



European
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Council



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Workshop: best practices for modeling human behaviour in IAMs

Goal: define a clear framework distinguishing concepts, aims and methods

Location: Milan, November 22nd (full day) and 23rd (till lunch time)

Format: small workshop (15 people), 6 sessions kicked off by short presentations by moderators

Main objectives

Capturing behavioral features in numerical models is an acknowledged challenge. Within IAMs, with their broad scope and cross sector perspective, possibly even more challenging. Behavior, and behavioral change however plays an important role in climate change mitigation. Several attempts have been made to bridge this gap but a general view on how to tackle this topic in a consistent manner is currently lacking. Questions arise such as what do we define as behavior, how do we quantify it, but also what purpose does capturing these effect in models serve and are these long term models actually appropriate tools. Building on the modelling efforts done so far in this workshop we aim to distinguish what we can learn from the past and what as a community we can distinguish as important steps forward. **Some illustrative examples which address the topics discussed below are presented by the moderators** to kick start the discussion but the aim is to develop and **define a clear framework distinguishing concepts, aims and methods**. The findings of the workshop will be summarized in a perspective article.

Sessions: 1.5 hours each: 2/3 short presentations (10 minutes) followed by 1 hour brainstorming.

Day 1 – Thursday, 22 November

9:00 - 9:30 Welcome and coffee

9:30 - 11:00 Session 1

Theoretical background: Why do we want to model behavioral factors in IAMs and is it theoretically meaningful?

There is widespread recognition of the need to improve modeling of behaviour but there is less clear evidence on what are the most important mechanisms which need to be captured (misoptimization, other regarding preferences, social influence). Moreover, there are fundamental questions regarding the consistency of incorporating descriptive features into normative models: how can misoptimization in a specific sector be reconciled with a dynamic optimization model? Which behavioural factors are key? Can behavioural biased be incorporated in IAMs meant for normative analysis?

Moderators: Charlie Wilson, Valentina Bosetti and Johannes Emmerling

11:00 -11:30 Coffee break

11:30 - 13:00 Session 2

Empirical needs: How much data do we need, and do we have it?

Different efforts have been made to analyse and quantify behaviour affecting energy related choices. However collecting data across studies, which have a wide variability in approach is not straightforward. We can distinguish between data driven or model pulled quantification of behaviour. What are best practices and how comparable are the different approaches? Many behaviour related experiments are performed in a local setting and within a short time frame, therefore the challenge is to find relations that hold over time and understanding cross cultural differences –especially in fast growing economies which are typically under-represented in surveys. How to distinguish robust findings? How to extend studies in industrialized countries to developing ones? How to model evolution in preferences and technology?

Moderators: Bas van Ruijven, Enrica de Cian and Laurent Drouet

13:00 -14:00 Lunch

14:00 - 15:30 Session 3

Level of detail: how deep should we go?

Devil is in the detail, but how much devil is enough? Behavioral features are typically heterogeneous, and uncertain. Heterogeneity of choice can be modelled through more stylized approach or by explicitly including different agent types. By including heterogeneity, in particular when different agents are distinguished, interactions between agents can also be captured, such as social influence. Here there is a trade-off in adding more detail while keeping the model simple. Moreover, which sectors and decisions should be described in greater detail? What best practices can be distinguished?

Moderators: Oreane Edelenbosch, Jean Francois Mercure.

15:30 -16:00 Coffee break

16:00 - 17:30 Session 4

Modelling paradigm: what are the most suited modeling tools for this job?

Several model types have been shown to be able to feature a richer description of behaviour than usually done. These include Agent Based Models, Discrete Choice Models, as well as more traditional IAMs. Agent based models have in many fields been used to analyse interactions between individuals or groups to assess the effects on the wider system, whereas IAMs are used in the context of long term transitions. In this session we would like to learn from their experiences so far and discuss possible applications within IAMs. Questions include: to what extent can ABM represent long term decarbonization? When does it make sense to improve the behavioural representation of IAMs and when to link ABMs and IAMs? To what point can IAMs behavioural realism can and should be improved?

Moderators: Adam Hawkes, Celine Guivarch, Neil Strachan

19:30 Dinner

Day 2 – Friday, 23 November

09:00 - 10:30 Session 5

Use of behavioural modeling: what for?

Modeling behaviour allows to have a more realistic representation of decisionmaking or to evaluate alternative policy measures that can influence behavior change. The motivation of the work can influence which behavioral aspects one might focus on. While the first argument would require a consistent holistic view that incorporates all the different behavioral aspects, the second focuses on more specific behavioral features and aim to provide insights into how that specific feature could affect projected results. This sessions will explore the potential application of behavioral rich models for policy evaluation. To what extent behaviourally informed models can address policies which traditional ones cannot? How relevant are these policies for the long term decarbonization? Can these model help evaluate policy interactions between traditional policies (e.g. taxation, regulation) and innovative ones (e.g. information provision, nudging)? Which sectorial policies should be taken as goals? Can behavioural models inform also other aspects of climate change such as impacts and adaptation?

Moderators: Robert Pietzcker, Evelina Trutnevyte

10:30 -11:00 Coffee break

11:00 - 12:30 Session 6

Wrap up

The last session will wrap up the key take away messages and define the structure of a perspective article.

Moderators: Oreane Edelenbosch and Massimo Tavoni

12:30 -14:00 Lunch

Participants

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