



RESEARCH IN SUSTAINABILITY

CLIMATE

Photo: Mads Claus Rasmussen/Ritzau Scanpix

A climate-friendly society based on knowledge and data

The Earth's climate is under pressure and the sustainable transition of our society is literally a burning platform. The UN's Intergovernmental Panel on Climate Change (IPCC) estimates that the concentration of CO₂ in the atmosphere is at its highest level in over two million years.

The Danish Climate Act stipulates that Danish greenhouse gas emissions must be reduced by 50-54 per cent compared to 1990 by 2025, and we must be climate neutral by 2050 at the latest.

At DTU, we collect climate data from space, on land, and in aquatic environments. We monitor developments and use data to calculate the state of the climate, predict disasters, and ensure that the solutions and technologies we work with respect the planetary boundaries. We account for rebound effects and use the 'sustainability by design' approach. Developing the technologies that will help us achieve our goals requires collaboration and investment.

DTU holds a strong position in research in:

- Space technology
- Collection of climate data
- Aquatic resources and ecosystems
- Climate policies and impact assessment
- CO₂ capture and storage
- Transition to renewable energy sources
- Power-to-X
- Biosolutions

At DTU we are committed to a responsible future

In Europe we must transition towards a more viable society based on more sustainable solutions.

At DTU, we lead cutting-edge research in engineering and natural sciences, supported by one of Europe's most robust innovation ecosystems.

Our strength lies in interdisciplinary collaboration, where we develop advanced technologies and sustainable solutions to benefit society.

Kind regards,



Christine Nellemann,
provost



Data collection and processing

At DTU, we prepare society for the future through extensive collection of climate data and knowledge:

- Collection of data on greenhouse gases from meteorological observation systems on land
- Collection of data from aquatic ecosystems
- Collection of climate data from space, including:
Calculations of resource consumption such as freshwater resources and predictions of future climate disasters
- CO₂ uptake from trees and plankton
- Measuring biomass and growth rates in forests
- Data about melting in the Arctic and Antarctica through observations from space, air, and land

Impact analysis and sustainability assessment

At DTU, we conduct:

- Analyses and calculations of economic, social, and environmental impacts for the development of climate policies
- Integrated modelling of climate scenarios and calculations of socio-economic aspects of, e.g., floods
- Calculation of costs of establishing large-scale systems, including land use, risk economics, and human impact
- DTU's Centre for Absolute Sustainability develops models to calculate the absolute sustainability of products and our behaviour based on our planet's resources and planetary boundaries. The models show whether something is sustainable in an absolute sense and not just less environmentally harmful than the alternatives
- Mapping of hidden environmental elements that may have ecotoxic effects when scaled up

Development of climate technologies

DTU is leading in research:

- Technologies that can reduce CO₂ emissions immediately through capture and storage
- Energy technologies – wind, solar, and batteries – that contributes to increasing the share of renewable energy
- Power-to-X and acceleration of material development for catalysts that will deliver new forms of chemicals and fuels
- Biosolutions and microbial solutions in food, new materials, alternative fuels, biofilters, etc.

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