

Options for Estimating the Global Economic Impacts of Climate Change and the Social Cost of Carbon Module-by-Module

A Public Educational Webcast Series Presented by Stanford University and EPRI

John Weyant (Stanford University)

February 26, 2024 – Webcast #2



Series Focus on Global Economic Impacts Calculation Modules

TODAY'S TOPIC

Future economies and emissions

Future climates and earth systems

Future economic impacts (\$/year)

Discounting

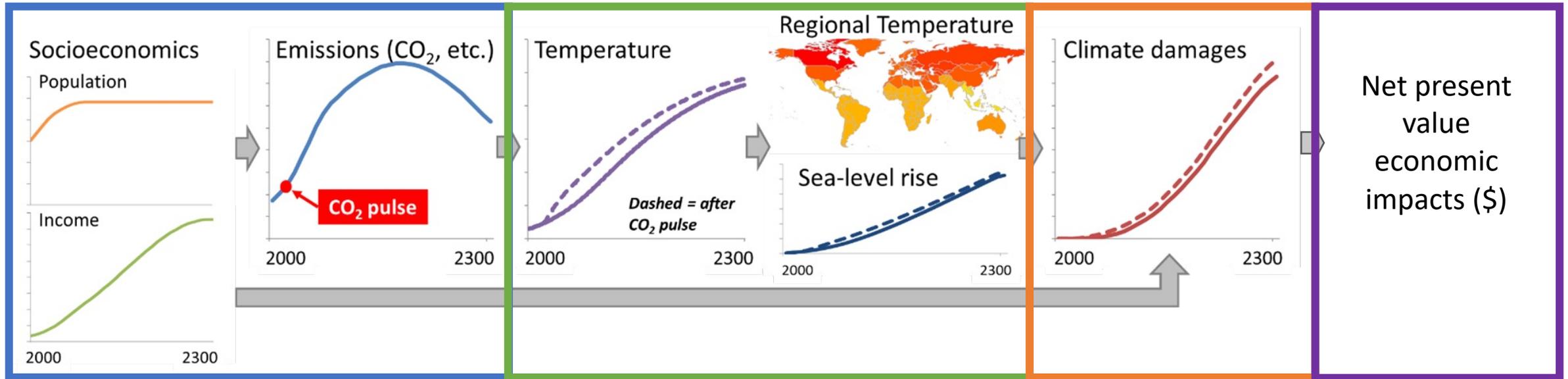


Figure: Rose et al (2017, 2014).

Used in NASEM (2017).

CO₂ pulse and dashed lines represent the secondary calculations required in social cost of carbon estimation.



The Series

Expert panels

- Convene panels of leading experts on the science related to each of the modules associated with estimating global economic impacts, and overall issues
- Each panel will share its thoughts on the available science, options, technical issues, and opportunities

Series' goals

- Improve the state of understanding regarding the available science related to each module
- Facilitate scientific and public dialogue on approaches, alternatives, and opportunities
- Inform the development of the scientifically reliable estimates needed for robust decisions and public confidence

Topics

- Series introduction and projecting economies and emissions for estimating the global economic impacts of climate change (speakers: van der Mensbrugge, van Vuuren, Delink, and Rose)
- Modeling global climate change and earth system responses to greenhouse gas emissions
- **Estimating the global economic impacts response to a future climate**
- Discounting future global economic impacts of climate change
- If not the social cost of carbon, what else or what in addition to it?
- Is module-by-module modeling of the global economic impacts of climate change credible?

January 11th

NEXT

TODAY



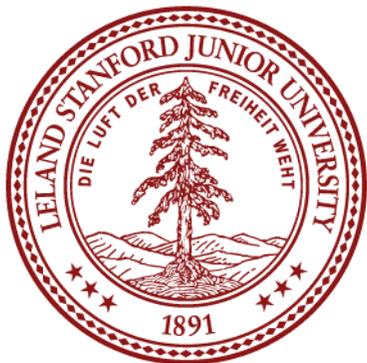
Series Motivation

- Significant policy and public interest in understanding the global economic costs of a changing climate
- This is important information:
 - For estimating the benefits of limiting warming to well below 2°C,
 - For evaluating macroeconomic climate risks to economies, and
 - For estimating the social costs of greenhouse gases (SC-GHGs) needed for evaluating the benefits and costs of policies
- However, these analyses are technically and scientifically challenging:
 - Requiring projecting global economic and physical systems for centuries
 - Dealing with significant uncertainty
- Recent IPCC reports and new SC-GHG methodology developments have created the need for assessment of current underlying scientific knowledge and translation of that information into global economic impacts of climate change modeling
- Governments and stakeholders need reliable information to inform decisions with significant national and global ramifications
- Broad scientific and public engagement, understanding, assessment, and dialogue are essential



Options for estimating the global economic impacts response to a future climate

Juan-Carlos Ciscar (European Commission Joint Research Center)



TODAY: Options for estimating the global economic impacts response to a future climate

SPEAKERS



Dr. John P. Weyant
Professor of Management
Science & Engineering,
Energy Science & Engineering
Director of the EMF
Stanford University



Dr. Juan Carlos Ciscar
Scientific Officer
European Commission Joint
Research Center



Dr. Ian Sue Wing
Professor of Earth &
Environment
Boston University



Dr. Maximilian Auffhammer
George Pardee Jr. Professor of
International Sustainable
Development
University of California, Berkeley



Dr. Steven Rose
Principal Research Economist
Energy Systems and Climate
Analysis Research
EPRI

Agenda

- Opening remarks: Dr. John Weyant (Stanford University)
- Topic introduction/moderator: Dr. Juan-Carlos Ciscar (EC Joint Research Center)
- Panel:
 - Dr. Steven Rose (EPRI)
 - Dr. Maximilian Auffhammer (University of California, Berkeley)
 - Dr. Ian Sue Wing (Boston University)
- Facilitated discussion



The needs

What for

- Climate risk assessment (granularity, asset-level)
- Adaptation, resilience assessment

Stakeholders

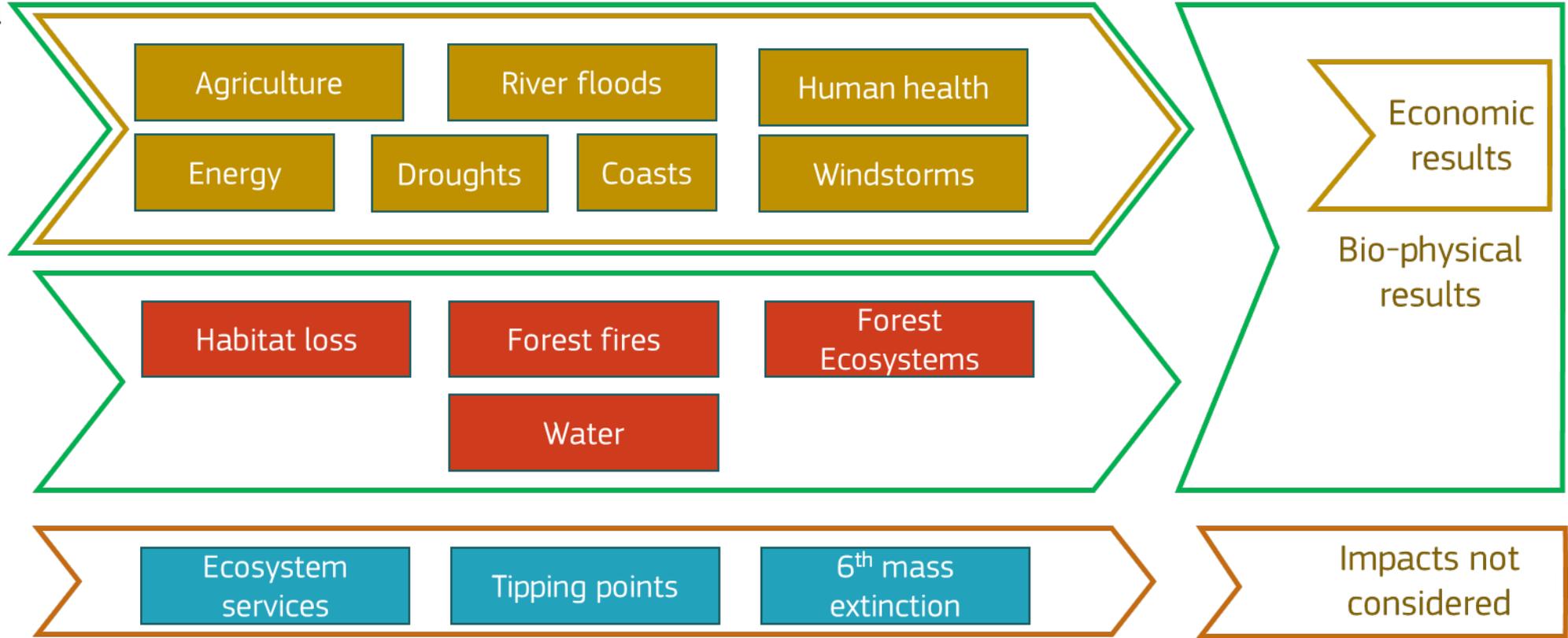
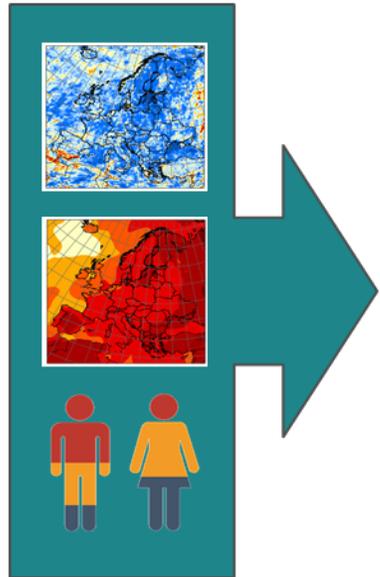
- Climate policy: mitigation and adaptation (federal-national, regional and local levels)
- Public finance (implications for public policy)
- Financial community (e.g. regulator, banks)
- other



Climate change impacts and adaptation in Europe: The JRC PESETA IV modelling protocol

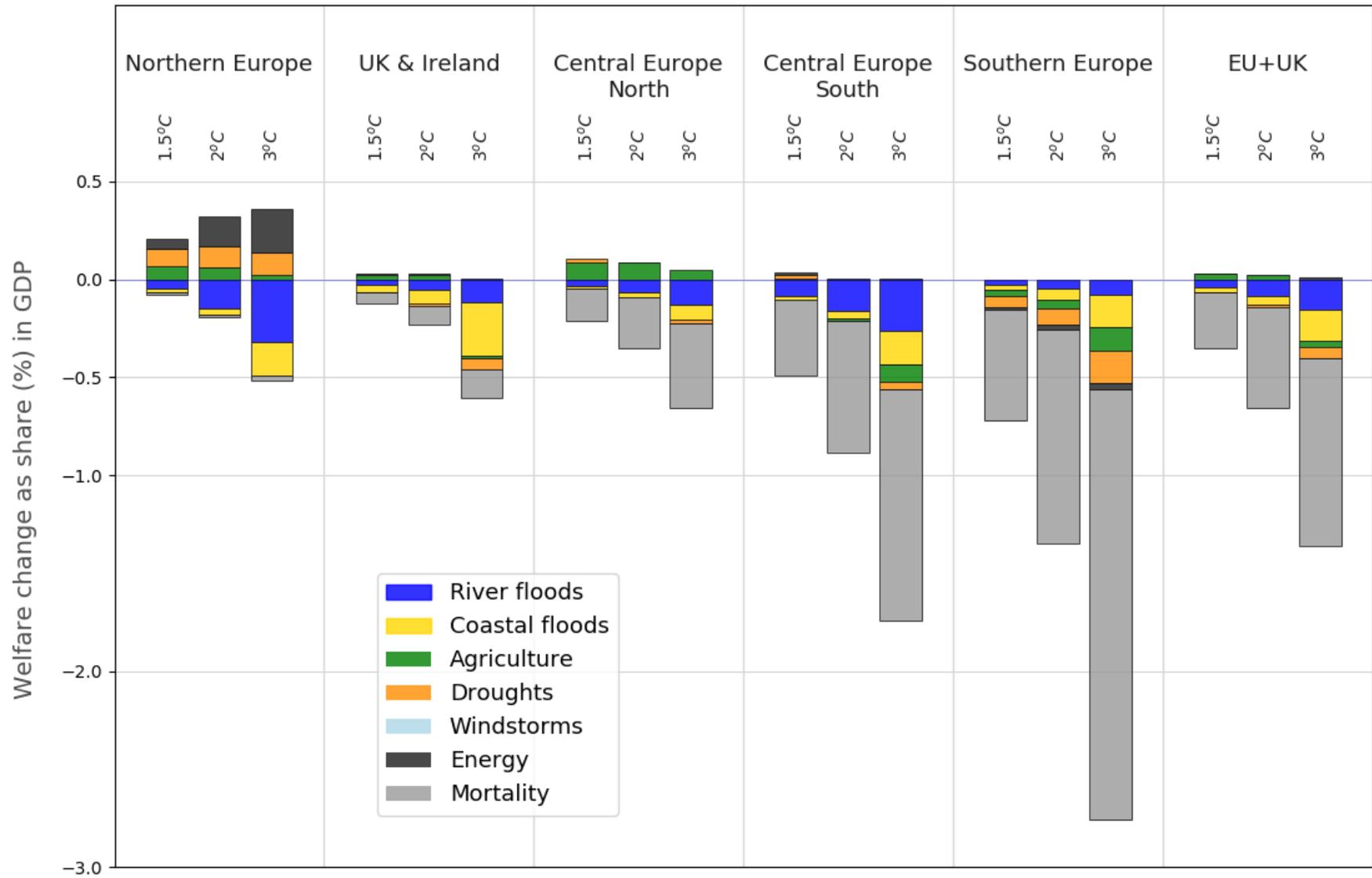
Climate change and socioeconomic data

Bio-physical modelling



Distribution of Welfare damages in the EU (JRC PESETA IV)

Projected changes in welfare as a share of GDP for different regions of Europe



- Mortality, coastal and river floods dominant impacts
- Southern Europe most affected
- Climate mitigation can strongly reduce impacts



Cost of inaction: beyond climate damages

2040 EU target European Commission Communication

- Cost of inaction assessment (EU climate law requirement)
- Various cost components
 - Climate impacts
 - Macroeconomic impacts due to energy dependence
 - Air pollution effects
 - Other



Today's panelists

- Steven Rose (EPRI)
- Maximilian Auffhammer (University of California, Berkeley)
- Ian Sue Wing (Boston University)



Dr. Rose



Dr. Auffhammer



Dr. Sue Wing



If you have questions?

- Questions will be taken during the discussion
- Please submit your questions via the Zoom Q&A feature (bottom of screen)
- We will be monitoring the Q&A and sequence and group questions
- We may not get to all the questions. We will do the best we can.



Thank you for participating today!

A banner for a public educational webcast series. It features a central image of the Earth from space. To the left of the Earth are the logos for Stanford Engineering Energy Modeling Forum and EPRI. To the right of the Earth, the text reads "Public Educational Webcast Series" in large white letters, followed by the title "Options for Estimating the Global Economic Impacts of Climate Change and the Social Cost of Carbon Module-by-Module" in smaller blue letters.

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**Public Educational
Webcast Series**

Options for Estimating the Global Economic
Impacts of Climate Change and the Social
Cost of Carbon Module-by-Module

Next webcast in the series

*Modeling global climate change and earth system responses to
greenhouse gas emissions*

Date TBD

Series information, including slides, bios, recordings:

<https://emf.stanford.edu/stanford-epri-public-educational-webcast-series>

Comments and questions: weyant@stanford.edu, rose@epri.edu

