

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)

May 16, 2025 – Webcast #4



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

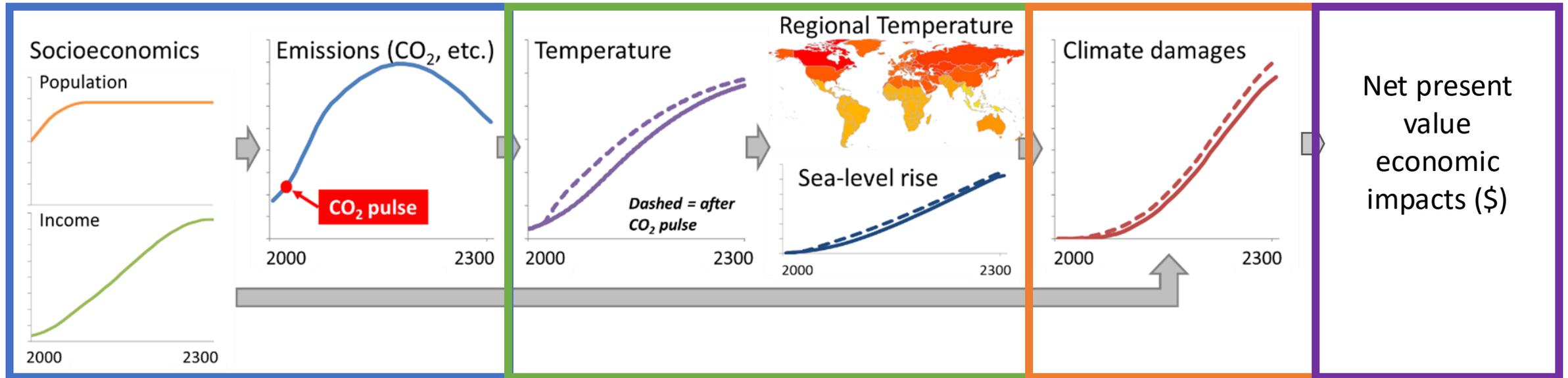


Figure: Rose et al (2017, 2014).

Used in NASEM (2017).

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



Objectives

Webcast series objectives

1. Improve the state of understanding regarding the science relevant to each module
2. Facilitate scientific and public dialogue on approaches, alternatives, and opportunities
3. Inform the development of the scientifically reliable estimation needed for robust decisions and public confidence

Discounting webcast objectives

Discuss the available options for discounting the future potential global economic impacts of climate change, including discounting approaches for benefit-cost analysis and the approaches proposed in U.S. Government social cost of carbon estimation methodologies. The expert speakers will provide insights into the strengths, weaknesses, challenges, and opportunities of current and possible alternative approaches to discounting. These choices have a significant impact on estimates of the economic impacts of climate change.



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

Topics

- Series introduction and projecting economies and emissions for estimating the global economic impacts of climate change (speakers: van der Mensbrugghe, 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 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?

PREVIOUSLY

TODAY



The discount rate's impact on social cost of carbon estimates

- Discounting has a significant impact
- Long history of scientific discussion and debate
 - e.g., IPCC (1996), Portney and Weyant (1999), around the Stern Review (2006), CEA (2017), NASEM (2017), Carleton and Greenstone (2021), Li and Pizer (2021)
- US federal SCC discounting to date
 - Obama Administration: 2.5%, 3%, 5%
 - First Trump Administration: 3%, 7%
 - Biden Administration:
 - “Interim” – 2.5%, 3%, 5%
 - “Final” – near-term 1.5%, 2%, and 2.5%
- **IMPORTANT:** The focus of the USG SCC discounting discussion is federal application (regulatory, other)
 - Among other things, it is not about setting global temperature targets

Biden “Interim” SCC Estimates

Emissions Year	Discount Rate and Statistic			
	5% Average	3% Average	2.5% Average	3% 95 th Percentile
2020	14	51	76	152
2025	17	56	83	169
2030	19	62	89	187
2035	22	67	96	206
2040	25	73	103	225
2045	28	79	110	242
2050	32	85	116	260

Biden EPA SCC Estimates

Emission Year	SC-CO ₂ (2020 dollars per metric ton of CO ₂)		
	Near-term rate		
	2.5%	2.0%	1.5%
2020	120	190	340
2030	140	230	380
2040	170	270	430
2050	200	310	480
2060	230	350	530
2070	260	380	570
2080	280	410	600



TODAY: Discounting the economic impacts of climate change

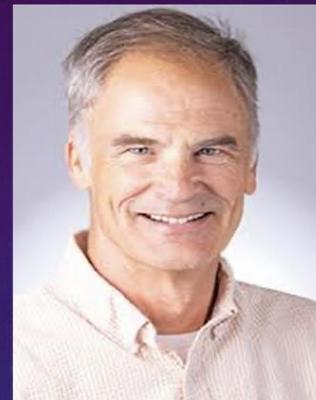
SPEAKERS: MAY 16, 2025, FROM 12:00 - 1:30 PM EST



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



Dr. Kerry Krutilla
Professor, O'Neill School of
Public and Environmental Affairs
Indiana University-Bloomington



Dr. Thomas F. Rutherford
Professor, Agricultural and
Applied Economics
University of Wisconsin-Madison



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

Agenda

- Topic introduction/moderator: Dr. John Weyant (Stanford University)
- Panel:
 - Dr. Steven Rose (EPRI)
 - Dr. Kerry Krutilla (Indiana University-Bloomington)
 - Dr. Thomas Rutherford (University of Wisconsin-Madison)
- Facilitated discussion



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 will sequence and group the 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 font, followed by "Options for Estimating the Global Economic Impacts of Climate Change and the Social Cost of Carbon Module-by-Module" in smaller blue font.

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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

If not the social cost of carbon, what else or what in addition to it?

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