EUROPEAN COMMISSION
DIRECTORATE-GENERAL
CLIMATE ACTION
Directorate A - International, Mainstreaming & Policy Coordination
CLIMA.A.3 - Adaptation

Adaptation preparedness scoreboard:

Draft country fiche for Denmark

Disclaimer

This draft country fiche was prepared in the context of the implementation of the EU's Strategy for Adaptation to Climate Change (EUAS). The indicators were developed and agreed with experts from the Member States (MS). This draft version of the fiche is published as background information to the public stakeholder consultation about the evaluation of the EUAS running from early December 2017 to early March 2018. It constitutes work in progress, a particular stage of information collection and dialogue between the Commission and the Member States. It presents a snapshot of the status in the country as of September or October 2017. The fiches are planned to be finalised and published as an annex to the strategy's evaluation report in the fourth quarter of 2018, before which they will be further updated and modified. Should you have any specific comments on the draft fiche, please send it to the mailbox CLIMA-CLIMATE-CHANGE-ADAPTATION@ec.europa.eu

Please note that the assessments (yes/no/in progress) need to be read in conjunction with the narrative that accompanies them. They assess the state of play *within* each country. While all effort has been made to ensure the coherence across fiches in the assessment of the same indicator, it should not be directly compared across the MS. Two countries with a "yes" on the same indicator could have a different national situation leading to that assessment. Not all indicators have the "in progress" status, some can only be "yes" or "no". For a more detailed explanation of what each indicator means and how its value is determined, please refer to the description of the scoreboard, a document published alongside the country fiches.

Contents

POLICY FRAMEWORK

Adaptation strategies

A1. National adaptation strategy

In Denmark, the **national adaptation strategy (NAS) was adopted in March 2008**[1]. The NAS included a description of the vulnerability of those sectors where climate change was expected to have significant consequences (see list in section 1.b). The strategy focused on what would be attainable in the individual sectors within the next 10 years. It was intended that measures should be scientifically, technically and socio-economically appropriate for implementation within the given period.

The strategy was based on the notion that adaptation to climate change is a long-term process, and that it is still uncertain what the consequences of climate change will be and how soon they will take effect. The strategy comprised a targeted information

[1] http://www.klimatilpasning.dk/media/5322/klimatilpasningsstrategi_uk_web.pdf

campaign, which included the creation of a web portal[2], with the aim of ensuring that climate change was incorporated into planning and development so that public authorities, businesses and citizens had the best possible basis for considering whether, how and when climate change should be considered.

A2. Adaptation strategies adopted at subnational levels

No evidence to suggest adaptation strategies have been adopted at the sub-national level (but all municipalities are obliged to develop an action plan for climate change by the end of 2013). A sector based approach to the NAS has been employed instead.

Adaptation action plans

B1. National adaptation plan

A National Adaptation Plan (NAP) was adopted in 2012.

The Action Plan for a Climate-Proof Denmark[3] was launched in December 2012 and is the first NAP in Denmark. The NAP is based on the notion that a responsible climate policy must more than just work towards climate change in the long term. It must also ensure the action necessary right now to adapt our society to a climate that is already changing. All parts of society must contribute to climate change adaptation in Denmark. Dealing with the climate challenge requires collaboration between authorities, organisations, private enterprises and individuals, regardless of whether the project is maintenance of existing roads, coastal protection, construction, or investments in new infrastructure.

The central government itself has a responsibility as the owner of infrastructure, buildings and land. However, the principle role for central government is to establish an appropriate framework for local climate change adaptation by, for example, adapting laws and regulations, but also by ensuring coordination and providing information. A solid framework for the efforts must support the specific parties involved, so that they can address the challenge in a socio-economically appropriate manner at the right time.

Climate change adaptation measures can also contribute to the development of new innovative solutions. In the NAP, the government commits to creating the basis for continued technological and knowledge development, so that Denmark will have a strong position on the global market for climate change adaptation.

The NAP presents 64 [4] new initiatives within the following five general areas of initiative:

1. An improved framework for climate change adaptation: The state must ensure the best possible framework for, as an example, the municipal climate change adaptation efforts, in order to ensure the most appropriate solutions. The NAP suggests, for example, changing and modernising relevant legislation and regulations.

2. More consultancy and a new knowledge base: There is a need for a common knowledge base and ongoing consultancy about the implications of climate change and how to adapt to climate change. The NAP describes which initiatives the government will launch in order to strengthen the knowledge base and ensure knowledge sharing.

[2] Danish web platform on adaptation to climate change: http://en.klimatilpasning.dk/
[3] http://en.klimatilpasning.dk/media/590075/action_plan.pdf
[4] http://en.klimatilpasning.dk/media/590075/action_plan.pdf

3. Strengthened collaboration and coordination: Climate change adaptation efforts must be coordinated across authorities, the business community and individuals. Initiatives are indicated that are able to promote and ensure the necessary dialogue and cooperation amongst the primary stakeholders in the area.
4. Green transition: Climate change adaptation efforts create the opportunity for green transition through development and use of new, innovative solutions. The NAP focuses on the potential for growth in this respect.
5. International climate change adaptation: Climate change is also a challenge for our neighbouring countries. Denmark is working internationally to reduce the effects of climate change, and for an ambitious EU-climate change adaptation that will support the Danish climate change adaptation efforts.

This fiche does not cover Greenland and the Faroe Islands[5].

B2. Adaptation plans adopted at sub-national level

The NAP requires all municipalities to develop an action plan for climate change by the end of 2013. To support municipalities and local level decision makers in their work, the Danish Nature Agency issued a Guidance document in 2013. All 98 Danish municipalities have finalized their action plans. Each plan includes a flood risk mapping and sets the priorities for the local climate change adaptation measures. The content of the plans as well as the legal framework has in 2017 been evaluated[6]. Each plan includes a flood risk mapping and sets the priorities for the local climate change adaptation measures.

An amendment to the Planning Act now makes it possible for the municipalities to include climate change adaptation directly in the local development plans from 1 June 2012. The possibility for wastewater companies to invest in climate change adaptation has been clarified with an amendment in the Water Sector Act in spring 2012.

Denmark currently has four signatories to the Covenant of Mayors for Climate and Energy for the adaptation commitment[7].

A Copenhagen Climate Adaptation (CCA) plan[8] was adopted in 2014 in response to the extreme, water-related consequences of climate change to which the city is exposed. Risk assessments that have been carried out in the Copenhagen climate adaptation plan show that there is a significant risk for the city of being hit by torrential rain and flooding from the sea. This risk will increase significantly in the future if climate change proceeds as forecasts predict. The plan focusses on three levels of adaptation: 1) reducing the likelihood of an event happening, 2) reducing the scale of the event, and 3) reducing the city's vulnerability to the event. Some examples of adaptation measures include disconnection of storm water from the sewer by separation or sustainable drainage systems, establishing dikes, raising building elevation, building green structures, and monitoring the impact of the changing climate on public health.

[5] Information about climate change impacts and adaptation in Greenland and the Faroe Islands can be found in e.g. "Denmark's Sixth National Communication on Climate Change" under UNFCCC, December 2013. http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/7550.php

[6] Summary of the evaluation of the municipal climate change efforts

[7] As 20th June 2017, includes: Albertslund, Copenhagen, Næstved and Roskilde. See: http://www.covenantofmayors.eu/about/about/signatories_en.html?q=&country_search=dk&population=&date_of_adhesion=&status=&commitments1=1&commitments2=1&commitments3=1

[8] http://international.kk.dk/artikel/climate-adaptation

Heavy rainfall in July 2011 prompted the city of Copenhagen to develop a Cloudburst Management Plan in 2012[9] in order to prepare the city for one of the biggest climate change challenges it faces, namely extreme rainfall and pluvial flooding. The Plan contains more than 300 site-specific projects. Some of the Plan's adaptation measures include developing structures that allow rainwater to be led out to sea such as roads, canals, and tunnels; developing storage for surface runoff such as emergency flood channels; and the building of blue-green infrastructure throughout the city.

Regions have no formal responsibilities in the field of adaptation, but have started tackling adaptation through their regional development plans – for most Danish *regioner* these include adaptation measures. Two out of five Danish *regioner* have carried out studies on the impacts and risks of climate change, as the basis for regional strategic planning for adaptation. Sectors most covered include health, water management, transport, and buildings.

The Central Denmark Region (mid-Jutland) is responsible for the project management of the LIFE IP project Coast to Coast Climate Challenge, or C2C CC running in the period 2017 - 2022[10]. The project has 31 partners running 24 sub projects managed by the partners. The total budget is EUR 11.7 million of which EUR 7 million are subsidized by EU LIFE.

The Capital Region of Denmark has established a Regional Task Force with the aim of supporting municipalities, water utilities and hospitals in their effort to move from plan to action within climate change adaptation[11].

B3. Sectoral adaptation plans

The Danish adaptation web portal includes a wide range of examples of adaptation action in various sectors linked to the NAS/NAP, and a few sectors, such as transportation[12] and coastal protection, have dedicated adaptation plans embedded in sector strategies.

SCOREBOARD

Step A: preparing the ground for adaptation

1. Coordination structure

1a. A central administration body officially in charge of adaptation policy making

Yes / No

A central administration body is officially in charge of adaptation policy making. The responsibility for climate change adaptation is shared between the national and the municipality levels.

In June 2015, the Ministry of Food, Agriculture and Fisheries was merged with the Ministry of Environment to create the Ministry of the Environment and Food. The overall

[9] http://en.klimatilpasning.dk/media/665626/cph_-_cloudburst_management_plan.pdf
[10] http://www.c2ccc.eu/english/
[11] http://www.klikovand.dk/english-resume/
[12] http://www.klimatilpasning.dk/media/808629/strategi_for_klimatilpasning___baggrundsrapport.pdf

responsibility of climate change adaptation is now with the Danish Environmental Protection Agency within the Ministry of the Environment and Food.

1b. Horizontal (i.e. sectoral) coordination mechanisms exist within the governance system, with division of responsibilities

Yes / In progress / No

At the beginning of 2017 a cross-ministerial committee was set up to propose new initiatives to support municipalities and property owners in establishing cost-effective and holistically planned flood protection and erosion protection.

In the period February to August 2016, a cross-ministerial working group carried out an evaluation of the municipal climate change adaptation efforts.

The Task Force on Climate Change Adaptation evaluated in 2012 the impacts of possible climate change in Denmark. The report: "Mapping climate change – barriers and opportunities for action"[13] addresses fourteen sectors of priority[14]: Construction and housing, Coasts and ports, Transport, Water, Agriculture, Forestry, Fisheries, Energy, Tourism, Nature, Health, Emergency preparedness, Insurance and Spatial planning.

A cross-ministerial committee of government officials has been responsible for mapping the impacts of climate change in Denmark and the Action plan for a climate-proof Denmark. The action plan highlights 64 initiatives which contribute to a better framework for climate change adaptation effects by central and local government, private enterprises and individuals.

To ensure a coordinated effort among public authorities, an organisational framework worked from 2008 to 2011, including a horizontal coordination forum on adaptation (KoK[15]).

1c. Vertical (i.e. across levels of administration) coordination mechanisms exist within the governance system, enabling lower levels of administration to influence policy making

Yes / In progress / No

Municipalities have the main planning competences and they are identified in the NAS as the level of implementation of adaptation policy.

Regions have no formal responsibilities in the field of adaptation, but have started tackling adaptation through their regional development plans

The Coordination Forum was a broad spectrum of bodies and institutions as well as municipalities and regions. The forum monitored climate developments, research in the area, and the experience of other countries. It advised the Danish Government.

Cooperation forums

The Ministry of Transport works together with, amongst others, the municipalities in the Greater Copenhagen area, to tackle the traffic-related challenges in the area, in particular flooding of major approach roads. Similarly, an emergency response plan has been drawn up for the area around Ryparken Station in Copenhagen.

[13] Mapping Climate change: http://en.klimatilpasning.dk/media/600858/130206_mapping_climate_change_final.pdf
[14] Information about the sectors: http://en.klimatilpasning.dk/sectors.aspx
[15] In Danish: "Tværministerielle Koordinationsforum for Klimatilpasning (KoK)"

Under the auspices of the Road Regulation Council, the Ministry of Transport cooperates with municipalities, consultants, contractors etc. when, for example, preparing proposals for regulations and recommendations on how to solve climate change related problems.

In 2012, the Ministry of Transport and the asphalt industry established a working group to investigate the environmental consequences of using special types of asphalt, including those relating to climate change adaptation. This team offered guidance and facilitates collaboration between municipal authorities and other stakeholders in the field, for example with regard to preparing municipal climate change adaptation plans. Local Government Denmark (LGDK[16]) is the umbrella and interest group for Danish municipalities. All 98 municipalities are members. LGDK has a climate network, which comprises some of the municipalities.

In 2011, the Ministries of the Environment and Transport appointed 10 flood prone areas according to the Danish Flood Risk Act, which relates to the Directive 2007/60/EC of the European Union on the assessment and management of flood risks. The 10 flood risk areas involved 22 municipalities, which had to prepare flood risk management plans in order to reduce the flood risk through mitigation and adaptation measures. The preparation of risk management plans built on a multi-layer concept with emphasis on prevention–protection–preparedness and had to be based on the provided hazard, vulnerability and risk maps. The plans had to be coordinated with municipal climate adaptation plans and take into account floods related climate impacts.

2. Stakeholders' involvement in policy development

2a. A dedicated process is in place to facilitate stakeholders' involvement in the preparation of adaptation policies

Yes / No

A dedicated process is in place to facilitate stakeholders' involvement in the preparation of adaptation policies.

In 2011, the new government decided to strengthen the collaboration and coordination between sectors, authorities, the business community and individuals in order to achieve the best solutions.

Initiatives in the climate change adaptation area are based on an open and inclusive decision-making process that ensures forward-looking input and ownership of the common climate change adaptation efforts. As an example, the Ministry of the Environment carried out a pilot project in the climate change adaptation area under the slogan Dialogue on the environment – open ministry ("Aktiv miljødialog – åbent ministerium"). This broad, network-based stakeholder involvement has provided input for new legislation and helped create synergy between sectors.

Additionally, in 2012 the Minister for the Environment established and headed a national dialogue forum for climate change adaptation consisting of the main players from the business community, research institutions and municipalities. This forum advised the Minister for the Environment on the need for action and suggests practical solutions.

Following storm surges in December 2016 and January 2017, the Minister for the Environment and Food held several stakeholder meetings focusing on climate change

[16] Local Government Denmark (LGDK): http://kl.dk/English/

adaptation, coastal protection and erosion. Afterwards, new initiatives[17] were adopted as part of the work of a cross-ministerial committee set up at the beginning of 2017.

2b. Transboundary cooperation is planned to address common challenges with relevant countries

Yes / No

The Ministry of the Environment and Food is taking part in collaboration with Germany and the Netherlands on climate change adaptation of the Wadden Sea, where the unique nature and low-lying towns are under pressure as a result of climate change.

Through the Nordic Council of Ministers, Denmark has contributed to Nordic collaboration and knowledge-building in Nordic networks within research into climate change adaptation[18], through the top-level research initiative – Impact studies and adaptation to climate change ("Effektstudier og tilpasning til klimaændringer").

Denmark is a member of the European Network of the Heads of Environment Protection Agencies (EPA) Interest Group Climate Change and Adaptation.

Step B: assessing risks and vulnerabilities to climate change

3. Current and projected climate change

3a. Observation systems are in place to monitor climate change, extreme climate events and their impacts

Yes / **In progress** / No

There is an elaborate system in place for the observation of weather variables including e.g. sea level and storm surges. Some of the data is publicly available e.g. on the web portal[19] of the Danish Meteorological Institute (DMI). The DMI is also known globally for regional climate modelling (RCM) and is the leading national authority on regional climate change projections. DMI uses Global Climate Models to monitor interactions and feedback mechanisms between atmosphere, ocean, land surface and ice on a larger scale.

There are no indicators developed for extreme events. DMI keeps track of events.

3b. Scenarios and projections are used to assess the economic, social and environmental impacts of climate change, taking into account geographical specificities and best available science (e.g. in response to revised IPCC assessments)

Yes / In progress / No

On the basis of the most recent Danish and European scenario calculations, the Danish Metereological Institute (DMI) has estimated the expected climate change in Denmark

[17] New coastal protection and erosion initiatives 2017 (link mangler p.t.)
[18] See Nordregio: http://www.nordregio.se/en/Metameny/About-Nordregio/Modules-About-Nordregio/Geographical-scope-we-cover/Norden/Addressing-climate-change-adaptation-at-the-Nordic-level/
[19] DMI: Weather: http://www.dmi.dk/vejr; Climate: http://www.dmi.dk/klima and http://research.dmi.dk/research/research-topics/climate/; Sea: http://www.dmi.dk/hav

focusing on 2050[20]. The assessment of future climate change is based on the scenarios used by the Intergovernmental Panel on Climate Change (IPCC).

Climate simulations and understanding of associated uncertainties are constantly being improved. The report from DMI presents the latest results based on European studies where a number of climate simulations were performed with several regional climate models (ENSEMBLES project and ABC4CDE: Assuring Best practiCes for Climate model Data Evaluation project which will provide scientific assessment and gap analysis[21]). Projection of future climate change based on an ensemble of climate models is more robust than estimates based on a single model.

3c. Sound climate risks/vulnerability assessments for priority vulnerable sectors are undertaken to support adaptation decision making

Yes / **In progress** / No

The impacts of possible climate change in Denmark have been evaluated several times, most recently in the 2012 report by the Task Force on Climate Change Adaptation: Mapping climate change – barriers and opportunities for action[22].

Vulnerability assessments have been an element in the mapping of impacts of climate change in Denmark[23].

Computer models show that an increased green-house effect results in changes in frequency, intensity and duration of extreme weather events.

Denmark will experience an increase in the frequency and duration of heat waves. Summers will be characterised by longer dry spells and an increase in heavy precipitation events. The occurrence of days with sub-zero temperatures will decrease dramatically, while the length of the growing season will increase. The increase in sea level will give rise to increased storm-surge height. A report on future climate in Denmark is available[24] and an analysis of the 5th Assessment Report from IPCC, with special focus on Denmark is available[25]

No further updates/publications on impacts of climate change since 2015 are available.

---

[20] Olesen et al. 2012: Future Climate Change in Denmark (in Danish); Mapping Climate Change – Barriers and opportunities for action, Task Force on Climate Adaptation 2012, http://klimatilpasning.dk/media/590078/mapping_climate_change.pdf

[21] See here: http://research.dmi.dk/research/research-topics/climate/

[22] Background report, mapping climate change, barriers and opportunities for action, May 2012, Task Force on Climate Change Adaptation , Danish Nature Agency, ISBN 978-87-7279-609-3, http://en.klimatilpasning.dk/media/600858/130206_mapping_climate_change_final.pdf

[23] See e.g. chapter 6.1.3 in Denmark's Sixth National Communication on Climate Change, UNFCCC, December 2013, which covers construction and housing, transport infrastructure, groundwater and water supply and waste water and flooding, agriculture, forestry, fisheries, energy, tourism, nature, health, and cross-sectoral areas. http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/7550.php

[24] http://www.klimatilpasning.dk/media/854031/dmi_-_klimaforandringer__2014_.pdf

[25] http://www.klimatilpasning.dk/media/868690/analyse_af_ipcc_delrapport_2__effekter_klimatilpasning_og_s_rbarhed_fina_____3_.pdf

3d. Climate risks/vulnerability assessments take transboundary risks into account, when relevant

Yes / **In progress** / No

It is unclear whether climate risks and vulnerability assessments take transboundary risks into account. However, 2b provides evidence that coordinated collaboration on transboundary risks takes place.

4. Knowledge gaps

4. Work is being carried out to identify, prioritise and address the knowledge gaps

Yes / In progress / No

There are no recent documents on the identification, prioritisation or work on knowledge gaps. The Ministry of Environment and Food has regular meetings with universities in order to highlight need for further research on climate change adaptation. There is recent work done on adaptation knowledge regarding local level planning and coastal impacts.

The Coordination Unit for Research in Climate Change Adaptation (in Danish: Koordineringsenhed for Forskning i klimatilpasning - KFT[26]) was established under the Danish government's "Strategy for Adaptation to a Changing Climate". KFT was mandated to strengthen the coordination of national research activities in the context of climate change adaptation, to ensure that synergies across a broad range of different research areas were harvested. KFT was a joint endeavour by the National Environmental Research Institute at the Aarhus University, the Danish Meteorological Institute, the Geological Survey of Denmark and Greenland (GEUS), University of Copenhagen and Denmark's Technical University. KFT reported to the interministerial "Coordination Forum on Adaptation" and provided science based knowledge to a national web portal on climate adaptation at that time hosted by the Danish Ministry of Climate and Energy.

KFT aimed to collate and transfer knowledge within all Danish (and international) research areas that worked on the issue of climate change adaptation, and helped coordinate information access at the science-policy interface. This activity built on strong cooperation across a wide range of scientific disciplines as well as regular interaction with both the policy-makers and other stakeholders. In addition, KFT fostered national and international networks; identified and described knowledge gaps as input for future strategic research programmes.

In 2013 KFT was transferred to a network of research activities on climate change adaptation. The network meets on a yearly basis and keeps up network activities. The website is no longer active

[26] KFT Homepage- research Network on climate change adaptation (in Danish): http://klimatilpasning.au.dk/

5. Knowledge transfer

5a. Adaptation relevant data and information is available to all stakeholders, including policy makers (e.g. through a dedicated website or other comparable means)

Yes / In progress / No

The Danish web-portal[27] for Climate Change Adaptation contains news, concrete cases about climate change adaptation and interactive tools. A number of tools aimed at municipalities, enterprises and individuals were made available in 2012. These tools can be used to assess risk from rising sea levels and to climate-proof buildings.

The portal provides the public, authorities and businesses with information about climate change and their influence on society. Furthermore, it will give practical information about climate adaptation. The portal is under constant development and will include: updated data and maps of temperatures, precipitation, sea and groundwater; articles and guidance about areas in various sectors affected by climate changes; practical advice on climate adaptation; examples of calculations of how climate change may be included as a basis for important decisions; useful analysis and assessment tools for the public and decision-makers; and information about the latest research and development into adaptation to climate change. An English version is available with an English newsletter.

5b. Capacity building activities take place; education and training materials on climate change adaptation concepts and practices are available and disseminated

Yes / In progress / No

At an earlier stage of implementation, the Danish Adaptation Strategy and Action Plan have provided for capacity building at central, municipal, and citizens levels. A mobile team (2012-2013) was established as part of the Task Force on Climate Change Adaptation. This team offered guidance and facilitated collaboration between municipal authorities and other stakeholders in the field, for example with regard to preparing the municipal climate change adaptation plans.

A new mobile team on flooding and erosion has been established[28]. The focus is on municipalities.

[27] the Danish portal for Climate Change Adaptation: http://en.klimatilpasning.dk/

[28] http://www.klimatilpasning.dk/rejseholdet.aspx

Step C: identifying adaptation options

6. Adaptation options' identification

6a. Adaptation options address the sectoral risks identified in 3c, the geographical specificities identified in 3b and follow best practices in similar contexts

Yes / No

The Danish adaptation policy addresses fourteen sectors of priority including geographical issues such as for coastal regions. (see indicator 1b). Information, including on relevant risk assessments, is available on the Danish web portal[29]. A coastal analysis was made by the Coastal Authority. The analysis focuses on effects of a future changing climate at the Danish coasts[30].

6b. The selection of priority adaptation options is based on robust methods (e.g. multi-criteria analyses, stakeholders' consultation, etc.) and consistent with existing decision-making frameworks

Yes / **No**

Adaptation options have been prioritised, but the methodology used for this prioritisation could not be determined on the basis of the information available. The NAS refers to development of socio-economic modelling tools for climate change adaptation as a field where further work is needed. A new tool, PLASK, that calculates the socioeconomic benefits from climate change adaptation, has been developed and can be found on the webportal[31]. The tool is now being tested in municipalities.

6c. Mechanisms are in place to coordinate disaster risk management and climate change adaptation and to ensure coherence between the two policies

Yes / **In progress** /No

There is some evidence that climate change impacts and projections is taken into consideration in disaster risk reduction planning. The Danish Emergency Management Agency (DEMA) assists in ensuring knowledge about climate change and extreme weather events is taken into account in the risk based design of local Fire and Rescue Service as well as planning on a local level.

The Danish web portal[32] on adaptation includes information on the link to disaster risk management[33]. The web portal provides information regarding preparedness[34].

The National Risk Profile for Denmark provides a common ground for further coordination of both risk management and climate change adaptation considerations. The most recent version of the National Risk Profile was published in January 2017 and

[29] http://www.klimatilpasning.dk/publikationer/2014-danske-publikationer.aspx
[30] http://kysterne.kyst.dk/kystanalyse.html
[31] http://www.klimatilpasning.dk/viden-om/%C3%B8konomi/beregningsvaerktoej.aspx

[32] Danish Portal on Climate Change Adaptation: www.klimatilpasning.dk
[33] http://en.klimatilpasning.dk/technologies/ready-and-fully-prepared-emergency-preparedness.aspx
[34] http://en.klimatilpasning.dk/sectors/preparedness.aspx

includes three incident types directly impacted by climate change: hurricanes and strong storms, extreme rainfall events, and coastal flooding[35].

7. Funding resources identified and allocated

7. Funding is available to increase climate resilience in vulnerable sectors and for cross-cutting adaptation action

Yes / In progress /No

A dedicated budget is available for financing cross-cutting adaptation action (e.g. national scenarios and climate services, capacity building, website). Information on the various sources (including domestic public finance, private finance, and EU level funds/grants) is provided on the web portal[36].

Funding is allocated to increase resilience in vulnerable sectors, which are defined in the report: Mapping Climate Change (see 1.1.b).

The Danish adaptation web portal lists a range of possible funding sources[37].

Several funding allocations are identified in the NAP, by various ministries, ranging from adaptation actions in the housing sector, to surface and wastewater treatment. There is seemingly no consolidated overview of overall funding needs and matching sources available.

The Danish Minister for Environment and Food has granted DKK 24,4 million in 2016 to nine projects in which municipalities will take care of climate proofing and ensuring better environmental conditions and less nitrogen in the aquatic environment[38]. Recently the grant has been increased by DKK 10 million to additional projects, which will be decided before end of December 2017. In 2017, the Government decided to carry out a number of initiatives to support municipalities and property owners in establishing cost-effective and holistically planned flood and erosion protection17. Several of the initiatives build on the work of a cross-ministerial committee set up at the beginning of 2017. Total funding allocated is DKK 62 million[39].

Step D: Implementing adaptation action

8. Mainstreaming adaptation in planning processes

8a. Consideration of climate change adaptation has been included in the national frameworks for environmental impact assessments

Yes / No

The Danish transposition of the revised EIA directive (Law number 448/2017) includes adaptation considerations in article 1, paragraph 2, article 12 and article 20.

[35] http://brs.dk/viden/publikationer/Documents/Nationalt-Risikobillede-2017-LowRes.pdf
[36] http://www.klimatilpasning.dk/teknologi/tilskud-til-klimatilpasning.aspx
[37] Funding sources: http://www.klimatilpasning.dk/kommuner/tilskud-til-klimatilpasning.aspx
[38] https://stateofgreen.com/en/profiles/mim/news/newnature-solutions-prevent-cities-from-flooding
[39] Awaiting adoption of the Budget 2018

8b. Prevention/preparedness strategies in place under national disaster risk management plans take into account climate change impacts and projections

Yes / **No**

Systematic warning systems[40] of extreme weather events are in place and being used by the Danish authorities and population..

Preparedness provisions are made in the National Preparedness Plan which keeps abreast of climate induced disaster risks by way of the National Risk Profile for Denmark. The most recent version of the National Risk Profile was published in January 2017. There is however no evidence how projected future climate extremes are factored in disaster risk management plans.

8c. Key land use, spatial planning, urban planning and maritime spatial planning policies take into account the impacts of climate change

Yes / No

Spatial planning has a central role in tackling extreme weather conditions in the future. The Ministry of the Environment has therefore amended the Planning Act, to make it possible for the municipalities to include climate change adaptation directly in the local development plans from 1 June 2012. This amendment was followed up with guidance to the municipalities. A change to the Planning Act is now in consultation and includes the provision that municipalities revise the local flood risk maps.

8d. National policy instruments promote adaptation at sectoral level, in line with national priorities and in areas where adaptation is mainstreamed in EU policies

Yes / **In progress** / No

Other sectors include climate change adaptation, such as transportation, buildings, coastal management, forestry, agriculture, energy, health, emergency preparedness, insurance.

8e. Adaptation is mainstreamed in insurance or alternative policy instruments, where relevant, to provide incentives for investments in risk prevention

Yes / No

There is clear awareness of the role to be played by insurance: insurance is mentioned in the NAS, and is well covered by the Danish adaptation portal where a search returns more than 450 references on "insurance".

Many insurance companies offer a discount if you invest in risk prevention at your property. If the damage is done, you can apply for compensation from the Danish Storm Council[41]. The Danish Storm Council handles cases concerning three types of natural catastrophes: storm surge, flooding from waterways and lakes and windfall.

The trade organization Insurance has collected a variety of data and information on climate damage to their homepage on climate change adaptation.

[40] Danish Emergency Management Agency (in Danish: "Beredskabsstyrelsen"): www.brs.dk

[41] http://www.danishstormcouncil.dk/Menu/About-The-Danish-Storm-Council/What-is-the-Danish-Storm-Council

Insurance[42] is also included as a dedicated web-page on the Danish adaptation portal. Overall little evidence available to confirm if adaptation has been effectively mainstreamed in insurance policy instruments.

9. Implementing adaptation

9a. Adaptation policies and measures are implemented, e.g. as defined in action plans or sectoral policy documents

Yes / **In progress** / No

The action plan presented 64 initiatives where 62 are either planned or implemented. 2 initiatives are cancelled. The overview of the implementation is not published.

9b. Cooperation mechanisms in place to foster and support adaptation at relevant scales (e.g. local, subnational)

Yes / No

Cooperation mechanisms foster and support adaptation at relevant scales (eg. local, subnational).

Central to climate change adaptation efforts is a strong interaction between state and municipalities. All 98 Danish municipalities have finalized their action plans and the rest were expected to catch up during 201643. A new mobile team with focus on flooding and erosion has been established.44

9c. Procedures or guidelines are available to assess the potential impact of climate change on major projects or programmes, and facilitate the choice of alternative options, e.g. green infrastructure

Yes / **No**

Procedures and guidelines to assess the potential impact of climate change on major projects or programmes are mentioned in the NAS. Guidelines are being developed by the mobile team to help municipalities to start the implementation of the climate change adaptation plans.

9d. There are processes for stakeholders' involvement in the implementation of adaptation policies and measures

Yes / **No**

Although there is ad-hoc stakeholder involvement in the implementation of adaptation policies and measures (for instance, by the private sector and specific interest groups), it is unclear whether processes have been established to facilitate this involvement.

[42] Insurance on the Danish adaptation portal: http://www.klimatilpasning.dk/sektorer/forsikring.aspx
[43] http://www.klimatilpasning.dk/kort/kommunekort.aspx
[44] http://www.klimatilpasning.dk/rejseholdet.aspx

Step E: Monitoring and evaluation of adaptation activities

10. Monitoring and reporting

10a. NAS/NAP implementation is monitored and the results of the monitoring are disseminated

Yes / **No**

Whereas the Danish adaptation web portal includes a wide range of examples of adaptation action in various sectors linked to the NAS/NAP currently there is no monitoring and evaluation mechanism using e.g. relevant indicators.

According to bilateral information sources, the action plan presented 64 initiatives where 62 are either planned or implemented. 2 initiatives are cancelled. The overview of the implementation has not been published.

10b. The integration of climate change adaptation in sectoral policies is monitored and the results of the monitoring are disseminated

Yes / **No**

The Danish adaptation web portal includes a range of examples and information about adaptation actions in various sectors in the form of case studies[45].

There are, however, no reports available that are dedicated to progress of adaptation in sectors.

10c. Regional-, sub-national or local action is monitored and the results of the monitoring are disseminated

Yes / **No**

The Danish adaptation web portal compiles a wide range of adaptation information at central and municipal levels[46]. The Danish regions are taking part in the coordination process. Many of the municipal websites contain information about the local climate change adaptation measures.

However, it is unclear whether there are systems in place allowing collection of information on adaptation action at sub-national levels in a comprehensive manner.

An evaluation[47] of all 98 municipalities' climate change adaptation plans shows that they are well in the process of handling floods. All municipalities have drawn up maps that designate flood risk areas. The municipalities have also prioritized the adaptation efforts.

[45] http://www.klimatilpasning.dk/sektorer.aspx
[46] Maps of plans and activities in the Danish municipalities: http://www.klimatilpasning.dk/kort/kommune-kort.aspx
[47] http://www.klimatilpasning.dk/media/1174683/evalueringsrapport.pdf

11. Evaluation

11a. A periodic review of the national adaptation strategy and action plans is planned

Yes / **No**

The government will continuously take stock of the progress of the initiatives in the action plan, and is expected to assess whether or not a review will be initiated. The NAP was reviewed in 2013 and 2015 in an inter-ministerial process. New initiatives have been decided in 2017 build on the work of a cross-ministerial committee set up at the beginning of 2017. Further a review of the municipal climate change adaptation action plans took place in 2016

11b. Stakeholders are involved in the assessment, evaluation and review of national adaptation policy

Yes / **No**

The Danish adaptation web portal does not provide information about the involvement of stakeholders in the monitoring, evaluation and review of adaptation actions.

SUMMARY TABLE

Adaptation Preparedness Scoreboard		
No.	**Indicator**	**Met?**
Step A: Preparing the ground for adaptation		
1	***Coordination structure***	
1a	A central administration body officially in charge of adaptation policy making	**Yes** / No
1b	Horizontal (i.e. sectoral) coordination mechanisms exist within the governance system, with division of responsibilities	**Yes** / In progress / No
1c	Vertical (i.e. across levels of administration) coordination mechanisms exist within the governance system, enabling lower levels of administration to influence policy making.	**Yes** / In progress / No
2	***Stakeholders' involvement in policy development***	
2a	A dedicated process is in place to facilitate stakeholders' involvement in the preparation of adaptation policies	**Yes** / No
2b	Transboundary cooperation is planned to address common challenges with relevant countries	**Yes** / No
Step B: Assessing risks and vulnerabilities to climate change		
3	***Current and projected climate change***	
3a	Observation systems are in place to monitor climate change, extreme climate events and their impacts	Yes / **In progress** / No
3b	Scenarios and projections are used to assess the economic, social and environmental impacts of climate change, taking into account geographical specificities and best available science (e.g. in response to revised IPCC assessments) Yes / In progress / No (e.g. in response to revised IPCC assessments)	**Yes** / In progress / No
3c	Sound climate risks/vulnerability assessments for priority vulnerable sectors are undertaken to support adaptation decision making.	Yes / **In progress** / No
3d	Climate risks/vulnerability assessments take transboundary risks into account, when relevant	Yes / **In progress** / No
4	***Knowledge gaps***	
4	Work is being carried out to identify, prioritise and address the knowledge gaps	**Yes** / In progress / No
5	***Knowledge transfer***	
5a	Adaptation relevant data and information is available to all stakeholders, including policy makers (e.g. through a dedicated website or other comparable means).	**Yes** / In progress / No

Adaptation Preparedness Scoreboard		
No.	**Indicator**	**Met?**
5b	Capacity building activities take place; education and training materials on climate change adaptation concepts and practices are available and disseminated	**Yes** / In progress / No
Step C: Identifying adaptation options		
6	***Identification of adaptation options***	
6a	Adaptation options address the sectoral risks identified in 3c, the geographical specificities identified in 3b and follow best practices in similar contexts	**Yes** / No
6b	The selection of priority adaptation options is based on robust methods (e.g. multi-criteria analyses, stakeholders' consultation, etc.) and consistent with existing decision-making frameworks	Yes / **No**
6c	Mechanisms are in place to coordinate disaster risk management and climate change adaptation and to ensure coherence between the two policies	Yes / **In progress** /No
7	***Funding resources identified and allocated***	
7	Funding is available to increase climate resilience in vulnerable sectors and for cross-cutting adaptation action	**Yes** / In progress /No
Step D: Implementing adaptation action		
8	***Mainstreaming adaptation in planning processes***	
8a	Consideration of climate change adaptation has been included in the national frameworks for environmental impact assessments	**Yes** / No
8b	Prevention/preparedness strategies in place under national disaster risk management plans take into account climate change impacts and projections	Yes / **No**
8c	Key land use, spatial planning, urban planning and maritime spatial planning policies take into account the impacts of climate change	**Yes** / No
8d	National policy instruments promote adaptation at sectoral level, in line with national priorities and in areas where adaptation is mainstreamed in EU policies	Yes / **In progress** / No
8e	Adaptation is mainstreamed in insurance or alternative policy instruments, where relevant, to provide incentives for investments in risk prevention	**Yes** / No
9	***Implementing adaptation***	
9a	Adaptation policies and measures are implemented, e.g. as defined in action plans or sectoral policy documents	Yes / **In progress** / No
9b	Cooperation mechanisms in place to foster and support adaptation at relevant scales (e.g. local, subnational)	**Yes** / No
9c	Procedures or guidelines are available to assess the potential impact of climate change on major projects or programmes,	Yes / **No**

Adaptation Preparedness Scoreboard		
No.	**Indicator**	**Met?**
	and facilitate the choice of alternative options, e.g. green infrastructure	
9d	There are processes for stakeholders' involvement in the implementation of adaptation policies and measures.	Yes / **No**
Step E: Monitoring and evaluation of adaptation activities		
10 Monitoring and reporting		
10a	NAS/NAP implementation is monitored and the results of the monitoring are disseminated	Yes / **No**
10b	The integration of climate change adaptation in sectoral policies is monitored and the results of the monitoring are disseminated	Yes / **No**
10c	Regional-, sub-national or local action is monitored and the results of the monitoring are disseminated	Yes / **No**
11 Evaluation		
11a	A periodic review of the national adaptation strategy and action plans is planned	Yes / **No**
11b	Stakeholders are involved in the assessment, evaluation and review of national adaptation policy	Yes / **No**