friskvind

Renewable energy facilities in the village cluster

"Jeg forstår godt, at vi skal have flere vindmøller og solceller... men hvorfor skal de alle sammen være herude? Jeg gad godt høre hvad Københavnerne ville sige, hvis de fik møller i baghaven."

- Kvinde ude foran MinKøbmand i Stauning

"Tændpipe-møllerne er faktisk begyndt at glæde mig... lidt, haha! Når jeg ser dem, så ved jeg, at jeg snart er hjemme."

- mand ude foran MinKøbmand i Velling

What do people actually think of all the renewable energy facilities in the area? Well… they are not happy.

To investigate the opinions about renewable energy facilities in the area, I've conducted informal Vox pops in front of the grocers in the villages – I asked what people thought of the wind turbines and solar panels – both those already there and those that are to come – in the area. The responds I got wasn't straight out positive, but they weren't all negative either, some even use them as landmarks.

Now, people in West Jutland weren't that talkative, so to complement the few answers I got, I also turned to the media. The television show Signe Molde på udebane made an episode about the renewable energy controversies in RKSK municipality in November – the episode is called Signe Molde på udebane: Skrid med jeres vindmøller (2024). In the episode the journalist Signe Molde talks with people who are fighting against Megaton and the renewable energy facilities that are connected to the Power-to-X facility. The name of the episode reveals that the people interviewed or filmed voicing their opinions, for the most part don't want any more renewable energy facilities in their area. When you listen to their reasons for not wanting anymore renewable energy facilities in their area, especially two arguments stand out – they fear that they'll lose their landscape – and with it, some of their quality of life – and they don't feel like they have a voice in the discussion. The idea of financial compensation isn't received well either – one of the interviewed women goes as far as calling it blood money (judas penge red.). (Signe Molde på udebane: Skrid med jeres vindmøller, 2024)

"Og det er judaspenge man får, fordi man accepterer noget, som er forkert. (...) Vi taler ikke kroner og øre. For os er det helt andre ting. Det er landskab, det er stilhed, det er sjælefred, det er horisonten, det er høj himmel."

- Birgitte Vinding
(Signe Molde på udebane: Skrid med jeres vindmøller, 2024, min. 07.53-08.18)

"Jamen, altså... Jeg er måske sådan lidt afskrækket i den modstand der er mod vindmøllerne, fordi det er jo på en eller anden måde... på en eller anden måde os, som skal bo i det her, i fremtiden."

- ung mand til borgermøde i Stauning
(Signe Molde på udebane: Skrid med jeres vindmøller, 2024, min. 17.30-17.40)

"Altså, jeg er utilfreds med den måde man vælger at bruge... Vestjylland på. Som det er os der skal tage al skraldet for at andre kan føle, at de kan pudse deres klimaglorie."

- Birgitte Vinding
(Signe Molde på udebane: Skrid med jeres vindmøller, 2024, min. 01.50-02.30)

"Man tænker bare: jamen... hvordan skal man kunne... hvordan skal ens stemme kunne blive hørt."

- Eva Lauritsen
(Signe Molde på udebane: Skrid med jeres vindmøller, 2024, min. 03.40-03.45)

"Hvis man plastrer det til med solceller og vindmøller... jamen, så er der ikke længere noget ved at bo på landet"

- ung kvinde til borgermøde i Stauning
(Signe Molde på udebane: Skrid med jeres vindmøller, 2024, min. 12.05-12.05)

Stauning Impressions

Ill. 76 Houses along the mainstreet

Ill. 77 The fjord landscape

Ill. 78 Impression from Stauning Harbour

Ill. 82 From Stauning Harbour to the fjord

Ill. 81 Harbour environment

Ill. 80 Welcome to Stauning

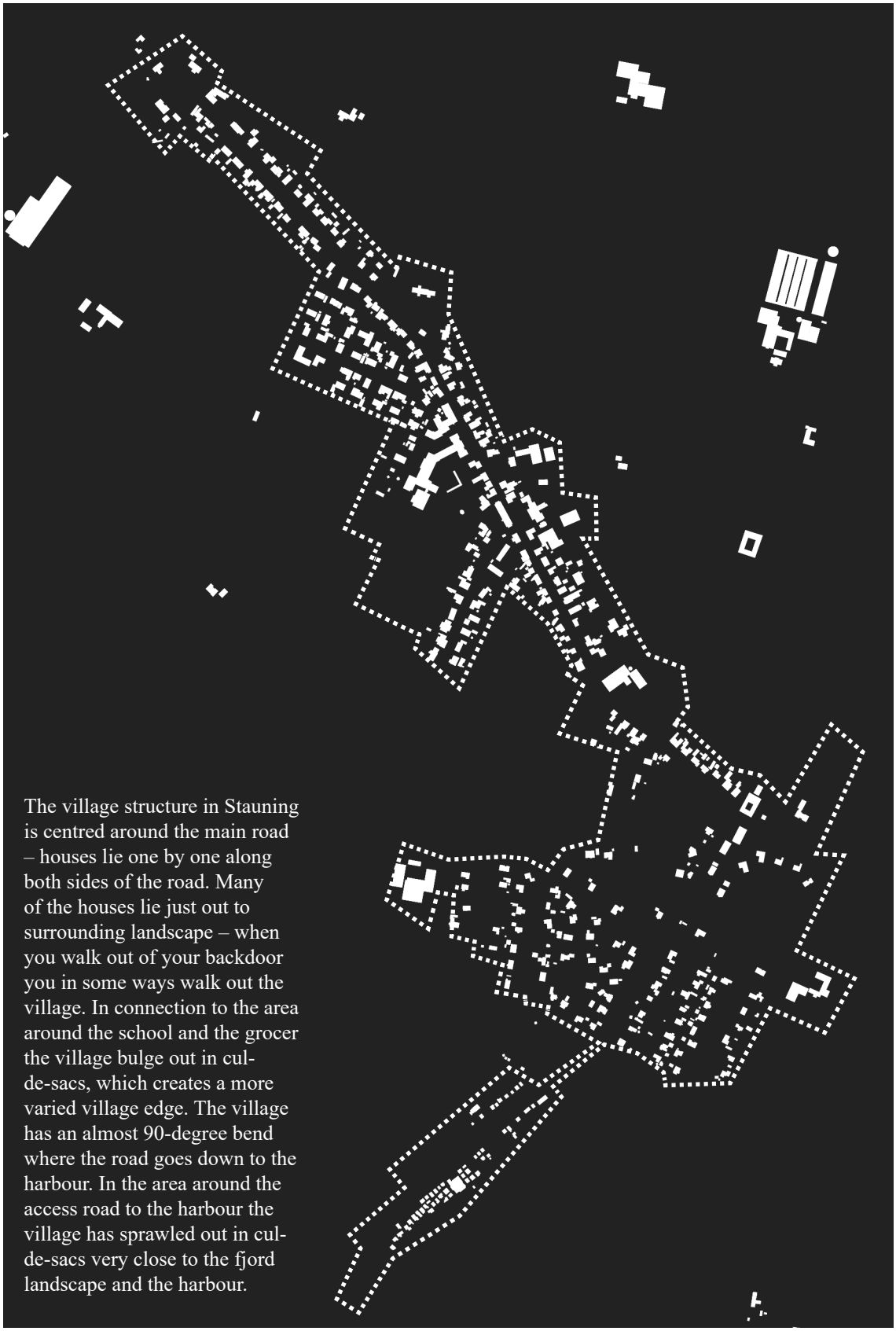
Ill. 79 Stauning grocery store and the village space in front

Stauning - an overview

Stauning stretches from north to south along the beach meadows that border Ringkøbing Fjord. The fjord and the connected nature along the coast are the main landscape qualities of the village. Besides the fjord Stauning is surrounded by cultivated fields. The Fjord is only accessible in connection to the harbour. Stauning has a public school, a nursing home, a church and a local grocery store, as well as a well-loved harbour. On the next couple of pages, I will zoom in on the structural configuration of the village, as well as the functions and nature qualities of the village. Lastly, I will identify the existing village spaces and landscape space that add quality to the village – I will analyse the properties and potentials of one of the village spaces.

Ill. 83 Ortophoto, Stauning

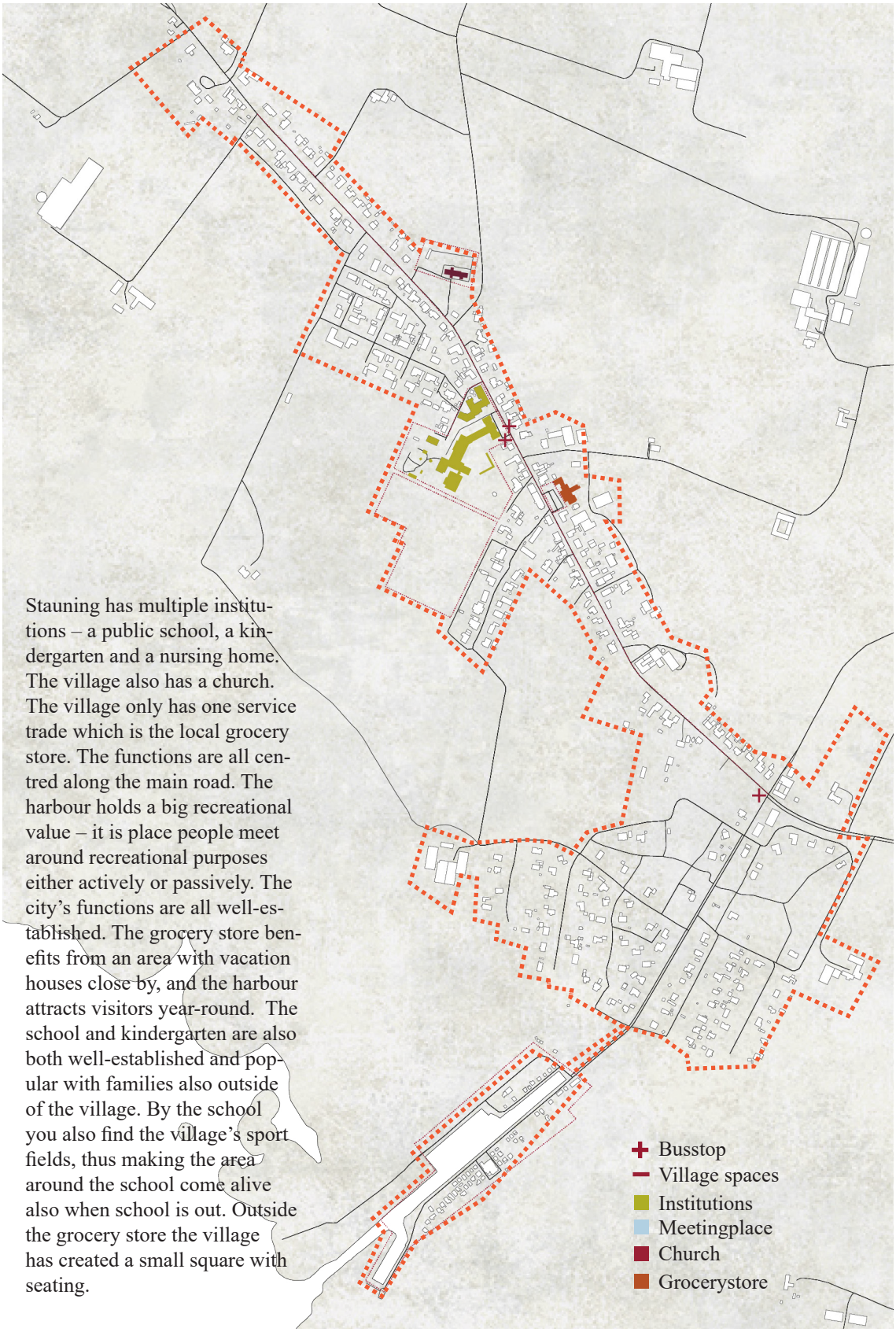
Stauning
Figure ground



The village structure in Stauning is centred around the main road – houses lie one by one along both sides of the road. Many of the houses lie just out to surrounding landscape – when you walk out of your backdoor you in some ways walk out the village. In connection to the area around the school and the grocer the village bulge out in cul-de-sacs, which creates a more varied village edge. The village has an almost 90-degree bend where the road goes down to the harbour. In the area around the access road to the harbour the village has sprawled out in cul-de-sacs very close to the fjord landscape and the harbour.

Ill. 84 Figure ground, Stauning

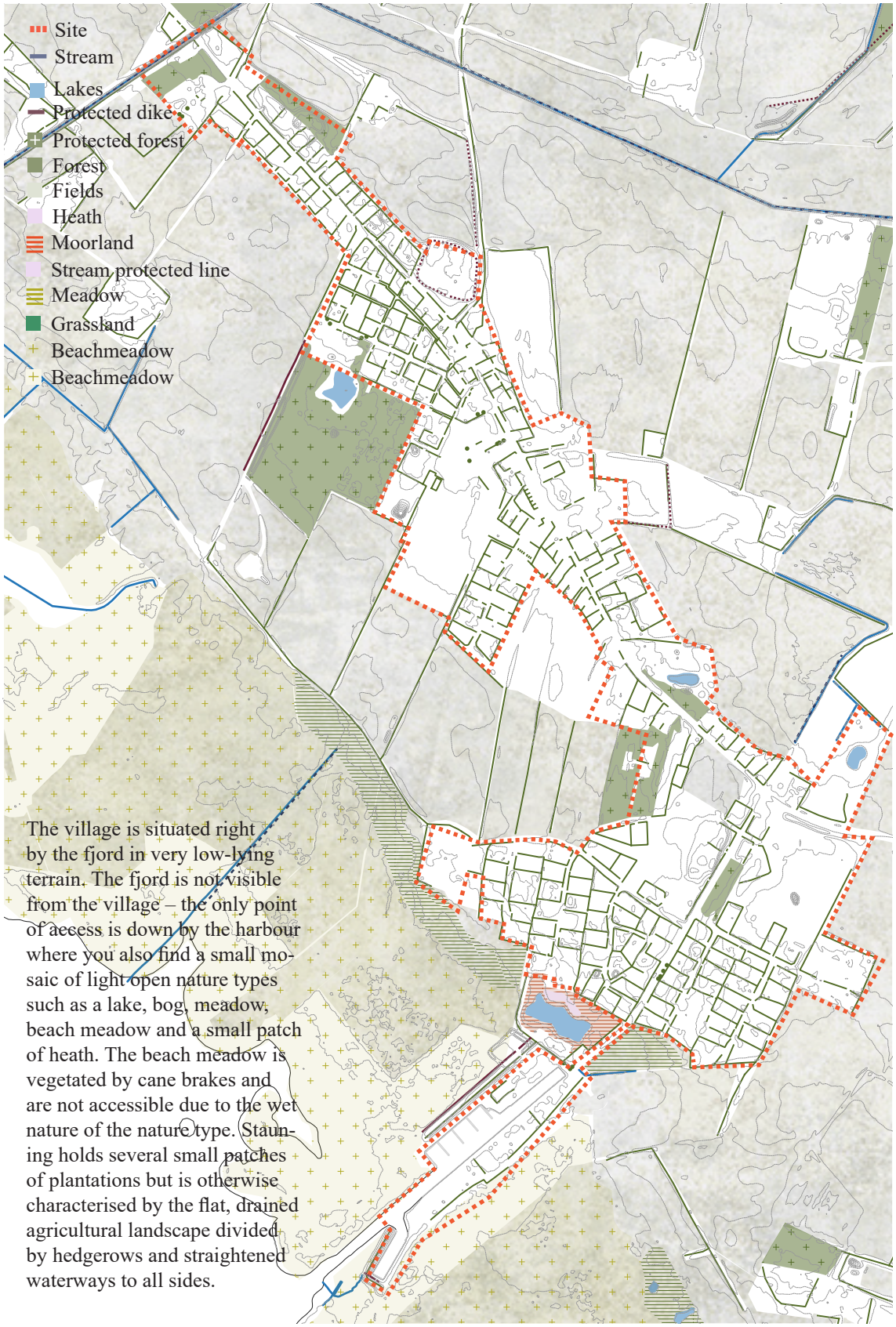
Stauning
Functions



Stauning has multiple institutions – a public school, a kindergarten and a nursing home. The village also has a church. The village only has one service trade which is the local grocery store. The functions are all centred along the main road. The harbour holds a big recreational value – it is place people meet around recreational purposes either actively or passively. The city's functions are all well-established. The grocery store benefits from an area with vacation houses close by, and the harbour attracts visitors year-round. The school and kindergarten are also both well-established and popular with families also outside of the village. By the school you also find the village's sport fields, thus making the area around the school come alive also when school is out. Outside the grocery store the village has created a small square with seating.

Ill. 85 Mapping of functions, Stauning

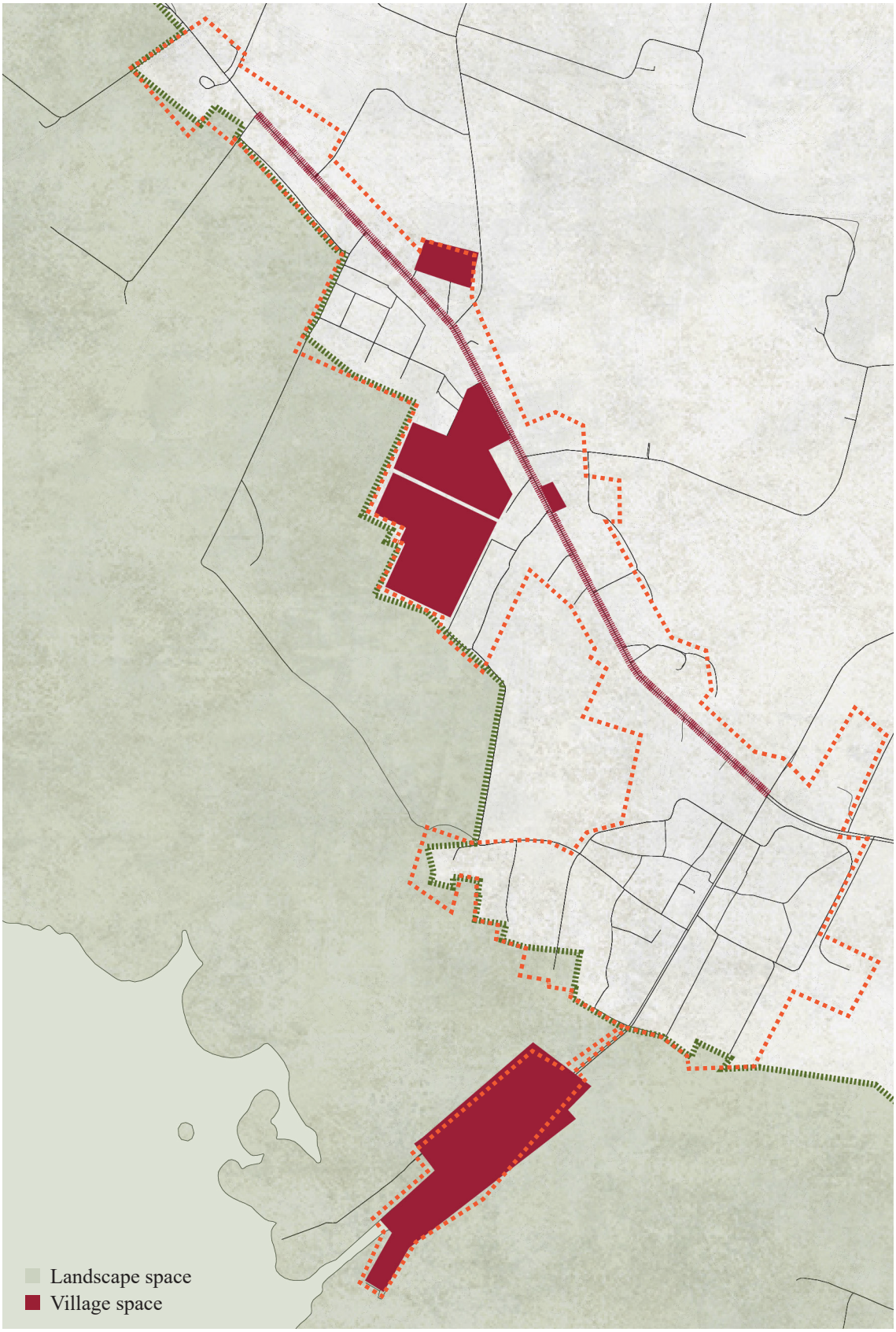
Stauning
Nature



The village is situated right by the fjord in very low-lying terrain. The fjord is not visible from the village – the only point of access is down by the harbour where you also find a small mosaic of light open nature types such as a lake, bog, meadow, beach meadow and a small patch of heath. The beach meadow is vegetated by cane brakes and are not accessible due to the wet nature of the nature type. Stauning holds several small patches of plantations but is otherwise characterised by the flat, drained agricultural landscape divided by hedgerows and straightened waterways to all sides.

Ill. 86 Mapping of nature and landscape, Stauning

Stauning
Village spaces



Ill. 87 Existing village spaces and landscape spaces, Stauning

Ill. 91 The Schoolyard

Ill. 89 The playground

Ill. 90 Tracks in the hedgerow

Ill. 88 The football field

I have identified six village spaces in Stauning – the harbour, the main road, the village square by the grocery store, the school and kindergarten spaces, the sports field, the church and last the main road. As well as the fjord landscape as the dominant landscape space – on the illustration I've included all of the NATURA 2000 area as a landscape space.

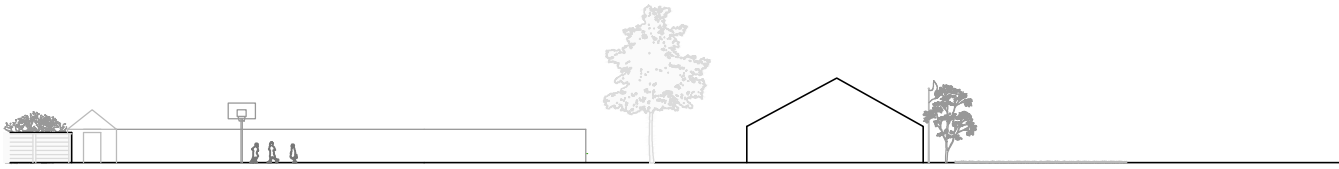
All village spaces are existing meeting places in the village and therefore hold potential for being the basis for further development in the village. I have chosen to zoom in on the village space that spread across the area of the school and the sport fields.

The village space is busy with activity most days between eight in the morning and seven in the evening depending on the season of course.

The village space consists of a paved school yard lined by a low bike shed that is furnished with benches. The bike shed is used as a covered outside area if it rains or the sun shines bright during the school hours. In the evening it is a hang out spot for some of the teenagers. Behind the bike shed, there is a classic playground and a covered fireplace. The schoolyard doesn't have that many freestanding elements beyond a basketball court and some graphics in thermos plastics. In the transition from school yard to sport fields there is a bouncing cushion that is turned on during the school day. Beyond the bouncing cushion the sport fields spread out. They are flat and the grass is cut short. The fields are framed by hedgerows, where the kids have made small pathways when playing in there. Towards the kindergarten there is a multi-purposed sports court.

Potentials

The village space holds many functions – hang outs, school, play and sport – and it holds them well. It is a space that functions. The school lies close to fjord and there might be a potential in connecting the village space with the landscape space through a path and/or a boardwalk. This way the fjord landscape can be activated as a subject in the school and a connection like that would add value to the village as a whole. There is also a potential in roughening up the village space a bit more – it is visible that the kids like playing in the hedgerow. An approach where nature is given space would be good for the kids as well as the biodiversity.



Ill. 92 Crosssection of the village space 1:500

Dejbjerg Impressions

Ill. 93 The heath near Dejbjerg

Ill. 94 Celebrating new life in Dejbjerg

Ill. 95 A seat by the lake in the plantation

Ill. 96 There are two ways to go in Dejbjerg

Ill. 100 Dejbjerg Church

Ill. 99 Dejbjerglund Efterskole

Ill. 98 Dejbjerg Plantage

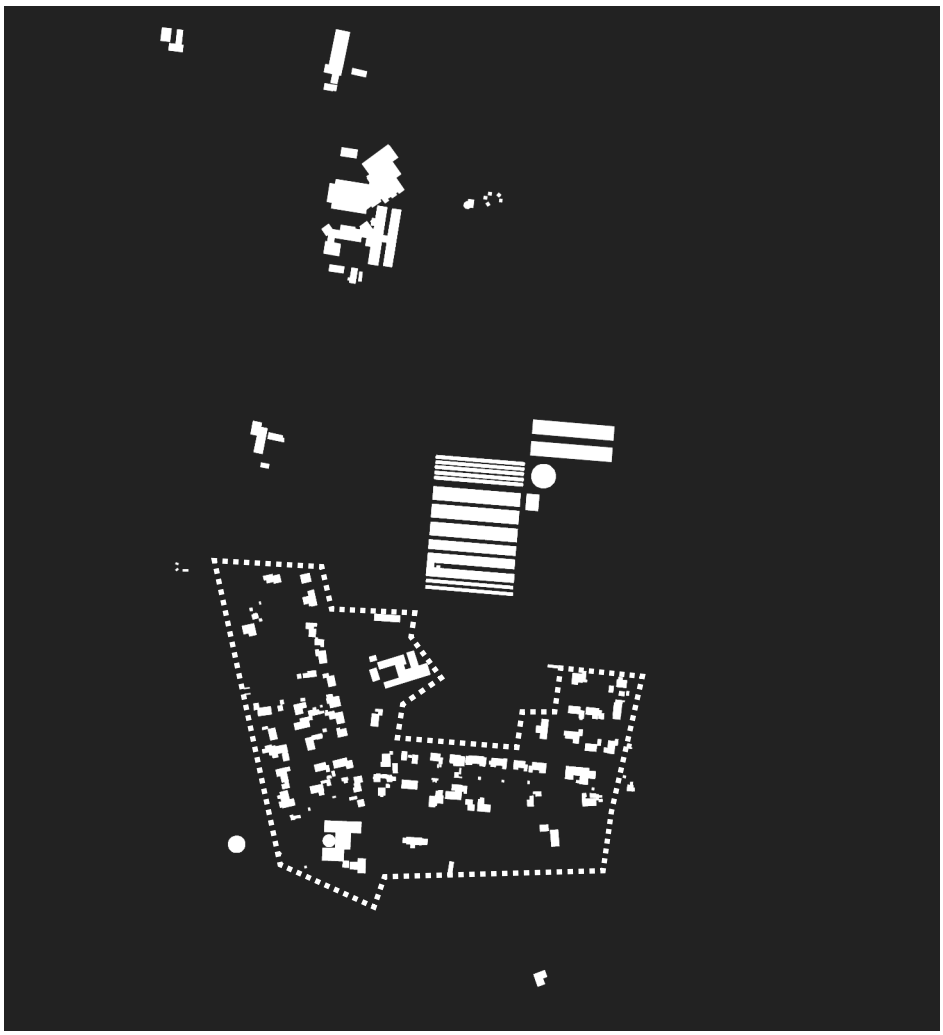
Ill. 97 View from the church

Dejbjerg
An overview

Ill. 101 Ortophoto, Dejbjerg

Dejbjerg is the smallest of the five villages. The village is situated on top of the hill island, and if you look towards west there is a view down over the outwash plain and the fjord. To the east Dejbjerg is framed by a big plantation. Dejbjerg has a church, and just outside of the village there is a continuation school with indoor and outdoor sport facilities that the village use. The continuation school also has a culture house that host different open events. On the next couple of pages, I will zoom in on the structural configuration of the village, as well as the functions and nature qualities that the village holds. Lastly, I will identify the existing village spaces and landscape spaces that create quality in the village – I will analyse the properties and potentials of one of the village spaces.

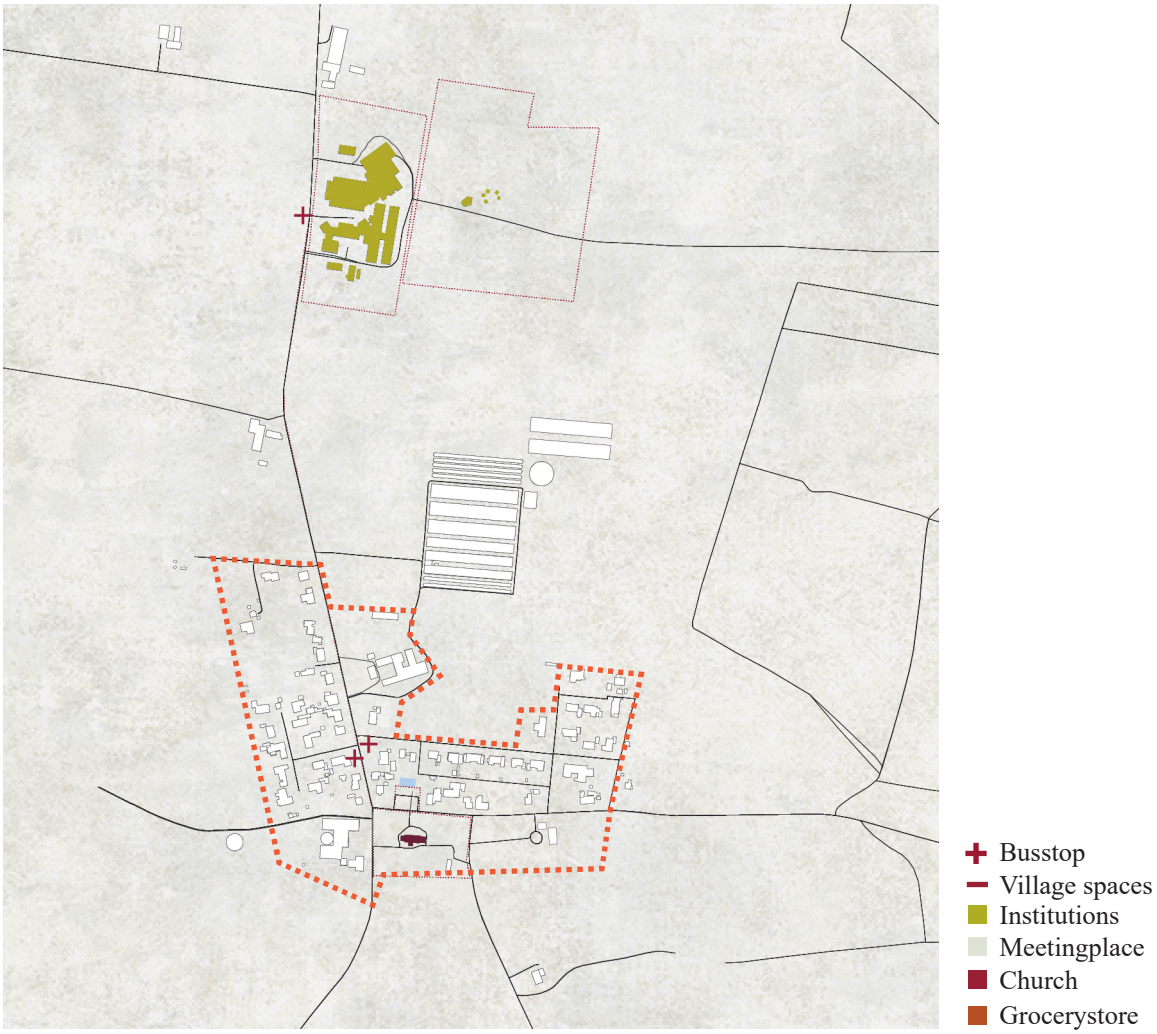
Dejbjerg
Figure ground



Ill. 102 Figure ground, Dejbjerg

The village structure in Dejbjerg spreads out on the two sides of the main road. Along the main road you find three big structures – two farms and the church. Otherwise, all the other houses are low-rise single-family homes. The village spreads out in two enclaves one towards west that look out over the fjord and one towards east bordering the plantation. Towards north you find the continuation school that has this amorphous shape that places like that have due to several expansions. Just outside the village there is an old mink farm.

Dejbjerg
Functions



Ill. 103 Mapping of functions, Dejbjerg

Dejbjerg doesn't have many functions. The village has a church, a missionary house and the continuation school. Between the church and the missionary house there is a small extension of the pathway where benches have been put up beside an info board with the story about Dejbjerg and the plantation. Just on the edged of the village in the beginning of the plantation there are a couple of lakes where a bench has been put up. The primary centre is outside the village or perhaps between the village and the continuation school. The continuation school holds different sports facilities and a culture house with open events. The continuation school is in many ways the motor in Dejbjerg.

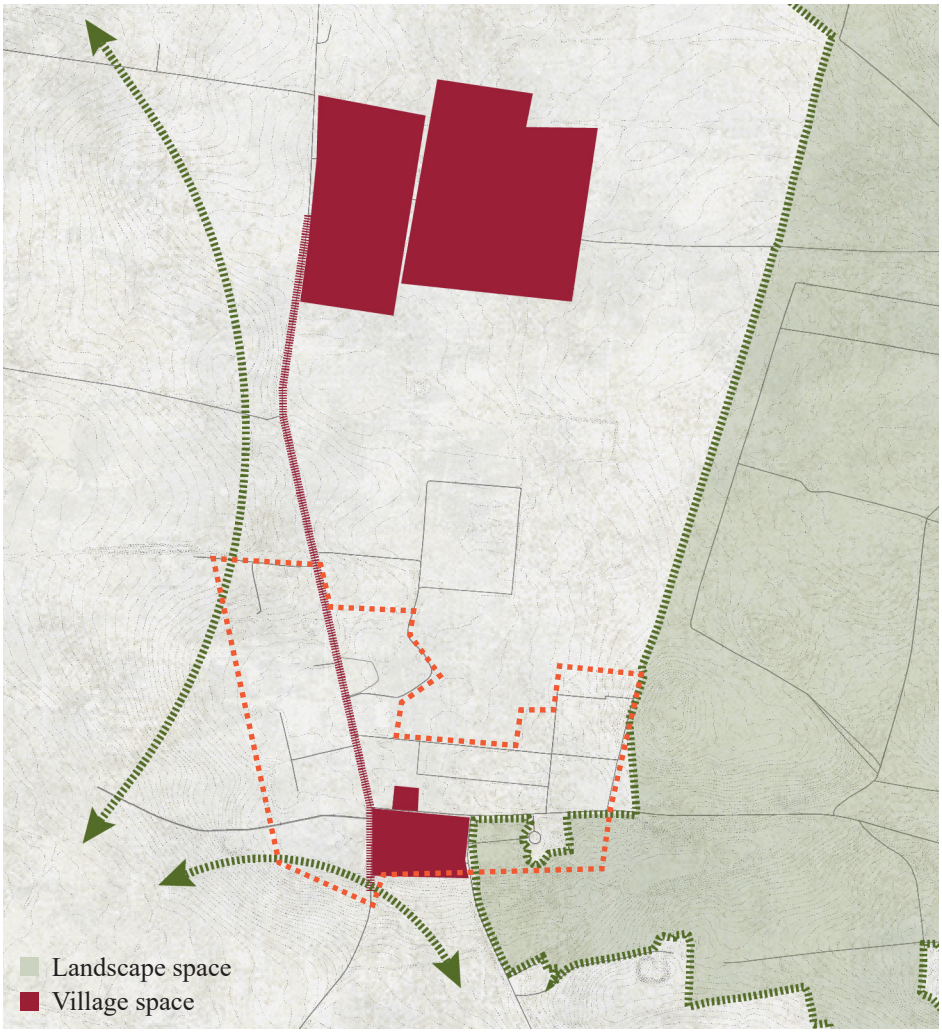
Dejbjerg

Nature

Ill. 104 Mapping of nature and landscape, Dejbjerg

Dejbjerg borders up to a big plantation, Dejbjerg Plantage, that also holds patches of heath and a couple of lakes and wetland areas. The plantation is the biggest nature quality of the village. Just before Dejbjerg the terrain rises drastically in a hill island and Dejbjerg has a view over the agricultural landscape and the fjord towards west and south. The agricultural landscape is characterised by big fields divided by hedgerows and straightened out streams.

Dejbjerg
Village spaces



Ill. 105 Existing village spaces and landscape spaces, Dejbjerg

I have identified five village spaces in Dejbjerg – the church, the bench between the church and the missionary house, the continuation school, the road between the village and the continuation school and the bench just in the beginning of the plantation. The plantation is the dominant landscape space in the village, but the views towards west and south also add nature value. All of the identified village spaces hold qualities that could be the basis for further placemaking. I have chosen to zoom in on the road that connects the village and the continuation school.

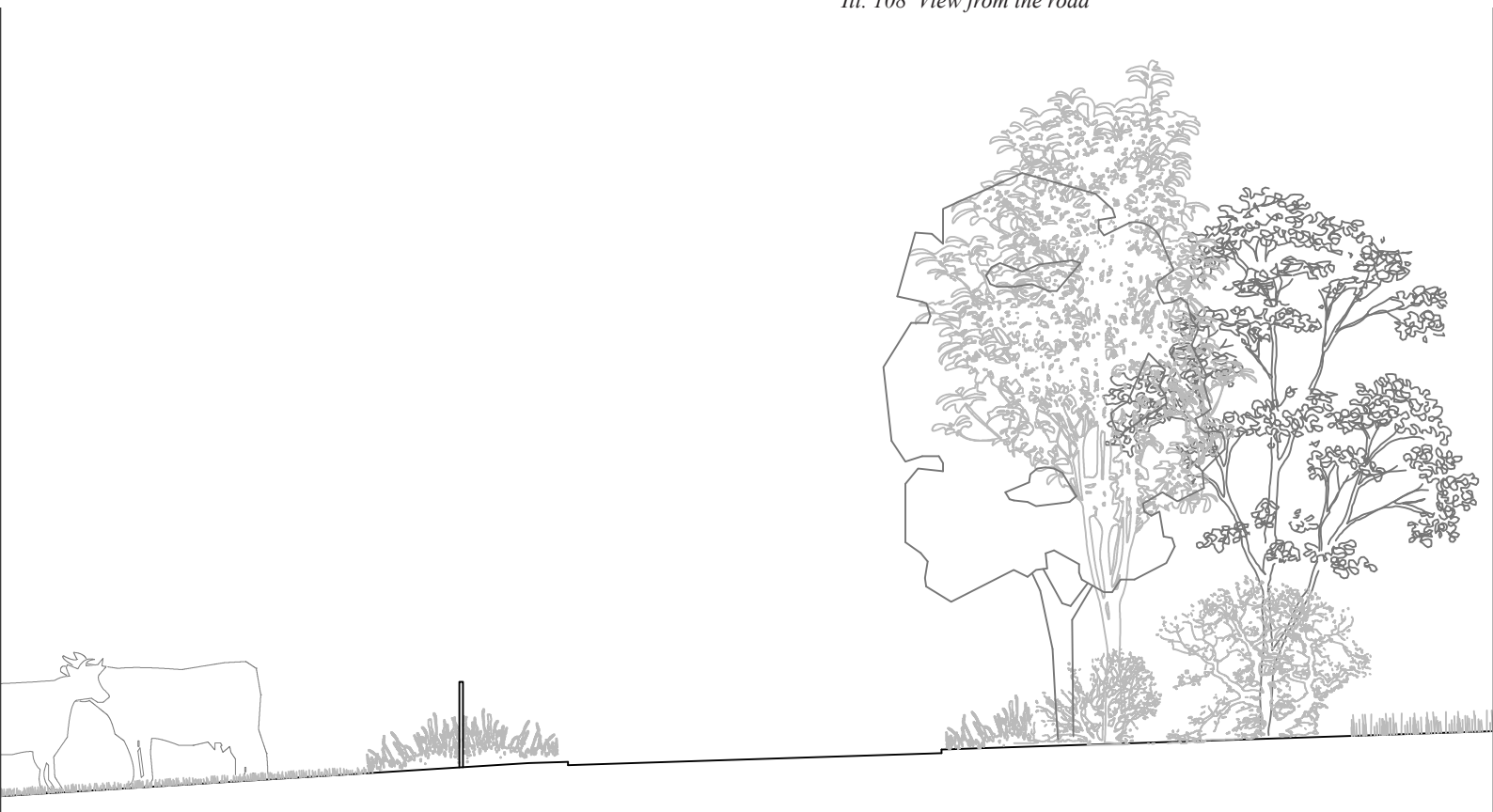
The road is approximately 5,6 metres wide, and pedestrians and cyclists must walk and bike on the road as well or walk in the grass in the roadside. Towards east the road is framed by either cultivated fields or hedgerows, and towards south there are small hedgerows, a house or open agricultural fields that offer a view over the landscape and the fjord. Function wise the road is important because it connects the village and the continuation school. It is a small road and people tend to drive fast, and being a vulnerable road user can feel exposed.

Ill. 107 Dejbjerglund Hallen

Ill. 108 View from the road

Potentials

The road serves its purpose – it connects the village and the continuation school. There is however a potential in creating a pathway on the west side of the road for vulnerable road users. This could become a recreational connection for both pedestrians and bike riders. There could also be a potential in creating a new meeting place that look out over the agricultural landscape and the fjord along the road.



Ill. 106 Crosssection of the village space 1:100

Højmark Impressions

Ill. 109 Schoolgarden in Højmark

Ill. 111 Shelters by the school

Ill. 110 Square in front of Village Hall

Ill. 112 The landscape view from Højmark

Ill. 115 The sportsfacilities by the school

Ill. 114 Celebrating village milestones

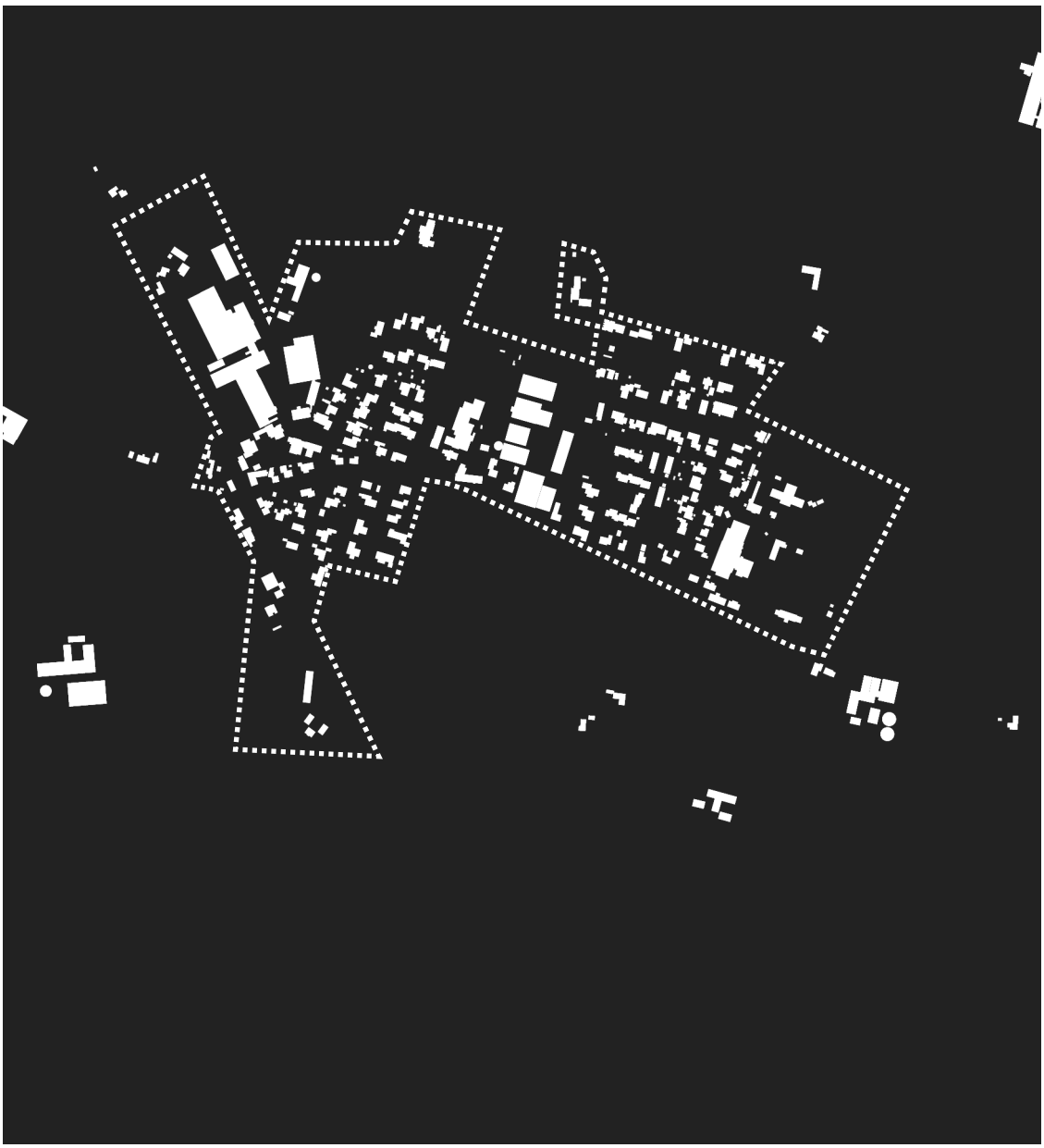
Ill. 113 The new kitchen in the village hall

Højmark
An overview

Ill. 116 Ortophoto, Højmark

Højmark is situated on top of the hill island and has a view out over the agricultural landscape towards south. It lies as an appendix to the trunk road that connects Ringkøbing and Skjern. The village has its own church, village hall, sports hall, kindergarten and independent school, as well as a couple of bigger industrial buildings. Otherwise, the village consists housing.

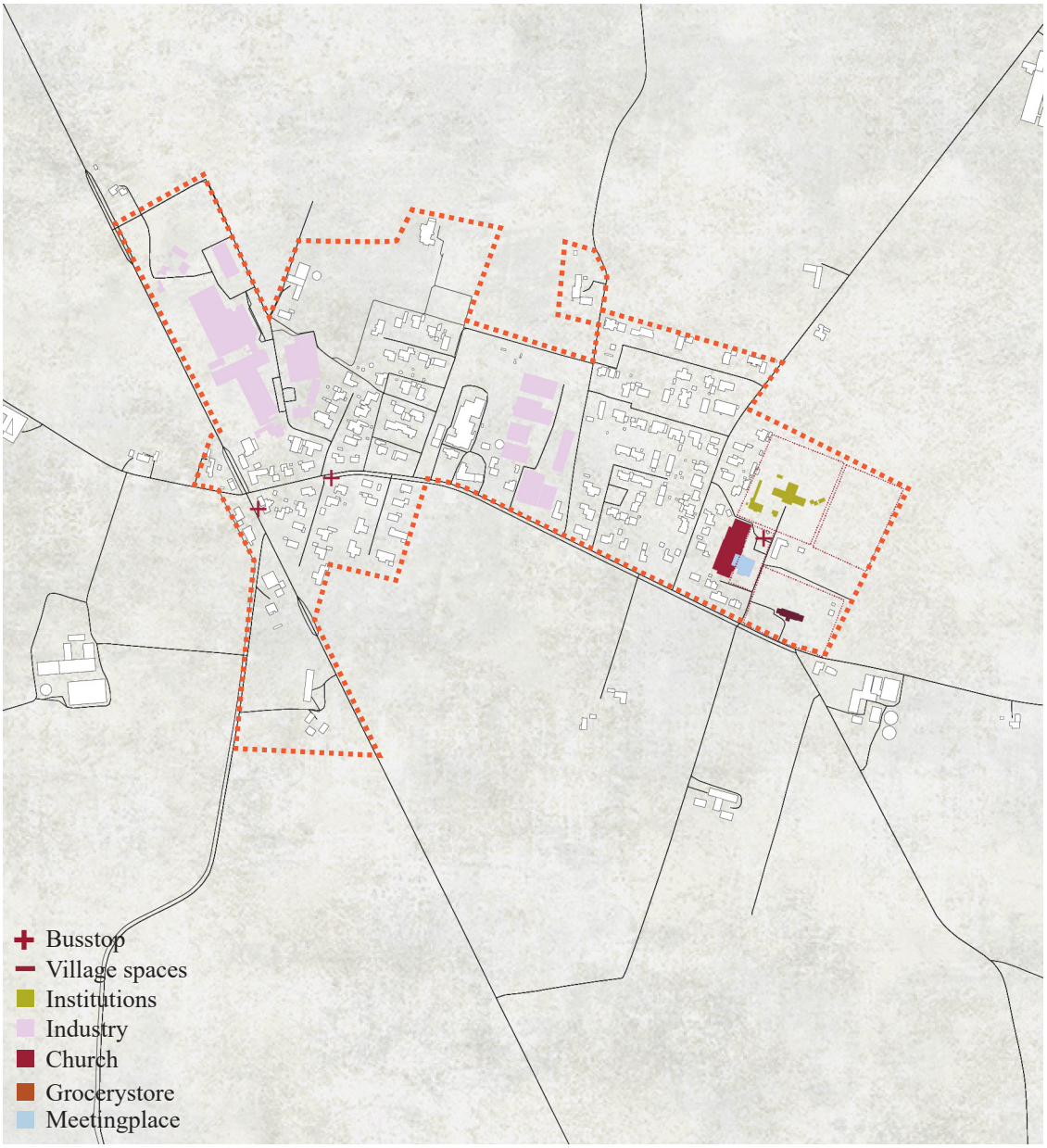
Højmark
Figure ground



Ill. 117 Figure ground, Højmark

Towards west Højmark is cut in two by the trunk road that connects Ringkøbing and Skjern just in the edge of the village. Just when you turn into the village from the trunk road the village spreads out on both sides of the main road in cul-de-sacs with low-rise single-family homes. The is almost divided in two by a big industrial building, a grain handling facility. On the other side of the grain handling facility the city only spreads out on one side of the main road leaving the view towards south open from the main road. The village is structured in cul-de-sacs with low-rise singe family homes. Longest towards east a couple of big structures lie in a group and at the edge of the village you find the sport fields.

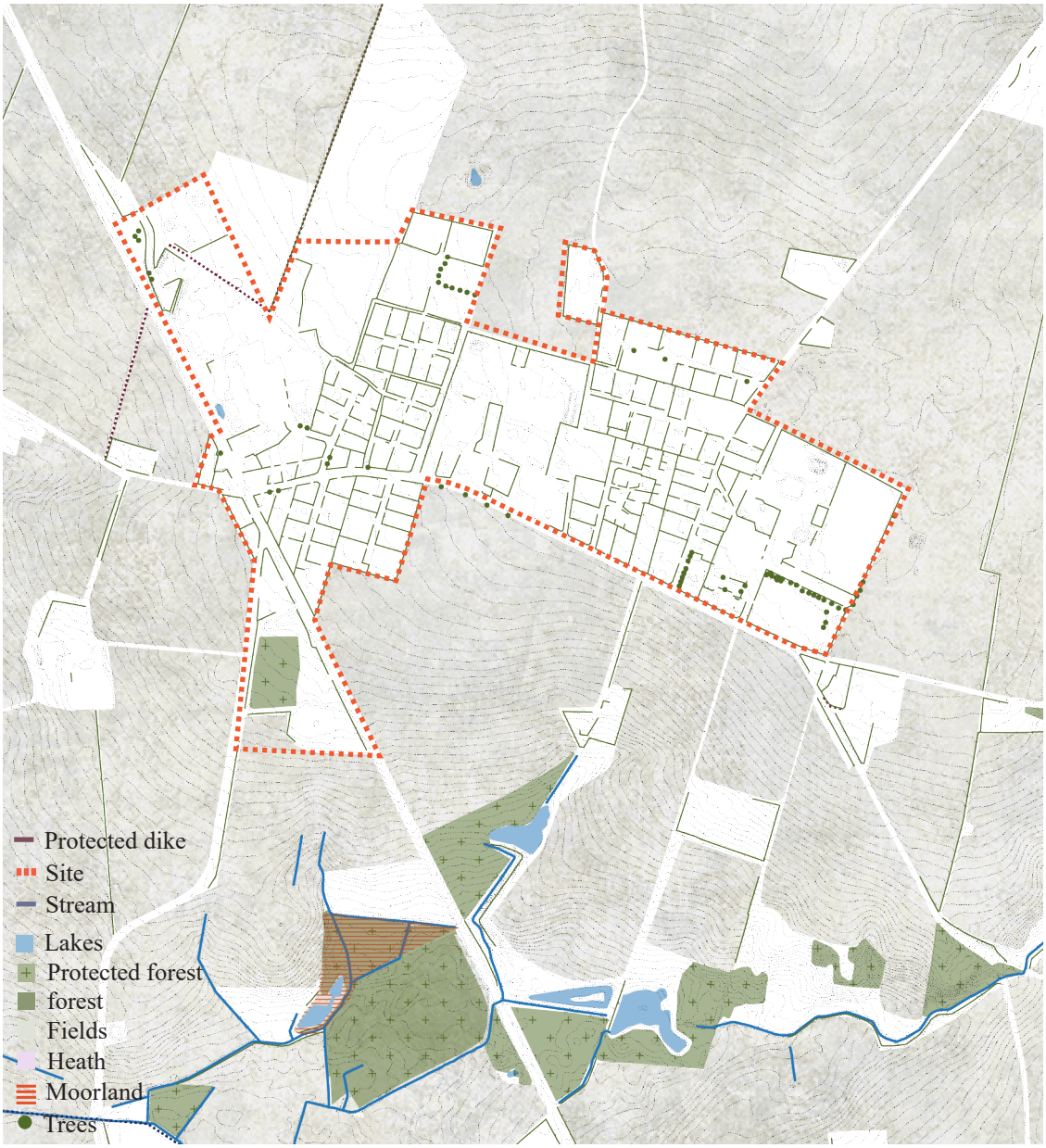
Højmark
Functions



Ill. 118 Mapping of functions, Højmark

The village centre in Højmark lies towards east where the independent school, the kindergarten, the sports hall, the village hall and the church are grouped in an enclave. Towards the village edge you fnd the sports fields. Back in the day the village had its own grocery store, but the building has been left empty for many years now. Towards the trunk road lies a couple of industry buildings. The trunk road makes it easy for people in Højmark to access the rest of the municipality as well as neighbouring municipalities.

Højmark
Nature & landscape

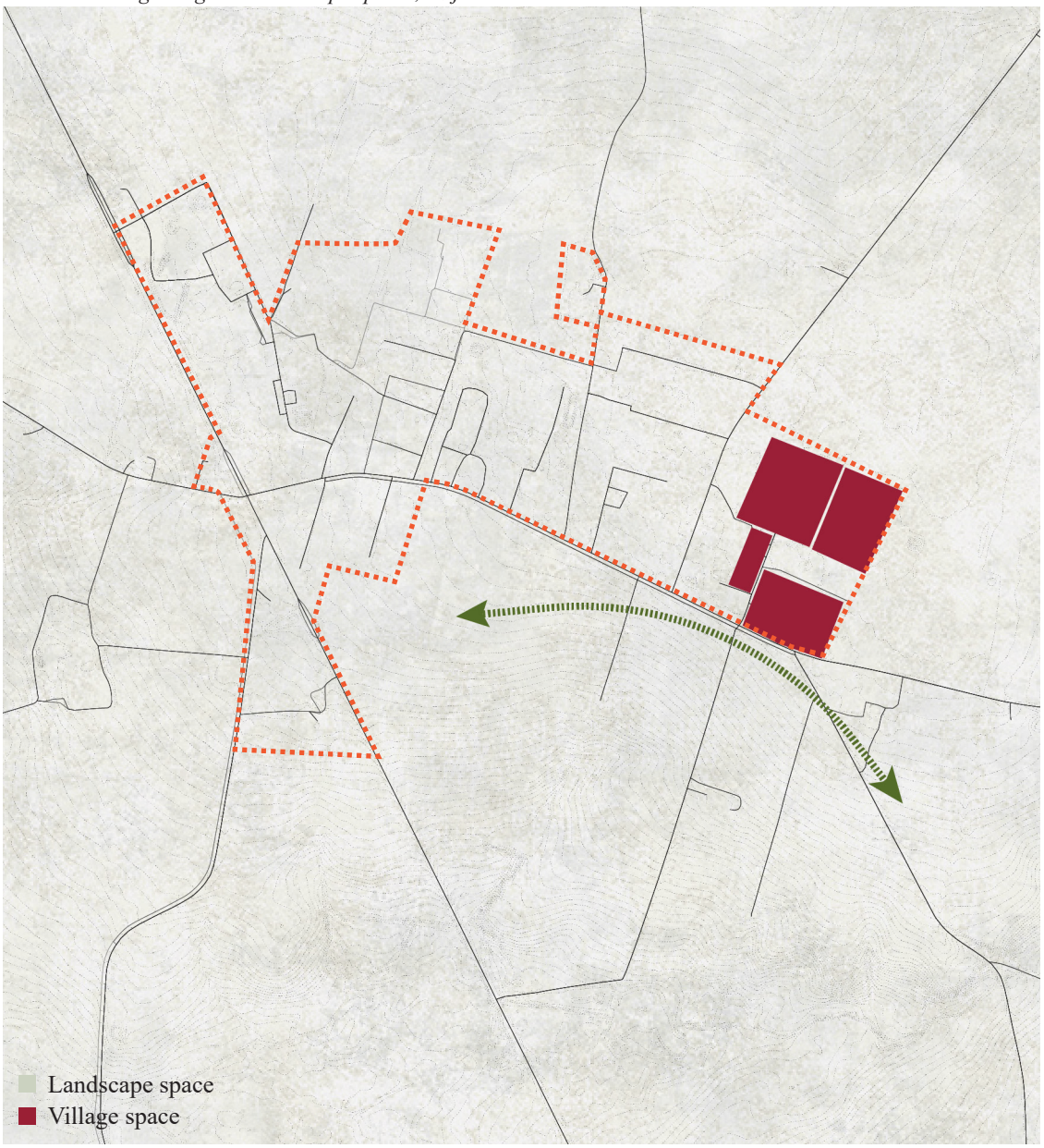


Ill. 119 Mapping of nature and landscape, Højmark

Højmark is situated on top of the hill island and has views towards both west and south. The village is surrounded by the agricultural landscape on all sides. The landscape is thus characterised by big open fields divided by hedgerows. South of the village there is a beautiful valley with a stream, lakes, bog and wetlands. If you move a bit more north and east there are two plantations.

Højmark
Village spaces

Ill. 120 Existing village and landscape spaces, Højmark



Højmark has a very strong village centre in the east of the village – here are the church, the village hall, the sports hall, the kindergarten, the independent school and the sports fields and together they create a big village space. Højmark doesn't have a landscape space in the village except the agricultural landscape that also holds a cultural value to many in West Jutland.

The village space is busy with activity most days between eight in the morning and seven in the evening depending on the season of course.

The village space is kind of fragmented in the sense that it holds many different spaces – the school yard and the green school areas, the church, the parking lot in front of the sports hall and the little seating arrangement in front of the village hall. The cross-section cuts through the parking lot, through the vicarage and lastly through the sports fields. In this axis the village space consists of two very large and open spaces – the parking lot and the sports fields. If I had cut through the village space in the other direction the space would be read as very long. The different spaces exist beside each other but don't relate to each other.

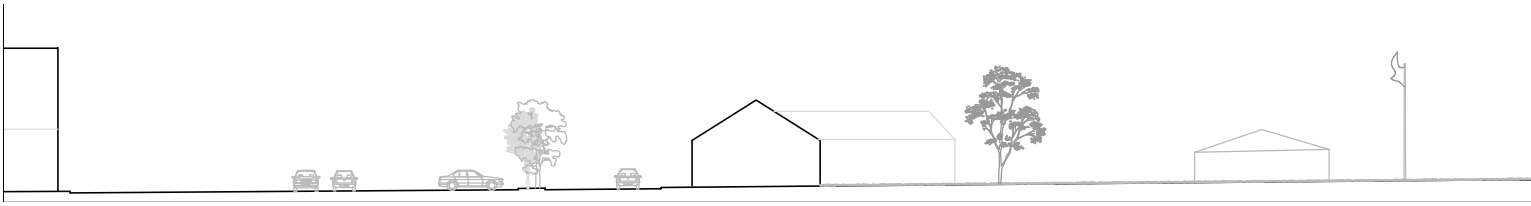
Ill. 124 The football fields

Ill. 123 The busy parkinglot

Ill. 122 Small village square

Potentials

There is a potential in creating an element – a green avenue or a common meeting place – to connect the many village spaces. To create a physical centre not only a functional centre.



Ill. 121 Cross section of the village space 1:500

Lem
Impressions

Ill. 125 Town trademark - iron sculptures

Ill. 126 Playground and shelter in the park

Ill. 127 Diversity down by the Vestas factory

Ill. 128 Sculptures by Lem Hallen

Ill. 131 A bench overlooking the landscape

Ill. 132 The station

Ill. 130 The square by Smedenes Hus

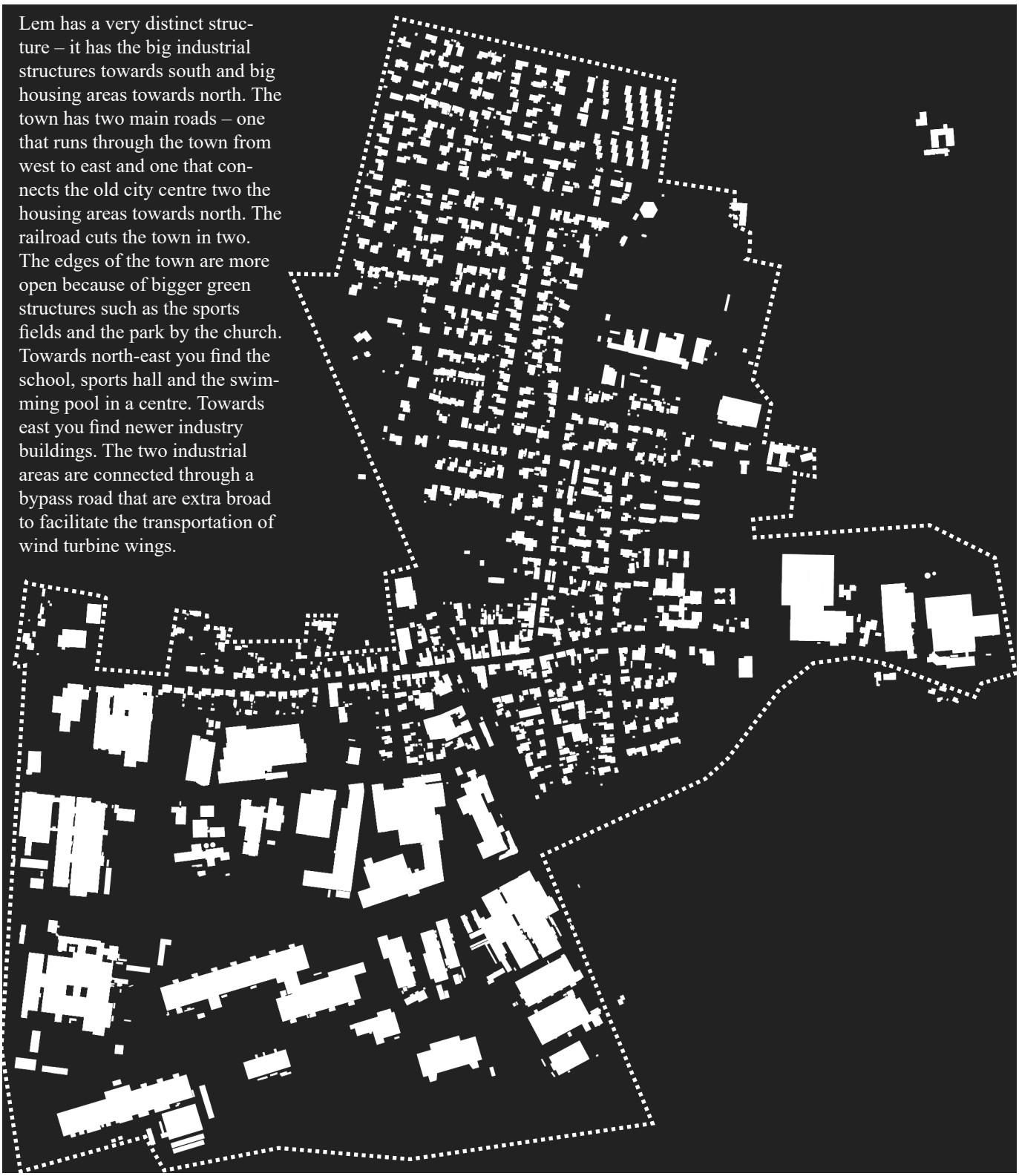
Ill. 129 A bench by the lake

Lem
An overview

Ill. 133 Ortophoto, Lem

Lem
Figure ground

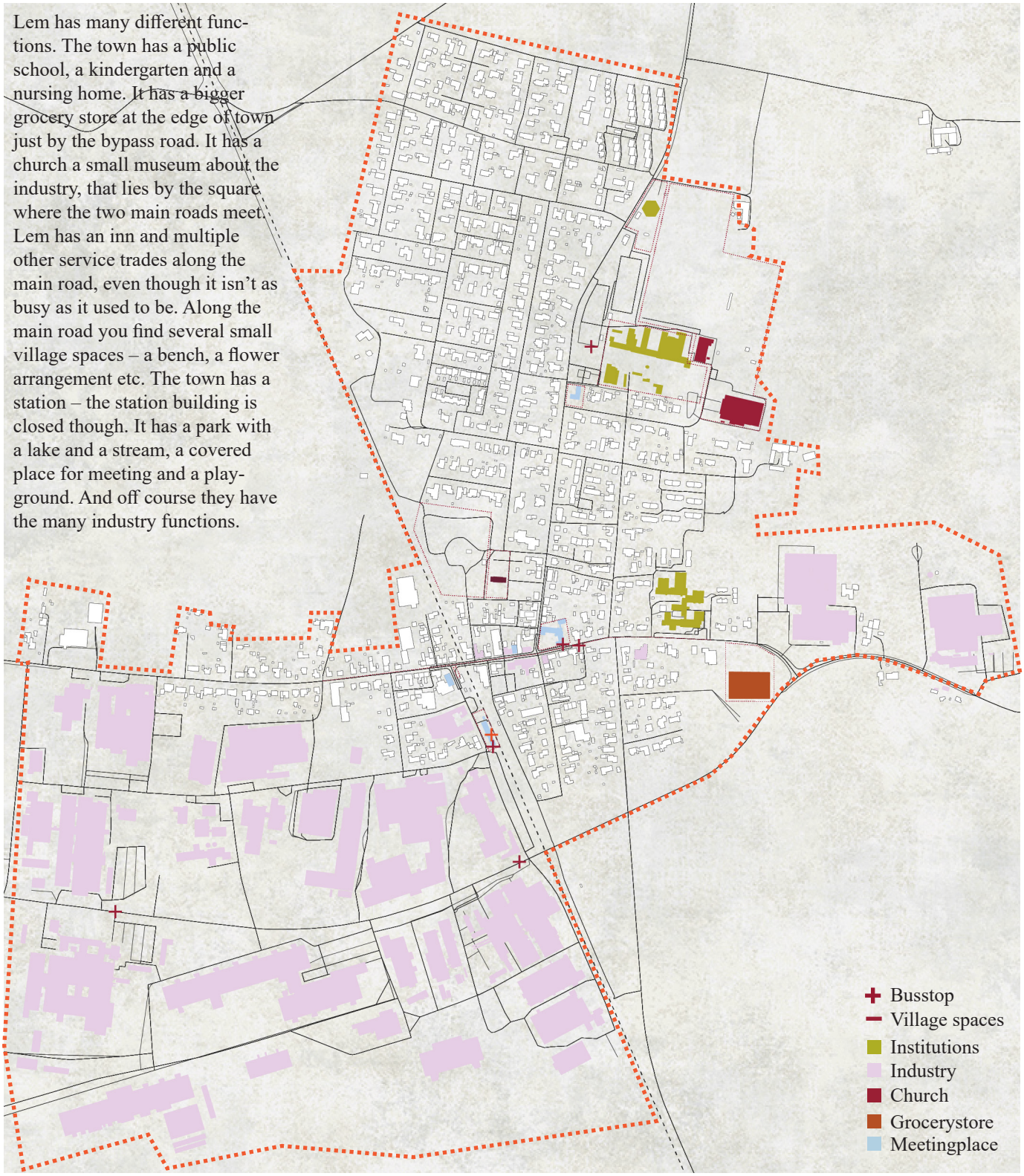
Lem has a very distinct structure – it has the big industrial structures towards south and big housing areas towards north. The town has two main roads – one that runs through the town from west to east and one that connects the old city centre two the housing areas towards north. The railroad cuts the town in two. The edges of the town are more open because of bigger green structures such as the sports fields and the park by the church. Towards north-east you find the school, sports hall and the swimming pool in a centre. Towards east you find newer industry buildings. The two industrial areas are connected through a bypass road that are extra broad to facilitate the transportation of wind turbine wings.



Ill. 134 Figure ground, Lem

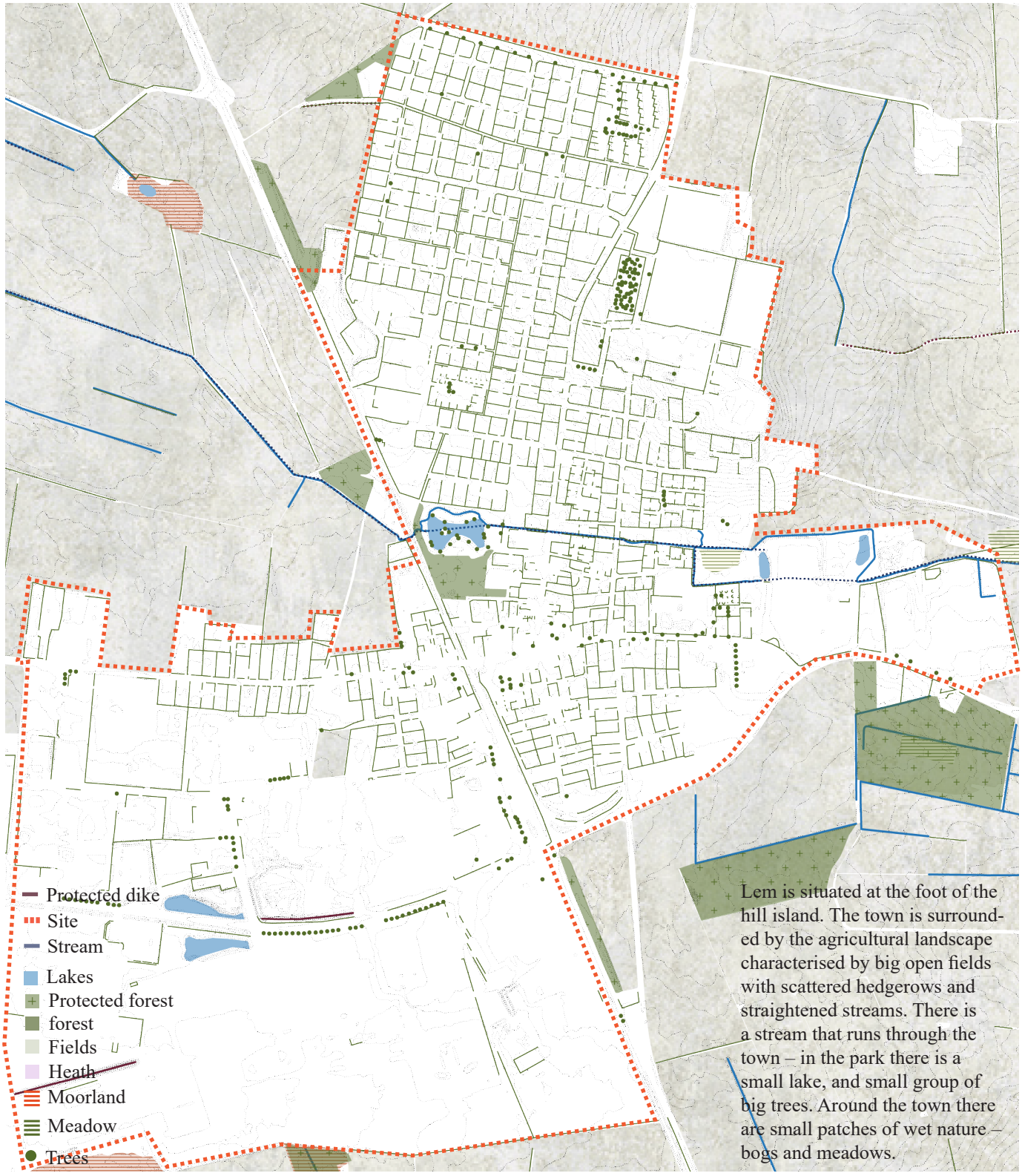
Lem
Functions

Lem has many different functions. The town has a public school, a kindergarten and a nursing home. It has a bigger grocery store at the edge of town just by the bypass road. It has a church a small museum about the industry, that lies by the square where the two main roads meet. Lem has an inn and multiple other service trades along the main road, even though it isn't as busy as it used to be. Along the main road you find several small village spaces – a bench, a flower arrangement etc. The town has a station – the station building is closed though. It has a park with a lake and a stream, a covered place for meeting and a playground. And off course they have the many industry functions.



Ill. 135 Mapping of functions, Lem

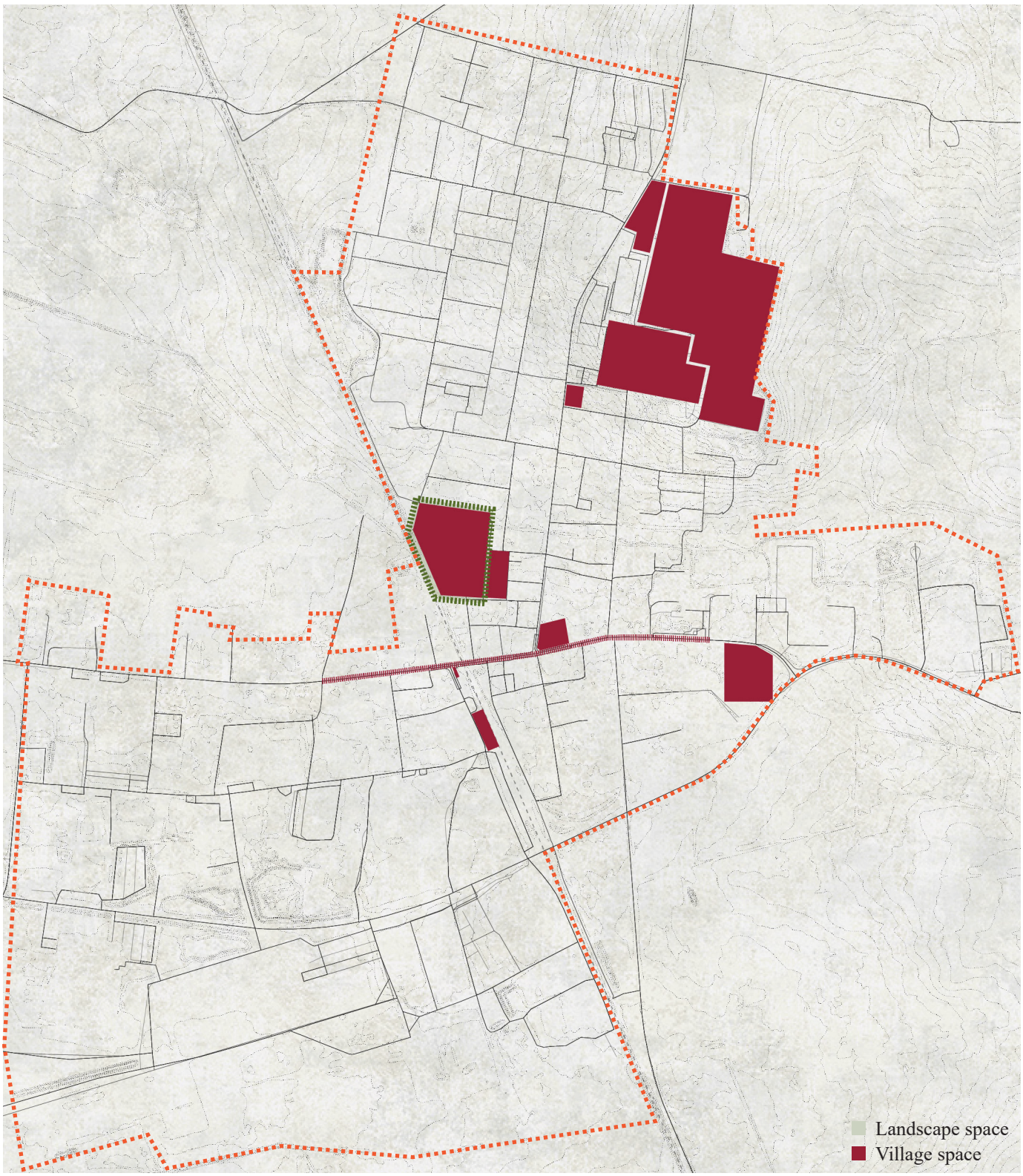
Lem
Nature & landscape



Ill. 136 Mapping of nature and landscape, Lem

Lem
Village spaces

Ill. 137 Existing village and landscape space, Lem



Ill. 141 The trees in the park

Ill. 140 The stream

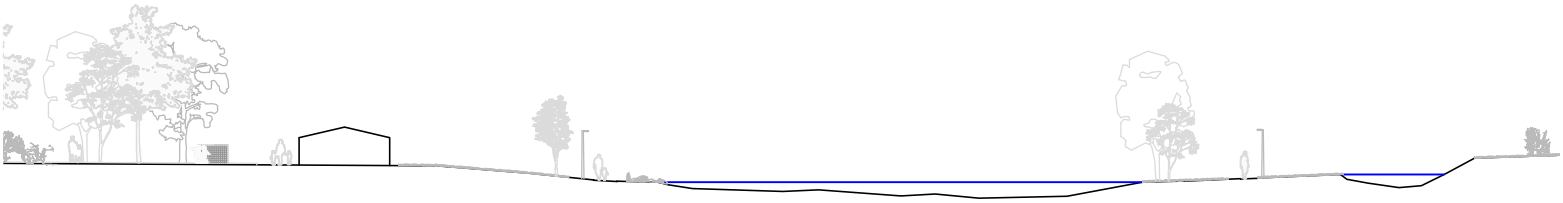
Ill. 139 Sculptures in the park

Lem has many village spaces of varying size and different configurations. There are big village spaces like the one around the school and sports facilities or the park. There is the main road, the square and the station. And last, there is a village place by the grocery store. The main landscape space is the park and the stream that runs through the town. I have looked closer at the park, since it is a type of village space that is special to Lem in the context of the village cluster.

The park has a very classic configuration – it has a lake, a stream and little white bridges. It has pavilion that offer a covered place to meet, a small playground and big old trees. The surface consists of small grave paths and otherwise cut grass. Outside in the lake there is a little island with trees and bushes. Up against the neighbouring gardens there has recently been planted several patches of rhododendron. Scattered around the park are different iron sculptures. The sculptures are a trademark for the town and can be found scattered around in the village spaces. There has recently been laid out some tiles for a table and benches by the lake. Several benches are scattered around the lake.

Potentials

The playground is popular among families, but otherwise the park isn't used that much. It holds great potential. And I think there is a potential in heightening the nature quality of the park. Letting the grass grow, planting some herbs and bushed, putting out rocks in the edge of the stream and perhaps adding a plateau close to the water table. It would heighten the landscape value of the space and add something that the town lacks.



Ill. 138 Cross section through the park 1:500

Velling Impressions

Ill. 142 Velling Friskole

Ill. 144 Small harbour where the waterway meets the fjord

Ill. 143 The fjord landscape

Ill. 145 The busy foot ball fields

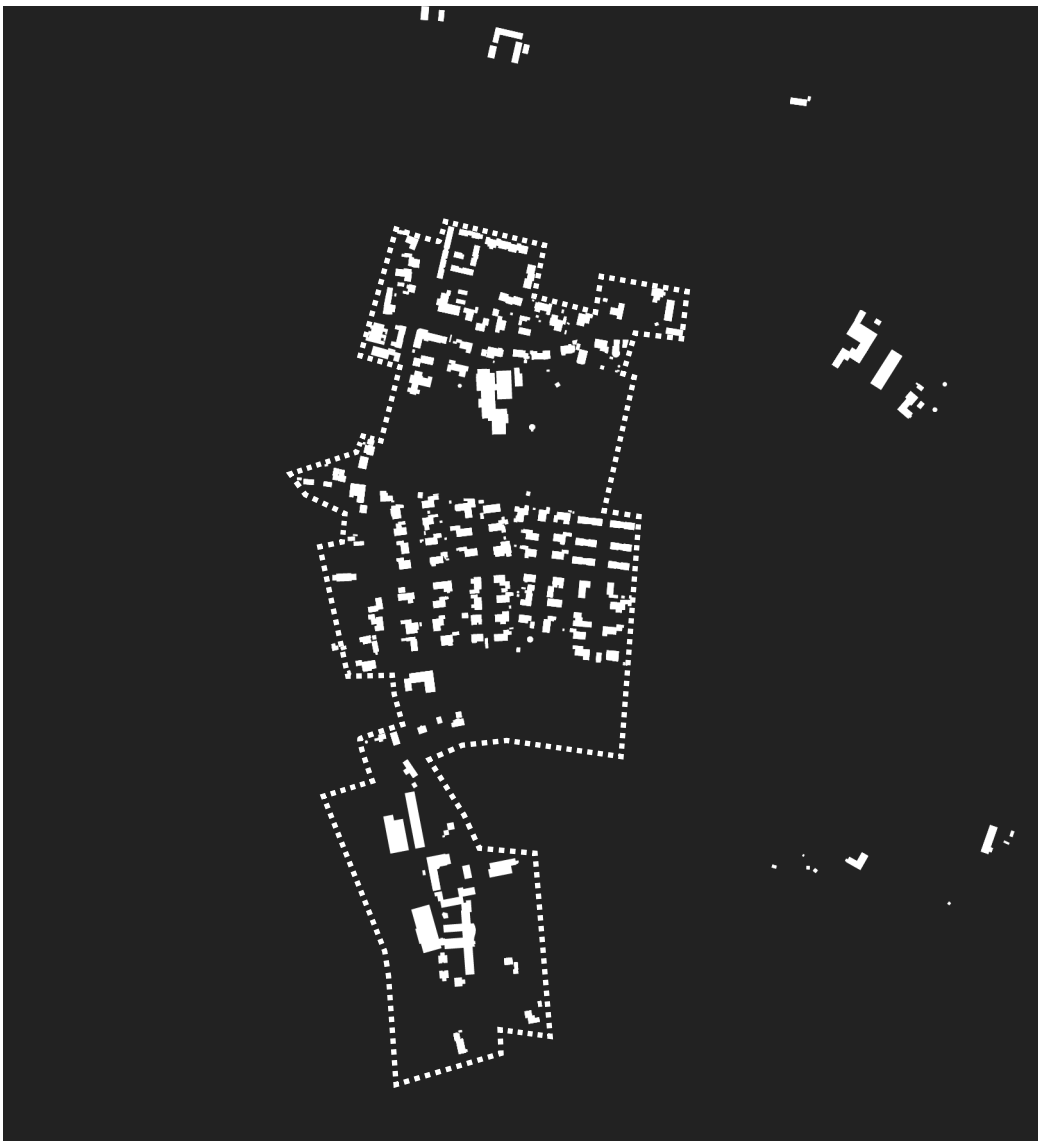
Ill. 146 Small village space by the grocery store

Velling
An overview

Ill. 147 Ortophoto, Velling

Velling is situated by the fjord close to Ringkøbing. It is village with both an independent school and kindergarten and a continuation school. Just outside the village towards north you find a folk school as well. All the schools are well-established. Velling has its own grocery store and its own church as well.

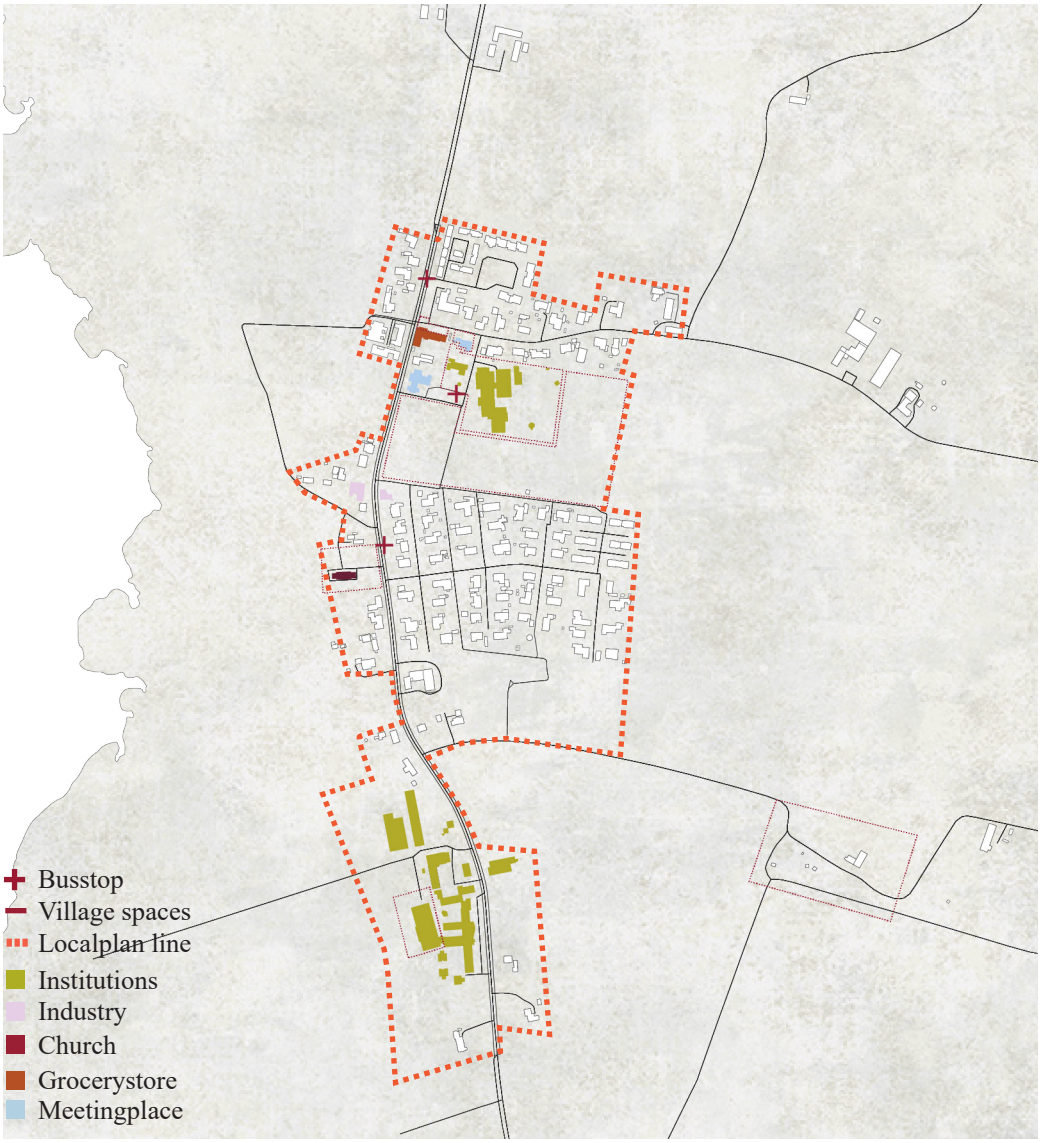
Velling
Figure ground



Ill. 148 Figure ground, Velling

Velling has a main road that connects it to Lem and Stauning towards south and Ringkøbing towards north-west. Along the main road the houses are scattered and stretched out. The village has mainly grown inland with a cul-de-sac with low-rise single-family houses as well as similar housing areas towards north. Building wise the village is cut in two by the sports fields that are situated by the school. Towards south you see the characteristic shape of the continuation school and its many extensions.

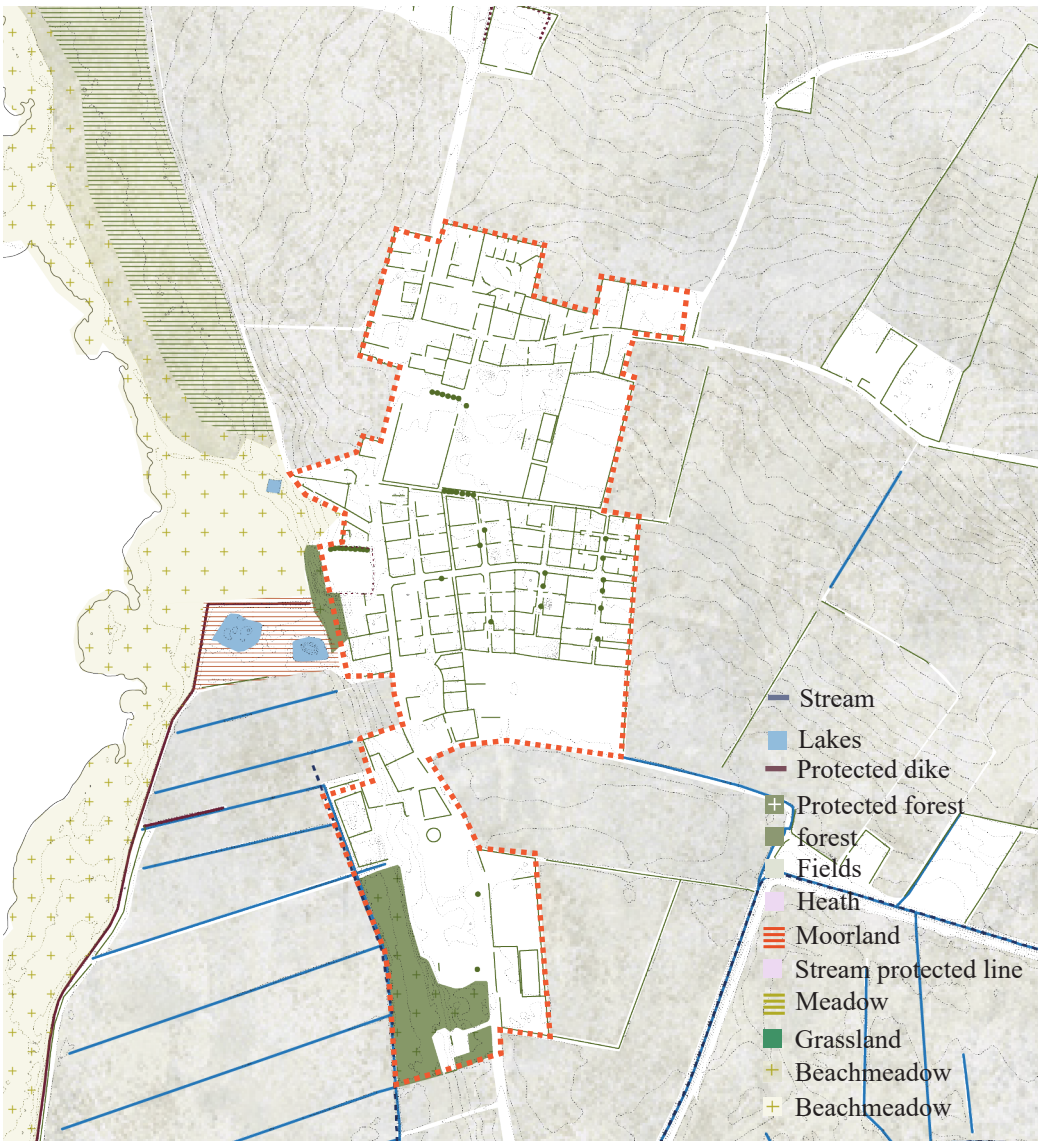
Velling
Functions



Ill. 149 Mapping of functions, Velling

Velling is a small village with many functions. It has the continuation school towards south, and the church and some small service trades along the main road. The village has clear village centre around the independent school, the grocery store, the kindergarten, the village hall and the new community house. The school has added a big sports hall within the last couple of years centralising the recreational life even more around the school. In the recent years the village hall has changed business strategy and are not only a party location. Each week they traditional dishes for dinner with great success. Last year the independent school bought the house next two the kindergarten to make the playground bigger. The house has been turned into a community house with a music studio and room for the many communities. By the grocery store there is a small space with a bench and potted plants.

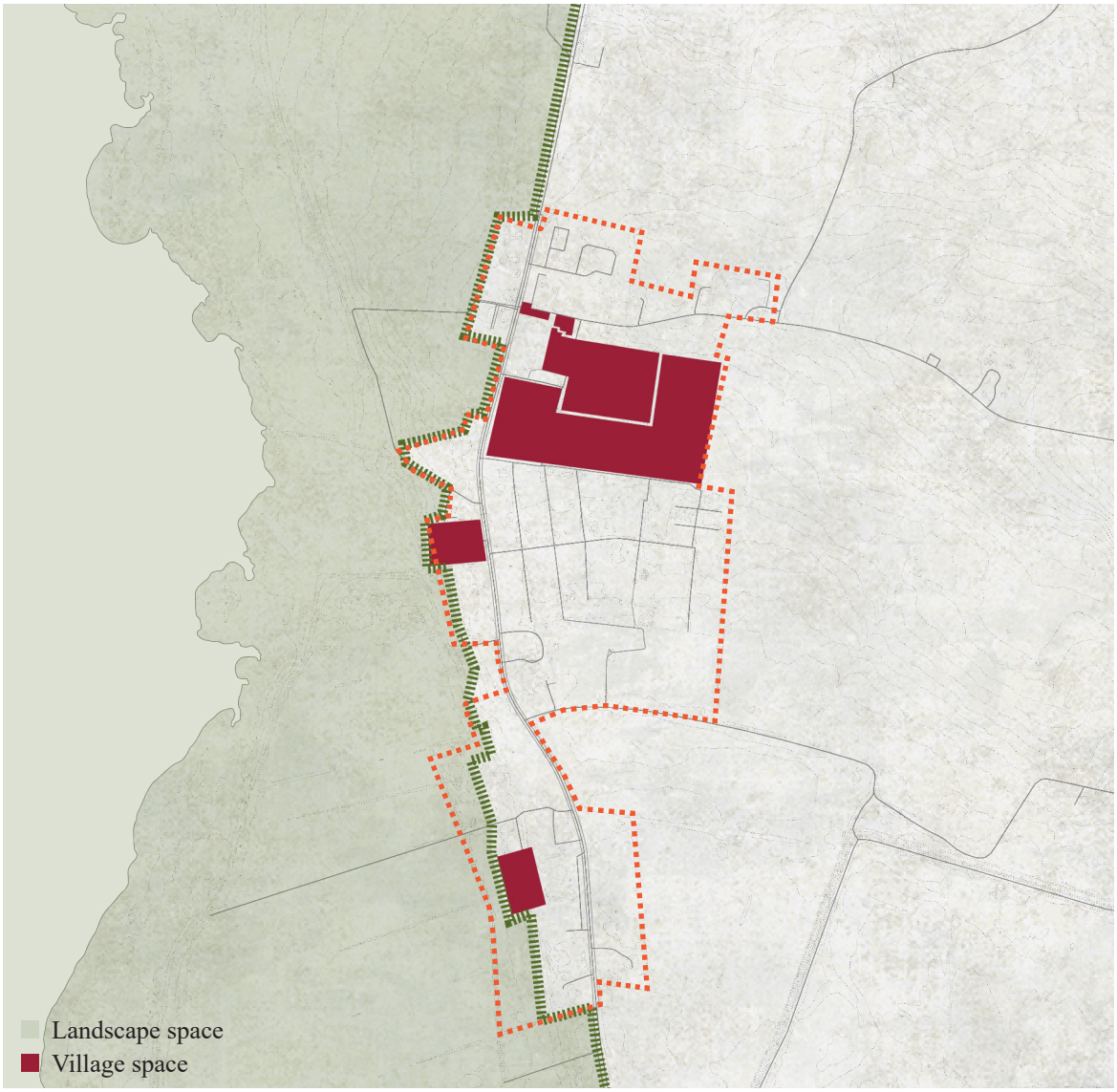
Velling
Nature & landscape



Ill. 150 Mapping of nature and landscape, Velling

The biggest landscape feature in Velling is the fjord landscape with its shallow waters and the wet nature types framing it. The village has beach meadow, meadow, bog and lakes close by. All nature types are though vegetated with cane breaks and aren't accessible. The fjord and the areas framing them is protected as NATURA 2000 habitat areas and bird protection areas, which increases the nature value of the town. Towards north, east and south Velling is surrounded by the agricultural landscape characterised by drained open fields, hedgerows and straightened out waterways. The area towards south is originally marsh but is extensively drained and the excess water is pumped out into the fjord through the many drain ditches that cut across the fields. To the east of Velling there is a water way between the many fields, and towards north you find a plantation, Velling Plantage.

Velling
Village spaces



Ill. 151 Existing village and landscape spaces, Velling

Ill. 152 Seating arrangement in front of the grocery store

Ill. 153 The grocery store

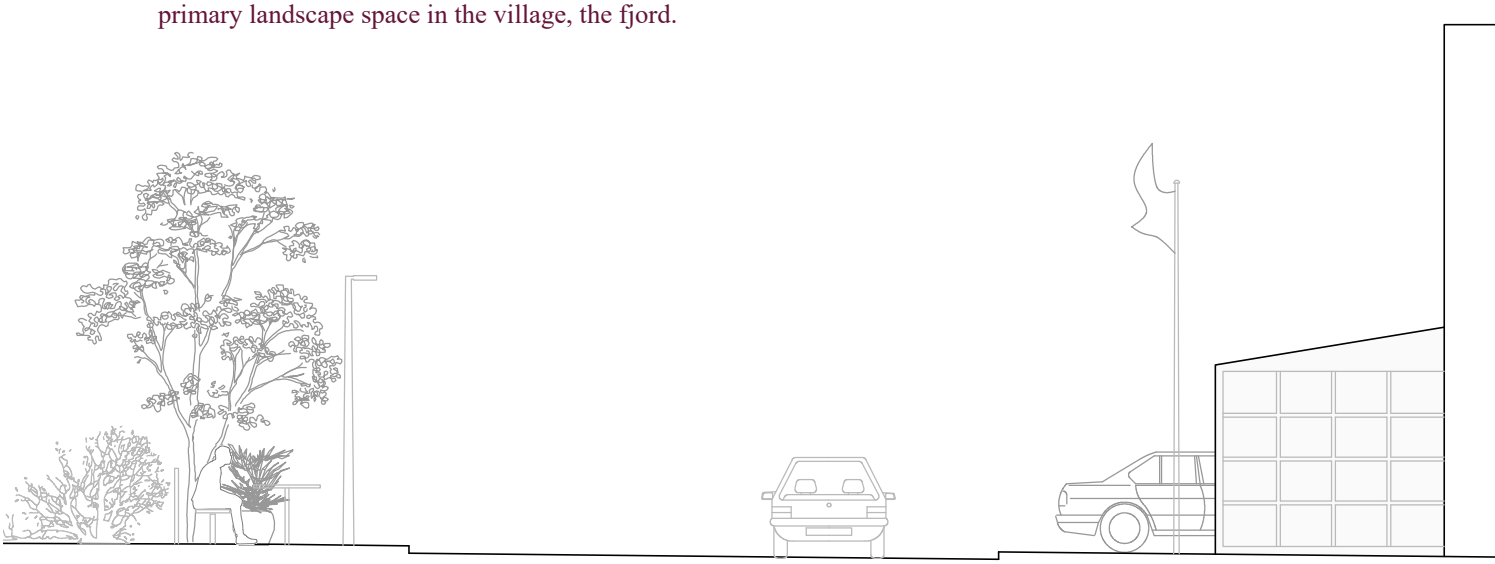
Potentials

There is a potential in connecting the village space to the fjord and the fjord landscape, as well as the community house. The community house is new and the front of it is still just a front garden. There is a development strategy in connecting a new meeting spot with an existing meeting spot and in connecting them to the primary landscape space in the village, the fjord.

Velling has a clear village centre where their different village spaces have accumulated. Here you find the school, kindergarten, grocery shop, sports fields, village hall and the community house. The continuation school also has a sports hall that the village sometimes uses. And the church also has a village space. The fjord and the nature that frames it is the biggest landscape space in Velling and holds great nature value. It is however only accessible at one point.

All the village spaces are existing and important meeting places in the village, and therefore hold potential for being basis for further development in the village. I have chosen to zoom in on the village space by the grocery store.

The village space spreads out between the front of the grocery shop and over the road to the little notch with benches, a table and big flowerpots. The village space starts inside the grocery store, that is an important function in the village. The shop can only survive because of local people who volunteer. The bench and table face towards south. Towards west you can look down towards the fjord, and towards east you find the community house and the school. The bench and the table are a meeting spot – it is e.g. here that the voluntary gardeners meet each Tuesday to drink their morning coffee before starting their work maintaining the green village spaces. It is also a hang out spot for the big kids from the school and the young people from the continuation school.



Ill. 154 Cross section of the village space 1:100

06 *Synthesis*

In this chapter I condense my findings from the prior chapter in two scales - the local scale and the site scale. Based on my findings and my theoretical position I formulate 2 strategies and 5 sub strategies to protect, nurture and enhance rural quality of life in areas with renewable energy facilities.

Ill. 155 Nørhede-Hjortemose Energy Park

Analysis synthesis

The project site Geestenge is situated in Ringkøbing Skjern Municipality. The municipality is one of the most productive municipalities when it comes to renewable energy from solar and wind power – a position they want to keep. They also want to be front runners regarding the production of green fuel. The project they have in the pipeline, Megaton, requires energy from x acres solar panels and x land-based wind turbines – all of these must be placed within the municipality. This calls for a big reorganization of land use in the municipality which is evident in the municipality plan. This restructuring of the land use will change the landscape, which in turn affects the quality of life of the people living in the rural area. They are opposed to the many new renewable energy projects – not because they don't support the green transition, but because they feel that they aren't part of the process and because they feel that the green transition happens to the detriment of the landscape that they find value in everyday, to some extent base their identity on and that are important to the quality of their lives. Especially one quote has stayed with me:

" Vi taler ikke kroner og øre. For os er det helt andre ting. Det er landskab, det er stilhed, det er sjælefred, det er horisonten, det er høj himmel." (Birgitte Vinding in Signe Molde på udebane: Skrid med jeres vindmøller, 2024, min. 07.53-08.18)

The landscape that holds so much value is the cultivation landscape, the agricultural landscape, that is open and big. Even though agricultural traditions, the reclamation of land and the intense cultivation, are part of the problem in terms of the climate crisis, the biodiverse crisis and the state of our marine environment, it is also a quality. Something that is completely integral to the people who live in rural areas – it is wide views, a big sky, hedgerows, drain channels and plantations. It is manmade but resembles nature – it is landscape.

And it is a landscape that holds value to those who live in it. The analysis shows that apart from the cultivated landscape, the biggest nature and landscape value in the vicinity of the project area is Ringkøbing Fjord. The fjord is an important scenic and nature element in the area and is emphasized because of the framing landscape – the flat outwash plain that leads down to the fjord and the rising hill island further inland. Thus, the fjord is a quality from afar as well as up front. The surrounding energy landscapes also holds value – the area around Gestenge holds several wind turbines. The wind turbines are a landscape element that the local people love to hate and hate to love. Even though they start out as foreign elements they become landmarks – something that the local people use as a guiding element, something that remind them of home.
The landscape around an in Gestenge holds great landscape value that can be used as a driver for rural quality of life.

In Ringkøbing-Skjern Municipality they prioritise applications for Grøn Pulje if they are within 4,5 kilometres of the new renewable energy facility. Grøn Pulje can help lift the development of the areas surrounding new renewable energy facilities – this is a major strength, since the financial part of community development through placemaking has been taken care of. Within the 4,5 kilometres around Gestenge there are five villages – Velling, Højmark, Lem, Stauning, and Dejbjerg. The five villages are organised in a village cluster. The village cluster structure can be used as the basis for development strategies that strengthens the quality of life in the entire area and not just in one place.

Each village has its characteristics and qualities. They are all rich on village spaces and most of them has strong village centres. The analysis shows that the village spaces could be made stronger if we think about

them as just that, places where people meet, and not just parking lots or football fields. All the villages have village spaces that holds potential – working with connectivity, placemaking and green structures could make them even stronger. Which in turn would strengthen the community well-being and thus affect the rural quality of life positively.

This thesis hasn't dealt with restructuring the proposed energy park in Gestenge. But by analysing the existing landscape and the plans of the future facility multiple potentials for enhancement of the rural quality of life has occurred. The project site holds many cultural traces – hedgerows, drain channels, big open areas, plantations and wind turbines. All of which will be erased. There is a potential in keeping some of the traces, thus joining the past, present and future place in one. The area is a drained lowland there is a potential in thinking about the possible hybridity of the landscape – this way the area will benefit the climate in two ways, and the closed off area of the solar power facility could develop naturally through the duration of project. The plan has earmarked a big area in the middle of the project site for a fauna passage. The shape and extent of the fauna passage is decided by the waterway protection line. The local plan allows agricultural cultivation of the land in the fauna passage. There is a potential rethinking the fauna passage as a nature and landscape element thus creating both nature, landscape and recreational value within the renewable energy facility.

The analysis has highlighted the many ways that the existing landscape and communities can be used as drivers for rural development in areas of new renewable energy facilities – both on site and off site. On the next pages the potentials found through the analysis is synthesised in maps in two scales.
xx

Map synthesis

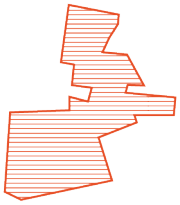
1. Grøn Pulje
Grøn Pulje can fund development of rural communities in the vicinity of new renewable energy facilities. In Ringkøbing-Skjern Municipality they prioritise the are within 4,5 kilmotres of the RE-facility.

2. Village Cluster
The village cluster, Friskvind, holds the potential for developing the local communities more strategically and in a bigger scale through the funds from Grøn Pulje.

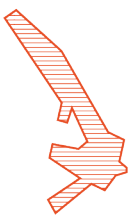
3. Velling
Velling has a clear village center and clear connection to the fjord landscape. There is a development perspective in connecting and adding nature quality to the existing village spaces as a development strategy.

4. Højmark
Højmark has a very distinct village centre. The village centre is divided in big fragmented areas, and there is a development strategy in creating a village center that is experienced as one - by creating a green spine or a meeting place.

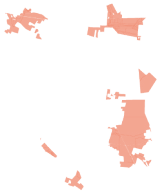
5. Dejbjerg
Dejbjerg is experienced fragmented in the sense that the recreational centre lies outside the village. There is a development potential in strenghening the connection and utilising the view over the agricultural landscape.



6. Lem
Lem has many village spaces. They are all experienced the same. There is a potential in re-wilding the park to create higher nature and recreational value.



7. Stauning
Stauning has a two village centres - at the harbour and around the main street. There is a potential in strenghening the village centre that connects to the school - to creater higher nature and recreational value for the good of the school as well as the village



8. Plantations
The area has many plantations - it is a culture historic trace as well as a landscape and nature value. The plantations hold potential for connecting the area as well as for developing the recreational value of the area.

9. Views
The contrast between the hill islands and the outwash plain is stark. The landscape therefore offers great views over the entire area. There is a development strategy in creating places that harness this quality.

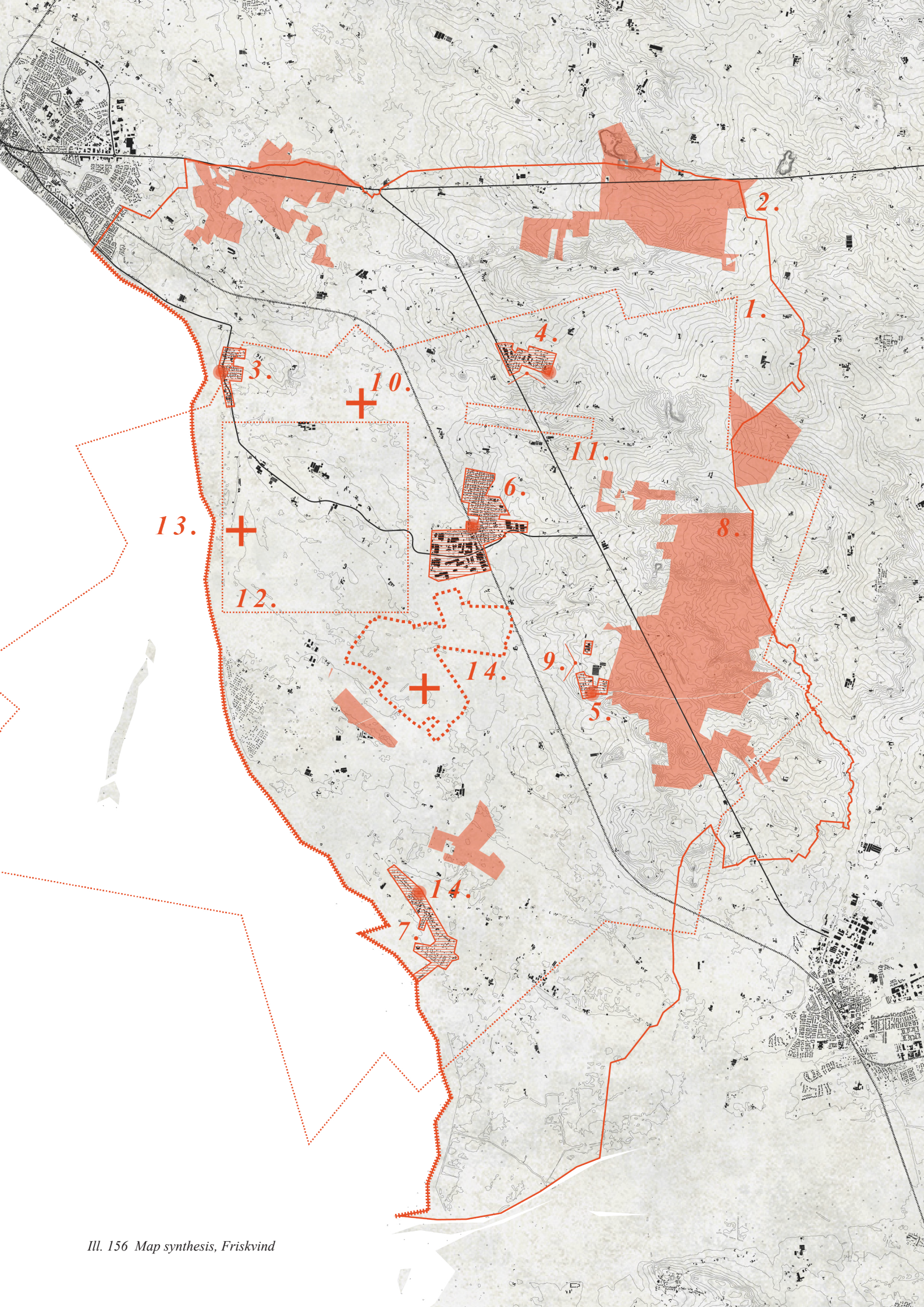
10. Wind turbines
There are multiple big wind turbines in the area. There is a potential in connecting the plots, to tell the story of the green transition and the development of technology.

11. River valley
The river valley between the hill islands holds potential due to its nature value. It also holds a nature historic perspective since the glacial period landscape is very visible here.

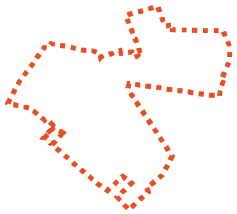
12. Agricultural landscape
The flat and open agricultural landscape is the dominant landscape feature in the area. It is characterised by big open fields, straighened waterways and hedgerows. The landscape holds a great landscape value for the people in the area, and highlighting it holds potential as development strategy.

13. Ringkøbing Fjord
Ringkøbing Fjord holds great potential for rural developement. It has both a high nature, landscape and recreational value for the local people. The accessibility is poor and there is a development strategy in connecting the village cluster around the Fjord landscape.

13. The churches
The villages all have churches. Churches has culture historic value and the act as landmark. There is a potential in connecting the churches in the village cluster through a recreational connection.

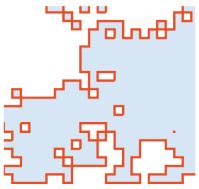


Ill. 156 Map synthesis, Friskvind



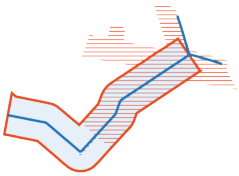
15. The energy landscape

The actual energy landscape holds potential as well. Because of the solar power facility the cultivation of the land must stop. Herein lies the potential of cultivating the landscape, cultural heritage as well as the nature value in direct connection to the energy production.



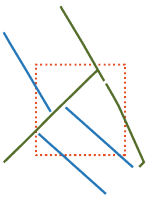
15a. Lowland soil

Some of the project area lies on former low-land soil. There is a potential in creating a hyr-bid landscape that both produce green energy through solar power and sequesters CO2.



15b. Nature

The local plan has allocated an area of the project site as fauna passage. The area is equal to the protection line around the stream. The local plan allows cultivation of the area. There is a development strategy in cultivating nature instead of produce, thus strenghening the nature value of the site.

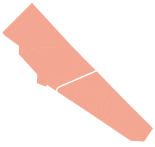


15c. Agricultural landscape

The site holds strong traces of the cultivation of the area - hedgerows and straight drain ditches. There is perspective in keeping some of the structures as marker of the cultural heritage and the history of the site.

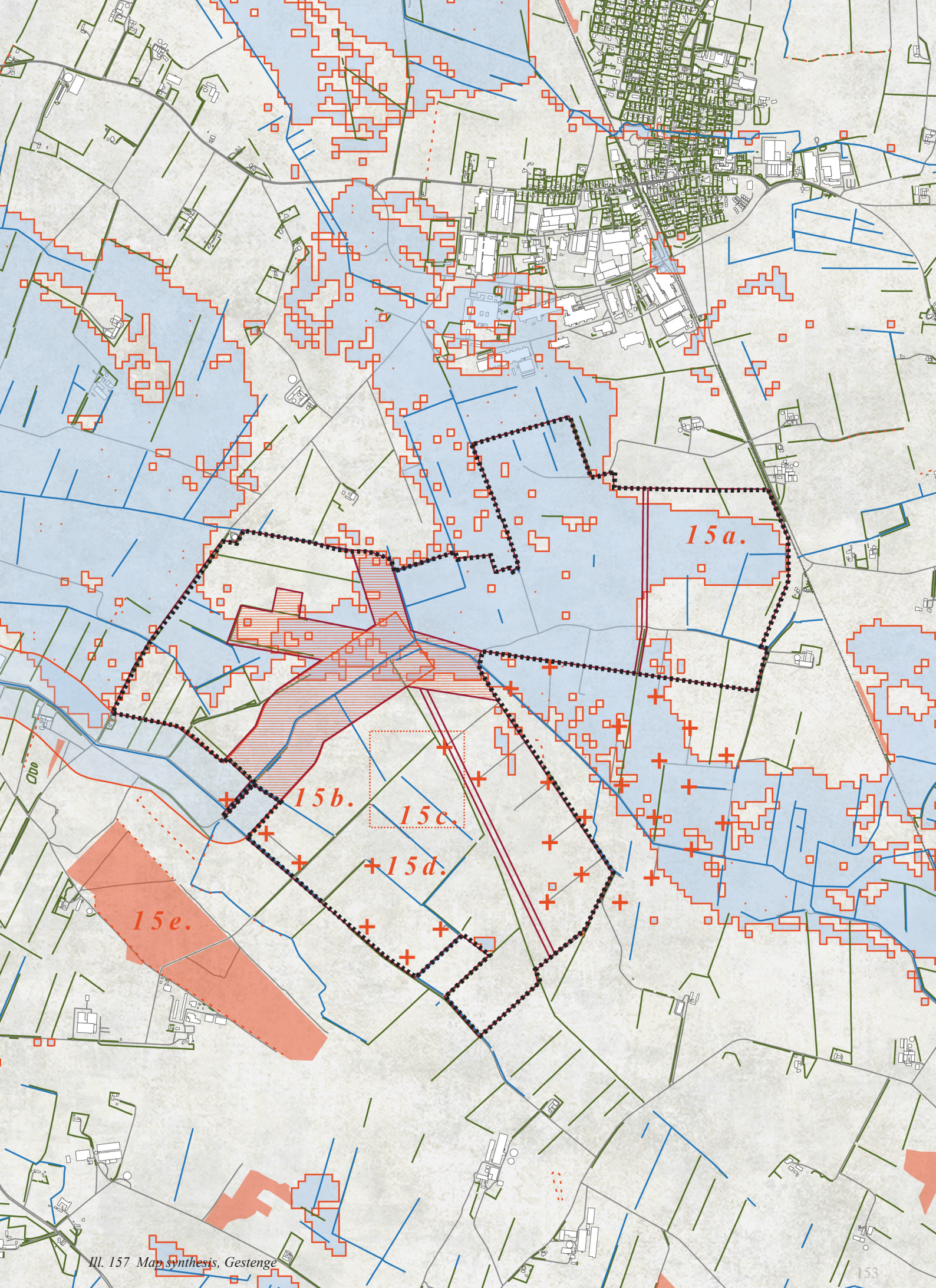
15d. Old wind turbines

Today the area is filled with old wind turbines. They are to be taken down when the solar power facility is erected. Wind power is part of the local DNA, and there might be a development perspec-tive in reusing a wind turbine structure. Perhaps as a accessible view point



15e. Stauning Plantage

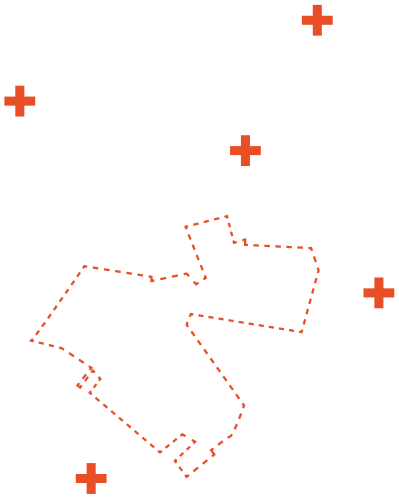
The small plantation south-west of the project site holds great nature, landscape and cultural value. It is a quality that could built upon within the project site.



Ill. 157 Map synthesis, Gestenge

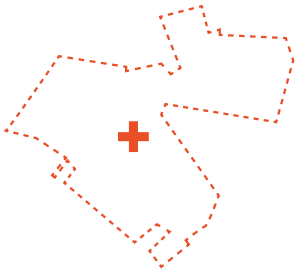
Strategies

The analysis has given an overview and a holistic understanding of the “rural and renewable energy facility”-assemblage in the specific case of Gestenge. It has given a strong basis for strategic decision making. The findings play an important role in the protection and development of rural life in areas that experience the addition of renewable energy facilities in the landscape. Based on the findings from the analysis, the theory presented earlier in the report and input from the broader theme of future land use I have developed two main strategies for enhancing, protecting and nurturing rural quality of life in areas with new renewable energy facilities. Each strategy can manifest in different forms, thus creating several additional sub-strategies.



add value off site

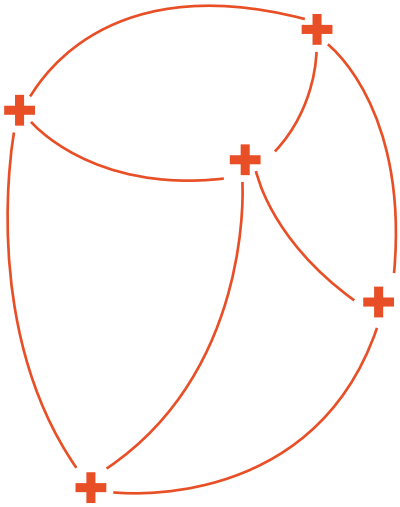
Placemaking in the area around the renewable energy facility as a way of enhancing, protecting and nurturing rural quality of life in areas with new renewable energy facilities.



add value on site

Placemaking in the project site to make the energy landscape multifunctional thus enhancing, protecting and nurturing the rural quality of life in areas with new renewable energy facilities.

Ill. 158 Strategies diagram

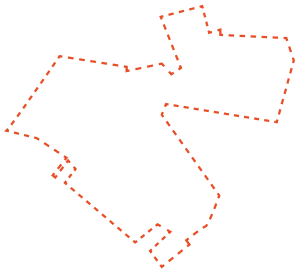


connect

Placemaking between the settlements – village to village or village to landscape.

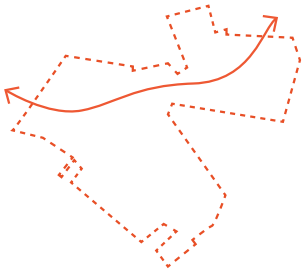
target

Targeted placemaking in a village – enhancing the existing village spaces and their potential for supporting community well-being.



nature

Cultivate nature in the gaps between renewable energy technology.



recreational

Add recreational value to energy facilities by making nature paths and meeting places.

hybrid

Make the energy landscape hybrid production landscapes – either include restored lowlands or afforestation.

06 *Intervene*

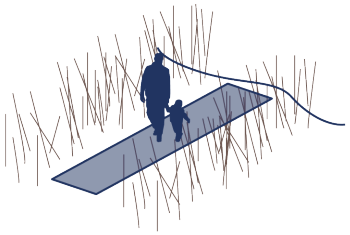
The following chapter will exemplify how the strategies could manifest physical form. The goal is to showcase how rural development can look in a case like Gestenge – both on site and off site.

Ill. 159 Something breaks out of Gestenge

Add value off site

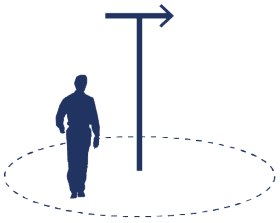
connect
connection between characteristic landscape elements

The connect-strategy aims to add value off site by connecting the surrounding landscape elements and spaces. In a case like Gestenge there is a big potential in creating physical connections between the five villages, that already is organized in a village cluster. Utilizing characteristic landmarks, such as churches and wind turbines, has potential, because it is cultural heritage that all villages have in common. Also, the plantations are characteristic landscapes in the area and could also act as connecting elements. The agricultural landscape and the fjord landscape are the dominant landscape features. Both landscapes are hard to access – the fjord because of the wet beach meadows and cane breaks, the agricultural landscape because of ownership issues. Making both landscapes accessible so the local people can get closer to them and sense them instead of just observing them from afar holds a big potential.



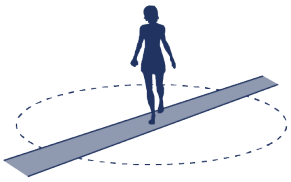
Ill. 160 A path to the fjord

Ill. 161 A path along the hedgerows



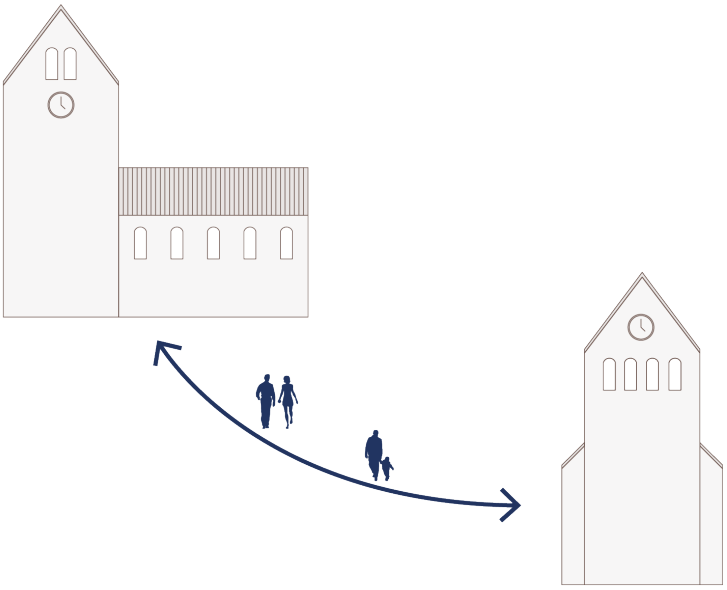
Ill. 162 Wayfinding

Ill. 163 A bench

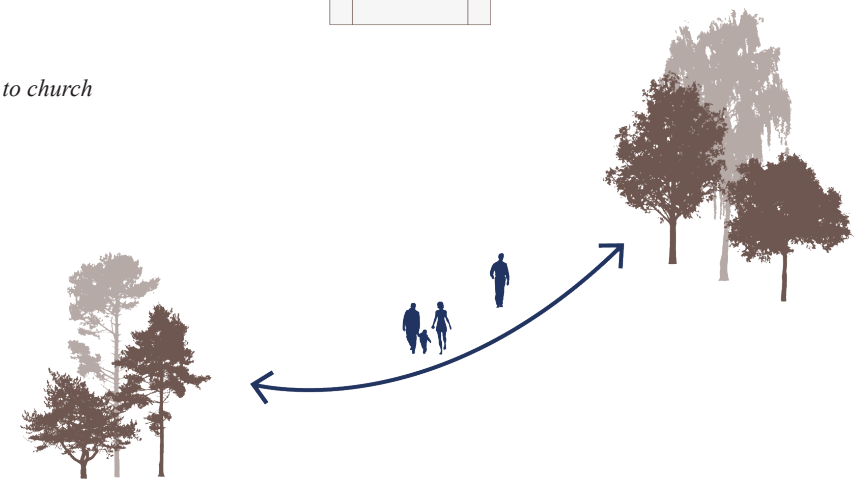


Ill. 164 A path

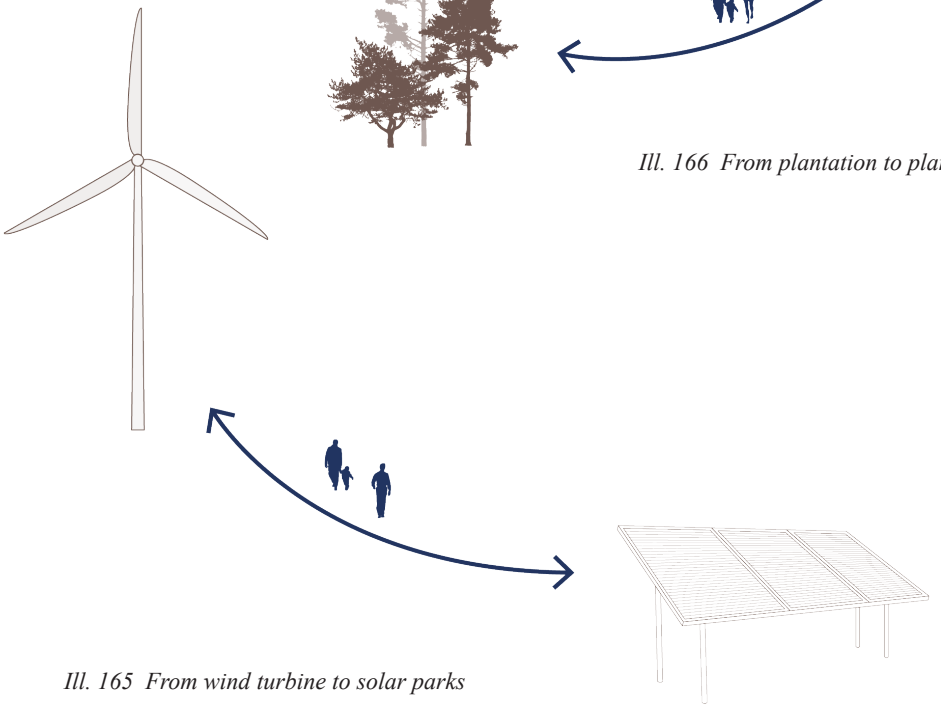
Placemaking in a strategy like this can take many forms. It can of course be an actual connection, a physical path that connects two otherwise separate entities. It can also be a special bench that is placed at specific points in the plantations or by all the churches. A connection can also take form through wayfinding and information.



Ill. 167 From church to church



Ill. 166 From plantation to plantation



Ill. 165 From wind turbine to solar parks

Add value off site

target
a connection between Dejbjerg and Dejbjerglund Efterskole

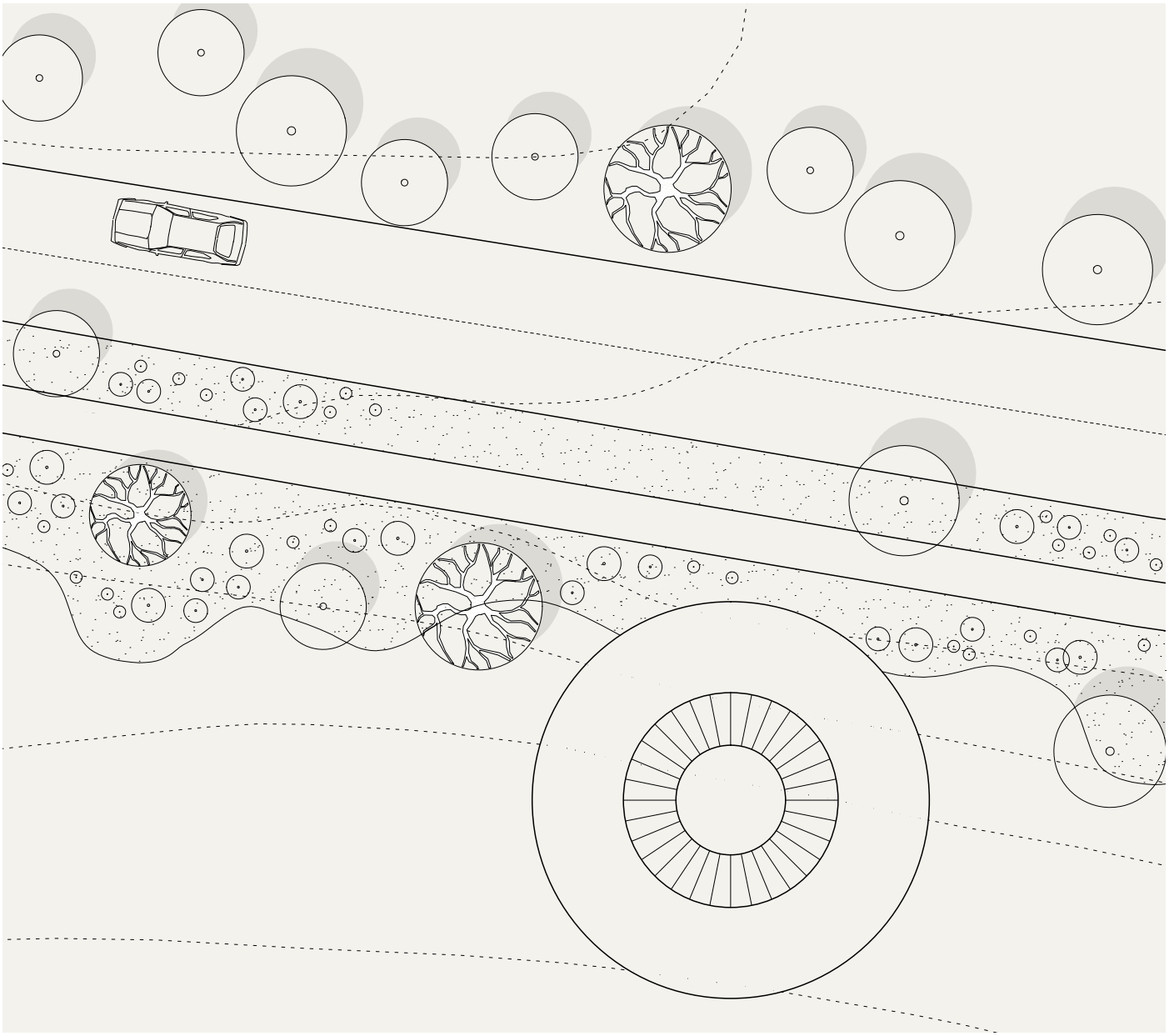
The target strategy aims to add value off site and in a specific village. In this thesis we have looked at the existing village spaces and how one might improve them to add value – may it be nature, landscape or recreational. The strategy doesn't dictate the function or aesthetic of the places that are created or improved. There is however a big potential in many of the villages we have looked at here to cultivate the spaces that tie the village spaces together with each other or the dominating landscape space.

To exemplify the approach, I have worked on the connection between Dejbjerg and the continuation school just outside of the village, Dejbjerglund Efterskole. I suggest creating a recreational connection between the two, so both pedestrians and cyclists can move between the two in a comfortable manner. I have proposed to create a sundown plateau that faces west. From the plateau you get a beautiful view over the agricultural landscape and the fjord landscape. The plateau can act as a small breakpoint, a meeting spot or a viewpoint. By introducing the sundown plateau the view that is otherwise reserved the people with houses on the first row or from the road becomes accessible to all.

Ill. 168 Section 1:200

Ill. 169 Situational plan 1:4000

Ill. 170 Plan 1:200



Add value on site

nature

a fauna passage focused on the well-being of fauna and flora

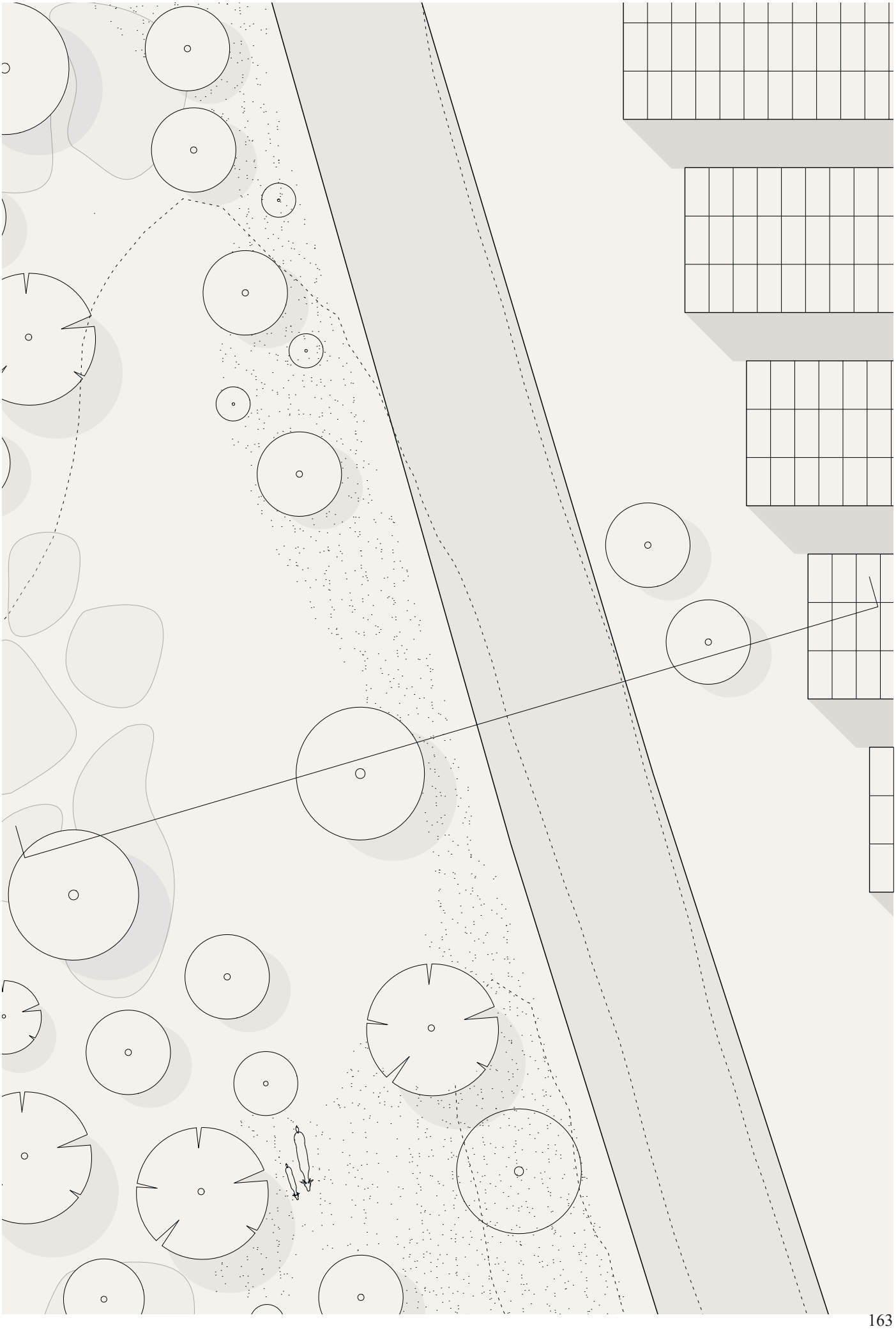
The nature strategy aims to add nature value on site of a renewable energy facility. This breaks up the technical configuration of the place and adds additional value making the energy landscape valuable beyond the production of energy. Solar panels and wind turbines have an estimated life span of 30 years. This in turn means that if we make space for nature and supports natural processes in energy landscapes they can act as ecological corridors and nature catalyst for just as long. Nature can be added in many ways. If there are existing nature elements on site those should be used as a base for further development.

In Gestenge there are several existing nature qualities. There is a waterway that has been straightened and a patch of moorland. The waterway is protected, which limits the expansion of the solar power facility. In the local plan the protection zone around the waterway functions as a fauna passage, however agricultural cultivation is allowed. I propose that the fauna passage is exempt from cultivation, thus allocating the entire fauna passage for nature restoration. This would add nature value to the site, which can evolve and possibly spread through the next 30 years.

The small patch of moorland could be restored, and the waterway could be restored to its natural shape, thus creating better conditions for natural ecosystems. The existing hedgerows could be preserved as a cultural heritage trace, but also because they are distinct habitats. The area between the waterway and the solar panels can either be sowed with native herbs and grasses or you could let nature evolve on its own. The free space underneath the solar panels can also be sowed with native herbs and grasses. If grassers such as goats and sheep aren't introduced to the area trees will be sowed and grow naturally. The fauna passage is kept free of human activity for the well-being of nature.

Ill. 171 Section 1:200

Ill. 172 Plan 1:200



Add value on site

recreational

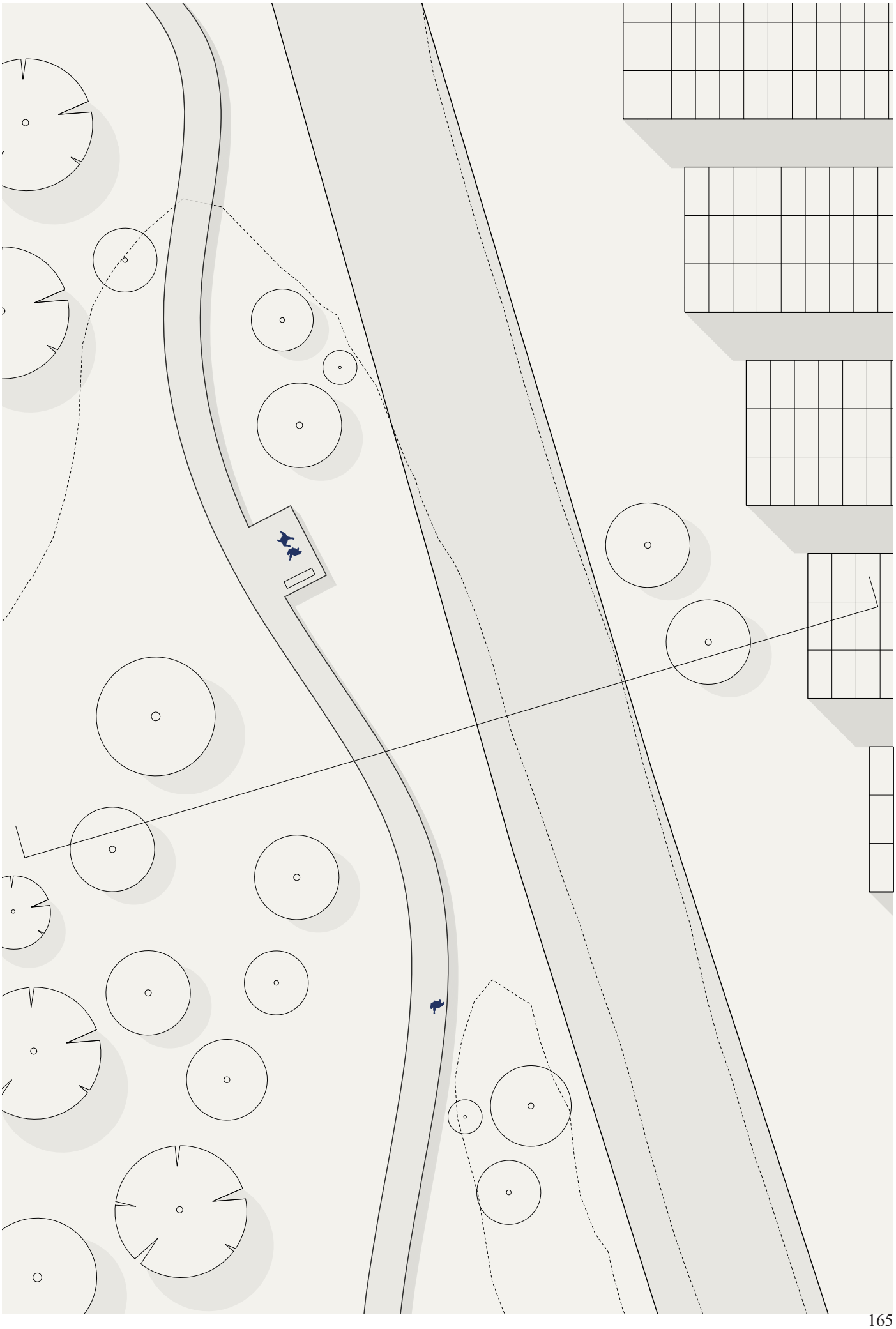
a fauna passage focused with room for both human and non-human actors

The aim of the recreational strategy is to add a recreational path or structure on site. Thus, making energy landscapes part of the experienced landscape, instead of a fenced in no-mans land. Cultivating nature and recreational value in an energy landscape would create a varied landscape experience. It might even become an attraction – a place where you can experience the past, present and future landscape.

In the case of Gestenge I propose keeping the fauna passage free of agricultural cultivation, and instead restore nature as described earlier. I propose placing a boardwalk on one side of the waterway – leaving the fauna and flora alone on the other side. A boardwalk would allow nature to be as undisturbed as possible by human interference. The boardwalk has a small plateau where you can sit and experience the varied landscape. The experience of the ever-changing landscape could be enhanced by preserving the original hedgerows and drain channels under and between the solar panels as a cultural trace. There is also a potential in the old wind turbines – perhaps they could act as viewpoint if they were accessible. Then you could experience the energy landscape, gone nature landscape, gone recreational landscape from above as well as in right in front of you.

Ill. 173 Section 1:200

Ill. 174 Plan 1:200

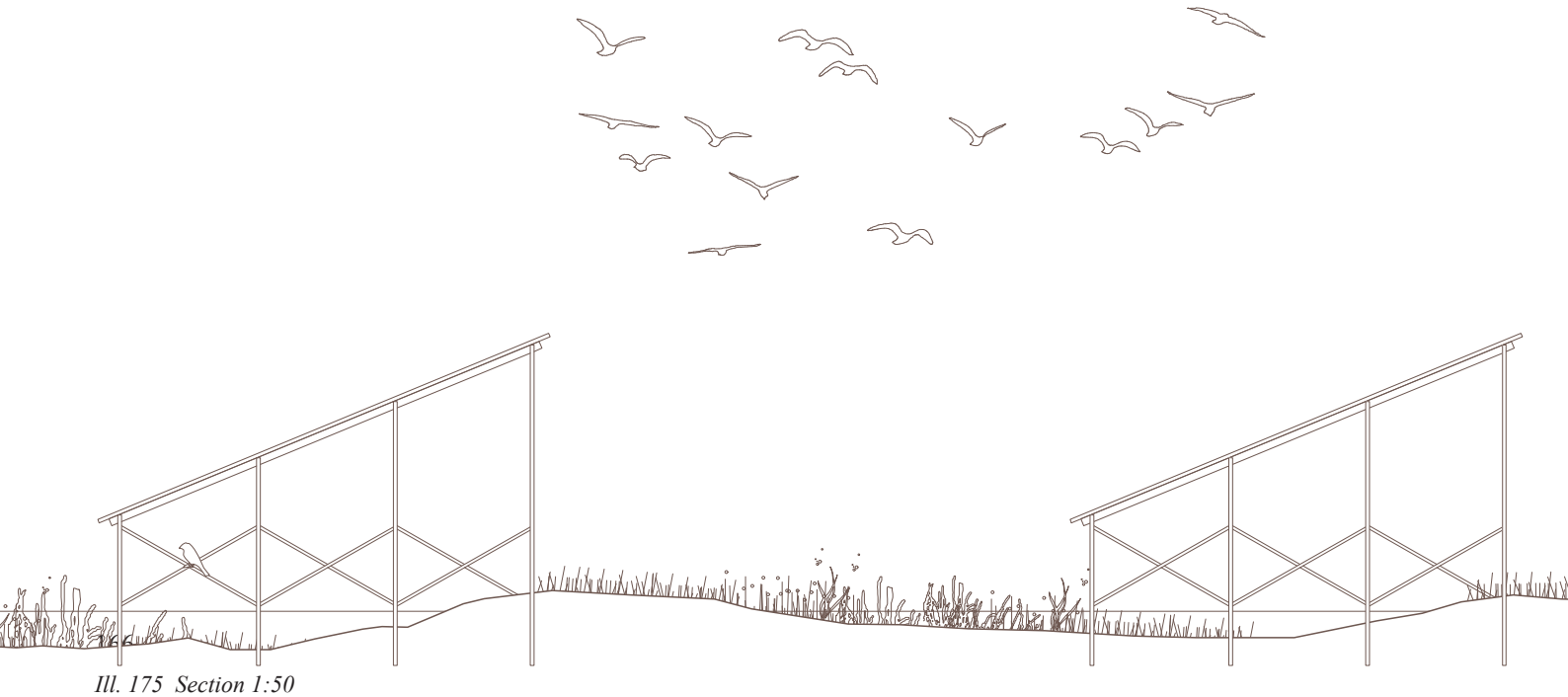


Add value on site

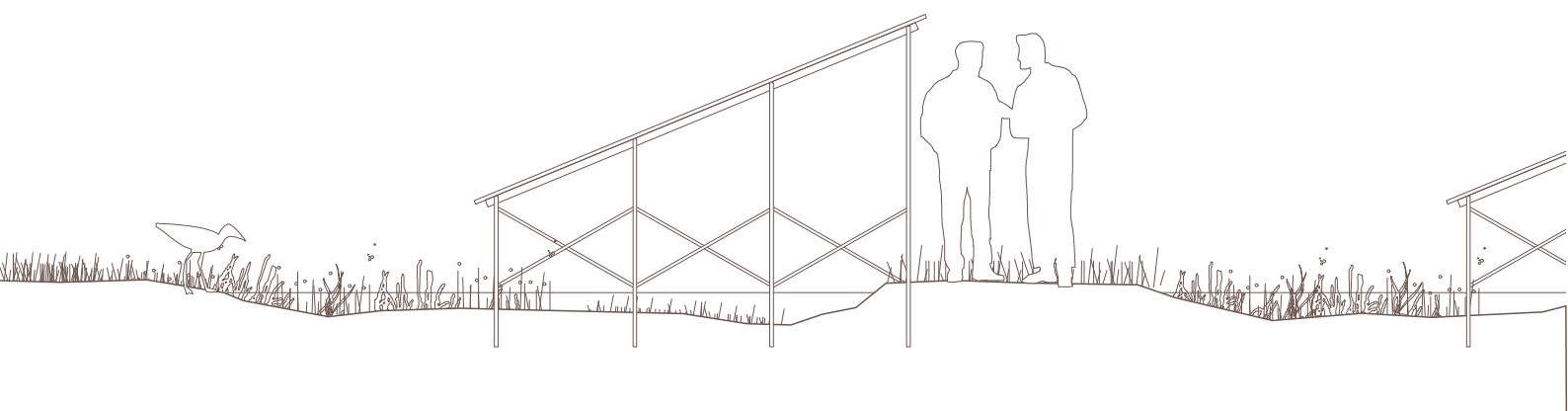
hybrid
an energy landscape as well as a lowland area

The hybrid strategy aims to make the area with renewable energy technology multifunctional. Either through afforestation or by restoring original lowlands. Wind turbines can co-exist with both, but solar panels work best with the restoration of lowlands since trees would create shadow. The strategy breaks with the mono-functionality of energy landscapes, and makes them meaningful beyond the production of energy. The strategy also holds a time perspective, since the forest or the lowlands has 30 years to evolve – increasing the nature value of the site, which in turn creates value with local communities.

In the case of Gestenge part of the area is identified as potentially suited for lowland restoration, and the area under the solar panels could potentially be restored as wetland. By placing the solar panels strategically, it will be possible to rewet the soil, while still allowing efficient management of the solar panels. This is a tentative proposal, and the coexistence of the solar panels and wetlands must be researched further than this thesis does. The wetland will sequester CO2, but will also act as a nature element, increasing the nature value of the site now and in the future.



Ill. 175 Section 1:50



06 *Epilouge*

In this chapter I will present my conclusion and reflection on the thesis project Under Pressure. Last you'll find the literature list and the illustration list.

Ill. 176 Gestenge

Conclusion

The aim of this thesis was to investigate how to protect, nurture and enhance rural quality of life in areas that experience the addition of a new renewable energy facility in their landscape within the scope of urban design and planning.

Through theoretical research and a study of a specific renewable energy facility case – Gestenge in Ringkøbing-Skjern Kommune – I suggest two approaches to develop rural areas in light of renewable energy planning. Both approaches rely on the municipality granting financing for urban development through Grøn Pulje. To enhance, nurture and protect rural quality of life I propose either adding value off site by connecting the villages in the area or by targeting specific village spaces in the individual villages, or adding value on site by cultivating nature, adding recreational functions or introducing multiple land uses.

To achieve the aim of the project the thesis has explored four objectives.

First, I explored the context of contemporary land use with a special focus on energy landscapes. I found that we in Denmark face a multitude of issues that has to be addressed through a restructuring of the land use. Right now, the municipalities have to find space for not only renewable energy facilities, but also new forests, restored lowlands and big and cohesive nature areas. This in turn pressures the rural districts in Denmark – most analyses conclude that much of the new functions must be placed in rural areas. I found that people in rural areas often are against renewable energy facilities, and often fight the process because renewable energy facilities change landscapes. Landscape in turn often carries identity, and when local people aren't included in the planning process regarding renewable energy in their area their sense of justice is violated – we can call it landscape democracy or the lack thereof.

You could write an entire thesis about only citizen involvement or the mere placement of renewable energy facilities. The research of contemporary land use and the pressure it puts on rural communities, however let to a more specific interest in how we develop the rural quality of life through urban design and planning. Of course, with take-off in the introduction of a new renewable energy facility in the area.

To inform the scope and approach of the thesis I have explored existing research on rural quality of life, the theoretical relationship between humans and nature, and last theory on sense of place and placemaking. There are a multitude of elements that contribute to rural quality of life – the research that I have reviewed emphasise on civil participation, placemaking, social relations and the close connection to landscape. When I explored these themes more in depth, I found that landscape act as the mediator between humans and nature. I additionally found that understanding human and nature as one instead of entities is crucial, if we are to act on the climate and biodiversity crisis. This shift from the human-centred world view to a world view based on assemblage theory and the actor-network theory has informed the methodology of the thesis as well as the focus of the analysis. Lastly, I found that place is dynamic, and also can be thought of as an assemblage – a situation between elements, humans, nature, technology etc.

Third I utilised urban design and planning methods to explore the "rural and renewable energy"-assemblage. I conducted analyses in three scales and focused on planning, nature, landscape, existing places, structure and cultural heritage. The analysis revealed that landscape, nature, cultural heritage and existing village places hold qualities that act as the basis of rural development in light of the addition of renewable energy facilities in the area through placemaking. The making of place can happen in multiple scales – on site or off site.
Based on a synthesis of my findings in the analysis and the incorporated theory I found that rural quality of life can be protected, even nurtured and enhanced, in areas where new renewable energy facilities are put up. We just need to create places that incorporate elements of the past, present and future.

Reflection

I haven't really spent that much time on discussing whether or not we need renewable energy facilities or not. I haven't done so because I believe that we do – I don't see an alternative if we are to phase out fossil fuel and push the green transition. When reviewing the additions to the Danish Renewable Energy Act within the last couple of years, it seems like the politicians and their advisors agree with me. The expansion of the Danish Renewable Energy portfolio needs to be big and happen fast. This hurried policy-making approach however seems to be driven by techno-rational logics, which has led to the planning of overlarge, monofunctional renewable energy facilities like the one planned in Gestenge. The legislation undermines the cultural value in rural landscapes, closes in protected nature types, ignores biodiversity and lowland restoration potential, and perhaps most importantly it undermines the people who have to live side by side with the tall wind turbines and the expansive solar power facilities.

People in rural areas are often opposed to renewable energy facilities being erected in the vicinity of their home. The government's approach to increase local endorsement has been to initiate multiple financial compensation schemes. To some extent though they miss the point. People are worried about their property losing value. But often enough they are more worried about the changes that are being made to the landscape that they call home and find identity in.

This thesis is in some ways tied up on one of these financial compensation schemes – Grøn Pulje. The premise has been that to secure and develop rural well-being we must invest in placemaking and landscape, and to do that we need money. From this perspective my thesis is flawed. In the case I study in the thesis, Gestenge, the project has been signed, sealed and almost delivered, and first then I activate the role of rural development financed through Grøn Pulje. In this sense the place and landscape development I propose is just that, a compensation. My proposed strategies might enhance, protect and nurture rural development, but they do not necessarily increase the local endorsement.

In present thesis I have applied a 'top-down' approach. I have been the urban planner and designer – I have registered the landscape and the village spaces – I have drawn the conclusions – I proposed the strategies and the interventions. Which of course is part of my position as just that – an urban designer and/or planner. But if the strategies that I propose are to play a role beyond increasing the well-being of rural communities, the local actors must be included in the process. All research on the matter shows that local communities tend to support renewable energy projects that they have been involved with from the beginning. In this light there might be a perspective in including the placemaking strategies of present thesis from the beginning as well, thus connecting the two beyond the compensation scheme. Some of the research presented earlier in this thesis has highlighted civil participation as a key element in understanding rural well-being (Iversen, Fehsenfeld & Ibsen, 2022). Also, Tietjen and Jørgensen (2022) mentions that community well-being is increased through the mere act of creating places with each other. By initiating placemaking initiatives you could perhaps activate local actors as creators and experts instead of victims and opponents. Their knowledge could inform both the planning process of the renewable energy facility as well as the placemaking strategies proposed in the present thesis. By doing so the gap between the top-down and the bottom-up approach could be bridged. By doing so rural development projects in relation to renewable energy facilities can be rooted in the local communities.

Such an approach would benefit the understanding of the "rural and renewable energy"-assemblage. By acknowledging the local actors as active entities new connections across the human-landscape-technology spectrum might be revealed. This in turn might lead to even more specific strategies for securing the qualities of rural life in areas with renewable energy facilities than has been presented in the present thesis.

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Illustrations

All illustrations except the following have been made by the author herself. All photographs have been taken by the author herself. The thesis uses photographs taken by the author in connection to Landsbyklyngeprojektet in 2022, and are being used with permission.

Ill. 56 Videnskabernes Selskabskort (1762-1820)
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Illustration references

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