

**ECEMP, Brussels
17 October 2025**

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

Co-Designing Stakeholder-Informed Research Questions: A Transdisciplinary Approach for Integrated Assessment Modelling

Dr Stephanie Briers (ETH)

Vienni-Baptista, B.; Koasidis, K.; Peters, G.; Mittal, S.; Butnar, I.; Maximov Gajardo, S.;
Malliaroudaki, M.; Sanders, M.; Treibich, T.; van der Kam, M.; Nikas, A.

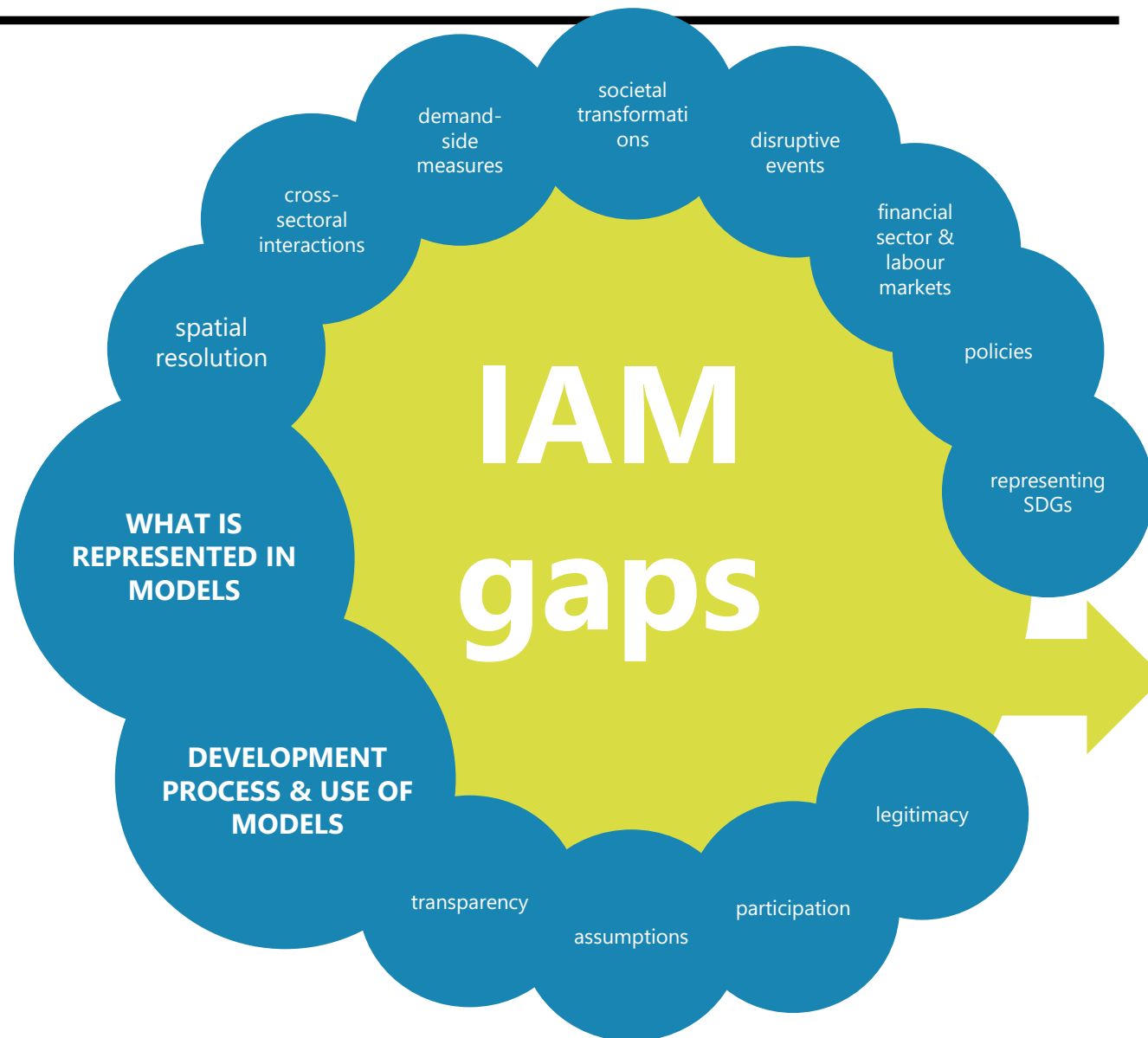


**Funded by
the European Union**

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.



DIAMOND Objective



Integrated assessment models

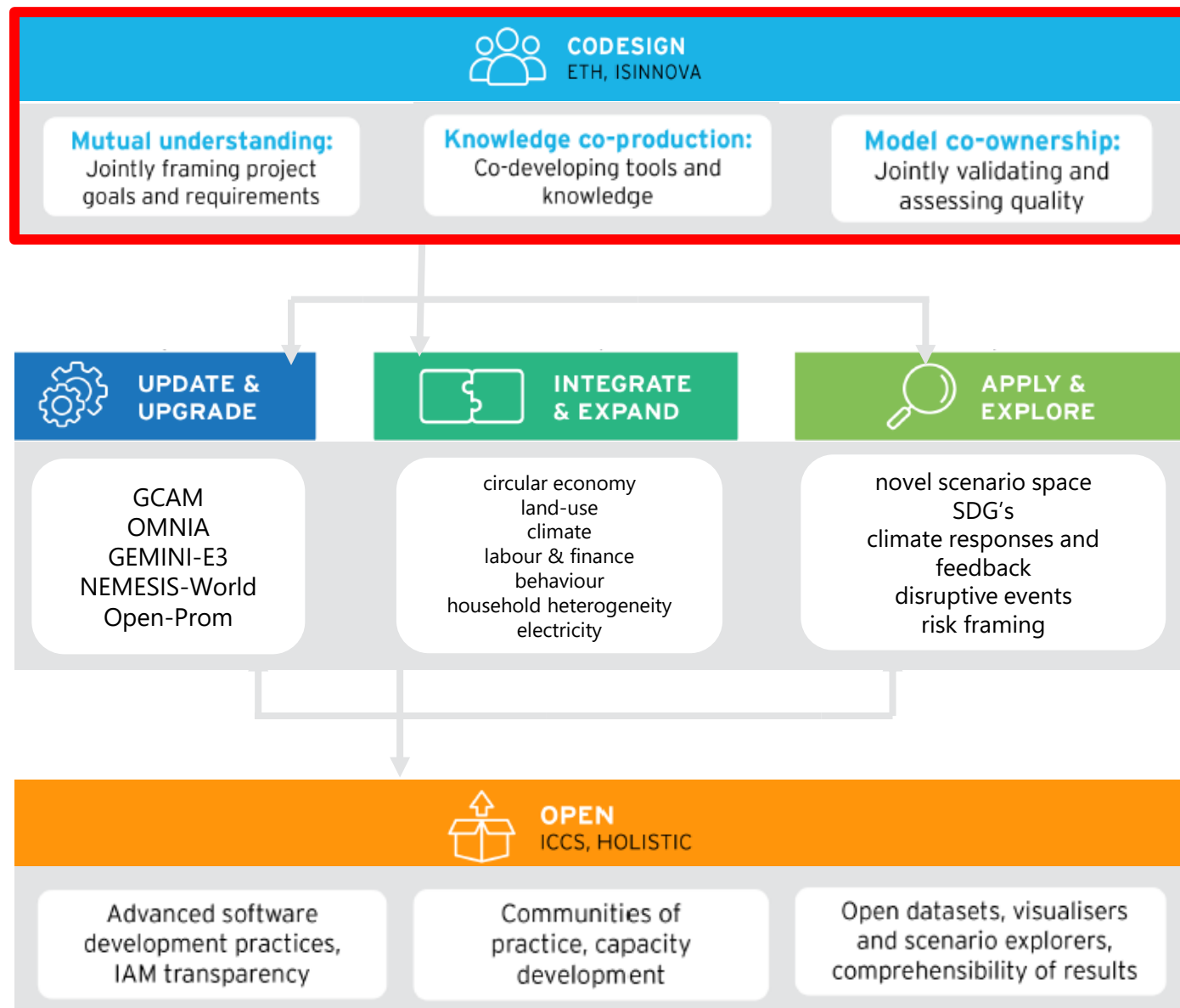
Integrated assessment models are increasingly **used to inform policy decisions** to adapt to and mitigate climate change

...and are therefore **increasingly criticised**

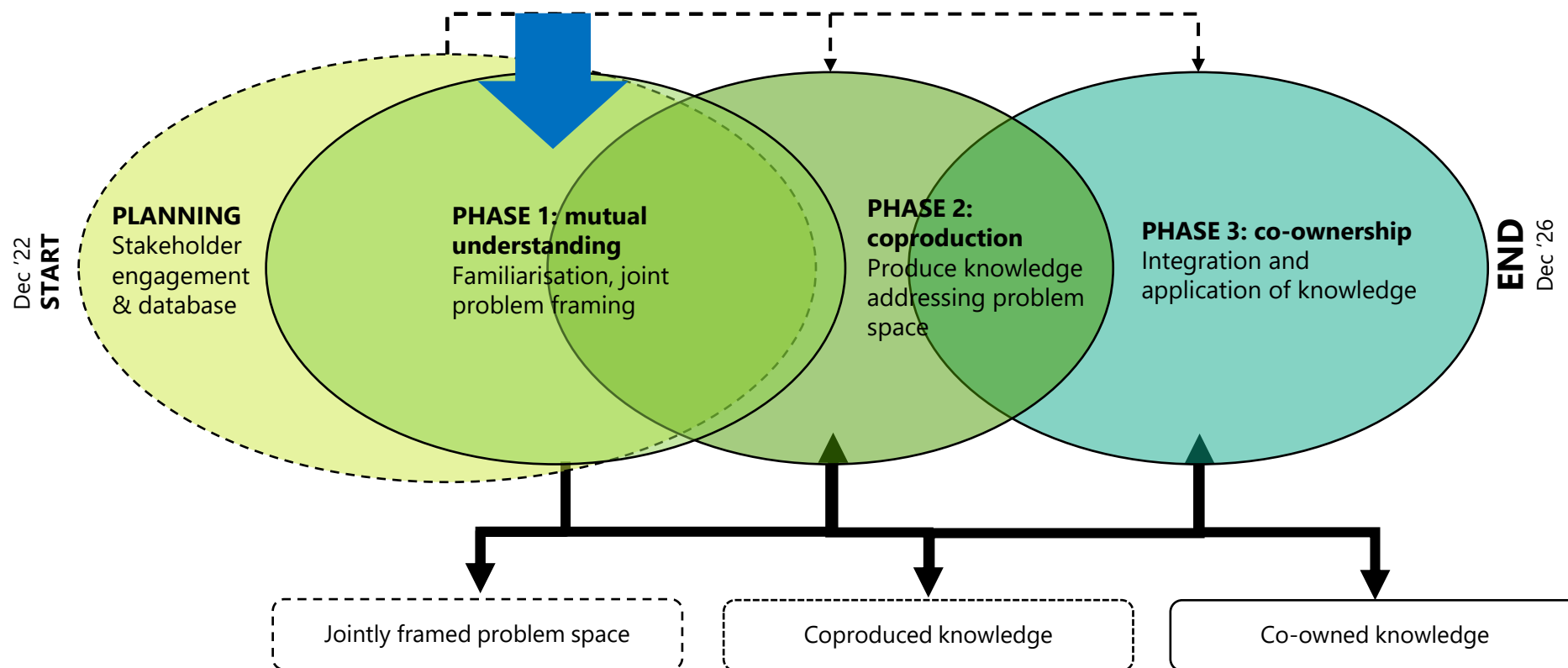


Addresses these criticisms by developing IAMs that are open, transparent and equipped to inform climate policy

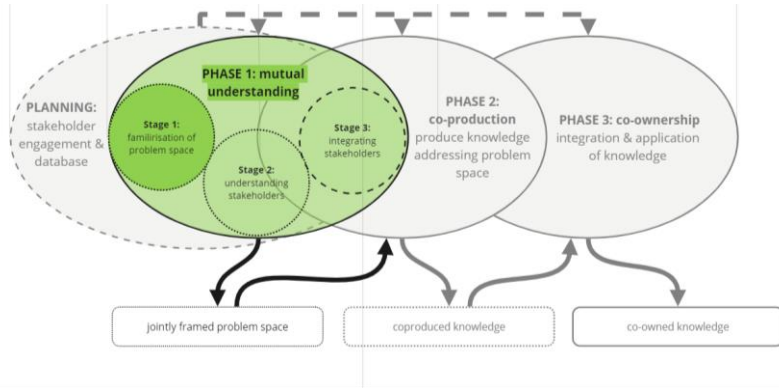
Work package 2: Co-design



WP2: Codesign phases



Phase 1 Stage 1: mutual understanding of project goals, needs & limits



Stage 1: Familiarisation of problem space

Focus:

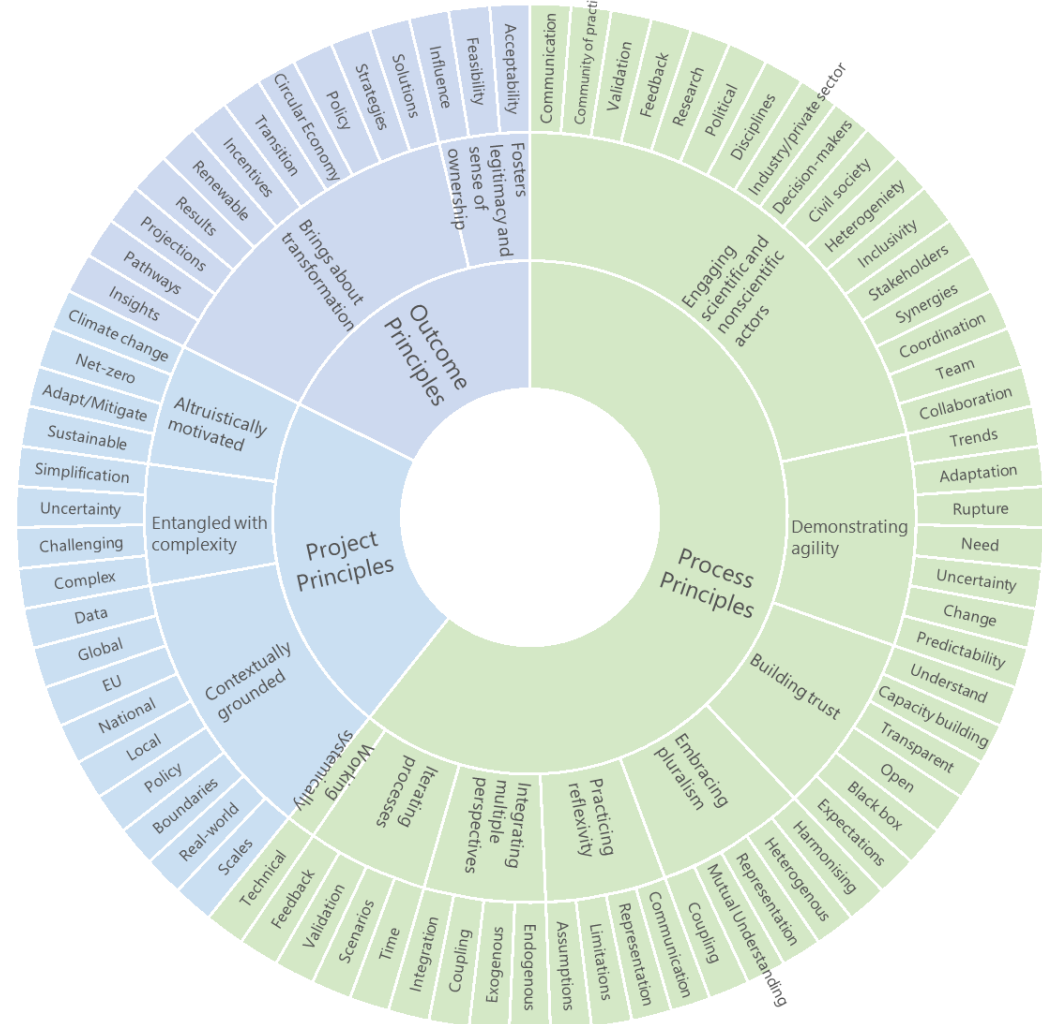
- Familiarise with the consortium teams, their perceptions of the project mission,
- Develop an understanding of the degree of transdisciplinary experience in DIAMOND

Outcome:

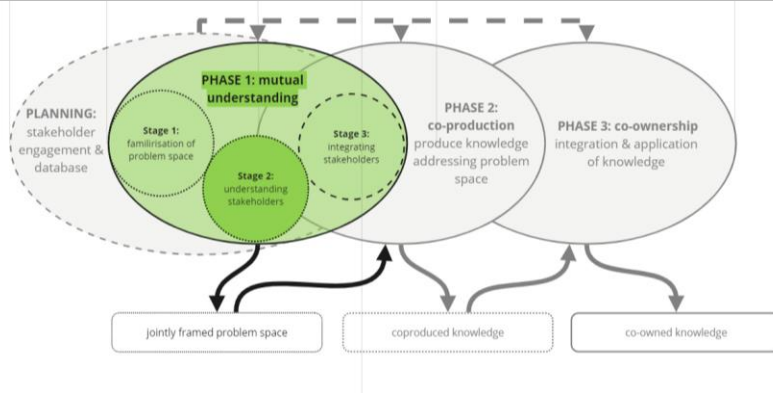
- A set of take-aways to bring into the next stage to strengthen transdisciplinarity in DIAMOND
- A set of transdisciplinary principles, identifying which areas of the TD approach to strengthen (*Briers, Vienni-Baptista, under review*)

Transdisciplinary principles in DIAMOND

■ Project Principles ■ Process Principles ■ Outcome Principles



Graph: Thematic coding on the transdisciplinary principles in DIAMOND from Stage 1 workshop data



Stage 2: Understanding stakeholders

Focus:

- Follow up on take-aways from Stage 1
- Understanding the heterogeneous nature of stakeholders and the different modes of engagement

- Ensuring inclusive stakeholder engagement

Outcome:

- Actions to improve transdisciplinarity in DIAMOND
- Understanding different stakeholders considered by DIAMOND partners
- A set of definitions of inclusivity and principles to ensure inclusive stakeholder engagement (Herbig, 2024)

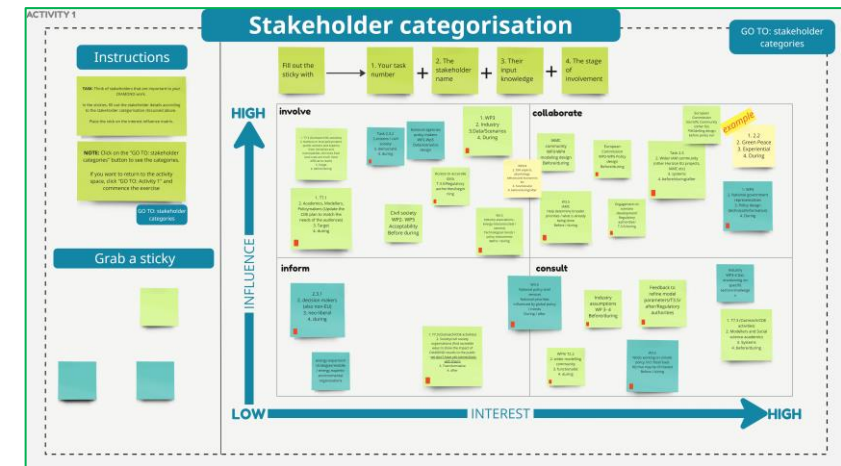


Figure: Workshop exercise looking at the degree to engage different types of stakeholders

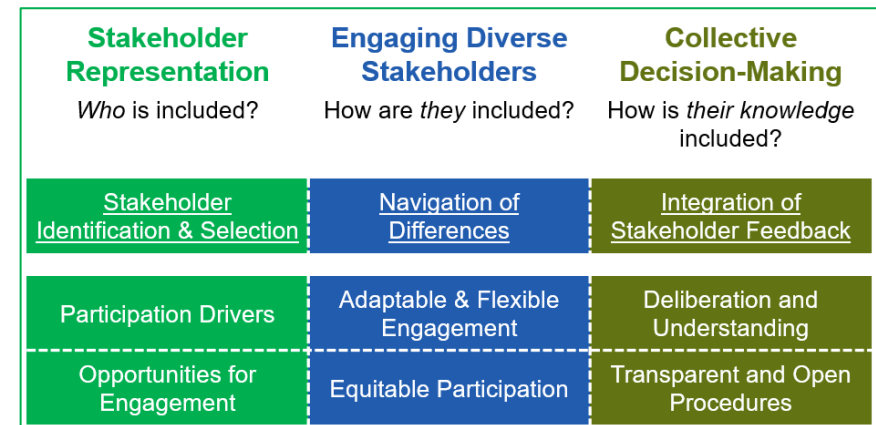
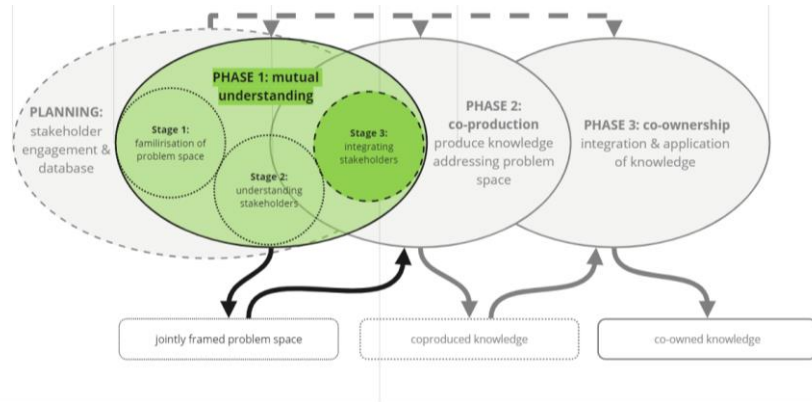


Figure: Conceptual Framework for an Inclusive Modeling Environment (Herbig, V, 2024)

Phase 1 Stage 3: formulating research questions with stakeholders



Stage 3: Integrating stakeholder perspectives

Focus:

- Develop 8 co-design modules based on DIAMOND scenario themes
- Scope DIAMOND model research interests through a set of exploratory questions
- Match-making exercise between scenario themes, model interests and capabilities
- Within each co-design module, co-design research questions with stakeholders

Outcome:

- A set of research questions that will guide DIAMOND scenario development (D2.5 Stakeholder informed research questions- Update)

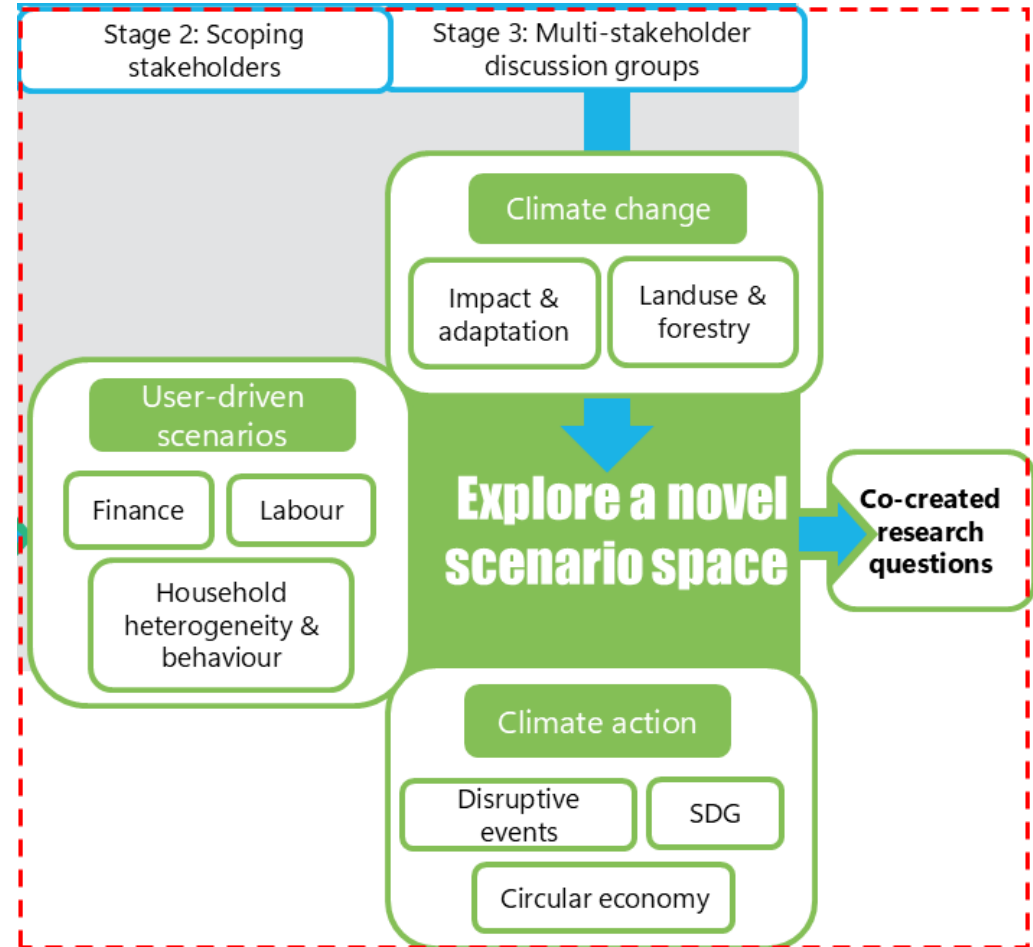
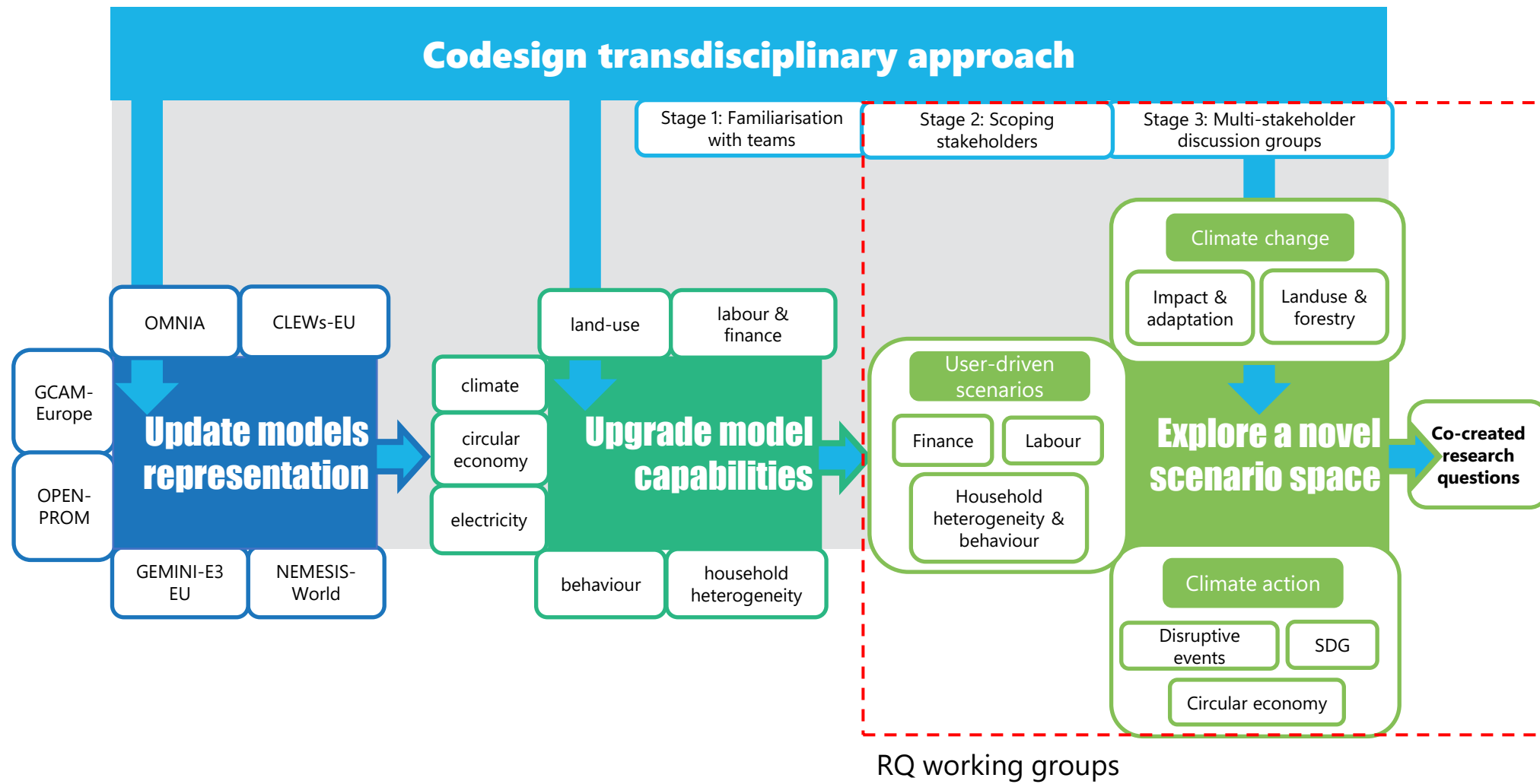


Figure: First iteration of the Circular Economy Codesign module that will coproduce stakeholder-informed research questions



First iteration: Feb 2024 – Nov 2024

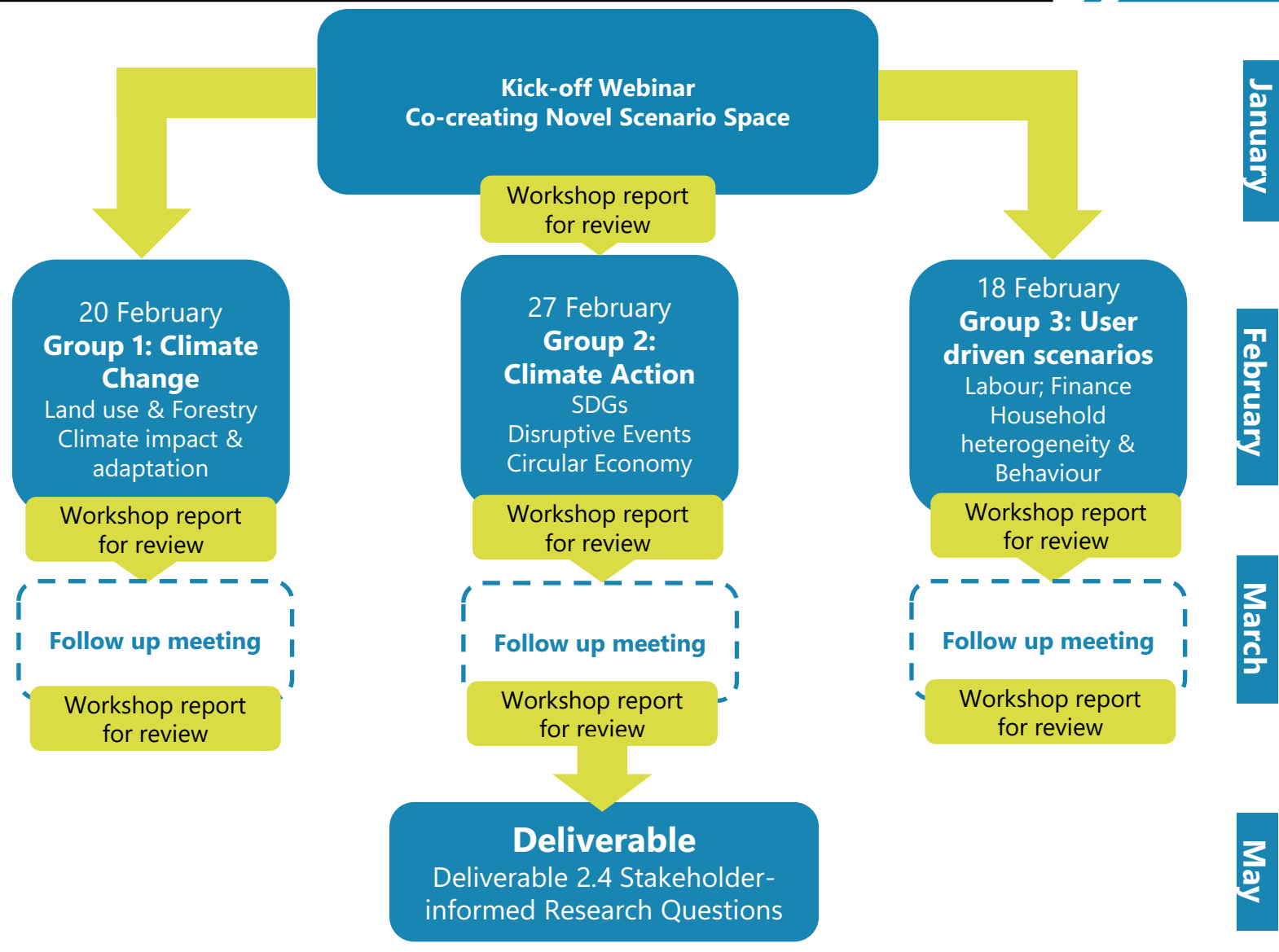
- ### Second iteration: Oct 2024 – Jan 2025

- ### Third iteration: Jan 2025 – May 2025

-
- LEVEL RQ**
- What will the climate be in 2100? What will the climate be in 2100? What will the climate be in 2100?
- human behavior**
- TEAM**
- CLEWs (3), OMNIA (1) GCAM
- Task 4.6 Representations of behavioral aspects and preferences for climate action
- SCENARIO RQ**
1. What can we do to reduce greenhouse gas emissions? What can we do to reduce greenhouse gas emissions? What can we do to reduce greenhouse gas emissions?
2. What will be the impact of climate change on the environment? What will be the impact of climate change on the environment? What will be the impact of climate change on the environment?
3. What will be the impact of climate change on the environment? What will be the impact of climate change on the environment? What will be the impact of climate change on the environment?
4. What will be the impact of climate change on the environment? What will be the impact of climate change on the environment? What will be the impact of climate change on the environment?
5. What will be the impact of climate change on the environment? What will be the impact of climate change on the environment? What will be the impact of climate change on the environment?
- TECHNICAL RQ**
1. What will be the impact of climate change on the environment? What will be the impact of climate change on the environment? What will be the impact of climate change on the environment?
2. What will be the impact of climate change on the environment? What will be the impact of climate change on the environment? What will be the impact of climate change on the environment?
3. What will be the impact of climate change on the environment? What will be the impact of climate change on the environment? What will be the impact of climate change on the environment?
- check if scenario is consistent with the assumptions in the model

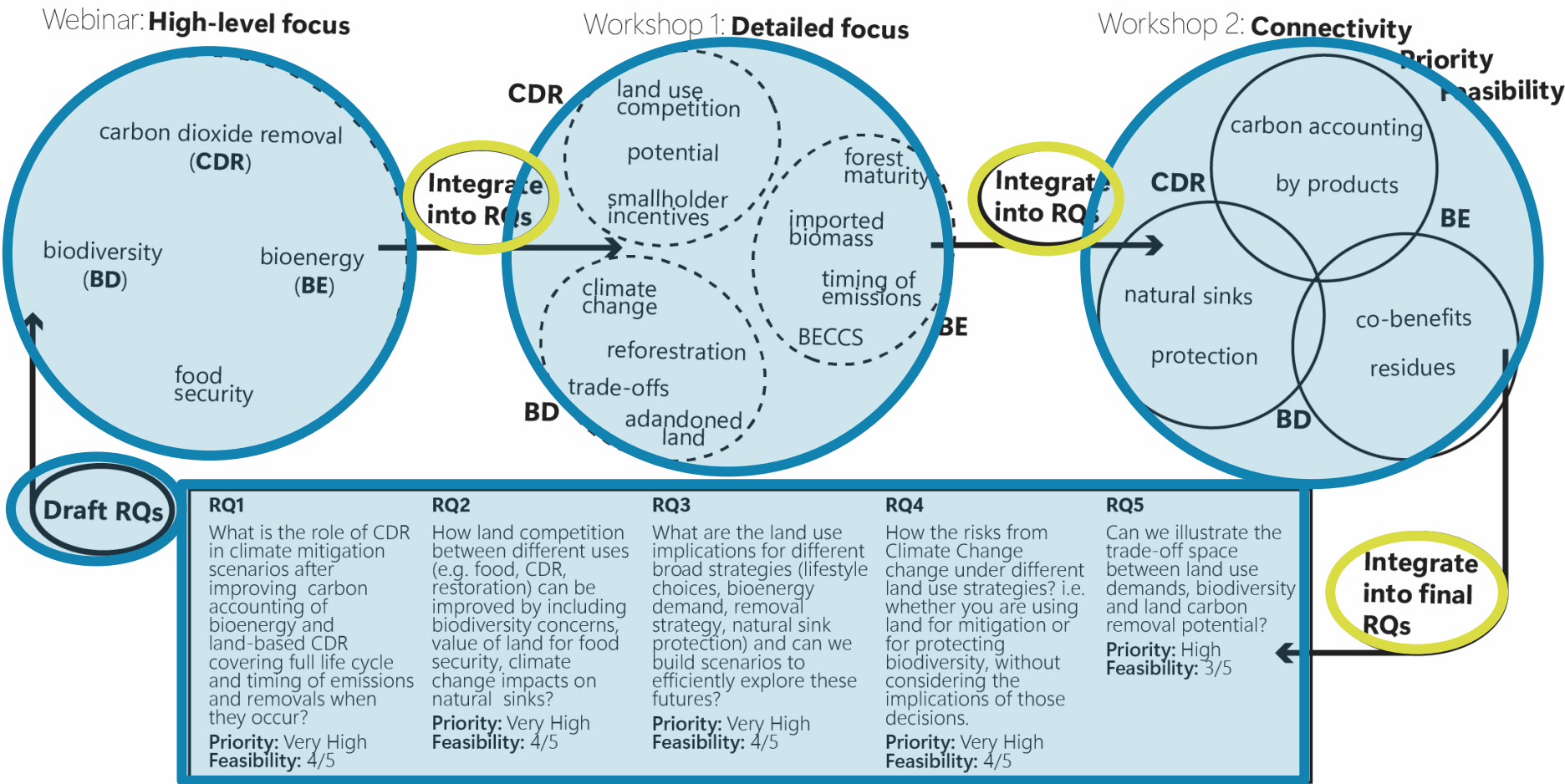
[illegible]

Phase 1 Step 3: formulating research questions with stakeholders



Phase 1: Output example

Co-creating Research Questions for Climate Change Impact: Land use and Forestry



broaden the IAM scenario space

account for a wide range of uncertainties and contestations

realism in economic and political assumptions

serve user needs more effectively

transparency around trade-offs

align scenario narratives with national policy definitions and metrics



Moving beyond engaging societal actors to critically engaging with IAMs

Joint problem framing goes beyond creating research questions

Translate societal actor knowledge and needs across themes and contexts

Be transparent about how research questions are answered



Thank You

Bianca Vienni-Baptista

Bianca.Vienni@usys.ethz.ch

Stephanie Briers

Stephanie.briers@usys.ethz.ch

 [climatediamond](#)

 [climatediamond](#)

 [climatediamond](#)

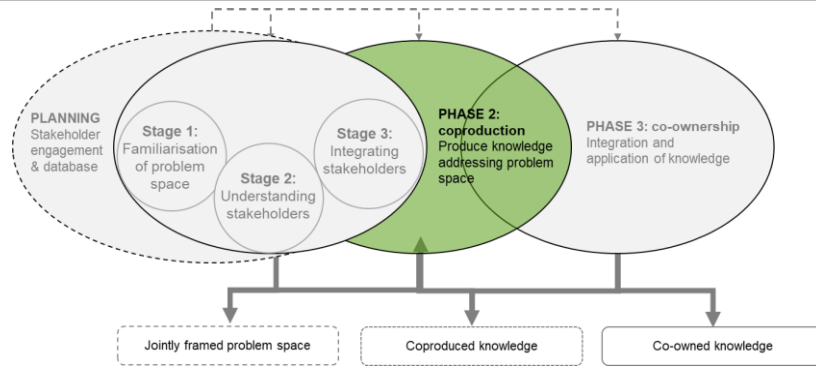


**Funded by
the European Union**

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

#ClimateDiamond

Phase 2: Co-producing scenarios from RQs



Co-produce scenarios and model development

Focus:

- Models capacity to answer questions
- The novelty of the questions for scenario development
- Depth to which questions can be addressed
- Highlight limitations to addressing questions
- Produce scenarios and model development based on questions

Outcome:

- Co-produced scenarios to run in models
- Questions not addressed highlighted for further research, pointing out model limitations

1.2 LAND USE & FORESTRY. TEAM:

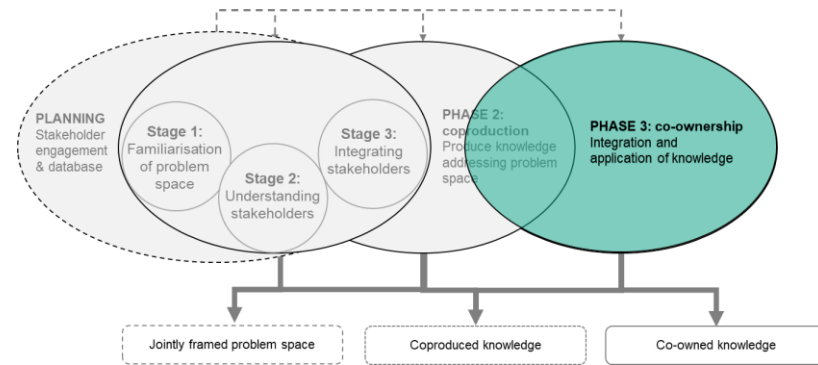
Forest File

RQ	MODEL	SCENARIO	DEPTH	FINAL EVAL.
RQ1: What is the role of CDR in climate mitigation scenarios after improving carbon accounting of bioenergy and land-based CDR covering full life cycle and timing of emissions and removals when they occur? VH4/1.1	GCAM-Europe CLEWS Magpie	Carbon accounting Life cycle emissions Timing emissions/rem	3 2 4	stylized detailed detailed (GCAM magpie) stylized (CLEWS)
RQ2: How land competition between different uses (e.g. food, CDR, restoration) can be improved by including biodiversity concerns, value of land for food security, climate change impacts on natural sinks? VH4 1.2	GCAM-Europe CLEWS Magpie	Land Competition • Bio • Value of land for food security • CC natural sinks	3 4 4	stylized stylized stylized stylized stylized stylized
RQ3: What are the land use implications for different broad strategies (lifestyle choices, bioenergy demand, removal strategy, natural sink protection) and can we build scenarios to efficiently explore these futures? VH4	GCAM-Europe CLEWS Magpie	- lifestyle - bioenergy demand - removal - natural sink prot - CC risks	4 4 4	stylized stylized stylized stylized stylized
How the risks from Climate Change change under different land use strategies? i.e. whether you are using land for mitigation or for protecting biodiversity, without considering the implications of those decisions. VH4 1.2				Land Use demand - detailed bioenergy - stylized
RQ4: Can we illustrate the trade-off space between land use demands, biodiversity and land carbon removal potential? H/3 1.2	GCAM-Europe CLEWS Magpie	Trade off	3 4 4	Carbon Removal - stylized stylized stylized
Dink				

We can merge these two

Levi H. SHINDEA

Phase 3: Co-ownership (planned for 2026)



Closing off DIAMOND's codesign process

Focus:

- Present model results and scenarios derived from co-produced questions to societal actors
- Present areas for further research where models/scenarios could not address Questions
- Gain understanding of how societal actors would make use of the project results

Outcome:

- Co-ownership of results
- Increased openness and transparency to further build trust
- Increased uptake into policy-making



Participation diversity in webinar	Approximate number
Total external participants (stakeholders)	52
Countries represented	16
Organisations represented	36
Policy perspective	11
Industry perspective	11
Civil society perspective	13
Thematic expertise	11

Accumulative participation diversity in workshops	Approximate number
Total external participants	26
Countries represented	11
Organisations represented	25 (of which 8 were universities)
Policy perspective	7
Industry perspective	6
Civil society perspective	8
Thematic expertise	5

