



Annual meeting series

Session 4

*Policy and development planning:
Macro-economic and financial implications of the transition*

Wednesday 13 April 2022

Agenda

- **Welcome and introduction**
- **Presentations**
 - Elsa Kyander, Vivid Economics
 - Chloé Boutron, I4CE
 - Dana Yermolyonok, GIZ-Kazakhstan
 - Stéphane Hallegatte, World Bank Group
- **Q&A session** – prepare your questions!
- **Closing remarks** by the 2050 Pathways Platform Secretariat

2050 Pathways Platform *in brief*



Key facts

- Government and multi-stakeholder initiative **launched at COP22** gathering countries with interest on long-term strategies and ambition
- **Hosted by the European Climate Foundation**
- **Funded by philanthropy and public funds**
- **36 member countries**, working with many more non-member countries to support LT-LEDs
- Bringing together a **network of donors, international and national think tanks, and climate policy experts** on long term planning
- **Granting** governments, local analytical organizations, local stakeholders, and global think-tanks

Areas of support



**FINANCIAL
SUPPORT**



**KNOWLEDGE &
ADVISORY**



**CAPACITY
BUILDING**

Why discuss macro-economic and financial aspects in long-term strategies (LTS)?

The transition to low-carbon development in the face of the climate emergency should be a central issue for Ministries of Economy and Finance

- Reaching net zero by 2050 implies a **structural economic transition. Economic ‘frictions’** to be expected, climate benefits notwithstanding
- Climate change already **affecting a number of economic activities and infrastructure** – and expected to have more severe effects by 2050, even under a 1.5°C scenario
- Long-term strategies can **help identify and anticipate** the underlying macro-economic impacts – and the public finance implications of the long-term transition
 - **Inflation** as new technologies come to market + possible carbon pricing
 - **Fiscal incentives** to accelerate low-carbon solution uptake
 - **Less value added and fewer jobs** in high-carbon activity – more in ‘green’ sectors
 - Changes in **trade flows**, current account **balances**, fiscal revenues
 - **Distributional effects and social transfers** to facilitate the low-carbon transition
 - **Rethinking budgetary, procurement and other processes** to align with climate
 - Overall: how will countries **finance their pathways to low-carbon climate resilient development?**

A brief and incomplete state of play on macro-economics / long-term climate strategies

- NGFS (Network for Greening the Financial System) Climate Scenarios for central banks and supervisors – but global, carbon price-driven
- French Development Agency's GEMMES research on economic and financial stability implications of climate change vulnerability (Morocco, Vietnam, ...)
- IMF working paper WP/19/185 – literature review of financial, macro and monetary tools for the transition, more than about problems, knock-on effects and accompanying measures
- Myriads of country-specific analyses – but scope could be broadened to shed light on possible frictions and engage Min of Economies and Finance ... and more (see presentations)
- Growing interest of MDBs as the climate topic overflows to broader sectoral and policy issues



Presentations

1. Elsa Kyander, Vivid Economics
2. Chloé Boutron, Institute for Climate Economics (I4CE)
3. Dana Yermolyonok, GIZ-Kazakhstan
4. Stéphane Hallegatte, World Bank Group



• Including macroeconomic and fiscal considerations in LTS

13 April 2022

Vivid Economics has been working with the 2050 Pathways Platform to prepare guidance for Long Term Strategies

The guidance focuses on three themes: Adaptation and Resilience; Agriculture, Forestry and Other Land Use (AFOLU); Macroeconomic and Fiscal



Establish best practice, understand gaps in capacity to deliver and identify priority focus areas.

Overview of how countries can integrate theme across information, intervention and implementation.

Step-by-step guidance supplemented with case studies in identified priority focus areas.

Deliver user-friendly, practical guidance for each theme.

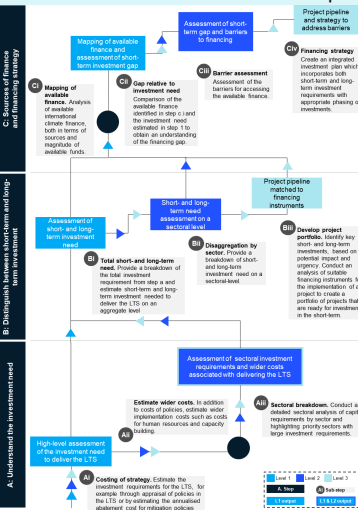
Example outputs from the analysis



Exhibit 1: thematic checklist

	Level 1	Level 2	Level 3
Macroeconomic and fiscal analysis	Identify key risks and opportunities	Identify key risks and opportunities	Identify key risks and opportunities
Adaptation and Resilience	Identify key risks and opportunities	Identify key risks and opportunities	Identify key risks and opportunities
Agriculture, Forestry and Other Land Use (AFOLU)	Identify key risks and opportunities	Identify key risks and opportunities	Identify key risks and opportunities
Macroeconomic and Fiscal	Identify key risks and opportunities	Identify key risks and opportunities	Identify key risks and opportunities

Exhibit 2: flow-chart for deep dive



Examples from Macroeconomic & Fiscal theme



• The physical consequences of climate change and the low-carbon transition can have pervasive macro-fiscal consequences



Increased frequency and severity of physical hazards

- Physical hazards such as heatwaves, floods and changing precipitation patterns are likely to increase relief and recovery costs and reduce productivity
- Can lead to deterioration in the government's fiscal position



Changing production and consumption patterns to decarbonise

- Demand for renewable energy, new green technologies and commodities needed for the transition is expected to increase
- Can create opportunities for investment, job creation and other benefits
- Industries such as fossil fuel extraction, utilities and mining are expected to decline



Increased need for investment

- Meeting mitigation and adaptation needs will require substantial investment
- Need to be supported by both by both public and private finance



: **The LTS is an opportunity to understand the economic impacts of climate change, the investment need and financing sources**

The LTS can enable policymakers to identify the risks and opportunities associated with the low carbon transition and physical climate change



An analysis of the economic impacts of climate change can highlight risks and opportunities

- An analysis of the impact of the low carbon transition and physical climate change on indicators such as GDP, employment and inflation can identify risks and opportunities which will inform policy decisions



The LTS can identify the investment need for the transition

- An estimation of the capital requirement is required to deliver the LTS, to enhance the credibility of the LTS and to support mobilisation of finance



International climate finance can provide additional funding for the LTS

- The LTS is an opportunity to outline an approach to mobilise international climate finance to deliver short-term mitigation and adaptation investments



Fiscal instruments can provide funding and enable the transition

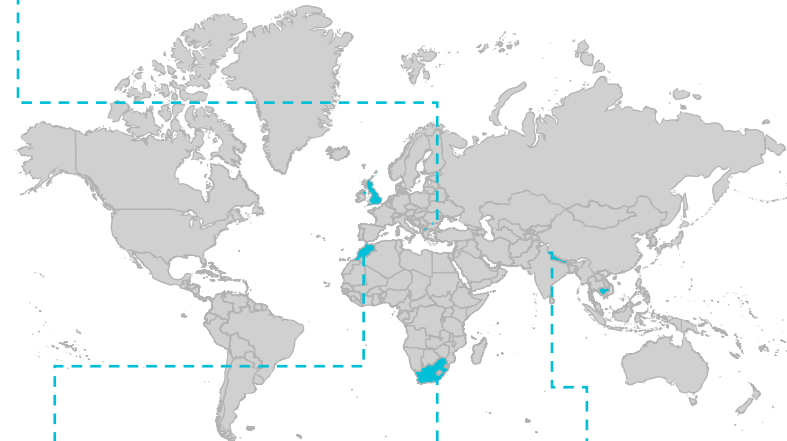
- Fiscal reforms can enable mitigation and adaptation action by raising revenue for the public sector and by influencing private sector behaviour

To date macro-fiscal themes have been lightly covered in published LTS, with some examples of these considerations being incorporated in the LTS analysis

1



Macroeconomic analysis



3



Assessment of fiscal instruments

4



Evaluation of climate finance opportunities

2



Assessment of investment need



• The four focus areas for step-by-step guidance was determined by an assessment of the 'gaps' as well as stakeholder input

Information

Qualitative and quantitative analysis to inform target-setting and prioritisation

Analyse:

- Macroeconomic and fiscal risks and opportunities arising from domestic and global trends (climate policy and physical climate change)
- Capital investment requirements for delivering LTS

1 Analysis of macroeconomic and fiscal risks and opportunities

2 Assessing the investment need of LTS interventions

Interventions

Identification and appraisal of key policies and actions

Develop:

- Financing strategy for LTS, leveraging private investment
- Green fiscal instruments to enable the transition
- Disaster risk financing strategy and other instruments to manage fiscal risks
- Green industrial policy to leverage opportunities from global low carbon transition

3 Identifying and prioritising green fiscal instruments

Implementation

Supportive enabling environment to ensure credible implementation

Enhance capacity for:

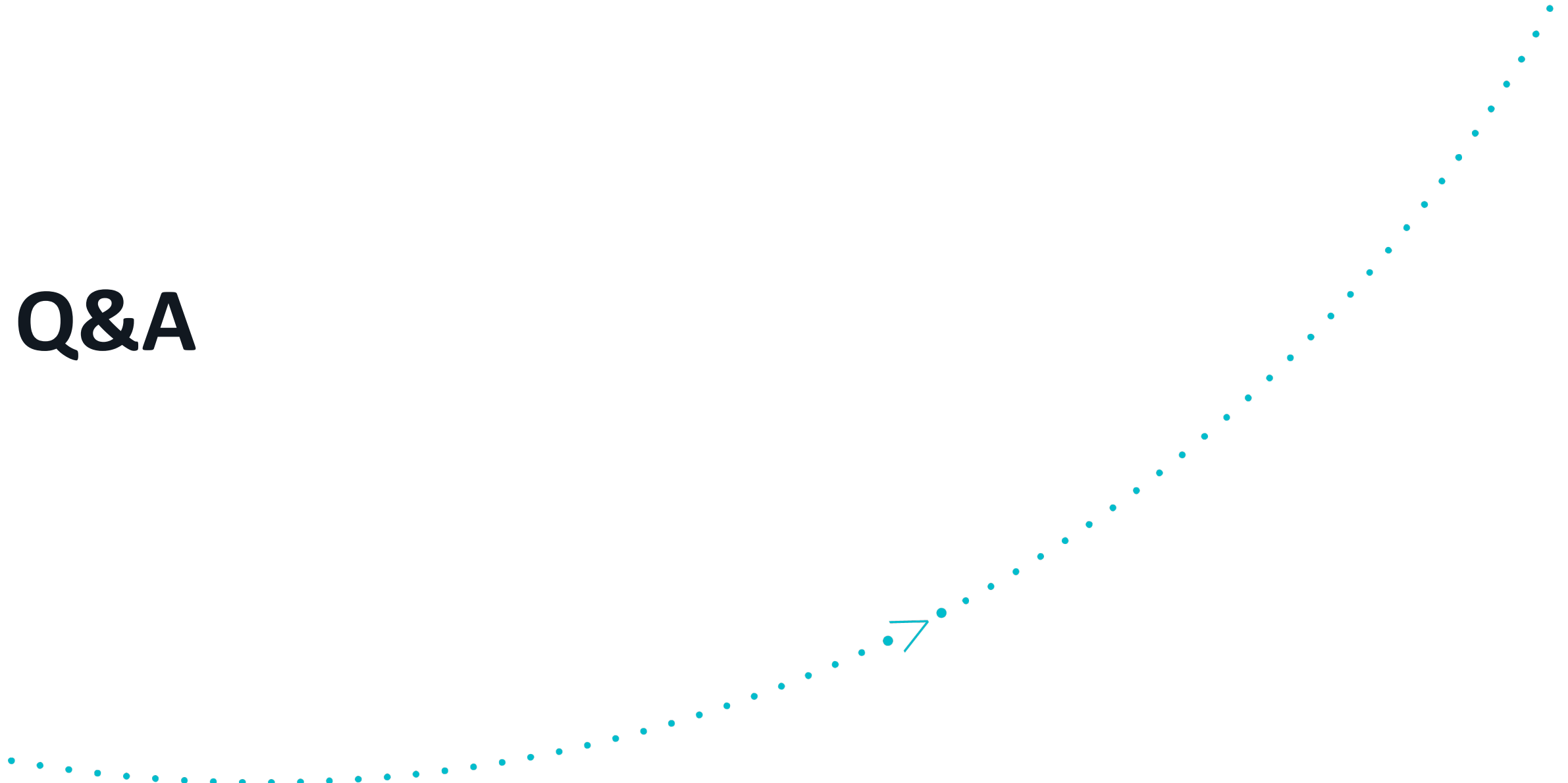
- Accessing international climate finance
- Enabling private sector investment
- Ensuring a just transition

4 Enhancing capacity for accessing international climate finance



Priority areas

: Q&A



The logo for I4CE, featuring the letters 'I4CE' in a bold, sans-serif font. The 'I' and '4' are black, while the 'C' and 'E' are red.

INSTITUTE FOR
CLIMATE
ECONOMICS

Une initiative de la Caisse des Dépôts et
de l'Agence Française de Développement

The public finance implications of Long-Term Strategies:

A dashboard of economic indicators

Chloé Boutron – I4CE

April 13th, 2022

Institute for Climate Economics

I4CE FIGURES



31 
Team members

50+ 
Events annually

20+ 
Publications annually

9000+ 
Twitter followers

+7 300 
Newsletter subscribers

400+ 
Press articles

OUR MISSION

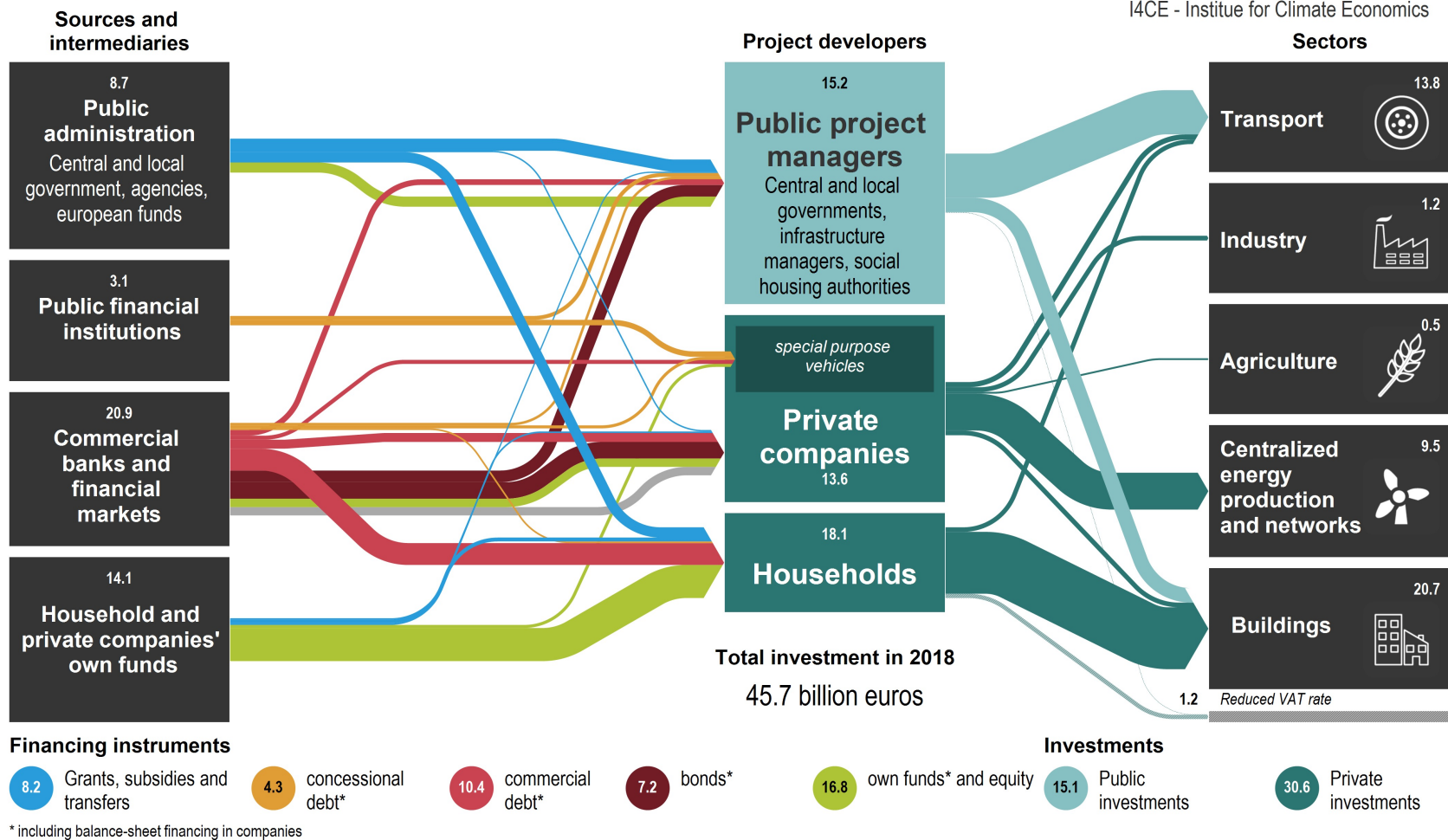
The Institute for Climate Economics is a think tank with expertise in economics and finance whose mission is to support action against climate change. Through its applied research, the Institute contributes to the debate on climate-related policies. It also publicizes research to facilitate the analysis of financial institutions, businesses and territories and assists with the practical incorporation of climate issues into their activities.

Project context

- **Long-term strategies (LTS):**
 - Are fundamental for climate action,
 - **Involve all actors of the economy**
- **Climate finance landscapes help visualize finance flows related to LTS**

Project context

Landscape of climate finance in 2018



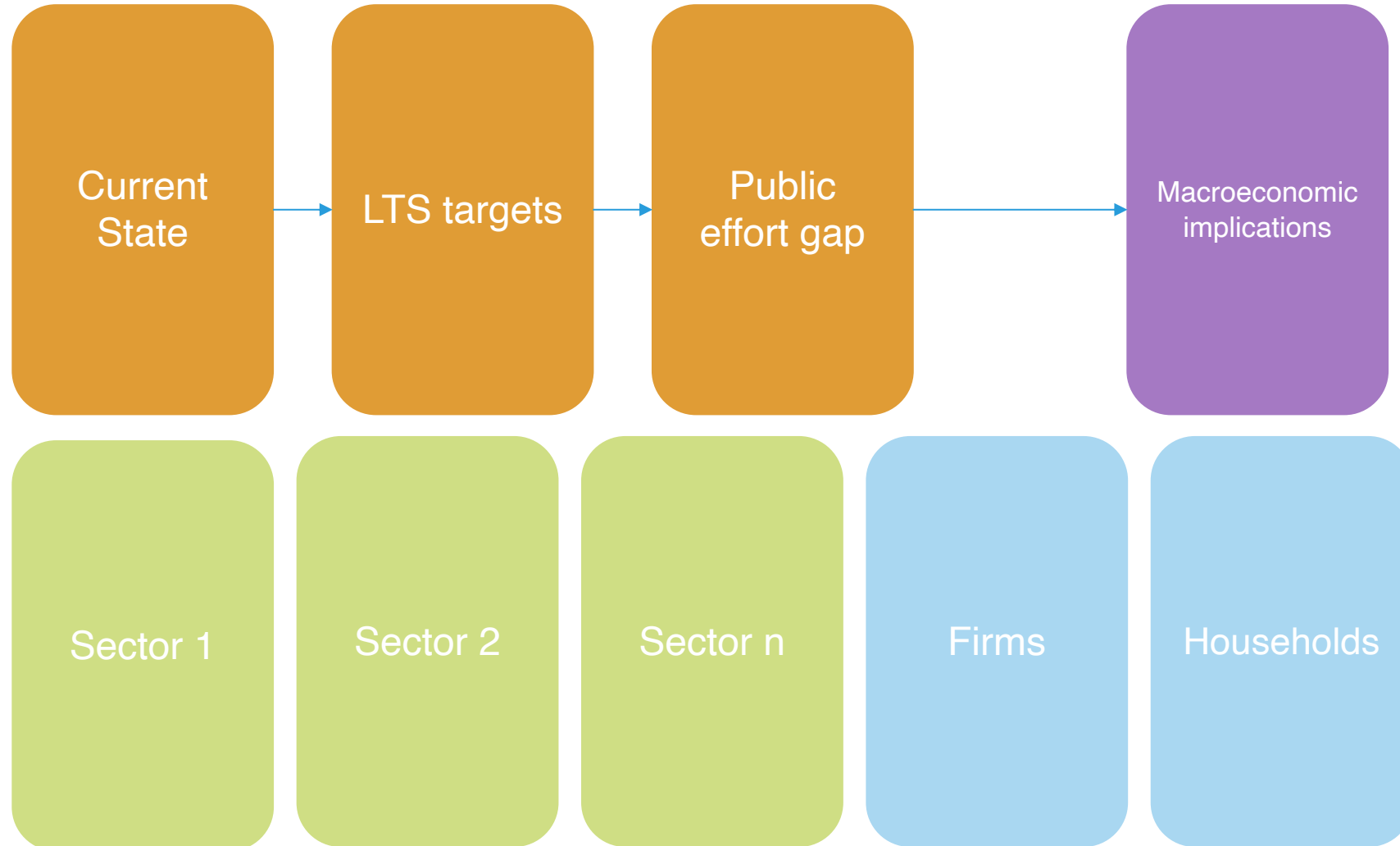
Project context

- **Finance Ministers have a crucial role to play in the implementation of LTS:**
 - They are key to **enabling climate public investment** for mitigation and adaptation projects,
 - They channel **investments for measures triggering private climate investments**,
 - They are responsible for the design, implementation, or removal of **fiscal policy and incentives**,
 - They can help improve **interagency coordination**,
 - Monitoring role.
- **LTS have implications for public finances** that need to be managed by Finance Ministries.

Project context

- **I4CE and the 2050 Pathways Platform** have launched a project:
 - To facilitate the identification of public finance implications and opportunities ensuing from national LTS,
 - At the intention of Finance Ministries in member countries.
- **Creation of a template dashboard of economic indicators:**
 - Indicators **linking current public finance management practices and Long-Term Strategies**,
 - To be **filled by countries** on a voluntary/capacity basis,
 - **Focus on investment and financing needs for the transition**, as well as **macroeconomic and sectoral implications**

Presentation of the dashboard



Examples of indicators

- Total green public investment. Level 2: breakdown by economic sectors
- Total green private investment.
- Public spending, fiscal expenditure for green incentive measures. Level 2: breakdown by intended aim: green capital formation, green technology development, behavioral change.
- Revenue from climate-related taxes. Level 2: explicitly green taxes, implicitly green taxes.
- Landscape of international public finance available in the country conditioned on green criteria.
- Spending in disaster recovery?

- **Total financing needs** to achieve GHG emission targets.
- Public climate investment needs. Level 2: volume by sector/project/climate objective.
- Public climate incentives needs. Level 2: breakdown by intended aim: green capital formation, induce green technology development, trigger behavioral change, other.

- **Gap indicators.**

Methodology and timeframe of project

- **Methodology:**
 - Desktop research, exchanges with peers (economic, public finance, modelling experts)
 - Interviews with public finance officials to ensure relevance
 - Final dashboard: **Excel file**
- **Timeframe:**
 - Present: exchanges with peers and interviews
 - June: dashboard complete
 - July: presentation of the dashboard to 2050 Pathways member countries

Questions or comments?





Thank you for your
attention

chloe.boutron@i4ce.org



Supporting LTS Development with Macroeconomic Modelling



Lessons learned from GIZ's IKI Program on Policy Advice for Climate Resilient Economic Development (CRED), Dana Yermolyonok April 13, 2022

On behalf of:

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany



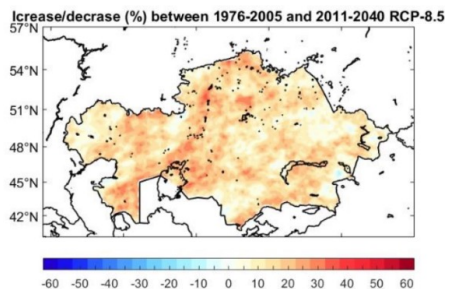
Why a macroeconomic model is the right choice to inform decision makers

- Recent IPCC Report “Climate Change 2022: Impacts, Adaptation and Vulnerability (WG II)” for policy makers:
 - regrets that prioritizing immediate and near-term climate risk reduction reduces the opportunity for transformational adaptation
 - **propagates multi-sectoral, inclusive and long-term planning** and implementation of adaptation actions with benefits to many sectors and systems
 - **suggests planning processes and decision analysis tools can help identify ‘low regrets’ options** that enable mitigation and adaptation in the face of change, complexity, deep uncertainty and divergent views.

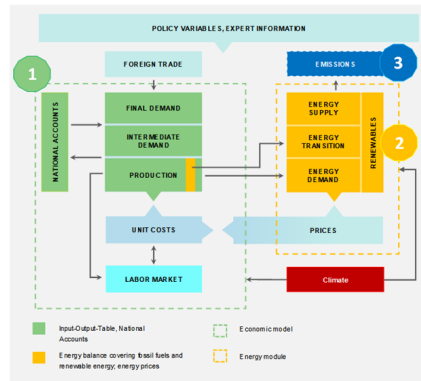


CRED Kazakhstan Process | Implementation Steps of the e3.kz model

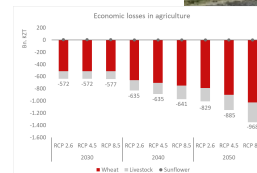
- Collect economic and climate data



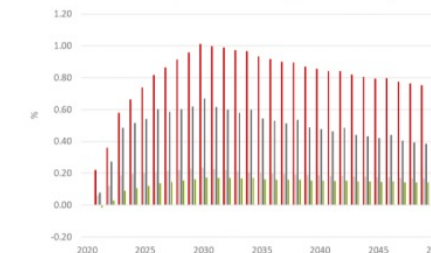
- Calibrate the model using economic and climate data.



- Define scenarios to simulate with the macroeconomic model.
- We link climate change to the economic system through estimated damages dependent on the climate variables.



- Sector-specific & economy-wide effects (GDP, jobs, CO₂ etc.)
- Direct and indirect effects



- GDP by final use, constant prices: Gross domestic product
- GDP by final use, constant prices: Export of goods and services
- Employment, total
- CO₂ emissions

- Feed results into policy process and stakeholder discussions
- Further analyse and rank adaptation options
- Discuss financing options



Data

Model

Scenario
Analysis

Results

Recommendations

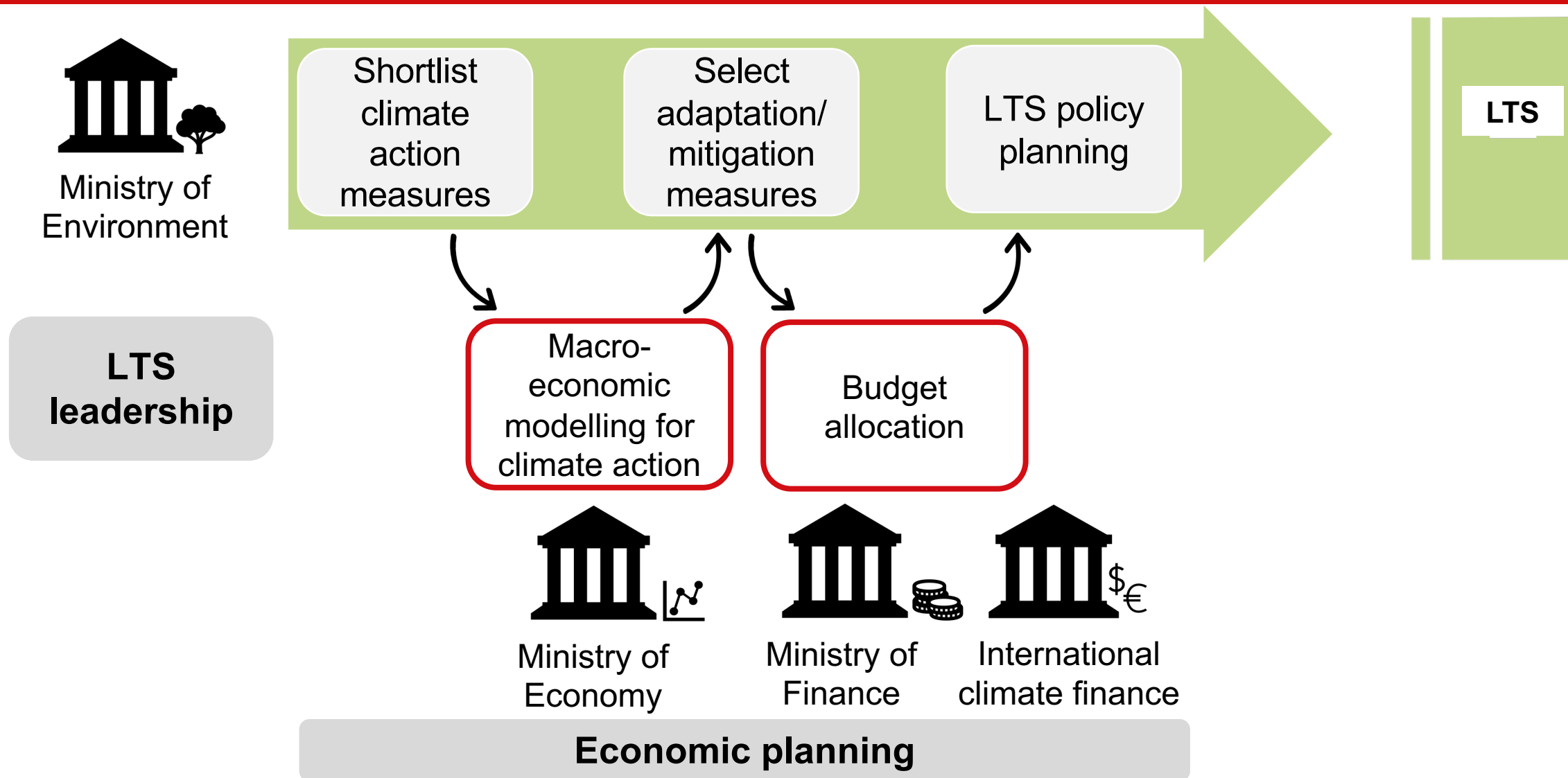


CRED Contribution in the Policy Cycle





Policy Advise | CRED in Long-term Strategy (LTS) Policy Planning





Benefits and Challenges of using macroeconomic models

Key benefits

- Mainstreaming climate adaptation into economic development agenda
- Integration of sectoral impact and adaptation assessments
- Comprehensive Risks Assessment

Key challenges

- Approximate reality
- Data intensive
- Need time and experts' know-how



Supporting Low-Emission Development Strategy Elaboration in Kazakhstan

- Kazakhstan pledged to achieve carbon neutrality by 2060
- Least cost decarbonization pathway modelled with the LEDS hybrid model
- Soft-linking with CRED modelling results in the LEDS document
- LEDS chapter on adaptation and holistic approach towards low-carbon and climate resilient development





Holistic approach and integrated climate action

- Complete integration and adaptation to shift from 'co-benefit' to 'multi-benefit' approach.
- Better climate action to reduce risks of maladaptation, ineffective mitigation measures and stranded assets.
- Better understanding of the controversial causal relationship between ambitious international climate policy and its impact on Kazakhstan.
- Tool for consensus building in a 'win-lose' country and understanding needs for new business models.





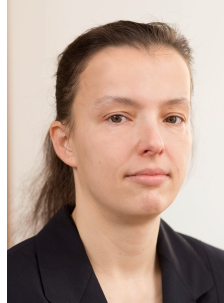
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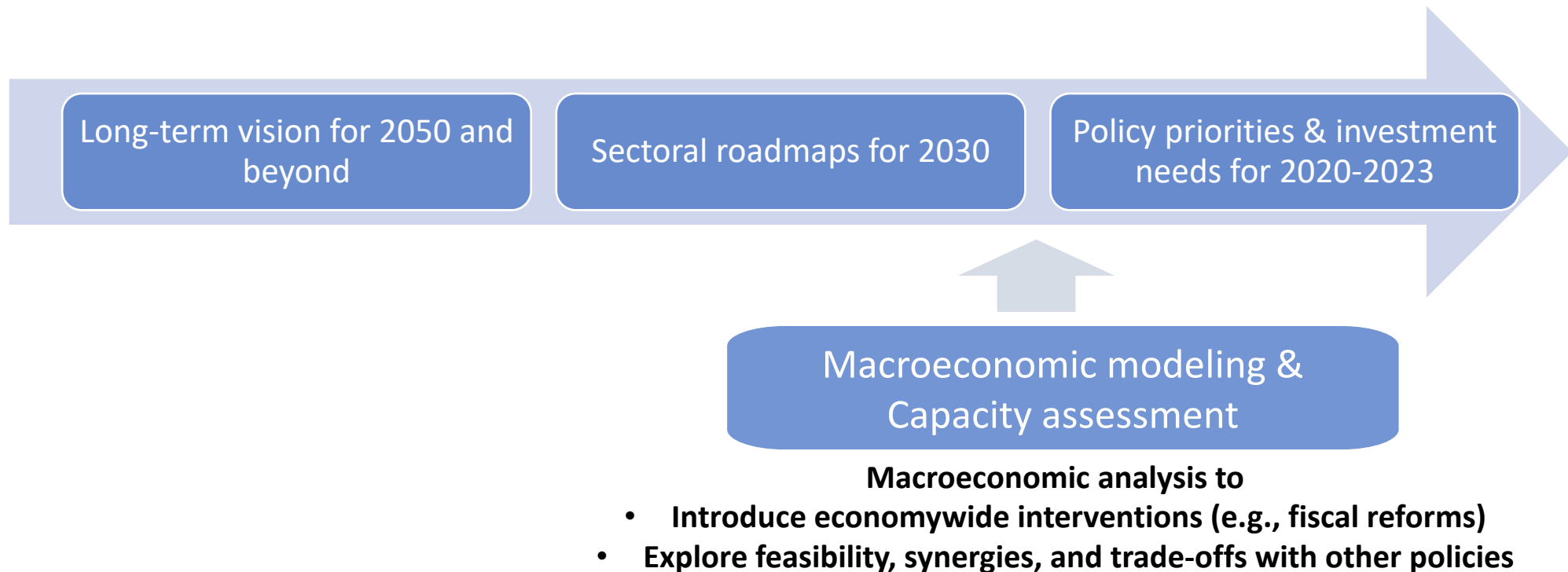
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Macroeconomic analyses for Long-term Strategies

Stephane Hallegatte

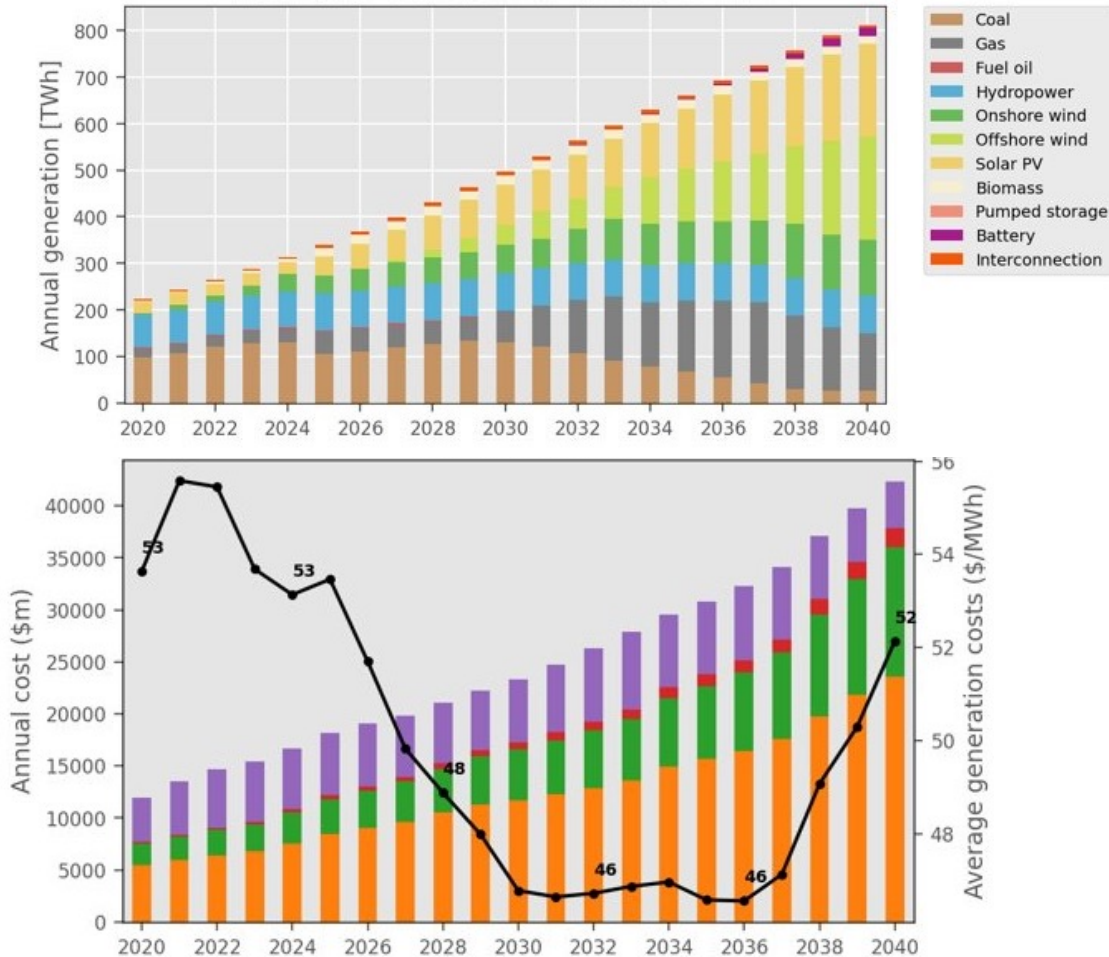
Senior Climate Change Adviser – The World Bank

Role of macroeconomic and financial analysis



From sectoral roadmaps to policy design and assessment

Power sector modeling provides least-cost path to certain targets



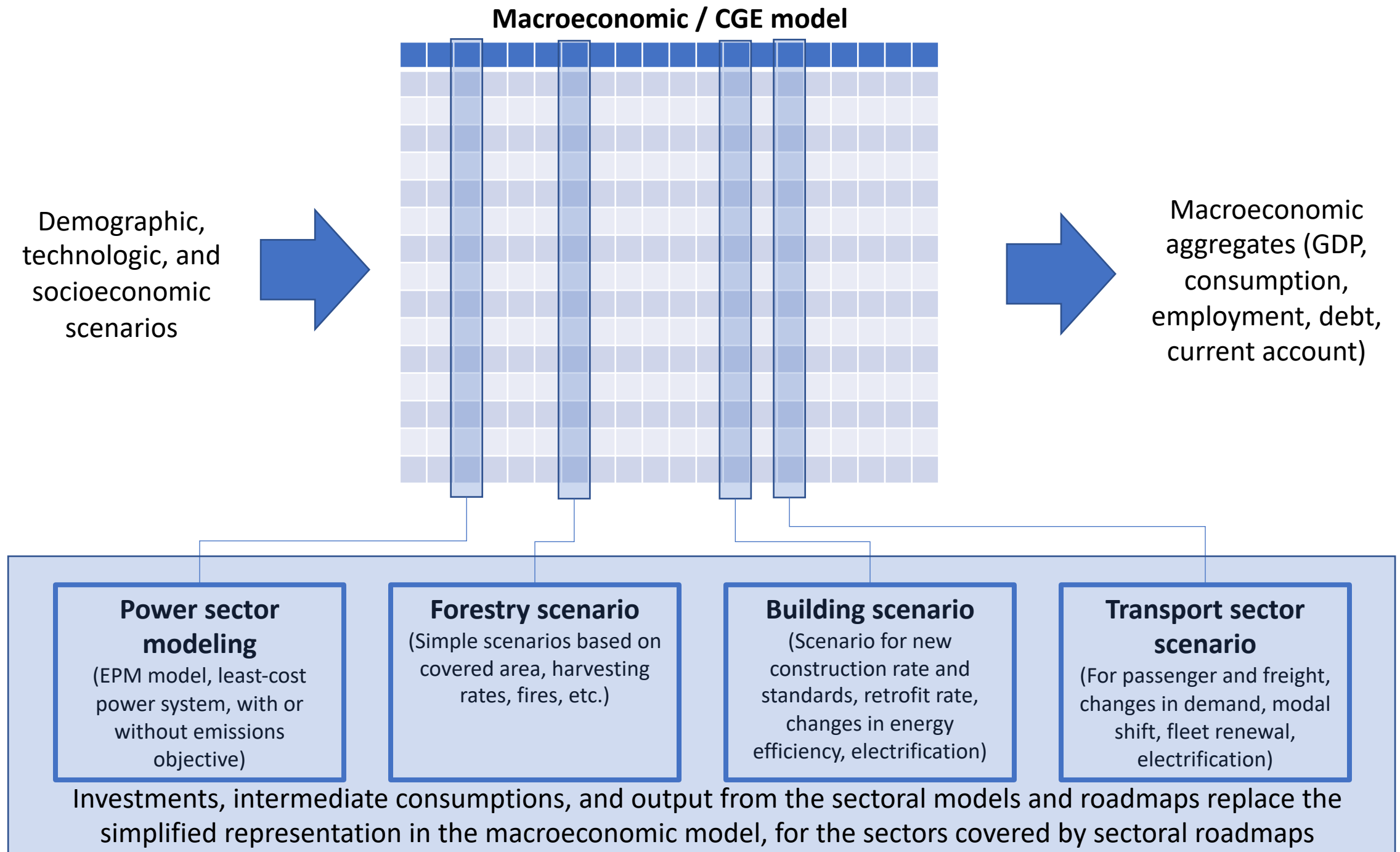
Set of policies,
incentives, financing
instruments, and
public investments

Investigate feasibility,
impact on macro-level
productivity and
output, public finance
and debt, etc.

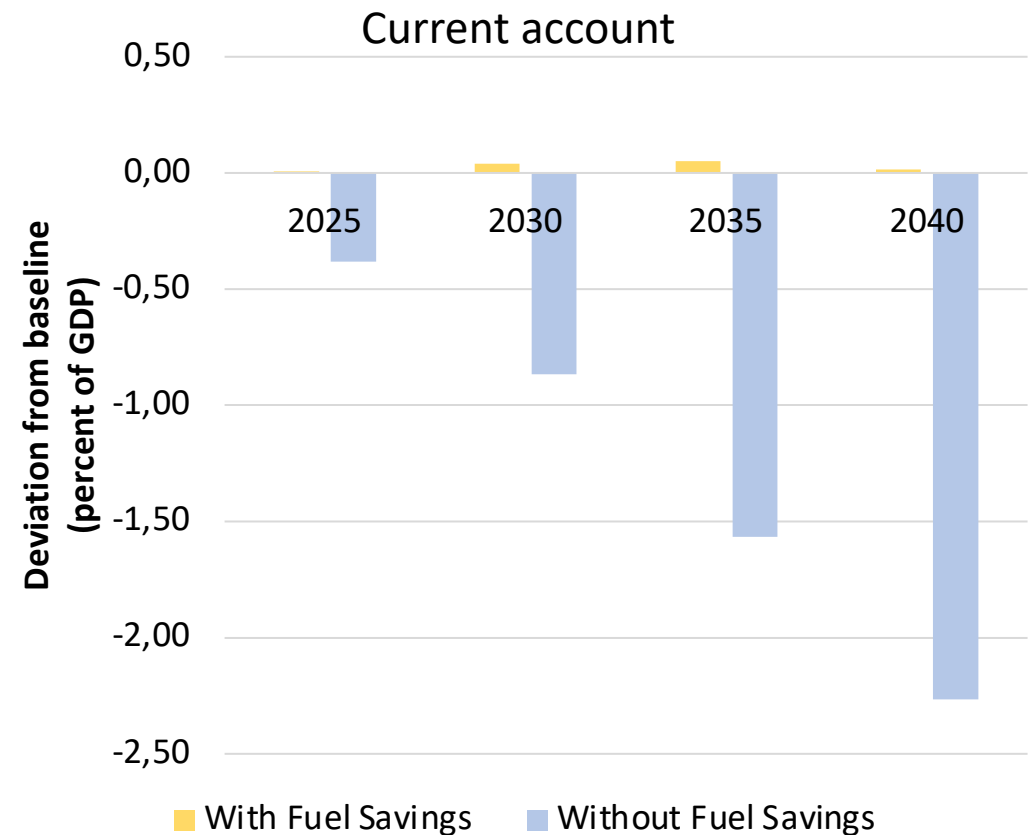
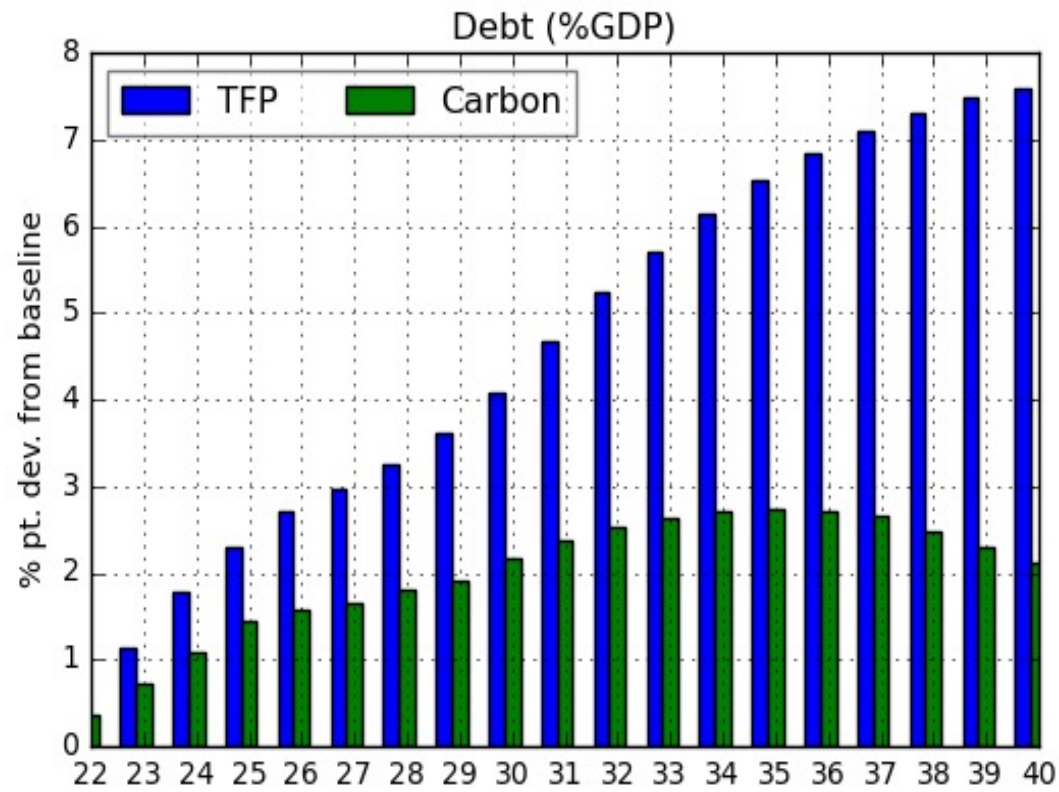
Bringing together costs and benefits

- Sectoral roadmaps to provide investments needs, costs, and benefits
 - Power sector
 - Transportation
 - Building sector
 - Industries
 - Forestry and land-use
 - Agriculture
 - Water
 - Other?

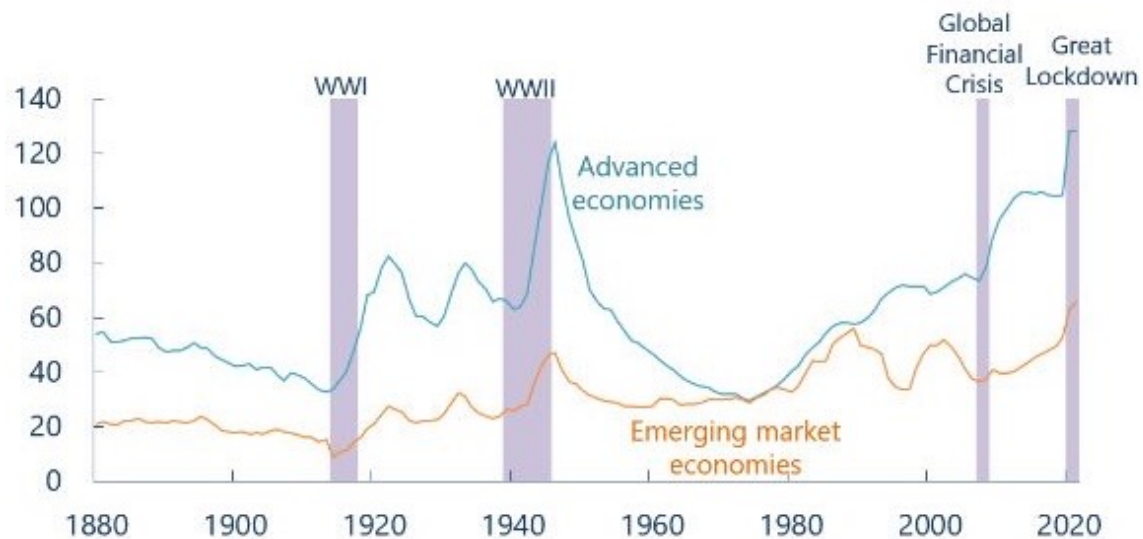
	2022–2030	2022–2040
POWER		
Investment needs: new generation and storage capacity		
Investment needs: transmission and distribution		
Other economic costs: operational and fuel costs		
Other economic costs: air pollution externality costs from coal		
Other economic costs: decommissioning of coal plants and mines		
BUILDING		
Investment needs: energy efficiency, electrification, and resilience		
Other economic costs: gas import		
Other economic costs: lives lost and injuries		
TRANSPORT & URBAN		
Investment needs: new infrastructure (including resilience cost)		
Other economic costs: fuel import		
Other economic costs: cost of disruptions		
Other economic costs: air pollution, congestion, and road fatalities		
FORESTED LANDSCAPES		
Investment needs: restoration and reforestation, and fire management		
Other economic costs: loss of harvest revenues		
AGRICULTURE		
Other economic costs: on-farm emissions reductions		
INDUSTRY AND MANUFACTURING		
Other economic costs: cement and iron and steel		
TOTAL INVESTMENTS AND ECONOMIC COSTS IN THESE SECTORS		
Net economic costs		
includes: investment needs		



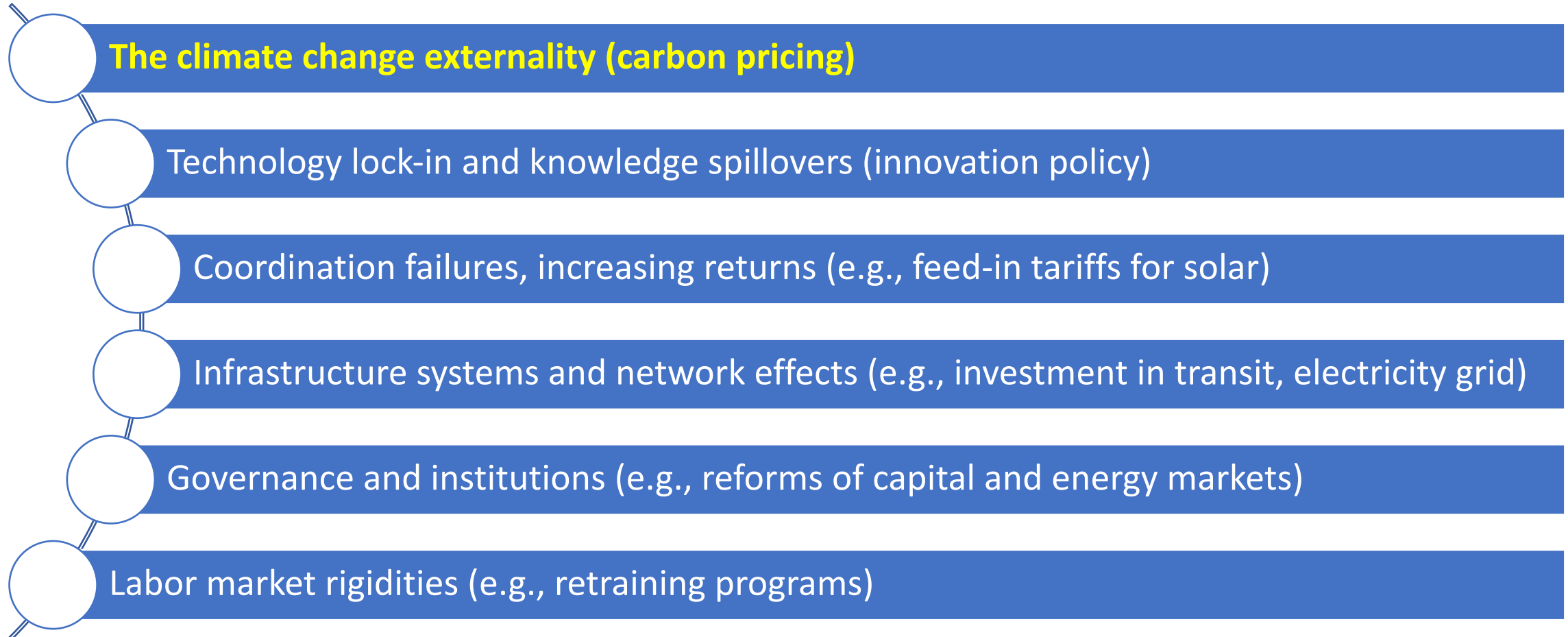
Typical results, for GDP but also debt or current account



Challenge 1: taking into account the development context and countries' objectives



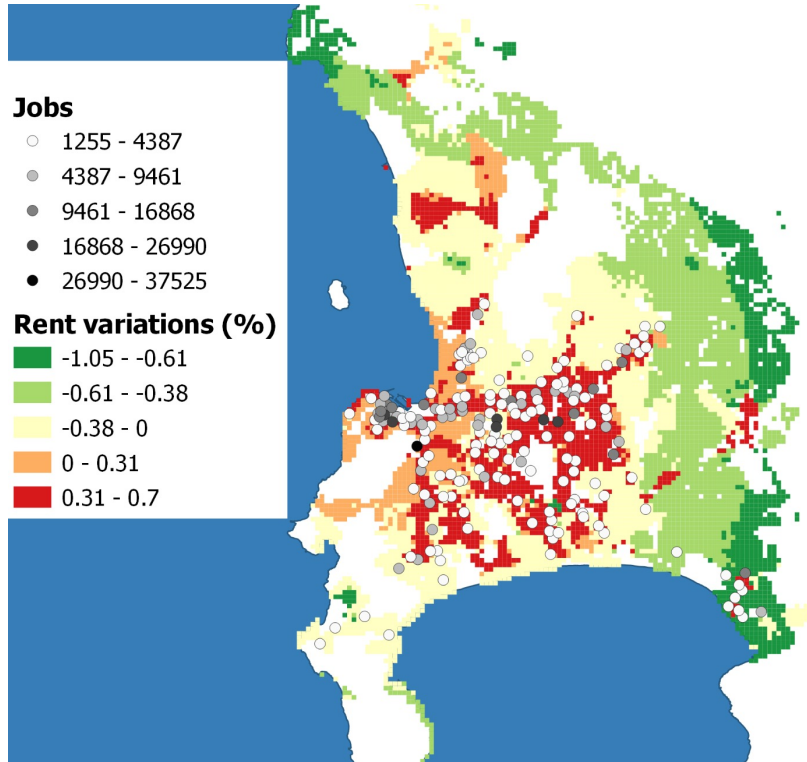
Challenge 2: Considering the full range of challenges



Economic models capture the role of prices and incentives well, but often fail at capturing the role of non-price policies that can be as or even more important.

Challenge 3: Distributional impacts are not only about income deciles

Spatialized impacts



Gender, age, ethnicity, religion



NHTS 2020: the main purpose of travel for most households was getting to education institutions.

Differences across occupation



Climate change and climate policies negative effects **magnified by existing discrimination and exclusion** (e.g., related to gender ability to own land or acquire certain skills)

Challenge 4: Biases introduced by macroeconomic modeling

- Some impacts of policies are easy to represent (e.g., investment costs)
- Some impacts are hard to represent (e.g, energy security, city livability)
- Some benefits tend to be non-market benefits, which valuation depends on preferences and values
- Policy assessment can be biased if only a fraction of costs and benefits are captured



No model can answer all questions – a suite of models can be mobilized

Models	MFMod	ENVISAGE	MAN AGE	CPAT	EIRIN	FSAP	Shock Waves/ Unbreakable	GIDD
Impacts of mitigation/adaptation policy on								
Macroeconomic indicators	✓	✓	✓	✓	✓			
Sectoral indicators	✓	✓✓	✓✓	✓			✓	
Co-benefits	✓		✓	✓				
Poverty / distributional issues		✓~	✓~	✓			✓	✓
Impact of extreme weather events on								
Macroeconomic indicators	✓					✓		
Sectoral indicators	✓~				✓		✓	
Financial indicators	✓~				✓	✓		
Poverty / distributional issues							✓	✓
Impact of gradual global warming on								
Macroeconomic indicators	✓	✓	✓					
Sectoral indicators	✓~	✓	✓✓				✓	
Financial indicators	✓				✓	✓		
Poverty / distributional issues		✓~	✓~				✓	✓

Source: World Bank staff; Note: the combined symbol ✓~ implies the issue is partially addressed in the framework.

The World Bank created a global Long-Term Strategy Program

- Developing methodologies and approaches
- Engage with partners (2050 Pathways Platform, DDPP, etc.)
- Support countries willing to develop a long-term strategy
- Benefit from and support Country Climate and Development Reports (CCDRs)



2050pathways.org

Thank you for your attention