CLEAN ENERGY FOR EU ISLANDS

CLEAN ENERGY TRANSITION AGENDA

Venø

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CLEAN ENERGY FOR EU ISLANDS

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Preface

This Island Clean Energy Transition Agenda for Venø is the strategic and tactical roadmap for the transition process towards clean energy as desired by the stakeholders on the island.

This Island Clean Energy Transition Agenda was developed by ProEnergi with the support from VenøBoen, Struer municipality, Venø Seafood, Struer Energy, NOE and Venø Boarding School.

This Transition Agenda is a roadmap for the local stakeholders and residents on the island to achieve its vision for clean energy and become CO_2-neutral by 2050. It includes the islands baseline, pathways and strategies for the clean energy transition.

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Part I: Island Dynamics

1. Geography, Economy & Population

1.1 Geographic Situation

Venø is a part of Struer Municipality and is located in the western part of the Limfjord between Venø Bugt and Venø Sund. The island is one of Denmark's 27 small islands with a length of 7.5 km, width of 1.5 km and an area of 6.42 km^2.

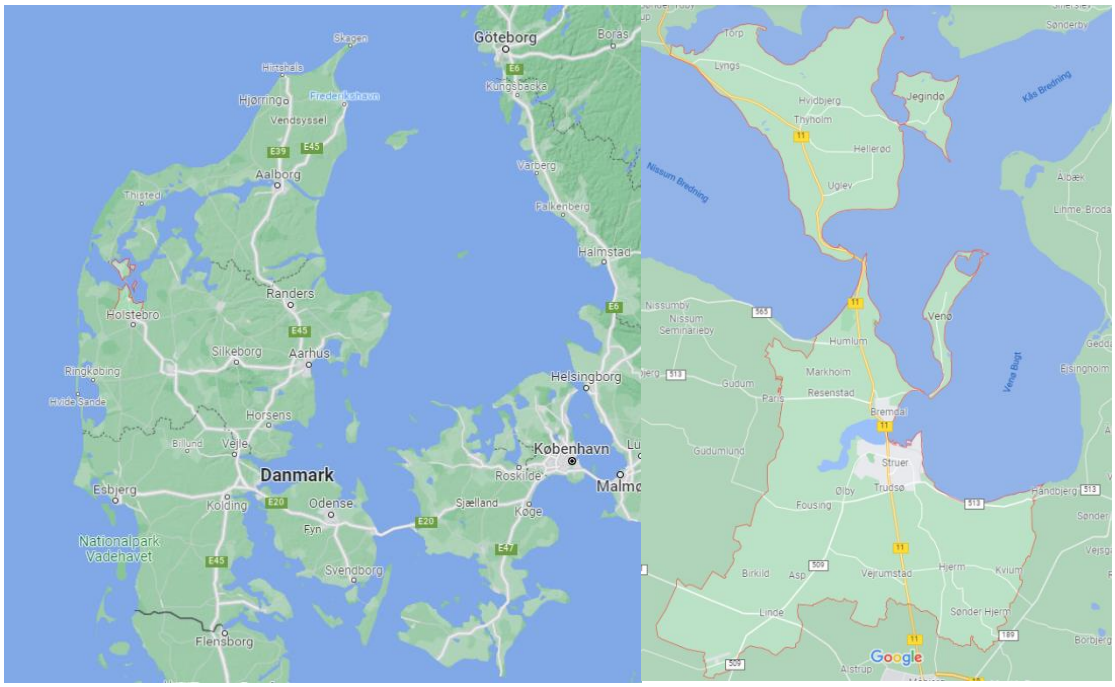

Figure 1: Struer municipality's placement in Denmark marked with red (left) and Venøs placement in Struer municipality (right) (Source Google Maps)

The landscape on Venø consists of green fields, plains, forests, heats and beach meadows. Three farmers have plant production and one of them has sheep grasing on the green fields. The beach meadows cover about half of the outer edge around Venø and is protected under Natura 2000 together with the sea around Venø. The Northern part of the island is a wild bird reserve located at Nørskov Vig. The wild bird reserve is a part of Natura 2000 and protects the wildlife during the breeding season from the 1st of April to the 15th of July.

Struer Municipality is in the process of establishing a lowland area project at Møgelsig, at the southern part of Venø, as a part of a conservation programme financed by The Danish Government. The purpose of the project is to recreate wet meadows and lakes by shutting down three pumping systems. This will reduce the discharge of nutrients for the benefit of the ocean. In addition to the project, Venø wishes to remove the rose hypes and expand sheep grassing to increase biodiversity.

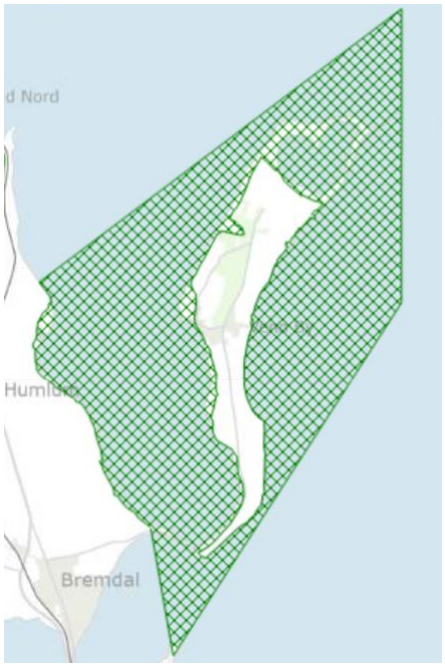

Figure 2: Natura 2000 areas on and around Venø, marked with green (Source: The Municipality Plan of Struer (Struer Kommuneplan))

Like many other places in the world, due to climate change, the northern and southern part of Venø experience floods more often than before.

1.2 Demographic Situation

There are approximately 200 permanent residents on the island mainly living in Venø By, and Venø Boarding School has 80 students each year during a school year. The students live at the school and visit their homes during holidays and some weekends. The population is equally divided it terms of men and women, distributed across all age groups.

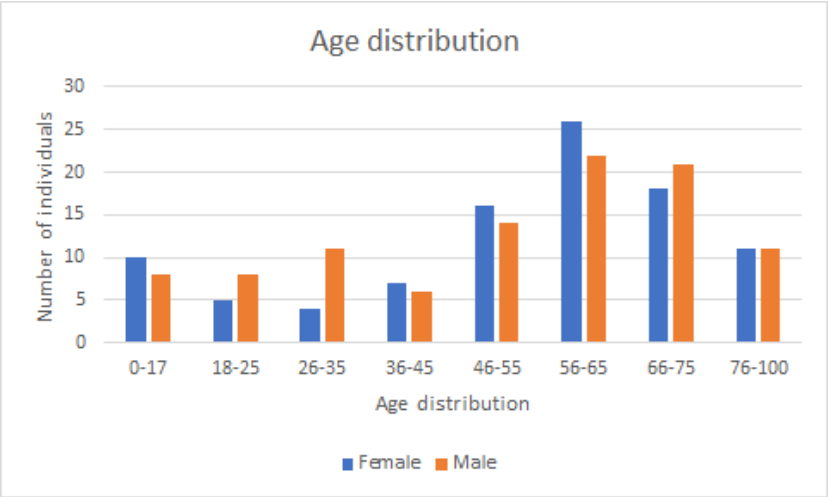

Figure 3: Table of age distribution (Source: Struer municipality)

The ferry makes it possible for the residents to live on the island while working or going to school on the mainland. Struer is the nearest city on the mainland and connects to Venø via an only 2-3 minutes ferry ride. Since the island is so close to the mainland, the residents have a 15 minutes drive, including the ferry ride, to the nearest childcare, school, high school, grocery store and train

station in Struer. There are therefore both summer cottages, country houses, single family houses, farms, childcare, a boarding school, camping sites, galleries and restaurants on the island. The easy access to and from the island makes it a popular island to live on and specially to visit as a tourist. During a year 70.000 tourists visit the island mainly on day trips due to lack of overnight accommodations. There is a public bus route to and from Venø, which has multiple pickup places on Venø and all the way to Struer city. During workdays the bus comes to Venø 6 times during a day and 2 times a day in the weekends. The Municipality wants to convert the bus from diesel to electricity.

In 2010 ProEnergi, NOE and Venøboen carried out an energy mapping of 29 households to optimize the energy use on the island. A part of the project was a solar cell plant at Venø that could produce renewable energy to the island. However, legal conditions concerning position and installation made it impossible back in 2010. Instead some households ended up installing their own solar cells.

1.3 Local Government

Venø is a part of Struer Municipality and there is no local government on the island. However, the island has the local community group: VenøBoen which is a member of The Association of Danish Small Islands ("Sammenslutningen af Danske Småøer" (SaDS)).

SaDS is a government sponsored interest organisation founded and governed by 27 small Danish islands. The purpose of SaDS is to preserve and develop the communities on the islands.

1.4 Economic Activities

Venø´s main economic activities are generated by Venø Bus (Venø Bussen), Venø Ferry Company (Venø Færgefart), tourism, Venø Boarding School, Venø Fish and Shellfish (Venø Fisk og Skaldyr) and Venø Seafood.

The ferry has approximately 11 employees, who take shifts sailing, taking care of the ferry and the logistics each day around the year. This creates the foundation for the other economic activities on the island, especially tourism. Further the ferry attracts prospective residents to settle down on the island, because of its close connection to the mainland and still being an island.

The Venø Bus (Venø Bussen) is one of the main economic activities with approximately 35 employees. It runs a tourist service that offers tours on Venø and to the mainland and it serves the public municipality bus-transport to and on Venø and the general public transport in the municipality.

Tourism creates the foundation for many economic activities such as:

Profession	Companies
Transportation	Venø Ferry Company (Venø Færgefart), The Venø Bus (Venø Bussen), Venø Harbour, bicycle for rent and Venøsund Færgelaug.

Hospitality and restaurants	Camping sites, B&Bs, summer cottages, Venø Inn (Venø Kro), Café, Venø Seafood and Camp schools.
Retail	Galleries, Venø Harbour Cafe and Kiosk (Venø Havnecafe og Kiosk) and Venø Herb Garden (Venø Urtehave).

Figure 4: Table over companies (Source: VenøBoen)

In the summer period Venø Harbour is visited by most of the 70.000 annual visitors, where few arrive by boat. The harbour also has a café and kiosk, that serves tourists and islanders during the summer months. Close to the harbour is Venø Kro, which serves guests during the summer months and year-round serves private parties.

Venø Boarding School has around 16 employees and 96 students, who live at the school, during the school year. Twice a year the ferry sails more frequently to get the new, and later the graduated students with their families to and from the school.

One of the main economic activities is Venø Seafood, which catches and processes oysters, mussels and lobsters. Venø Seafood distributes its products locally, nationally and to export. Venø Seafood operates a breeding project to preserve oysters and flatfish in the Danish waters. Venø Seafood is offering guided tours for tourist.

Further economic activities on Venø are agriculture, hunting, entrepreneur, carpentry and an electronic workshop.

1.5 Connection to the mainland

The ferry connects the island with the mainland through a 275 meters ferry route that takes about 2-3 minutes. The ferry carries 12-13 cars and 75-85 persons per trip and sails every 20 minutes at daytime and every 30 minutes in evenings until midnight. In 2020 the ferry used 100.000 litres of diesel and had an electricity consumption of 82.000 kWh, and sailed 38.400 trips to and from the island with:

Category	Number pr. category for year 2020
Passengers on foot	237.072
Bicycles**	12.570
Passenger cars	120.198
Busses	4.450
Caravans	297
Trucks*	1.944

Figure 5: Table over passengers on the ferry to Venø (Source: Venø Færgefart)

*In total the trucks transported 4159 ton of goods.

**The number of bicycles has doubled compared to the previous four years.

The power cable that supplies the island with electricity from the mainland, connects to Venø at the southern part of the island. The cable is an old oil cable from 1957 and will soon need to be replaced. It is the electricity supplier, NOE´s idea, that the new cable shall be connected to Venø

further south than the current position. Using the changed position, the cable will be connected closer to the ferry route.

In Struer Municipality the sewage and the rainwater are treated separately, where the sewage is led to Struer Energy´s (Struer Energi) sewage treatment plant on the mainland, 4,5 km away, and the rainwater is led to local recipients.

2 Energy System Description

2.1 The energy system

The energy system is mapped using available data and estimates when data wasn't available, all for year 2020. This means that the final energy consumption and CO2 emissions on Venø will be an estimate based on available data and knowledge. The mapping of the energy system is broken-down pr sector and category, with the final energy consumptions and CO2 emissions shown in the figure and tables below.

The figure shows the consumed and produced energy on Venø for transportation, electricity, and heating mediums.

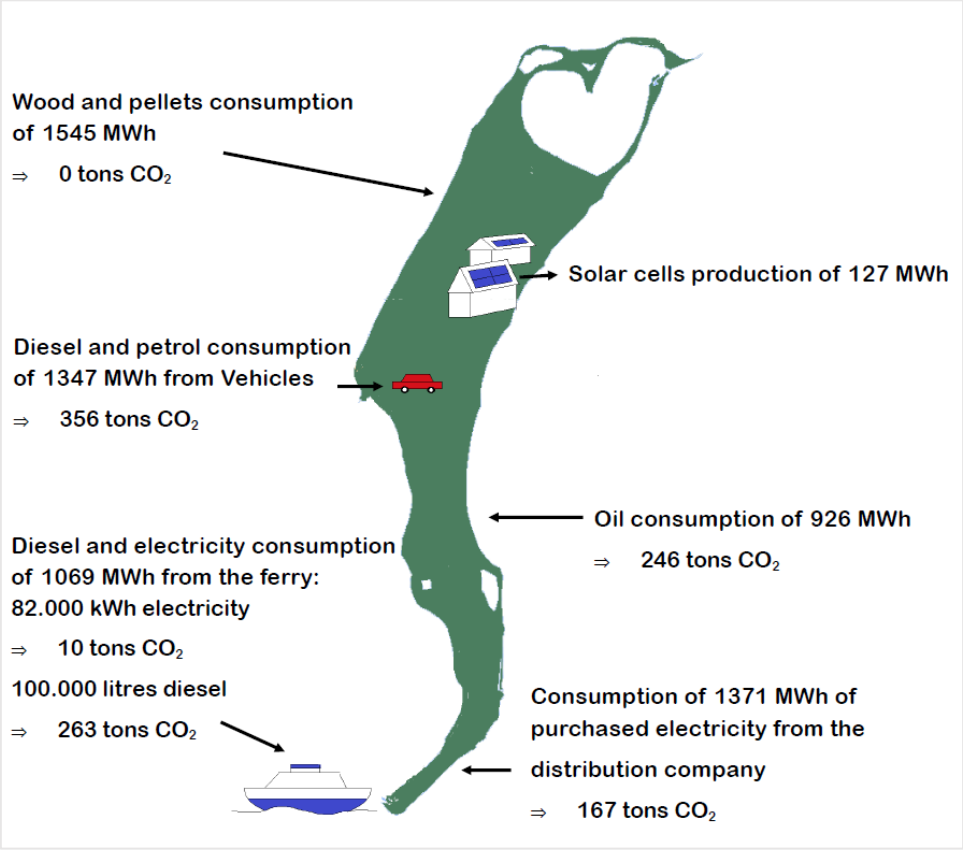

Figure 6: Energy system on Venø for year 2020 (Source: ProEnergi)

The tables below show a more detailed overview of energy consumption and production per category and sector.

Data for year 2020	Final energy consumption [MWh]	CO_2 emissions [tonne]
Electricity consumption*		
Residential	*593*	*72*
Summer cottage	*144*	*18*
Primary sector	*108*	*13*

Industries and tertiary sector	*526*	*64*
Total	***1371***	***167***
Transport on the island		
Cars	*1152*	*304*
Lorries	*80*	*21*
Buses	*115*	*31*
Total	***1347***	***356***
Transport to and from the island		
Maritime transport	*1069*	*273*
Total	***1069***	***273***
Heating and cooling		
Oil burners	*926*	*246*
Wood and pellets	*1545*	*0*
Electricity	*965*	*118*
Total	***3436***	***364***
TOTAL	***6258***	***1042***

Figure 7: Energy system: consumptions in 2020 (Source: ProEnergi)

*The electricity consumption is the final electricity bought from the electricity company, without the consumption from its own produced energy on the island, which also includes the electricity used for heating. The consumed electricity from its own produced energy on the island is estimated to be 37,4 MWh, based on the capacity of the Solar Photovoltaic and electricity sold back to the electricity company. The electricity consumption also includes the consumed electricity for heating.

´Electricity consumption´ and ´Transport to and from the island´ are data directly from the distributor. ´Transport on the island´ and ´Heating and cooling´ are estimated data based on registered data and standard numbers for consumption per sector.

Data for year 2020	**Total energy production [MWh]**	**CO_2 emissions [ton]**
Solar Photovoltaics	*127*	-
TOTAL	***127***	**-**

Figure 8: Energy system: production in 2020 (Source: ProEnergi)

The island´s energy production comes from 28 small scale solar photovoltaics placed on roofs of residents and primary, secondary, and tertiary sectors. 90 MWh of the total estimated 127 MWh produced energy on the island was sold back to the electricity company.

2.2 Electricity consumption

The main consumers of electricity are ´Residents´ and ´Industries and tertiary sector´, which also have the main activity and economic activities on the island during a year. They each consume over a third of the final electricity consumption on the island in 2020. The electricity company has 97 different households and 35 different ´Industries and tertiary sectors´ registered for electricity

consumption. This means that the ´Industries and tertiary sector´ is the main consumer of electricity per registered, where the main consumptions come from Venø Boarding School. Approximately 16,2 MWh of the electricity consumed in the sector ´Industries and tertiary sector´ went to pumping of water and wastewater from Struer Energy (Struer Energi). For the primary sector Venø Seafood is one of the main consumers as well as one of the main economic activities on the island.

Table 1 and 2 show that the energy production on the island is fare from enough to cover the islands electricity consumption. When converting from fossil fuels to electricity, the energy production will need to be significantly increased to cover the electricity consumption. Today approximately 70% of the produced electricity on the island is sold back to the electricity company and therefore not consumed on the island.

2.3 Heating consumption

Heating is the main energy consumer and CO_2 emitter on Venø. The high consumption of energy comes from the use of wood and pellets for primary and secondary heating mediums in households and summer cottages. Wood and pellets are considered CO_2 neutral and does therefore not emit any CO_2 in the energy mapping. The high emissions come from the use of oil burners, where approximately 26% of the final consumed energy for heating is oil for oil burners. Emissions from oil burners are one of the main CO_2 emitters on Venø and should therefore be phased out to reduce that total CO_2 emissions on Venø.

The tables below show the final energy consumption and CO_2 emissions for each heating medium distributed per sector.

Electricity for heating	**Final energy consumption [MWh]**	**CO_2 emissions [ton]**
Residents	723,3	88,2
Summer cottages	209,0	25,5
Primary sector	0,0	0,0
Secondary sector	1,8	0,2
Tertiary sector	30,8	3,8

Figure 9: Distribution of electricity for heating (Source: ProEnergi)

Wood and pellets for heating	**Final energy consumption [MWh]**	**CO2 emissions [ton]**
Residents	889,4	0,0
Summer cottages	278,7	0,0
Primary sector	14,0	0,0
Secondary sector	0,0	0,0
Tertiary sector	363,1	0,0

Figure 10: Distribution of wood and pellets for heating (Source: ProEnergi)

Oil burners for heating	**Final energy consumption [MWh]**	**CO2 emissions [ton]**
Residents	782,0	208,0
Summer cottages	88,9	23,6

Primary sector	23,3	6,2
Secondary	0,0	0,0
Tertiary	32,0	8,5

Figure 11: Distribution of oil for heating (Source: ProEnergi)

The main CO_2 emissions for heating comes from residents and some from summer cottages, where only a small part comes from the primary, secondary and tertiary sector. The energy consumption primarily also comes from residents and summer cottages.

2.4 Transportation to and from the island

The ferry has a major share of the total CO_2 emissions on Venø, which mainly comes from the high diesel consumption. Only 4% for the CO_2 emissions comes from the electricity use and the rest comes from the use of diesel. The ferry sailed in total 38.400 trips to and from the island in 2020 with a layover of a couple of minutes on the Venø side. When transitioning the ferry to electricity the share of the total CO_2 emissions will be significantly reduced.

2.5 Transportation on the island

Data for transportation are estimated based on the total number of transported vehicles to the island by the ferry in 2020 and an assumed route around Venø. Based on the estimates, passenger cars are the main CO_2 emitter on the island, which comes from diesel and petrol consumption from residents, tourists, and workers on the island. Less than 1% of the total number of passenger cars are cars with caravans that come to Venø camping sites during the tourist season.

All buses on Venø run on diesel, where 27% of the consumption comes from public transportation and 73% comes from tourist buses. The municipality wishes to transform the public buses into electricity.

2.6 Conclusion

The main CO_2 emissions on Venø come from transportation on the island from passenger cars, transportation to and from the island from the ferry and heating with oil burners. A transition of the energy system should consist of the following actions to reduce the CO_2 emissions on Venø.

- A lowering of CO_2 emissions from heating, by phasing out oil boilers.
- A lowering of CO_2 emissions from transport to and from the island, by transitioning the ferry.
- A lowering of CO_2 emissions from transportation on the island, by transitioning the passenger cars.
- An increase of renewable energy production on the island, that can provide green electricity.

3 Stakeholder mapping

3.1 Civil society organizations

VenøBoen

VenøBoen is a local community group. Its members are residents from the island. Their purpose is to carry out projects on the island and represent the island at local, regional, national, and European level. VenøBoen is coordinating the CETA process. They are also involved in the process of collecting data, engagement on the island and getting in contact with stakeholders and the residents in order to prepare the CETA report.

Camp Firbjergsande and Venøborg

Firbjergsande and Venøborg are FDF (Frivilligt Drenge- og Pige- Forbund) scout camps, that both are used by scouts and tourists. They are introduced to the CETA process.

3.2 Businesses

NOE

NOE is an energy company that supplies electricity to Venø. They are involved in the process of providing data on the electricity consumption and production for Venø.

Venø Ferry Company (Venø Færgefart)

Venø Ferry Company (Venø Færgefart) is in the process of converting the ferry from diesel to electricity. The ferry company is involved in the process of providing data on transportation to and from the island. The ferry participates in the transition process and is engaged in their own transitions and in combining its projects with the projects on the island.

Venø Seafood

Venø Seafood is one of the main energy consumers on the island. They therefore changed their heating system from oil to electricity in 2021 and aim to have an electricity supply from renewable energy such as solar cells. They will be involved in the CETA process.

Venø harbour

Venø harbour is the only harbour at Venø besides the ferry harbour and is highly touristed, and at the same time landing site for oysters, mussels and lobsters to Venø Seafood. They will be informed and involved in the CETA process.

Agriculture

The three agricultures on Venø will be involved in the CETA process.

The Venø Bus (Venø Bussen)

The Venø Bus (Venø Bussen) is a tourist transportation company on Venø, that also drives the public buses on the island. They will be informed and involved in the CETA process especially in regards to transportation on the island.

3.3 Public Sector

Governmental Actors

Struer municipality

Struer Municipality is consulted in the CETA process, as they are preparing their own climate action plan for the municipality in the DK2020 process.

Economic Activities

Struer Energy (Struer Energi)

Struer Energy (Struer Energi) is owned by Struer Municipality and delivers electricity, water, heat, and they handle sewage for residents in Struer and from Venø. They are involved in the process of providing data on the sewage from Venø along with consumed energy to its pumping stations on Venø.

3.4 Schools and Academia

Secondary Education

Venø Boarding school

Venø Boarding School is one of the main energy consumers on the island. They have visions of converting their heating system from an old pellet stove to solar cells, a battery pack, and a heating pump. They will be involved in the CETA process.

4 Policy and Regulation

4.1 Municipality policy and regulation

Recent municipality legislation on energy environment and climate

Energy and Sustainability Plan 2020 (Energi- og bæredygtighedsplan 2020)

Struer Municipality is a member of KL-Local Government Denmark and is therefore working on the EU-requirements to reduce its CO2 emissions. In 2020 the municipality prepared an Energy and Sustainability plan, which not only sets up to fulfill the EU-requirements, but also the Danish goal to reduce Denmark's greenhouse gas emission with 70 percent by 2030. The plan contains goals to reduce the consequences of climate changes. The Energy and Sustainability Plan is based on the municipality's strategic plan (Planning Strategy (Planstrategien), 2019) and aims at 7 out of the 17 world goals that can promote Struer Municipality's sustainable development. The Municipality Plan of Struer (Kommuneplanen)- 2020 and The Climate Adaption Plan (Klimatilpasningsplanen)-2020 are also based upon the Planning Strategy (Planstrategien). Both work with consequences of climate changes, where the Energy and Sustainability plan (Energi- og bæredygtighedsplan) work on reducing the climate changes. The goals in the Energy and Sustainability plan (Energi- og bæredygtighedsplan) are to become independent of fossil fuels by 2035, increase sustainability, reduce energy needs, reduce CO2 emissions, expand forest areas and in general increase areas of nature.

Planning Strategy (Planstrategi) 2019

Local Agenda 21, which is the municipality's Sustainability Plan, is incorporated in Planning Strategy (Planstrategien) 2019. The Sustainability Plan works with number 6, 8, 11, 12, 13, 15 and 17 out of the 17 world goals. With number 13 they especially work with reducing its CO2 emissions with 2 percent each year.

Struer Municipality's Planning Strategy (Planstrategien) is built upon the Planning act (Planloven), which is a national law. One of the regulations in the Planning Act (Planloven) deals with coastal zones, which applies about 300 m from the edges of the beach. The law is administered by the municipalities, based on the government's laws. Because of the size of Venø the law applies to the entire island. However, the Planning Strategy (Planstrategien) has pointed out two development areas in Venø town within the protected coastal zones. The areas can to a limited degree ensure the development of the town despite the coastal zones and protected beach edges.

The Municipality Plan (Kommuneplan) 2020-2032

The Planning Strategy (Planstrategien) is the basis for the 2020-2032 Municipality Plan (Kommuneplan), where the local plans are built upon Kommuneplanen. Natura 2000 areas is a part of the Municipality Plan (Kommuneplanen) and states that certain areas can't be built on. In addition, no changes may be made in and around Natura 2000 areas that may impair nature and wildlife.

The Municipality Plan (Kommuneplan) includes the Green Map of Denmark (Grøn Danmarkskort), which states that the marked Natura areas must be preserved and improved. It contains plans for lowland areas that cover part of Venø, which must be kept free from buildings and facilities. As well as nature areas it preserves cultural areas and buildings on Venø.

To adapt to the climate changes the plan also includes a 2020 Climate Apaption Plan (Klimatilpasningsplan), which is a climate adaptation plan. Among other aspects the plan includes a storm surge protection project of Venø By.

The Nature Strategy (Naturstrategi) 2021

The Nature Strategy (Naturstrategi) 2021 builds upon the plans described above and focuses on nature. It states to preserve and secure the Natura 2000 areas as well as increase access to nature, secure organic streams and lakes, increase the biodiversity, increase the forests, create nature conservation initiatives for wetland projects, create coastal protection projects and create nature restoration projects on peat soils. For Venø the law states to map and control the rose hips, where no state subsidy can be obtained for Nature 2000 areas.

DK2020

Struer municipality is a part of the DK2020 project aimed at implementing the Paris Agreement in Denmark. The project is developed by Realdania, C40 and CONCITO, where the partnership between Realdania, Kommunernes Landsforening and the five Danish Regional Authorities makes it possible for municipalities to participate in the DK2020 project. The project is based upon C40 and its international standard "The Climate Action Planning Framework", aiming at implementing the Paris Agreement at a local level. This means that Struer municipality is in the process of making a climate action plan.

4.2 National policy and regulation

Recent national legislation on energy environment and climate

2020 Climate law (Klimalov)

In Juny 2020 the Danish parliament passed the Climate Law. The law states that Denmark must reduce its emissions from greenhouse gas by 70% before 2030 compared to the emissions in 1990. Further it commits Denmark to be climate-neutral before 2050. The law builds upon the Paris Agreement and its goal is to keep global warming under 1,5 degrees Celsius. The law also includes a grant when converting the heating medium from fossil fuel, as well as a grant for climate neutral solutions in rural areas.

The national regulations also include 5 laws on planning, nature, the environment, building, and roads. The Planning law covers the Costal Protection Act, which states to preserve the beaches approximately 300 meters from the edge of the water.

National Strategy for Sustainable Constructions (National Strategi for bæredygtigt byggeri)

In March 2021 the National Strategy for Sustainable Constructions was introduced with 21 initiatives distributed on the following topics:

- Climate friendly constructions and facilities
- Durable buildings and constructions in high quality
- Resource efficient buildings and constructions
- Energy efficient and healthy buildings and constructions
- Digitally supported buildings and constructions

To ensure more sustainable buildings and constructions that focuses on the entire life cycles of buildings and constructions in relation to the economy and the environment.

2018 Energy Agreement (2018 Energiaftale)

The Energy Agreement from 2018 states that 55 percent of the energy must be from renewable energy sources by 2030. It also states that 90 percent of the district heating must come from other energy sources than oil, gas and coal by 2030 and that the electricity must come from renewable energy sources.

The Electricity Supply Act (Elforsyningsloven) 2021

The Electricity Supply Act from 2021 has provided an opportunity for renewable energy communities and citizens´ energy communities with the 1069 executive order. The new bill implements the Electricity Market Directive (2019/944 EU) and opens for a green transition of the Danish electricity market.

The 1069 executive order states that the same rights and obligations apply to renewable energy communities and citizens´ energy communities as well as to all other electricity consumers. When sharing the electricity in the communities, grid tariffs and taxes apply to the electricity flow as to all other electricity consumers. The communities can be run as an association, an interest network company, a cooperative or a capital company, and must have an electricity trading company to handle the distribution. However, renewable energy communities and citizens´ energy communities can handle the electricity trading, if setting up an electricity trading company themselves.

4.3 European policy and regulation

Recent EU legislation on energy environment and climate

Fuel EU Maritime

Fuel EU Maritime is an initiative that currently is in a feedback period before the EU commission can pass the initiative. Fuel EU Maritime is an initiative for the maritime transport in the EU to increase the use of sustainable alternative fuels. The goal is that maritime transport becomes climate-neutral before 2050.

Next generation EU

The next generation EU is a temporary recovery plan after the COVID-19 pandemic, which is set up in 2020. The recovery plan also contains goals to optimize the European budget for 2021-2027. 30 percent of the total 2,018 billion euros budget is set aside to reduce climate changes when restoring Europe after COVID-19. As well as 50 percent of the total 2,018 billion euros budget, is set aside to promote the modernization of the EU. The goal is that the EU becomes greener, more digital, and even more resistant.

European Climate Law

In June 2021 the goals of the European Green Deal were set into a law by the European Climate Law. The law also contains the Fit for 55 package, which aims at reducing the net greenhouse gas emissions by 55% by 2030 compared to year 1990. The law states that Europe should be climate-neutral in 2050 and obtain the Fit for 55 goals.

European Green Deal

The Green Deal was presented in 2019 as a goal to reduce the net greenhouse gas emissions by at least 55% by 2030, compared to 1990 as well as a goal to become climate-neutral by 2050. The goals are built upon the Paris Agreement, where Denmark and 195 other members of the UN signed the

agreement in 2015, which is a legally binding climate-agreement. The goal is to keep global warming under 1.5 degrees Celsius by reducing greenhouse gas emissions. Through the Danish government and the municipalities, the climate-agreement is incorporated into the Danish policies and regulations. Besides reducing the net greenhouse gas emissions and improving the climate, the goal is also to improve the living conditions for all.

In September 2021 the commission adopted the concept of the New European Bauhaus. The goal with the project is to accelerate the transformation of the economic sectors, such as buildings, in order to provide goods that are circular and less carbon intensive for all citizens. The project is financed with 85 million euros by the Horizon Europa program, the LIFE program and the European Regional Development Fund.

Clean Energy for all Europeans Package

In 2019 the EU overhauled its policy on energy to reduce the use of fossil fuel and deliver on the Paris Agreement. The Clean Energy for all Europeans Package is the new energy guidebook consisting of 8 laws that EU countries must implement into national laws. The laws state to reduce the energy efficiency in buildings, have 32 percent renewable energy sources by 2030, integrate a 10-year national energy and climate plan and establish a modern design for Europe's electricity market.

The Directive in common rules for the internal market for electricity (EU) 2019/994 states that civic energy communities are cooperation between residents and local actors. The directive is a part of the modern design for Europe's electricity market in the Clean Energy for all Europeans Package. In all EU member countries, the rights for civic energy communities must be the same as for the electricity companies on the market. It also states that no other law or fee must reduce the development of the civic energy communities.

Winter package

As a part of the Winter package, adopted in 2016, each European country must publish a report on its total economic and social development.

Part II: Island Transition Path

5 Vision

Venø´s vision is to become CO_2 neutral and free of fossil fuels by 2050. The strategy is to transition all oil burners, diesel and petrol vehicles into e.g., electricity such as a heat pump and electric vehicles. This will increase the electricity consumption on the island, and the strategy will be to implement renewable energy production, such as solar cells and wind turbines, that can supply the island with electricity. As well as implementing energy storage that will ensure the supply of renewable energy to the island.

6 Transition Governance

The clean energy transition is governed by different stakeholders, Struer Municipality and Venø Energy Group (VenøBoen). However, Struer Municipality will be the main governance of the clean energy transition of Venø. The stakeholders that will help Venø achieve its transition to clean energy are Venø Seafood, Venø Boarding School, Venø Færgefart, Venø Energy Group (VenøBoen), residents on the island and the municipality. The pathways for achieving the vision will be driven and administered by Venø Energy Group (VenøBoen), residents and local stakeholders.

7 Pathways

The proposed pathways for Venø to achieve its visions are:

- To become CO_2 neutral by 2050.
- To phase out all consumption of fossil fuel by 2050 and replace it with renewable energy.
- To balance and strengthen the electricity grid.
- To become self-sufficient with renewable energy.

8 Pillars of the Energy Transition

The tables below show the objectives, strategies and actions to obtain the vision for Venø for each pillar ´transition to and from the island´, ´transport on the island´, ´heating´, ´electricity´, ´electricity storage and grid´, and ´citizens involvement´.

Pillar: Transport to and from the island	
Objective: • To become free of fossil fuels. • To ensure the same amount of ferry departures. • To ensure that the transport to and from the island becomes CO2 neutral before 2050.	
Strategy:	Actions:

• Transform the ferry from fossil fuel to electricity. • Implement a battery pack at the mainland to ensure a fast charging of the ferry, which can happen when charging from battery to battery.	1. The municipality is in the process of examining the transition of the ferry. 2. Examine the opportunities for a shared battery pack between the ferry and the citizens on Venø. 3. Examine and set up a smart Grid between the grid on Venø and the battery pack.

Figure 12: Pillar for transportation to and from the island (Source: ProEnergi)

Pillar: Transport on the island	
Objective: • To become free of fossil fuels before 2050. • To ensure alternative transportation, to fossil fuels vehicles, to get around on the island.	
Strategy: • Promote taking the bike around Venø, by implementing bicycle paths on the island and to the island from Struer city. Along with promoting the already existing electric bicycles. • Promote electric vehicles on the island instead of fossil fuels, by implementing electric charging stations. • In continuation of promoting electric vehicles the island wishes to implement electric rental cars for both residents and tourist, which can be used on the island. • By time ban fossil fuels vehicles on the island. The alternative to transportation on the island will be electric vehicles and an electric public bus. • Transform the public bus on Venø, which has routes to the mainland, to electricity.	Actions: 1. Promote bicycles on Venø. 2. Find financing for an electric charging station to promote electric vehicles on the island. 3. Find financing for implementation of electric rental cars. 4. Examine the opportunities to create and finance bicycle paths. 5. Examine the opportunities to ban diesel and petrol vehicles on the island.

Figure 13: Pillar for Transportation on the island (Source: ProEnergi)

Pillar: Heating	
Objective: • To become free from fossil fuels by 2050. • To use renewable energy for heating. • To reduce the energy consumption for heating.	
Strategy: • Replace all oil burners with a heat pump or other renewable energy sources.	Actions: 1. Informe the residents on replacing their oil burner and how to get grants to replace it with e.g., a heat pump.

• Make energy renovations on all relevant houses to reduce the energy consumption.	2. Examine each house to map and make energy renovations.

Figure 14: Pillar for heating (Source: ProEnergi)

Pillar: Electricity	
Objective: • To supply the island with electricity from renewable energy produced on the island. • To ensure that all electricity consumed on the island is CO2 neutral before 2050. • To reduce the electricity consumption.	
Strategy: • Implement renewable energy in the form of solar cells on the roof, solar cell plants, household wind turbines and water turbines. • Make energy renovations on all relevant houses in order to reduce the energy consumption.	Actions: 1. Apply for permission from the municipality to set up a household wind turbine. 2. Examine the opportunities for solar cells on the roofs and how much they can produce to the island. 3. Examine the laws and regulations for renewable energy at the harbour, since the coastal zones and the laws for protected beach edges does not apply at the harbour 4. Examine each house to map and make energy renovations. 5. Examine the opportunities for a water turbine.

Figure 15: Pillar for electricity (Source: ProEnergi)

Pillar: Electricity storage and Grid	
Objective: • To ensure an electricity grid that can provide renewable energy to the entire island. • Decentralise the electricity and electricity production.	
Strategy: • Balance the electricity grid on the island to ensure that no high peaks occur on the electricity grid throughout the day. • Implement battery packs on the island that can store the produced renewable energy, that will ensure that the electricity becomes decentralised to the island, along with helping balancing the electricity grid. This will ensure that the electricity produced on the island is also consumed on the island, which will ensure	Actions: 1. Examine how much renewable energy the island must produce to implement a battery pack that can be repaid. As well as be able to balance the electricity grid. 2. Examine the opportunities for a shared battery pack between the ferry and the citizens. 3. Examine the opportunities for a Smart Grid on the island.

that the island can become free from fossil fuels. • Implement a battery pack on the mainland to ensure a fast charging of the ferry. • Ensure that the ferry can use the produced renewable energy on the island during the day, when the citizens are not home, and that the citizens can use the produced renewable energy during the evening and when they are home. • Implement a Smart Grid on the island that can ensure that the citizens can share the produced electricity on the island in order to provide renewable energy for alle residents, as well as balancing the electricity grid.	

Figure 16: Pillar for electricity storage and grid (Source: ProEnergi)

Pillar: Citizen involvement	
Objective: • To ensure that the citizens feel and have ownership of the energy production on the island. • To ensure that the residents obtain their visions. • To ensure that the transition to a clean energy system happens through engaging citizens.	
Strategy: • Informe the residents on replacing their oil burner and how to get grants to replace it with a heat pump. • Informe the residents on good electricity and heating habits, and how to save energy and therefore money. • Inform the residents on how to correct data in the national Building- and Housing Register to ensure the correct data, which is a legal requirement for the owners. • Ensure that the residents get ownership of energy plants and/or other energy projects on the islands.	Actions: 1. Inform the residents on good electricity and heating habits, and how to save energy and therefore money. 2. Inform the residents on how to correct data in the national Building- and Housing Register to ensure the correct data, which is a legal requirement for the owners. 3. Inform the residents on replacing their oil burner and how to get grants to replace it with a heat pump. 4. Examin how the citizen can own energy plants and other energy projects as a community.

Figure 17: Pillar for citizen involvement (Source: ProEnergi)

9 Financing

Financing opportunities for developing

The European Life Program and the subprogram LIFE Clean Energy Transition

The European Life Program is a European funding program for environment and climate actions projects and improvements. The program invests in project developing and implementing for innovative solutions that offer clear benefits for the environment and the climate. One of the subprograms under the Life program is LIFE Clean Energy Transition, with a budget of approximately 1 billion EUR during the period 2021-2027. The subprogramme is set up to help the transitions towards energy efficiency, implementation of renewable energy and becoming climate neutral while strengthening the economy.

Typically, the co-financing happens between EU and multiple small and medium-sized stakeholders. Projects under the Life program Clean Energy Transition are co-financed by the EU in the five listed areas below.

- Projects that support the clean energy transition.
- Projects that accelerate and support the development of new technologies, new services, and business models, as well as projects that enhance the professional skills available on the market.
- Projects that attract private finance for implementation of sustainable energy.
- Projects that support the development of local and regional investment projects.
- Projects that involve and empower citizens in the clean energy transition.

Currently open calls under the LIFE Clean Energy Transition subprogram are:

- LIFE-2021-CET-PDA: Project Development Assistance (PDA) that offers technical assistance to project developers to undertake energy efficiency and renewable energy investments of ambition and scale. Click here to read more.
- LIFE-2021-CET-HOMERENO: This topic aims at creating or replicating innovative local or regional "integrated home renovation services". Click here to read more.

Both calls are open until January 12, 2022, 17:00:00 Brussels time.

Calls for proposal for the LIFE Program and the subprogram LIFE Clean Energy Transition are published on CINEA´s website and on the European Commission´s Funding & Tenders portal website. Rules for application, guidance and templates for proposals can be found at the European Commission´s Funding & Tenders portal. Proposals can only by submitted electronically on the Funding & Tenders portal.

The European Energy Efficiency Fund (EU)

The European Energy Efficiency Fund (EEEF) is a European funding program that supports and promotes climate protection and a sustainable energy market. The EEEF technical support Facility received ELENA funds under the European Horizon 2020 programme. European Local Energy Assistance (ELENA) offers funding and technical assistance for energy efficiency and renewable

energy projects for buildings and innovative urban transport. EEEF offers funding for energy efficiency projects and small-scale renewable energy projects through technical in the public sector. The aim is to support the public sector through the necessary activities to prepare for investments in sustainable energy projects. Activities under the technical support are feasibility studies, energy audits, evaluation of the economic viability of the investments and legal support.

Projects funded by EEEF investments fall under the listed themes below:

- Energy saving and energy efficiency projects for public and private buildings.
- Renewable energy sources implementation projects.
- Clean urban transport for the public sector.

To apply for technical assistance, the project investment volume must be higher than EUR 5 million and has a saving of at least 30% of the primary energy and CO_2 equivalents. The public sector or privates working on behalf of the public sector can apply their proposals by following the application format, which can be found here. There are no deadlines or calls for application, this means that the fund is open on first-come-first-serve basis. It is advised that Venø and Fur apply together to fulfil the criteria.

European City Facility

European City Facility (EUCF) is a European funding for technical support for municipalities and local authorities. The EUCF is set up under the Horizon 2020 program for research and innovation of the EU to accelerate investments in sustainable energy projects in the municipalities. The funding grant is a lump sum of EUR 60.000 for technical support such as feasibility studies, market analyses, stakeholder analyses, legal, economic and financial analyses, risk analyses and further supporting tasks.

To recieve funding, the municipalities and local authorities must apply to become a beneficiary here. The next open call is the 4th call in May-June 2022.

Financing opportunities for implementation

LAG Small Islands (LAG Småøerne)

LAG Small Islands (Småøerne) is a Danish fund for small islands through local associations that generates development and innovation in the community by granting investments. Through the LAG Small Islands (Småøerne) local businesses, associations and communities can apply for funding from the European Rural Development Program, which is funded by the European Agriculture Fund for Rural Development (EAFRD). When the LAG Small Islands (Småøerne) has approved the proposal the Housing- and Planning Agency (Bolig- og Planstyrelsen) has to give the final approval in order to get the grant.

Projects funded by the LAG Small Islands (Småøerne) investments fall under the listed themes below:

- Business and tourism development

- Housing: establishment of workplaces and new forms of housing.
- Collaborative development: to create local development strategies and projects that strengthen the local communities.

The aim is local anchoring, innovation and cooperation in the local communities.

LAG Small Islands (Småøerne) also has a grant for fishing and marine development called N-FLAG with funding through the European Marine and Fisheries Fund (EMFF).

To apply for funding the proposal must fulfill the LAG Small Islands (Småøerne), European and Housing- and Planning Agency (Bolig- og Planstyrelsen) criteria and policies. The criteria, policies and how to apply can be found here. The next call for LAG is open until March, 22, 2022 and N-FLAG is open until February, 25, 2022.

The Rural Fund (Landdistriktspuljen)

The Rural Fund (Landdistriktspuljen) is a Danish fund that aims to promote rural development by funding the listed projects below.

- Pilot projects in rural areas: Aims at increasing employment, business development, living conditions, housing and improving the local cultural and leisure activities in rural areas. The next call opens again in 2022. How to apply and when the call opens again can be found here.
- Research projects: Aims at enlightening the development terms and opportunities in rural areas. The next call opens again in 2022. How to apply and when the call opens again can be found here.
- Projects on the small islands: Aims at supporting initiatives and projects that create development and workplaces on the small islands, also known as Island-support (Ø-Støtte). The next call opens again in 2022. How to apply and when the call opens again can be found here.
- Projects in areas with onshore wind turbines: Aims at supporting non-profit social and cultural projects that improve the experience of the immediate areas. As well as strengthening the local community and giving compensation for the inconvenience of the onshore wind turbines. The next call opens again in 2022. How to apply and when the call opens again can be found here.

Other financing opportunities for implementation are private investments, stakeholder investments, the European LIFE program, and local banks.

10 Monitoring

Indicator 1: Clean Energy Transition Agenda

Score: 4

A Clean Energy Transition Agenda for the island has been developed and approved by the transition team in December 2021. The visions shared in the agenda are developed by the transition team and multiple stakeholders. The Clean Energy Transition Agenda has yet to be approved by the Clean Energy for EU Islands Secretariat.

Indicator 2: Vision

Score: 4

There is a long or medium-term island-wide vision on clean energy that includes clear objectives.

Indicator 3: Community – Stakeholders

Score: 3

There is strong commitment from individual actors and in the planning phase shared commitment on an island-wide level.

Indicator 4: Community – Organisation

Score: 4

An island-wide Transition Team drives the energy transition. It is formed and supported by actors from multiple stakeholder groups. (E.g. a community initiative with the support from academia).

Indicator 5: Financing concept

Score: 3

A list of possible national and European funding has been listed.

Indicator 6: Decarbonisation plan – Island diagnosis

Score: 5

A technical and economic analysis of the island's energy system exists that includes a final energy consumption breakdown covering electricity generation, heating, cooling, transport on the island and transport to and from the island.

Indicator 7: Decarbonisation plan – Data

Score: 4

A recent inventory of consumption and CO2 emission data exists for all sectors based on local reporting. There is no periodic reporting process in place.

Indicator 8: Decarbonisation plan – Action Plan

Score: 4

There is an island-wide Action Plan on clean energy that describes the necessary actions to achieve the vision.

Indicator 9: Multi-level governance

Score: 4

There is interaction with some other levels of governance on clean energy transition to align the island's CETA/decarbonization strategy with existing plans. The CETA-strategy is at the administrative level shared and supported by the municipality of Struer.

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