

First Scientific Workshop

Energy Use for Adaptation: State-of-the-art and advancements in Integrated Assessment Modelling

Venice + Zoom, 3-4 May2021, 2-5 pm CET

Background: Space cooling needs will be an increasingly important driver of future energy demand, but most energy and climate policy scenarios do explicitly represent how the demand for this energy service will respond to climate change. Therefore, we have a limited knowledge regarding the potential implications growing space cooling could have on the environment, the economy as represented by different sectors and different groups of households, especially in the context of a deeper and accelerating energy transition.

This workshop seeks to identify knowledge gaps and delineate directions for further research within a field of research that lies at the intersection between applied and empirical economics and economic modelling or Integrated Assessment Modelling (IAM).

The workshop will be articulated in three virtual sessions distributed over two days. In each session, two short presentations from the ENERGYA team will kick-off the discussion. The discussion will focus on approaches and data requirements for representing cooling and heating needs and dynamics in energy-environment-economic models. Our main hypothesis is that climate change impacts can significantly alter the understanding of the mitigation challenge, but we still do not know precisely how.

Research questions:

1. How energy-environment-economic models incorporate decisions regarding the adoption and use of cooling appliances?
2. How can we improve the empirical evidence on the joint decision of adopting and using AC?
3. To what extent the massive use of AC that is projected by several studies could hinder progress towards the reduction of GHG emissions? To what extent the massive use of AC that is projected by several studies could create a new type of energy poor?
4. How can we model collective strategies (e.g. urban planning) related thermal comfort decisions?

Format: Each session will be kicked off by two short presentations by the ENERGYA team that will be challenged by discussants who can present a few slides and start a discussion on some of the issues illustrated within each session. Presentations should introduce the main idea, explain the methodology and illustrate the main criticalities in about 15 minutes.

Agenda

<p>Day 1: Empirical session</p> <p>14.00-14.10</p>	<p>Welcome and introduction to the workshop: State-of-the-art in modelling energy demand for space cooling</p>
<p>14.10-15.30</p>	<p>Session 1- Air conditioning adoption and use – Empirical evidence</p> <p>Presenters (10+10): Teresa Randazzo (Ca' Foscari University); Sebastian Renner (MIGCC)</p> <p>Pros and cons of the different empirical methods we can use to study the determinants of AC adoption and the implications of its use on energy demand. How can we study adaptation when data on appliances are not available? Does using different meteorological variables matter?</p> <p>Discussants (10 + 10 min): Miguel Poblete-Cazenava (IIASA), Ian Sue Wing (Boston University)</p> <p>What opportunities arise from high-frequency data, such as smart meters and social media? Are existing surveys comprehensive or do we need new/dedicated surveys? Can online social media data complement or substitute survey data? What can we learn from mixed method approaches?</p> <p>Discussants (10+10+10 min): Sibel Eker (IIASA), Radhika Khosla (University of Oxford), Massimo Tavoni (RFF-CMCC and Politecnico University of Milan), Jacopo Bonan (RFF-CMCC and Politecnico University of Milan)</p> <p>Break</p>
<p>Day 1: Modelling session</p> <p>15.45 - 17.00</p>	<p>Session 2 - AC adoption and use – Improving models</p> <p>Presenters (10+10): Colelli (Ca' Foscari University and CMCC); André Lucena, Roberto Schaeffer (COPPE)</p> <p>How can we integrate impacts, adaptation, and mitigation in a unified framework? How can we integrate adaptation needs with power transmission and supply vulnerabilities and integrate climate change impacts on energy demand and energy supply (mostly on the power sector)? Are there advantages from modeling impacts based on the occurrence of extreme events rather than Degree Days or mean temperature, and how to represent the former within IAMs? How to model AC energy efficiency developments in bottom-up vs top-down energy demand models? How can we integrate building-specific components into global models?</p> <p>Discussants (45 min): David Gernaat (PBL and Utrecht University), Franziska Piontek (PIK), Alessio Mastrucci (IIASA), Johannes Emmerling (RFF-CMCC), Vincent Vigué (CIRED)</p>

**Day 2: CGE
modelling**

Session 3 - AC adoption and use – Implications and distributional consequences

Presenters (10+10): Lorenza Campagnolo (Ca' Foscari University and CMCC), Raffael Garaffa (COPPE)

14:00-14:30

What are the advantage and disadvantages of using different downscaling methods? How should the characterization of groups be implemented (e.g. different elasticities)? What are the inconsistencies that may arise in the baseline? [More technical session on actual modelling practices]

14: 30-15:15

Discussants (30 min): van Ruijven (IIASA) / Schinichiro Fujimori (Kyoto University)/ Toon Vandyck (JRC)

Break

How can we analyze the distributional implications of joint climate change impacts and policies? How can we measure the distributional and poverty implications? How can we integrate the broader implications on health outcomes and account for the benefits of AC in terms of avoided health cost, avoided GDP loss (labor productivity)? [Broader discussion on extensions]

15:15-16:00

Discussants (30 min): Louis-Gaëtan Giraudet (CIRED), Shonali Pachauri (IIASA), Rob Dellink (OECD)

Meeting wrap-up