

Inventory climate-friendly Wadden Sea Region

Introduction

Political framework

At the 11th Trilateral Governmental Conference for the Protection of the Wadden Sea on Sylt in 2010, it had been stated that the Wadden Sea Region (WSR) shall develop into a CO₂-neutral region. § 24 reads as follows: *"... support the global and national efforts to mitigate causes of climate change at the regional level, by calling especially upon local and regional competent authorities and stakeholders, to work towards developing the Wadden Sea Region into a CO₂-neutral area by 2030 or before, putting the focus on the special threats for coastal zones by global warming and sea level rise."*

In February 2014 the Tønder Declaration referred to that statement by addressing the following in §47: *"Appreciate the ongoing efforts, especially at the local and regional levels, to work towards developing the Wadden Sea region into a CO₂-neutral area, and reconfirm the Sylt Declaration §24."*

Also the work of the WSF was appreciated in the Tønder Declaration:

"Take into account the activities and recommendations by the Wadden Sea Forum on sustainable development and participatory processes, in particular with regard to... efforts and recommendations of the WSF to contribute working towards a CO₂-neutral Wadden Sea Region as envisaged by the governments."

Goal of this report

A complete picture of the various developments in the trilateral WSR is missing and it is unclear how the regional and local governments are currently contributing to the trilateral aim. Therefore the aim of this document is to give an overview and state of the art of the CO₂ reduction goals and measures of provinces, municipalities, and counties for the WSR region. Also a list of several best cases per country is part of the inventory.

The content of the inventory:

- As a starting point, an overall overview of CO₂ emissions per European country from the EEA is elaborated;
- An overview of goals and policies around CO₂ reduction per WSR governmental layer (national, regional) are the emphasis of the project.¹ The goals and policies on the European level are included too;
- WSR best cases, to give examples of the variety of climate friendly/CO₂ reduction initiatives which are initiated in the WSR.

Since there are no detailed specific CO₂ reduction policies in the three countries, the project will focus on some important sectors:

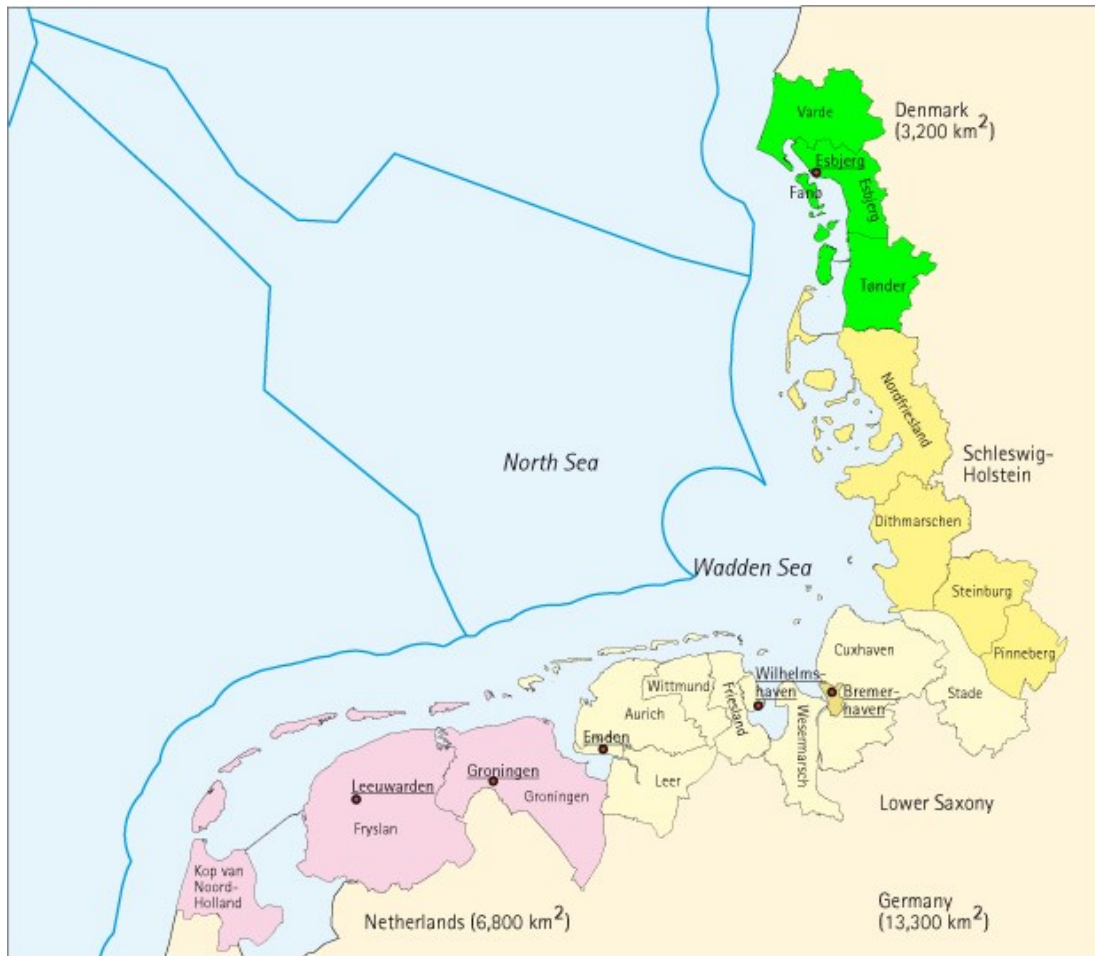
- Greenhouse gases
- Energy (efficiency, sustainable supply generation)
- Capture and storage of CO₂ (CCS)
- Emission trading
- Transport
- Agriculture (peatland, greenhouses, livestock)

In this inventory education, consumption, waste and other topics are not included.

¹ excluding the municipalities in Germany and the Netherlands.

Wadden Sea Region

The inventory will focus on the Wadden Sea Region, this includes the three Dutch Wadden Sea provinces, the German counties along the coast and the Danish Wadden Sea municipalities.



Content

INTRODUCTION	1
CONTENT	3
EUROPE	8
OVERVIEW CO ₂ EMISSIONS EUROPE.....	8
GREENHOUSE GASES.....	9
ENERGY.....	9
SUSTAINABLE SUPPLY GENERATION.....	10
CAPTURE AND STORAGE OF CO ₂ (CCS).....	10
EMISSION TRADING.....	10
TRANSPORT.....	10
AGRICULTURE (PEATLAND, GREENHOUSES, LIVESTOCK).....	12
THE NETHERLANDS – NATIONAL LEVEL	13
GREENHOUSE GASES.....	13
ENERGY.....	13
CAPTURE AND STORAGE OF CO ₂ (CCS).....	14
EMISSION TRADING.....	14
TRANSPORT.....	15
AGRICULTURE (PEATLAND, GREENHOUSES, LIVESTOCK).....	15
PROVINCE OF NOORD-HOLLAND, ‘KOP VAN NOORD-HOLLAND’	17
GREENHOUSE GASES.....	17
ENERGY.....	17
CAPTURE AND STORAGE OF CO ₂ (CCS).....	17
EMISSION TRADING.....	17
TRANSPORT.....	17
AGRICULTURE.....	17
PROVINCE OF FRIESLAND	18
GREENHOUSE GASES.....	18
ENERGY.....	18
CAPTURE AND STORAGE OF CO ₂ (CCS).....	18
EMISSION TRADING.....	18
TRANSPORT.....	19
AGRICULTURE.....	19
PROVINCE OF GRONINGEN	19
GREENHOUSE GASES.....	19
ENERGY.....	19
CAPTURE AND STORAGE OF CO ₂ (CCS).....	20
EMISSION TRADING.....	20
TRANSPORT.....	20
AGRICULTURE (PEATLAND, GREENHOUSES, LIVESTOCK).....	20
BEST CASES NETHERLANDS	21
GERMANY – NATIONAL LEVEL	22
GREENHOUSE GASES.....	22
ENERGY.....	23
CAPTURE AND STORAGE OF CO ₂ (CCS).....	24
EMISSION TRADING.....	25

TRANSPORT	25
AGRICULTURE (PEATLAND, GREENHOUSES, LIVESTOCK)	26
PROVINCE OF LOWER SAXONY AND BREMERHAVEN	26
GREENHOUSE GASES	26
ENERGY	27
CAPTURE AND STORAGE OF CO2 (CCS)	27
EMISSION TRADING	27
TRANSPORT	27
AGRICULTURE	27
LOWER SAXONY AND BREMERHAVEN – LOCAL LEVEL	27
LEER COUNTY:	27
GREENHOUSE GASES	27
ENERGY	28
CAPTURE AND STORAGE OF CO2 (CCS)	28
EMISSION TRADING	28
TRANSPORT	28
AGRICULTURE	28
EMDEN (CITY):.....	28
GREENHOUSE GASES	28
ENERGY	28
CAPTURE AND STORAGE OF CO2 (CCS)	29
EMISSION TRADING	29
TRANSPORT	29
AGRICULTURE	29
AURICH COUNTY:	29
GREENHOUSE GASES	29
ENERGY	29
CAPTURE AND STORAGE OF CO2 (CCS)	29
EMISSION TRADING	29
TRANSPORT	29
AGRICULTURE	29
WITTMUND COUNTY:.....	29
GREENHOUSE GASES	29
ENERGY	30
CAPTURE AND STORAGE OF CO2 (CCS)	30
EMISSION TRADING	30
TRANSPORT	30
AGRICULTURE	30
FRIESLAND COUNTY:	30
GREENHOUSE GASES	30
ENERGY	31
CAPTURE AND STORAGE OF CO2 (CCS)	31
EMISSION TRADING	32
TRANSPORT	32
AGRICULTURE	32
WILHELMSHAVEN (CITY):	32
GREENHOUSE GASES	32

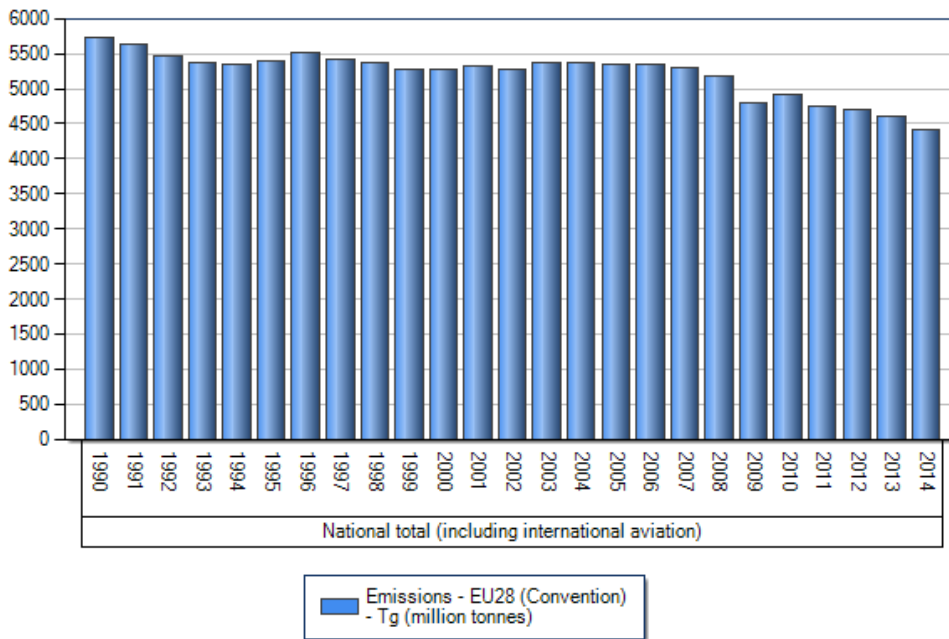
ENERGY	32
CAPTURE AND STORAGE OF CO2 (CCS)	32
EMISSION TRADING	33
TRANSPORT	33
AGRICULTURE	33
WESERMARSCH COUNTY:	33
GREENHOUSE GASES	33
ENERGY	33
CAPTURE AND STORAGE OF CO2 (CCS)	33
EMISSION TRADING	33
TRANSPORT	34
AGRICULTURE	34
BREMERHAVEN (CITY):	34
GREENHOUSE GASES	34
ENERGY	35
CAPTURE AND STORAGE OF CO2 (CCS)	35
EMISSION TRADING	35
TRANSPORT	35
AGRICULTURE	35
CUXHAVEN COUNTY:.....	35
GREENHOUSE GASES	35
ENERGY	35
CAPTURE AND STORAGE OF CO2 (CCS)	35
EMISSION TRADING	35
TRANSPORT	35
AGRICULTURE	36
STADE COUNTY:	36
GREENHOUSE GASES	36
ENERGY	36
CAPTURE AND STORAGE OF CO2 (CCS)	36
EMISSION TRADING	36
TRANSPORT	36
AGRICULTURE	37
SCHLESWIG-HOLSTEIN.....	37
GREENHOUSE GASES	37
ENERGY	37
CAPTURE AND STORAGE OF CO2 (CCS)	38
EMISSION TRADING	39
TRANSPORT	39
AGRICULTURE	39
DITHMARSCHEN (COUNTY):	41
GREENHOUSE GASES	41
ENERGY	41
CAPTURE AND STORAGE OF CO2 (CCS)	41
EMISSION TRADING	41
TRANSPORT	41
AGRICULTURE	42
NORDFRIESLAND (COUNTY):	42

GREENHOUSE GASES	42
ENERGY	42
CAPTURE AND STORAGE OF CO2 (CCS)	43
EMISSION TRADING	43
TRANSPORT	43
AGRICULTURE	43
PINNEBERG (COUNTY):.....	43
STEINBURG (COUNTY):.....	43
GREENHOUSE GASES	43
ENERGY	43
CAPTURE AND STORAGE OF CO2 (CCS)	43
EMISSION TRADING	43
TRANSPORT	44
AGRICULTURE	44
BEST CASES GERMANY	44
DENMARK – NATIONAL LEVEL	51
GREENHOUSE GASES	51
ENERGY	51
CAPTURE AND STORAGE OF CO2 (CCS)	52
EMISSION TRADING SYSTEM.....	52
TRANSPORT	52
AGRICULTURE	52
REGION OF SOUTHERN DENMARK	52
GREENHOUSE GASES	52
ENERGY	53
CAPTURE AND STORAGE OF CO2 (CCS)	53
EMISSION TRADING	53
TRANSPORT	53
AGRICULTURE	53
VARDE MUNICIPALITY	53
GREENHOUSE GASES	53
ENERGY	54
CAPTURE AND STORAGE OF CO2 (CCS)	54
EMISSION TRADING	54
TRANSPORT	54
AGRICULTURE	55
ESBJERG MUNICIPALITY	55
GREENHOUSE GASES	55
ENERGY	55
CAPTURE AND STORAGE OF CO2 (CCS)	56
EMISSION TRADING	56
TRANSPORT	56
AGRICULTURE	56
FANØ MUNICIPALITY	56
GREENHOUSE GASES	56
ENERGY	56
CAPTURE AND STORAGE OF CO2 (CCS)	57

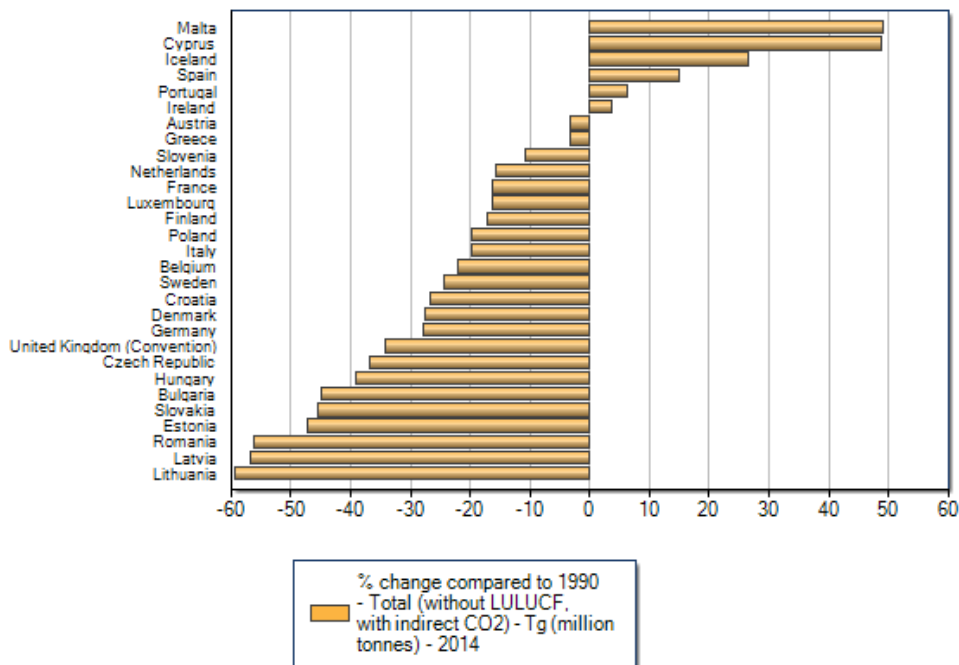
EMISSION TRADING	57
TRANSPORT	57
AGRICULTURE	57
TØNDER MUNICIPALITY	57
GREENHOUSE GASES	57
ENERGY	57
CAPTURE AND STORAGE OF CO ₂ (CCS)	58
EMISSION TRADING	58
TRANSPORT	58
AGRICULTURE	58
BEST CASES DENMARK	58
ANNEXES	59
ANNEX: CONTRIBUTIONS FROM SCHLESWIG-HOLSTEIN	59

Europe

Overview CO2 emissions Europe



Total GHG emissions in EU28 (EEA, 2017)



Change in emissions per country (EEA, 2017)

Greenhouse gases

In the international climate change agreement, the world has agreed to achieve a global balance between greenhouse gas emissions and capture and storage by the second half of the 21st century.

Goals		Policies
2020	20% less CO2 emissions compared to 1990 levels	Management plan Amongst others: 2020 Energy Strategy 2030 Energy Strategy The Energy Roadmap 2050 by the Commission in 2011.
2030	40% decrease in greenhouse gas emissions compared to 1990 To achieve this ETS sectors would have to cut emissions by 43% (compared to 2005), non-ETS sectors would need to cut emissions by 30% (compared to 2005).	
2040	60% decrease in greenhouse gas emissions	
2050	80-95% decrease in greenhouse gas emissions (climate-neutral), compared to 1990	
sources	https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2020-energy-strategy https://ec.europa.eu/clima/policies/strategies/2030_en http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0029	

Energy

Efficiency

Goals		Policies
Per year:	<ul style="list-style-type: none"> – an annual reduction of 1.5% in national energy sales – EU countries making energy efficient renovations to at least 3% of buildings owned and occupied by central governments per year – mandatory energy efficiency certificates accompanying the sale and rental of buildings – minimum energy efficiency standards and labelling for a variety of products such as boilers, household appliances, lighting and televisions (ecodesign) – the preparation of National Energy Efficiency Action Plans every three years by EU countries – large companies conducting energy audits at least every four years protecting the rights of consumers to receive easy and free access to data on real-time and historical energy consumption – the Commission has published guidelines on good practice in energy efficiency. 	Management- plan 2020 Energy Strategy 2030 Energy Strategy
2020	<ul style="list-style-type: none"> – 20% energy conservation (20/20/20) – new buildings are practically energy neutral (for government buildings already in 2018) – the planned rollout of close to 200 million smart meters for electricity and 45 million for gas by 2020 	
2030	<ul style="list-style-type: none"> – the energy efficiency should be improved by 27% relative to 1990. – Targets for buildings: A-label for energy 	
2050	– all houses should be energy-neutral	
sources	https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2020-energy-strategy https://ec.europa.eu/energy/en/topics/energy-efficiency	

Sustainable supply generation

Goals		Policies
2020	– 20% sustainable energy compared to 1990 levels.	Management- plan Revised Renewable energy Directive; 2030 Energy Strategy National renewable energy action plans
2030	– the share of renewable energy should be at least 27%	
sources	https://ec.europa.eu/energy/en/topics/renewable-energy https://ec.europa.eu/energy/en/topics/renewable-energy/biofuels https://ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive https://ec.europa.eu/energy/node/71	

Capture and storage of CO2 (CCS)

With CCS, CO₂ is stored for an unlimited period of time, and therefore does not contribute to climate change.

Pilots:

Work on capture is aimed at developing new CO₂ post-combustion separation processes suited to the problems of capture of CO₂ at low concentrations in large volumes of gases at low pressure. The processes will be tested in a pilot unit capable of treating from 1-2 tonnes of CO₂ per hour from real fumes. Pilot in Esbjerg power station, operated by Elsam in Denmark.

A second pilot is on storage in a depleted gas reservoir, deep 25000m in the North Sea, Netherlands, operated by Gaz de France, injection in 2004.

Goals		Policies
2030	CCS should contribute to the 40% decrease in greenhouse gas emissions compared to 1990 Expectation is that CCS can contribute for 15% of the emissions.	Management- plan CCS Directive
sources	https://ec.europa.eu/clima/policies/strategies/2030_en http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0029 https://ec.europa.eu/energy/en/topics/oil-gas-and-coal/carbon-capture-and-storage	

Emission trading

Goals		Policies
2020	From 2013 till 2020 the Commission wants to reduce per year the maximum number of allowances, with 1,74%. From 2021 on the Commission strives to decrease the total with 2,2% per year.	Management- plan EU ETS
2030	ETS would have to cut emissions by 43% (compared to 2005) to achieve the 40% target of less greenhouse gas emissions	
sources	https://ec.europa.eu/clima/policies/strategies/2030_en https://ec.europa.eu/clima/policies/ets_en	

Transport

Goals		Policies
2020	- EU countries are each required to have at least 10% of their transport fuels come from renewable sources by 2020.	Management- plan Horizon2020, EUR 6.4 billion is available for low-carbon mobility

	<ul style="list-style-type: none"> - Fuel suppliers are also required to reduce the greenhouse gas intensity of the EU fuel mix by 6% by 2020 in comparison to 2010. - the framework for an European information, management and payment system for multimodal transport, both passengers and goods, should be made - further integrating cycling into the multimodal transport policy - to reduce fuel consumption and hence CO₂ emissions by 50 % per passenger kilometre, to reduce NOx emissions by 80 % (in landing and take-off according to ICAO standards) and to reduce unburnt hydrocarbons and CO emissions by 50 %, alongside pursuing significant noise reductions 	<p>projects.</p> <p>Making transport smarter, greener and more sustainable</p> <p>Clean Sky" Joint Technology Initiative.</p> <p>European Advanced Biofuels Flightpath</p> <p>Declaration of cycling (2015)</p>
2030	<ul style="list-style-type: none"> - 50% less cars on conventional fuels, also in urban transport - freight transport in city centers should be mainly CO₂-free - 30% of road freight over distances of over 300 km shift to other modes of transport, such as rail and water. - a fully functional core network of transport should be created in the EU, offering an efficient switching between the modes (TEN-T core network). This should be developed into a high capacity network in 2050. 	
2050	<ul style="list-style-type: none"> - To lower deaths as well as health and environmental damage, 60% of transport emissions should be reduced by 2050. - The use of cars on conventional fuels in urban transport must be reduced completely - A shift of 50% of the medium passenger and freight traffic from road to rail and water. - all core network airports have to be connected to the railway network, as well as the ports. 	
sources	<p>https://europadecentraal.nl/onderwerp/vervoer/vervoer-en-milieu/vervoer-2050/</p> <p>https://ec.europa.eu/clima/policies/transport_en</p> <p>http://ec.europa.eu/research/transport/index.cfm?pg=policy&lib=goals</p> <p>http://ec.europa.eu/transport/modes/air/environment_en</p> <p>https://ec.europa.eu/energy/node/76</p> <p>http://www.eu2015lu.eu/en/actualites/communiqués/2015/10/07-info-transport-declaration-velo/07-Info-Transport-Declaration-of-Luxembourg-on-Cycling-as-a-climate-friendly-Transport-Mode---2015-10-06.pdf</p> <p>http://ec.europa.eu/transport/themes/urban/cycling_en</p>	

Aviation and shipping:

CO₂ emissions from aviation have been included in the EU emissions trading system (EU ETS) since 2012. Under the EU ETS, all airlines operating in Europe, European and non-European alike, are required to monitor, report and verify their emissions, and to surrender allowances against those emissions. They receive tradeable allowances covering a certain level of emissions from their flights per year.

Goals		Policies
2020	<ul style="list-style-type: none"> - the European Common Aviation Area must be completed - the air traffic control system in Europe should be fully modernized, shorter and safer travel and an increase in capacity. 	<p>Management- plan</p> <p>In EU ETS</p> <p>Aviation Strategy</p>

	- to get the aviation industry to use 2 million tonnes of biofuels by 2020 (European Advanced Biofuels Flightpath)	
2050	- 40% of sustainable low carbon fuels in aviation; - A reduction in the emissions of shipping with at least 40%;	
sources	https://europadecentraal.nl/onderwerp/vervoer/vervoer-en-milieu/vervoer-2050/ https://ec.europa.eu/clima/policies/transport/shipping_en https://ec.europa.eu/clima/policies/transport_en https://ec.europa.eu/clima/policies/transport/aviation_en http://ec.europa.eu/transport/modes/air/aviation-strategy_en	

Fuel

Goals		
2020	<ul style="list-style-type: none"> - limits the share of biofuels from crops grown on agricultural land that can be counted towards the 2020 renewable energy targets to 7% - harmonises the list of feedstocks for biofuels across the EU whose contribution would count double towards the 2020 target of 10% for renewable energy in transport - requires that biofuels produced in new installations emit at least 60% fewer greenhouse gases than fossil fuels - introduces stronger incentives for the use of renewable electricity in transport (by counting it more towards the 2020 target of 10% for renewable energy use in transport) 	Policies Management- plan Fuel Quality Directive
sources	https://ec.europa.eu/energy/en/topics/renewable-energy/biofuels/land-use-change	

Agriculture (peatland, greenhouses, livestock)

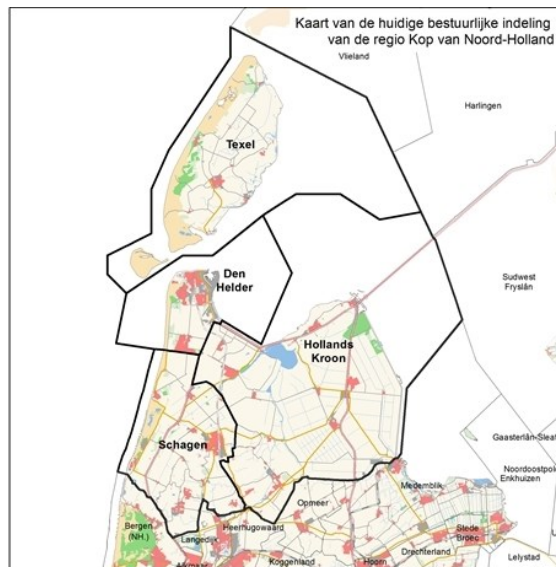
In the agricultural sector several greenhouse gases are released. The most important are CO₂, methane and nitrous oxide. The main sources of greenhouse gases in agriculture and horticulture are the livestock and greenhouse horticulture. In the field of agriculture, greenhouse gases are released using manure and fuels and by the conversion of peat. The Wadden Sea Region is agricultural land.

No-debt commitment for land use

The proposal requires each Member State to ensure that accounted CO₂ emissions from land use are entirely compensated by an equivalent removal of CO₂ from the atmosphere through action in the same sector. This commitment is referred to as the "no debit rule". In essence, if a Member State cuts down their forests (deforestation), it must compensate the resulting emissions by planting new forest (afforestation) or by improving the sustainable management of their existing forest, croplands and grasslands. http://europa.eu/rapid/press-release_MEMO-16-2496_en.htm

Goals		
2030	<ul style="list-style-type: none"> - all sectors, including land use and forestry, should contribute to the EU's target to reduce greenhouse gas emissions by at least 40% by 2030 compared to 1990 levels - agriculture together with other ETS sectors should contribute with at least 30% compared to 2005. 	Policies Management- plan -
sources	https://ec.europa.eu/clima/policies/forests/lulucf_en ; http://europa.eu/rapid/press-release_MEMO-16-2496_en.htm https://ec.europa.eu/energy/en/topics/renewable-energy/biofuels/land-use-change	

The Netherlands – National level



Greenhouse gases

No specific policies or goals are found in the Dutch national policy on greenhouse gases specific, except for fulfilling the EU goals.

Goals		Policies Management plan -
2020	20% less CO2 emissions compared to 1990 levels	
2030	40% greenhouse gas reduction in 2030	
2050	80-95% decrease in greenhouse gas emissions (climate-neutral), compared to 1990	
sources	https://www.government.nl/topics/climate-change/contents/eu-policy	

Energy

Efficiency

Goals		Policies Management plan National Energy Accord (NEA), Energy Agreement, Energy report
Per year	– an annual reduction of 1.5% in national energy sales – EU countries making energy efficient renovations to at least 3% of buildings owned and occupied by central governments per year	
2020	All new buildings need to be practically energy neutral	
2030	Target for buildings is the A-label for energy	
sources	https://www.rijksoverheid.nl/actueel/nieuws/2013/09/06/energieakkoord-schonere-energie-meer-banen	

Sustainable supply generation

Goals		Policies Management plan National Energy Accord (NEA), Energy Agreement, Energy report
2020	14% share of renewable energy (wind on land has to account for 6.000 MW)	
2023	16% share of renewable energy (wind on sea has to account for 4.450 MW)	
2050	Key issue is how to achieve a CO2 neutral energy supply system by 2050.	
sources	https://www.rijksoverheid.nl/actueel/nieuws/2013/09/06/energieakkoord-schonere-energie-meer-banen	

	meer-banen https://www.rijksoverheid.nl/onderwerpen/duurzame-energie/inhoud/meer-duurzame-energie-in-de-toekomst
--	--

Other policy:

Power plants

There will be no place for new coal-fired power plants in the transition and it is important for the electricity market to intensify the focus on the least polluting technologies. The cabinet will get together with the sector and other stakeholders to flesh out alternative plans for phasing out the coal-fired power plants.

Natural gas

As the least polluting fossil fuel, natural gas will continue to play an important role for a long time. The safe extraction of gas at socially acceptable costs will contribute to our energy independence. On 10 July 2015, the Dutch cabinet decided to place a five-year moratorium on the commercial exploration and extraction of shale gas. The use of natural gas will in any case be reduced as much as possible. We cannot rule out the shale gas option for the longer term.

Capture and storage of CO₂ (CCS)

Policy:

Since 2004 the Netherlands extracted CO₂ from gas, which is injected into the empty gas field. This way about 60,000 tonnes of CO₂ has been stored since 2004. The so-called K12-B project. The ROAD project (Rotterdams Opslag en Afvang Demonstratieproject) is a large-scale demonstration project in which CO₂ is captured from a coal plant on the Maasvlakte and stored under the seabed, about 20 kilometers from the coast.

Goals		Policies Management plan Energy agenda 2016
	<p>The Dutch government uses Capture and store CO₂ (CCS) in cases where there are no CO₂-poor alternatives available. The Cabinet aims at realizing the demonstration project storage and disposal of CO₂ at sea at Rotterdam (ROAD) as the first step towards a broader and large-scale CCS network.</p> <p>The Dutch government has so far no plans to store CO₂ under land.</p>	
sources	https://www.rijksoverheid.nl/onderwerpen/klimaatverandering/inhoud/co2-opslag https://www.milieucentraal.nl/klimaat-en-aarde/klimaatverandering/co2-afvangen-en-opslaan/	

Emission trading

Goals		Policies Management plan Energy agenda 2016
	<p>The Netherlands are restricted to reduce 36% compared to 2005 by the EU.</p> <p>The Netherlands is committed to strengthening the Emissions Trading System (ETS).</p>	
2021	<p>The ETS Directive is currently being revised. The Cabinet agrees with the revision to decrease the number of allowances from 2021 on with 2,2% per year.</p>	
2024	<p>In addition, the Netherlands proposes an increase in the number of rights withdrawn from the market in the market stability reserve, and also calls for the destruction of redundant rights from 2024 on. It is about destroying the number of rights in the market stability reserve insofar as this amount is greater than the number of rights auctioned</p>	

	in the previous year.	
sources	https://www.rijksoverheid.nl/documenten/rapporten/2016/12/07/ea	

Transport

Goals		Policies Management plan Renewable Fuels Long-term Plan <i>(duurzame brandstofvisie)</i> Agenda Cycling plan van aanpak 'Elektrisch Rijden in de Versnelling' Electric Vehicles Action Plan
No specific year	<p>The Netherlands is committed to the implementation of stricter CO₂-emissions requirements for road transport. Furthermore, the Netherlands is a proponent of stricter international requirements for shipping and aircraft emissions.</p> <p>The road will have to switch from fossil fuels to biofuels and fuel-efficient engines. The airline will have to switch to low-CO₂ fuels and will have to fly more efficiently. In addition, the government continues to vigorously promote energy conservation by industry. Production processes have to change so that less CO₂ is emitted.</p> <p>With the rise of the electric bicycle, the bicycle becomes an attractive alternative for many people for medium distances. In addition, the government elects for the spatial integration of good and safe (long-range) bicycle connections and an additional impetus of bicycle parking facilities in cities to stimulate use.</p> <p>Electricity transport plays an important role in government policy to reduce CO₂ emissions from the transport sector and improve air quality. Promoting electric mobility could lead to approximately 200,000 electric cars on the road by 2020, and a mature market of around 1 million cars by 2025.</p>	
2025	<ul style="list-style-type: none"> - Public transport buses are using renewable energy or biofuel - More safe cycle routes - Additional impulse for bicycle parking in cities 	
2035	<ul style="list-style-type: none"> - Only sustainable cars are for sale in the Netherlands - Railway sector completely on green electricity 	
2050	<ul style="list-style-type: none"> - Reduce transport emissions to at least 60% of the emissions of 1990. 	
sources	Renewable Fuels Long-term Plan (<i>duurzame brandstofvisie</i>) http://www.rvo.nl/onderwerpen/duurzaam-ondernemen/energie-en-milieu-innovaties/elektrisch-rijden http://www.rvo.nl/onderwerpen/duurzaam-ondernemen/energie-en-milieu-innovaties/elektrisch-rijden/stand-van-zaken/cijfers	

Agriculture (peatland, greenhouses, livestock)

Agriculture and horticulture are responsible for 10% to 15% of greenhouse gas emissions in the Netherlands. Glasshouse horticulture emits the most carbon dioxide. Livestock and crop farming are major sources of methane and nitrous oxide. Measures to lower emissions from agriculture and horticulture include:

- the innovation programme for climate-neutral greenhouses;
- encouraging livestock farmers to use sustainable animal feed, and use fertiliser as efficiently as possible;

- generating biogas from manure.

<https://www.government.nl/topics/climate-change/contents/national-measures>

Goals		Policies
	- Agreements are made in the Covenant clean and economical agro sectors (2007) to save about 14 million kilometres of road transport for agrology.	Management plan Agroconvenant report SER-akkoord Convenant Schone en Zuinige Agrosectoren Meerjarenaafpraak Energietransitie Glastuinbouw 2014-2020
Each year	- 2% energy saving per year.	
2020	- 30% less emissions compared to 1990 - The agro sector wants to deliver 1/3 of the goal of 20% sustainable energy - circa 12 PJ of sustainable energy through wind turbines - 200 PJ energy from biomass	
sources	https://www.agriholland.nl/dossiers/klimaatverandering/home.html http://www.rvo.nl/sites/default/files/2016/12/RVO_De%20Nederlandse%20landbouw%20en%20het%20klimaat_Broch_def.pdf	

Peatland Area

Not included.

Greenhouses

Goals		Policies
2020	- 2 Mton less CO2 emissions compared to 1990 (45%) - 20% of the own energy use needs to be generated sustainable (CA 25 PJ) - 25% of the greenhouses needs to be semi-closed. - New greenhouses will be build energy neutral. - Sector delivers energy and heat. - The greenhouse horticulture sector will emit a maximum of 6.2 Mton CO2 in 2020, including the CO2 emission of electricity supply;	Management plan Agroconvenant report Greenhouse as a source of energy Meerjarenaafpraak Energietransitie Glastuinbouw 2014-2017
2050	By 2050 the greenhouse horticulture sector has a fully sustainable and economically viable energy supply	
sources	http://www.rvo.nl/sites/default/files/bijlagen/Convenant%20Schone%20en%20Zuinige%20Agrosectoren%20Agroconvenant.pdf https://www.kasalsenergiebron.nl/onderzoeken/e15009_energiemonitor_glastuinbouw_2014_2017/ https://www.kasalsenergiebron.nl/over-ons/kas-als-energiebron/#meerjarenaafpraak	

Livestock*

Goals		Policies
2020	- There are about 400 Mostfermenters in the Netherlands, which together produce 1,500 millions of m3 of biogas. - The emission caused by direct energy use (gas, oil and electricity) in the sector is through sectoral developments and energy efficiency improvements by 2020 reduced by about 60% compared with 1990. - The dairy farm sector aims at reducing at least 5%	Management plan Convenant clean and economical agro sectors (2007). *for more goals specific per sector, for example dairy cattle, see the covenant.

	methane emissions per milk cow in 2020 compared to 2007 through ration optimization which takes into account the emission of methane and by using specific feed additives.	
sources	http://www.rvo.nl/sites/default/files/2014/05/energie-en-klimaat-in-de-agrosectoren.pdf http://www.rvo.nl/sites/default/files/bijlagen/Convenant%20Schone%20en%20Zuinige%20Agrosectoren%20Agroconvenant.pdf	

Province of Noord-Holland, 'Kop van Noord-Holland'

The province of Noord-Holland on itself is not in total part of the Wadden Sea Region, only a part of the province 'de kop Noord-Holland' is. However, a short overview of the provincial policy is given since this is relevant for the Kop van Noord-Holland as well.

Greenhouse gases

No explicit goals, policies and management plans².

Energy

Goals		Policies
2020	<ul style="list-style-type: none"> - Building energy neutral - For 2021 the province has the goal to have clear what the savings potential is per company in the province. - 685,5 MW Wind energy 	Management plan Coalition agreement 2015 – 2019 Policy agenda Energy Transition 2016-2020 Action plan Sustainability North of Noord-Holland.
2040	- include 500,000 homes to a heating network	
2050	- The province of Noord-Holland wants to be fully energy neutral in 2050.	
sources	https://www.noord-holland.nl/Onderwerpen/Duurzaamheid_Milieu/Duurzame_energie https://www.noord-holland.nl/Configuratie/Publicaties/Publicaties/Coalitieakkoord_2015_2019	

Capture and storage of CO2 (CCS)

The province takes part in a process of CO2 Smart Grid, in which CO2 is stored in empty gas fields in the sea.

Emission trading

No provincial policy.

Transport

No explicit goals, policies and management plans.

Agriculture

No explicit goals, policies and management plans.

Peatland Area*

Goals		Policies
2040	to reduce peat degradation and a substantial reduction of the associated problems, and to develop where possible local peat.	Management plan Water vision.
sources	-	

² No specific policies or goals except for fulfilling the EU goals.

*The peatland areas are limited in the Kop Noord-Holland, and therefore not relevant for this inventory.

Greenhouses

The province signed a Green Deal CO2 in which residual CO2 is used for greenhouse horticulture. The greenhouse horticulture can make a significant contribution to reducing emissions but needs CO2 if we want to switch to non-fossil fuels. Particularly with the preservation and modernization of greenhouse horticulture are great successes. The province therefore has a concentration policy on greenhouse horticulture because there are great collective sustainable benefits.

Goals		Policies
2050	Fossil free greenhouses.	Management plan Coalition agreement 2015 – 2019 Policy agenda Energy Transition 2016-2020
sources	https://www.noord-holland.nl/Configuratie/Publicaties/Publicaties/Coalitieakkoord_2015_2019	

Livestock

No explicit goals, policies and management plans.

Province of Friesland

Greenhouse gases

No explicit goals, policies and management plans.

Energy

Goals		Policies Management plan Coalition agreement 2015 – 2019 Implementation agenda sustainable energy
	Each Frisian gets the opportunity to participate individually or in a wider context in the generation of sustainable energy.	
2020	<ul style="list-style-type: none"> - 16% of the energy in Friesland must be sustainably generated - 20% energy savings by 2020 compared to 2010. - 4.000 energy-related jobs - 530,5 MW (4,2 PJ) wind energy - 0.29 PJ geothermal energy - 1.24 PJ Residual heat - 1.43 PJ biomass - Solar energy 500 MW (1,51 PJ). 	
2025	<ul style="list-style-type: none"> - 25% sustainable energy generation - provincial organization self-sufficient in energy (buildings, grounds, cars). - Solar energy 1.300 MW (= 3,87 PJ). 	
2050	- A fossil-free and sustainable society	
sources	https://www.fryslan.frl/bestuur/coalitieakkoord_3244/	

Capture and storage of CO2 (CCS)

The province of Friesland will not store CO2 or extract shale gas.

Emission trading

No provincial policy.

Transport

Goals		Policies
	<ul style="list-style-type: none"> - To achieve more sustainable transport - The grantor of transport requires the concessionaire for instance to use environmentally friendly vehicles - Within the infrastructure the province has started to look at CO2 emissions from road maintenance, and the use of roads by cars and trucks. The data is not known yet. - Cycling and walking paths will be improved 	Management plan Coalition agreement 2015 – 2019 Implementation agenda sustainable energy
sources	https://www.fryslan.frl/bestuur/coalitieakkoord_3244/	

Agriculture

Goals		Policies
	Companies consuming more than 50,000 kWh are required to make adjustments in their energy consumption.	Management plan Year plan 2017
2020	<ul style="list-style-type: none"> - 20% less energy consumption compared to 2010. - 150MW of power is located on the roofs of agricultural companies - 20 energy neutral example farms 	
sources	https://www.fryslan.frl/bestuur/coalitieakkoord_3244/	

Peatland area

Goals		Policies
	Slow down the disappearance of the peat	Management plan Peatland area vision' (Veenweide visie, result 28).
sources	Peatland area vision' (Veenweide visie, result 28).	

*The Frisian peat meadow area is about 85,000 hectares, with a combination of grasslands, lakes, natural areas and buildings. The peatland area is spread over several Frisian municipalities. If the current agricultural land use and water management in the Frisian peat meadow areas will be continued there will be no more peat in 100 years.

Greenhouses

No explicit goals, policies and management plans.

Livestock

No explicit goals, policies and management plans.

Province of Groningen

Greenhouse gases

No explicit goals, policies and management plans.

Energy

Goals		Policies
	- 1.5% energy saving per year.	Management plan

	- The use of biomass in a circular bio based economy is supported.	Coalition agreement 2015 – 2019
2020	- 21% sustainable energy - 855,5 MW Wind energy	
2035	- 60% sustainable energy - provincial property energy neutral	
2050	- 100% sustainable energy	
sources	https://www.provinciegroningen.nl/gs/over-gedeputeerde-staten/collegeprogramma-2015-2019/	

Powerplants/shale gas/nuclear waste

The ambition of the province is no nuclear power plants or new coal plants. Regarding the existing coal plan a lasting solution is being sought. We do not allow the extraction of shale gas from our soil, and the storage of nuclear waste.

Natural gas Groningen

The province uses its influence to ensure that gas production takes place at a responsible and safe level. The Dutch government is responsible for safe gas extraction.

We are committed to minimize/resolve the effects of earthquakes as much as possible. A key measure is the appointment of the National Coordinator Groningen, this enables public control.

Capture and storage of CO₂ (CCS)

The province of Groningen is against the storage or disposal of CO₂ in empty gas fields as long as safety cannot be guaranteed.

Emission trading

No provincial policy.

Transport

Goals		Policies Management plan
	The province of Groningen encourages sustainable forms of transport and traffic, such as energy-efficient cars, public transport and cycling. Also the use of alternative fuels as hydrogen is stimulated.	
sources		

Agriculture (peatland, greenhouses, livestock)

Groningen is an agricultural province. About 80% of the land area is agricultural land.

The province wants to transform the sector to a more sustainable sector.

Greenhouses

There is no need for new facilities for greenhouses.

Peatland Area

Goals		Policies Management plan
	The province of Groningen wishes to avoid further oxidation of peat. The challenge is to present the existing peat areas as innovative agriculture with a sustainable energy, water and environmental management towards a bio based economy.	
sources		

Livestock

Goals		Policies
2019	From 2019 onwards we will no longer accept expansion of existing intensive farming. The ban on new establishments will be maintained.	Management plan -
sources		

Best Cases Netherlands

This overview gives some examples of local dutch governments with high aims on CO2 reduction.

1. Dutch Wadden Sea Islands (municipalities)

The 5 Wadden Sea Islands in the Netherlands (Texel, Vlieland, Terschelling, Ameland and Schiermonnikoog) work together in a collaboration called the Wadden Sea Islands (samenwerkingsverband De Waddeneilanden). Already in 2007 the Dutch Islands announced a concept to become independent by 2020 in energy and water, inspired by the success of the Danish island of Samsø.

Policy document: Uitvoeringsprogramma Duurzame Waddeneilanden 2015 - 2018

<http://labvlieland.nl/files/2015-04/duurzame-waddeneilanden-03-02-15-los.pdf>

<http://www.waddenzee.nl/themas/duurzame-wadden/projecten-duurzame-energie/duurzame-waddeneilanden/>

2. ANNO Municipalities

The Frisian municipalities Dongeradeel, Dantumadiel, Ferweradiel, Kollumerland, Achtkarspelen and Tytsjerksteradiel have together the ambition to achieve in 2025 40% of renewable energy.

Policy document: Energy transition ANNO. Uitvoeringsprogramma 2017 - 2020

http://www.knnadvies.nl/portfolio/projecten_van_knn_advies/duurzame_energietransitie_binnen_de_annogemeenten/

3. Municipality of Groningen

The municipality of Groningen aims to be energy neutral in 2035.

Policy document: Groningen Energy 2015-2018, Masterplan Groningen Energy neutral 2035

<https://gemeente.groningen.nl/groningen-geeft-energie>

4. Kop Noord-Holland:

The Kop of Noord-Holland has an own sustainability action plan. Main goals are the development of a circular economy and being energy neutral in 2040. To achieve this, action will be on: circularity, building of energy neutral new homes, heat and sun as a renewable energy source. From 2017 on the aim is to build energy-neutral new homes, and in 2018 new housing estates without gas works. The area Noord-Holland Noord has distinctive potential in the area of biomass (gasification), seaweed/ biomass cultivation and tidal energy off grid test center.

Policy document: Actieplan Duurzaamheid Noord-Holland Noord

Germany – National level



Greenhouse gases

Aims		Policies
2020	cutting greenhouse gas emissions by 40 percent by 2020 compared to 1990	Management plan German Climate Action Programme 2020, valid since 3 December 2014; National Action Plan on Energy Efficiency (NAPE) Launched 3 December 2014; German Climate Action Plan 2050, Valid since 14 November 2016
2030	Germany's total greenhouse gas emissions need to be reduced by at least 55 percent compared to 1990 by 2030 at the latest	
2050	80-95% decrease (climate-neutral), compared to 1990	
sources	The German Government's Climate Action Programme 2020 http://www.bmub.bund.de/en/topics/climate-energy/climate/national-climate-policy/climate-action-programme/ Climate Action Plan 2050 http://www.bmub.bund.de/en/topics/climate-energy/climate/details-climate/artikel/climate-action-plan-2050/ The German Government's Climate Action Programme 2020 http://www.bmub.bund.de/fileadmin/Daten_BMU/Pool/Broschueren/aktionsprogramm_klimaschutz_2020_broschuere_en_bf.pdf Climate action needs your initiative' Germany makes it efficient National Action Plan on Energy Efficiency National Action Plan on Energy Efficiency (NAPE): making more out of energy	

Best Practice Example of "Reduction GHG":

Brief description of the project

**The German government's climate protection policy
National Climate Initiative**

At national level the Federal Environment Ministry supports effective climate protection measures through various programmes and projects for municipalities, companies, consumers and educational facilities. The National Climate Initiative's programmes promote

- climate protection in municipalities, and in social and cultural institutions
- exemplary climate protection projects in municipalities
- municipalities which focus their climate protection strategies to complete decarbonisation by the year 2050 or even earlier (masterplan 100% Klimaschutz)
- innovative projects for companies and in the consumer, education and municipal sector
- highly efficient small combined heat and power systems (mini CHP systems) and
- energy-efficient cooling and air-conditioning applications, presumably with natural refrigerants.

Since 2008, the Federal Ministry for the Environment has contributed through the NKI to the fact that climate protection is visible on the ground: innovative approaches and concepts are developed and actively implemented in cooperation with citizens as well as actors from society, business and science. For example, around 25,000 projects with over 765 million euros have been funded since 2008, resulting in investments of more than 1.5 billion euros. The NKI thus makes an important contribution to climate protection in Germany.

The German government has adopted a National Action Plan on Energy Efficiency (NAPE), a comprehensive package of measures designed to improve the country's energy performance that is being put in place during this parliament.

Alongside renewables development, improving energy efficiency is also crucial in order to make the energy transition a success. This applies to private households just as much to industrial companies and local authorities. The German Government has in fact set out clear energy efficiency targets. By 2020, Germany is to cut its primary energy consumption by 20% compared to 2008. During the same period, greenhouse gas emissions are to be cut by 40% compared to 1990.

Energy

Aims		Policies
2020	Numerous other measures also aim to achieve additional emission reductions of 25 to 30 million tonnes CO ₂ equivalent compared to 1990 as a result of increased energy efficiency (cutting greenhouse gas emissions by 40 percent by 2020 compared to 1990)	Management plan German Climate Action Programme 2020, valid since 3 December 2014; Renewable Energy Act (EEG) "Erneuerbare-Energien-Gesetz vom 21. Juli 2014 (BGBl. I S. 1066), das zuletzt durch Artikel 2 des Gesetzes vom 22. Dezember 2016 (BGBl. I S. 3106) geändert worden ist" Energieeinsparverordnung (EnEV) (vom 24. Juli 2007
2030	(Germany's total greenhouse gas emissions need to be reduced by at least 55 percent compared to 1990 by 2030 at the latest).	
2050	By 2050, power generation in Germany needs to be almost carbon-free in order to reach the national and European climate targets.	

	(80-95% decrease (climate-neutral), compared to 1990)	(BGBl. I S. 1519), die zuletzt durch Artikel 1 der Verordnung vom 18. November 2013 (BGBl. I S. 3951) geändert) Green Paper on Energy Efficiency Energy Efficiency Strategy for Buildings German Climate Action Plan 2050, Valid since 14 Nov 2016
sources	Energieeinsparverordnung (EnEV)	

Best Practice Example of "Energy efficiency" or "Sustainable Energy supply":

Brief description of the project

<p>The latest amendment to the German Energy Saving Ordinance (EnEV), which entered into force on 1 May 2014, includes an increase in the new building requirements, which became effective on 1 January 2016. The annual primary energy demand for new buildings is reduced by an average of 25 percent And the value for the minimum heat insulation of the building envelope is reduced by an average of 20 percent. Building-standards will be enhanced aiming at virtually climate neutrality.</p> <p>The Energy Efficiency Strategy in Buildings explores ways of achieving a virtually climate-neutral building stock by 2050 and covers both existing and new buildings. The Climate-Friendly Building and Housing Strategy will take into account the findings of the Energy Efficiency Strategy in Buildings and the Alliance for affordable Housing and Building.</p>
--

Further comments:

The German government will introduce a competitive tendering model for energy efficiency, promote contracting, further develop existing energy efficiency programmes and initiate energy efficiency networks.

Capture and storage of CO2 (CCS)

On the 24th August 2012 the 'act on the demonstration and application of technologies for the capture, transport and permanent storage of carbon dioxide (CO2)' entered into force, cited as: "Kohlendioxid-Speicherungsgesetz vom 17. August 2012 (BGBl. I S. 1726), das durch Artikel 116 der Verordnung vom 31. August 2015 (BGBl. I S. 1474) geändert worden ist".

With this act the German government has decided on a step-by-step process in regard to CCS. In the area of CO2 storage the act initially only regulates testing and demonstration. Broad public participation is required for the licensing of demonstration storage facilities. Till the end of 2016 there was none application for licensing.

By doing this the German government ensures that the special features of this new technology and public concerns are given due consideration. A decision on a large-scale introduction of CCS will only be taken once there is sufficient proof of storage safety. The act will be thoroughly evaluated in 2017. To this end, the Government will prepare a report for the German Bundestag. The CCS process will only continue if the findings are positive.

Aims		Policies
2020	step-by-step process (see above)	Management plan Act on the demonstration and application of technologies for the capture, transport and permanent storage of carbon dioxide (CO2)
sources	Press Release: Cabinet adopts CCS act	

CCS-Act: <http://www.gesetze-im-internet.de/bundesrecht/kspg/gesamt.pdf>

Emission trading

Aims		Policies
2020	It depends on decisions at EU level on structure	Management plan German Climate Action Programme 2020. valid since 3 December 2014
sources	Press Release: Cabinet adopts CCS act: http://www.bmub.bund.de/en/pressrelease/cabinet-adopts-ccs-act/ CCS-Act: http://www.gesetze-im-internet.de/bundesrecht/kspg/gesamt.pdf	

Further comments:

Germany strives a reform of the emissions trading scheme. It is a question of safeguarding the central role of emissions trading as a harmonised European climate policy instrument and creating effective incentives to reduce emissions. In the short term, current excess allowances need to be reduced quickly and effectively. And in the long term, emissions trading must make a key contribution to reaching the EU's target of at least a 40 percent reduction by 2030 compared with 1990.

Transport

Aims		Policies
2020	to save around 10 percent of final energy consumption in transport by 2020 compared to 1990	Management plan German Climate Action Programme 2020, valid since 3 December 2014 Electric Mobility Act, entered into force on 12 June 2015 German Climate Action Plan 2050, Valid since 14 November 2016; German Climate Action Programme 2020, valid since 3 December 2014
2030	42-40 % decrease, compared to 1990	
2050	to save around 40 percent of final energy consumption in transport by 2050 (reference year 2005)	
sources	Improved funding of electric vehicles, https://www.bundesregierung.de/Content/DE/Infodienst/2016/05/2016-05-18-elektromobilitaet1/2016-05-18-elektromobilitaet.html Governmental Programme Electric Mobility – Implemented Measures; http://www.bmub.bund.de/themen/luft-laerm-verkehr/verkehr/luft-verkehr-download/artikel/regierungsprogramm-elektromobilitaet/?tx_ttnews%5BbackPid%5D=710 Renewably mobile - Marketable solutions for climate-friendly electric mobility; http://www.bmub.bund.de/fileadmin/Daten_BMU/Pool/Broschueren/erneuerbar_mobil_2014_broschuere_en_bf.pdf The German National Platform for Electric Mobility; http://nationale-plattform-elektromobilitaet.de/en/the-npe/publications/ The new Electric Mobility Act, http://www.bmub.bund.de/en/topics/air-mobility-noise/mobility/electric-mobility/	

Further comments:

The planned measures in the transport sector aim to contribute around 7 to 10 million tonnes CO₂ equivalent to closing the climate mitigation gap. With these measures, the German government is also pursuing the goals for the transport sector contained in the Energy Concept

The Federal Government promotes electric mobility in Germany by around one billion euros. These include an environmental bonus for electric vehicles, the development of the necessary charging infrastructure for electrically operated vehicles, and the promotion of tax.

Agriculture (peatland, greenhouses, livestock)

Aims		Policies
	In the agriculture sector, the German government plans to amend the Fertiliser Application Ordinance (Düngeverordnung) and increase the share of organic farming	Management plan German Climate Action Programme 2020, valid since 3 December 2014 German Climate Action Plan 2050, Valid since 14 November 2016
2020	According to the Federal Government 's projection report, the emissions in By 2020 to 72 million tonnes of CO ₂ eq	
2030	34–31 % decrease, compared to 1990	
sources	Agriculture and Climate Protection	

Further comments:

In the agriculture sector, the German government plans to amend the Fertiliser Application Ordinance (Düngeverordnung) and increase the share of organic farming.

http://www.bmel.de/DE/Landwirtschaft/Nachhaltige-Landnutzung/Klimawandel/_Texte/LandwirtschaftUndKlimaschutz.html;jsessionid=5B67BAF26DF944090FD92224292D19E8.1_cid385?nn=310028

Province of Lower Saxony and Bremerhaven

Greenhouse gases

Goals		Policies
2030	<ul style="list-style-type: none"> – Reduction of greenhouse gases by min. 50% versus 1990 – For the area of the regional administration: Reduction of CO₂ emissions by 70% versus 1990 	Management plan <ul style="list-style-type: none"> – Model of a sustainable energy and climate protection policy (August 2016); – Climate law in preparation, there is a legal draft by the regional government (currently in parliamentary deliberation) Not legislated to date; The integrated energy and climate protection programme (IEKN) integrated in the draft bill shall include implementation measures. That is currently being developed in the Ministry of Environment.
2050	<ul style="list-style-type: none"> – Min. 80-95% lower CO₂-equivalent versus 1990 – Climate-neutral regional administration as far as possible 	
Sources	<ul style="list-style-type: none"> - Model of a sustainable energy and climate protection policy - Draft of Lower Saxony's bill on promoting climate protection and adapting to the effects of 	

climate change (Lower Saxony's Climate Law - Nds. KlimaG)

Energy

Goals		Policies
2050	<ul style="list-style-type: none"> - Proportion of renewable energy to the energy supply: nearly 100% - Installed output wind energy (onshore): min. 20 GW - Near exhaustion of the existing potential for energy efficiency and energy saving 	<p>Management plan</p> <ul style="list-style-type: none"> - Model of a sustainable energy and climate protection policy (August 2016); - Wind energy order: February 2016 <p>The integrated energy and climate protection programme (IEKN) integrated in the draft bill shall include implementation measures. That is currently being developed by the Ministry of Environment.</p>
Sources	<ul style="list-style-type: none"> - Wind energy order Lower Saxony - Model of a sustainable energy and climate protection policy 	

Capture and storage of CO2 (CCS)

In Lower Saxony, the permanent subterranean storage of carbon dioxide was precluded by the Lower Saxony's carbon dioxide storage law (NKSpG) on 14 July 2015.

Emission trading

No explicit goals, policies and management plans.

Transport

No explicit goals, policies and management plans.

Agriculture

Goals		Policies
no time specification	<ul style="list-style-type: none"> - Reduction of the greenhouse gas emissions from moor soils and further high-carbon soils as well as preservation of peat as a carbon stores. - Restoration of the natural reduction function of the moorlands for carbon as much as possible. 	<p>Management plan</p> <p>Lower Saxony's moor landscapes: Programme for the protection and development of the Lower Saxony's moorland (June 2016)</p>
Sources	Programme Lower Saxony's moor landscapes	

Lower Saxony and Bremerhaven – Local Level

Leer county:

Greenhouse gases

No explicit goals, policies and management plans.

Energy

No explicit goals, policies and management plans.

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

Goals		Policies
2020	<ul style="list-style-type: none"> – Changeover of the entire vehicle fleet of the district administration Leer to e-mobility (approx. 60 vehicles) – Expansion of the infrastructure for the purpose of e-mobility at a minimum 17 new locations. 	Management plan To date, no guideline/model has been determined for the implementation. Until now, no transport development plan has been concluded by the highest municipal decision-making body.
Sources		

Agriculture

No explicit goals, policies and management plans.

Emden (city):

Greenhouse gases

Goals		Policies
2020	Old goal of the climate protection concept of the City Emden: Substantial CO2 reduction by 2020 (cf. goals of the climate alliance)	Management plan Currently, the 'Master plan 100% climate protection' is being prepared. 24.03.2011: Resolution of the 'old' climate protection concept 09.07.2015: Decision to participate in the BMUB programme master plan 100% climate protection. Since 2012, the position of a climate protection and/or master plan manager has been included in the budget.
2030	Old goal as per climate protection concept of the City Emden: Halve the CO2 emission versus 1990 by 2030 (cf. goals of the climate alliance)	
2050	<u>New goals as per master plan 100% climate protection:</u> GHG reduction by 95% by 2050	
Sources	Beschlussvorlage_KSM_Zustimmung Endbericht Beschlussvorlage-15_2015-06-30klimaschutzkonzept_gesamt_endversion	

Energy

Goals	Policies
-------	----------

2050	New goals as per master plan 100% final power reduction by 50% by 2050	Management plan cf. information on greenhouse gases.
Sources	cf. information on greenhouse gases.	

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

In the course of developing the master plan, sub-goals and sectoral goals will also be developed for climate-friendly mobility. However, until now, there are no useable/publishable results from the work process.

Agriculture

No explicit goals, policies and management plans.

Aurich county:

Greenhouse gases

No explicit goals, policies and management plans.

Energy

No explicit goals, policies and management plans.

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

No explicit goals, policies and management plans.

Agriculture

No explicit goals, policies and management plans.

Wittmund county:

Greenhouse gases

Goals		Policies
2030	CO2 neutrality is seen as the orientation value.	Management plan climate protection goal 2012: 'By exhausting the energy potentials on site, climate neutrality will be reached on the balance-sheet

		around 2025 in the areas of energy, heat and mobility.’ In 2013, an integrated climate protection concept was concluded by the highest municipal decision-making body.
Sources	ISKS Wittmund County - page 36, 80	

Energy

Goals		Policies Management plan No guideline/directive has been determined for the implementation.
2030	<u>Power savings</u> Renovation rate residential- and non-residential buildings: 1.0% Energy savings residential- and non-residential buildings: -0.8% Replacement oil boilers: 2.5% Replacement gas boilers: 2.5% Replacement heat pumps (oil): 2.0% Replacement heat pumps (gas): 5.0% Expansion solid fuel boilers: 10.0% <u>Renewable energies</u> Expansion solar thermal energy: 10.0% Expansion rate PV: 10.0% Biomass systems heat: 44 GWh/a Power: 37 GWh/a Wind farms: 420 GWh/a	
Sources	ISKS Wittmund County - page 76,77	

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

No explicit goals, policies and management plans.

However, a traffic development plan (TDP) shall be developed (source: *ISKS Wittmund County - page 137*).

Agriculture

No explicit goals, policies and management plans.

Friesland County: Greenhouse gases

Goals		Policies Management plan In 2010, the 1. integrated
2020	Update the climate protection concept and prepare the carbon footprint for the district’s own properties: considered	

	topics include traffic, properties, procurement...	climate protection concept was concluded. Harnessing grassland as CO2 reservoirs - general settlement developments considered for this: internal before external development, post densification of settlement sites, less claiming of new areas and less surface sealing. In 2010, the implementation of the 1. integrated climate protection concept was concluded; an update in 2017 was decided in the country committee. Personnel and financial resources are available for the implementation: 1 position for climate protection management was created (open-ended, no subsidies)
Sources	Climate protection concept 2010 county Fri	

Energy

Goals		Policies
2020	2020: further expansion of the EE: Repowering wind energy and regional control through priority areas wind energy (concentration effect, 'no disfigurement of the landscape')	Management plan An implementation directive was concluded, effective from Feb. 2017, implemented in the next 6-8 years. Since 2016, the Friesland county has been part of the research project 'enera' (cf. Best Practice example no. 4) County decision on a master plan school expansion and energy refurbishment is available, the project is coordinated by the building management and planning. RROP-Neuaufstellung, KT-Beschluss 2014 (county decision 2014) Municipality Sande: General optimisation of the energy consumption as well as energy refurbishment of city hall (without a resolution)
	2024: Master plan school expansion energy rehabilitation, modernisation and expansion of the county's own properties	
	2027: line planning, securing lines and high-power lines in the 380kV field for the onward transport of offshore wind energy, RROP 2017, (O)-NEP 2025	
Sources	Master plan school expansion, draft and grant confirmation Enea	

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

Goals		Policies
Until 2020	2017/2018: Improvement of the bicycle path infrastructure 2018: Expansion of 20 further e-charging stations in the county 2018: New local transport plan county FRI, focus on public transport/railway systems Municipality Sande: Changeover of the vehicle fleet for the administration to e-vehicles	Management plan Yes, the master plan 'District roads (roads and bicycle paths) from 2017 - 2022'; All goals valid since Feb. 2017. In 2017, a TDP for the implementation was concluded by the highest municipal decision-making body. ISEK city Shortens is in development.
Sources	'District roads (roads and bicycle paths) from 2017 - 2022'; (Kreisstraßen (Fahrbahnen und Radwege)	

Agriculture

No explicit goals, policies and management plans.

Wilhelmshaven (city):

Greenhouse gases

Goals		Policies
2020	Wilhelmshaven has been a member of the Climate Alliance since 2006. Member municipalities are required to, i.a.: <ul style="list-style-type: none"> – reduce CO₂ emissions by 10% every five years – halve the per capita emissions by the latest 2030 compared to 1990 – reduce the emissions to 2.5 tonnes CO₂ equivalent per inhabitant and year 	Management plan No, a political decision is still pending. In 2014, a climate protection concept for the implementation was concluded by the highest municipal decision-making body. Personnel and financial resources are available for the implementation.
2030	50 % halve the per capita CO ₂ emissions compared to 1990 by the latest 2030	
2050		
Sources	Integrated power and climate protection concept Wilhelmshaven: http://www.wilhelmshaven.de/umwelt_energie/19015.htm	

Energy

No explicit goals, policies and management plans.

Capture and storage of CO₂ (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

In 2015, a TDP for the implementation was concluded by the highest municipal decision-making body. It cannot be viewed online, however.

Agriculture

No explicit goals, policies and management plans.

Wesermarsch county:

Greenhouse gases

Goals		Policies
2030	Reduction of the greenhouse gases by 50% by 2030 compared to the base year 2011	Management plan A model is included in the Integrated Climate Protection Concept (ICP). Concluded in the county council of the Wesermarsch county on 15.12.2014. 2014: Integrated climate protection concept regional forum Bremerhaven (Cooperation between county Wesermarsch, county Cuxhaven, city Bremerhaven)
Sources	Regional forum Bremerhaven - final report;	

Energy

Goals		Policies
2030	Complete coverage of the power demand to be reached through renewable energies (guidelines from the ICP)	Management plan 2010 County council decision to participate in the European Energy Award ® (eea) Measures in the ICP, among others: janitor trainings, energy refurbishment of the own properties classes on energy saving in schools and day-care centres (Kita) Set up energy saving networks
Sources		

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

Goals		Policies Management plan
	<p><i>Declaration of intent in the ICP:</i> <i>the region supports the traffic sector in its efforts to contribute to a reduction of greenhouse emissions by using alternative,</i> climate-friendly fuels underscored by measures in the ICP To improve the bicycle path infrastructure; The county moderates a process to find sites for e-charging stations; The county has replaced a car of its vehicle fleet with an e-car</p>	
Sources		

Agriculture

Goals		Policies Management plan
-	<p>Declaration of intent in the ICP, underscored by measures to preserve and protect CO2 reductions. The current update of the Landscape Framework Plan (LFP, expert opinions, not legally binding) contains designated priority areas for moors with the goal of preserving these. Current update of the Regional Planning Programme (RPP), currently, no statement can be made on the treatment of moor areas.</p>	
Sources		Landscape framework plan of the Wesermarsch county – Update 2016/2017

Bremerhaven (city): Greenhouse gases

Goals		Policies Management plan
2020		<p>The model 'Climate Concept Regional Forum Bremerhaven' was developed in the course of a participation process and is part of the 'Integrated Climate Protection Concept Regional Forum Bremerhaven' Model Production of the 'Integrated Climate Protection Concept Regional Forum Bremerhaven' for 23 cities and municipalities of the Unterweser region as well as the two counties Cuxhaven and Wesermarsch. The Building and Environmental Committee of the sea town Bremerhaven acknowledged the report on the IKS 2015. The final report was positively reviewed by the members. The working group 'climate protection' was established in the regional forum for the further</p>
2030	Reduction of the greenhouse gases by 50% compared to the base year 2011	
2050		

		approach in the field of climate protection.
Sources		

Energy

No explicit goals, policies and management plans.

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

No explicit goals, policies and management plans.

Agriculture

No explicit goals, policies and management plans.

Cuxhaven county:

Greenhouse gases

Goals		Policies
2030	Reduction of the greenhouse gases by 50% by 2030 compared to the base year 2011.	Management plan Model included in the ICP, not determined separately In 2015, the Integrated Climate Protection Concept Regional Forum Bremerhaven (ICP) was concluded.
Sources	Integrated Climate Protection Concept Regional Forum Bremerhaven (ICP) - final report;	

Energy

Goals		Policies
2030	Directive from the ICP: by 2030, a complete coverage of the power demand to be reached through renewable energies	Management plan
Sources	Integrated Climate Protection Concept Regional Forum Bremerhaven (ICP) - final report;	

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

Goals	Policies
-------	----------

	E-mobility represents an important future topic for the county. Declaration of intent in the ICP: the region supports the traffic sector's efforts to contribute to a reduction in greenhouse gases by using alternative, climate-friendly fuels.	Management plan A declaration of intent was determined for the implementation.
Sources		

Agriculture

No explicit goals, policies and management plans.

Stade county:

Greenhouse gases

Goals		Policies Management plan
	The county Stade consistently pursues efforts to protect the climate and sees this task as an important challenge. In 2009, a climate protection report was created that lists the potential actions for the county's scope of tasks. It was updated in 2015 and now forms the working basis for all departments. The county Stade has not created a position for climate protection management.	
Sources	https://www.landkreis-stade.de/buergerservice/dienstleistungen/klimaschutzbericht-901000085-20350.html?myMedium=1&auswahl=0 .	

Energy

Goals		Policies Management plan
	There is a climate protection sub-concept (from 2010) for municipal properties and schools. This is consistently done with a high investment volume in building management and the design of energy savings concepts. A significant increase in energy efficiency is achieved. The energy refurbishment measures are currently funded - supported by Federal funds - by the Lower Saxony's Municipal Investment Funding Law (NKomInvFöG).	
Sources		

Capture and storage of CO2 (CCS)

Not applicable on German county-level (please refer to guidance on German national level and Lower Saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

The county supports climate-friendly mobility through public local transport in the shape of shared taxis that are called (AST) and the membership in the Hamburg Traffic Association (HVV).

Agriculture

No explicit goals, policies and management plans.

Schleswig-Holstein



Greenhouse gases

The following overview shows that the state government of Schleswig-Holstein supports the objectives pursued at the federal level for short -, medium - and long-term reduction of greenhouse gas emissions. While the reduction of CO2 emissions is on a good path to its goal, Schleswig-Holstein has significantly lower reductions in methane and nitrous oxide emissions compared to the federal average. This is mainly due to the increase in animal farming and agricultural land use, associated with significantly increased fertilizer use.

Nevertheless Schleswig-Holstein can and will reach CO2 neutrality by 2030. (Provided that 'CO2-neutrality' means lowering of CO2 equivalents.) Schleswig-Holstein will produce up to three times as much electricity from renewable energies by 2030 as it consumes, the surplus quantities can be credited for consumption of CO2.

Goals		Policies Management plan Energy and Climate Report 2017
2020	Reduction of Greenhouse gases by at least 40% compared to 1990 levels	
2030	Reduction of Greenhouse gases of 55% compared to 1990 levels	
2050	Reduction of Greenhouse gases of 80-95% compared to 1990 levels	
Sources	Energy and Climate Protection Report 2017 (Landtag-Drs. 18/5427 of 25.4.2017)	

Energy

Goals		Policies Management plan
2020	- Expansion of electricity generation from renewable energies in TWh	

	by 28 TWh - Converted as a share of gross electricity consumption approx. 180% - Share of heat from renewable energy sources at final energy consumption heat by 18%	Draft of the new regional wind power plans for Schleswig-Holstein (governmental decision on 6.Dec.2016), Energy and Climate Protection Report 2017, Energy Conversion and Climate Protection Act of the country Schleswig-Holstein (Energiewende- und Klimaschutzgesetz Schleswig-Holstein – EWKG)
2025	- Expansion of electricity generation from renewable energies in TWh to 37 TWh - Implies as a share of gross electricity consumption approx. 240% - Share of heat from renewable energy sources at final energy consumption heat of 22%	
2030	- Expansion of electricity generation from renewable energies in TWh to 44 TWh - Converted as a share of gross electricity consumption approx. 300% - Share of heat from renewable energy sources at final energy consumption heat of 25%	
Sources	Energy and Climate Protection Report 2017 (Landtag-Drs. 18/5427 of 25.4.2017) www.schleswig-holstein.de/windenergie .	

To achieve these aims, a broad package of measures will be implemented to reduce energy consumption, to increase energy efficiency, for the expansion of renewable energies and in relation to climate protection in the agriculture and forestry sectors. In the following the focus is on the presentation on measures in the electricity sector. For measures in other fields of action (heat, buildings / construction, living) see the Energy and Climate Protection Report 2017.

Best Practice examples:

- The state of Schleswig-Holstein will be greenhouse-neutral by 2030 in the sense described above, i.e. that the greenhouse gas emissions will be reduced by about 55% compared to 1990 levels and the remaining emissions will be offset by the export of electricity from renewable energies.
- Expansion of wind energy on land and at sea. Overall: until 2030 electricity from renewable energies can be produced up to three times more as it is consumed in Schleswig-Holstein. The state government provides 2% of the land area for the use of wind energy on land and assigns suitable areas for this purpose.
- Expansion of flexibility and sectoral integration to contribute to climate protection in the heat and transport sectors with electricity from renewable energies. A central project is the "**Norddeutsche Energiewende 4.0**", which tests various flexibilities.
- Adoption of an Energy Conversion and Climate Protection Act (EWKG). The EWKG sets climate protection targets and creates a legal basis for energy conversion, climate protection and climate change adaptation measures in Schleswig-Holstein. Further information: Announced version in the law and regulations sheet for Schleswig-Holstein dated 30.3.2017 (Verkündete Fassung im Gesetz- und Verordnungsblatt für Schleswig-Holstein vom 30.3.2017)

Capture and storage of CO₂ (CCS)

CCS is not possible in Schleswig-Holstein. It is based on the Act on the Regulation on the Carbon Dioxide Storage in Schleswig-Holstein (KSpG SH), which came into effect on 25 April 2014, which is the implementation of the so-called "Länderklausel" in Article 2 (5) of the Federal Carbonation Act (KSpG). In the KSpG Schleswig-Holstein was divided into five areas. Why the storage of CO₂ is not possible in the respective areas was weighed-up individually. The area is essentially identical to the geological situation in Schleswig-Holstein. The main reason for refusing the storage of CO₂ in the respective areas is the geological inadequacy, the preeminence of geothermal energy use and the possible impairment of tourism.

Emission trading

Schleswig-Holstein can and will reach CO2 neutrality by 2030.

Schleswig-Holstein will produce up to three times more electricity from renewable energies by 2030 as it consumes, the surplus quantities can be credited for consumption of CO2. On other hand, emissions trading is regulated at European level. Therefore, there are no country-policy measures in Schleswig-Holstein.

Transport

The state government focuses on the following strategic approaches to expand electric mobility:

Goals		Policies Management plan Landesstrategie Elektromobilität
	<ul style="list-style-type: none"> - intensify the involvement of companies, universities and other institutions in the country in the value chains linked to the electromobilit - Promotion of innovative technology projects for novel electromobile applications within the country's technology-oriented funding programs - Support for demonstration projects and innovative pilot projects in the field of electromobility including resources from the European Agricultural Fund for Rural Development (EAFRD) for the implementation of the integrated development strategies of the active regions - Networking of regional actors and coordination of activities with the neighboring countries and the National Platform for electromobility by the coordination center for electromobility in business promotion and technology transfer Schleswig-Holstein GmbH - By 2017 and 2018, the country plans to erect up to 100 charging stations at state properties for the electrification of transport. This also strengthens the public awareness for electromobility which helps to promote the process. In addition, a variety of public events are planned, like the annual Elektromobilitätsforum in Kiel. - A test track will be built for the so-called eHighway by the end of 201 - a motorway section equipped with overhead lines for the supply of electrically operated trucks 	
Sources	<ul style="list-style-type: none"> - Landeskoordinierungsstelle Elektromobilität - Strategy for electric mobility - Land Development Strategy Schleswig-Holstein, 2030 	

Agriculture

Goals		Policies Management plan
	Reduce intensive farming <ul style="list-style-type: none"> - Because of the special importance of the permanent greenland for climate protection and other protective goods, efforts are being made to increase the grassland area again. For this reason, 	

	<p>the permanent conversion of arable land into permanent greenland (especially on moorland sites) is to be funded financially</p> <ul style="list-style-type: none"> - Treatment on protection of natural resources for agriculture has been further developed and will continue - Establishment of an agri-environmental and climate action "Varied crops in agriculture" for farmers with a yearly subsidy amount of 1,4 Mio € from 2016-2021 - Establishment of climate and energy advice within the framework of the "Sustainable Agriculture" advisory program, starting from January 2016 for 5 years. A total budget of around 1 million € per year is available for the measure, including approx. 100,000 € for the "Climate and Energy" sector 	
	<p>Measures for the protection of moors/marshland:</p> <p>The following measures for the protection of moore have been and are being implemented:</p> <ul style="list-style-type: none"> - Determination of greenhouse gas emissions (GHG) from dewatered bogs for Schleswig-Holstein - Development of a transnational position paper for the protection of bogs on common standards and objectives - Implementation of measures within the framework of the national mud protection program (purchase, irrigation, hydrological appraisals) - Protection of permanent greenland before conversion into arable land by adopting a permanent greening conservation law (DGLG of 07.10.2013) <p>Since May 2014, interested citizens and companies can acquire "MoorFutures" carbon certificates in Schleswig-Holstein and thus voluntarily contribute actively to climate and nature conservation. The proceeds from the certificates flow to one hundred percent in the renaturation of Schleswig-Holstein marshes</p>	
Sources	<p>Eine Vision für Moore in Deutschland - Potentiale und Ziele zum Moor- und Klimaschutz. Gemeinsame Erklärung der Naturschutzbehörden</p>	

Remarks:

While the reduction of CO2 emissions is on a good path to its goal, Schleswig-Holstein has significantly lower reductions in methane and nitrous oxide emissions compared to the federal average. This is mainly due to the increase in animal farming and agricultural land use, associated with significantly increased fertilizer use.

Dithmarschen (County):

Greenhouse gases

Goals		Policies
2030	CO ₂ -neutral in the sectors electricity, mobility and heat energy	Management plan Integrated climate protection concept for the county of Dithmarschen (decided March 2013)
Sources	<ul style="list-style-type: none"> - <i>Integrated climate protection concept for the county of Dithmarschen</i> - <i>Guiding principles for the energy region Dithmarschen</i> 	

Energy

Goals		Policies
2030	CO ₂ -neutral in the sectors electricity, mobility and heat energy	Management plan Integrated climate protection concept for the county of Dithmarschen (decided March 2013)
Sources	<ul style="list-style-type: none"> - <i>Integrated climate protection concept for the county of Dithmarschen</i> - <i>Guiding principles for the energy region Dithmarschen</i> 	

Projects:

Creation of a county wide heat grid to provide a basis for more sustainable heat supply

Remarks:

The county of Dithmarschen currently produces several times more of its entire electricity requirement from renewable energies (primarily wind energy)

Capture and storage of CO₂ (CCS)

Not applicable on German county-level (please refer to guidance on German national level and lower saxony).

Emission trading

No explicit goals, policies and management plans.

Transport

Goals		Policies
2030	CO ₂ -neutral in the transport sector	Management plan Integrated climate protection concept for the county of Dithmarschen (decided March 2013)
Sources	<ul style="list-style-type: none"> <i>Integrated climate protection concept for the county of Dithmarschen</i> <i>Guiding principles for the energy region Dithmarschen</i> 	

Projects:

- Erection of electric vehicles charging station in the district

- Launch of the "strong route" on main routes in public transport (reliable hour / 2-hour cycle and better linkage with connections of other bus and railway lines)

Agriculture

Not applicable.

Projects:

- Project "small moores" in Dithmarschen, actual in concept phase (<http://www.buendnis-dithmarschen.de/kleine-moore>)
- Rewetting / renaturation of moors, e.g. Offenbütteler Moor

Nordfriesland (County):

Greenhouse gases

Goals		Policies
2020	<ul style="list-style-type: none"> - Most climate friendly county of Germany - First CO₂-neutral county - Climate friendly vacation in Nordfriesland 	Management plan 14.11.2008: Council decision on the drafting of a climate protection concept 01.04.2011: Council decision on climate protection management 05.12.2014: Council decision on an extension of climate protection management
Sources	<ul style="list-style-type: none"> - https://www.nordfriesland.de/loadDocument.phtml?ObjSvrID=2271&ObjID=1003&ObjLa=1&Ext=PDF - http://ratsinfo.nordfriesland.de/sdnet/sdnetrim/Lh0LgvGcu9To9Sm0NI.HayIYu8Tq8Sj1Kg1HauCWqBZo5Ok5KeyIiuLWtAWv4Rk4TezKeyDWq8Sn6Rk1Lf0KjvFavETqASj1Mj0KaxJYr8Zm9UGJ/Vorlage_42-2011_1.--Ergaenzung.pdf - http://ratsinfo.nordfriesland.de/sdnet/sdnetrim/Lh0LgvGcu9To9Sm0NI.HayIYu8Tq8Sj1Kg1HauCWqBZo5Ok5KeyIduGwSHTs4Qp0Oe-Hd.CXuCWn40i0Lg-IbvDauHTp8To1Ok0HbwHau8Vt6Pi7Kj2GJ/Vorlage_82-2014_1.--Ergaenzung.pdf 	

Energy

Goals		Policies
2020	Germany's front runner at environmentally friendly power generation - 200% electricity from renewable energies	Management plan 14.11.2008: Council decision on the drafting of a climate protection concept 01.04.2011: Council decision on climate protection management 05.12.2014: Council decision on an extension of climate protection management
Sources	<ul style="list-style-type: none"> - https://www.nordfriesland.de/loadDocument.phtml?ObjSvrID=2271&ObjID=1003&ObjLa=1&Ext=PDF - http://ratsinfo.nordfriesland.de/sdnet/sdnetrim/Lh0LgvGcu9To9Sm0NI.HayIYu8Tq8Sj1Kg1HauCWqBZo5Ok5KeyIiuLWtAWv4Rk4TezKeyDWq8Sn6Rk1Lf0KjvFavETqASj1Mj0KaxJYr8Zm9UGJ/Vorlage_42-2011_1.--Ergaenzung.pdf - http://ratsinfo.nordfriesland.de/sdnet/sdnetrim/Lh0LgvGcu9To9Sm0NI.HayIYu8Tq8Sj1Kg1HauCWqBZo5Ok5KeyIduGwSHTs4Qp0Oe-Hd.CXuCWn40i0Lg-IbvDauHTp8To1Ok0HbwHau8Vt6Pi7Kj2GJ/Vorlage_82-2014_1.--Ergaenzung.pdf 	

IbvDauHTp8To1Ok0HbwHau8Vt6Pi7Kj2GJ/Vorlage_82-2014_1.--Ergaenzung.pdf

Capture and storage of CO2 (CCS)

Not applicable on german county-level (please refer to guidance on german national level and lower saxony.).

Emission trading

No explicit goals, policies and managementplans.

Transport

No explicit goals, policies and managementplans.

Agriculture

No explicit goals, policies and managementplans.

Pinneberg (County):

No contribution received.

Steinburg (County):

Greenhouse gases

Goals		Policies
2020	<ul style="list-style-type: none"> Reduction of CO2 emissions by concrete goals based on Energy and climatological model Up to now one third of total CO2 consumption has been saved 	Management plan Energy and climatological model of the County of Steinburg Valid since 5 Feb 2013; Energy and climate protection programme. Decision 11 Dec 2014 (to 11 Dec 2017)
Sources	<ul style="list-style-type: none"> www.steinburg.de/.../Energie-_und_Klimaschutzprogramm_Kreis_Steinburg.pdf http://www.steinburg.de/fileadmin/bilder/buerger-service/dienststellen-ansprechpartner/dezernat-1/amt-fuer-umweltschutz/modellprojekt_energieeff._Kreis/Leitbild_Energieeffizienter_Kreis_Steinburg.pdf http://www.steinburg.de/fileadmin/download/buerger-service/dienststellen-ansprechpartner/dezernat-1/amt-fuer-umweltschutz/abfallwirtschaft/Download/Energie-_und_Klimaschutzprogramm_Kreis_Steinburg.pdf 	

Energy

A large number of projects to reduce CO2 and energy consumption have been established. Project details under: Energie- und Klimaschutzprogramm; Decision 11 Dec 2014 (to 11 Dec 2017)

Capture and storage of CO2 (CCS)

Not applicable on german county-level (please refer to guidance on german national level and lower saxony.).

Emission trading

No explicit goals, policies and managementplans.

Transport

No explicit goals, policies and management plans.

Agriculture

No explicit goals, policies and management plans.

Best cases Germany

In this chapter several best cases in Lower Saxony and Bremerhaven are described which are implemented by governmental organizations.

1. Municipal energy management and the European Energy Award (eea)

Municipal energy management (MEM) reduces energy consumption in the own properties and thus also leads to a reduction in cost. A municipality with 20,000 inhabitants has annual energy costs for its properties of approx. 1 million euro and rising. These costs can be lowered by up to 20 per cent solely through low- and non-intensive measures. These include the collection and analysis of the energy and water consumption of the properties as well as the needs-based control of the heating systems or the regular maintenance of the ventilation systems.

The European Energy Award© (eea) is a quality management system and certification process for municipalities. By participating in the eea, a systematic detection, assessment and control of all climate protection activities takes place as well as the regular review of the successes. Throughout the implementation process, an energy team is created that especially keeps an eye on the measures that are relevant to the energy consumption. The following counties in Lower Saxony's Wadden Sea region pursue climate protection goals through strict municipal energy management:

- **Emden (city):** Introduction of an energy management system for managing the city's buildings since 2004. Since then, a coordinated collection and monitoring of the energy consumption of the municipal properties has been taking place and measures have been derived to increase the energy efficiency.
- **Cuxhaven county:** In early 2016, the project group 'Energy refurbishment of buildings' was established according to a political resolution. The project group is comprised of managerial and political representatives and pursues the goal of systematically processing the energy renovation work that is necessary for the municipality's own properties. To do so, a series of technical criteria shall be developed that allow setting up a ranking concerning the urgency of single renovation measures. These criteria include, among others, the energy consumption, for example, the user behaviour as well as the building circumstances of the respective properties. In this context, the municipality's own school buildings are especially urgent, which are to be successively and extensively renovated energy-efficiently according to the determined order. The county plans to produce an annual energy report, regularly carries out janitor and employee training, is introducing an energy savings model as the municipality's own school and supports the establishment of an overarching energy-saving network.
- **Stade county:** The county achieves a significant increase in energy efficiency for the municipality's own properties and schools. The measures in the climate protection sub-concept are consistently implemented with a high investment volume. The energy renovation measures are currently supported by Federal funds and backed by Lower Saxony's Municipal Investment Funding Law (NKomInvFöG). According to this bill, the county will receive a total of 3.5 million euro in fund allocations in 2017 for energy renovations totalling more than 4 million euro (allocation ratio of nearly 90%). Thereby, the county will be put into a position to implement the climate protection renovations significantly more quickly than originally planned.
- **Wilhelmshaven (city):** The city has already been an eea municipality since 2006 and has been using the quality and environmental management system. In 2010 and 2014, the necessary score was reached to receive the silver award. Since 2013, the in-house operated lands and buildings (GGS) has been producing annual energy reports and maintaining monthly controlling for heat, energy and water.
- **Wesermarsch county** has been participating in the eea programme since 2011 and was first distinguished in 2014.

2. Climate protection through moor development

Worldwide, soils contain more than twice as much carbon as the atmosphere. The most carbon-rich soils include the high and low moors. As one of the most bog- and moor-rich regions of Germany, Lower Saxony thus has a special responsibility to preserve these moors both as a carbon reservoir as well as for its biological diversity.

A large portion of Lower Saxony's moor areas will be drained and used for agricultural and forestry purposes as well as peat extraction. Through the drainage, large amounts of carbon are released that had been stored in the peat body. The preservation and regeneration of the moorlands thus are some of the most important climate-political tasks of the future for Lower Saxony.

In view of this future task, the **state of Lower Saxony** has created a **support programme** to reduce the release of CO₂ and other greenhouse effects from carbon-rich soils: The rewetting or optimisation of the water supply in moorlands as well as the research, development and testing of climate-friendly exploitation of moor soils are funded with a grant of up to 75%. Municipalities as well as agricultural, peat extracting and processing, horticultural and forestry companies are entitled to apply. (Source: <https://www.nbank.de/%C3%96ffentliche-Einrichtungen/Energie-Umwelt/Klimaschutz-durch-Moorentwicklung/index.jsp>)

In addition, in early 2017, Lower Saxony's regional government agreed on significant changes to the **Regional planning programme (LROP)**, which also included priority areas for peat preservation. The specifications on **peat preservation** contribute to achieving the national and international climate protection goals.

The following cities and counties in the Wadden Sea region of Lower Saxony pursue climate protection goals through moor development:

- **Bremerhaven (city):** The project 'Moorland' offers the possibility to reduce any produced greenhouse gases by purchasing 'climate certificates' in a manner very close to nature, because, as a result, selected moor areas in the region North Sea-Elbe-Weser-Ems can be rewetted. The project is a joint initiative of the environmental protection and tourism in the metropolitan region Bremen-Oldenburg in the northwest. At the project's start, certificates could be purchased online for the 'climate moor Dorumer Moor'. An aerial image of the moor was shown with single grid fields. With the click of a mouse, buyers could select a partial area which they wished to purchase symbolically. Each grid field represents a moor piece of approx. 85.6 sqm and one climate certificate with the reduction output of about 1t CO₂ equivalent, 20 EUR each plus fees. Each buyer received a custom climate certificate and could additionally be named as a climate protector on a climate moor card. In total, 2,675 moorland climate certificates were available for purchase for the climate moor Dorumer Moor, rewetted in March 2015. The last certificate was booked on 31.01.2017. Moorland and its offers have been a successful concept. A new climate moor with about 3,000 new certificates is planned to be bookable in the summer of 2017. In addition, the plan is to expand the moorland across all of Lower Saxony and to offer further climate moorland in the mid-term. (Source/further info: <http://www.moor-land.de/>)
- **Aurich county:** In the course of the updated Regional planning programme (LROP) from February 2017, counties that have designated priority regions in the context of the moor protection and peat preservation have been tasked with drafting an integrated regional development concept (IGEK). As the first county of Lower Saxony, the county Aurich presented a concept for approval, which was granted on 05 April 2017. At the moment, efforts are made to integrate this concept into the regional planning programme (RROP).
- **Wittmund county:** Renaturation of moor areas.
- **Friesland county:** Optimisation of the water management to benefit the agricultural use and settlement-structural advantages of the site.
- **Cuxhaven county:** The nature protection foundation in the Cuxhaven county was founded in 1997 and pursues new ideas and goals in environmental protection. The foundation's means are applied in the focal areas moorland, green wetlands, water bodies, biotope cross-linking, copse/field shrubs, heather fields, near-natural mixed and deciduous forests and 'experience nature'. The nature protection foundation is currently working on the following projects, among others, in field or moor protection:
 - rewetting/renaturation of the Dorumer Moor <http://www.landkreis-cuxhaven.de/index.phtml?La=1&sNavID=1779.186&object=tx,578.5312.1&kat=&sub=0>

- Conversion of the intensively used grassland of the Ahlen moor into species-rich, extensive meadows and pastures (<http://www.landkreis-cuxhaven.de/index.phtml?La=1&sNavID=1779.186&object=tx,578.5313.1&kat=&sub=0>)

3. Heat generation from regenerative energies

'We strive to switch the entire energy supply in Lower Saxony nearly completely over to renewable energy with a strong Lower Saxony contribution by 2050 and to use additional potentials to supply our neighbouring regions.' This is stated in the mission statement of a sustainable energy and climate protection policy for the state of Lower Saxony, which was concluded by the federal state government in August 2016.

In the course of the EFRE funding period 2014 to 2020, the **state of Lower Saxony** concluded the directive 'Support of energy saving and efficiency measures for public agencies and cultural facilities'. Operators of public buildings and plants, social and health-care facilities as well as cultural installations in Lower Saxony will hereby receive a grant of up to 50% for investment measures targeted at energy saving and efficiency. Among other things, systems to generate heat from regenerative energies including setting up a heat network as well as storing renewable energy are supported at the site of their origin. (source: <https://www.nbank.de/%C3%96ffentliche-Einrichtungen/Energie-Umwelt/Energieeinsparung-und-Energieeffizienz-bei-%C3%B6ffentlichen-Tr%C3%A4gern-Kultureinrichtungen/index-2.jsp>).

As the planning authority, municipalities enable the settlement of systems to use renewable energies and they can accelerate the changeover to climate-friendly energy production via their municipal utilities. The following cities and counties in Lower Saxony's Wadden Sea region already pursue this path today:

- **Emden (city):** In Emden's urban area, more power is generated than needed (approx. 470,000MWh, 113% of the energy consumption). The excess power which is primarily produced through wind energy, shall be used in the future to create a connection between the power generation and heat supply (sector coupling via smart technologies such as power to heat and power to gas).
- **Wittmund county:** In the spring of 2008, Ardorf, a district of Wittmund, commissioned a modern biogas plant. The heat energy arising in the plant is fed into a local heat grid, in order to thus supply the households of the village with heat energy. To do so, about 100 founding members of the village population formed the 'Nahwärme Ardorf eG'. The residents can now independently connect their houses to the heating transfer substation. As they cover the costs of lines and connections themselves, they receive the heat free of charge for 5 years. Today, the local heating grid supplies 110 households, which, by heating with biogas, save approx. 4000,00 litres of heating oil, so 1,276t of CO₂ equivalent³ per year.
- **Wilhelmshaven (city):** In the context of the planned project 'Blattgold', briquettes shall be produced from biomass as a climate-friendly fuel, which is meant to be used as a thermal energy supply for a school centre and the botanical garden. To dry the 'Blattgold pellets', unused digester and landfill gases shall be utilised in a combined heat and power plant. Approx. 1,500 t of green waste and 800 t of foliage shall be thermally used per year. By that means alone, approx. 2.9 GWh_{th} in fossil fuel in the shape of natural gas could be substituted. Approx. 586 t of CO₂ are saved thereby. The application for funding is planned for early 2018. The execution of the project still has to be approved by different political committees of the city of Wilhelmshaven.

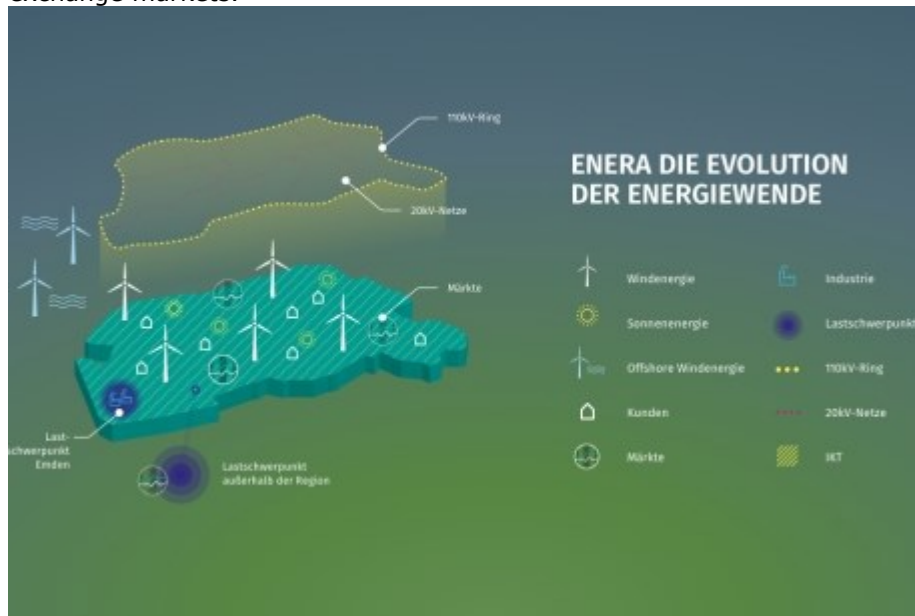
4. Research & development: enera - decentralised energy supply in a practical test

With the help of intelligent technologies, the energy system of a model region is meant to be prepared for the future: How can the transition from a static power grid to a flexible, decentralised energy supply system be successfully achieved? In order to demonstrate how this could work, 75 partners joined forces for the 'enera project' in the northwest of Lower Saxony - businesses, research institutes and municipalities.

³ Conversion figures for heating oil: 0.319 CO₂-eq.kg/kWh as derived from the GEMIS database of the International Institute for Sustainability Analyses and Strategies (IINAS). (www.iinas.org, current version 4.95, as at 11/2016)

For the first time on this scale, intelligent power grids and markets, storage-, communication- and consumption-technologies were to be jointly tested - during a high input of wind energy. Intelligent measuring systems replace three-phase current metres and help to make the energy production and consumption more transparent for an efficient control.

The Federal government supports enera in the framework of the funding programme 'Schaufenster intelligente Energie' (SINTEG) with a total of 50m euro across four years. The companies and partners involved in the project intend to invest a further 120m euro into the model region, in order to equip the energy grid with intelligent measuring systems, construct storage systems, to technically expand wind turbines and to expand market models with regional products in collaboration with power exchange markets.



ENERA THE EVOLUTION OF THE ENERGY REVOLUTION

Image: Blueprint for the energy revolution ©EWE AG

The free city of Emden and the county Aurich, Wittmund and Friesland are all part of the research project. Further reading: <http://www.energie-vernetzen.de/index.html>

5. Energy efficiency in businesses

Increase energy efficiency, reduce costs, produce and act more competitively: For companies, lots of potential for energy and cost savings are hidden in professional energy management, the use of renewable energy and resource efficiency.

The state of **Lower Saxony** concluded the directive '**Support for measures aimed at optimising operational resource and energy management**' in the context of the EFRE funding period 2014 to 2020. Small and mid-sized companies (SME) receive a grant of up to 70% for measures aimed at energy efficiency, for example, investments in buildings and systems to reduce the energy consumption or erecting systems or plants to acquire heat from regenerative energy.

Independent from the funding by the state of Lower Saxony mentioned above, the '**Climate Centre North**', located in the county Aurich, is working on the topic of energy efficiency for the growth region Ems-axis. The Climate Centre North (CCN) was part of the cross-border project 'Sustainable Energies Netherlands Germany' of the Ems-Dollart region. As a project partner of this ambitious project, the county Aurich founded the CCN. The CCN was supported in the context of the INTERREG IV A-programme Germany-Netherlands with funds of the European Regional Development Fund (ERDF) and Provinsje Groningen, Provinsje Drenthe, Provinsje Fryslan as well as Lower Saxony's Ministry of Labour, Economy and Transport. It is accompanied by the programme management of the Ems Dollart Region (EDR). Similar structures exist on both sides of the EDR and the renewable energy industry is given great importance. Through the cross-border collaboration, synergies in the field of

knowledge and experience, innovative working methods and the implementation of energy efficiency measures in companies shall be realised. The CCN's range of tasks includes:

- setup of a cross-border company network
- energy and CO₂ balancing of the Ems-Dollart region,
- organisation of information and network events,
- presentation of the energy efficiency award of the Ems-Dollart region,
- introduction and implementation of energy management systems in small and mid-sized companies,
- climate classes in primary schools.

6. CO₂ balance sheets for farms and agricultural businesses

The agricultural sector can and must - just like all other areas of the economy and life - contribute their share to climate protection. A reduction of emissions can especially be reached through increasing efficiency. Moreover, improved energy efficiency in agricultural operations leads to lower costs.

Analogously to an already ongoing project in the Oldenburg county, the Friesland county plans to include the production of single-operational balance sheets, seminars and lectures on climate-friendly agriculture in the climate protection strategy of the county. The forecast CO₂ savings is oriented on the scope of the project. Based on previous experience, approx. 50t of CO₂ reduction potential per consulted farm or operational branch is realistic.

7. Energy saving models for schools

Energy saving models are a special type of climate protection management and contribute to climate protection in a number of ways. On the one hand, they reveal potential energy savings and offer the possibility to reduce energy costs and greenhouse gas emissions. Furthermore, educationally accompanying measures contribute to anchoring climate protection and conscious handling of resources in the thoughts and actions of different user groups. That way, climate protection is carefully integrated in everyday life and can be experienced on site. Children and young adults can simply carry the concept of environmental and climate protection naturally into their families and circle of friends and encourage them to emulate their newly-learned behaviour.

The Stade county has established its own funding and energy saving project in the shape of a climate protection competition for schools. By rewarding prize money in the total amount of 10,000 euro through the climate protection competition, the county motivates its own schools to increasingly save energy and to concretely implement climate protection activities. Today's competition model was preceded by a 3-year 'Fifty-fifty' project, in which schools could learn about handling energy, heat and water responsibly. With considerable success: During the three-year pilot phase, the CO₂ emissions were reduced by approx. 11% and roughly 42,000 euro were saved each year. Half of the saved amount was paid to the schools as an energy savings prize. Promotional premiums were also awarded for special efforts.

8. Climate-friendly mobility

The transport sector supplies a substantial share of the CO₂ emissions in Lower Saxony and causes further damaging emissions. To find a remedy, alternative concepts need to be developed for the motorised single traffic in urban and rural areas. Climate-friendly mobility concepts aim at secure the mobility of all population groups while reducing the greenhouse gasses and noise emissions.

To fund and implement this, the state of Lower Saxony created the 'Mobility Network Lower Saxony'. This initiative works on networking, informing and activating actors throughout the region in the field of alternative drive systems (e-mobility, H2BZ), for example in the course of workshops, informative events and consultations. (Further reading: <https://www.mobilitaet-nds.de/>).

The municipalities are central actors regarding the implementation of climate-friendly mobility concepts. They can accelerate sustainable local public transport through their transport operations and, by designing the traffic grids, municipalities have a big impact on mobility that is climate-friendly.

In the Wadden Sea region of Lower Saxony, the municipalities are increasingly relying on e-mobility, as exemplified by the Leer county and city of Wilhelmshaven:

- **Leer County:** In 2013, the changeover of the district administration's fleet to e-cars was started. At 31 vehicles, roughly half has been achieved by the end of May 2017. The expansion of the e-mobility infrastructure is developed with the help of regional funds; 17 sites are currently planned. Furthermore, the first e-police car is already in use on Borkum Island and the first fully-electric bus (AG EMS) will soon follow.
- **Wilhelmshaven (city):** In addition to e-mobility, the city is focused on strengthening bicycle use and the local public transport within the mobility network. Electronic vehicles were acquired for the city's fleet. In 2010, a bicycle traffic concept was concluded and a 'Round table bicycle traffic' was established to implement the concept. Moreover, the city utility's transport company Wilhelmshaven GmbH offers a job ticket to companies in Wilhelmshaven.

9. LED street lighting

On average, the municipal street lighting system is responsible for nearly a third of the entire energy consumption of the district. For many municipalities, it is thus profitable to replace the outdated street lighting system with newer, more energy efficient LED lights. Several Lower Saxony's municipalities have already proven that the energy renewal of street lighting systems does not only have a positive environmental, but also economic effect.

The following projects have been or are being implemented in the Wadden Sea region of Lower Saxony:

- **Friesland County:** Upgrade of the street lights to LED light systems. For example, in the so-called 'municipal approach', approx. 1,000 lights have been replaced in the city of Schortens since 2016. The amortisation period amounts to five years according to the EWE information.
- **Wilhelmshaven (city):** This climate protection measure plans to replace roughly 700 old lights with sodium vapour lamps with current LED lights. By means of the new lights and dimming these at night time, energy savings of up to 80% can be reached for a majority of these lights. The upgrade shall be finished by the end of the first quarter 2017. The project is funded by Federal Ministry in the context of the National Climate Protection Initiative.

10. Public relations for municipal climate protection

Public relations for renewable energy, energy efficiency and climate-friendly behaviour serves to give the topic of climate protection a positive image, to keep it in the public mind long-term and to foster the motivation to contribute to climate protection.

Municipal administrations assume an important role-model function in matters of climate protection. Numerous municipalities proceed in an exemplary fashion and demonstrate that climate protection is possible and even profitable with limited funds. Many citizens and companies have a growing interest to live in an energy-efficient way and to utilise renewable energy for their own energy supply. Municipalities can play an active role here. They are the central contact point for questions regarding living in the municipality and offer extensive neutral information.

To strengthen the task of climate protection in Lower Saxony's municipalities, the **state Lower Saxony**, together with Lower Saxony's municipal umbrella organisations, has created the **competition 'Municipal climate'**. The competition's goal is to publicise the numerous creative and innovative local climate protection activities in Lower Saxony among a wide audience and to honour the municipal efforts. In that context, the municipalities are invited to submit exemplary climate protection projects every two years and to compete for the title of 'climate municipality in Lower Saxony' and a total of 100,000 euro in prize money.

On a municipal level, **exemplary projects** for good PR work can be found in the **Stade county**. These include the climate protection workshops the Stade county offers for its county's own municipalities and neighbouring counties, during which topics were worked on such as 'Funding options for municipal climate protection measures', 'CLIMATE WORKSHOP in the county Stade', 'Free energy consultation by the consumer centre Lower Saxony', 'E-mobility in municipalities', 'Long-term security, supply and mobility in rural areas', 'Climate adaptations in the example of KLEE (KLIMZUG North follow-up project climate adaptation in the drainage area of the Este)', for example. Further reading:

<https://www.landkreis-stade.de/Klimaschutz-Workshop>.

Denmark – National level



Denmark has ratified the Paris Agreement and a Governmental agreement on the Danish national energy policy for 2012 -2020 was signed in the March 2012; supplementary initiatives beyond 2020 is to be negotiated before the end of 2018. The Agreement supports the common EU targets.

Towards 2020 a process of conversion to sustainable energy production will be ongoing 56 % of the electricity consumption is today from renewable energy sources and 51 % of the energy used for district heating. In 2020, it is expected to be 72 % of the electricity and 71 % of the heating.

Greenhouse gases

Goals		Policies
2020	- 20% CO2 reduction for the non-ETS emissions in 2020 compared to 1990 - 40% CO2 reduction in 2020 compared to 1990.	Management plan since 2012 Energi-aftalen fra 2012 (Energy agreement 2012) Basisfremskrivning 2015 – baggrundsrapport The Danish Climate Law (no juridical obligations for the present government concerning the goal set of 40%)
2030	The reduction target that has been set for Denmark from EU from 2005 until 2030 at 39% for the non ETS-sectors, has not yet been adopted.	
2050	Denmark is independent of fossil fuels.	
sources	https://ens.dk/ansvarsomraader/energi-klimapolitik/fakta-om-dansk-energi-klimapolitik/dansk-energipolitik https://ens.dk/sites/ens.dk/files/EnergiKlimapolitik/aftale_22-03-2012_final_ren.doc.pdf http://efkm.dk/klima-og-vejr/klimaindsatsen-i-danmark/ https://ens.dk/sites/ens.dk/files/energistyrelsen/Nyheder/2014/aftale_om_klimaloven.pdf	

Political basis

The Energy Agreement from 2012 sets the overall framework for energy policy. According to that, we in Denmark will reduce our total energy consumption by 7% in the period 2010 to 2020. The long-term goal of the agreement is that Denmark's energy supply must be 100% independent of fossil fuels by 2050.

Energy

Efficiency

Goals		Policies
2020	Reduce energy consumption with 7% from 2010 to 2020	Management plan Yes valid since 2012 Energi-aftalen fra 2012 (Energy agreement 2012)
2050	A fossil-free society based on renewable energy sources	

		Danish Climate Law
sources	https://ens.dk/sites/ens.dk/files/EnergiKlimapolitik/aftale_22-03-2012_final_ren.doc.pdf https://www.retsinformation.dk/forms/r0710.aspx?id=163875	

Sustainable supply generation

Goals		Policies Management plan Regeringsgrundlaget, Marienborgaftalen november 2016 (Danish Government agreement November 2016)
2020	30% share of total energy consumption from renewable energy sources (This goal was reached in 2015)	
2030	50% of the energy from renewable sources	
2050	The government has the ambition that Denmark by 2050 should be a low-emission society that is independent of fossil fuels, coal, oil and natural gas. This means that in 2050 Denmark must be able to produce renewable energy enough to cover the total Danish energy consumption. Therefore, the energy supply and transport sector must be converted so that they can be based on renewable energy sources, such as wind, solar, biofuels and geothermal energy.	
Sources	http://efkm.dk/klima-og-vejr/klimaindsatsen-i-danmark/	

Capture and storage of CO2 (CCS)

For the time being, CCS is not an option in Denmark, according to the Danish Minister of Energy, Utilities and Climate, Lars Christian Lilleholt,
<http://videnskab.dk/teknologi-innovation/hvor-staar-vi-med-co2-lagring>

Emission trading System

Denmark is like the other members of EU linked to the energy market in Europe and the world, and is committed to the European agreements such as the common emission trading system.

Goals		Policies Management plan Yes valid since 2012 Danish Climate Law
	Denmark is committed to strengthening the Emissions Trading System (ETS).	
2030	Denmark is restricted to reduce 20% in 2030 compared to 2005 by the EU.	
sources	https://ens.dk/ansvarsomraader/energi-klimapolitik/danmarks-klimarapporteringer-til-fn-og-eu	

Transport

EU goals.

Agriculture

EU goals.

Region of Southern Denmark

Greenhouse gases

No explicit goals, policies and management plans.

Energy

Goals		Policies
2020	40% CO2 reduction in the geographic entity Region Southern Denmark compared with the level of 1990 Region Southern Denmark organization reduction of CO2 emissions with 40% compared to 2004	Management plan December 2015 Green opportunities - Regional Climate and Sustainability Strategy 2016 – 2019 (<i>Region Syddanmark, Grønne muligheder – Regional klima- og bæredygtighedsplan 2016-2019</i>)
2050	(Governmental goal = regional goal) A fossil-free society based on renewable energy sources, with a reduction of the greenhouse gas emissions of 80-95%	
sources	Green opportunities - Regional Climate and Sustainability Strategy 2016 – 2019 (The strategy was adopted by the Region Council in December 2015) https://www.regionsyddanmark.dk/dwn555278	

Capture and storage of CO2 (CCS)

The Region of Southern Denmark is not planning on storage of CO2 or extract shale gas. At the moment, CCS is not an option in Denmark.

Emission trading

No explicit goals, policies and managementplans.

Transport

No explicit goals, policies and managementplans.

Agriculture

No explicit goals, policies and managementplans.

Danish Wadden Sea Municipalities

The four wadden sea municipalities are all part of the Region South Denmark, and are characterised by many rural areas, which to a high degree are supplied through individual heating, and less from the big central heating plants. The expansion of wind power in Southern Denmark is expected, according to the National Energy Agency, mainly to be offshore, it is often a challenge to get the sufficient political and local support for wind turbines on land.

Three of the municipalities are working together on a common strategy for energy planning, the plan is in process and has not yet been finalised. Tønder municipality is working together with other border municipalities on a strategy for energy planning.

Sources:

http://www.fanoie.dk/Files/Files/Dagsordner/committee_79886/agenda_246549/documents/89592ffd-e8be-428b-9f6b-175c2bb1cab5.pdf

<https://www.regionsyddanmark.dk/wm217286>

Varde Municipality

Greenhouse gases

Goals		Policies
2020	<ul style="list-style-type: none"> - Contribute to the governmental goal of a 40% CO2 reduction in Denmark compared with the level of 1990 - Contribute to the governmental goal of 50% the traditional electricity consumption is covered by wind energy. 	Management plan September 2014 July 2014 Strategic Energyplan 2014 – 2018 Varde Municipality

2050	A fossil-free society based on renewable energy sources.	(Strategisk Energiplan 2014-2016 Varde Kommune) Climate and Environmental policies for Varde Municipality. (Klima og Miljøpolitik for Varde Kommune, 2 juli 2014)
sources	http://polweb.varde.dk/open/Byr%C3%A5det%20(%C3%85ben)/2014/07-10-2014/Referat%20(%C3%85ben)/07-10-2014%20-%20Bilag%20259.02%20Strategisk%20Energiplan%20for%20Varde%20Kommune.pdf http://epaper.dk/VardeKommune/Centralforvaltningen/Ledelsessekretariatet/klima-og-milj%C3%B8politik/	

Energy

Goals		Policies
	Reducing the energy consumption with 2% per year until 2018. Energy renovation of municipal buildings. (see below) Improving the energy efficiency in the municipality.	Management plan (expected to be adopted on the 20th of June 2017) (expected to be adopted on the 20th of June 2017); Varde Kommune som klima-kommune (Climate municipality); Varde Municipality -Building strategy Kommuneplan Varde Kommune 2017 (Municipality plan 2017)
2025	It is the City Council's goal that the production of electricity from wind turbines in 2025 should cover minimum 40% of the electricity consumption in Varde Municipality.	
sources	http://www.dn.dk/media/5803/co2-opg%C3%B8relse-2015-varde-kommune.pdf http://www.vardekommune.dk/kommuneplan-2017	

Energy efficiency in municipality buildings – Varde.

Varde municipality is in an ongoing process to enhance the energy efficiency of the municipal buildings, lately with focus on the building envelope components, such as insulation of walls and roofs, energy efficient windows. A more efficient heating and ventilation systems, has been implemented in many of the buildings owned by the municipality, for example with a change to climate friendly solutions such as geothermal heating and heat pumps (non-geothermal).

Strategy for buildings.

Varde Municipality is expected to adopt a building strategy in summer 2017; the goal of the strategy is to improve the utilization of the building stock in a smarter way, in order to reduce the expenses for operation and maintenance. The focus in the strategy is on the municipality schools, but also other buildings are included.

Streetlights – low energy

In recent years Varde Municipality has been working on replacing street lighting in the entire municipality for new low-energy LED versions, this process is expected to be fully implemented during 2017.

Focus on communication and information to the public concerning green solutions and energy optimisation and efficiency.

Capture and storage of CO2 (CCS)

Not applicable.

Emission trading

No explicit goals, policies and managementplans.

Transport

No explicit goals, policies and managementplans.

Agriculture

No explicit goals, policies and management plans.

Esbjerg Municipality

Greenhouse gases

Goals		Policies
2020	To reduce the CO2 Emissions with 30% in 2020 compared to 2011 (2011 level of emission was 783.833 tons CO2) – with an overall goal to become CO2 neutral as soon as realistic possible.	Management plan adopted by the City Council 18th January 2016 Climate and Energy Strategy for Esbjerg Municipality (<i>Klima- og Energistrategi i Esbjerg Kommune</i>)
2050	A fossil-free and sustainable society based on renewable energy sources. With an insignificant CO2 emission.	
sources	http://www.esbjergkommune.dk/om-kommunen/strategier-og-visioner/klima--og-energistrategi.aspx	

Energy

Goals		Policies
	Energy renovation of municipal buildings.	Management plan adopted by the City Council 18th January 2016 Climate and Energy Strategy for Esbjerg Municipality (<i>Klima- og Energistrategi i Esbjerg Kommune</i>) Heating Strategy Esbjerg Municipality, 2013 COWI Climate and Energy Strategy for Esbjerg Municipality (<i>Klima- og Energistrategi i Esbjerg Kommune</i>)
	Conversion from coal to biomass - The Coal power plant in Esbjerg owned by DONG Energy will stop using coal in 2023. The power station will be replacing coal with sustainable biomass. This will give a CO2 reduction of 21 %.	
	Renewable energy - example: Two V164 Wind turbines on land in Måde/Esbjerg with a capacity each of 8 Megawatt. The mills are test mills for off shore use. (Each can produce what corresponds to the electricity consumption of 9000 Danish households). The wind-turbines were inaugurated in April 2016.	
	Nature Energy and Sydvestjysk Biogas is building a new biogas plant. The production will start in spring 2018 when the plant is fully developed it is expected to produce 22 million cubic meters of green biogas every year. It will be the largest biogas plant in Denmark.	
sources	http://www.esbjergkommune.dk/om-kommunen/strategier-og-visioner/klima--og-energistrategi.aspx	

Energy efficiency - Esbjerg Municipality

Energy efficiency municipal buildings initiatives, which has been implemented:

- Insulation of the building envelope and replacement of doors and windows
- Optimization of heating, ventilation and lighting
- Replacing the fluorescent LED tubes in existing fixtures.

Energy production for internal use - implemented:

- Changing the oil and gas boilers with heat pumps
- Installation of solar PV in buildings with high consumption.

Energy efficiency of streetlight - implemented

- Replacement of street lighting fixtures and control units

Conversion of the municipality's own fleet

- Pilot project with electric cars and Pilot project with hydrogen cars

Capture and storage of CO2 (CCS)

Not applicable.

Emission trading

No explicit goals, policies and managementplans.

Transport

Goals		Policies Management plan Adopted 2016 Climate and Energy Strategy for Esbjerg Municipality (<i>Klima- og Energistrategi i Esbjerg Kommune</i>)
	<ul style="list-style-type: none"> - Adaptation of infrastructure in order to support an urban structure with focus on public transport, direct bus routes, improving accessibility to train and bus stations and the town centres. - Esbjerg municipality wants to become a cycling city where up to 50% are using the bike instead of the car on a daily basis. - Esbjerg municipality will collaborate with local operators and bus companies for the conversion of bus services to sustainable energy sources such as electricity or biogas. - Establishment of new suburban rail line 	
sources	http://www.esbjergkommune.dk/om-kommunen/strategier-og-visioner/klima--og-energistrategi.aspx	

Agriculture

No explicit goals, policies and managementplans.

Fanø Municipality

Greenhouse gases

No explicit goals, policies and managementplans.

Energy

Goals		Policies Management plan
	Fanø is together with Varde and Esbjerg Municipalities working together on a common strategy for energy planning, the plan is in process and has not yet been finalised	
sources	http://www.fanoe.dk/Files/Files/Dagsordner/committee_79886/agenda_246549/documents/89592ffd-e8be-428b-9f6b-175c2bb1cab5.pdf	

Fanø Municipal Plan strategy

The Municipality of Fanø - City Council will:

Be in a front position when it comes to reduction of resource consumption and waste sorting. It must be worthwhile for both locals and tourists to reduce the energy consumption and sort the waste.

Supports the possibility of establishing new energy supply systems, which in prioritized order will secure CO2 reductions in the energy supply, as well as ensuring the lowest price for the end users.

Through information and guidance, make the individual citizen, tourist and entrepreneur aware of their responsibility in relation to resource consumption and recycling.

Make good conditions for cyclist so that cycle is preferred over car.

Cooperation between municipalities on energy planning

Support local initiatives from groups working on reduction of environmental impact, promoting biodiversity or initiatives supporting local sustainability.

Support ideas from local citizens for a more sustainable Fanø
 Focus on citizen involvement
 Urban development when needed and take the groundwater conditions and risk of flooding into account.
 Fanø Kommune-plan Strategy 2017 (Fanø municipality plan strategy 2017) -
<http://reader.livedition.dk/fanoe/220/>

Capture and storage of CO2 (CCS)

Not applicable.

Emission trading

No explicit goals, policies and managementplans.

Transport

No explicit goals, policies and managementplans.

Agriculture

No explicit goals, policies and managementplans.

Tønder Municipality

Greenhouse gases

No explicit goals, policies and managementplans.

Energy

Goals		Policies Management plan Tønder Kommune Strategiplan_2016-2019
2015	In 2015 54 % of the total energy consumption in Tønder municipality came from renewable energy sources.	
2019	Increase local kilowatt production by 100% until 2019.	
2050	The municipality of Tønder commits itself to supporting the government's energy strategy with ambitious initiatives by 2050, which means that the energy sector has to switch from fossil fuels to renewable energy sources.	
sources	http://sparenergi.dk/offentlig/vaerktoejer/energi-og-co2-regnskab/toender?year=2015	

Energy efficiency:

Tønder Municipality is replacing street lighting in the entire municipality for new low-energy LED versions; in total, approx. 6,500 streetlights will be replaced. The process is expected to be fully implemented during 2021.

Climate and green energy in Tønder Municipality

In Tønder Municipality, we protect our natural resources, which create the local jobs; we live with and use nature as a sustainable resource. We use the large natural- and agricultural areas and exploit the great wind and solar potential through tourism, biomass production, wind and solar power plants. Over the past 500 years, we have lived with climate change. However, the sea level is rising and we will have increased precipitation, which increases the pressure on the dikes, streams and rivers, nature and agricultural areas as well as the towns. We still have to deal with the challenges of climate change. The municipality has prepared a climate adaptation plan, that we will implement. In the municipality of Tønder, significant investments have been made in green energy over the last few years. There are positive developments with the district heating plants in Toftlund and Løgumkloster, with investments in solar energy and also private investments in wind and solar energy. Overall, the projects are on a scale that supports the municipality's position as one of Denmark's important CO2-neutral energy areas.

Goals

- Increase local kilowatt production by 100% until 2019.
- Increase the number of local jobs in climate, green energy and climate with 70 new jobs until 2017.
- Increase the local focus on climate adaptation and energy optimization.

Source: http://toender.dk/sites/default/files/din_kommune/filer/strategiplan_2016-2019.pdf

Capture and storage of CO2 (CCS)

Not applicable.

Emission trading

No explicit goals, policies and managementplans.

Transport

No explicit goals, policies and managementplans.

Agriculture

No explicit goals, policies and managementplans.

Best cases Denmark

Here, two examples of energy related good examples in Denmark are described.

1. Energy Programma Southern Denmark

EPD-project - Energy efficient buildings - the Region Southern Denmark in cooperation with 14 municipalities in the region have committed themselves to invest 597 mill. DKK from 2014 - 2017 in energy efficient investments in public buildings and streetlights. The project is envisaged to result in a CO2 emission reduction of 16000 tons CO2 per year. All 4 Wadden Sea municipalities participate in the project.

<https://www.regionsyddanmark.dk/wm449299>

<http://sparenergi.dk/offentlig/vaerktoejer/energi-og-co2-beregneren>

2. DONG Energy

A step towards this target has been supported by DONG Energy who has decided that from 2023, coal will no longer be used as fuel at the company's power stations. The decision is a result of the company's vision to lead the way in the transformation to a sustainable energy system and to create a leading green energy company. The power stations will be replacing coal with sustainable biomass. Since 2006, DONG Energy has reduced its coal consumption by 73 per cent, from 6,2 million tonnes in 2006 to 1,7 mio tonnes in 2016, and from 2023 it will be 0. Denmark's total annual emissions of greenhouse gases have been reduced by approximately 25 million tonnes CO2 from 2006 to 2016, and DONG Energy's share of the reduction amounts to approximately 53 per cent. Two coal fired power stations in Denmark remain, their total annual use of coal was in 2016, 1 million tonnes of coal. These two stations are owned by the municipalities of Odense and Aalborg they are planning to stop using coal in 2028 and 2030 at the latest.

<http://www.dongenergy.com/en/media/newsroom/news/articles/dong-energy-to-stop-all-use-of-coal-by-2023>

<http://www.business.dk/energi/danmark-bliver-kulfrit-i-2030>

Annexes

Annex: contributions from Schleswig-Holstein

GREENHOUSE GASES

Es wird im Folgenden davon ausgegangen, dass sich das Ziel der Regierungskonferenz Wattenmeerregion, die Wattenmeerregion bis spätestens 2030 zu einem CO₂-neutralen Gebiet zu entwickeln, auf die Minderung von CO₂-Äquivalenten bezieht und damit neben CO₂ auch die anderen Treibhausgase (THG) einschließt, auf die sich nationale und internationale Minderungsverpflichtungen beziehen, also insbesondere auch Methan und Distickstoffoxid.

Die folgenden Ausführungen basieren auf den jährlichen Energiewende- und Klimaschutzberichten der Landesregierung Schleswig-Holstein. Quelle für Daten ist der Energiewende- und Klimaschutzbericht 2017 (Landtags-Drs. [18/5427](#) vom 25.4.2017). Über Maßnahmen hat die Landesregierung zuletzt im Energiewende- und Klimaschutzbericht 2016 berichtet (Landtags-Drs. [18/4389](#) vom 6.7.2016).

Die (bis zur Landtagswahl im Mai 2017 amtierende) Landesregierung verfolgt ambitionierte **Ziele der Energiewende- und Klimaschutzpolitik:**

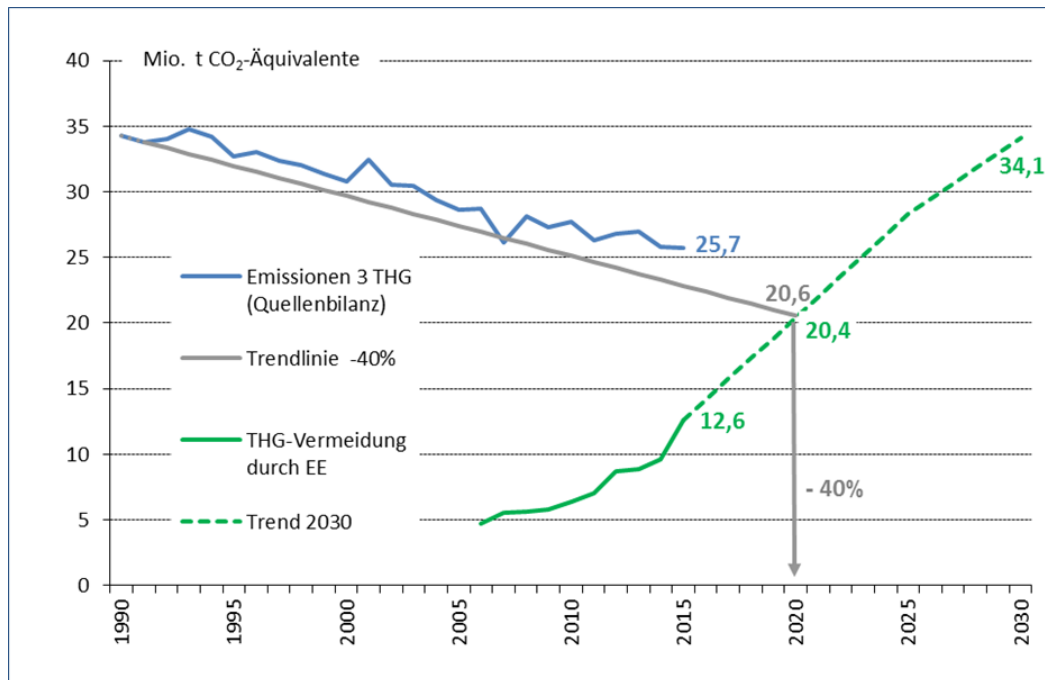
	Ist-Wert	Zielszenario			
	2015	2020	2025	2030	2050
Minderung der Treibhausgasemissionen jeweils ggü. 1990	24,9%	40%	k.A.	55%	80-95%
Ausbau der Stromerzeugung aus Erneuerbaren Energien in TWh (umgerechnet als Anteil am Bruttostromverbrauch)	17,9 TWh (114,5%)	28 TWh (ca. 180%)	37 TWh (ca. 240%)	44 TWh (ca. 300%)	k.A. k.A.
Anteil der Wärmeversorgung aus Erneuerbaren Energien am Endenergieverbrauch Wärme	14,1%	(18%)	22%	25%	k.A.

Quelle: Energiewende- und Klimaschutzbericht 2017, dort sind auch weitere Erläuterungen zu den Zielen

Wie die Übersicht zeigt, unterstützt die Landesregierung die auch auf Bundesebene verfolgten Ziele zur kurz-, mittel- und längerfristigen Minderung der Treibhausgasemissionen und strebt ihre Erreichung auch in Schleswig-Holstein an. Abb. 1 zeigt, dass die Entwicklung der Emissionen der drei Treibhausgase Kohlendioxid, Methan und Distickstoffoxid in Schleswig-Holstein oberhalb der Trendlinie zur Erreichung einer Minderung um 40% bis 2020 liegt. Der Pfad zur Zielerreichung ist in der Abbildung in grau dargestellt, die tatsächlichen THG-Emissionen in blau.

Während die Minderung der CO₂-Emissionen auf einem guten Pfad zur Zielerreichung liegt, hat Schleswig-Holstein im Vergleich zum Bundesdurchschnitt deutlich geringere Minderungen der Methan- und Distickstoffoxid-Emissionen zu verzeichnen, was maßgeblich am Anstieg von Tierhaltung und landwirtschaftlicher Flächennutzung und damit verbunden auch deutlich gestiegenem Düngemiteleinsatz liegt.

Abb. 1: Entwicklung der Emissionen der drei THG 1990 - 2015 und Trendlinie zum Ziel 2030 sowie THG-Minderung durch Erneuerbare Energien



Quelle: Energiewende- und Klimaschutzbericht 2017

Abb. 1 zeigt weiterhin, dass die Erneuerbaren Energien 2015 mit 12,6 Mio. t bereits 49% der schleswig-holsteinischen Treibhausgasemissionen vermieden bzw. kompensiert haben. Bei Realisierung der angestrebten THG-Minderung und der Ausbauszenarien der Erneuerbaren Energien wird deren Beitrag zur Treibhausgasvermeidung im Jahr 2020 bei gut 20 Mio. t liegen und damit den bei Einhaltung des Minderungspfades verbleibenden Treibhausgasemissionen entsprechen. Bis 2030 soll der Treibhausgasvermeidungsbeitrag der Erneuerbaren Energien auf rund 34 Mio. t CO₂-Äquivalente ansteigen und dann einen Beitrag zur bundesweiten Treibhausgasminderung leisten, der weitaus größer ist als die schleswig-holsteinischen Treibhausgasemissionen.⁴

Schleswig-Holstein kann und wird also voraussichtlich bis 2030 CO₂-Neutralität erreichen. Angestrebt wird das Ziel der Minderung der Treibhausgasemissionen um 55% bis 2030 gegenüber 1990 und es bestehen gute Aussichten zur Erreichung dieses Ziels. Dafür sind die Minderung des Energieverbrauchs, die Steigerung der Energieeffizienz, der Ausbau der Erneuerbaren Energien sowie Klimaschutz in der Landwirtschaft von besonderer Bedeutung. Die noch verbleibenden Treibhausgasemissionen werden durch den angestrebten Ausbau insbesondere der Stromerzeugung aus Erneuerbaren Energien (über-) kompensiert. Da Schleswig-Holstein bis 2030 bis zu dreimal mehr Strom aus Erneuerbaren Energien produzieren wie verbrauchen wird, kann für die Überschussmengen eine CO₂-Minderung gutgeschrieben werden.

best practice“ Beispiele

- Das Land Schleswig-Holstein wird bis 2030 in dem vorstehend beschriebenen Sinne treibhausgasneutral sein, d.h. die Treibhausgasemissionen werden um etwa 55% gegenüber 1990 gemindert sein und die verbleibenden Emissionen werden durch Export von Strom aus Erneuerbaren Energien kompensiert.

⁴ Erneuerbare Energien, die in Schleswig-Holstein fossile Brennstoffe ersetzen (wie es ganz überwiegend bei Wärme und Kraftstoffen aus Erneuerbaren Energien der Fall ist), sind eine Ursache für den Trend zu sinkenden Treibhausgasemissionen. Soweit Erneuerbare Energien über die Landesgrenzen Schleswig-Holsteins exportiert werden (wie es zu einem großen Teil bei der Stromerzeugung der Fall ist), findet die ihnen zurechenbare THG-Minderung ihren Niederschlag nicht in der schleswig-holsteinischen, sondern in der nationalen oder europäischen Bilanz der Treibhausgasemissionen.

Die Ermittlung der Treibhausgasminderung erfolgt durch das Statistikamt Nord im Auftrag des MELUR, dabei wendet das Statistikamt Nord die auch auf Bundesebene von BMWi / UBA angewendeten Methoden an. Die Dokumentation erfolgt in der jährlich aktuell herausgegebenen Ausgabe von „Erneuerbare Energien in Zahlen für Schleswig-Holstein“, siehe http://www.schleswig-holstein.de/DE/Schwerpunkte/Energiewende/Daten/_documents/versorgungsbeitrag.html

- Ausbau der Windenergie an Land und auf See. Insgesamt kann bis 2030 bis zu dreimal mehr Strom aus Erneuerbaren Energien produziert werden wie in Schleswig-Holstein verbraucht wird. Die Landesregierung stellt 2% der Landesfläche für die Nutzung der Windenergie an Land zur Verfügung und weist dafür geeignete Flächen aus.
- Ausbau von Flexibilitäten und Sektorkopplung, um mit Strom aus Erneuerbaren Energien auch zum Klimaschutz in den Sektoren Wärme und Verkehr beizutragen. Ein zentrales Vorhaben ist das Schaufenster-Projekt "Norddeutsche Energiewende 4.0", in dem verschiedene Flexibilitäten getestet werden.
- Verabschiedung eines Energiewende- und Klimaschutzgesetzes (EWKG). Mit dem EWKG werden Klimaschutzziele festgelegt und es wird eine rechtliche Grundlage für Energiewende-, Klimaschutz- und Klimaschutzanpassungsmaßnahmen in Schleswig-Holstein geschaffen. Weitere Informationen: [Verkündete Fassung im Gesetz- und Verordnungsblatt für Schleswig-Holstein](#) vom 30.3.2017; [Dokumente zum Gesetzgebungsverfahren](#)

ENERGY (efficiency, sustainable supply generation)

Zur Erreichung dieser Ziele wird ein breites Maßnahmenbündel umgesetzt zur Minderung des Energieverbrauchs, zur Steigerung der Energieeffizienz, zum Ausbau der Erneuerbaren Energien sowie für den Klimaschutz auch in den Sektoren Land- und Forstwirtschaft.

Im Folgenden wird der Schwerpunkt der Darstellung auf Maßnahmen im Stromsektor gelegt. Für Maßnahmen in anderen Handlungsfeldern siehe den Energiewende- und Klimaschutzbericht 2017.

1. Ausbau Windenergie an Land

Als Land zwischen den Meeren ist Schleswig-Holstein prädestiniert für die Nutzung der Windenergie, sowohl im Binnenland (onshore) als auch auf See (offshore). Mehr als 6 Gigawatt installierte Leistung aus Windenergie an Land und 1,5 GW Windenergie auf See waren Ende 2016 bereits an das schleswig-holsteinische Stromnetz angeschlossen.

Onshore-Windenergie ist die kosteneffizienteste Form der Erneuerbaren Energien. Der Ausbau der Windenergie in Schleswig-Holstein trägt somit ganz erheblich dazu bei, dass die Kosten des Umstiegs von konventionellen auf Erneuerbare Energieträger gebremst werden und zusätzliche Belastungen für den Verbraucher reduziert werden können.

Um den weiteren Ausbau zu ermöglichen und zu steuern, hat die Landesregierung am 6.12.2016 die Entwürfe der neuen Windenergie-Regionalpläne für Schleswig-Holstein verabschiedet. Für Details der neuen Windplanung, die Darstellung des Planungsprozesses und weitere Informationen siehe www.schleswig-holstein.de/windenergie.

Für Juni 2017 ist das Ende der ersten Anhörungsphase vorgesehen. Nach Auswertung der Stellungnahmen wird sich eine zweite Anhörung anschließen. Mit einem Inkrafttreten der Raumordnungspläne ist nicht vor 2018 zu rechnen.

2. Ausbau Flexibilitäten und Sektorkopplung

Die fluktuierende Stromerzeugung aus Wind und Sonne prägt zunehmend das energiewirtschaftliche System. Damit ergeben sich zentrale Herausforderungen, die zu bewältigen sind:

Reagiert das System rasch genug auf die Fluktuation?

Wohin mit den Erzeugungsspitzen, wenn die Stromerzeugung aus Windenergie und Photovoltaik höher ist als die Last?

Wie kann bei geringer Stromerzeugung aus Windenergie und Photovoltaik Versorgungssicherheit gewährleistet werden?

Die Antwort auf diese Herausforderungen liefern Sektorkopplung und Flexibilitäten. Flexibilitäten sind alle Optionen, die dazu beitragen, dass Verbrauch und Erzeugung im Stromsektor flexibel auf ein großes („Überschuss“) oder geringes („Knappheit“) Angebot an Wind- und Sonnenstrom reagieren. Sektorkopplung ist die Verzahnung der bisher voneinander weitgehend getrennten energiewirtschaftlichen Sektoren Elektrizität, Wärmeversorgung und Verkehr.

Das Ziel der Sektorkopplung besteht darin, den effizienten und emissionsarmen Einsatz von Energie in allen Sektoren zu ermöglichen. Neben der Bereitstellung von Flexibilität ist Sektorkopplung daher auch wesentlicher Baustein der Effizienz- und Klimaschutzstrategie.

Projekt Norddeutsche Energiewende 4.0

Die Energiewende im Stromsektor ist in Schleswig-Holstein weiter fortgeschritten als in den meisten anderen Regionen Europas. Hier ist man daher auch früher mit technischen Herausforderungen konfrontiert. Der von der Landesregierung unterstützte Wettbewerbsantrag „Norddeutsche Energiewende NEW 4.0“ von Hamburg und Schleswig-Holstein, der aus dem BMWi-Programm „Schaufenster intelligente Energien/Wind“ gefördert wird, ist von strategischer Bedeutung für das Land, weil hier an Lösungen für die Energiewendezukunft gearbeitet werden wird. Am 6.12.2016 gab das BMWi den offiziellen Startschuss für dieses und vier weitere Projekte. Mehr unter www.new4-0.de. Das Schaufenster Norddeutsche Energiewende "NEW 4.0" besteht aus Unternehmen in der Region Hamburg als großem Energieverbrauchszentrum und Unternehmen bzw. Projekten in der Region Westküste in Schleswig-Holstein als bedeutendem Windenergie-Erzeugungszentrum. Das Schaufenster will aufzeigen, dass in dem Verbund dieser Regionen bereits 2025 die Stromversorgung sicher und zuverlässig mit 70 Prozent auf Basis regenerativer Energien erfolgen kann. Hierfür sollen Erzeugung und Verbrauch mittels modernster Technologien und weiterentwickelter Marktregeln optimal aufeinander abgestimmt werden.

Insgesamt soll über NEW 4.0 eine Flexibilität im Umfang von 300 MW erreicht werden. Dazu gehört die Aufstellung einer virtuellen Kraftwerksleistung von über 1.600 MW. Wesentliche Herausforderung ist dabei das dynamische Zusammenspiel zwischen Stromerzeugung und -verbrauch. Insbesondere die großen Industrieverbraucher können dazu z.B. Lastgradienten von 10 MW pro Sekunde bereitstellen. Neben den thermischen Lasten sind aber auch Batteriespeicherprojekte und Power-to-Gas Projekte sehr flexible Instrumente, um einen Ausgleich zwischen den dynamischen Verhaltenskurven von Last und Erzeugung zu erzielen.

Flexible Kraftwerke

Flexible Kraftwerke sind vor allem auch dann gefordert, wenn aus Wind und Sonne kein oder kaum Strom erzeugt wird. Flexible KWK-Anlagen in Kombination mit einer P_{th}-Anlage und einem Wärmespeicher sind ein wesentlicher Baustein der Energiewende und werden bereits heute von mehreren Unternehmen in Schleswig-Holstein betrieben.

Ein Beispiel ist das geplante „**Küstenkraftwerk K.I.E.L.**“, das die Stadtwerke Kiel durch seine modulare Bauweise mit 20 Gasmotoren in die Lage versetzt, auf künftige Entwicklungen der Energiemärkte angepasst zu reagieren. Bei niedrigen Strompreisen laufen nur einzelne Motoren, ohne dass diese in einem ineffizienten Betriebspunkt in Teillast betrieben werden müssen. Die Gasmotoren erlauben, schnell auf die Anforderungen des Strommarktes zu reagieren und sich auch auf dem Regelleistungsmarkt zu engagieren. In Kombination mit der Power to Heat Anlage wird elektrische Energie praktisch ohne Umwandlungsverluste durch die Vermeidung der Gasverbrennung gespeichert.

Lastmanagement

Lastmanagement bezeichnet die aktive Steuerung des Stromverbrauchs („Demand Side Management“) und äußert sich insbesondere in Lastverschiebung und Lastreduktion. Nennenswerte Beiträge werden dabei vor allem von der stromintensiven Industrie erwartet. Um die Potenziale bei den Haushalten zu heben, sind insbesondere variable Tarife eine wichtige Voraussetzung. Hilfreich wäre auch die organisatorische Steuerung z.B. über regionale Marktplätze. Und für Schleswig-Holstein als Ganzes ist angesichts der Lage vor den Engpässen im deutschen Übertragungsnetz vor allem die Zuschaltung von Lasten bedeutsam.

Stromspeicher

Das Thema Speicher entwickelt sich in Schleswig-Holstein sehr dynamisch, wozu auch die von der Landesregierung etablierte Fördermöglichkeit mit EFRE- und Landesmitteln beiträgt. Vorhaben, die die Einspeisung von Erneuerbaren Energien in die Strom- und Wärmenetze verbessern und zum regionalen Einsatz von Speichertechnologien beitragen, können nach der Richtlinie für die Gewährung von Zuwendungen zur Förderung der Energiewende und von Umweltinnovationen (30. November 2015) gefördert werden.

Power to Gas

Mit Power to Gas werden der Einsatz von Strom zur Erzeugung von Wasserstoff und die Verwendung dieses Wasserstoffs in sehr unterschiedlichen Anwendungsbereichen bezeichnet; z.B. im Wärme- und Verkehrssektor, in der chemischen Industrie und grundsätzlich auch in der Stromerzeugung (Rückverstromung). In Schleswig-Holstein wird an der Entwicklung dieser Technologien in verschiedenen Projekten gearbeitet.

Für weitere Informationen zu konkreten Projekten in den Bereich Lastmanagement, Speicher und Power to Gas siehe den Energiewende- und Klimaschutzbericht 2017.

CAPTURE AND STORAGE OF CO₂ (CCS)

CCS ist in Schleswig-Holstein nicht möglich. Grundlage ist das Gesetz zur Regelung der Kohlendioxid-Speicherung in Schleswig-Holstein (KSpG SH), das am 25. April 2014 in Kraft getreten ist und das der Umsetzung der sog. Länderklausel in § 2 Abs. 5 Kohlendioxidspeichergesetz des Bundes (KSpG) dient. Im KSpG SH wurde Schleswig-Holstein in fünf Gebiete unterteilt. Für jedes der Gebiete wurde einzeln eine Abwägung vorgenommen, warum in dem jeweiligen Gebiet die Speicherung von CO₂ nicht möglich ist. Die Gebietseinteilung stimmt im Wesentlichen mit geologischen Lagemerkmalen in Schleswig-Holstein überein. Hauptgründe zur Versagung der Einlagerung von CO₂ in den jeweiligen Gebieten sind dabei die geologische Unzulänglichkeit, der Vorrang der Geothermienutzung und die mögliche Beeinträchtigung des Tourismus.

Der Gesetzentwurf der Landesregierung zur Regelung der Kohlendioxid-Speicherung in Schleswig-Holstein (Landtags-Drucksache 18/1020) enthält auch eine Begründung. Dort heißt es unter anderem: Das Gebiet 4 (Kreise Dithmarschen und Steinburg, einschließlich der Nordsee bis zur 12 Seemeilen-Grenze) liegt innerhalb des Glückstadt-Grabens. Es ist geologisch ungünstig, dort Kohlendioxid einzulagern. Hier gelten die Ausführungen zur Geologie beim Gebiet 1 entsprechend. Außerdem ist das Küstenmeer Schleswig-Holsteins im Bereich der Nordsee fast flächendeckend als FFH- oder Vogelschutzgebiet ausgewiesen und unterliegt den europarechtlichen Verpflichtungen zum Schutz des zusammenhängenden europäischen ökologischen Netzes „Natura 2000“ im Sinne der Richtlinien 92/43/EWG und 79/409/EWG. Es ist im Landesentwicklungsplan als Vorranggebiet des Naturschutzes ausgewiesen. Wesentlicher Teil dieser Natura 2000-Gebiete ist der „Nationalpark Schleswig-Holsteinisches Wattenmeer“, der sich teilweise bis zur 12-Seemeilen-Zone der Nordsee erstreckt. In diesen naturschutzrechtlich geschützten Gebieten steht das Interesse an einer dauerhaften Kohlendioxidspeicherung den insoweit überwiegenden Belangen des Umweltschutzes, insbesondere den Erhaltungszielen und dem Schutzzweck dieser Gebiete gegenüber. Die möglichen Auswirkungen u.a. auf Tiere, Pflanzen und Boden bei der Durchführung oder Vorbereitung dieser Vorhaben und die Bedeutung der Schutzgebiete sprechen dafür, die naturschutzrechtlich geschützten Gebiete generell von dauerhaften Kohlendioxidspeichervorhaben frei zu halten. Zudem ist dieses Gebiet – bis auf zwei bergrechtlich genutzte Exklaven – Teil des Weltnaturerbe Wattenmeer und steht damit auf der Liste „Erbe der Menschheit“ der UNESCO, der Organisation der Vereinten Nationen für Bildung, Wissenschaft, Kultur und Kommunikation. Eine Nutzung des Gebietes für die Speicherung von Kohlendioxid wäre politisch nicht in Einklang zu bringen mit der Anerkennung als Weltnaturerbe. Der Nordseeteil des Gebietes 5 ist flächendeckend als Natura 2000-Gebiet ausgewiesen. Darin befinden sich zudem wesentliche Teile des Nationalparks Schleswig-Holsteinisches Wattenmeer“. Hierzu gelten die Ausführungen zu Gebiet 4 entsprechend.

EMISSION TRADING

Der Emissionshandel wird auf europäischer Ebene geregelt. Es gibt daher keine landespolitischen Maßnahmen in Schleswig-Holstein.

TRANSPORT

Ein wesentlicher Handlungsschwerpunkt im Bereich Klimaschutz im Verkehr ist der Ausbau der Elektromobilität.

Ziel der Landesregierung ist es, einerseits durch die Elektrifizierung des Verkehrswesens einen Beitrag zum Klimaschutz zu leisten und andererseits die Unternehmen, Hochschulen und sonstigen Einrichtungen im Land verstärkt an den mit der Elektromobilität verbundenen Wertschöpfungsketten zu beteiligen (Landesstrategie Elektromobilität). Dabei konzentriert sich die Landesregierung auf folgende strategische Ansatzpunkte:

- Förderung innovativer Technologievorhaben für neuartige elektromobile Anwendungen im Rahmen der technologieorientierten Förderprogramme des Landes.
- Unterstützung von Demonstrationsvorhaben und innovativen Pilotprojekten im Bereich der Elektromobilität, u. a. über Mittel aus dem Europäischen Landwirtschaftsfonds für die Entwicklung

des ländlichen Raums (ELER) für die Umsetzung der integrierten Entwicklungsstrategien der AktivRegionen.

- Vernetzung der regionalen Akteure und Abstimmung von Aktivitäten mit den Nachbarländern und der Nationalen Plattform Elektromobilität durch die Koordinationsstelle Elektromobilität bei der Wirtschaftsförderung und Technologietransfer Schleswig-Holstein GmbH.

Mit der für 2017 und 2018 geplanten Errichtung von bis zu 100 Ladestationen an Landesliegenschaften bringt das Land nicht nur den Ausbau der notwendigen Infrastruktur für die Elektrifizierung des Verkehrswesens voran, sondern stärkt hiermit auch die Wahrnehmung der Elektromobilität. Sichtbarkeit, Bereitstellung von Informationen und Anregung von Diskussionen rund um das Thema Elektromobilität sind wichtige Elemente, um den Markt zu befördern. Hierzu gibt es ein Vielzahl an öffentlichen Veranstaltungen (Foren, Workshops, Messen), die durch die Landeskoordinierungsstelle Elektromobilität und das Land organisiert oder unter deren Beteiligung stattfinden. Herauszustellen ist hier das jährlich stattfindende Elektromobilitätsforum in Kiel, welches 2016 mit über 200 Teilnehmern einen sehr hohen Zuspruch fand und Akteure aus Wirtschaft, Wissenschaft und Politik zum aktiven Austausch zusammenbringt.

Als Energiewende-Land stellt sich Schleswig-Holstein der Herausforderung, innovative Technologien zur Integration von Erneuerbaren Energien in den Verkehrssektor in Pilotprojekten zu testen. In Schleswig-Holstein entsteht bis Ende 2018 eine Teststrecke für den sogenannten eHighway, ein mit Oberleitungen ausgestattetes Autobahnteilstück zur Versorgung von elektrisch betriebenen Lastkraftwagen. Der Betrieb und die angelehnte wissenschaftliche Begleitforschung sollen die Umsetzung dieses Konzeptes im operativen Prozess einer Spedition testen und die Potentiale untersuchen.

Schleswig-Holstein soll nicht nur zum Vorreiter neuer Mobilität werden, sondern es soll eine raum- und energiesparende und gleichzeitig finanzierbare Mobilitätsinfrastruktur realisiert werden (Landesentwicklungsstrategie Schleswig-Holstein 2030). Dies berücksichtigt nicht nur die Bedürfnisse der Menschen in den einzelnen Lebens- und Wirtschaftsräumen, sondern vor allem auch die Nutzung technischer Innovationen, um neue Formen klimafreundlicher Mobilität zu ermöglichen.

AGRICULTURE (PEATLAND, GREENHOUSES, LIVESTOCK)

Intensive farming

Ziel ist eine Vermeidung bzw. Reduzierung von Treibhausgasemissionen aus der Landwirtschaft bzw. aus der Landnutzung. Als ein wesentlicher Maßnahmenswerpunkt erfolgt die Förderung von Maßnahmen zur Minderung von Treibhausgasen im Rahmen der neu gestalteten ELER-Förderung, insbesondere für jene Flächen, für die Synergien zwischen Klima-, Boden-, Gewässer- und Naturschutz zu erwarten sind:

- Wegen der besonderen Bedeutung des Dauergrünlandes für den Klimaschutz und andere Schutzgüter wird angestrebt, die Grünlandfläche wieder zu vergrößern. Deshalb soll die dauerhafte Umwandlung von Acker in Dauergrünland (insbesondere auf Moorstandorten) finanziell gefördert werden. Die Vertragsnaturschutzangebote für die Landwirtschaft sind weiterentwickelt worden und werden fortgesetzt. So werden die für den Klimaschutz bedeutsamen Bewirtschaftungsbeschränkungen (beispielsweise bei der Düngung) beibehalten und inhaltlich um Biotopgestaltungsmaßnahmen (z.B. Graben- und Grüppenanstau auf Grünlandflächen) ergänzt.

- Etablierung einer Agrarumwelt- und Klimamaßnahme „Vielfältige Kulturen im Ackerbau“. Die Teilnahme an dieser Maßnahme erfordert nicht nur, dass fünf verschiedene Hauptfrüchte angebaut werden, sondern auch, dass diese einen bestimmten Mindestanteil an der Ackerfläche und einen Mindestanteil von 10 % Körnerleguminosen (Einsparung von Herstellung und Anwendung N-haltiger Mineraldünger durch Bindung des Luftstickstoffs) einnehmen müssen, zusätzlich ist nach den Leguminosen eine Folgefrucht anzubauen. Es steht dafür im Zeitraum 2016-2021 eine jährliche Fördersumme von ca. 1,4 Mio. € zur Verfügung.
- Etablierung einer Klima- und Energieberatung im Rahmen des Beratungsangebotes „Nachhaltige Landwirtschaft“, beginnend ab Januar 2016 für 5 Jahre. Für die Gesamtmaßnahme steht im Jahr ein Budget von ca. 1 Mio. € zur Verfügung, davon für den Bereich „Klima und Energie“ jährlich ca. 100 Tsd. €.

Greenhouses

Diese Zwischenüberschrift verstehe ich nicht. Wenn damit „Treibhäuser“ gemeint sind, wäre für SH Fehlanzeige zu melden.

Peatland Area

Folgende Maßnahmen zum Moorschutz wurden und werden umgesetzt:

- Ermittlung der Treibhausgasemissionen (THG) aus entwässerten Mooren für Schleswig-Holstein. Dabei wurden zwei mögliche Landnutzungs-Szenarien und die damit verbundene Veränderung der THG-Emissionen dargestellt. Nach Schätzungen aus dem Jahr 2010 entweichen aus den entwässerten Mooren Schleswig-Holsteins rund 9% der gesamten schleswig-holsteinischen THG-Emissionen.
- Erarbeitung eines länderübergreifenden Positionspapiers zum Moorschutz durch verschiedene Bundesländer, in denen der Anteil an Mooren eine große Bedeutung hat. Für dieses Papier wurden gemeinsame Standards und Ziele für den Moor- und Klimaschutz vereinbart. Das Positionspapier liegt gedruckt und als Download⁵ vor.
- Durchführung von Maßnahmen im Rahmen des landesweiten Moorschutzprogramms (Ankauf, Vernässung, hydrologische Gutachten). Seit Beschluss des Moorschutzprogrammes im Jahre 2011 wurden dafür Mittel in Höhe von über 9 Mio. € eingesetzt. Das Moorschutzprogramm soll mit folgenden Schwerpunkten fortgeführt werden:
 - Finanzierung von Flächenkäufen oder sonstigen flächensichernden Instrumenten, um Moore dauerhaft wiedervernässen zu können.
 - Finanzierung von vorbereitenden Arbeiten, z.B. hydrologischen Gutachten.
 - Finanzierung von konkreten Maßnahmen zur Wiedervernässung und sonstigen biotopbegleitenden Maßnahmen.

⁵ [Eine Vision für Moore in Deutschland - Potentiale und Ziele zum Moor- und Klimaschutz. Gemeinsame Erklärung der Naturschutzbehörden](#)

- Schutz von Dauergrünland vor Umwandlung in Acker durch Erlass eines Dauergrünlanderhaltungsgesetzes (DGLG vom 07.10.2013). In einer definierten Schutzkulisse, zu der Flächen, die hoher oder sehr hoher Wassererosionsgefährdung unterliegen, Überschwemmungs- und Wasserschutzgebiete, Gewässerrandstreifen, Moor- und Anmoorböden gehören, ist die Umwandlung untersagt, in den anderen Gebieten unterliegt die Umwandlung einem Genehmigungsverfahren.
- Schleswig-Holstein hat sich nach Brandenburg als drittes Bundesland für die Einführung der 2011 von Mecklenburg-Vorpommern entwickelten MoorFutures entschieden. Seit November 2014 können in Schleswig-Holstein interessierte Bürger und Bürgerinnen sowie Unternehmen MoorFutures-Kohlenstoffzertifikate erwerben und damit freiwillig einen aktiven Beitrag zum Klima- und Naturschutz leisten. Der Erlös aus den Zertifikaten fließt zu einhundert Prozent in die Renaturierung schleswig-holsteinischer Moore.