

Annual meeting series

Session 4

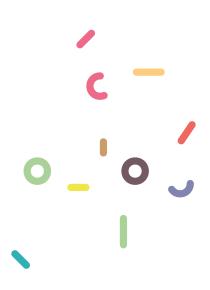
Policy and development planning:

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

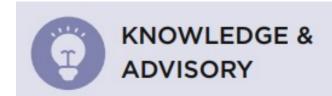


Key facts

- Government and multi-stakeholder initiative launched at COP22 gathering countries with interest on longterm strategies and ambition
- Hosted by the European Climate Foundation
- Funded by philanthropy and public funds
- 36 member countries, working with many more nonmember 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







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 macroeconomics / long-term climate strategies

PATHWAYS PLATFORM

- 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



DB



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

1. Scoping

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

2. Guidance: overview

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

3. Guidance: focus areas

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

4. Reporting & launch

Deliver user-friendly, practical guidance for each theme

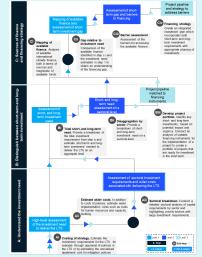
Example outputs from the analysis



Exhibit 1: thematic checklist

Mornation	Macroeconomic and facel analysis What are the key climate change related talks and opportunities for the domestic economy?	identify core channels of impact	identifyksy daks and apportunities	☐ Identifykey deks and apportunities ☐ Dewice scenarios for economy, climate change, climate palicy	☐ identify key risks and opportunities ☐ Densitip scenarios for economy, climate change, climate policy
	 What are the impacts of climate change and climate policy on key macroscoramic inflactors (employment, inflation, QQF)? 	implications for the domestic economy and fiscal position	Qualitative assessment of risks and apportunities	☐ Sectoral modeling of risks and apportunities ☐ Leverage existing macroeconomic models to analyse were fosal impact.	Sectoral modeling of risks and opportunities It reverage existing macroconstric models to analyse mecro-fiscal impact.
	Capital investment need What is the required level of investment received to deliver the LTS? What are the (domestic and international) sources of finance are available?	Understand the investment need	Estimate investment need associated with delivering LTS	 Estimate investment need associated with delivering LTS by sector 	 Estimate investment need associated with delivering LTS by sector
		Outline a portfolio of interventions	☐ Identify priority short-term investments	Outre a timeline of investments by sector	Outline particle of projects with clear timing of delivery
		Sources of finance and financing strategy	☐ Analyse available sources of finance ☐ Estimate investment gap	☐ Quantify gaps in finance ☐ Identify barriers and solutions	☐ Quantify gaps in finance ☐ Morelly barriers and solutions ☐ Develop investment sterlegy
	Green fiscal instruments - How can insultantiments be used to feature the LTE and enable the teasition?	identify available instruments and levers	Analyse relevant focal instruments in place Identify potential focal options	Analyse relevant fiscal instruments in place Identify potential fiscal options	Analyse misraetifiscal instruments in place Identify potential facel options
		Assess suitability of instruments	Assess suitability of focal spirons	☐ Assess suitability of fiscal options ☐ Assess potential revenues and costs of fiscal options	☐ Assess suitability of facel options ☐ Assess potential revenues and costs of facel options
		instrument select- ion and design	 Prioritize high impact fecal aptions 	☐ Prioritize fiscal options	Prioritize facal options Broader green facal reform.
written	Flood risk management - What are the main climate change related food risks - How conchese risks be managed?	Assess physical and transition fiscal risks	☐ Identify key food risks from physical climate disk and the global law carbon transition ☐ Outline channels of impact of food risks on key indicators	☐ Identify key fiscal risks from physical climate disk and the global live content transition ☐ Outline channels of impact of facel risks on key indicators ☐ Quantitatively analyse fiscal risks	☐ Identify key fiscel risks from physical climate risk and the global lose cutters framition ☐ Outline channels of impact of fiscel risks on key indications ☐ Quantitatively analyse fiscal risks
Vielei		Risk management strategy	 Identify options for managing facal risks (desertor risk financing, economic investments) 	 Appraise policy options for managing facel risks (deaster risk financing, economic investments) 	☐ Develop statingly to manage facel risks ☐ Strengther institutional processes for managing climate-related facel risks
	Green Industrial strategy * What are the economic opportunities from a global two are how the seconomic of the seconomic of the seconomic of the seconomic of the seconomic opportunities to realize of	identify key sociors	 Identify green subsection with potential for growth Prioritize subsections with comparative advantage 	Identify grean subsection with potential for growth Prioritize subsections with companions advantage Analyse beniess its growth in prioritized subsector.	☐ Identify green subsection with potential for growth. ☐ Prioritize subsections with comparative advantage. ☐ Analyse baniers to grawth in prioritised subsection.
		Policy and regulation prioritisation	 Identify priority policy and regulatory options for subsector growth 	 Identify priority policy and regulatory options to support subsector growth 	Identify priority policy and regulatory options to support subsector growth Integrate interventions within sectoral and restoral strategies
beginnedation	Accessing international climate finance - How can climate finance underso be improved to access available international climate finance?	Assessment and scenarios	Analyse existing sources of climate finance Identity opportunities to occess new sources of climate finance.	☐ Analyse existing sources of climate finance ☐ Identify appodunities to access new sources of climate finance	Analyse existing sources of climate finance Identify appointings to access new sources of climate finance
		Sector and project prioritisation	 Identify which sectors are best suited to international climate finance 	☐ Identify which sectors are best suited to climate finance ☐ Match project pipeline to specific sources	Identify which sectors are best suited to dimate finance Match project pipeline to specific sources
		Barriers to accessing finance	☐ Identify key overstrhing barriers	☐ Identify oversorting bentons ☐ Identify instrument/sector specific barriers	☐ Identify everanding barriers ☐ Identify instrument/sector specific barriers
		Climate finance readiness	Develop donor partnerships I identify factors for medimes	Develop donor partnerships Develop stellegy to improve readiness	Develop door partientlips Develop stating to improve residenss
	Enabling private sector investment New cas private sector investment be incertivised?	Develop investment plan	☐ Identify priority short term investments	Outline a timeline of investments by sector, identifying investments with role for private sector	Develop investment plan Develop pipoline of potential private projects
		identify barriers and solutions	☐ Identify key barriers and solutions to unboding private sector finance	☐ Identify sector-specific barriers and solutions to unsacking private sector finance	identify key barriers and adultions to unboking private sector finance
		Support project implementation			Develop institutional framework to coordinate project finance with investors

Exhibit 2: flow-chart for deepdive



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



- 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

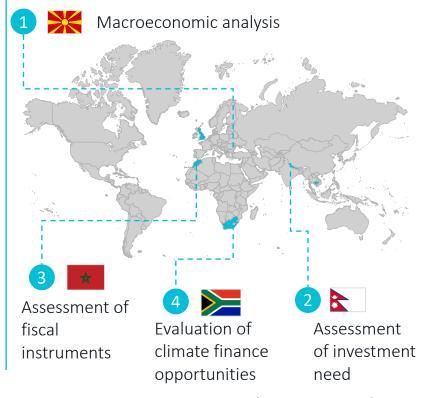
• The LTS is an opportunity to outline an approach to mobilise international climate finance to deliver short-term mitigation and adaptation investments



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



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
- Analysis of macroeconomic and fiscal risks and opportunities
- 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
- 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
- Enhancing capacity for accessing international climate finance



Priority areas

:Q&A

•••••••••••







A dashboard of economic indicators

Chloé Boutron - I4CE

Institute for Climate Economics

I4CE FIGURES













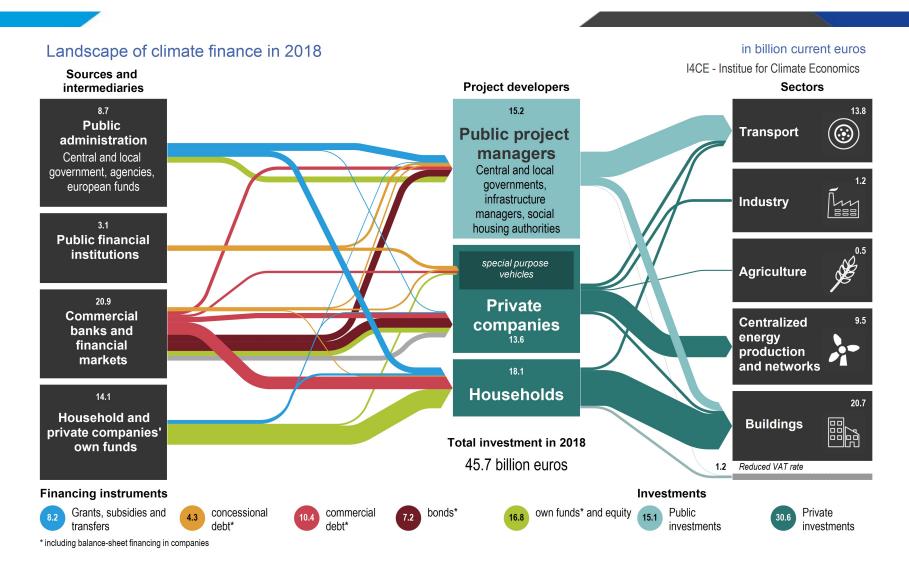


OUR MISSION

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.

- 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

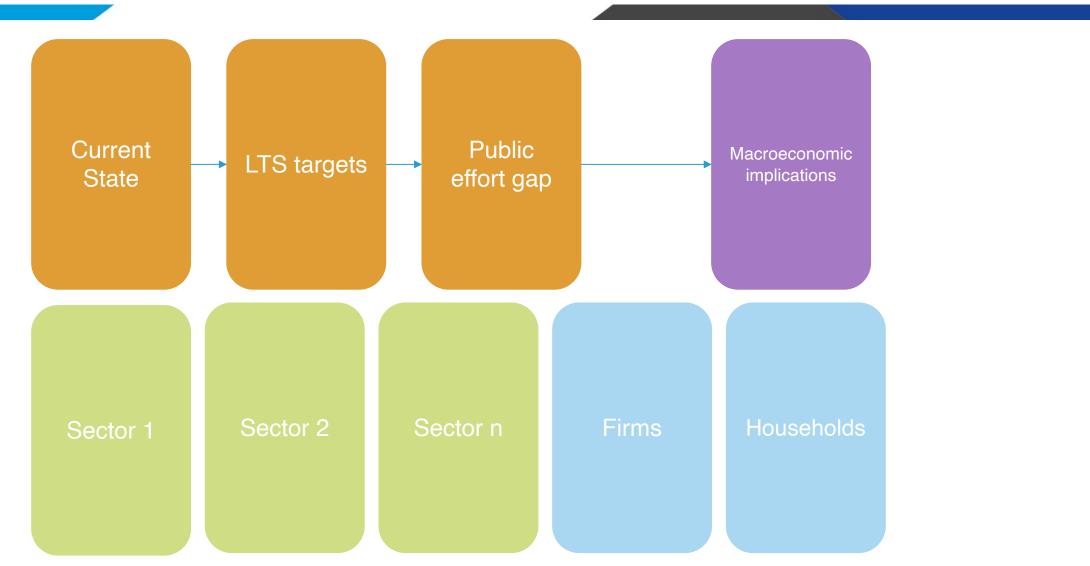


- Finance Ministers have a crucial role to play in the implementation of LTS:
 - They are key to **enabling climate public investment** for mitigation and adaptation projects,
 - They channel investments for measures triggering private climate investments,
 - They are responsible for the design, implementation, 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.

- I4CE and the 2050 Pathways Platform have launched a project:
 - To <u>facilitate the identification of public finance implications and opportunities ensuing from</u> 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



I4CE – Institut de l'économie pour le climat

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.
- <u>Landscape of international public finance</u> 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.
- <u>Public climate incentives needs</u>. 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?



www.isco.org/contact@isco.org







Thank you for your attention

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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:



of the Federal Republic of Germany



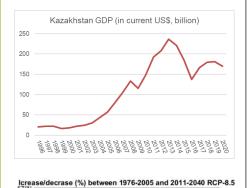
Why a macroeconomic model is the right choice to inform decision makers

- 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.

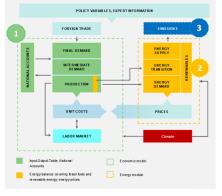


CRED Kazakhstan Process | Implementation Steps of the e3.kz model

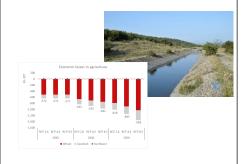
 Collect economic a nd climate data



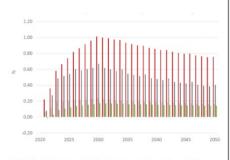
 Calibrate the model using econo mic and climate data.



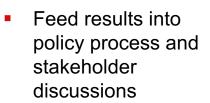
- Define scenarios to simulate with the macroeconomic model.
- We link climate change to the economic system through estimated damages dependent on the climate variables.



- 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, to
- CO2 emissions



- 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



Shortlist climate action measures

Select adaptation/ mitigation measures

LTS policy planning

LTS

LTS leadership Macroeconomic modelling for climate action

Budget allocation



Ministry of Economy



Ministry of Finance



International climate finance

Economic 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

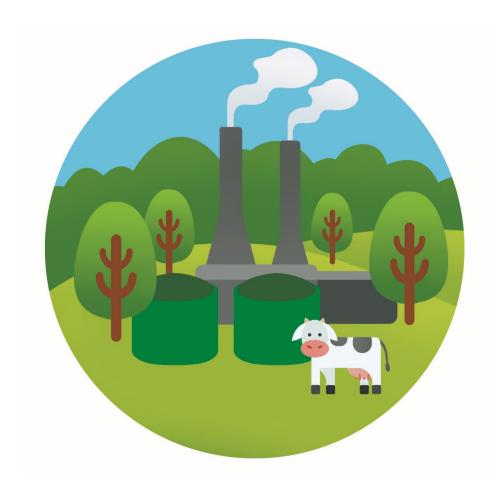
Key challenges

- Approximate reality
- Data intensive
- Need time and experts' knowhow



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.









Contacts



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Macroeconomic analyses for Long-term Strategies



Role of macroeconomic and financial analysis

Long-term vision for 2050 and beyond

Sectoral roadmaps for 2030

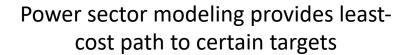
Policy priorities & investment needs for 2020-2023

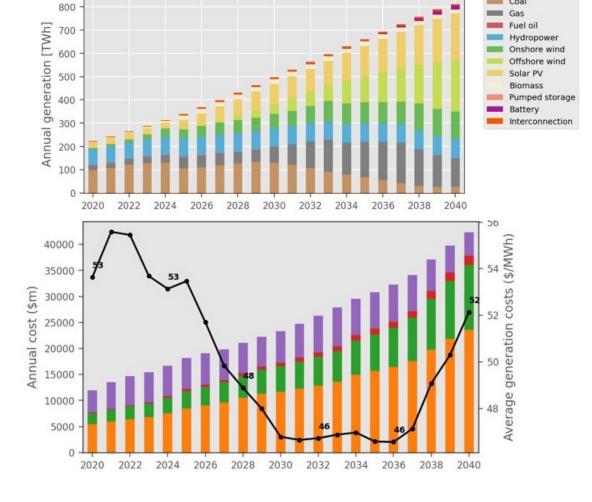
Macroeconomic modeling & Capacity assessment

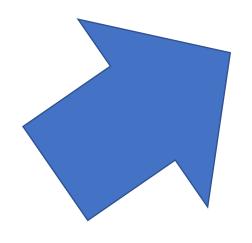
Macroeconomic analysis to

- Introduce economywide interventions (e.g., fiscal reforms)
- Explore feasibility, synergies, and trade-offs with other policies

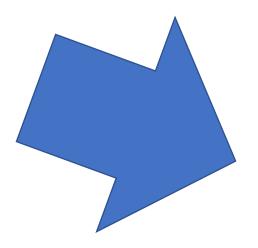
From sectoral roadmaps to policy design and assessment







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

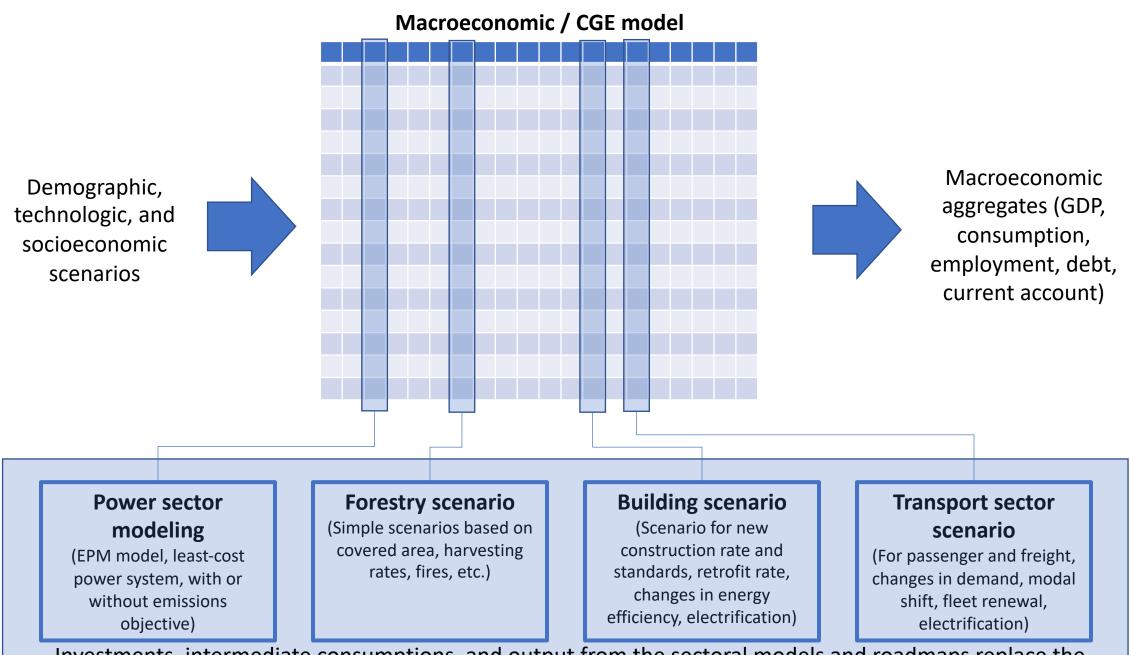


Investigate feasibility, impact on macro-level productivity and output, public finance and debt, etc.

Bringing together costs and benefits

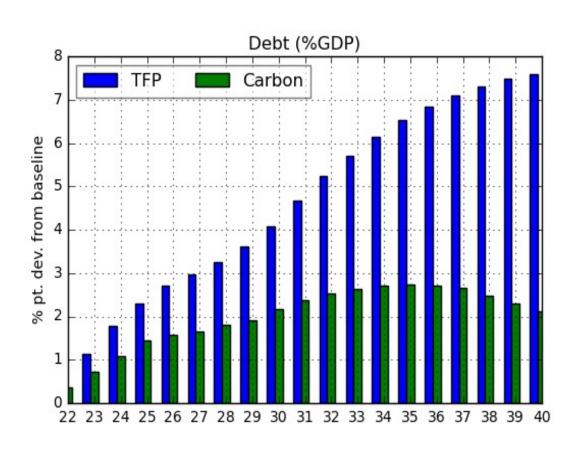
- Sectoral roadmaps to provide investments needs, costs, and benefits
 - Power sector
 - Transportation
 - Building sector
 - Industries
 - Forestry and land-use
 - Agriculture
 - Water
 - Other?

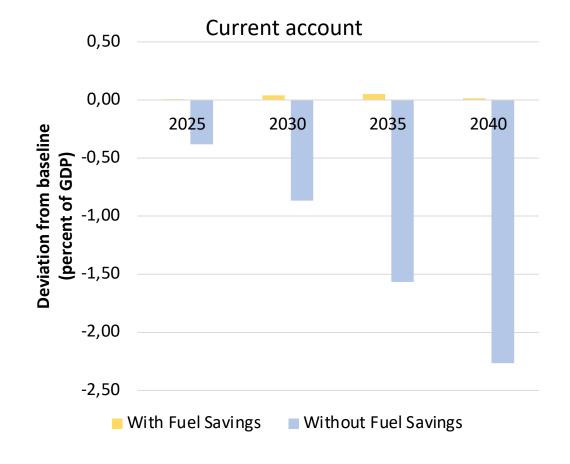
	2022–2030	2022–2040				
POWER						
Investment needs: new generation and storage capacity						
Investment needs: transmission and distribution						
Other economic costs: operational and fuel costs						
Other economic costs: air pollution externality costs from coal						
Other economic costs: decommissioning 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						



Investments, intermediate consumptions, and output from the sectoral models and roadmaps replace the simplified representation in the macroeconomic model, for the sectors covered by sectoral roadmaps

Typical results, for GDP but also debt or current account

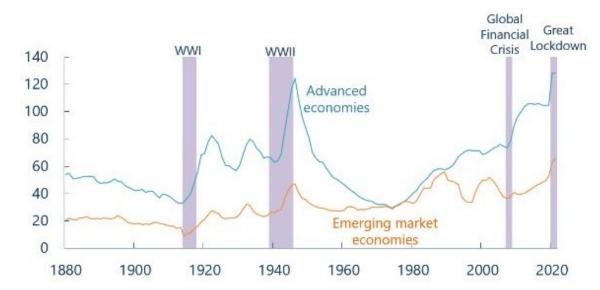




Challenge 1: taking into account the development context and countries' objectives







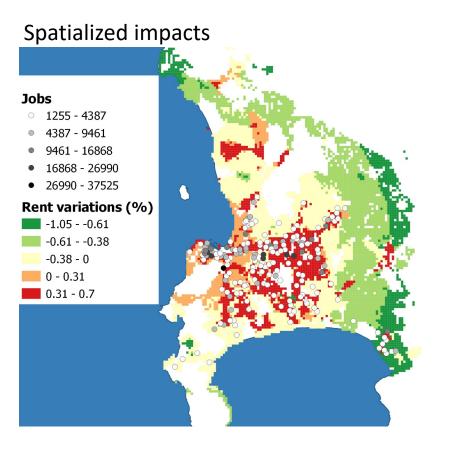


Challenge 2: Considering the full range of challenges

The climate change externality (carbon pricing) Technology lock-in and knowledge spillovers (innovation policy) Coordination failures, increasing returns (e.g., feed-in tariffs for solar) Infrastructure systems and network effects (e.g., investment in transit, electricity grid) Governance and institutions (e.g., reforms of capital and energy markets) Labor market rigidities (e.g., retraining programs)

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



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 biases 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	9				1	1		
Macroeconomic indicators	~	V	V	V	V			
Sectoral indicators	V	VV	11	V	-		V	
Co-benefits	V		V	V			177	
Poverty / distributional issues		√~	√ ~	V			V	V
Impact of extreme weather events on		1						
Macroeconomic indicators	V				W.	V		
Sectoral indicators	V~				V		V	
Financial indicators	V~	1			V	V		
Poverty / distributional issues							V	V
Impact of gradual global warming on	()				()		141	
Macroeconomic indicators	V	✓	V		J			
Sectoral indicators	V~	V	11				V	
Financial indicators	V				V	V		
Poverty / distributional issues		V~	√~	,			✓	1

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)

