Búzios Scientific Statement – Evidence-Based Insights for COP30

Búzios, RJ, Brazil

(updated version, 17 November 2025)

More than 250 leading international scientists convened this week in **Armação dos Búzios, RJ, Brazil**, in parallel with the COP30 negotiations, at the Integrated Assessment Modelling Consortium's (IAMC) annual conference to present and debate the latest scientific evidence on what it will take to halt global warming and pursue the goals of the Paris Agreement. The IAMC brings together leading climate researchers from all over the world focussing on mitigation and adaptation solutions.

At the conference, these national and international experts discussed the most up-to-date science on climate change mitigation and adaptation pathways towards the Paris Agreement's climate goals. Since the publication of IPCC AR6, 300 new pathways have been developed by the research community.

During the conference, members of the IAM community got together to summarize several high-level policy-relevant insights for COP30:

1. Overshoot 1.5°C unavoidable, but returning below is possible

Due to insufficient emission reductions, even the most ambitious emission reduction pathways will now result in a temporary exceedance of the 1.5°C warming level. But the pathways also show that returning below 1.5°C this century is possible through removal of CO2 from the atmosphere.

Every fraction of a degree of overshoot will lead to escalating impacts on ecosystems, human health and development prospects, particularly in the developing world. It is critical to realize that every five years without substantial CO_2 emission reductions locks in an additional temperature increase of about 0.1°C, and implies an additional need of around 200 GtCO2 of negative emissions to return to 1.5°C.

2. Towards closing the emissions gap in this decade

Announced Nationally Determined Contributions (NDCs) imply an emissions gap of more than 20 $GtCO_2$ per year by 2035 relative to a 1.5°C pathway.

Immediate and comprehensive policy shifts beyond current commitments, and strengthening of international cooperation followed by actions can address this shortfall.

Such efforts can build on rapid market developments and new innovations, including for renewable energy and battery technologies, which enable substantially higher emissions reductions this decade to limit the overshoot of 1.5°C and bring social and environmental benefits.

3. Global Benchmarks for 2035

Recent mitigation pathways provide information on what would be consistent with limiting overshoot above 1.5°C, including by achieving the following global benchmarks by 2035:

- Reduce global greenhouse gas emissions by about half relative to 2024.
- Increase the global contribution of solar and wind renewables by a factor five to six over the 2024-2035 period.
- Reduce global fossil fuel production and use by a quarter to half compared with 2024.

Enhanced action in the near-term requires evaluating and considering equity and justice and a range of other societal and policy priorities.

4. The role of individual countries

To complement and supplement the global analyses, national mitigation and adaptation pathways towards country net zero targets are being synthesized and assessed. Emerging science illustrates that multiple transitions will occur across all countries, although the rate and pace of emission reductions and the role of sectors and technologies will differ.

Given the need to bridge the gap and increased global benchmarks by 2035, every country will need to ratchet its NDC/emission targets towards ‘highest possible ambition’ based on their respective national priorities (including development) and capacities. Emerging insights on investment needs at the country level can assist with mobilizing finance.

5. Adaptation planning and implementation essential

Climate change impacts are widespread today and will continue to intensify. This underscores the urgency of planning and increasing adaptation action globally, including through mobilising increased financial resources for adaptation. Establishing clear indicators to assess progress towards the global goal of adaptation will be essential to catalyze implementation.

Integrated perspectives incorporating mitigation and adaptation solutions are central to maximise adaptation and mitigation synergies and minimise trade-offs.

List of original signatories (in alphabetical order)

Keigo Akimoto, Research Institute of Innovative Technology for the Earth, Japan

Alaa Al Khourdajie, Imperial College London, IPCC, United Kingdom

Lara Aleluia Reis, CMCC, Portugal

Marina Andrijevic, International Institute for Applied Systems Analysis (IIASA)

Gerd Angelkorte, Cenergia/Coppe/UFRJ, Brazil

Joyal Arya, India

Cindy Azuero Pedraza, Colombia

Maro Baka

Pedro Luiz Barbosa Maia, Cenergia/COPPE/UFRJ, Brasil

Clarissa Bergman-Fonte, Centre for Energy and Environmental Economics (Cenergia), Energy Planning Program (PPE), Coppe, Universidade Federal do Rio de Janeiro, Brazil

Maksym Chepeliev, Purdue University, United States

Shih-Ming Chung, ITRI-GEL, Taiwan

Omar Cisse, Enda Energie, Sénégal

Vassilis Daioglou, PBL Netherlands Environmental Assessment Agency, Greece

Michel den Elzen, PBL Netherlands Environmental Assessment Agency, the Netherlands

Laurent Drouet, CMCC

Kristie Ebi

Johannes Emmerling, CMCC, Italy

Panagiotis Fragkos, Greece

Mel George, University of Maryland - College Park, India

Anastasis Giannousakis, E3-Modelling, Germany

Otávio Grassi-Gonçalves, Cenergia, Brazil

Aron Hartvig, IIASA, Hungary

Fergus Haswell, Utrecht University, Netherlands

Léa Hayez, PIK, Germany

Chenmin He, China

Parisa Javadi, University of Virginia, United States

Yujie Jiao

Igor Julião, Coppe/UFRJ, Brazil

Júlia Kaiser, CMCC, Italy/Brasil

Puneet Kamboj

Jarmo Kikstra, International Institute for Applied Systems Analysis, Austria, Netherlands

Alexandre Koberle, Brazil

Laurin Köhler-Schindler, Potsdam Institute for Climate Impact Research (PIK), Germany

Volker Krey, International Institute for Applied Systems Analysis, Austria

Elmar Kriegler, Potsdam Institute for Climate Impact Research, Germany

Robin Lamboll, Imperial College London, UK

Junling Liu, Harbin Institute of Technology, Shenzhen

André Lucena, COPPE/UFRJ, Brazil

Gunnar Luderer, PIK, Germany

Jyoti Maheshwari, India

Alessio Mastrucci, IIASA, Austria

Sioux Fanny Melo Leon, Utrecht University, Colombia

Shotaro Mori, Kyoto University, Japan

Firuz Ahamed Nahid, Postdoctoral Researcher, SMARTS Center, Asian Institute of Technology, Bangaldesh and Thailand

Femke Nijsse, University of Exeter, United Kingdom

Sammy Oleku, Pastoralists Org. for Water and Environmental Research (POWER), Kenya

Juliane Oliveira, Oswaldo Cruz Foundation, Brazil

Ana Carolina Oliveira Fiorini, Universidade Federal do Rio de Janeiro (UFRJ), Brazil

Benjamin Peeters, PIK, Germany

Sanjib Pohit, India

Yoga Wienda Pratama, IIASA, Indonesia

Keywan Riahi, International Institute for Applied System Analysis (IIASA), Austria

Pedro Rochedo, UFRJ, Brazil

Théo Rouhette, Basque Centre for Climate Change (BC3), Spain

Marie Jeanne G. Sambou, LPAOSF/ESP/UCAD, Sénégal

Sompob Saralamba, Mahidol Oxford Tropical Medicine Research Unit, Thailand

Roberto Schaeffer, Cenergia/Coppe/UFRJ, Brazil

Karl Scheifinger, International Institute for Applied System Analysis (IIASA), Austria

Carl-Friedrich Schleussner, International Institute for Applied System Analysis (IIASA), Germany

Diego Silva Herran, NIES

Luis Felipe Sivolella, Cenergia/Coppe/UFRJ, Brazil

Jingyang Song, Peking University, China

Vassilis Stavrakas, Technoeconomics of Energy Systems laboratory (TEESlab), University of Piraeus, Greece

Fabio Teixeira F. da Silva, Cenergia/Coppe/UFRJ, Brazil

Tsai-Chen Tsai, Lucy Tsai, Taiwan

Dominique van der Mensbrugghe, Purdue University

Bas van Ruijven, IIASA, Austria/Netherlands

Detlef van Vuuren, PBL Netherlands Environmental Assessment Agency, The Netherlands

Huang Wei, Cenergia, Brazil

Georgios Xexakis, HOLISTIC S.A., Greece

Marianne Zanon Zotin, Pbl

Xiuming Zhang, IIASA, China

Shu Zhang, Tsinghua University, China

Jiarui Zhong

Additional signatories

Maksym Chepeliev, Purdue University, United States

Bruno Scola L. Cunha, COPPE/UFRJ, Brazil

Luiz Bernardo Baptista Cenergia, Coppe/UFRJ, Brazil

Sophie Chlela, Lebanon

Alicia Zhao, Center for Global Sustainability, University of Maryland USA

Tommi Ekholm, Finnish Meteorological Institute, Finland

Kathleen Kennedy, Center for Global Sustainability, UMD, United States of America

Rebecca Draeger, Cenergia/Coppe/UFRJ, Brazil

Adrien Poujon, Technische Universiteit Delft, Netherlands

Julia Landau, PPE/COPPE/UFRJ, Brazil

Setu Pelz, IIASA, Austria

Mercedes Bustamante, University of Brasília, Brazil

Assad Eduardo, Getúlio Vargas foundation, Brazil

Alireza Atabati, IIASA | International Institute for Applied Systems Analysis, Austria

Anne Goujon, International Institute for Applied Systems Analysis & Austrian Academy of Sciences, France

Thiago Brito, IIASA, Brazil

Alexandros Nikas, National Technical University of Athens, Greece

Qianzhi Zhang, China

Marta Kozicka, IIASA, Austria

Sibylle Rouet Pollakis, IIASA, Austria

Lucas Barros, Cenergia/Coppe/UFRJ, Brazil

JoAnne Linnerooth-Bayer, IIASA, Austria

Cheng-Ting Lin, Industrial Technology Research Institute, Taiwan

Diogo Kramel, NTNU, Brazil

Cheng-pin Kuo, Researcher, Taiwan

Giacomo Falchetta, IIASA, Austria / CMCC, Italy

Florian Humpenöder, PIK, Germany

Jun Ukita Shepard, International Institute for Applied Systems Analysis (IIASA), USA

Malin Wiese, Leipzig University, Germany

Camilla Lo Giudice, KTH, Sweden

Neus Escobar, Basque Centre for Climate Change (BC3), Spain

Roisin Moriarty, University College Cork, Ireland

Bradley Phelps, University of Maryland, USA

Siddharth Joshi, IIASA, India/Austria

Gernot Wagner, Columbia University, United States

Oscar Andres Higuera Roa, IIASA, Colombia

Brian Wagner, Environmental Psychology, University of Groningen, Austria

Lena Hölzle, University of Groningen, Netherlands

SILPASAILA KUMAR, PhD researcher, Netherlands

Anne Eichholtzer, University of Groningen, France

Chao Qin

Zan Mlakar, University of Groningen, Netherlands

Linda Steg, University of Groningen, Netherlands

Bas Ankoné, University of Groningen,The Netherlands

Philipp Eppe, University of Bremen, Germany

Andrew Miller, Center for Global Sustainability, USA