Towards climate neutral and resilient energy networks

European Climate-Resilient Energy System –
Enhancing adaptation and resilience indicators in the ENTSO-E TYNDP CBA framework – Part 2
20 March 2025

prof. Lena Kitzing

https://climate-advisory-board.europa.eu

European Scientific Advisory Board on Climate Change

Outline

- About the Advisory Board
- Published and upcoming advice
- Opportunities to enhance EU's climate resilience and long-term preparedness

European Scientific Advisory Board on Climate Change

The Advisory Board

shall serve as a point of reference for the Union on scientific knowledge relating to climate change by virtue of its independence and scientific and technical expertise.

European Climate Law (EU) 2021/1119

Scientific experts, appointed in a personal capacity

European Scientific Advisory Board on Climate Change

Ottmar Edenhofer
(Chair)
Technische Universität in Berlin

Jette Bredahl Jacobsen
(Vice-Chair)
University of Copenhagen

Laura Diaz Anadon
(Vice-Chair)
University of Cambridge

Maarten Van Aalst
University of Twente

Constantinos Cartalis
National and Kapodistrian University of Athens

Suraje Dessai
University of Leeds

Vera Eory
Scotland's Rural College

Edgar Hertwich
Norwegian University of Science and Technology in Trondheim

Lena Kitzing
Technical University of Denmark

Elena Lopez-Gunn
ICATALIST

Lars J. Nilsson
Lund University

Keywan Riahi
International Institute for Applied Systems Analysis

Joeri Rogelj
Grantham Institute of the Imperial College London

Nicolaas Schrijver
Leiden University

Jean-François Soussana
French National Research Institute for Agriculture, Food…

Broad mandate in the European Climate Law and a specific mandate in the TEN-E regulation

European Scientific Advisory Board on Climate Change

European Climate Law

- Consider the latest findings of the IPCC relevant to the EU
- Provide scientific advice on EU measures, targets, budgets, and their coherence with EU commitments
- Identify actions and opportunities
- Contribute to the exchange of scientific knowledge
- Raise awareness on the impacts of climate change

+ Specific tasks in the revised TEN-E Regulation (art. 11 on CBA, and art. 12 on scenarios)

Advice published so far

European Scientific Advisory Board on Climate Change

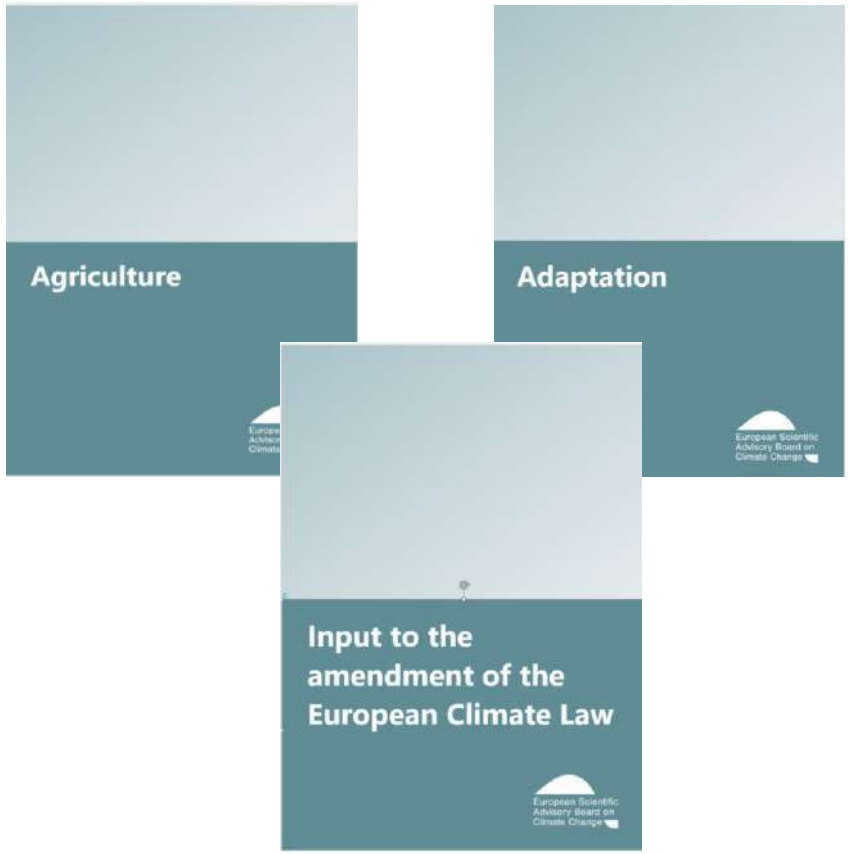
- 3 reports under TEN-E reg (TYNDP)
  - scenario methodology
  - CBA methodology
  - draft scenarios

- 5 reports on
  - 2040 target determination
  - Progress, policy gaps and opportunities
  - Carbon dioxide removals including CCS infrastructure

Advice coming soon

European Scientific Advisory Board on Climate Change

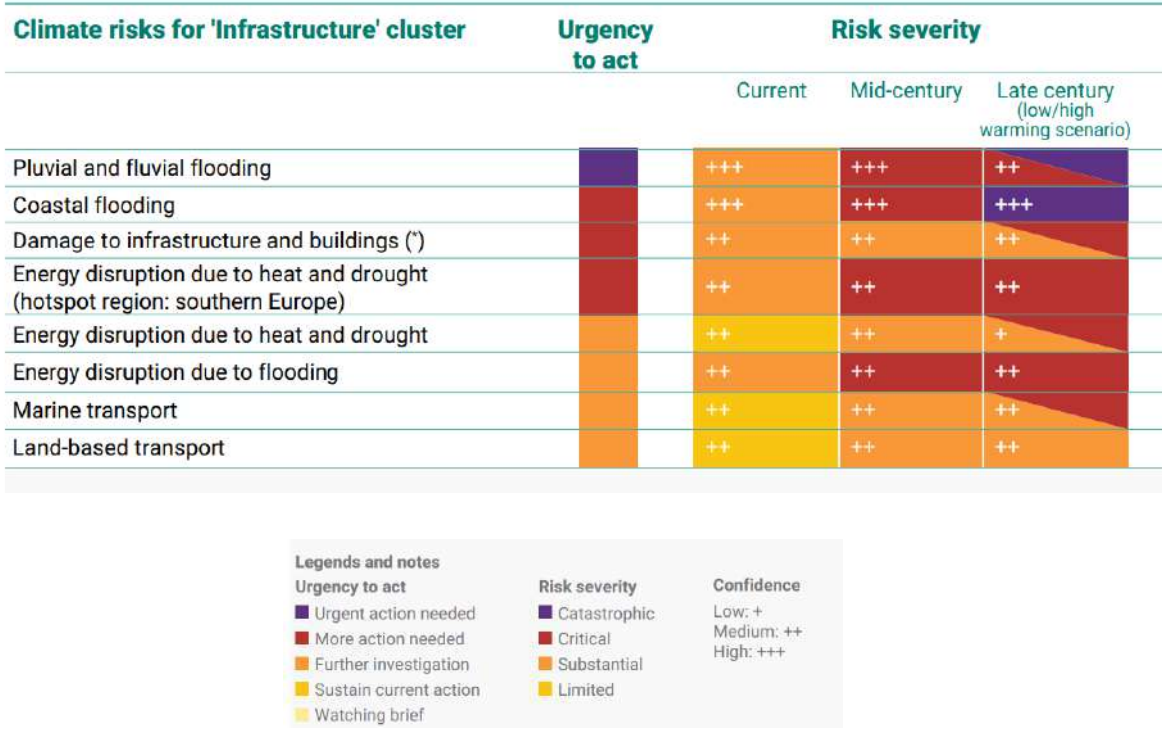
work programme 2025



Opportunities to enhance EU's climate resilience and long-term preparedness

- **Europe as the fastest-warming continent, intensifying climate events: unprecedented heat waves, devastating floods, and shifting precipitation patterns.**
  - global temperatures surpassing 1.6°C above pre-industrial levels in 2024

- *"Climate impacts on critical infrastructure, can affect nearly all aspects of society, from human health to the wider economy and the financial system."* EUCRA, 2024



Climate risks for 'Infrastructure' cluster	Urgency to act	Risk severity		
		Current	Mid-century	Late century (low/high warming scenario)
Pluvial and fluvial flooding		+++	+++	++ / +++
Coastal flooding		+++	+++	+++
Damage to infrastructure and buildings (*)		++	++	++
Energy disruption due to heat and drought (hotspot region: southern Europe)		++	++	++
Energy disruption due to heat and drought		++	++	+
Energy disruption due to flooding		++	++	++
Marine transport		++	++	++
Land-based transport		++	++	++

Legends and notes

Urgency to act
- Urgent action needed
- More action needed
- Further investigation
- Sustain current action
- Watching brief

Risk severity
- Catastrophic
- Critical
- Substantial
- Limited

Confidence
Low: +
Medium: ++
High: +++

Opportunities within the joint scenarios

System level

The draft TYNDP scenarios released in May 2024

X build on outdated climatic information

X do not reflect climate projections expected with high confidence

X neglect infrastructure resilience/adaptation needs

ENTSO-E and ENTSOG should **factor in climate risks into their scenarios, to enhance the resilience of EU energy infrastructure against the adverse effects of climate change**

Opportunities within the cost-benefit analysis

Project level

The draft CBA methodology assessed in Q1 2023

X does not guide on how to provide project-specific descriptions and cost estimates of adaptation measures relating to climate variables and climate-related hazards

X does not include quantifiable indicators on climate adaptation costs and benefits

X sufficiently build on institutional learning and empirical adaptation data that help to track the costs of extreme weather event management

CBA methodology should encourage

- **Assessment of the benefits of climate resilient infrastructure**
- **Assessment the costs of climate adaptation measures**
- **Institutional learning and new knowledge on climate adaptation**

We watch EU's progress and policies and provide scientific insight to advance net zero and resilience

secretariat.advisoryboard@esabcc.europa.eu

https://climate-advisory-board.europa.eu

Thank you

European Scientific Advisory Board on Climate Change