

## Who we are



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**Delivering the next generation of open Integrated Assessment Models for Net-zero, sustainable Development**

DIAMOND seeks to contribute to the development of the next generation of IAMs, for effective climate policy support; by the end of the project, six new or enhanced IAMs will be fully open and sufficiently equipped to scientifically underpin and support an accelerated transition towards circular, resilient, desirable, and sustainable climate neutrality.

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## Objectives

"DIAMOND" aims to:

- » Produce iteratively updated, upgraded, open-source versions of six leading IAMs
- » Further enhance the capabilities of IAMs to assess the trade-offs and co-benefits of a transition to climate neutrality with other SDGs
- » Enable the systematic evaluation of interactions among climate change mitigation, adaptation, risks, physical impacts
- » Validate the capacity of the enhanced IAMs to support climate and other development policies and COVID19 recovery efforts at multi-level aspects
- » Transparently open all modelling enhancements to the wider modelling community
- » Develop a transdisciplinary scientific approach to co-create the research questions, legitimise the implementation process and model development, and optimise the communication of project results

## Approach

### CODESIGN

This component establishes, operationalises, and manages a co-creation mechanism that drives all model developments as well as scenario exercises in the project. This mechanism, actively placing actors from all relevant stakeholder groups (scientists, policymakers, industries, citizens) at the heart of the project, helps form mutual understanding toward co-producing and therefore co-owning models and knowledge

### UPDATE & UPGRADE

Here, six IAMs that are emblematic in scientific and policy processes as well as in capacity development activities of leading international organisations are opened and advanced in terms of sectoral and technological detail, spatial and temporal resolution, and geographic granularity. Six IAM super-groups use the co-produced requirements and coordinate with one another toward upgrading—as well as updating and harmonising the parameters of producing GCAM-Europe, OMNIA, CLEWs-EU, GEMINI-E3 EU, NEMESIS-World, OPEN-PROM.

### INTEGRATE & EXPAND

With a view to achieving a sustainable balance between model complexity on the one hand and usability/comprehension of results on the other, creating the next generation of IAM capabilities must go beyond advancements on the models themselves. This interdisciplinary block of activities creates linkages of the six enhanced IAMs with other models, tools, and theories from modelling science as well as social sciences and humanities, to expand the IAM feasibility space to enable to adequately address aspects of behaviour, finance, labour, equity, physical impacts, biodiversity, and broader sustainability within and around mitigation.

### APPLY & EXPLORE

This block applies the co-produced model enhancements and linkages to explore questions driven by scientific and policy needs as well as engaged stakeholders. It first creates a scenario definition space that acknowledges the progress made in modelling science before understanding the outstanding research gaps. Based on this space, it explores mitigation in conjunction with broader sustainable development perspectives, as well as with physical impacts and adaptation, and carries out systematic assessments of disruptive events (pandemics, economic shocks, innovations, and weather events, etc.). It seeks to stretch the frontiers of climate-economy modelling science, by exploring mitigation vis-a-vis circularity performance, labour and finance dynamics, societal transformations, and alternative economic paradigms, and by providing a novel risk framing of the produced scenarios.

### OPEN

This component establishes new business models for IAM transparency and openness as well as governs IAM development, integration, and application using these models. It includes diagnostics and evaluation protocols, development pipelines (versioning, open codes, software management), user-tailored libraries and data explorers in the I<sup>2</sup>AM PARIS platform, and FAIR data management.

Notably, this block also creates and sustains communities of practice for all six IAMs, leveraging participation in relevant networks and consortia as well as already established communities underlying their development and use, thereby enhancing the openness, transparency, sustainability, usability, ownership, and relevance of the advanced IAMs and scenarios produced in the project.

## Expanding Capabilities

Knowledge co-production envisaged in DIAMOND is a challenging task that must be carried out from a multi- (from different disciplines), inter- (across different disciplines), and trans-disciplinary lens (across actors and sectors). By developing appropriate methods and frameworks, scenarios will be developed and analysed, among others, for:

- » The circular economy
- » The land sector and nature-based solutions
- » Climate responses and fully integrated assessments
- » Preferences, behavioural aspects, and heterogeneity
- » A finer detail of the electricity sector

