

# °CICERO

## Newsletter

Quarterly dissemination of CICERO researchers' scientific publications, reports and other outputs.

### Featured



npj Climate and Atmospheric Science

[Satellite-based analysis of top of atmosphere shortwave radiative forcing trend induced by biomass burning aerosols over South-Eastern Atlantic](#)

[Caroline Jouan](#) and [Gunnar Myhre](#)

This study investigates long-term changes in the shortwave direct aerosol radiative effect at the top of the atmosphere induced by biomass burning aerosol transported from southern Africa to the south-eastern Atlantic

stratocumulus region during extended fire seasons. The study reveals satellite capabilities in capturing complex biomass burning aerosol-cloud-solar radiation interactions for accurate radiative forcing estimates and projections. [Read more.](#)

## Publications



Transportation Research Part D: Transport and Environment

[Carbon leakage from aviation under the European Union Fit for 55 policies](#)

[Taoyuan Wei](#) and [Steffen Kallbekken](#)

Carbon leakage is an essential concern in the aviation industry. This study combines an aviation sectoral model with a general equilibrium model to assess the leakage associated with the European Union Fit for 55 policies for aviation. The authors conclude that the industry's concerns over carbon leakage are valid, but primarily for reasons of general climate policy efficiency, and not sectoral competitiveness. [Read more.](#)

Frontiers in Climate

[Efficacy of climate forcings in transient CMIP6 simulations](#)

[Gunnar Myhre](#), [Rachael E. Byrom](#), Timothy Andrews, Piers M. Forster, Christopher J. Smith

For effective radiative forcing to be an ideal metric for comparing the strength of different climate drivers (such as CO<sub>2</sub> and aerosols), the ratio of

radiative forcing to global-mean temperature change must be the same for each driver. Here, the authors analyse transient simulations from CMIP6 experiments and show comparable results between transient and abrupt perturbation experiments. They demonstrate that aerosol efficacy is not significantly different from unity, however inter-model differences in aerosol experiments are notably large. [Read more.](#)

Geophysical Research Letters

[Underestimated Land Heat Update Alters the Global Energy Distribution in CMIP6](#)

[Norman Julius Steinert](#) et. al.

Current global warming results in an uptake of heat by the Earth system, which is distributed among the different components of the climate system. However, current-generation climate models deliver heat inventory and partitioning estimates of Earth system components that differ from recent observations. Here the authors investigate the global heat distribution under warming by using fully-coupled CMIP6 Earth system model experiments, including a version of the MPI-ESM with a deep land model component, accommodating the required space for more realistic terrestrial heat storage. [Read more.](#)

Climate Change Economics

[Impacts of global warming on regional energy and economy: Uneven consequences arising from global warming-induced heating and cooling demand of households](#)

[Lin Ma](#), [Taoyuan Wei](#), Kalle Nordling and Asbjørn Aaheim

The impacts of global warming vary across regions. This paper studies the distributional implications of global warming impacts on household energy use for heating and cooling and the induced macroeconomic responses under different scenarios in 140 regions worldwide. The authors find that at the global level, the market effects cause a reduction in the direct impact on the demand for oil and gas, while that for electricity displays a positive but moderate growth. Whereas the regional effects vary across countries and lead to changes in both directions. [Read more.](#)

Journal of Common Market Studies

[When EU Agencies Set Up Advisory Committees: All About Autonomy?](#)

[Torbjørn Jevnaker](#)

Relations with interest groups are important for EU agencies' autonomy and effective functioning. Advisory committees are organisational structures providing for regular interaction amongst EU agencies and interest groups. Hence, they could offer insights into the EU agencies' operational practices and actual (de facto) autonomy, which are relevant for understanding EU agencies' role in the developing European administrative space. This paper examine establishment and design of three European Stakeholder Committees by the Agency for the Cooperation of Energy Regulators (ACER). [Read more.](#)



European Journal of Risk Regulation

[De Facto Rule-Making Below the Level of Implementing Acts: Double-Delegated Rule-Making in European Union Electricity Market Regulation](#)

**[Torbjørge Jevnaker](#)**, Karianne Krohn Taranger, Per Ove Eikeland and **[Marie Byskov Lindberg](#)**

Within the area of electricity market regulation, a practice has emerged in which the chain of delegation has gone beyond the European Commission, resulting in double delegation. This article examines how double-delegated rule-making unfolds in a novel and emerging practice, evolving beneath implementing acts. By analysing the factors behind whether terms, conditions and methodologies are adopted jointly by national agencies or not, the study investigates whether this form of delegated rule-making in a network setting delivers decisions or whether rule-making by a European Union agency is needed. [Read more.](#)

Indian Pediatrics

[Protecting Child Health From Air Pollution in India](#)

**[Sourangsu Chowdhury](#)**, Ekta Chaudhary, Sagnik Dey

Recent research has underscored the diverse ways in which air pollution detrimentally affects child health in India. Notably, India shoulders one of the highest burdens of mortality of children under five years of age globally due to exposure to air pollution. As India embarked on a mission to reduce air pollution, showcasing health benefits linked to interventions is crucial. Augmenting access to health data is equally essential to bolster evidence-based policymaking aimed at reducing the child health burden stemming from air pollution in India. [Read more.](#)

Journal of Environmental Economics and Management

[Can policy packaging help overcome Pigouvian tax aversion? A lab experiment on combining taxes and subsidies](#)

Gøril L. Andreassen, [Steffen Kallbekken](#), Knut Einar Rosendahl

Tax aversion makes it politically challenging to introduce Pigouvian taxes. One proposed solution to overcome this resistance is to package policies. Using an online lab experiment, we investigate whether combining a tax and a subsidy is perceived as more acceptable than the tax or the subsidy alone. We find that support for a combination of a tax and a subsidy equals the simple average of support for the two instruments alone. Combining a tax and a subsidy therefore does not reduce tax aversion. [Read more.](#)

Earth System Dynamics

[Solar radiation modification challenges decarbonization with renewable solar energy](#)

Susanne Baur, [Benjamin M. Sanderson](#), Roland Séférian, and Laurent Terray

Solar radiation modification (SRM) is increasingly being discussed as a potential tool to reduce global and regional temperatures to buy time for conventional carbon mitigation measures to take effect. However, most simulations to date assume SRM to be an additive component to the climate change toolbox, without any physical coupling between mitigation and SRM. In this study we analyze one aspect of this coupling: how renewable energy capacity, and therefore decarbonization rates, may be affected under SRM deployment by modification of photovoltaic (PV) and concentrated solar power (CSP) production potential. Our study suggests that using stratospheric aerosol injection (SAI) to reduce high-end global warming to moderate global warming could pose increased

challenges for meeting energy demand with solar renewable resources. [Read more.](#)

#### Nature Scientific Data

[Global high-resolution growth projections dataset for rooftop area consistent with the shared socioeconomic pathways, 2020–2050](#)

Siddharth Joshi, Behnam Zakeri, **Shivika Mittal**, Alessio Mastrucci, Paul Holloway, Volker Krey, Priyadarshi Ramprasad Shukla, Brian O'Gallachoir, James Glynn

Assessment of current and future growth in the global rooftop area is important for understanding and planning for a robust and sustainable decentralised energy system. These estimates are also important for urban planning studies and designing sustainable cities. This single harmonised global dataset can be used for climate change, energy transition, biodiversity, urban planning, and disaster risk management studies covering continental to conurbation geospatial levels. [Read more.](#)



#### Scandinavian Journal of Public Health

[Valuation and perception of the costs of climate change on health](#)

Zuzana Nordeng, Hedi K. Kriit, Helen Poltimäe, **Kristin Aunan**, **Miriam S. Dahl**, Marija Jevtic, Vlatka Matkovic, **Gunnell Sandanger**, Hans Orru

Climate change affects our societies and lives through our economies, our livelihoods, and our health. Economic losses of climate change are estimated at \$23 trillion, largely through externalities due to premature mortality, healthcare expenditure, and health-related work losses. Even if there are established methods to quantify the health economic burden, there is limited information on how people perceive this information. The current study aimed to examine different health cost evaluation methods and observe perceptions of stakeholders in the climate change context. [Read more.](#)

## Environmental Health

[Modification of heat-related effects on mortality by air pollution concentration, at small-area level, in the Attica prefecture, Greece](#)

Sofia Zafeiratou et. al. and the [EXHAUSTION project](#)

The independent effects of short-term exposure to increased air temperature and air pollution on mortality are well-documented. There is some evidence indicating that elevated concentrations of air pollutants may lead to increased heat-related mortality, but this evidence is not consistent. Most of these effects have been documented through time-series studies using city-wide data, rather than at a finer spatial level. In this study, the authors examined the possible modification of the heat effects on total and cause-specific mortality by air pollution at municipality level in the Attica region, Greece, during the warm period of the years 2000 to 2016. [Read more.](#)

## Earth System Science Data



[Indicators of Global Climate Change 2023: annual update of key indicators of the state of the climate system and human influence](#)

Piers M. Forster et. al. Contributions by CICERO-researchers [Gunnar Myhre](#), [Glen Peters](#) and [Robbie Andrew](#)

Global warming caused by humans is advancing at 0.26 degrees °C per decade - the highest rate since records began, according to a new study - the second annual Indicators of Global Climate Change report. The study reveals that human-induced warming has risen to 1.19 °C over the past decade (2014-2023) - an increase from the 1.14 °C seen in 2013-2022. [Read more.](#)

Earth System Science Data

[Global nitrous oxide budget \(1980–2020\)](#)

Hanqin Tian et. al. Contributions by CICERO researcher [Glen Peters](#)

According to a new report by the Global Carbon Project, emissions of nitrous oxide – a greenhouse gas about 300 times more potent than carbon dioxide – continued unabated between 1980 and 2020. [Read the paper.](#) [Read the joint press release by the Norwegian contributors from NILU and CICERO.](#)

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