

DAY 1 - SYSTEM DYNAMICS INTRODUCTION AND MODELLINGDate: 3rd November**10:00 General Introduction of MOOC**

Simone D'Alessandro

Citizens demand change, and policymakers seek sustainable solutions. The course presents WILIAM, an Integrated Assessment Model, teaching how to assess sustainability policies and transition to a low-carbon society effectively and transparently.

Simone D'Alessandro is professor at the Department of Economics and Management of the University of Pisa. His research interests involve the distribution of income and wealth, development economics, behavioral economics, ecological economics, ecological sustainability and degrowth. His work in recent years is focused on the socio-economic effects of policies to promote the transition towards sustainability.

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10:20 IAMs and System Dynamics

Luis Javier Miguel González

The course introduces System Dynamics as a method used in WILIAM to overcome these barriers, allowing the integration of various variables, modularity, interdisciplinary work, and clear graphical representation of causal relationships. System Dynamics enables dynamic modeling, exploration of socio-ecological system changes, and adaptation to new scenarios and policies, making it a versatile approach for IAM development.

Luis Javier Miguel González is a professor in the Department of Systems Engineering and Automatic Control at the University of Valladolid. His priority research line is the application of systems dynamics to the analysis of energy resources and policies.

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11:15 BREAK**11:30 Introduction to the WILIAM model**

Iñigo Capellan

The lecture introduces WILIAM as a sophisticated system dynamics simulation model designed to analyze complex feedback loops and relationships among social, economic, and environmental variables. It explores long-term socio-ecological transitions considering planetary limits and socio-economic constraints. The model incorporates detailed representations of sectors like decarbonization-related industries and assesses interactions between firms, households, governments, and biophysical dimensions, providing a comprehensive understanding of socio-ecological dynamics.

Inigo Capellan is an industrial engineer from the University of Valladolid and ENSAM Arts et Métiers Paris-Tech. His research interest focuses on the analysis and modeling of the energy-economy-environment systems, the transition to renewable energies in the context of the depletion of fossil fuels and climate mitigation and the technical and social transformations towards sustainability.

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12:30 System Dynamics and Feedback Loop on VENSIM

The lab activity aims to familiarize participants with System Dynamics reasoning in IAMs through practical exercises. It includes hands-on sessions using Vensim PLE software, serving as a foundation for subsequent lab activities. Participants will gain introductory knowledge crucial for the following days' tasks.