

NETHERLANDS ENVIRONMENTAL ASSESSMENT AGENCY (PBL) AND  
INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS (IIASA) WORKSHOP ON

## ENHANCING THE STATE OF TRANSPORT MODELING IN IAMs

AN EXPERT MEETING CARRIED OUT WITHIN THE FRAMEWORK  
OF THE EUROPEAN COMMISSION FP7 ADVANCE PROJECT  
(WODAK ROOM, IIASA, LAXENBURG, AUSTRIA – 19 NOVEMBER 2013)

8:15 *Departure with shuttle bus from hotel to IIASA  
Grand Hotel Mercure Biedermeier (Landstraßer Hauptstraße 28, 1030 Vienna)*

9:00 **Opening remarks** (10 min)  
*Welcome from host:* Keywan Riahi  
*Objectives of the meeting:* David McCollum, Detlef van Vuuren

9:10-  
10:30 **Session 1: What is the current state of transport modeling in IAMs and where should it go?**  
To advance the state of modeling, it is important to understand the current ‘lay of the land’ and how the integrated assessment modeling community arrived at this point. This session will provide an overview of the present state of transport modeling within IAM frameworks, as well as the challenges that lie ahead. The evolution of these models will be discussed from both present-day and forward-looking perspectives. What criticisms have been made of IAM transport models in the past? How have IAMs responded to these criticisms? Which models include which features? How do scenario results compare across models for key transport metrics, and are these results easily explained by the parametric assumptions and structural frameworks of the models? How do IAM transport results compare to more focused sectoral studies? In what ways are the IAM teams in ADVANCE hoping to improve the representation of transport in their models in the foreseeable future?  
**Chair: David McCollum**

**Bastien Girod**, ETH-Zurich & PBL Netherlands Environmental Assessment Agency (20 + 10 min)  
*Global transport modeling in IAMs: past experience, pitfalls, and paths forward; comparison of results across models*

**Tom Longden**, Fondazione Eni Enrico Mattei (15 + 5 min)  
*Comparing IAM results for transport and embedding them within the wider sectoral study context*

**Oreane Edelenbosch**, PBL Netherlands Environmental Assessment Agency (10 + 5 min)  
*Areas of planned/desired IAM transport modeling improvement, as identified by the transport stocktaking exercise in the context of ADVANCE*

Group discussion (15 min)

10:30-  
10:45 **Coffee Break**

**10:45-12:00**      **Session 2: What transport data is available and what more do we need for IAM work?**

Model results are driven in large part by input data and assumptions: this is as true for transport modeling as for any other energy sector. Various sources of transport data exist, but where are the best places to find it? Are there any centralized repositories of combined country-global data? Are particular data sets better than others? How similar or different are they? Are there any known caveats? How certain or uncertain are the numbers thought to be? What do we do about gaping holes in the data for particular countries and transport modes? Is it possible or useful to construct an historic database for common use throughout the research community? What is the best way to harmonize data across models?

**Chair: Detlef van Vuuren**

**Detlef van Vuuren**, PBL Netherlands Environmental Assessment Agency and Utrecht University (5 min)

*Introduction into the session: What is it that we want to achieve in ADVANCE with respect to data collection and organization? What will we use it for? What kind of product (e.g., database) might emerge from ADVANCE?*

**Lew Fulton**, University of California, Davis (15 + 10 min)

*State of global/national transport databases; caveats and known issues; how can improved data resolution also increase the resolution of scenarios*

**Jari Kauppila**, International Transport Forum (OECD) (15 + 10 min)

*State of global/national transport databases; caveats and known issues; what data is best to use for transport modeling within IAMs?; is it possible or useful to construct a common database?*

Group discussion (20 min)

**12:00-13:30**      **Lunch (sandwiches will be provided outside meeting room)**

**13:30-15:00**      **Session 3: Key determinants of mode choice and service demand - how can IAM transport models be improved to reflect heterogeneous behavior and consumer choices?**

Capturing consumer choice and behavior in numerical models is an acknowledged challenge, especially in the transport sector, given the myriad market imperfections. This session will discuss key determinants of mode choices driving transport energy demand, and how these vary within a population, over time, and spatially. Best-practice modeling examples from the community will be noted, and experiences shared. What vehicle and mode choice algorithms can be feasibly incorporated into IAMs? What do we know about modeling price-induced demand responses and how are these affected by consumer preferences and choices? Are different modeling paradigms required for developing vs. industrialized countries? How demand-influencing policies (e.g., 'fee-bates', public transit and land use, road and parking pricing, etc.) be represented in IAMs?

**Chair: Charlie Wilson**

**Mark Jaccard**, Simon Fraser University (20 + 10 min)

*Determinants of modal choice and service demands, including examples of how to model transport-sector policies?*

**Jillian Anable**, University of Aberdeen (20 + 10 min)

*Modeling of transport demand, behavior and consumer choices – present practice and challenges?*

Group discussion (30 min)

**15:00-15:30**      **Coffee Break**

**15:30-17:00**     **Session 4: How can transport infrastructure be better modeled in IAMs?**

The complex networks supporting person and freight mobility are fundamental elements of the transport sector, even if they are not fully represented in many IAMs. This session will reflect on which of these elements are most critical to model and how best to model them. For advanced vehicles and fuels this potentially includes representing pipelines, refueling stations, and fast-chargers, among others. How are infrastructures supporting fossil liquids, biofuels, electricity, and hydrogen different in this context? The ‘chicken-and-egg’ dilemma is well known, but can it be satisfactorily modeled in IAMs? How should models treat the different actors involved in making these decisions: public vs. private; society vs. individuals? How far should the IAM system boundaries be extended along the infrastructure dimension – all the way to network capacity issues and the construction of roads, bridges, rail lines, ports, airports, bike lanes, etc.?

**Chair: Robert Pietzcker**

**David Greene**, Oak Ridge National Laboratory and University of Tennessee (20 + 10 min)

*How can fuel delivery and infrastructure decisions be captured in IAMs? Is it possible to model the “chicken and egg” dilemma? How do biofuels, electricity, and hydrogen compare in this context? How might infrastructure issues influence energy transition dynamics?*

**Hannah Daly**, University College London (20 + 10 min)

*Infrastructure decisions in energy systems and integrated assessment models*

**Alexander Körner**, International Energy Agency (10 min)

*Estimating road and railway infrastructure capacity and costs – lessons learned from IEA analyses*

Group discussion (20 min)

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**17:00-18:00**     **Discussion Session: Where do we go from here?**

Wrap-up of the meeting. What follow-up activities can we imagine? Which areas are the most feasible? Which are of the highest priority (for policy, for the IAM community, for other research communities, etc.)?

**Chair: Keywan Riahi**

18:00     *Departure with shuttle bus from IIASA to hotel*

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