

Project No 308329

ADVANCE

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

FP7-Cooperation-ENV
Collaborative project

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Project presentation and leaflet

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Organization name of lead contractor for this deliverable:
FONDAZIONE ENI ENRICO MATTEI (FEEM)

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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	



**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



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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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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)



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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

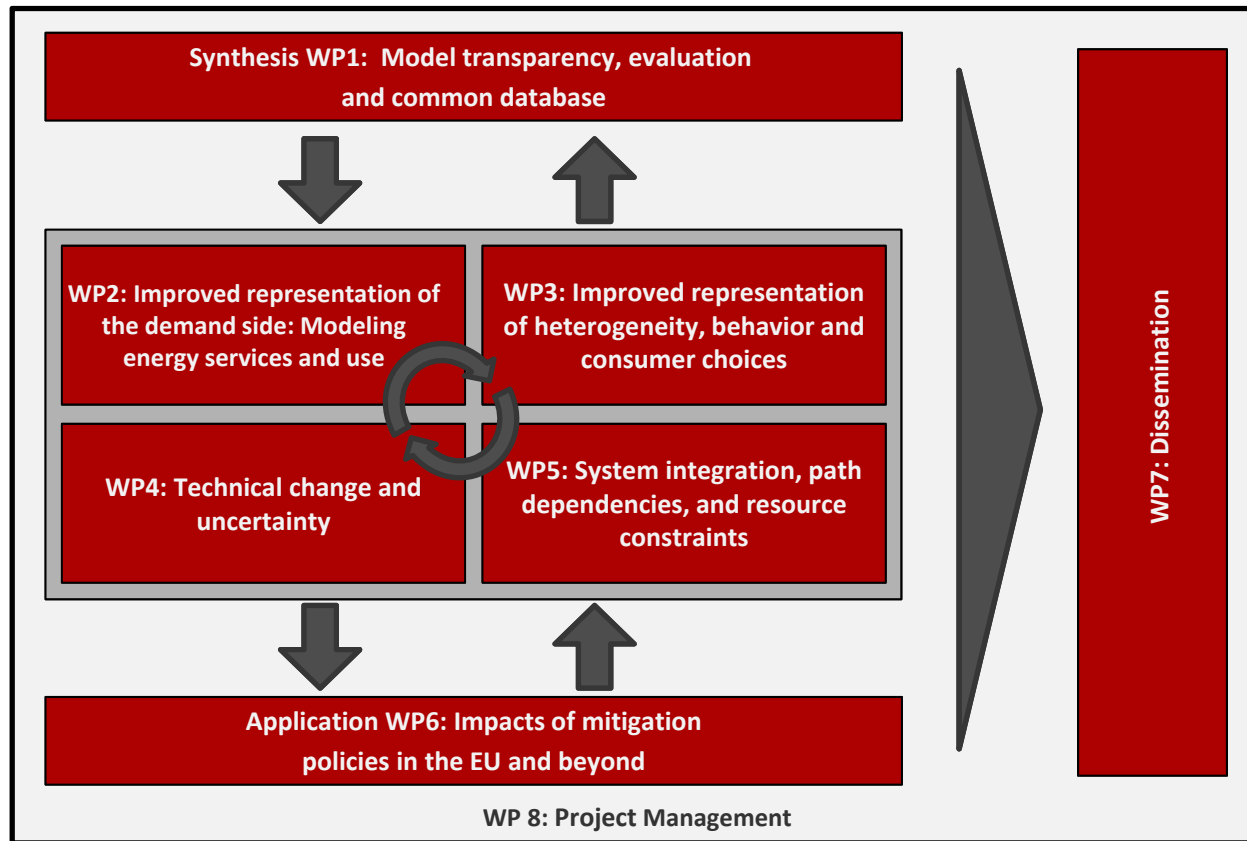


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P I K



ADVANCE in a nutshell



ADVANCE project partners



Potsdam-Institut für Klimafolgenforschung (PIK),
Germany



Internationales Institute for Applied System Analysis
(IIASA), Austria



PBL Netherlands Environmental
Assessment Agency

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



Fondazione Eni Enrico Mattei (FEEM), Italy



Joint Research Centre IPTS, European Commission



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ADVANCE project partners



University College London (UCL), United Kingdom



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



University of East Anglia (UEA), United Kingdom



Institute of Communication and Computer Systems (ICCS/E3MLab)



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ADVANCE project partners



University Pierre-Mèndes-France, France



Norwegian University of Science and Technology (NTNU), Norway



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



Utrecht University (UU), Netherlands



Enerdata SA (NRD), France



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Partners

 Potsdam-Institut für Klimafolgenforschung (PIK), Germany


 International Institute for Applied Systems Analysis (IIASA), Austria


 PBL Netherlands Environmental Assessment Agency
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

 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

 Univesité Pierre Mendes France (UPMF-EDDEN), France

 Norwegian University of Science and Technology (NTNU), Norway

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

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Objectives

- Building trust and confidence of politicians in the results of energy-economy and integrated assessment models (IAM) 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
- Considerably improving the representation of energy demand in IAMs through better modeling of energy services, technologies, and consumer behavior
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- Evaluation of impacts of mitigation policies on economic sectors in the EU and beyond
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WORK FLOW FOR METHODOLOGICAL INNOVATIONS



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Project Summary

Integrated assessment and energy-economy models 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 integrated assessment models. This will be achieved by substantial research and development work in key areas where model improvements are greatly needed:

- end use and energy service demand;
- representation of consumer heterogeneity, preferences and behavior;
- technical change and uncertainty;
- system integration of variable renewable energy sources, path dependencies and resource constraints;
- economic impacts of mitigation policies.

In the past, methodological innovations and improvements were hindered by the unavailability of suitable input data. The **ADVANCE** project will make a large and coordinated effort to generate relevant datasets. These datasets, along with newly developed methodologies, will be made available to the broader scientific community as open-access resources.

ADVANCE will also put a focus on improved model transparency, model validation, and data handling. A central objective of **ADVANCE** is to evaluate and to improve the suitability of models for climate policy impact assessments. The improved models will be applied to an assessment of long-term EU climate policy in a global context, and the results disseminated to the wider community.