



**Ministry of Environment
of Denmark**

Environmental
Protection Agency

Climate Change Adaptation in Denmark

June 2026



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Photo: NIRAS

1. The Impacts of Climate Change on Denmark

In Denmark, temperature increases have broadly followed the global average since observations began in the 1870s. Over the past 150 years, temperatures have risen by approximately 1.5°C, and since the mid-20th century developments have closely matched climate model projections towards 2100.

Under a high-emissions scenario, temperatures are projected to rise by approximately 3.4°C by 2100 compared with the 1981-2010 average. By comparison, projected warming is approximately 1°C under a low-emissions scenario and around 2°C under an intermediate scenario.

Higher temperatures will lead to more frequent and prolonged heatwaves, warmer summer nights above 20°C, and fewer frost days. Precipitation patterns are also changing.

Annual rainfall in Denmark has already increased by around 100 mm over the past century and is expected to continue rising, particularly during autumn and winter. At the same time, cloudbursts and heavy rainfall events are projected to become more intense and frequent.

Selected climate impacts by the end of the century (2071-2100) under an intermediate emissions scenario (RCP4.5/SSP2-4.5), compared with 1981-2010, include:

- An average temperature increase of approximately 2.0°C nationwide.
- Around 50 frost days annually, compared with approximately 80 today, and a growing season extended by almost two months to approximately 10 months.
- Heatwave days increasing from approximately 2 days to 5 heatwave days per year.
- Winter precipitation increasing by nearly 12%, with more precipitation falling as rain.
- Summer precipitation remaining broadly unchanged overall, but occurring more frequently as intense showers.
- Accelerating sea level rise, lowest in northern Jutland and highest in south-western Jutland due to post-glacial land uplift differences.
- More severe storm surges, with rising sea levels causing substantially greater flooding impacts.
- A storm surge event that currently occurs statistically once every 20 years becoming likely every second year.



Photo: NIRAS

2. Governance and Legislative Framework

The Danish governance model is characterized by a highly decentralized public administration structure, where responsibilities are distributed between the state, regions, municipalities, and utility companies. Within spatial planning, climate adaptation, and flood management, governance is based on a combination of national framework regulation, local implementation, and sector-specific coordination.

National Level

At the national level, the Danish state establishes the overall legal and policy framework through legislation, national planning directives, environmental regulation, climate policies, and sectoral plans. The state retains a coordinating and supervisory role and may intervene in municipal planning if local plans conflict with national interests. The Ministry of the Environment and related national agencies are responsible for safeguarding national interests in areas such as coastal protection, environmental regulation, water management, and spatial planning. National governance is therefore primarily framework-based, relying on legislation, guidance, and veto powers rather than direct implementation. Recently, the state is taking a greater role in ensuring progress in projects located in areas with a high risk of coastal flooding.

Municipal level

Municipalities constitute the core operational level of Danish governance. Since 2007, municipalities have held primary responsibility for land-use planning, local climate adaptation, flood risk management, wastewater planning, and implementation of local development projects. Municipal plans and legally binding local plans regulate land use and urban development. Municipalities also issue building permits and ensure that development complies with planning and environmental legislation. The Danish planning system is therefore strongly municipality-driven, reflecting a broader governance tradition based on decentralization and local political autonomy.

Waste Water Utility Companies

Utility companies (“forsyninger”), particularly municipally owned wastewater utilities, play a central role in climate adaptation and flood management. Although formally organized as independent corporate entities, utilities operate within a regulated public framework and closely coordinate with municipalities. They are responsible for wastewater infrastructure, stormwater management, sewer systems, and increasingly the implementation of climate adaptation projects aimed at handling cloud-bursts and extreme rainfall. Utilities are financed through user tariffs and therefore constitute an important financing mechanism for local climate adaptation investments. Their role has expanded significantly as climate adaptation has become increasingly integrated into urban and infrastructure planning.

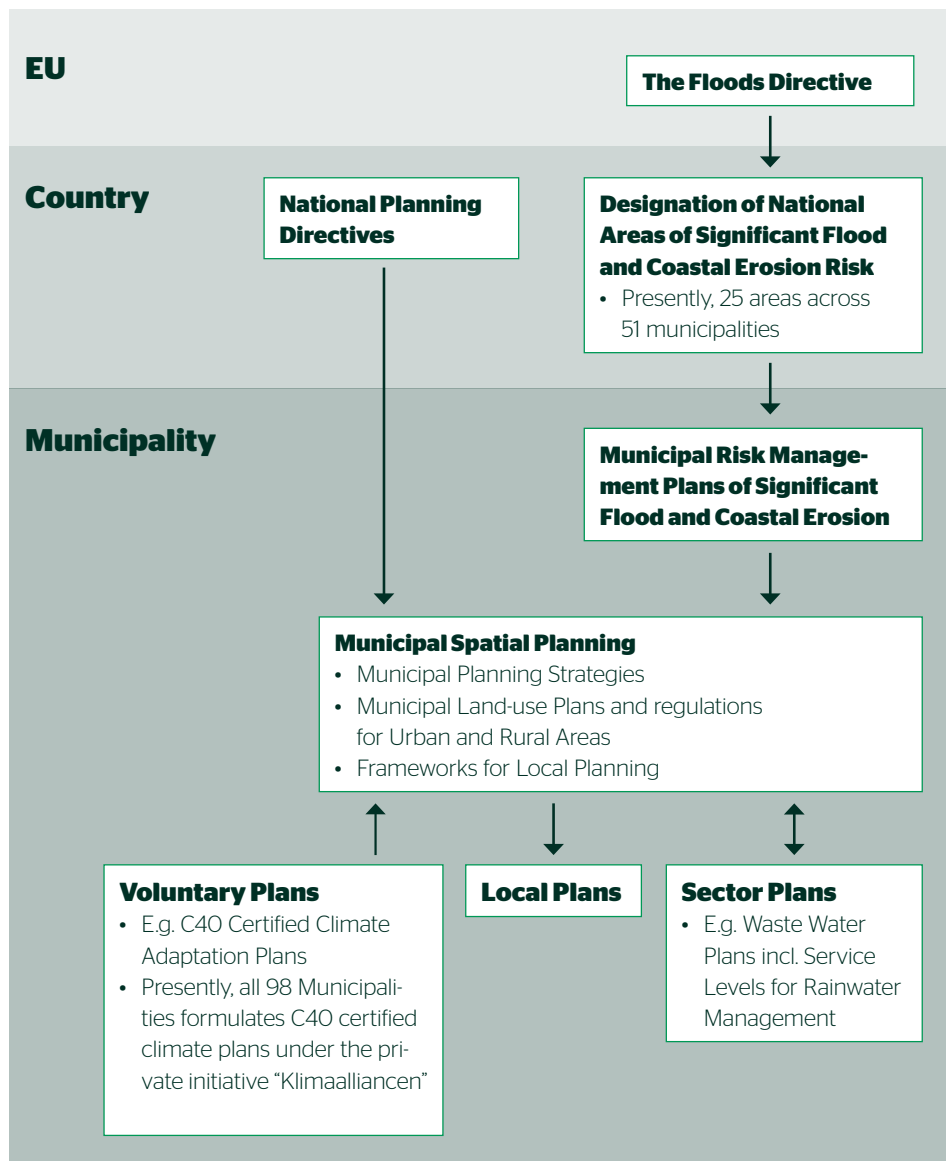
The EU Level

The EU Floods Directive (Directive 2007/60/EC) has been implemented in Denmark primarily through the Flood Risk Act (“Oversvømmelsesloven”) and integrated into the Danish planning system through a hierarchical governance structure linking national, municipal, and sectoral planning.

At the national level, the state is responsible for preparing preliminary flood risk assessments, flood hazard maps, flood risk maps, and national flood risk management plans in accordance with the directive. The Danish Environmental Protection Agency coordinates implementation and ensures compliance with EU requirements.

Implementation is closely linked to Denmark’s planning hierarchy. National flood risk management plans provide the strategic framework, while municipalities are responsible for integrating flood risk considerations into municipal plans, local plans, and land-use regulation.

Overall, the Danish governance model is characterized by multi-level governance, where the state defines strategic and legal frameworks, municipalities carry out implementation and land-use regulation, and utility companies provide technical infrastructure and financing capacity. The model relies heavily on co-operation, negotiated coordination, and shared responsibilities across administrative and sectoral boundaries.



Danish Plan Hierarchy Related to Climate Change Adaptation (Edited after Galland and Enemark, 2015)



3. Regulation of Climate Change Adaptation

The Danish regulatory framework is divided across several separate acts and related executive orders and regulations. The overview below provides a summary of the regulation applicable to each type of water-related risks, including the relevant legislation, the authorities involved, and the allocation of responsibilities for preventive measures.

The overview covers six main categories of water-related risks: rising sea levels and erosion, storm surges, watercourses, cloudbursts, rainwater, and shallow groundwater. It includes only the principal authorities and the most significant legislation relating to preventive climate adaptation projects and damage compensation. In addition, it outlines the financing structure, including which parties bear the initial costs and which parties ultimately finance the solutions. Finally, the overview illustrates how compensation for damages is handled, including whether damages are covered by insurance schemes or the national storm surge compensation scheme.

Flood types	Higher sea levels and erosion	Storm surge	Watercourses	Cloudbursts	Rainwater	Shallow groundwater
Key regulation	Coastal Protection Act	Coastal Protection Act Natural Disaster Act	Watercourse Act Natural Disaster Act	Wastewater Payment Act Water Sector Act Environmental Protection Act		
Collective prevention of flood damage						
Who can initiate?	• The State • Municipalities • Property owners	• The State • Municipalities • Property owners	• Municipalities • Property owners	• Municipalities • Property owners	• Municipalities • Wastewater utility companies	• Property owners • (Municipalities) • (Wastewater utility companies)
Who must approve?	• The State • Municipalities • Danish Coastal Authority	• The State • Municipalities • Danish Coastal Authority	• Municipalities	• Municipalities	• Municipalities	• Municipalities
Who carries out the work?	• The State • Municipalities • Coastal protection associations	• The State • Municipalities • Coastal protection associations	• Municipalities • Pumping associations	• Property owners • Municipalities • Wastewater utility companies	• Wastewater utility companies	• Property owners • (Wastewater utility companies)
Who provides financing upfront?	• The State • Protected property owners • Municipalities • Municipally guaranteed loans	• The State • Protected property owners • Municipalities • Municipally guaranteed loans	• Municipalities • Property owners • Pumping associations	• Property owners • Municipalities • Wastewater utility companies	• Wastewater utility companies	• Property owners • (Wastewater utility companies)
Who ultimately pays?	• The State • Municipalities • Protected property owners • State coastal protection fund	• The State • Municipalities • Protected property owners • State coastal protection fund	• Municipalities • Property owners	• Property owners • Municipalities • Wastewater utility companies	• Wastewater utility companies	• Property owners • (Wastewater utility companies)
Who can appeals be made to?	• The authority that made the decision. • Appeals handled by the Danish Environmental and Food Appeals Board	• The authority that made the decision. • Appeals handled by the Danish Environmental and Food Appeals Board (Coastal Protection Act) • Natural Disaster Council (Natural Disaster Act)		• The Water Sector Appeals Authority, appeals handled by the Competition Appeals Tribunal (Water Sector Act) • The authority that made the decision. Appeals handled by the Danish Environmental and Food Appeals Board (Environmental Protection Act) • Energy Appeals Board (Wastewater Payment Act)		
Possibility of compensation for damages						
Who bears the risk?	• Property owner	• Covered under the Natural Disaster Act	• Covered under the Natural Disaster Act • Property owner	• Property owner • Covered by insurance	• Property owners • Limited possibility of insurance coverage	• Property owners • Limited possibility of insurance coverage

Source: Hilbert, S. (2025). Water, damages and flood prevention. Schjødt Advokatpartnerselskab
Overview of the Regulation Applicable to Each Type of Water-Related Risk

4. Public and Private Funding Sources

Several Danish and European funding schemes and sources support climate adaptation and flood resilience projects. They differ in scope and purpose, ranging from public co-financing of infrastructure projects to innovation funding, philanthropic support, and international cooperation initiatives.

The Danish Coastal Protection Fund

The Coastal Protection Fund is a Danish state co-financing scheme administered by the Authority that supports coastal protection and climate adaptation projects aimed at reducing the risk of coastal flooding and erosion. The scheme provides funding for measures such as dikes, flood barriers, sluice gates, and beach nourishment projects implemented by municipalities and local coastal protection partnerships. The purpose of the scheme is to strengthen longterm resilience to rising sea levels and increasingly severe storm surges caused by climate change. Projects receiving support are generally required to provide co-financing for the remaining project costs.

The Danish Environmental Technology Development and Demonstration Programme (MUDP)

MUDP is a funding scheme under the Danish Ministry of Environment that supports the development, testing, and demonstration of innovative environmental technologies. The programme is administered by the Danish Environmental Protection Agency and aims to accelerate green technological solutions to environmental and climate-related challenges.

Within climate adaptation, MUDP supports projects that strengthen resilience against flooding, storm surges, heavy rainfall, and other climate-related risks. Funding is provided for the development and demonstration of technologies and digital tools related to water management, flood prevention, climate-resilient infrastructure, and risk assessment.

The Danish State Research Reserve

The Danish State Research Reserve is a national funding mechanism through which the Danish Parliament annually allocates strategic research and innovation funding via the national budget. The funds are distributed across selected thematic priorities, including climate adaptation, and are administered through various public research and innovation programmes under the Danish Ministry of Higher Education and Science. Within climate adaptation, DKK 34 million annually during 2026–2029 are allocated to continue activities within the ongoing and long-term research areas established by the National Centre for Climate Research (NCKF) since 2020. In addition, DKK 73.3 million in 2026 are allocated for initiatives aimed at strengthening the knowledge and data basis for climate adaptation and flood forecasting.

Realdania

Realdania is a philanthropic association that supports projects within the built environment, including climate adaptation and climate-resilient urban development. Through grants and partnerships, Realdania supports projects that combine flood protection and climate adaptation with broader social, urban, and environmental benefits. The organisation particularly focuses on innovative and demonstrative projects that strengthen resilience against cloudbursts, storm surges, and rising sea levels while simultaneously improving urban spaces and quality of life.

The EU LIFE and EU Interreg Programmes

The EU LIFE Programme is the European Union's funding instrument for environment and climate action. Within climate adaptation, LIFE supports innovative projects related to flooding, storm surges, water management, and climate-resilient infrastructure. Funding is available for pilot projects, large-scale implementation, governance initiatives, and capacity building, with a focus on scalable solutions supporting EU climate policies.

The EU Interreg programmes are EU-funded territorial cooperation programmes supporting cross-border and transnational collaboration between municipalities, regions, research institutions, and other public actors. Within climate adaptation, Interreg funds projects related to flood risk management, coastal protection, water management, urban resilience, and adaptation planning, with a strong focus on knowledge exchange and testing innovative approaches across Europe.

5. Additional National Implementation Mechanisms

The Danish state plays a central role in climate adaptation through national strategies, regulatory frameworks, funding initiatives, data infrastructure, and planning support tools. In recent years, Denmark has strengthened its national climate adaptation governance through comprehensive action plans, improved coordination between public authorities and utility companies, and the development of advanced decision-support systems for flood risk management and spatial planning. Together, these initiatives provide the strategic, technical, and knowledge-based foundation for local climate adaptation planning and implementation across Denmark.

The National Climate Adaptation Plans

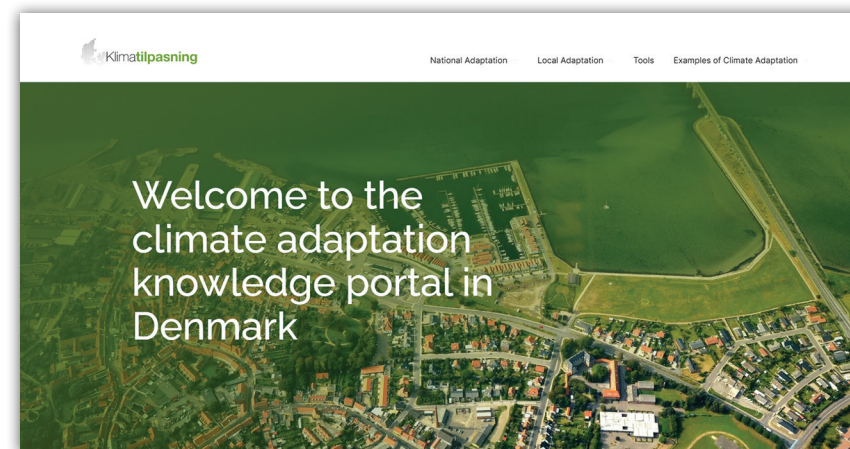
The Danish Government launched “The National Climate Adaptation Action Plan no. 1” in 2023 to strengthen Denmark’s resilience against flooding, storm surges, sea level rise, erosion, and rising shallow groundwater. The plan focuses particularly on coastal protection, management of shallow groundwater in urban areas, and improved coordination between the state, municipalities, and utility companies. The Government allocated approximately DKK 1.3 billion to the initiative, including funding for coastal protection projects, protection of the Danish west coast, and strengthened climate adaptation planning.

In 2025, the Danish Government significantly increased national climate adaptation funding through a DKK 900 million acceleration package for coastal protection, followed by an additional DKK 982 million allocated in the national budget for climate resilience measures. In February 2026, the Government also presented the proposal for “Climate Adaptation Plan no. 2”, including a proposed DKK 14.9 billion national coastal protection initiative, which has not yet been politically adopted.

The national climate adaptation plans function as a national strategic framework for climate adaptation. They establish national priorities, funding initiatives and allocation of responsibilities. The plans are not implemented directly as legally binding plans under the Danish Planning Act, but are instead translated into practice through national legislation, guidance documents, national interests in municipal planning, sector-specific legislation, and related regulatory instruments.

National Climate Adaptation Webportal

Klimatilpasning.dk is Denmark’s national knowledge and information platform for climate adaptation. The platform is operated by the Danish Environmental Protection Agency together with a number of ministries, government agencies, and organizations. It provides guidance, data, tools, case studies, and regulatory information related to climate adaptation and flood risk management. The platform also serves as a central access point for national climate adaptation tools, guidance documents, funding information, and examples of best practice projects across Denmark.



The national webportal with information and inspiration on climate adaptation

National Climate Adaptation Decision Support Tools

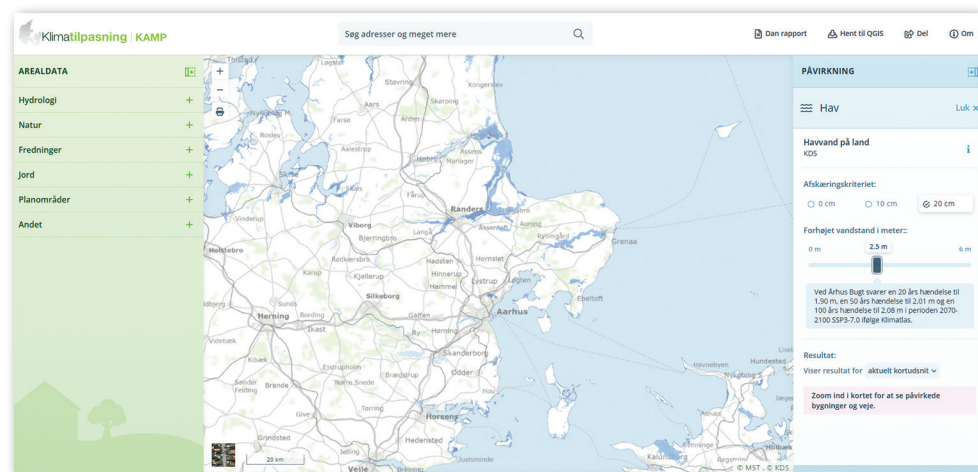
The Danish state provides a range of national climate adaptation tools that support municipalities, utility companies, authorities, and other stakeholders in climate adaptation planning and flood risk management. The tools provide access to climate data, hydrological models, risk screening, and spatial planning support related to flooding, sea level rise, groundwater, and extreme weather events.

KlimaAtlas (Climate Atlas) is developed by the National Centre for Climate Research at the Danish Meteorological Institute (DMI) and provides authoritative climate data and projections for Denmark. The tool includes data on future temperature, precipitation, sea levels, storm surges, drought, and extreme weather under different emissions scenarios and is widely used as a common planning basis for climate adaptation.

HIP (Hydrological Information and Prognosis System) provides access to national hydrological data and model calculations related to groundwater, surface water, and the hydrological cycle. The platform visualises hydrological conditions in a consistent format and supports assessments of groundwater and water-related climate risks.

KAMP (Climate Adaptation and Land Use Tool for Environmental and Planning Staff) is a national screening tool that combines climate, hydrological, land-use, and infrastructure data. It helps municipalities identify areas potentially at risk from flooding, sea level rise, heavy rainfall, and rising groundwater. KAMP also enables assessments of potentially affected buildings, roads, and economic values.

Kystplanlægger 2120 (Coastal Planner) is a national coastal planning tool developed by the Danish Coastal Authority. The tool maps long-term coastal flood and erosion risks towards the year 2120 and provides indicative strategies and adaptation options for coastal protection and spatial planning in vulnerable coastal areas.



The decision support tool KAMP



Photo: NIRAS

6. Voluntary Initiatives

Some of the most significant voluntary climate adaptation initiatives in Denmark are collaborative partnerships and demonstration projects that go beyond mandatory municipal planning requirements. These initiatives typically involve municipalities, utility companies, philanthropic foundations, research institutions, and civil society actors working together to develop innovative climate adaptation solutions.

One of the most influential initiatives is the DK2020 initiative, under which all 98 Danish municipalities voluntarily committed to preparing comprehensive climate action plans aligned with the Paris Agreement and the C⁴O climate planning framework, including both CO₂ reduction and climate adaptation.

DK2020 continues in the initiative Klimaalliancen (the climate alliance) that is a national expanding of the work initiated under the DK2020 programme. Building on the climate plans developed under DK2020, Klimaalliancen focuses on implementation, cross-municipal cooperation, capacity building, and the sharing of knowledge and tools related to climate mitigation and adaptation. The initiative aims to support municipalities in translating climate ambitions into concrete action.

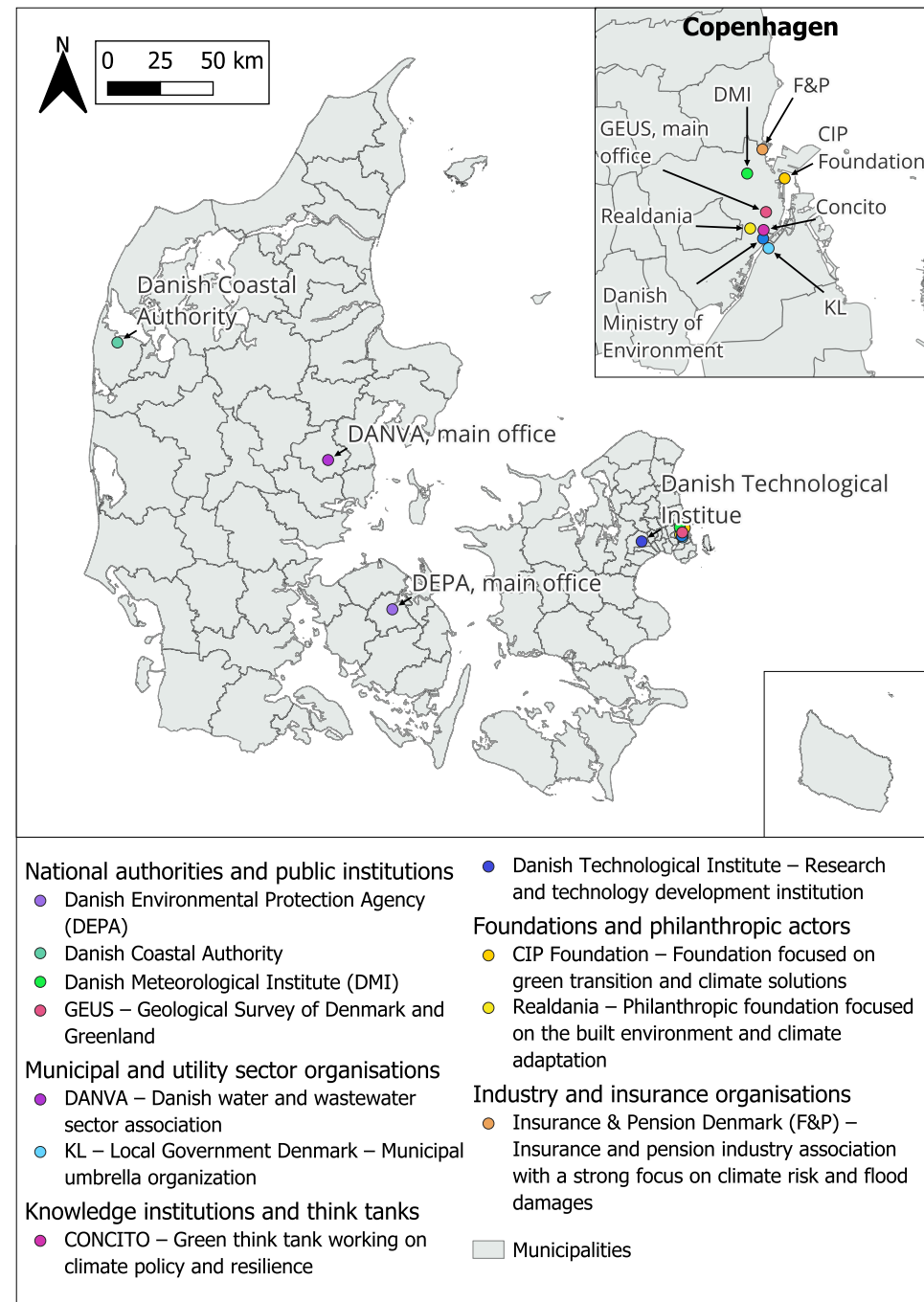
The initiative is supported by Realdania and KL (Local Government Denmark). It has significantly strengthened local climate adaptation planning and cross-sectoral cooperation in municipalities across Denmark.



Photo: NIRAS

7. Map of Major Public and Private Institutions

Several agenda-setting organisations play an important role in shaping climate adaptation policy, knowledge development, financing, and implementation in Denmark. These actors include national authorities, research institutions, utility and municipal organisations, foundations, industry associations, and knowledge centres. Together, they contribute to governance, regulation, innovation, advocacy, and practical climate adaptation solutions related to flooding, sea level rise, water management, and climate resilience.



8. Additional Information

Danish Environmental Protection Agency

The Danish Environmental Protection Agency (DEPA) works to integrate climate adaptation into environmental and related legislation and coordinates national climate adaptation guidance. Under the DEPA, the Danish Coastal Authority is responsible for coastal protection and adaptation to sea level rise and coastal flooding. The DEPA also operates Klimatilpasning.dk, Denmark's national climate adaptation portal, which provides guidance, tools, case studies, and information on climate adaptation in collaboration with ministries, government agencies and Local Government Denmark (KL).

Useful links:

- Danish DEPA: <https://eng.mst.dk/>
- Danish Coastal Authority: <https://kyst.dk/english>
- Klimatilpasning.dk: <https://eng.klimatilpasning.dk/>

Selected project cases from Klimatilpasning.dk:

- Case: Climate Adaptation at Aarhus Docklands
- Case: Stream Restoration in Haarby Reduces the Risk of Flooding
- Case: Recreational Areas Lead Water Away From the new Herlev Hospital
- Case: Cheap and Effective Climate Change Adaptation in Hareskoven
- Case: Innovative climate change adaptation at Lemvig Harbour

Danish Meteorological Institute (DMI)

Danish Meteorological Institute (DMI) is Denmark's national meteorological authority and a central governmental institution for climate research, weather forecasting, and climate data. DMI plays a key role in Danish climate adaptation by providing authoritative climate projections, sea level data, storm surge forecasts, warning and information on extreme weather events. Through the National Centre for Climate Research and tools such as KlimaAtlas, DMI supports municipalities, utility companies, authorities, and planners with data and analyses used in climate adaptation planning, flood risk management, coastal protection, and infrastructure resilience.

Useful links:

- DMI: <https://www.dmi.dk/about-dmi>
- KlimaAtlas: <https://www.dmi.dk/klimaAtlas>

Geological Survey of Denmark and Greenland (GEUS)

GEUS is Denmark's national geological research institution under the Ministry of Climate, Energy and Utilities. GEUS provides research, mapping, and data on ground-water, hydrology, coastal processes, and sea level rise to support climate adaptation and flood risk management.

GEUS contributes to several national climate adaptation tools, including ground-water maps, hydrological models used in HIP, and geological and groundwater datasets integrated into KAMP and other national screening tools used by municipalities, utilities, and state authorities in climate adaptation planning.

Useful links:

- GEUS: <https://eng.geus.dk/>

The decision-support tools:

- HIP: <https://hipdata.dk/>
- KAMP: <https://kamp.klimatilpasning.dk/>

CONCITO – Green Think Tank

CONCITO is Denmark's green think tank and works to accelerate the transition to a climate-neutral and climate-resilient society through research, policy analysis, and stakeholder collaboration. Within climate adaptation, CONCITO focuses on strengthening national climate resilience, promoting integrated climate planning, and developing policy recommendations related to flooding, water management, urban resilience, and naturebased solutions.

Useful links:

CONCITO: <https://concito.dk/en/topic/climate-adaptation>



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