IAM COMPACT

Expanding Integrated Assessment Modelling:
Comprehensive and Comprehensible Science
for Sustainable, Co-Created Climate Action

MS6 - Training material on concepts & tools

WP6 – Explaining: Analysing policy from a political sciences perspective, developing, and extending capacities

27/02/2023

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Preface

IAM COMPACT supports the assessment of global climate goals, progress, and feasibility space, and the design of the next round of Nationally Determined Contributions (NDCs) and policy planning beyond 2030 for major emitters and non-high-income countries. It uses a diverse ensemble of models, tools, and insights from social and political sciences and operations research, integrating bodies of knowledge to co-create the research process and enhance transparency, robustness, and policy relevance. It explores the role of structural changes in major emitting sectors and of political, behaviour, and social aspects in mitigation, quantifies factors promoting or hindering climate neutrality, and accounts for extreme scenarios, to deliver a range of global and national pathways that are environmentally effective, viable, feasible, and desirable. In doing so, it fully accounts for COVID-19 impacts and recovery strategies and aligns climate action with broader sustainability goals, while developing technical capacity and promoting ownership in non-high-income countries.

NTUA – National Technical University of Athens	EL	
Aalto – Aalto Korkeakoulusaatio SR	FI	
AAU – Aalborg Universitet	DK	
BC3 – Asociacion BC3 Basque Centre for Climate Change – Klima Aldaketa Ikergai	ES	
Bruegel – Bruegel AISBL	BE	
CARTIF – Fundacion CARTIF	ES	
CICERO – Cicero Senter for Klimaforskning Stiftelse	NO	
E3M – E3-Modelling AE	EL	
KTH – Kungliga Tekniska Hoegskolan	SE	
POLIMI – Politecnico di Milano	IT	
UPRC – University of Piraeus Research Center	EL	
UVa – Universidad De Valladolid	ES	
WI – Wuppertal Institut fur Klima, Umwelt, Energie GGMBH	DE	
IIMA – Indian Institute of Management	IN	
THU – Tsinghua University	CN	
USMF – University System of Maryland	US	
AAiT – Addis Ababa University	ET	
KEI – International Civic Organisation Kyiv Economics Institute	UA	
RUSL – Raja Rata University of Sri Lanka	LK	
TUM – Technical University of Mombasa	KE	
UNIGE – Université de Genève	CH	
Imperial – Imperial College of Science, Technology and Medicine	UK	

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Contents

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1 Access

This milestone consists of a set of **open access training and teaching material developed collaboratively**, licensed under CC BY 4.0, and available on IAM COMPACT's Zenodo repository, and through the project's website.

The material is in the form of pptx files and includes the following presentations (divided by concept):

- Introduction to energy (and electrification) modelling; DOI: 10.5281/zenodo.10715685
- Introduction to OnSSET; DOI: 10.5281/zenodo.10719078
- Minigrid modelling; DOI: 10.5281/zenodo.10719106
- Use of energy system models and scenarios in policy – Case studies; DOI: 10.5281/zenodo.10719111
- Introduction to input-output analysis; DOI: 10.5281/zenodo.10719139
- Input-output analysis hands-on; DOI: 10.5281/zenodo.10719152
- Energy-economy modelling case studies; DOI: 10.5281/zenodo.10719167
- Integrated resource modelling and examples; DOI: 10.5281/zenodo.10719192
- Designing scenarios; DOI: 10.5281/zenodo.10719218

The open license allows free distribution and re-use (including editing) by anyone, provided attribution is given and the terms of the license are complied with. The material can be cited as indicated on the Zenodo repository (each presentation is added separately, with a DOI). Contribution by new users and communities of practice is very welcome. Please get in touch with the authors of the material.

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2 Scope and intended users

The training material covers ground concepts, ontology, and introduction to modelling tools and approaches from the modelling ecosystem of IAM COMPACT. It introduces the concepts of energy systems and integrated resource modelling, encompassing climate, land, energy (and electrification), water, health, economy and, more broadly Integrated Assessment Modelling. It provides examples of use of modelling tools to inform policy, describes the concept of scenarios, and provides overviews of tools within the diverse IAM COMPACT model ensemble, such as OSeMOSYS, OnSSET, MicroGridsPy, MARIO, CLEWs, GCAM, and WILIAM (all modelling tools presented in the training material are also described in detail in the I^{2}AM PARIS platform).

As such, it targets any user with a technical background, who would like an introduction to the use of modelling tools in the energy access and climate mitigation and adaptation space. We aim for (re-)use and adjustments by both learners (students, technical staff in government institutions, other stakeholders with technical background) and teachers (academic staff or potential trainers in international training events).

There are spaces for online collaborative development of teaching material, where new teachers may propose re-elaborations of this material. One example is: https://curriculum.climatecompatiblegrowth.com/, created and managed by the UK FCDO-funded Climate Compatible Growth Programme. Access to the content management can be provided to interested trainers. Several of the authors of the material hereby shared are contributors to the above-linked source, too. IAM COMPACT also contributed as a project by transferring an existing course on Climate, Land, Energy, Water systems (CLEWs) modelling onto the above resource, to encourage collaborative development.

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3 Production and ownership

The material is the result of an effort of **collaborative development of teaching material**. This effort moved from the preparation of material for workshops carried out in Kenya, Ethiopia, and Sri Lanka (and polishing afterwards) as part of the IAM COMPACT project's capacity development effort (IAM COMPACT Task 6.5). The preparation of this material involved several teams (both from the EU and from the countries where the workshops were being organised) and entailed the re-elaboration of knowledge retained in different forms by each team separately. The need for re-elaboration was strong, also considering that the various workshops were conducted in very different contexts, for very different audiences. Therefore, they required the explanation of concepts from several angles.

The concepts that emerge are, therefore, explained under new angles, joining experiences, and understanding of several trainers. In a word, this material is the product of **co-creation**. All the authors are acknowledged, and the open access license dictates the terms for attribution.

The best available open science protocols are applied by the authors for the curation of the material, linking this milestone to the work of IAM COMPACT Task 3.3 (on open science protocols).

It should be noted that the capacity development effort of IAM COMPACT is still ongoing, and many more sets of teaching material are expected to be produced and published (in the same form as the current ones) until at least Month 24 of project duration (August 2024).

We also aim to improve this material, as well as to publish updated versions with short speaker notes, as guidance for both learners and teachers.

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