



**Advanced Model Development and Validation for the  
Improved Analysis of Costs and Impacts of Mitigation Policies**

# Structure and key objectives of ADVANCE

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## The context of ADVANCE

- Integrated Assessment Models (IAMs) have become central tools for informing long-term global and regional climate mitigation strategies
- Sound policy advice requires improved representations of complex system interactions and thorough validation of model behavior in order to increase confidence in climate policy assessments
- ADVANCE aims to respond to this demand by triggering the development of a new generation of IAMs



## Typical Questions asked by ADVANCE

- What's the role of energy efficiency improvements for climate change mitigation?
- What are the bottlenecks for the development of a sustainable/carbon-minimizing energysupply system?
- What are broader sustainability implications of alternative mitigation pathways?
- How does uncertainty about technological innovation affect optimal innovation policies?
- How can climate mitigation targets and energy access objectives be reconciled?

## Objectives of the project

- Building trust and confidence of politicians in the results of energy-economy and integrated assessment models (IAMs) by increasing transparency of models, underlying structures, and model-specific input data assumptions
- Developing a new generation of advanced energy-economy and integrated assessment modeling tools for the analysis of the costs and impacts of climate change mitigation policies
- Validation and diagnostics of models with the aim of evaluating their strengths and limitations

## Objectives of the project (continued)

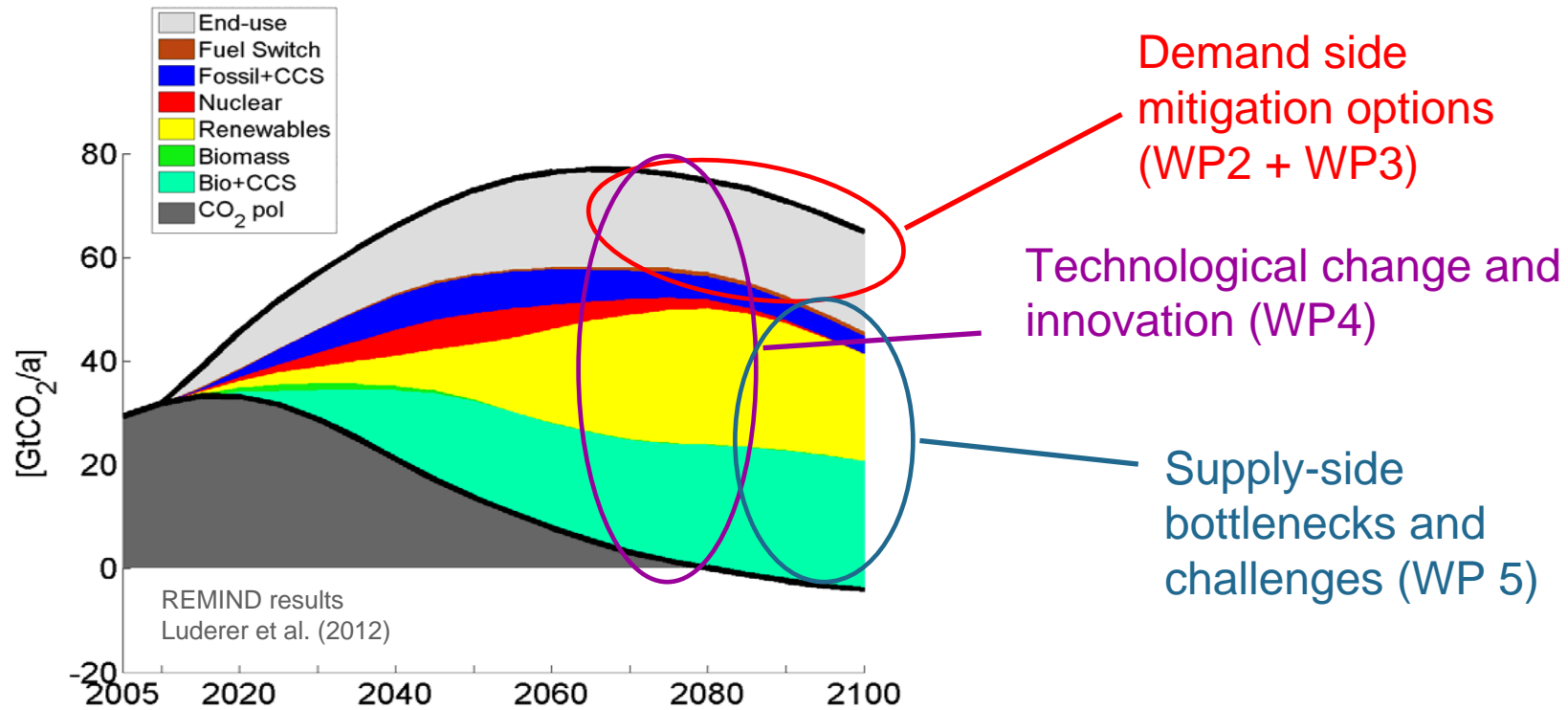
- Considerably improving the representation of energy demand in IAMs through better modeling of energy services, technologies, and consumer behavior
- Enhanced understanding and representation of technological innovation, uncertainty, system integration and resource constraints
- Evaluation of impacts of mitigation policies on economic sectors in the EU and beyond
- Creation of a platform for the coordinated development and sharing of methodologies and input data sets for the general modeling community



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# Improving our understanding of the mitigation challenge



## Key areas of model improvements

- Improved representation of end-use technologies providing energy services, drivers of energy demand, and potentials for energy efficiency improvements
- Representing the heterogeneity of consumer preferences, and how behavioral changes affect energy demand
- Treatment of innovation, technological change and uncertainty
- Identification and improved representation of supply-side bottle-necks

**WP2 (Lead: PBL)**

**WP3 (Lead: IIASA)**

**WP4 (Lead: FEEM)**

**WP5 (Lead: PIK)**

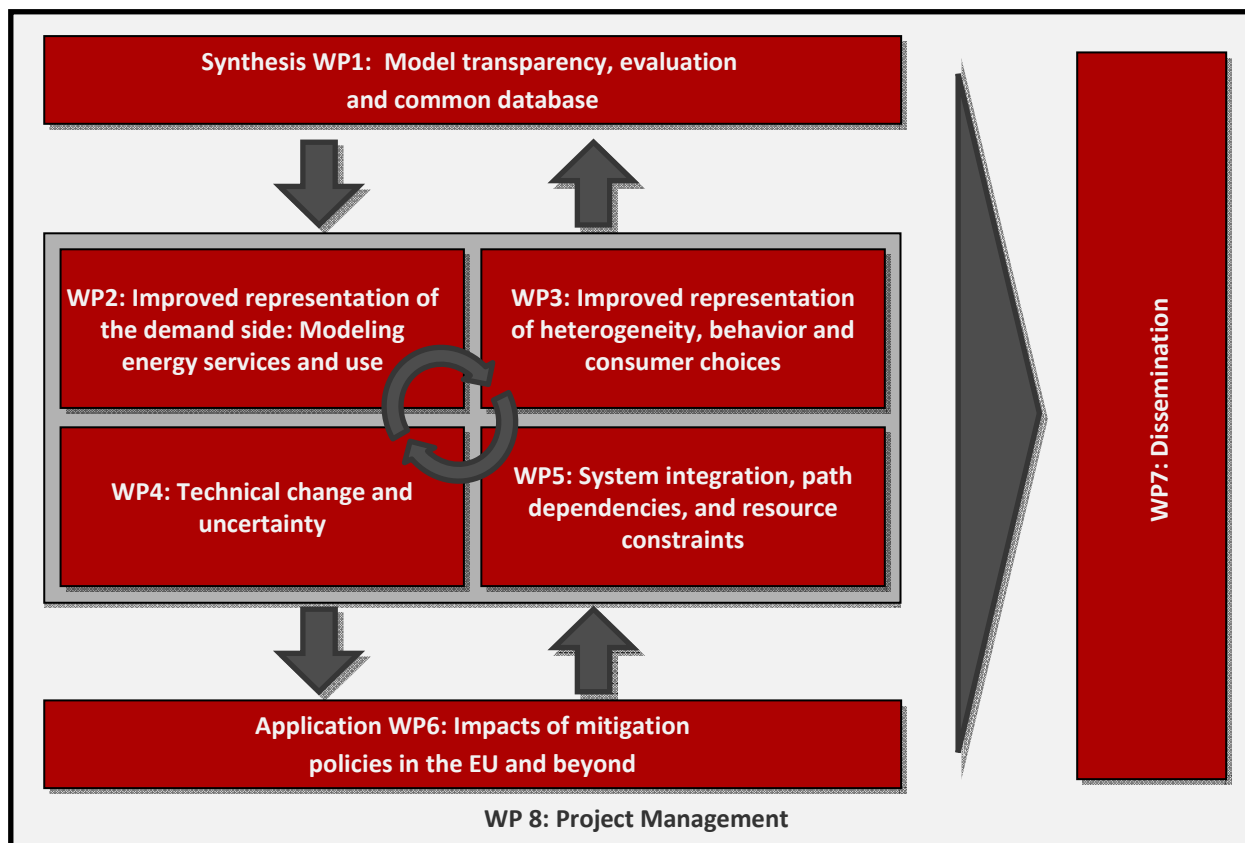
## Promoting innovation in Integrated Assessment Modeling



Creation of a platform for the coordinated development and sharing of methodologies and input data sets is at the core of the ADVANCE work programme



# ADVANCE in a nutshell



## ADVANCE project partners



Potsdam-Institut für Klimafolgenforschung  
(PIK), Germany



International Institute for Applied Systems  
Analysis (IIASA), Austria



Ministerie van Infrastructuur en Milieu,  
Planbureau voor de Leefomgeving (PBL),  
Netherlands



Fondazione Eni Enrico Mattei (FEEM), Italy



JRC - Joint Research Centre - European  
Commission (IPTS), Belgium



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## ADVANCE project partners (continued)



University College London (UCL), United Kingdom



Société de mathématiques appliqués aux sciences humaines - Centre International de Recherche sur l'Environnement et le Développement (SMASH), France



University of East Anglia (UEA), United Kingdom



Institute of Communication and Computer Systems (ICCS/E3MLab), Greece



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## ADVANCE project partners (continued)



Univesité Pierre Mendes France  
(UPMF-EDDEN), France



Norwegian University of Science and  
Technology (NTNU), Norway



Deutsches Zentrum fuer Luft- und  
Raumfahrt (DLR), Germany



Universiteit Utrecht

Utrecht University (UU), Netherlands



Enerdata

Enerdata SA (NRD), France



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