



LEAF

Inspire • Explore • Transform



PowerShift

Supporting multi-stakeholder dialogue
on low-carbon transition in Colombia

Unil

UNIL | Université de Lausanne

ETH zürich



Bern University
of Applied Sciences

The origins



The **PowerShift** game has been developed by *LEAF Inspiring Change* together with *AFD* and representatives of the *Government of Colombia*, in the framework of the project '*Supporting multi-stakeholder dialogue on low-carbon transition through a strategy game*'.

It was designed based on the findings of **GEMMES Colombia**, an empirical model developed by the *National Planning Department*, the *Ministry of Finance and Public Credit*, the *National University of Colombia* and *AFD* to better understand macroeconomic vulnerabilities and opportunities for a just low-carbon transition.

1. Dependence on fossil fuels: Colombia is highly dependent on fossil fuel exports and tax revenues from these activities.

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2. Gradual decline of reserves: Oil and gas reserves are in a process of gradual depletion.

1. Dependence on fossil fuels: Colombia is highly dependent on fossil fuel exports and tax revenues from these activities.
2. Gradual decline of reserves: Oil and gas reserves are in a process of gradual depletion.
3. Ambitious climate commitments: The country has set a target to reduce its greenhouse gas (GHG) emissions by at least 51% by 2030.

**Diversifying
the
production
matrix**

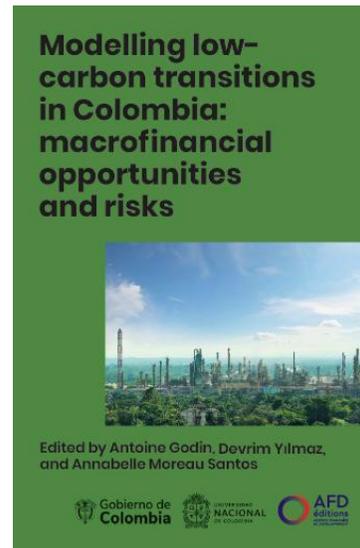
**Decrease
hydrocarbon
consumption**



Analyse the country's vulnerabilities (transition risks, financial risks and macroeconomic vulnerabilities in the fiscal, external and real spheres) arising from a global low-carbon transition;



Analyse the opportunities generated by this context and by the Colombian energy transition (structural changes and ways of financing this transition in the best possible conditions).



<https://www.afd.fr/en/ressources/modelling-low-carbon-transitions-colombia-macrofinancial-opportunities-and-risks>

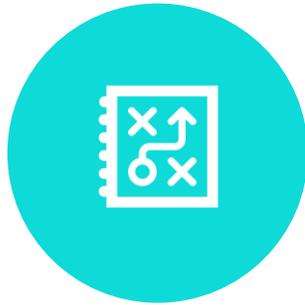
What is a strategy game?

- **Strategic interaction** is a situation in which the decisions of one person or group affect and are affected by the decisions of others.
- **Game theory** is the fundamental science of strategic interaction.
- **Strategy games** are the practical application of game theory.



Why a strategy game?

The game integrates a social dimension to the GEMMES model and was designed as an interactive tool for...



...**strengthen ownership and understanding** of the macroeconomic aspects of transition and its implications.



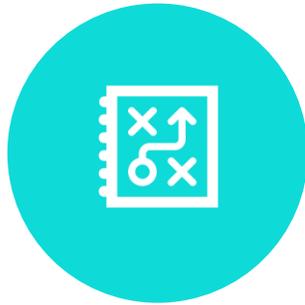
...**highlight the mental models** of key actors to identify possible synergies and tensions.



...**facilitate dialogue** between the high-level actors involved in Colombia's transition to a low-carbon economy

Why a strategy game?

The game integrates a social dimension to the GEMMES model and was designed as an interactive tool for...



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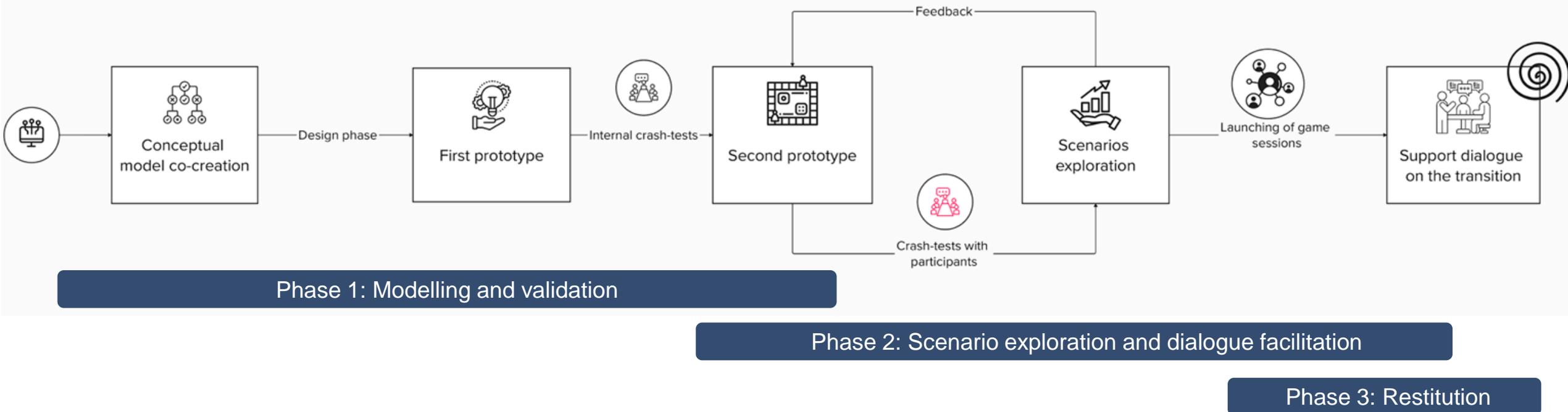
...support the **design and evaluation of policies** that foster the transition...?



...**facilitate dialogue** between the high-level actors involved in Colombia's transition to a low-carbon economy

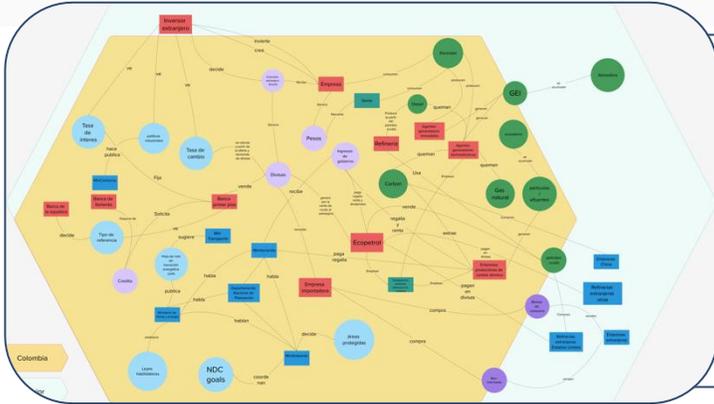
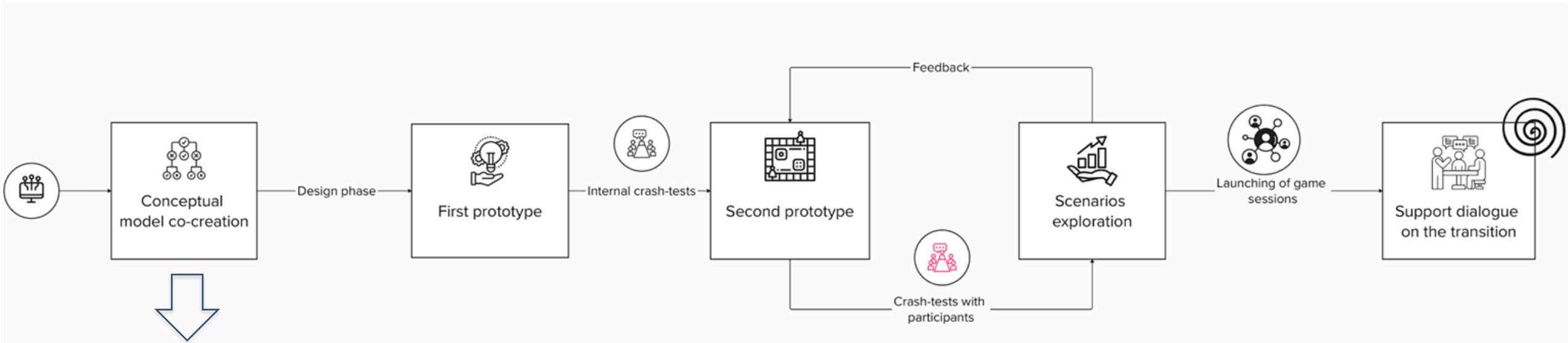
The process

Crafted through collaboration: a game born from a participatory, iterative process



Conceptual Model

26 Apr 2024



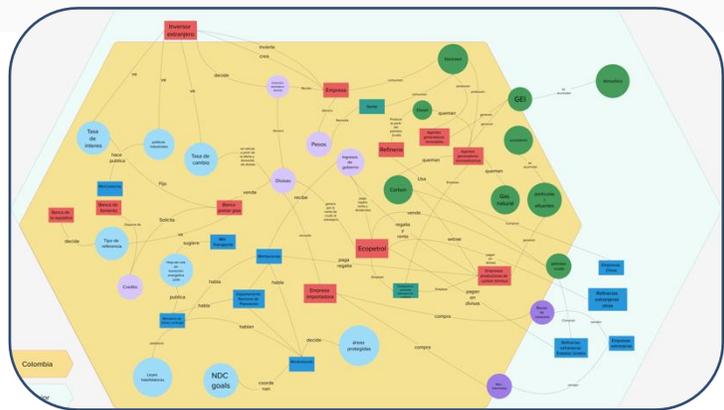
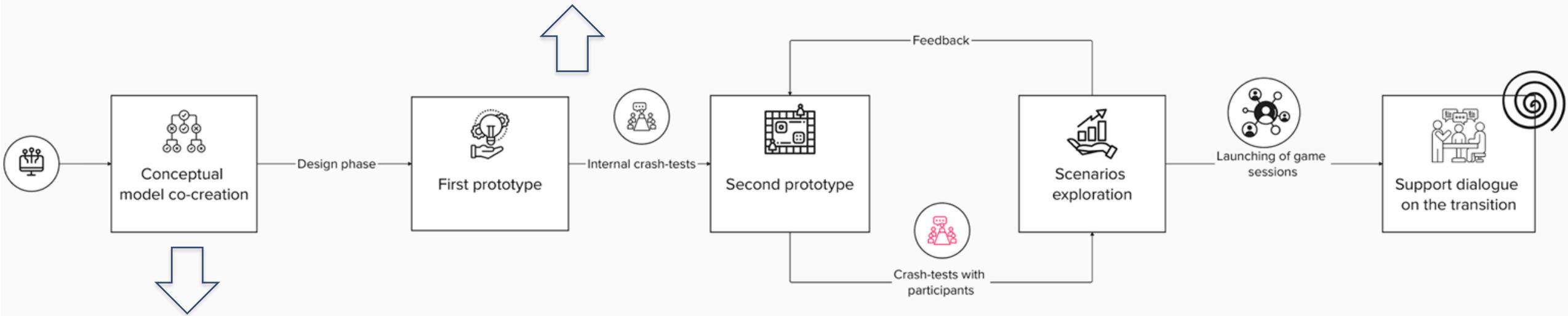
Six online sessions organised with representatives from:

- Ministry of Finance and Public Credit (MHCP)
- Ministry of Mines and Energy (MME)
- National Planning Department (DNP)
- French Development Agency (AFD)

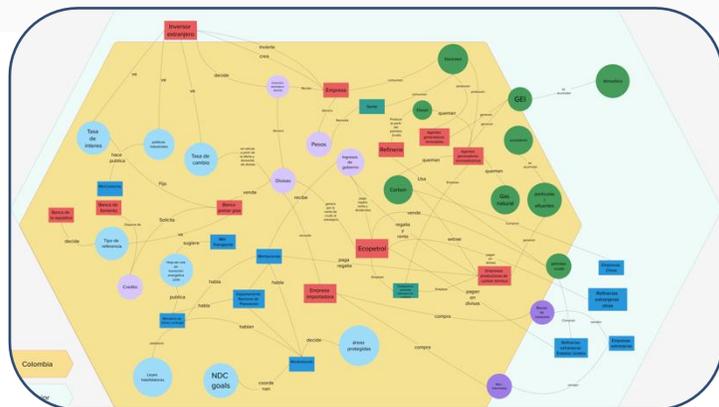
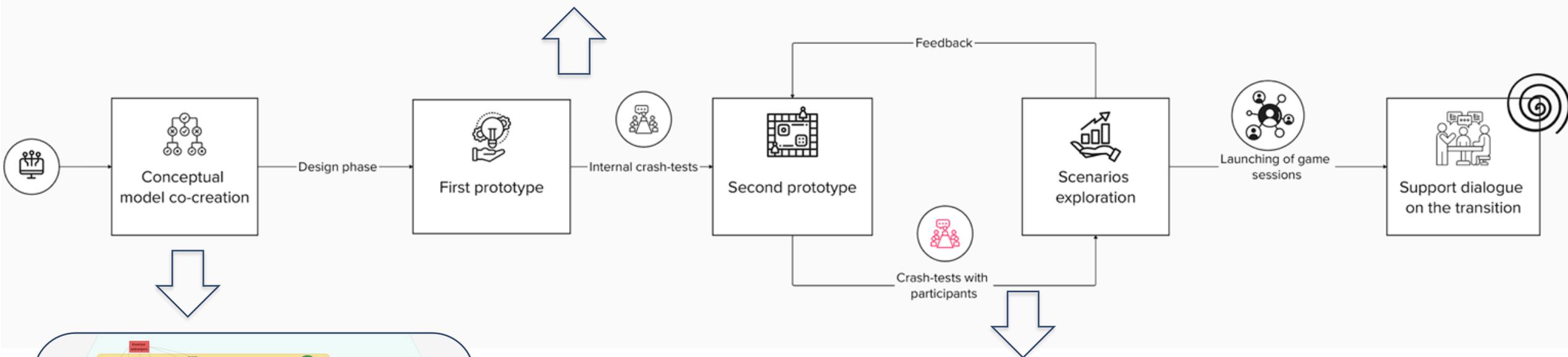


Internal crash-testing of the first prototype with members of LEAF and AFD

Crash-test 16 May 2024 Paris



First mission 17-28 Jun 2024 Bogotá



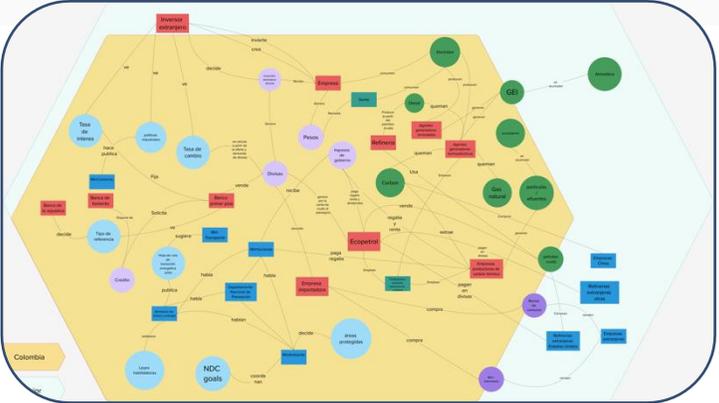
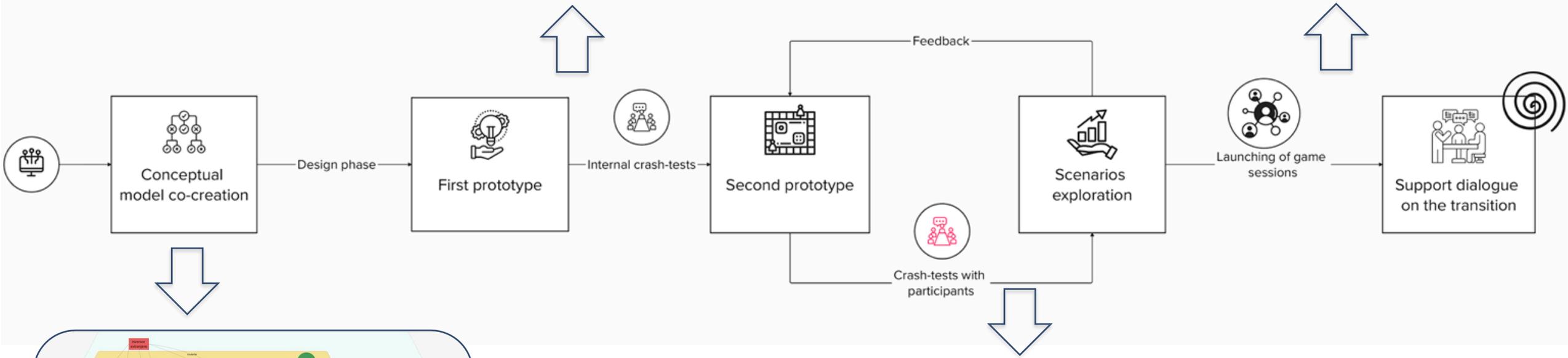
Six game sessions:

- 45 players
- 4 ministries
- 26 institutions

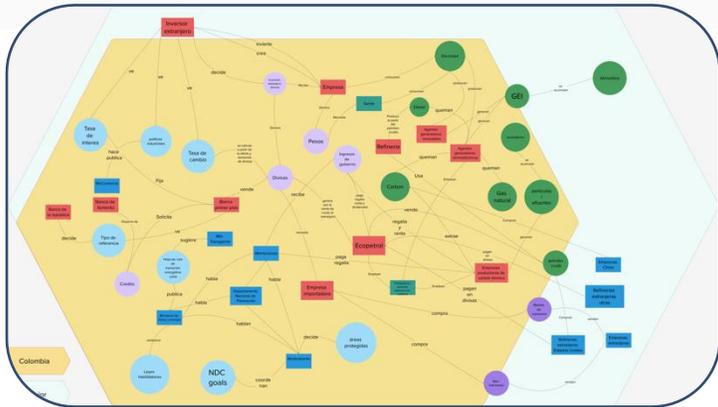
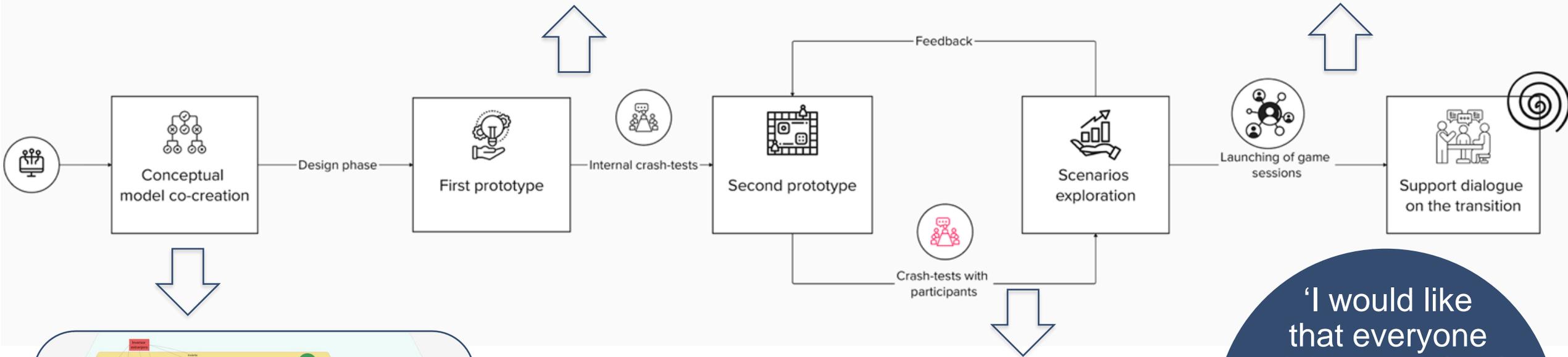
Second mission 23-27 Sep 2024 Bogotá



- Six game sessions:
- 128 players
 - 6 ministries
 - 40 institutions



Sessions Oct 2024 Paris & Zurich



'I would like that everyone doing models of transition play this game, so they can see what their models miss'.

Who we are reaching—and why it matters

1. **Designers:** have contributed to build the conceptual model as the foundation of the game
2. **Players:** have experienced the game.
3. **Spectators:** have no direct experience with the game.



PowerShift

A strategy game that challenges players to transform the extractivist economy of the fictional country of Columbia towards a low-carbon future, while maintaining economic stability and ensuring the well-being of its citizens.

*It's Columbia
not Colombia!*



The roles



Investors ensure the operation of their enterprises by guaranteeing inputs, labour and selling products nationally and internationally. They start with two enterprises and can acquire or create new ones.



Households must meet their needs for food, health, fuel, electricity and goods through employment in private or public enterprises. If jobs are scarce, they turn to the informal economy or convert land into profitable projects.



The **government** manages a budget to support ministries and advance the transition, meeting the goals of the Paris Agreement while balancing household needs and economic stability.

Overview of a game session

Households

Investors

Government



Economic indicators

Exchange rate

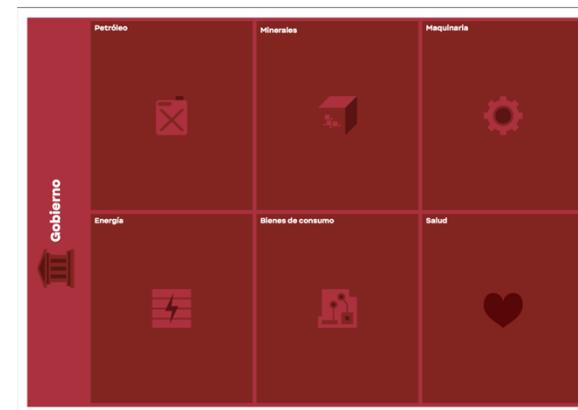
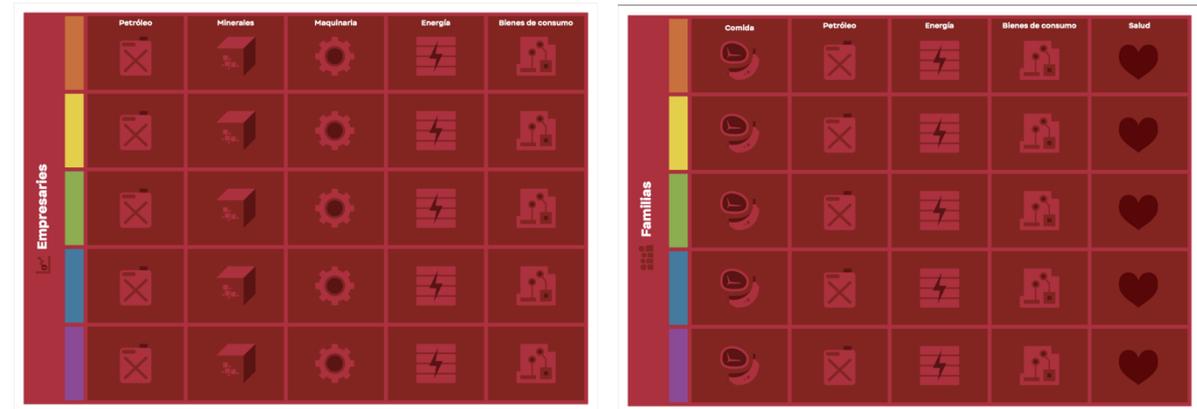
Determined on the basis of trade balance

IMPORT			
Petróleo	Minerales	Energía	Maquinaria
Plátano	Carne	Café	Bienes de consumo

EXPORT			
Petróleo	Minerales	Energía	Maquinaria
Plátano	Carne	Café	Bienes de consumo

Gross Domestic Product (GDP)

Calculated from household, company and government spending, as well as net exports and investment in future production.



Human Development Index (HDI)

determined based on the level of citizens' consumption, which includes expenditure on health care, as well as expenditure by the Ministry of Education and Labour.

	Comida	Petróleo	Energía	Bienes de consumo	Salud
Familias					

Gobierno Educación		
	Oficina	Energía
Input	8	1
	Maquinaria	Materias primas
		2

Environmental indicators

Greenhouse gas emissions

Determined by domestic consumption of petrol and minerals (by citizens, companies or government), forest or plains conversions and exports to the international market.

IMPORT			
Petróleo	Minerales	Energía	Maquinaria
Plátano	Carne	Café	Bienes de consumo

	Petróleo	Minerales	Maquinaria	Energía	Bienes de consumo
Empresas					

	Comida	Petróleo	Energía	Bienes de consumo	Salud
Familias					



EXPORT			
Petróleo	Minerales	Energía	Maquinaria
Plátano	Carne	Café	Bienes de consumo

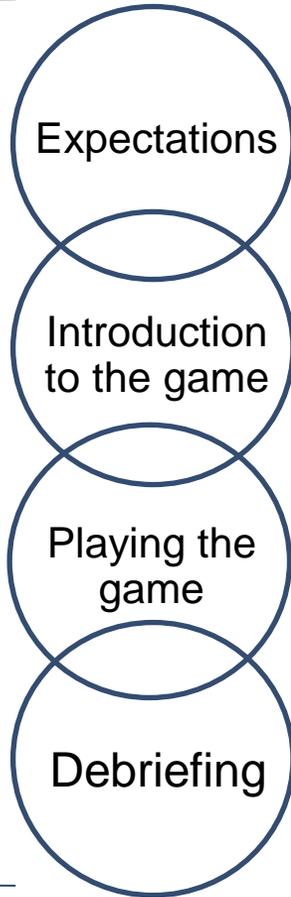
	Petróleo	Minerales	Maquinaria
Gobierno			
	Energía	Bienes de consumo	Salud



PowerShift sessions

June 2024

Workshop



Monitoring & Evaluation

Interviews ex-ante

Questionnaire ex-ante

Questionnaire ex-post

Interviews ex-post

September 2024

September mission: hosts and participating institutions

Ministry of Mines and Energy
DNP,
UPME,
FENOGE,
MinHacienda,
MinEnergía,
MinAmbiente

AFD
CCI en Colombia,
Transparencia por Colombia,
Fondo acción,
Banco Davivienda,
Banco de la Republica,
Embassy of France,
Ecopetrol, PTI, POMA,
Forvis Mayars,
EPM

Financial Superintendence of Colombia
Departamento de:
Finanzas sostenibles,
Innovación,
Inclusión financiera,
Metodología/Análisis,
Investigación y desarrollo,
Recursos humanos

Financial Superintendence of Colombia
Departamento de:
Macroeconomía,
Metodología/Análisis,
Emisores, Inclusión financiera,
Oficina de planificación,
Subdirección de riesgos,
Seguros,
Regulación

Ministry of Finance and Public Credit
MinHacienda, ANH,
MinAgricultura,
MinAmbiente,
MinComercio, MinSalud,
MinVivienda,
SuperTransporte,
MinEnergía

Heinrich Böll Foundation
MinTrabajo, Censat Agua Viva,
Fundación Paz y Reconciliación,
Polen TJ, WWF, WRI,
Movilizadorio, HB Foundation,
SEI, Trasforma, PCNJ,
350 org,
Climate trade

September mission: hosts and participating institutions



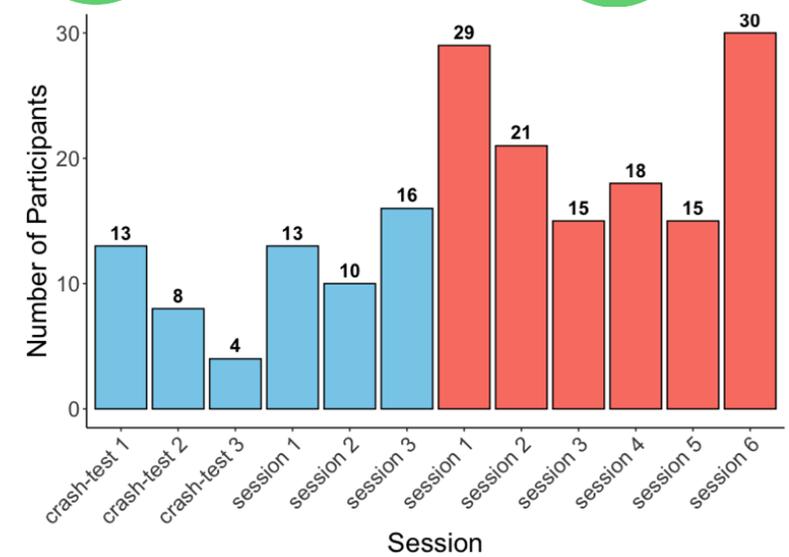
29



21



15



18



15



30

Main emerging dynamics

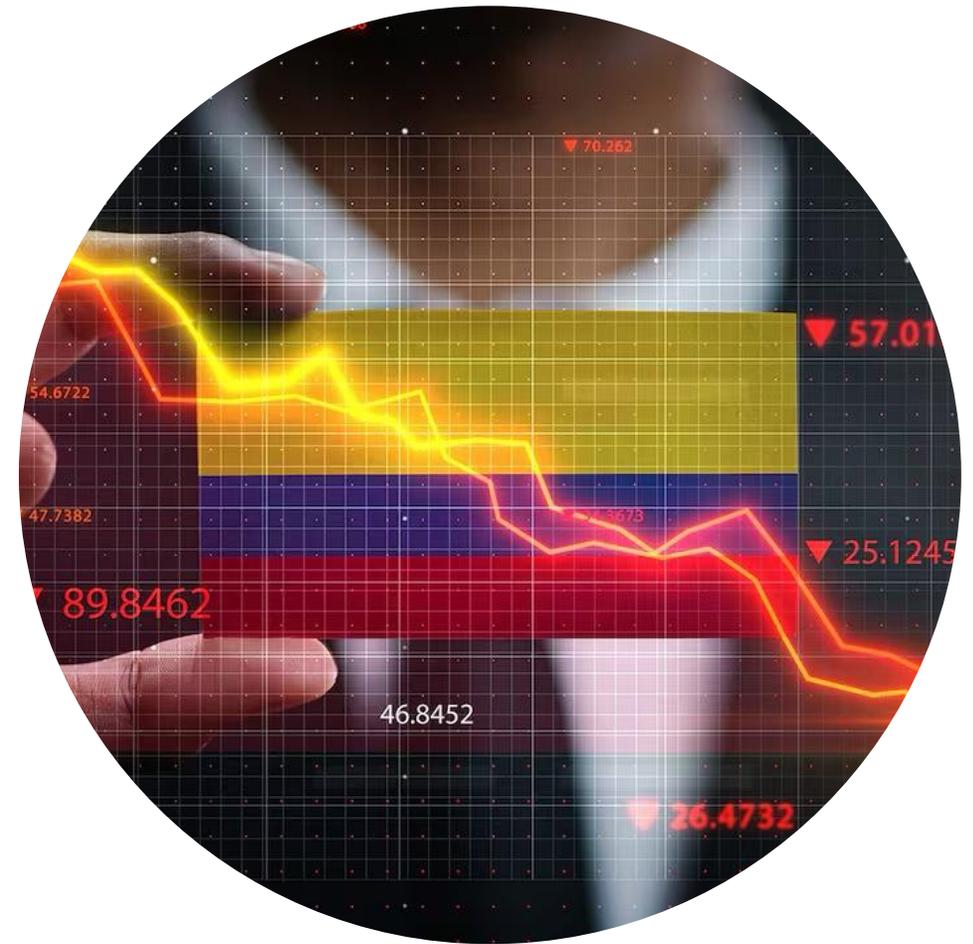
Oil crisis: Depletion of oil reserves without innovation affects government revenues through loss of royalties, as well as households and businesses.



Main emerging dynamics

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Currency crisis: Heavy taxes on capital may lead companies to invest abroad, exacerbating the trade imbalance.



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Unjust transition: Emissions reductions are achieved through fuel scarcity, which hurts households and pushes them into precarious and informal economic activities.



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Land conversion: Households lead innovation but convert the landscape to establish livestock or agricultural farms.



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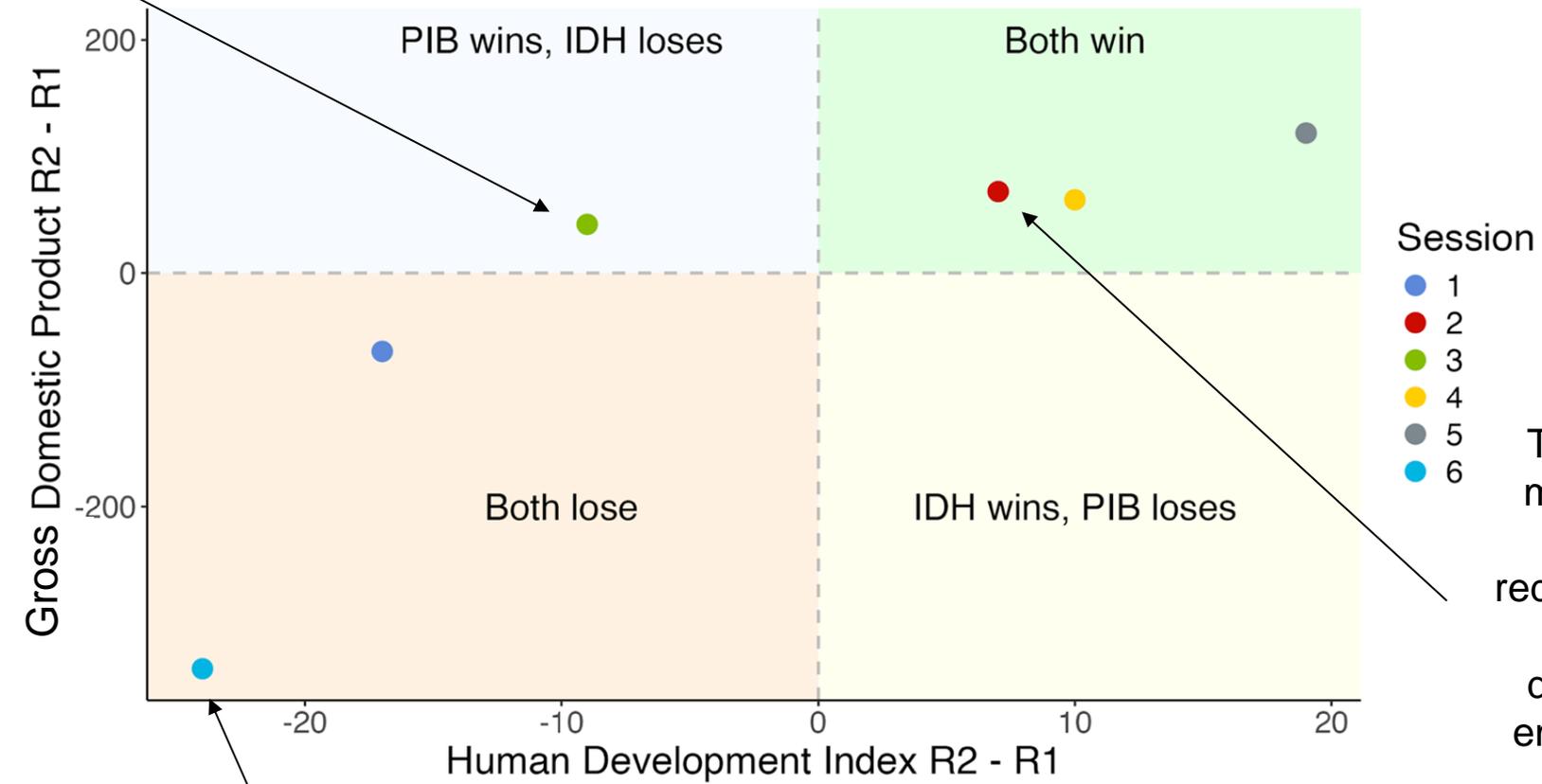
Strike: In response to social crisis and government failures, households impose strikes to make their needs heard.



El Niño

The drought affected hydropower plants and farms that lacked agroforestry practices. To cope with the energy crisis, thermoelectric plants were activated, moving the country away from the Paris Agreement commitments.

Inter-sessions comparison: GDP by HDI

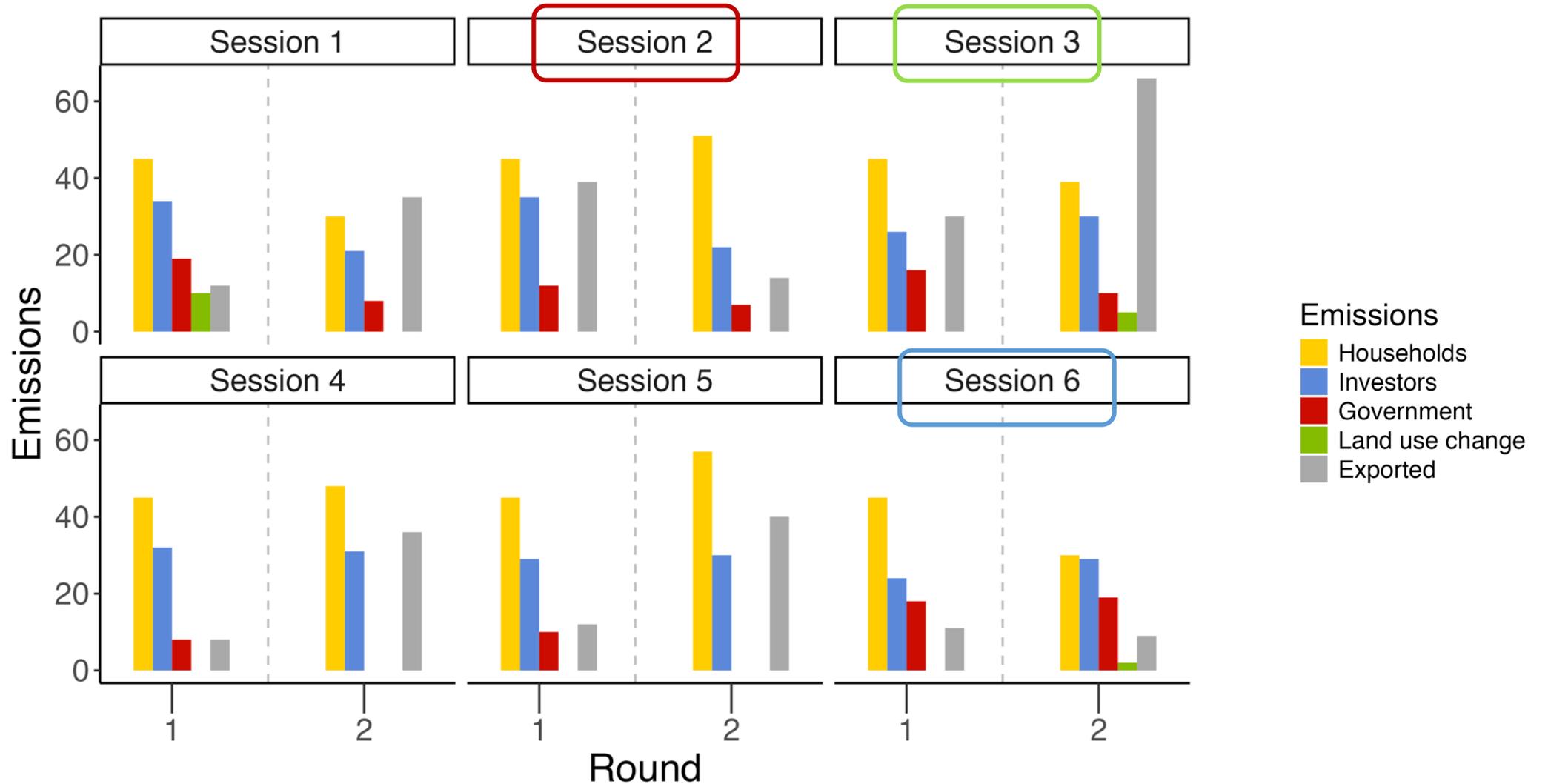


Tax reforms
The increase in the minimum wage and royalties led to a reduction in production and an apparent decline in domestic emissions. However, new businesses opened, boosting GDP.

Oil crisis

PetrolEco's cut in oil production and exports led to reduced government revenue, costly petrol imports and a high trade deficit. This economic strain, combined with food and health shortages, sparked social unrest and national strikes.

Inter-sessions comparison: domestic and exported emissions



Oil crisis

El Niño

Tax reforms

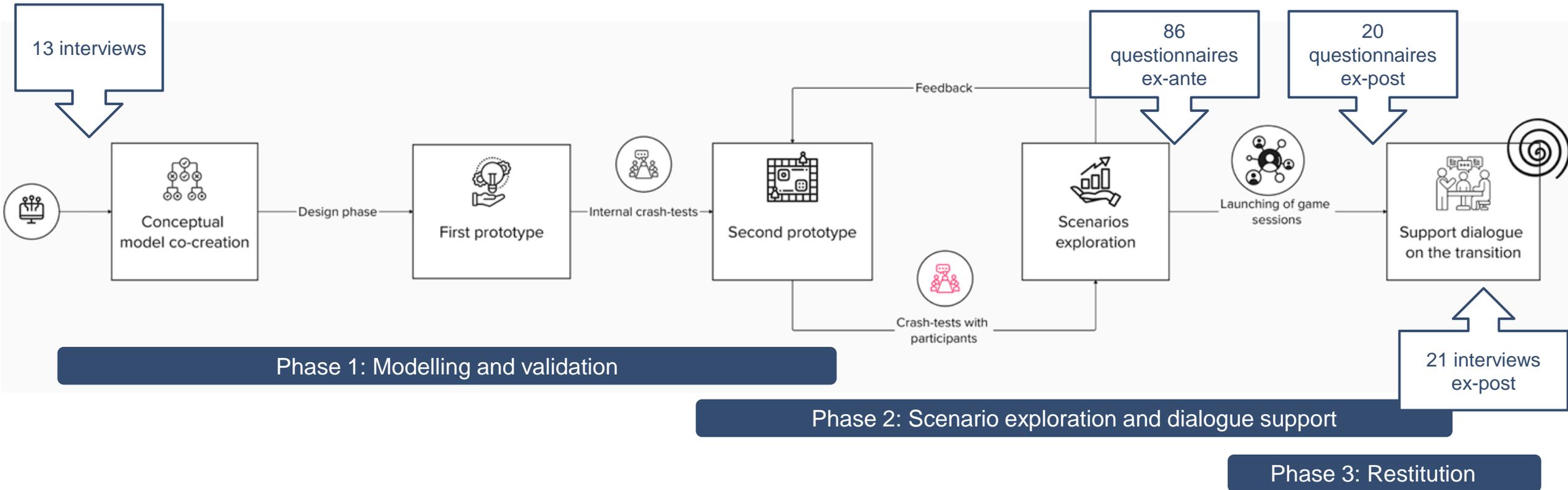
Key messages



‘A social and decision-making experiment between actors in an economy’

- **Coordination:** ensure active, effective, efficient and timely communication between sectors.
- **Diagnosis:** identify needs, strengths and opportunities of each actor.
- **Indicators:** ensure that indicators reflect social, economic and environmental realities.
- **Anticipation:** define clear short-, medium- and long-term objectives and use them to explore scenarios.
- **Adaptation and resilience:** adopt a flexible approach, with preventive, forward-looking and cross-sectoral actions.
- **Commitment and willingness:** avoid radicalisation of positions and aim for the common good.
- **Leadership:** Foster inclusive leadership that inspires trust, drives innovation and prioritises strategic actions.

Monitoring & Evaluation



Theory of change

Goal

Reinforce high-level and inter-ministerial engagement in transformative dialogue and decision-making on Colombia's energy transition

Outcomes

1. Consolidating scientifically informed frameworks as a basis for decision-making.

2. Enhancing system's understanding on energy transition among decision-makers.

3. Initiating an inter-ministerial dialogue process with high-level decision-makers that enhances trust and creates space for constructive exchange.

- Improved engagement
- Enhanced quality of collaborative decision-making

Outputs

1. Transform the GEMMES model into a strategy game through a participatory modeling process together with key stakeholders that ensures the integration of diverse perspectives and enhances ownership of the models (GEMMES and strategy game) among high-level decision-makers.

2. Use the strategy game to explore scenarios and understand stakeholders' choices and strategies in decision-making. The game will elicit mental models and shed light on tensions and synergies.

3. Restitute and disseminate findings of the participatory process to ensure broad uptake of the process among high-level decision-makers.

- More informed and cohesive inter-ministerial dialogue

Activities

Organize participatory workshops to **build a conceptual model and co-create a strategy game** together with key stakeholders

Facilitate a series of game sessions with relevant stakeholders across different ministries and sectors.

Analyse the outcomes of the game sessions and present the findings of the participatory process in reports and publications

Organize restitutions events of the findings with high-level decision-makers and relevant audiences

- Increased knowledge
- increased networking opportunities between sectors

Overview of respondents

Jun 2024
3 sessions
30 players

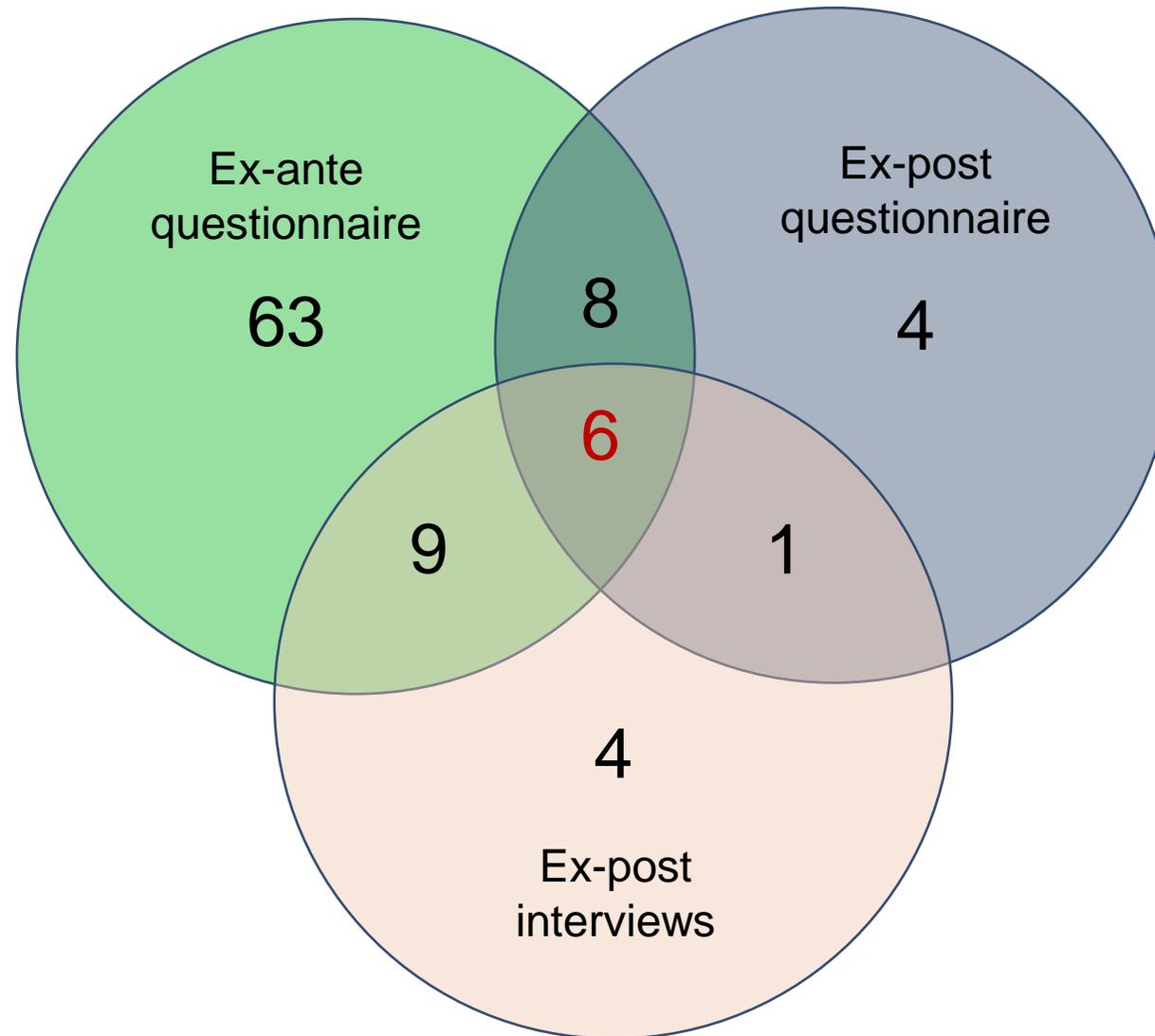
Sept 2024
6 sessions
128 players

Category	Total
Total Participants	158
Total Institutions	56
Average Participants per Session	18
Average Institutions per Session	8.3
Female Participants	77
Governmental Participants	94

Organization Type



Overview of responses



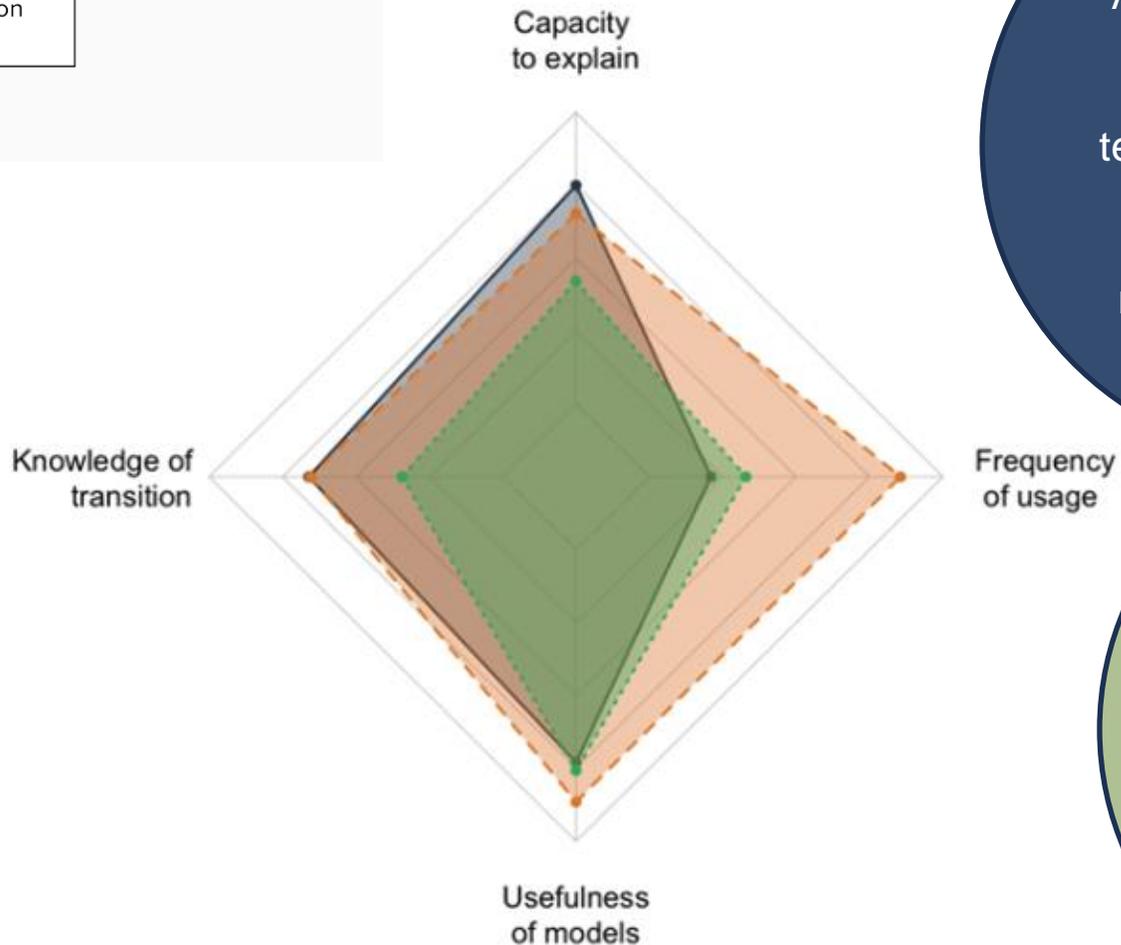
86 ex-ante questionnaires

Ex-ante questionnaires

Scenarios exploration



Cluster Profiles



Cluster 1

A solid understanding of the transition and are familiar with technical tools that can support decision-making, but they do not often use models in practice

Cluster 2

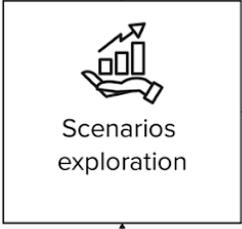
An even higher belief in models' usefulness but, unlike Cluster 1, use them with a much higher frequency.

Cluster 3

Scored lower in both the ability to explain and tackle the transition compared to cluster 1 and 2. Similar rating of models' usefulness while reporting a low frequency of use.

Using A. K. Sen's capability framework, five capabilities were analysed:

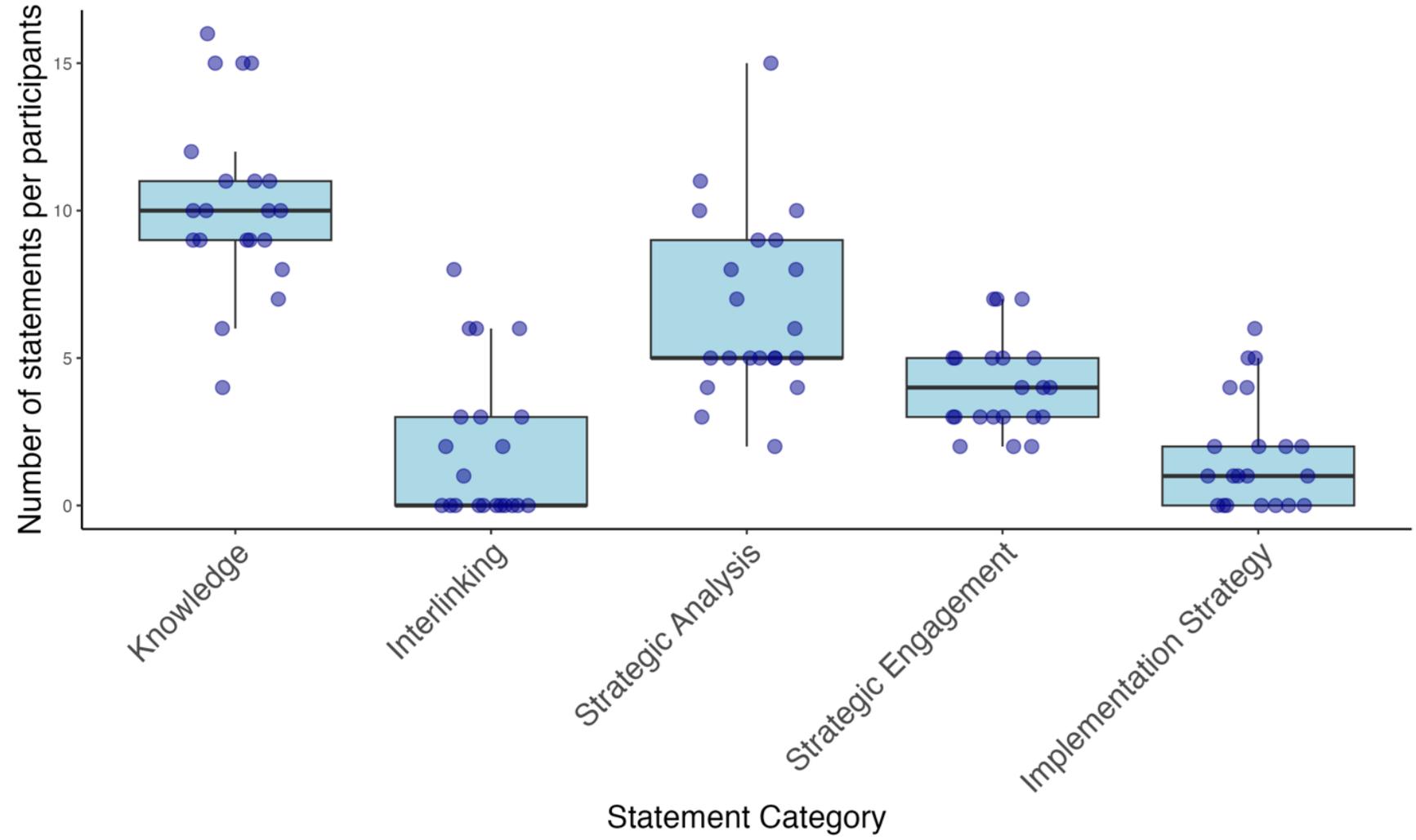
- **Knowledge:** acquisition of new information or knowledge.
- **Networking:** developing new relationships with relevant actors during the sessions.
- **Strategic analysis:** improved insight or analysis of possible pathways that are most effective in achieving desired changes.
- **Strategic commitment:** decision to commit to a specific course of action identified as the most effective.
- **Strategy implementation:** concrete actions taken on pathways considered relevant to achieving the desired changes.



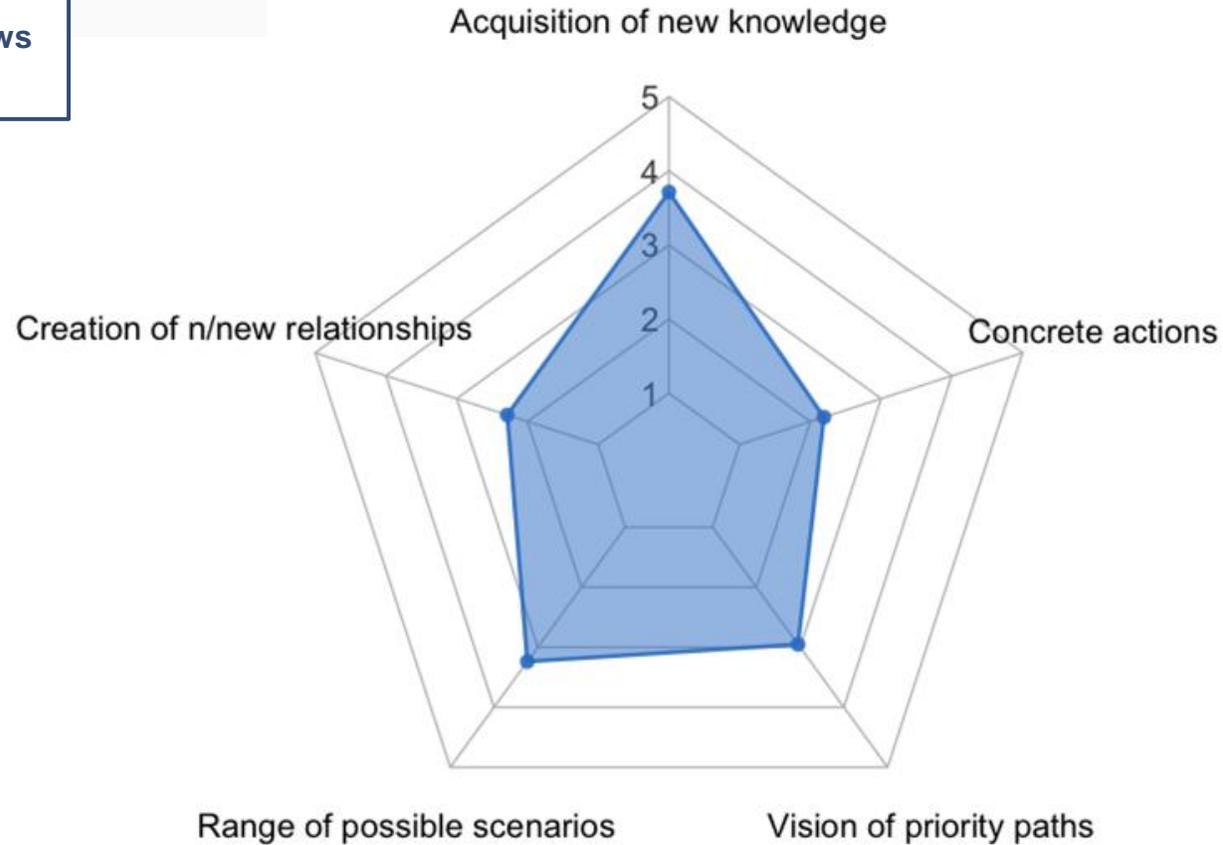
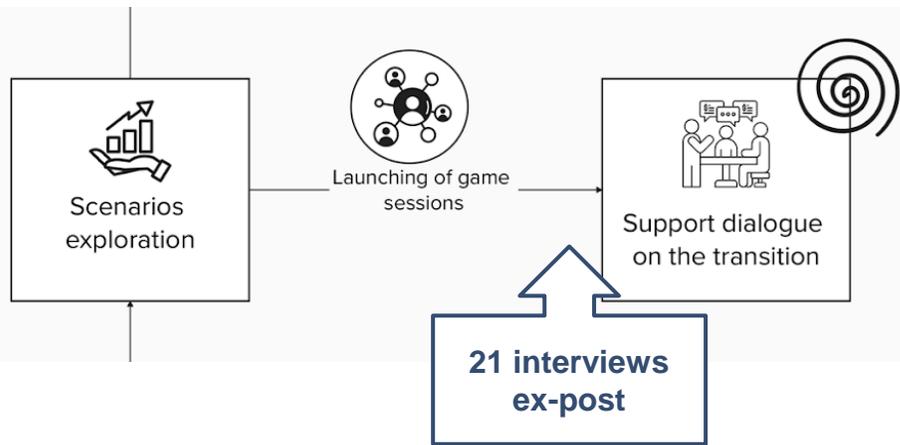
21 interviews ex-post

Ex-post interviews

519
statements
extracted
and coded



Ex-post interviews



Monitoring & Evaluation: Knowledge

How much has your participation in Powershift contributed to the **acquisition of new knowledge?**

‘I realised that, although there are technical solutions, human decisions are complicated due to economic and political constraints, which makes it difficult to move forward in the energy transition.’

‘I realised that some of my preconceived ideas about the energy transition were wrong and simplified’.

1 - Not at all	2 - A little	3 - Moderately	4 - Much	5 - Very much
0 (0%)	2 (10%)	5 (24%)	11 (52%)	3 (14%)

Monitoring & Evaluation: Networking

To what extent has your participation in Powershift facilitated the **creation of new relationships** with other entities that are linked to the energy transition in Colombia?

‘Through the activities, we connected with other key sectors that are involved in the energy transition.’

‘Although interactions have not increased in frequency, relevant contacts have been maintained for future projects.’

1 - Not at all	2 - A little	3 - Moderately	4 - Much	5 - Very much
9 (43%)	3 (14%)	3 (14%)	6 (29%)	0 (0%)

Monitoring & Evaluation: Strategic Analysis

To what extent has your participation in PowerShift **broadened the range of potential scenarios** and options for energy transition in Colombia?

‘I increased my ability to identify the multiple possible strategies and pathways to achieve the energy transition, adapting theoretical knowledge to practical situations arising in the energy transition.’

‘I improved my ability to consider the systemic impact of decisions at different levels.’

1 - Not at all	2 - A little	3 - Moderately	4 - Much	5 - Very much
1 (5%)	3 (14%)	7 (33%)	10 (48%)	0 (0%)

Monitoring & Evaluation: Strategic commitment

To what extent has your participation in PowerShift **clarified your vision of the priority pathways** for Colombia's energy transition?

'The game has helped us to see more clearly the ways forward, and we are including new ideas in our projections, such as the impact of water on agriculture and energy.'

'I have a clearer vision of the importance of bringing everything that is being planned at the political level down to the local and regional level.'

1 - Not at all	2 - A little	3 - Moderately	4 - Much	5 - Very much
1 (5%)	6 (29%)	7 (33%)	7 (33%)	0 (0%)

Monitoring & Evaluation: Strategic implementation

To what extent has your involvement in PowerShift prompted you to take **practical action** on the energy transition in Colombia?

‘We will be launching a series of policy briefs on energy transition issues, using elements learned in the game to communicate the results more effectively.’

‘The contact with [X] and international cooperation led to concrete meetings with initial results.’

1 - Not at all	2 - A little	3 - Moderately	4 - Much	5 - Very much
8 (38%)	4 (19%)	6 (29%)	3 (14%)	0 (0%)

Conclusions and next steps



- **Model validated** by a wide range of actors from the public, private and civil society sectors.
- Able to **simulate the main challenges of the transition** to a low-carbon economy in Colombia.
- Effective in **fostering dialogue** on transition and providing a safe space for policy experimentation.



- Continue to use PowerShift to **support decision making** around transition in Colombia.
- Bring PowerShift to **other geographic regions**.
- Identify working groups with a shared agenda to participate in multi-day sessions, refining strategies, evaluating policy options and building consensus **for real-world decision-making**.

‘From the game, we have been implementing policy actions based on what we have learned, creating clearer and more concrete narratives for the policy briefs we are developing.’

‘The curious thing is that the more you play, the more Columbia looks like Colombia’.

‘It generates attitudes similar to those of reality’.

‘A tool capable of reflecting the reality of any country’

Other projects

- In collaboration with the **Ministry of Environment** of the Democratic Republic of Congo.
- We used our **MineSet** and **Agriforest** strategy games to simulate forest and landscape management at national and local levels.
- We promoted the development of an **initial draft of the National Forest Policy**.



‘I am struck by the logical progression: from the games to the formulation of the key elements of diagnosis and policy’.

About the Project

- AFD Project Pages in [French](#) and in [Spanish](#).
- AFD Project Concept Note in [Spanish](#).
- Brainstorming sessions detailed summaries: Planet C, Themes, Actors, Resources, Dynamics and Interactions ([all summaries, in Spanish](#))

About PowerShift

- PowerShift: Supporting multi-stakeholder dialogue through strategy games. One pager June mission report in [English](#) and in [Spanish](#).
- PowerShift: Supporting Dialogue on Colombia's Climate Action Plan. One Pager September mission report in [English](#) and in [Spanish](#)
- PowerShift: cómo lograr la transición baja en carbono. [Video](#).
- PowerShift: testimonials. [Video](#).

Similar projects

- Garcia et al (2022). Strategies to improve environmental policymaking ([Paper](#)) and ([Article](#))
- IUCN. Biodev 2030. Serious games helped to mobilise agriculture and fisheries stakeholders in Senegal to become ready to act for biodiversity ([Story](#))
- How to use a game to fight deforestation ([Article](#))
- Birdlife. A serious game to reconcile conservation issues in Sao Tomé ([Video](#))



Thank you





Q&A

