Climate partnerships for a greener future

How to achieve one of the world's most ambitious climate goals with recommendations from Denmark's 14 climate partnerships





Editor State of Green

The 14 climate partnerships

Aviation Per Henriksen, pehe@di.dk Blue Denmark Maria Skipper Schwenn, mss@danishshipping.dk Commerce Frederik Bergenfeldt Friis, fbfr@danskerhverv.dk Construction Henrik Teglgaard Lund, helu@di.dk Defence Joachim Finkielman, jofi@di.dk **Energy and utilities** Marie Holm Thomsen, mht@danskenergi.dk Energy intensive industries Louise Bank, loba@di.dk Finance Birgitte Søgaard Holm, bsh@fida.dk Food and agriculture Niels Peter Nørring, npn@lf.dk Inland transport Jesper Kronborg, jek@danskerhverv.dk Life science and biotech Ulrich Bang, uba@danskerhverv.dk Manufacturing Jacob Kjeldsen, jak@di.dk Service, IT and consultancy Poul Noer, pno@danskerhverv.dk Waste, water and circular economy Iben Kinch Sohn, ibso@di.dk

Design

Essensen

Photo credit

Unsplash Mærsk, page 16 Forsvaret, page 28 Danmarks Nationalbank, page 37 Green Mobility, page 48 VindØ Consortium, page 40 Vestas, page 40

Print Litotryk

©2021, State of Green



Content

linisters' foreword	3 4
Reducing greenhouse gas emissions by 70 per cent by 2030	
A new model for public-private climate action	6

The 14 climate partnerships

Climate partnerships' preamble	8
Aviation	9
Blue Denmark	13
Commerce	17
Construction	21
Defence	25
Energy and utilities	29
Energy intensive industry	33
Finance	37
Food and agriculture	41
Inland transport	45
Life science and biotech	49
Manufacturing	53
Service, IT and consultancy	57
Waste, water and circular economy	61



Ministers' foreword



By Dan Jørgensen, Danish Minister for Climate, Energy and Utilities, and Simon Kollerup, Danish Minister for Industry, Business and Financial Affairs

There is no doubt that the pace of climate change is only intensifying. We have to act fast if we are to avoid a bleak future with disastrous social, environmental and economic impacts.

The scale of the challenge is immense. In 2019, the Danish government created headlines around the world when it enacted legally binding targets that obliges the country to achieve a 70 per cent reduction in its greenhouse gas emissions by 2030 compared to 1990 levels. Policies and laws are an essential aspect of the race to decarbonise. However, to truly make an impact, countries will need to harness the combined strengths of government and the private sector in a way that not only supports climate goals, but also contributes to employment, economic prosperity and social cohesion.

Therefore, the Danish government established 14 industryspecific climate partnerships with the private sector in Denmark to devise concrete solutions that will reduce the country's CO₂e emissions across different sectors. We firmly believe that open dialogue and concerted action with the private sector will enable society to decarbonise in the most optimal way.

The private sector in Denmark has embraced the challenge. Spanning the entire breadth of the Danish economy, the climate partnerships have formulated specific actions and measures that can significantly reduce CO₂e emissions in their respective industries and significantly contribute to fulfilling government targets. Equally important, the proposals outlined by the partnerships will not only stimulate economic growth and employment, but also strengthen Danish businesses' green competitiveness in a global context.

We invite you to learn more about the structure of the Danish climate partnerships. Discover the actors behind them, their visions, and most importantly, their recommendations for government action. While every country is unique, you may find their policy recommendations or suggested actions relevant when mapping out a path to tackle your own country or industryspecific challenges.

Denmark is a small country with a relatively minor share of global emissions. Fulfilment of our ambitious targets will not be enough to avert global warming. By sharing a model for public-private cooperation, we seek to provide inspiration and concrete recommendations as to how countries, regions or sectors can decarbonise in a just, efficient and economically viable manner – not only for their own sake, but also for the future health of the planet.

Reducing greenhouse gas emissions by 70 per cent by 2030

Despite its modest size, Denmark has set one of the world's most ambitious climate goals: to reduce greenhouse gas emissions by 70 per cent by 2030 (compared to 1990 levels) and reach net zero emissions in 2050 at the latest. Achieving this goal will require both known solutions and new technologies that still need to be developed.

A strong tradition for public-private partnerships

Like many nations, Denmark was once entirely dependent on imported oil and other fossil fuels. Today, more than 30 per cent of Denmark's energy needs are met by renewable energy sources, and we are working towards an energy system that will be fossil-free by 2050. Public-private partnerships have proved to be a highly effective way to help achieve the country's climate and environmental targets.

The Danish public-private partnership model is characterised by openness and high levels of trust and aims to harness the strengths of both public and private stakeholders. While the public sector provides the ambitious long-term goals and stable framework conditions, the private sector supplies the innovation, solutions and investments needed to achieve the visions. That is why this model for collaboration is being applied to achieve the goal of reducing greenhouse gas emissions by 70 per cent by 2030.

How do we get to 70 per cent in 2030?

To fulfil this tremendous task by 2030, Denmark will need to further strengthen public-private partnerships, innovate, and scale up new technologies. Active involvement of the private sector is necessary in order to develop cost-effective ways to remove carbon from the atmosphere, develop green fuels for heavy transportation and reuse rather than through away.

How do we champion global change?

Denmark's contribution to reducing greenhouse gas emissions in its *own backyard* may be a drop in the ocean. To ensure significant impact, we need all nations to commit to the green transition – both big and small carbon emitters. Denmark wants to lead by example, collaborate across borders and share experiences on our journey towards 2030 to reach our shared goals, and most importantly help accelerate the green transition globally. We believe that our joint challenges require joint solutions.

Denmark will reduce GHG emissions by 70 per cent by 2030 (compared to 1990 levels)





167/179

members of parliament support the legally binding Climate Act.

Denmark's Climate Act

The Climate Act was passed in 2020 by 167 of the 179 members of the Danish parliament. It obligates the sitting government to work to reduce Denmark's greenhouse gas emissions by 70 per cent by 2030 compared to 1990 levels and towards net zero by 2050 at the latest.

A new model for publicprivate climate action

The private sector plays an important role in the effort to achieve the Danish government's climate goal. Partly via efforts to reduce emissions in value chains. And partly by developing new products, services, technologies, and business models which support the green transition – both at home and abroad.

Sector-specific recommendations from the private sector

Building on the Danish tradition for public-private partnerships and recognising the private sector as a central actor, the Danish government has formed 14 climate partnerships. Each representing the different sectors in the Danish economy. The 14 partnerships were tasked with presenting a proposal on how their individual sector could contribute to CO₂e reductions in a just way, supporting Danish competitiveness, exports, jobs, welfare and prosperity.

The proposal had to include measures that the sector itself could take to reduce emissions as well as recommendations to remove barriers and improve framework conditions in order to support reductions and green competitiveness. This resulted in more than 400 recommendations.

Organisation of the partnerships

Each partnership is chaired by a representative from a private sector company appointed by the Danish government with 1-2 business organisations serving as secretariats. The number of stakeholders involved varies from partnership to partnership due to different structures. Typically, the drafting of the recommendations has been an open process involving several companies and organisations from the entire sector.

From recommendation to implementation

Based on the climate partnerships recommendations and roadmaps, the Danish government will assess if and how the inputs can be addressed politically. Many of the recommendations have already been reflected in political initiatives, for instance on energy islands, Power-to-X, carbon capture technologies, electrification efforts and new financial models.

70% reduction of carbon emissions by 2030





Benefits of climate partnerships

The benefits of climate partnerships between private and public actors are manyfold and tangible. The ability to demonstrate these benefits is a critical first step to unlocking the potential of future green partnerships all over the world

Engagement

climate targets

The private sector emphasises their commitments to establishing long-term

Innovation

New technological solutions and business models are unlocked in the process of establishing new partnerships and developing recommendations

Acceleration

Decarbonisation and the development of new technologies are accelerated through concrete initiatives and increased awareness

Co-creation

Collaboration and co-creation across public and private sectors as well as businesses and industries towards one common goal

The climate partnerships: We stand together

We, the 14 climate partnerships, have worked intensely to resolve a both difficult and important task: to develop concrete recommendations for the Danish Government on how to reduce Denmark's emissions by 70 per cent by 2030, and at the same time ensure Denmark's position as a pioneering country in the rest of the world.

The Climate Partnerships' point of departure was two-fold: To make the world more sustainable and at the same time ensure green growth in Denmark. If we are to reach the ambitious target of 70 per cent reductions, it requires largescale investments. Therefore, sustainability and growth must go hand in hand, and as a society we must be ready to prioritise climate investments. Danish businesses are ready to take on our share of the task in close partnership with the Government and the Danish Parliament – and the rest of the society. Future economic growth is crucial in our efforts to solve climate challenges, and at the same time afford a wellfunctioning society. It requires that we ensure Denmark's competitiveness and create growth and new jobs while we convert climate ambitions into action.

The climate challenge is global. We must reach our national climate targets without pushing activities abroad. We must make an actual green transition of our society that measurably reduces the emission of greenhouse gasses on

a global level – and it has to be done through development rather than shutdown. With our efforts as inspiration for action, we are going to work internationally under the auspices of the United Nations and the EU. We will work to reduce global emissions and increase the development of green Danish solutions that we can share with the rest of the world.

In the 14 climate partnerships, we take joint action to contribute to Denmark's political goals. We look forward to seeing how our recommendations are turned into concrete climate actions, focusing on preventing climate change and ensuring continued growth.

The proposals from the 14 climate partnerships have not been coordinated, and many proposals are cross-sectorial and cross-industrial. We hope that all our proposals will be seen in the spirit and context as we have described.

 \rightarrow

In the following you can read the most important highlights from each of the 14 climate partnerships' reports.



Aviation





Aviation

million Danish passengers travelled

Challenge

Even in the medium-long term, sustainable aviation fuels (SAF) will be needed. It is critical to increase the availability of SAF and specifically, facilitate a process that will result in increasing volumes of Power-to-Xbased SAF towards 2030.

The key barrier is the price gap between conventional fuels and SAF.

Currently, they are 2-5 times higher, and as fuel costs represent approximately 20 per cent of an airline's cost base, it is vital to introduce some kind of funding mechanism until a reasonable level of economies of scale is established. The proposal for a climate fund financed by a small passenger contribution shall be seen in this perspective.

0.1 million tonnes CO2e

travel in 2019

Potential

Key objectives for the Danish aviation sector in reducing CO2e emissions

- 1. Minimum 70 per cent CO2e reduction on domestic air travel by 2030 compared to 1990 levels
- 2. Minimum 30 per cent CO₂e reduction on international air travel by 2030 compared to 2017
- 3. Ultimately: to achieve climate neutrality by 2050

70%

CO2e REDUCTION ON DOMESTIC AIR TRAVEL **BY 2030 COMPARED** TO 1990 LEVELS

from domestic air

Aviation



Recommendations

01

Global CO2e tax

A global CO₂e/fuel tax is recommended as the most efficient mechanism for reducing emissions. A return loop of funds to facilitate the cost of transition (covering the price gap of SAF) will speed up the process and safeguard a level playing field

02

Interim national climate fund

However, a global tax (or EU-based) will take time. To get started on a national level, the climate partnership recommends the establishment of a national aviation climate fund financed by a small contribution from each departing passenger. Approximately EUR 4 per person can finance the fund by EUR 67.2 million annually

Power-to-X infrastructure

03

Power-to-X is an ultimate tool to affect the transition. A master plan for green power and Carbon Capture, Utilitisation and Storage (CCUS) is needed in due time



3 million tonnes CO2e

International travels to and from Denmark in 2019





About the partnership Chairman Simon Pauck Hansen

COO, SAS Vice chairman Thomas Woldbye Group CEO, Copenhagen Airports

Private partners • Danish Aviation at Danish Transport Federation • 20 + committee – representatives from airlines, airports, NGO's, unions, scientists and consultancies

Public partners

 \cdot Ministry of Transport

Aviation

Cases



O1 The new generation of jet fuels

Green fuels produced using biogas sourced from manure, straw, and food waste can dramatically reduce aviation's CO₂ emissions.

Read more —



 \geq



Contact

Danish Aviation at Danish Transport Federation Per Henriksen pehe@di.dk

02

Decarbonising the complex aviation sector

Scandinavia's leading airline is embarking upon an ambitious journey that includes modernising its fleet and advancing the use of sustainable aviation fuels in order to make air travel more sustainable.

Read more -



 \rightarrow

J

Blue Denmark

Stans.

the and



Blue Denmark

1 km

Shipping is by far the most energy-efficient transportation mode. CO₂e emissions from the freight of one pair of shoes from Asia to Europe is the same as driving one kilometre in a car



The global maritime sector is responsible for approximately 3% of total CO2e emissions



CLIMATE NEUTRALITY BY 2050

Challenge

Danish domestic shipping emits 0.8 million tons CO2 annually. This includes ferries, fishing vessels and ships sailing between two Danish ports. Emissions from Danish international shipping amount to 38 million tonnes of CO2e.

Several barriers must be overcome to achieve Blue Denmark's CO₂e emission reduction targets. The key challenges to address over the next ten years are:

 Shipping is an extremely competitive sector, operating in a global market and is consequently sensitive to national regulation. The International Maritime Organization, IMO, is the only global regulator of the entire world fleet – hence IMO is the means to ensure significant global emission reductions while preserving a level playing field.

- 2. Shipping must take a quantum leap in technology by replacing traditional fuels with new climate-neutral fuels in order to further reduce emissions in absolute terms.
- 3. A substantial upgrade of the current energy systems on a national and global scale will need to take place to secure a reliable supply of green fuels in the maritime sector.
- 4. The land-based energy infrastructure in ports must be upgraded to be able to handle the new green fuels or batteries.

Potential

The transition to a more sustainable shipping industry is a massive challenge. As a leading maritime nation, Denmark has an obligation to show leadership and demonstrate that the Danish merchant fleet – be it ferries, fishing boats or ocean-going vessels – can become climate neutral. The vision of the climate partnership is to make Denmark an international pioneer in decarbonising shipping, and to help achieve the 70 per cent reduction target set by the Danish government. This requires a sustainable transition of the shipping industry on both a national and global level.

The climate partnership for Blue Denmark has set two ambitious targets supported by all industry players across the Danish maritime cluster. Blue Denmark has set a target of climate neutrality by 2050 without the use of climate compensation. Furthermore, the first ocean-going zero emission vessel must be in commercial operation by 2030. These targets are ambitious and go beyond the IMO's current global targets.

The climate partnership has developed six initiatives, which its members are ready to invest in under the current conditions and has put forward 15 recommendations for government action. Combined, these will allow Denmark to support a sustainable transition of both the national and global shipping industry.

Blue Denmark



Recommendations

01

Energy efficiency

Industry

Share shipping big data

Government

- Develop maritime climate solutions, including demonstration programmes
- Government-provided export financing to accelerate investment in climatefriendly vessels

02

Ports and shortsea shipping

Industry

Eliminate waiting time in ports

Government

- Introduce green ferry tenders
- Provide green municipal ferry services
 Establish green highways at sea, which
- give priority to green vesselsIntroduce a climate-differentiated toll at all ports
- Construct new energy infrastructure
 at ports

03

Green fuels

Industry

- Establish a partnership to test ships using green fuels
- Establish a research, test, and development facility (a Maritime Centre of Excellence)

Government

- Construct a demonstration ship to showcase the 2030 ship of the future
- Develop a national strategy for the development of Power-to-X in the maritime sector
- Develop pilot schemes for the transition to new fuels
- Remove regulatory barriers that prevent using a blend of green and fossil fuels

04

Climate diplomacy

Industry

- Establish a global innovation fund funded by the shipping industry
- Coordinated effort to attract research funds from the EU

Government

- Strengthened climate diplomacy in the IMO
- Efficient implementation of new IMO regulations
- Denmark to take the lead in establishing a fast-track approval scheme in the IMO for new climate technologies
- Expansion of fishing capacity regulations for fishing vessels in the EU





of Danish shipping activities take place outside of Denmark



About the partnership Chairman Søren Skou CEO, A.P. Møller - Mærsk

Vice chairmen Carsten Jensen CEO, Molslinjen **Bjarne Foldager** Senior Vice President, MAN Energy Solutions **Private partners** · Danish Shipping \cdot The Danish Fishermen

· Danish Pelagic PO · Danish Ports · Danish Maritime

Public partners

· Ministry of Industry,

· Ministry of Climate,

Energy and Utilities

Business and Financial

PO

Affairs

Blue Denmark

Cases



01

Container ship to sail on green methanol from 2023

In 2023, A.P. Møller - Mærsk will introduce its first container vessel capable of being operated on carbon neutral methanol in Northern Europe. A series of eight large ocean-going container vessels will follow in 2024.

Read more





Contact

Danish Shipping Maria Skipper Schwenn mss@danishshipping.dk

02

Propelling the maritime industry into a decarbonised future

The Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping has been established to accelerate the decarbonisation of the global maritime industry with a portfolio of powerful partners across the marine ecosystem.

Read more





Commerce



D



Commerce



The commercial sector represents 12 % of the Danish economy

Challenge

The commercial sector in Denmark comprises a total of 34,250 retail and wholesale companies with 300,000 full-time employees. The sector does not have a big, direct carbon footprint (0.14 million tonnes of CO₂e), but is indirectly responsible for the emissions caused by Danish consumers' consumption of food, clothes, electronics etc. Furthermore, the sector has vast potential to secure climate-friendly products and solutions by means of its companies' purchases, agreements and knowledge sharing with other enterprises. In addition, the commercial sector can directly influence consumer behaviour to select sustainable alternatives.



of the companies in the commercial sector believe that the climate agenda creates new business opportunities for them

Potential

The commercial sector takes global responsibility and goes even further than the Paris Agreement. The sector is deeply enmeshed in complex value chains, which means that the climate crisis cannot be overcome without thinking globally and taking initiatives that transect value chains, sectors and national borders. The commercial sector has unique, direct access to consumers, which must be utilised to enable companies to make it easier for their customers to choose climate-friendly products. The commercial sector has committed itself to working together with authorities and NGOs in terms of shared, action-oriented messaging enabling the sector to achieve genuine behavioural change for the benefit of the climate.

Commerce



Recommendations

01

A taxation reform to kick-start the sustainable transition

A CO₂e-tax will ensure that it is the emitter who pays for the emissions. This will incentivise innovation and reward sustainable front-runners with lower costs. Together, it will affect both the market forces and the green transition

02

Significantly improved recycling of resources

Discarded packaging, textiles, electronics, food, and other waste generated by the commercial sector largely end up being incinerated, because we are unable to efficiently collect, separate and recycle it. This area can be improved by initiatives such as clear common packaging principles, partnership for Sustainable Clothing and Textiles, streamlined recycling of resources, and implementation of manufacturer liability for packaging

03

Climate information for Danish consumers

Significantly improve the level of climaterelated information provided to consumers together with the authorities to make climate-friendly purchases more enticing. This entails initiatives such as reliably communicating about food and non-food product's climate footprints

04

Less resource waste to secure CO₂e reductions

A reduction in resource waste will help us avoid unnecessary costs and reduce the waste stream. The sector has already come far in achieving this goal, especially when it comes to reducing food waste. Nonetheless, there is still unexploited potential, and an incentive could for instance be to simplify the rules relating to product donations

05

Incentives for climate-friendly behaviour to help the sector

A number of incentives must be brought into play and barriers broken down to support the sector's contributions to achieve a more sustainable consumption and production of goods in Denmark. This entails initiatives such as public-sector procurement as a driver of climate-friendly behaviour and an implementation of a repair arrangement

7 tonnes CO2e

Each Dane emits 7 tonnes of CO₂e annually via their food consumption and other consumer goods

1in7 private workplaces in Denmark are part of the commercial

sector





Commerce

About the partnership

Chairman Michael Løve Executive Vice President, Netto International

Vice chairman

Signe Frese CSR Director, COOP Jens Obel Owner & CEO, DK Company Rune Jungberg Communications & CSR Director, JYSK Carsten Wandorf CEO, Fritz Schur Consumer Group

Private partners

- · Danish Chamber of Commerce
- · Conferation of Danish Industry
- Trade Association for
- Danish Fashion & Textile
- · SMEdenmark · And many more

Public partners

- Ministry of Industry, Business and Financial Affairs
- Ministry of Climate, Energy
- and Utilities
- Ministry of Food, Agriculture and
- Fisheries
- \cdot Ministry of Environment

Contact

Danish Chamber of Commerce Frederik Bergenfeldt Friis fbfr@danskerhverv.dk

Cases



01

Many hands make light work: securing sustainable packaging by 2025

An ambitious partnership between the retail sector and the Danish government will make packaging more sustainable by 2025.

Read more \longrightarrow



 \bigcirc

construction

15



Construction

40%

of Denmark's energy consumption and



of its CO₂e emissions derive from energy consumption in buildings



of Denmark's CO2e emissions arise from the production of building materials and the building processes for buildings and infrastructure projects

Challenge

The energy consumption of buildings is responsible for 40 per cent of Denmark's overall energy consumption and 23 per cent of CO₂e emissions. 10 per cent of the country's CO₂e emissions stem from the production of building materials and building processes. To significantly reduce these figures, the construction industry's climate partnership has investigated how CO₂e emissions can be reduced across all parts of the value chain and analysed the carbon footprint of buildings and infrastructure over their entire lifespan.

Potential

The vision

By 2030 we will have significantly lowered buildings' CO₂e emissions. Oil burners will have been replaced by electric heat pumps or district heating, and we will no longer use natural gas for heating. Only in rare cases will buildings be demolished, as it creates too much of a deficit on our CO₂e accounts. Instead, we will renovate, change their usage and create up-to-date green buildings. All this will take place using fossil-free construction processes.

Potential for CO2e reductions

The climate partnership has estimated that implementing the proposed measures by 2030 will result in a net reduction in CO₂e emissions of approximately 5.8 million tonnes per year.

5,800,000 tonnes

NET REDUCTION IN CO2E EMISSIONS PER YEAR BY 2030

Construction



Recommendations

01

Intelligent energy management and energy renovations - 1.2 million tonnes of CO₂e/year

Reducing the energy consumption of existing buildings and managing their consumption intelligently can lower consumption by 20-25 per cent by 2030

02

From fossil fuels to green heating - 1.8 million tonnes CO₂e/year

Danish buildings should be heated solely by renewable energy, which include a general plan for replacing natural gas with climate-friendly alternatives at 400,000 buildings, and replacing 100,000 oil boilers with heat pumps. Finally, renovations of the buildings should be undertaken to reduce homeowners' electricity and heating costs

03

CO₂e accounts for buildings – 1.1 million tonnes CO₂e/year

CO₂e accounts must be a non-negotiable requirement in the current voluntary sustainability standard and building regulations as soon as possible – and similar requirements for infrastructure projects

04

Fossil-free construction sites – 550,000 tonnes CO2e/year

No more gas and diesel at construction sites through electrically powered forklift trucks and cranes, biofuels for the excavators, and electricity and district heating in stead of diesel powered generators. Government can assist in securing access to green energy and biofuels and ensure that biofuels are financially competitive

05

Energy labelling for all buildings

Energy label all buildings within five years. Labels must contain continually updated information on the current state and possibilities for reducing energy and water consumption and improving the indoor climate





industry



of the waste from the construction industry is currently reused



Construction

Cases

About the partnership

Chairman Jesper Kristian Jacobsen CEO, Per Aarsleff

Vice chairman Ingrid Reumert Vice President, VELUX Peter Kaas Hammer CEO, Kemp & Lauritzen

Private partners

- · The Danish Construction
- Federation
- · SMEdenmark
- · Ramboll
- · Danish Association of Architectural Firms
- · CG Jensen
- · ROCKWOOL Group
- · BAT-Kartellet
- TEKNIQ • And 100+ companies and organisations
- related to the Danish construction industry

Public partners

• Ministry of the Interior and Housing

Contact

The Danish Construction Federation Henrik Teglgaard Lund helu@di.dk



O1

Social housing gets a healthy makeover

Climate renovation of buildings does not have to be expensive. The RenovActive project in Belgium proves that by exploiting a renovation concept that can be adapted to even the strictest of budgets, it is possible to solve one of the biggest health issues in Europe.

Read more -



 \rightarrow



02

Preparing for a new, sustainable district using fossil-free processes

In the city of Torup, Denmark, the construction of a new sustainable district has commenced. At the construction site, the preparation of the land for construction is done by only using fossil-free processes.

Read more -



Defence

1



Defence

254,000 tonnes CO2e

This is how much the Danish Ministry of Defence emitted in 2019

Challenge

Today, the overall emissions of the Danish defence sector are approximately 254,000 tons CO₂e. The defence sector covers a wide range of elements across most sectors. It is both an operator of aircrafts, ships, and vehicles, as well as a transportation and logistics organisation and an education facility. Furthermore, it is a landowner and a building administrator. At the same time, defence forces need to function under the most difficult and dangerous conditions. Since it needs to work both in times of peace and crises, the dilemma is how to reduce emissions and at the same time increase operational efficiency, security of supply and enhance the safety of soldiers.

Potential

The potential is not yet defined. There is an ambition to reduce CO₂e emissions, and, at the same time, increase operational efficiency. The balance is important, and conclusions must not in any way affect the safety and security of the soldiers.

Defence



Focus areas

The work in this climate partnership has only just been initiated and the recommendations are expected to be presented in 2022. The climate partnership's efforts will concentrate on three key areas:

01

Making optimal use of solutions already identified in the other 13 sector climate partnerships

There will be a mapping and initial analysis conducted on the potential to apply solutions that the partnership has identified from the other 13 climate partnerships' work

02

Identifying and reinforcing already identified actions within Danish Defence

There will be an analysis conducted on how already identified actions can be reinforced and further developed

03

Developing new technologies

We will work to identify where new technologies and procedures can help reduce emissions, enhance operational efficiency and provide more safety and security for our soldiers. This includes investigating options that combine civil and military technologies of the defense sector's CO₂e emissions stem from the use of fossil fuels

of CO2e emissions come from establishment operations, 4.2% from business trips and 2.4% from refrigeration and extinguishing agents



About the partnership Chairman Poul Skadhede Chair of OMT Vice chairman Steven Friberg CEO, UXV Technologies **Private partners** $\cdot \, \text{Confederation of} \,$ Danish Industry · Danish Chamber of Commerce · CenSec · Danish Maritime · Naval Team Denmark **Public partners** \cdot Ministry of Defense · Ministry of Industry, **Business and Financial** Defence

Cases

O1 First air force with electric aircraft

As one of the first countries in the world, the Danish Air Force will test the first formally approved electric aircraft in the world over a two-year period.

Read more –



PARTNERSHIP HIGHLIGHTS

Contact

Affairs

Affairs

 Ministry of Research and Education
 Ministry of Climate, Energy and Utilities

· Ministry of Foreign

Confederation of Danish Industry Joachim Finkielman jofi@di.dk

Danish Chamber of Commerce Frederik Bergenfelt Friis fbfr@danskerhverv.dk



G

Energy and utilities

.

.



Energy and utilities

58% of CO₂e emissions have been cut by the Danish energy and utilities sector since 1990



The total demand for renewable energy is expected to grow by 64% to 125 TWh by 2030



Challenge

In Denmark, the energy and utilities sector's CO2e emissions have already been cut by 58 per cent from 32 million tonnes in 1990 to 13 million tonnes in 2019. This has been achieved through the deployment of renewable energy, including wind, bioenergy and solar, as well as energy efficient supply of heat and electricity. The challenge towards 2030 is to secure enough renewable energy, phase out the remaining coal used for power stations and natural gas for district heating production, phasing out natural gas and oil in individual heating systems, carbon capture at large point sources, reduction of the use of plastics in waste-to-energy systems and reduction of the amount of natural gas used for energy production in the North Sea. Furthermore, we must couple the large amounts of renewable energy from wind and solar to the sectors, which have not yet been decarbonised such as transport, agriculture, buildings and industry. Through a further expansion of the renewable energy capacity, electrification and Powerto-X technologies, the energy and utilities sector may be able to reduce its CO2e emissions to approximately 1 million tonnes by 2030.

Potential

Implementing the energy and utilities sector's roadmap towards 2030 will entail a pervasive transformation of the way the sector supplies energy to the Danish society. In order to succeed, we need a collective and strategic approach to decision-making and the necessary resolve from policymakers and business executives. Since 1990, the Danish energy and utilities sector has reduced its carbon emissions by 58 per cent, but there is potential for the sector to reduce carbon emissions by more than 95 per cent towards 2030. Doing so will require a significant increase in green energy production to power the transformation adequately.

Potential exists to build 40 GW of offshore energy, where 15 GW would be used to reach climate neutrality in Denmark and 25 GW could be exported, thus creating earnings of approximately EUR 4–5 million in exports annually. Further, with the right efforts, Denmarkk could establish a considerable Power-to-X industry. If our large quantities of green power combined with early demand-side incentives and strong cooperation among relevant operators, Denmark can become a leading nation in this field.

Energy and utilities



Recommendations

01

95 per cent reduction in the energy and utilities sector

- Phase natural gas out of the heating system by 2030 and cease the use of coal in heat/power generation asap
- Introduce new regulations to support a transition to 100 per cent green energy in district heating
- Include Carbon Capture Utilisation & Storage (CCUS) in Denmark's national climate strategy
- Expand offshore wind in the North Sea

02

50 per cent less fossil fuel for buildings, transport and industry

- Introduce new vehicle taxation scheme to prioritise electric vehicles and phase out fossil fuel operated vehicles before 2030
- All new public transport contracts
 must be fossil-free solutions
- Phase out coal, oil and natural gas and transition to green alternatives

03

10 year roadmap for hydrogen fuels focusing on cooperation between government and industry

- Develop a strategy and roadmap for Power-to-X
- Allocate funds for industrial scale-up and appoint relevant locations for utilisation of, for example, waste heat

04

Target for an expansion of renewable energy ensuring sufficient capacity for a complete, green transformation

- Design a roadmap for the expansion of renewable energy and transmission infrastructure – including energy islands that are connected to other countries
- Increase biogas in the energy supply

05

Framework to upgrade Denmark's energy infrastructure to support a complete, green transformation

- Align economic regulations to enable an expansion of the distribution and transmission grids to meet future demand
- Implement time-differentiated tariffs to balance demand
- Convert existing gas infrastructure to be used for Power-to-X



71 TWh

Power consumption is expected to rise to approximately 71 TWh by 2030, necessitating significantly more green energy



Energy and utilities

Cases

About the partnership

Chairman Mads Nipper CEO, Ørsted

Vice chairmen

Henrik Andersen CEO, Vestas Jens Rasmussen CEO, Eurowind Energy Jesper Hjulmand Group CEO, Andel Kim Grøn Knudsen Group Vice President, Haldor Topsøe Lars Therkildsen CEO, HOFOR Martin Rune Pedersen Country Chair Denmark, **TotalEnergies Niels Duedahl** CEO, Norlys **Ole Hvelplund** CEO, Nature Energy **Thomas Egebo** CEO, Energinet

Private partners

- · Danish Energy
- · Confederation of Danish Industry
- · Danish Chamber of
- Commerce
- · Danish Waste
- Association · Danish District Heating
- Association
- \cdot Free Energy Companies
- Driving Force Denmark
 Danish Agriculture &
- Food Council
- · Oil Gas Denmark
- Wind Denmark
 Danish Forest
- Association
- Hydrogen Denmark
 Danish Metalworkers' Union

Public partners

• Ministry of Climate, Energy and Utilities

Contact

Danish Energy Marie Holm Thomsen mht@danskenergi.dk



01

Taking a large chunk out of Denmark's CO₂ emissions with CCS

Carbon capture and storage can play a major role in meeting climate targets. A group of utilities in the Greater Copenhagen area have joined forces to capture and store three million tonnes of CO₂ annually.

Read more -





02

The world's biggest electrolyser and e-fuel facility

Danish companies are developing what will be one of the world's largest electrolyser and e-fuel facilities in order to decarbonise the road, maritime, and aviation sectors.

Read more —





Energy intensive industry



Energy intensive industry

1.6%

of Denmark's GDP stems from the energy intensive industry, which includes 630 companies and accounts for 19,000 jobs

Challenge

The energy intensive industry contributes with crucial materials for society – for buildings, manufacturing, transport, food processing and energy production.

With annual direct CO₂e emissions (scope 1) of 4.8 million tonnes, the sector accounts for approximately 14 per cent of Denmark's overall emissions.

The sector has reduced emissions by 7 per cent as compared to 1990 levels. This has

primarily been achieved through increased energy efficiency. Emissions are projected to grow leading up to 2030 without the introduction of new initiatives.

It is difficult to decarbonise the energy intensive industry, both because it requires large amounts of energy to reach the necessary process temperature, which is often above 1,000 degrees Celsius and because the raw materials release CO₂e as part of the production process.



REDUCTION OF CO₂E EMISSIONS BY 2030

Potential

The Danish energy intensive industry's 2030 vision to be the most climate friendly energy intensive industry in the world while creating green exports, growth and jobs in Denmark.

The climate partnership shows that it is possible for the sector to reduce direct emissions (scope 1) by 70 per cent in 2030.

A reduction of 30 per cent by 2030 is possible and potentially profitable for society through investments in further energy efficiency measures, increased use of alternative fuels (such as biogas and waste), and changes in products (e.g., cement with a lower content of chalk). An additional 20 per cent reduction can be achieved through replacing coal and natural gas with biogas, and the electrification of processes at low and medium temperatures. This requires an increased supply of biogas, expansion of gas infrastructure and price support.

An additional 20 per cent reduction is possible through carbon capture at the largest emitters. The methods and technologies for CCUS are still in their infancy, so establishing a public-private partnership to develop them further is proposed.

Finally, significant scope 3 reductions are possible e.g., by replacing fossil fuels with biofuels at refineries.

Energy intensive industry



Recommendations

01

Shift to biogas

Biogas can replace fossil fuels in processes where high temperatures are necessary and which, therefore, cannot be electrified. To realise these reductions, further investments in biogas production, infrastructure and price support are needed

02

Demand for sustainable solutions

The introduction of more climate-friendly products requires higher demand and, consequently, willingness to pay a higher price. Sustainability as a criterion in public procurement is one tool that can be used to stimulate demand

03

Carbon capture

A national strategy for carbon capture is required along with pilot projects to further develop carbon capture for companies with high emissions

04

Increased use of surplus heat

Surplus heat from energy intensive companies can be used for heating e.g. in district heating networks – thereby reducing emissions from combined heat and power plants. To realise this potential, taxes on the use of surplus heat must be removed



14%

of Denmark's combined CO₂e emissions are generated by the sector. Half emanate from the use of fossil fuels and half from process chemical emissions



About the partnership Chairman Michael Lundgaard Thomsen Managing Director, Aalborg Portland Private partners • Confederation of Danish Industry Public partners • Ministry of Climate, Energy, and Utilities • Ministry of Industry, Business and Financial

Affairs

Energy intensive industry

Cases

01

Reducing NOx emissions in cement production

While CO₂e emissions from cement production is a global challenge, NOx emissions are more of a local and regional challenge. By utilising a new calciner, it is possible for cement producers to obtain significantly lower NOx levels.

Read more –





Contact

Confederation of Danish Industry Louise Bank Ioba@di.dk

02

Surplus heat from industry keeps citizens warm

The Aalborg Portland cement factory has implemented a heat recovery system, in which flue gases are utilised in heat exchanger installations to transfer thermal energy from the flue gas to the City of Aalborg's district heating network.

Read more —







Finance

80 billion EUR

needed between 2020 and 2030 to realise the green transition



Electricity production and distribution has an investment gap of EUR 13 to 32 billion where EUR 8–23 billion will be expansion of renewable energy

Challenge

The financial sector has very low direct emissions but has a large effect through investments and lending.

The financial sector plays a role in all parts of the economy and therefore has the potential to become a key catalyst for not just a green Danish economy, but also a green global economy. While the other 13 climate partnerships have the role of identifying areas requiring investment, the climate partnership for the financial sector has a pivotal role in providing the finance and investments necessary to establish wind farms, solar power, energy islands, Power-to-X, and energy systems etc. to ensure the transition to a green economy and that the goal of reducing emissions by 70 per cent by 2030 and climate neutrality by 2050 is reached.

Furthermore, through natural points of contact with customers, financial sector advisers can engage in dialogue with personal and business customers about the financing of, and investment in, sustainable measures.

Potential

The reduction potential of the financial sector itself is minimal, as the direct emissions are already very small. However, the partnership has made a commitment to reduce its direct emissions by 70 per cent by 2030 in accordance with the the Danish parliament's legislated target. Additionally, we are establishing ambitions regarding the total lending to, and investment in, green finance. We measure annually if we are on track. The financial partnership has developed a CO_2 model that provides a framework on how the individual members can collect and compile the most optimal information on their CO_2e footprint. In addition, the partnership has been at the forefront of developing a common method for calculating the CO_2e emissions of the private sector and the public sector.



REDUCTION OF DIRECT CO₂e EMISSIONS BY 2030

Finance



Recommendations

01

Long-term and predictable frameworks

Establish financing structures involving independent state loan funds that cofinance projects promoting sustainable development to lower investment risk. Support the transition towards a more sustainable agricultural sector via a special scheme, for example one that includes Vækstkaution (a growth guarantee to reduce risks)

02

Financing innovation, development, and the export of low-emission solutions

Finance innovation and the development of new technologies and new solutions for global climate challenges. Successful solutions developed in Denmark would support green growth in the coming years

03

Standardisation, digitalisation and access to data

To finance the green transition, it is critical that the financial sector has easy and inexpensive access to standardised and digital data regarding companies, households, etc. that need financing. Align this data with the future EU regulation on reporting for the financial sector

04

The role of the public sector

Utilise the role of the public sector as a buyer and construction project owner and indirectly as a trendsetter to promote the green transition in Denmark

05

The role of the public sector

Increase the use of public funding and venture capital to finance development projects with the potential to reduce global emissions, such as the development of e-fuels and the capture and storage of CO2 (CCS)

06

Framework conditions in Denmark and the EU on sustainable financing and investments

Continue the work to ensure that EU regulation in the financial field is ambitious, evidence-based and useful, while limiting administrative burdens on financial and non-financial institutions. Long-term, clear and attractive framework conditions in Denmark and in the EU play a major role in enabling sufficient investments from the private sector to further accelerate the green transition



11 billion EUR

needed in Danish households to invest in more energy-efficient buildings. Mortgage loans and bank loans are expected to cover this

47 billion EUR

commitment to green investments by 2030. In 2021, the investments already reached EUR 9.4 billion



Finance

Cases

About the partnership

Chairman Torben Möger Pedersen CEO, PensionDanmark

- Private partners
- Insurance & Pension
- Denmark · PensionDanmark
- · PEA
- · Spar Nord
- Danish Venture Capital and Private Equity Association

Public partners

- Ministry of Industry, Business and Financial Affairs
- Ministry of Climate, Energy and Utilities

Contact

Finance Denmark Birgitte Søgaard Holm bsh@fida.dk

Insurance & Pension Denmark Jan V. Hansen jvh@forsikringogpension.dk



01

Lake Turkana - Africa's largest wind farm

It took more than eight years to finalise the 310 MW large wind farm and it required a financial package of approx. EUR 600 million. Nordic Development Financing Institutions have provided a substantial part of the equity, while loan financing has been provided by several private banks and development banks.

Read more





O2 VindØ (Wind Island)

A consortium of three of the largest Danish pension funds and energy companies are ready to finance a future energy island in the North Sea, called Wind Island. Wind Island can become a base for 10 GW offshore wind turbines, which correlates to 25 traditional offshore wind farms.

Read more -





Food and agriculture



Food and agriculture

15.4 million tonnes CO2e

The climate impact of the Danish agriculture & food sector (incl. LULUCF) in 2017



decrease in climate impact in 2017 compared to 1990

↓ 62%

CO2e REDUCTION BY 2030 BY FOLLOWING THE RECOMMENDATIONS

Challenge

Decarbonising food production – which leaves behind a substantial climate impact globally – is difficult, as food is produced under biological and natural conditions.

Climate change, increasing pressure on natural resources and the need to feed a global population of 10 billion people by 2050 are some of the most pressing global challenges of our time. New, innovative solutions are needed so that we can produce and consume food in a sustainable way. The climate impact of the Danish agriculture & food sector, including land use, land-use change and forestry (LULUCF), amounted to 15.4 million tonnes CO_2 in 2017. The climate impact of the sector has decreased by 25 per cent between 1990 – 2017.

Potential

If the Danish Government and Parliament follow the 22 climate actions recommended by the climate partnership for Food and agriculture, the sector could reduce its climate impact by 62 per cent by 2030 (approximately 12.6 million tonnes CO₂e). At the same time, the partnership's analyses show that Denmark, through further research in the food field, is likely to reduce its climate impact by a further 10 percentage points, corresponding to an overall gain of 72 per cent. Overall, by following the proposals, Denmark can realise substantial gains in terms of achieving the sector's own goal of a climate-neutral industry by 2050. We endeavour to secure an industry that continues to have a large and competitive food, agriculture, aquaculture and forestry sector that delivers great value to Denmark in terms of employment, income, welfare and export earnings. Simultaneously, the industry contributes to the global climate transition.

Food and agriculture



Recommendations

01

Set aside of approx. 100,000 hectares of alluvial land

A significant part of the sector's emissions arise from carbon-rich alluvial land. Setting aside some of this (and compensating landowners) can reap considerable climate benefits

02

Reduction of nitrous oxide emissions

Using nitrification inhibitors in manure and chemical fertilisers can significantly reduce emissions

03

Frequent removal of slurry and disposal of manure

Evidence indicates that methane emissions can be reduced if the slurry from the pigsties is removed once a week rather than every five or six weeks, which is common practice today

04

Climate optimisation of fodder

If the fodder composition for ruminants become more climate efficient, they will emit less methane

05

Climate check and action plan for individual farms

Climate balance sheets give farmers insight into the scale of the climate impact of their farm and where it occurs

06

Biogas from degassing and advanced biofuels

Manure and residues from the food industry, agriculture and households offer a large, untapped biogas potential. Sustainable and advanced biofuels can help decarbonise heavy transport.

07

Renewable energy production

Utilise the large quantities of biomass the sector produces (such as straw, manure, residuals and by-products) for climate-friendly energy production. Erect wind turbines and solar panels on agricultural land

08

Increased afforestation and forest production

In its national forest programme, Denmark has established a target of increasing the forest area, so that forest landscapes cover 20-25 per cent of the country by the end of the 21st century

09

Green conversion of processing operations, including electrification and energy efficiency

Provide funds and incentives to decarbonise processing operations and incentives to switch to green energy consumption where possible

10

Replacement of fossil resources or energy-intensive materials in construction

Design and implement a strategy to increase the use of climate-friendly timber construction, including a revision of fire regulations and the building code

11

Research

Establish a number of large, multiannual and challenge-driven research partnerships (basic research, strategic research, development and demonstration) which ensure interdisciplinarity and regulatory involvement



10% additional reduction can be achieved with further research and innovation, totalling a CO₂e reduction of 72%



Food and agriculture

Cases

About the partnership

Chairman Jais Valeur Group CEO, Danish Crown

Private partners

- Danish Agriculture & Food Council
- ·SEGES
- · Okologisk Landsforening
- · Think tank Frej
- · Danish Forest
- Association • Danish Dairy Board
- Danish Food and Drink
- Federation • Danish Chamber of
- Commerce • Danish Aquaculture
- Danish Brewers'
 Association
- · Stop Wasting Food movement Denmark
- Aarhus University
 Technical University of
- Denmark
- · University of
- Copenhagen · Arla Foods
- · Agrointelli
- · Animal Nutritution DLG
- · Carlsberg
- · Chr. Hansen
- ·Daka
- · Danish Agro
- · Orkla Foods Denmark
- Nature Energy
- · Schulstad
- Trade Union NNF • Trade Union 3F

_ . . .

Public partners

• Ministry of Food, Agriculture and Fisheries of Denmark

Contact

Danish Agriculture & Food Council Niels Peter Nørring npn@lf.dk



01

Using Danish genetics to reduce CO₂e emissions from livestock production

Breeding and genetics are crucial for reducing methane emissions within the dairy and beef cattle sector. By implementing new systems, Indian dairy cows could reduce their methane emissions by 33 per cent per litre milk.

Read more \longrightarrow





02

Organic dairy saves time, money, and CO₂e emissions with new warehouse

Being a local dairy embedded in Thise town, it was paramount to Thise Dairy to show consideration towards both the environment and the neighbours when building a new high-bay warehouse.

Read more -





5

A Carlos

The climate partnership for

Inland transpor



Inland transport

7% fuel reduction can be achieved by delivering goods outside peak-hours

Challenge

The transport sector emits around 20 per cent of Denmark's total CO₂e emissions, whereas inland transport, including lorries, delivery vans and buses, is responsible for about 32 per cent of the transport sector's carbon emissions in Denmark. For example, more than 99 per cent of Denmark's 42,000 lorries still run on 93 per cent petrodiesel fuel. This figure demonstrates how the transport sector is working on the transformation process, as the lorries are fuelled by 7 per cent biodiesel. Yet it also highlights an unrealised capacity for further reducing heavy transportation's carbon emissions.



of the tranport sector's CO₂e emissions in Denmark stem from inland transport, including lorries, delivery vans and buses

Potential

The partnership aims to provide realistic solutions that are implementable within the foreseeable future and to contribute with genuine, significant reductions by 2030 while simultaneously preserving jobs and Denmark's future competitiveness.

Green transformation can be generated in three principal areas:

- The transport process can be further streamlined to reduce fuel consumption. This can be done through driving-pattern optimisation, capacity utilisation, off-hour deliveries, etc. It can also occur by lengthening combined vehicles and increasing the total weight of the vehicles themselves. Many of these initiatives can be implemented by the sector itself.
- A wider selection and greater use of green vehicles can be encouraged via subsidies. Converting the taxation system could promote the purchase of low-emission and zero-emission vehicles, and enlarging the refuelling and charging infrastructure for green fuels could break down barriers to the use of green vehicles
- 3. Green fuels can be promoted. A decarbonisation requirement and tax exemption for sustainable fuels could secure a technology-neutral conversion process, while safeguarding Denmark's competitiveness at the same time.

Inland transport



Recommendations

01

Decarbonisation requirement

A model with a gradually increasing decarbonisation requirement for fuel suppliers in Denmark up to 2030. Since the recommendations from 2020, this has been partially realised through the expansion of the EU ETS system to road transport

02

Double trailers

Experiments should be launched to examine new vehicle configurations. Specifically, experiments should be launched involving double-trailer combined vehicles, in which the combined vehicle is made up of two standard semi-trailers (up to 32 metres)

03

Proliferation of green vehicles

To promote the market for heavy vehicles running on alternative fuels in Denmark, it is proposed that a Danish subsidy scheme be set up for the first 10,000 heavy vehicles that run on alternative fuels (such as biogas, electricity or hydrogen) up to 2030

04

Electrofuels

Electrofuels are defined as the transport sector's moon shot, but it is difficult to see how they can be realised on a large scale before 2030. With an overarching goal for a carbon neutral Denmark and Europe by 2050, it is necessary to launch the project already now, so we can achieve the goal in time



of Denmark's 42,000 lorries still run on 93 % petrodiesel fuel



Inland transport

Cases

Chairman Jens Bjørn Andersen Group CEO, DSV

About the partnership

Vice chairmen Anne Kathrine Steenbjerge, CEO, Ancotrans Martin Danielsen CEO, Schou-Danielsen Logistik

Private partners

- $\cdot \, Hydrogen \, Denmark$
- · Biogas Denmark
- · CONCITO
- · Danish Construction Federation
- · Danish Ports
- · Danish Shippingand Port Companies
- Danish Electric Vehicle Alliance
- Danish Energy Association
- Danish Chamber
- of Commerce · Danish Freight
- Forwarders Association · Confederation of
- Danish Industry
- Danish Passenger Transport
- · Danish Fuel and
- Refineries
- ·FDM
- The Association of
- Professional Passenger Transport
- Green Transition
- Denmark • Youth Climate Council
- of Denmark
- · 3F Transport
- ·DTU
- · Aalborg Universitet

Contact

Danish Chamber of Commerce Jesper Kronborg jek@danskerhverv.dk



O1 Optimising urban mobility for rapidly expanding cities

A free-float, fully electric car-sharing platform reduces the number of cars occupying valuable space and allows urban dwellers to move seamlessly around the city while reducing CO₂e and pollution.

Read more -





02

Goodbye to polluting, noisy delivery trucks in Danish cities

A busy delivery route in the Danish city of Odense that covers 40 stops each day is now being served by an electric, emissions-free vehicle.

Read more —



00

Life science and biotech



Life science and biotech

9/10

companies in the life science and biotech sector have already set targets for reducing their climate impact



↓ 55%

CO2e REDUCTIONS IN 2017 COMPARED TO 1990 LEVELS

Challenge

The life science and biotech sector has been concerned with the environmental and sustainability agenda for many years. As a result, many companies have already implemented a wide range of measures to reduce their own CO₂e emissions in production. A survey showed that 9 out of 10 companies in the sector have already set targets for reducing their climate impact. Similarly, large Danish companies have similar targets for their own operations in Denmark and their subsidiaries located around the world. In Denmark, the sector has reduced CO₂e emissions from 118,000 tonnes in 1990 to 53,000 tonnes in 2017, which equates to a reduction of 55 per cent. This means that CO₂e emissions from the life sciences and biotechnology sector accounted for 0.1 per cent of all CO₂e emissions in Denmark in 2017. Optimisation of production and conversion to green energy can take a significant share of the credit for the low CO₂e emissions.

Potential

In the short term, the sector wants to ensure resource efficiency through energy efficiency, reduced and circular resource consumption and use of materials – both in its own operations and in the biotech solutions it provides. In the long term, the life science and biotech sector suggests that society should consider – if technically achievable – the use of excess CO₂ from point sources as well as biological production of e.g. pharmaceuticals, micro-organisms, enzymes, biological molecules etc. Biotech companies are also developing solutions, offering great potential to reduce global CO2 emissions if implemented on a large scale in sectors with significant emissions challenges. These include biofuels for transportation, bio-based alternatives in food production, agriculture, textile manufacturing, cleaning etc. and circular bio-recycling solutions for residual and side streams from production, household, processing, agriculture, etc., resource optimisation of energy, water and crops in the production and processing of textiles, food, feed, biological farming solutions (alternatives to pesticides and fertilisers) and improved feed efficiency and production of alternative proteins for food and feed.

Life science and biotech



Recommendations

01

Set our own house in order

- Better framework for the use of excess heat – remove taxes and change regulation
- Better framework for recycling strengthening the circular economy
- Better framework for climate
 optimisation of production within
 Good Manufacturing Practice (GMP)

02

Green demand from customers and for subcontractors

- Purchasing green transport
- Purchasing green energy
- Green public procurement

03

Innovation

- Biotech solutions in food production and agriculture
- Biotech solutions in transport and biorefining

04

Knowledge and international outlook

- Strengthened Danish climate
 engagement in the EU and globally
- Strengthened framework conditions for increased research and development
- Development and sharing of competences





In 2019, the life science and biotech sector accounted for over 18 % of total goods exports abroad, equivalent to over EUR 17.4 billion



Life Science and **Biotech**

Cases

partnership Chairman

About the

Ester Baiget CEO, Novozymes

Private partners

- · ALK-Abelló
- · BioPhero
- · BioSyntia · Coloplast
- · Demant · Ferring
- · Gubra
- · LEO Pharma
- · Lundbeck
- Novozymes
- · Siemens Healthineers · Danish Association of
- the Pharmaceutical Industry (LIF) · Danish Chamber
- of Commerce · Confederation
- of Danish Industry
- · Dansk Biotek (Danish Biotech)
- · Medtech Denmark

Public partners

- · Danish Ministry of Health
- · Ministry of Climate,
- Energy and Utilities
- · Ministry of Industry, **Business** and
- **Financial Affairs**

Contact

Danish Chamber of Commerce **Ulrich Bang** uba@danskerhverv.dk



01

Biobased alternative to plastics

8 per cent of all extracted crude oil is used directly for manufacturing of plastic materials. A Danish biotech company has developed a technology that replaces crude oil with biomass, thereby creating a fully bio-based, circular, and compostable material.

Read more \longrightarrow





02

Algae as an alternative source of protein

Global food production needs to support multiple protein sources to feed more people. Green proteins and specifically algae constitute an important alternative source of protein in sustainable food production and global food security.

Read more -



936.

Manufacturing



Manufacturing



of Denmark's GDP and 40% of total goods exports originates from the manufacturing industry, which covers 23 subsectors



of the total Danish CO₂e emissions (scope 1) originates from the manufacturing industry. Indirect emissions from purchased power and heating account for an additional 3% (scope 2)





POTENTIAL REDUCTIONS IN CO2e BY 2030

Challenge

Denmark's manufacturing sector has reduced direct emissions (scope 1) by 65 per cent since 1990 through increased efficiency, relocation of production and fuel switching. Meanwhile, output has increased by 35 per cent.

Today, only 20 per cent of manufacturing companies have formulated climate targets for their organisation, and only 10 per cent have calculated their emissions and carbon footprint. Thus, there is insufficient knowledge, information and attention to the topic in most companies. Most projects and initiatives to reduce CO₂e emissions require an up-front investment. Companies usually have a short time horizon, requiring investments with a pay back within e.g. 3 years. Consequently, many efficiency projects that are technically and even economically feasible may not be realised if their pay back time is longer than 3 years.

It is a challenge to inform and incentivise manufacturing companies – from large corporations to the many SMEs – to engage in energy efficiency and other climate measures. The first step is to create awareness and start sharing information, experience, best practice and concrete solutions among companies.

Potential

The vision for 2030 is for Denmark to have the world's first climate-neutral manufacturing industry while continuing to create green exports, growth and jobs in Denmark.

The climate partnership has charted a path for an 80-85 per cent reduction in CO₂e by 2030 using measures that are chiefly economically viable. Through economic incentives and further use of biogas, reductions can reach 90-95 per cent. Meanwhile, indirect emissions (scope 2) can be reduced by 95 per cent through more energy efficiency in electrical equipment and switching to green energy sources in the energy sector. This means, the manufacturing industry can nearly reach climate neutrality in scope 1 and 2 by 2030.

Realising this vision requires strengthened advisory services to companies, better financing possibilities, intelligent tax reform providing incentives for electrification and use of surplus heat and support for biogas for medium to hightemperature processes.

Manufacturing



Recommendations

01

Strengthened information and advisory services

Develop knowledge platforms to provide knowledge to industry, including the many SMEs, granting access to tools for measuring emissions, possible climate measures and consulting services

02

Better financing possibilities

Many companies have competing investment projects and require a short pay-back time on any project undertaken. Some energy efficiency measures may have a longer pay-back time than the company threshold, while still being optimal for society. Co-financing and other specialised incentive schemes for investments in energy efficiency should be made available

03

Intelligent tax reform

Taxes on the use of electricity and surplus heat should be lowered – enabling greater consumption of green energy sources

04

Support for biogas

Biogas is an optimal green energy source for medium and high-temperature processes that cannot run efficiently on electricity. Thus, efforts should be made to ensure more biogas in the national biogas grid and that companies use green gas in their processes The vision is to achieve carbon neutrality by



6x

Scope 3 emissions are 6 times higher than scope 1 and 2 combined



Manufacturing

Cases

About the partnership

Chairman Kim Fausing CEO, Danfoss

Vice chairmen Toke Foss Chairman of the Board

Chairman of the Boar and owner, DEIF John Vestergaard Former Group CEO Ege Carpets

Private partners

· Confederation of Danish Industry

Public partners

- Ministry of Climate, Energy, and Utilities
- Ministry of Industry, Business and Financial Affairs

Contact

Confederation of Danish Industry Jacob Kjeldsen jak@di.dk



01

Transforming the brewing process one hydraulic valve at a time

Patented water hydraulic valve technology is taking the global brewer Carlsberg one step closer to achieving zero emissions breweries.

Read more \longrightarrow





O2 Greening the manufacturing sector in Japan: the water-energy nexus

While initially sceptical, a leading Japanese tyre manufacturer reaped energy savings of more than 50 per cent by modernising its water pumps.

Read more \longrightarrow



Service, IT and consultancy

Services, IT, and consultancy

10%

reduction of animal products in the catering industry represents a potential reduction of 298,000 tonnes of CO₂e (globally)

Challenge

The Danish economy is strong in the services, IT and consultancy sectors – in addition to tourism and the creative occupations, which together create solid growth and value for Denmark, typically in partnerships with other business sectors and public authorities. This is reflected in the climate partnership for the services, IT and consultancy sectors, which covers 162,000 companies, employs up to half a million people and represents a third of the gross value added across the 14 partnerships. Within these sectors, the partnership expects to achieve a 73 per cent reduction in our climate footprint from 1990 to 2030. A challenge will be how to stimulate demand for the green products and services that already exist and which the sector can provide to reduce emissions, thereby creating incentives for further development. However, by far the largest contribution will be from the sector contributing to other sectors – both public and private and both nationally and internationally.



REDUCTION OF THE CLIMATE FOOTPRINT BY 2030

Potential

The service, IT and consultancy sectors create new markets and develops existing ones. This is via capacity expansion and the development of new products and services that efficiently drive new demand and addresses current challenges. This makes the industry a strong partner for change.

Another characteristic of these sectors is that they have considerable contact with other companies and ordinary citizens. This provides many opportunities to impact behaviour, ranging from procurement policies to digitalisation to food waste.

Through four key ambitions, which the climate partnership will contribute to the green transition in the Danish private sector:

- 1. Pave the way for a green transition in all sectors via the use of data, Al and digitalisation.
- 2. Create new markets that drive a demand for green products among companies and consumers.
- Drive new behaviour via customer contacts, employees, and supplier relationships.
- 4. Continue to reduce the sector's own climate footprint via sustainable business models.

Many of the climate initiatives that can be implemented via the partnership's 13 proposals can have an impact on other sectors of our society and in climate footprint calculations. Therefore, the potential is huge, and so are the opportunities for growth.

Services, IT, and consultancy



Recommendations

01

Take advantage of the potential for digitalisation, data, IoT and AI across sectors

Use new technology and super highspeed connections to reduce our climate footprint

02

Smart community

Data-driven green cities – both the private and public sectors must make better use of data in the utility sector and elsewhere

03

Internationally standardised key figures in climate and environmental reporting

Access to easy to understand and easy to use historical data for climate footprints

04

Procurement systems as an engine of change

Clear priorities for the EUR 51 billion in annual public sector procurements that can move and create private markets together with the business community

05

Greener transport

We need to embrace new, cost-effective technologies while avoiding unnecessary trips

06

Use the surplus heat from data centres

The tax system must allow for reusable heat to be used for district heating

07

Sustainable buildings

Use building regulations and financing to create a greener housing mass

80

Access to green venture capital

Public and private funds must complement each other, as a green transition requires green investments

09

Strong labelling schemes and new knowledge on climate footprints

The right schemes can promote the value of and highlight low climate footprints

10

Denmark as a sustainable destination

Draw more attention to and market sustainable Danish solutions for the tourism sector

11

Sustainable meals and reduced food waste

New knowledge, changes to behaviour and new models must pave the way for reducing food waste

12

Promote circular economy

Less waste, more efficient waste sorting and increased reuse/recycling of materials

13

SME: Green and SME: Digital

Practical help during the transition process for both business models and physical premises of SMEs





reduction (globally) can be achieved by cutting food waste in half



Services, IT, and consultancy

About the partnership

Chairman Kathrine Forsberg CEO, Atea Danmark

Vice chairman Rasmus Ødum Group COO, COWI

Private partners

- · Danish Chamber of Commerce
- Confederation of Danish
 Industry
- ·HORESTA
- · IT Industry
- · SME Danmark
- ·KMD
- ·COWI
- · BC Hospitality Group

Public partners

- Ministry of Climate, Energy and Utilities
- Ministry of Industry, Business and Financial Affairs

Case



01

Surplus heat from data centre used for district heating

Large data centres are on the rise and with these an increased energy consumption. A Ramboll-designed energy centre is redistributing surplus heat from Facebook's data centre in Odense, Denmark, to the city's district heating network.

Read more \longrightarrow



Contact

Danish Chamber of Commerce Poul Noer pno@danskerhverv.dk

Waste, water and circular economy



Waste, water and circular economy

50%

of the total global greenhouse gas emissions and more than 90 % of the loss of biodiversity is caused by the extraction and processing of natural resources

50% Denmark's water sector uses about half of the energy per m³ of water as the EU average



Challenge

Resource extraction, production and consumption come with high CO₂e emissions. This applies to products, materials and even water. Consequently, products and resources should be kept in circulation for as long as possible through reuse or recycling.

A transition to a circular economy can provide CO₂e reductions extending far beyond single sectors and national borders. By looping resources through reuse and recycling, the CO₂e emissions associated with extraction, production and use of resources are reduced.

Some of the challenges when transforming to a circular economy are a lack of competitive, high-quality recycled materials, lack of standards and knowledge about the content and quality of used products and recycled materials. It is essential we alter our consumption patterns and stimulate demand for circular solutions.

Globally, the water sector accounts for 2-4 per cent of the world's total electricity consumption and this amount will increase as more water is treated throughout the world. Energy-efficient technologies and a focus on CO₂e reductions can reduce this number significantly. Direct emissions of methane and nitrous oxides from the water sector, especially related to wastewater treatment, are significant but can be reduced with new technology.

Potential

The overall vision of the climate partnership is for Denmark to be a world leader in circular economy by 2030. Denmark can lead the way to climate neutrality in 2050 and support exports of resource-efficient technology.

The water sector in Denmark has set a goal to become climate and energy neutral by 2030. In the waste sector, the goal is to recycle 90 per cent of all waste by 2030.

Within circular economy, the potential for reducing CO₂e emissions is great. For Denmark, converting to a circular economy is estimated to result in a reduction of approximately 7-9 million tonnes of CO₂e in 2030 globally. Exports of Danish water technology and knowledge encompass considerable climate potential. If the European water sector was as energy efficient as Denmark's is today, it would lead to an estimated CO₂e reductions of 1.7 million tonnes and extrapolated up to 30 million tonnes globally in 2030. A global energy and climate neutral water sector will result in sizable CO₂e reductions worldwide.

Waste, water and circular economy



Recommendations

01

Circular economy

- Longer product life and increased reuse: Introduce circular design criteria into EU product policy, demand green and circular solutions through public procurement and increase access and incentive for repair and use of recycled models
- Increased use of recycled materials: Create an efficient market for recycled materials using globally recognised standards for secondary materials. Standards create a level playing field and create confidence amongst users and consumers
- Circular business models: Green Public Procurement should be a driving force for the transition to circular business models and solutions. The focus of public procurement should not only be on the acquisition price, but also total costs and entire value chains
- Change to new materials: A shift to bio-based materials and substitution of unwanted chemicals where relevant requires research into and development of methods in the field of circular bioeconomy as well as strategies for sustainable use of chemicals
- Reduced wastage: European and national strategies for waste reduction should present targets, tools and incentives to reduce waste from both households and companies

02

Waste

- Increased and improved recycling of waste
- Degassing from landfill
- CO₂e reduction from biogas plants
- Phase out composting

03

Water

- Reduction of direct greenhouse gas emissions in the wastewater sector
- Increased energy efficiency in the water and wastewater sector
- Avoid rainwater and unauthorised water in the wastewater system
- Increased energy production via biogas and heat pumps
- Export efficient water technology to achieve global impact





Waste, water and circular economy

Cases

About the partnership

Chairman Camilla Haustrup Hermansen Deputy CEO, Plus Pack

Vice chairmen Henrik Grand Petersen CEO, Stena Recycling Lars Schrøder CEO, Aarhus Vand

Private partners

- · Confederation of
- Danish Industry
- · Danish waste &
- resource industry • DI Water
- · DAKOFA
- · Danish Waste
- Association
- · Danish Chamber
- of Commerce
- Danish Environmental Technology Association
- Association of Danish
- Water Supply
- DANVA Danish Water and Wastewater Association
- Danish Construction
- Federation
- Danish Plastics Federation
- Danish Agriculture
- & Food Council
- Local Government Denmark (KL)

Public partners

· Ministry of Environment

Contact

Confederation of Danish Industry Iben Kinch Sohn ibso@di.dk



01

Turning wastewater into green energy

While wastewater treatment plants are considered as big energy consumers, Marselisborg Waste Water Treatment Plant has been transformed from an energy consuming to an energy producing plant, achieving an energy self-sufficiency of 150 per cent.

Read more —





02

Closed loop in reuse packaging-as-service

The reuse packaging-as-service offers a new circular consumption model, reducing packaging and waste, thereby encompassing the potential to reduce Co₂e emissions by up to 60 per cent when compared to single-use packaging.

Read more -





Want to know more about the climate partnerships and explore more green solutions?

ightarrow climatepartnerships2030.com







