



# Power Sector Implementation of a Country Coal-to-Clean Transition

**BRIEF FOR DECISION MAKERS**

**Charting a path to a clean, prosperous, and  
reliable power system in Southeast Asia**

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# Authors, Contributors and Acknowledgements

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## About RMI

RMI is an independent nonprofit founded in 1982 that transforms global energy systems through market-driven solutions to align with a 1.5°C future and secure a clean, prosperous, zero-carbon future for all. We work in the world’s most critical geographies and engage businesses, policymakers, communities, and NGOs to identify and scale energy system interventions that will cut greenhouse gas emissions at least 50 percent by 2030. RMI has offices in Basalt and Boulder, Colorado; New York City; Oakland, California; Washington, D.C.; and Beijing.

# Objectives and Key Audiences

This brief highlights key questions relevant to implementing the coal-to-clean transition in the power sector.

By indicating which questions are well-understood and which are less understood, it identifies where knowledge sharing will help drive the transition and where further exploration and new insights are needed.

Finally, the brief lays out how these various questions interconnect and shares an integrated roadmap to address them collectively.

## AUDIENCES FOR THIS ABRIDGED BRIEF

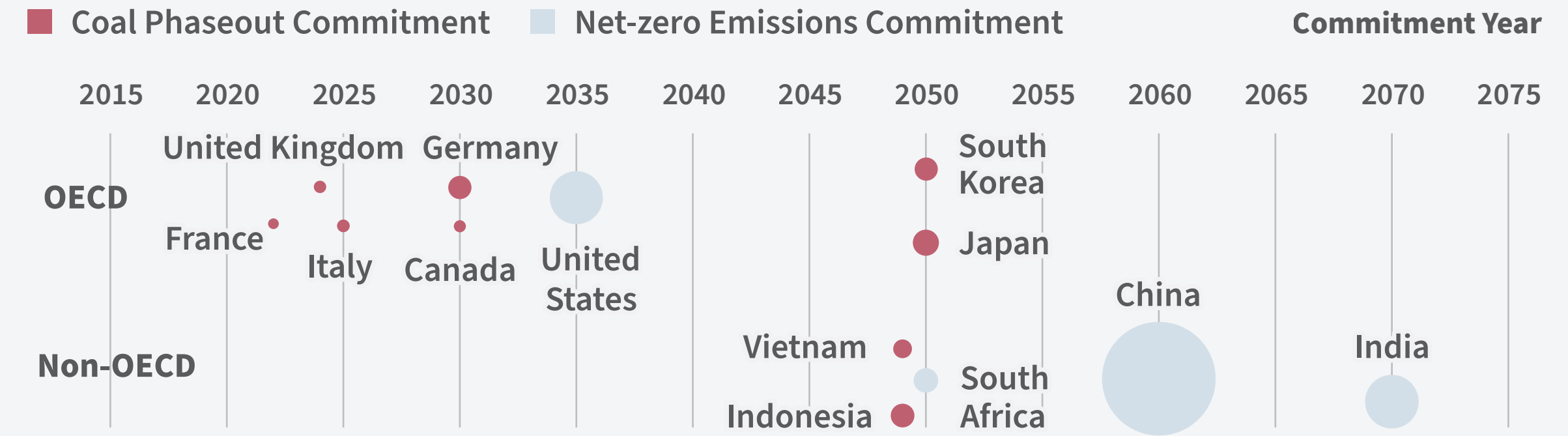
- **Policymakers, diplomats, and philanthropy** — these stakeholders can identify actions and direct resources to ensure answers to the identified questions are developed and shared.
- **High-level coordinating bodies** (e.g., JETP secretariats) — loop in, coordinate, support and convene stakeholders that can share, co-create, and adapt answers to the identified questions.
- **CSOs (global and local, technical and non-technical)** — share existing tools and solutions relevant to the identified questions, and identify areas for future work to bridge gaps in the implementation of the transition.



The past few years have seen significant momentum for the global coal-to-clean transition with several emissions, coal phaseout, and financing commitments. However, there are structural barriers to implementing the transition, and it needs careful planning and consideration.

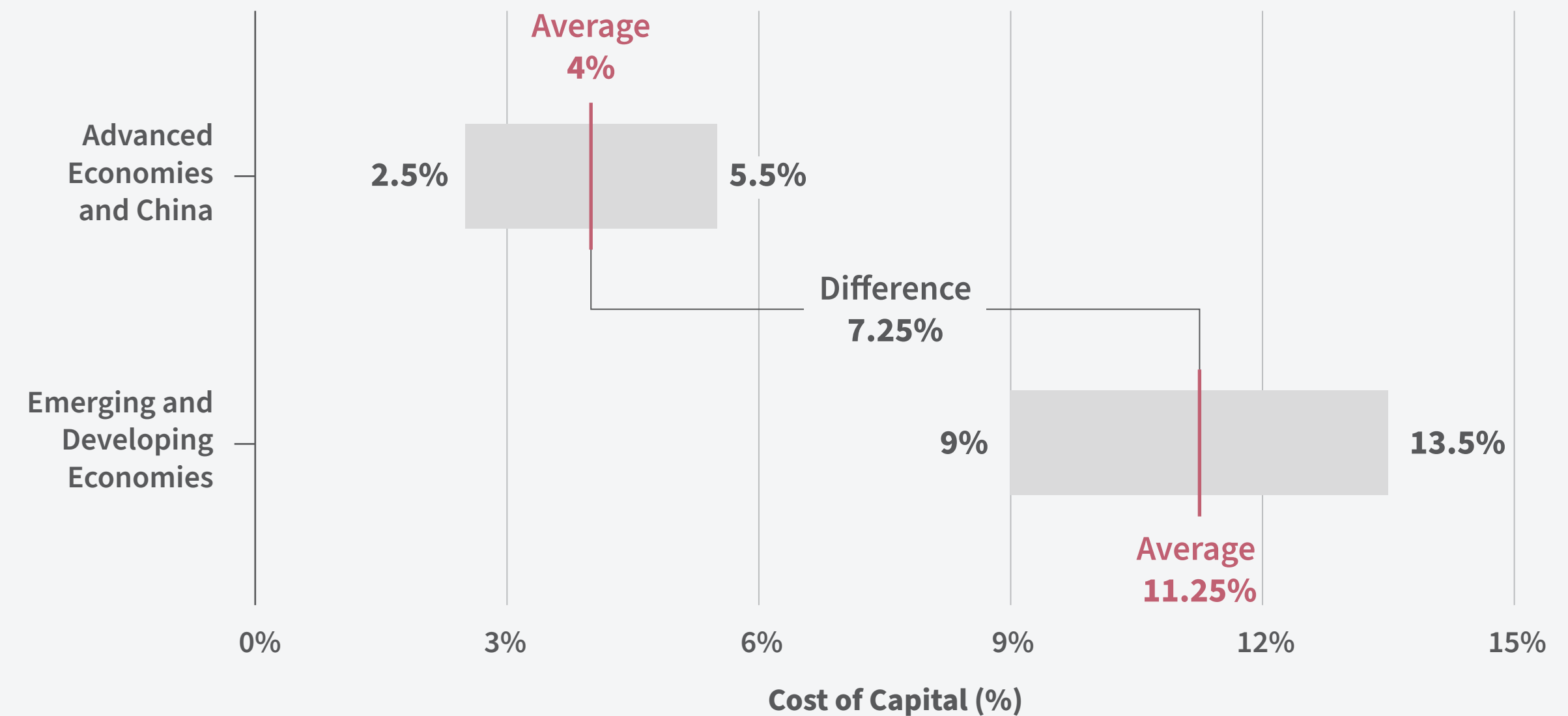
Many utilities and regulators face the challenge of ensuring sufficient power supply for rapidly growing economies as they manage heavy indebtedness, wavering grid reliability, and insufficient capacity for implementation.

### Countries (>1GW) with Coal Phaseout Commitments



NOTE: According to the IEA's Net Zero Emissions by 2050 Scenario, advanced economies would need to phase out unabated coal by 2030 and the rest of the world by 2040 to limit average global temperature rise to 1.5°C compared to pre-industrial levels.

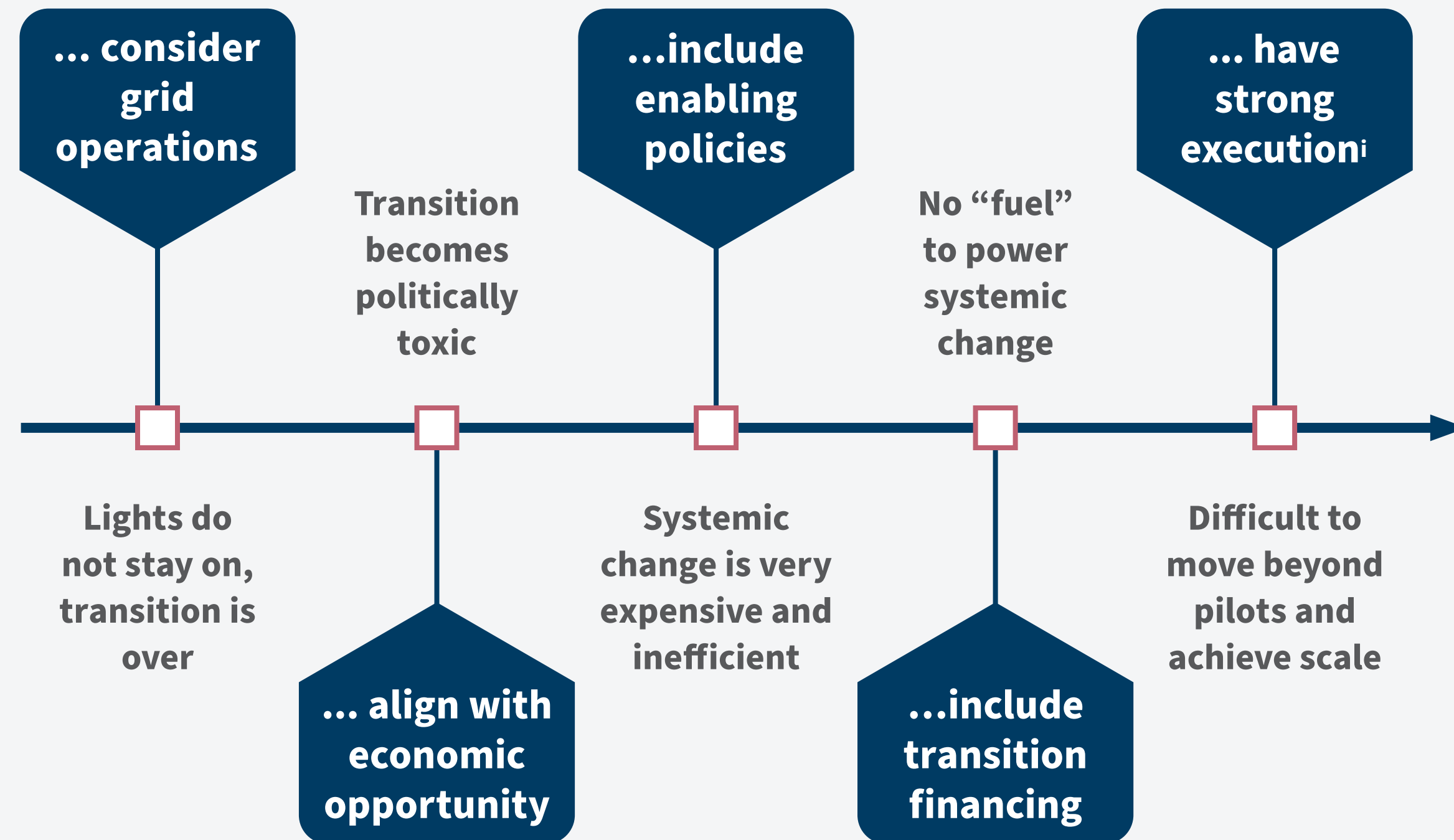
### Cost of Capital for a Solar PV Project, by Geography



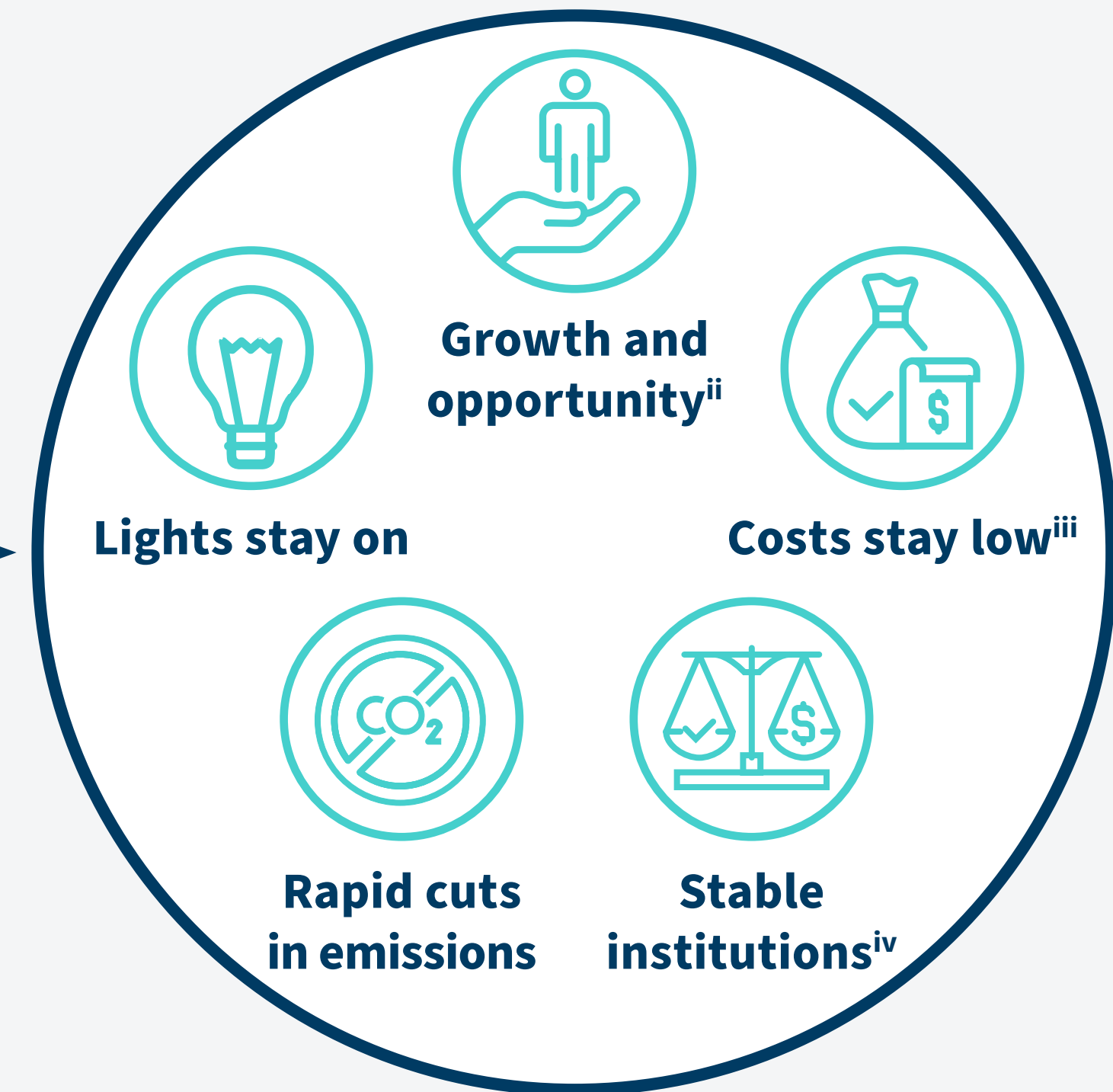
Source: [IEA Cost of Capital observatory](#)

The path to **successful implementation** of the transition requires an **integrated approach** that considers **grid operations**, aligns with **economic opportunity**, and includes **enabling policies**, **transition financing**, and **strong execution**. While all are important, ensuring **lights stay on** and the transition is **politically viable** are crucial.

IF TRANSITION DOES NOT ...



WHERE WE NEED TO BE



Such an approach raises a set of key questions that need to be answered along the road to implementation, some that are better understood than others.

Example Question    
  Applicable Lens    
  Sufficiently Understood    
  Somewhat Understood    
  Not Understood

Lenses for Transition	Piloting and Plant-Level Engagement	Planning and System-Level Engagement
Grid operations	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #006666; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #006666; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> </div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #006666; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>
Alignment with economic opportunity	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #006666; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #c00000; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>
Enabling policies		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #006666; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #006666; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #c00000; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #c00000; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>
Transition financing	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #006666; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #c00000; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #c00000; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>
Strong execution	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: flex; align-items: center; justify-content: center;"> <span style="background-color: #00c0c0; width: 15px; height: 15px; border-radius: 50%; margin-right: 5px;"></span> </div>

For questions that have been relatively well-answered, **proactive sharing and scaling of existing insights and best practices** is needed. This includes discussing how such solutions could be adapted to various local contexts.



Example Question



Applicable Lens

■ Sufficiently Understood

Lenses for Transition	Piloting and Plant-Level Engagement	Planning and System-Level Engagement
Grid operations	<p><i>How can a (coal) power plant be transitioned while ensuring reliability?</i></p>	<p><i>How can utility resource planning practices support ambitious climate goals?</i></p>
Alignment with economic opportunity		
Enabling policies		
Transition financing	<p><i>How are coal plant pilots selected?</i></p>	<p><i>Which policies would support a coal-to-clean transition?</i></p>
Strong execution		

**As an example, best practices exist – across multiple geographies – around utility resource planning and enabling policies for a coal-to-clean transition. These can be considered and adopted (as relevant) by local stakeholders.**

### UTILITY RESOURCE PLANNING, UNITED STATES

Reforming utility procurement [↗](#) of power to be:

- **All-source** – considering a range of utility-scale and distributed energy resources to meet the defined objectives
- **Objective-aligned** – bidding objectives are well-defined and include both power sector and broader public policy goals
- **Transparent** – bidding process and evaluation criteria are open, fair, and proactively communicated

### RENEWABLE ENERGY AUCTIONS, KENYA

Kenya implemented its Renewable Energy Auction Policy [↗](#) in 2021, which seeks to ensure **renewable power** projects are **competitively procured** through rounds of transparent auctions, all in line with utility and national energy plans.

Furthermore, its accompanying 2021 Feed-In Tariff (FiT) Policy aims to **standardize power purchase agreements (PPAs) terms** and provide renewables incentives, building on previous, successful FiT programs.

### SHORT-TERM MARKETS, INDIA

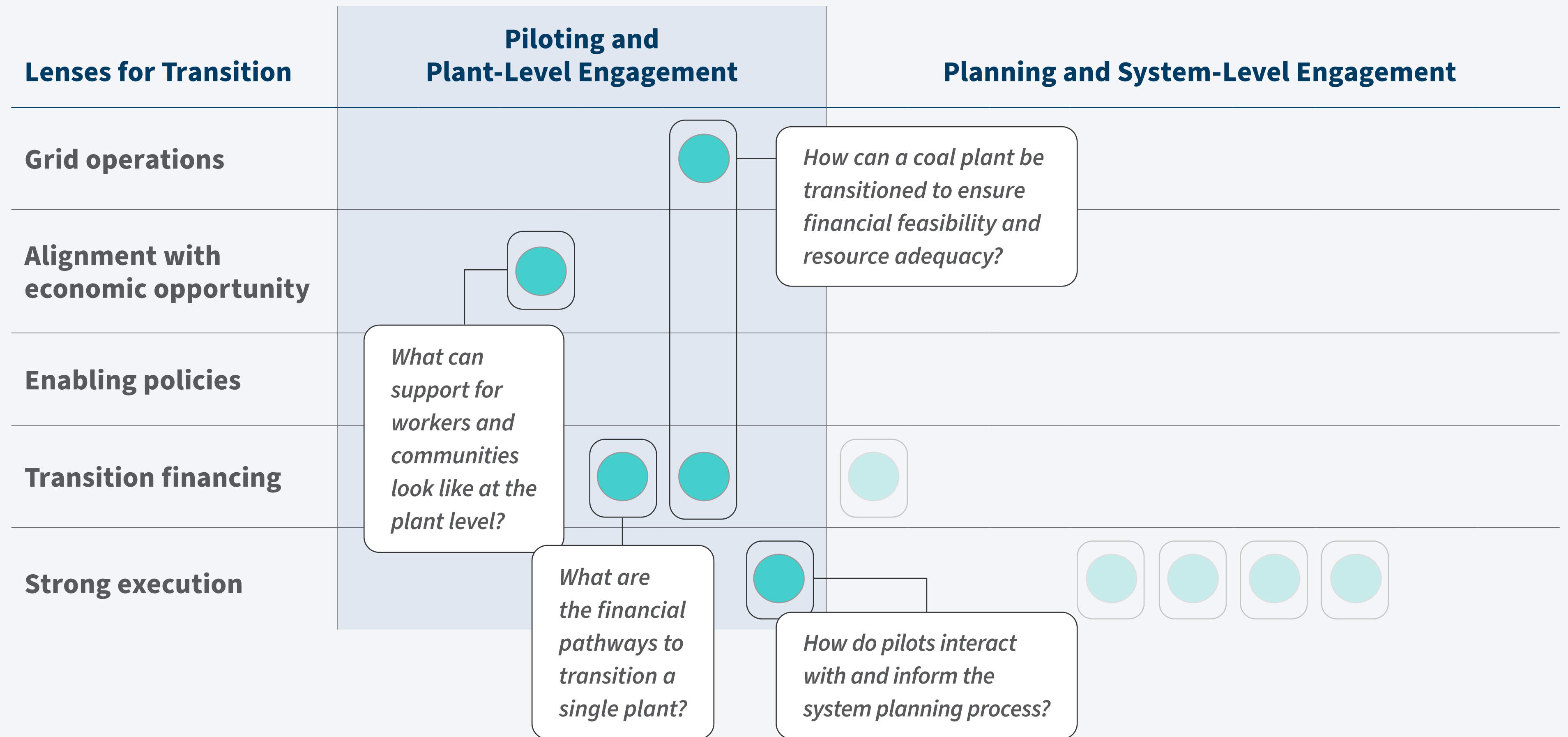
Considering short-term markets [↗](#) that move away from bilateral procurement of PPAs and include:

- **Real-time and ancillary markets** that allow for low-cost and rapid procurement of flexible resources
- **Demand and supply-side resource participation** that allows for optimization of demand and supply-side dispatch of wide range of available and new resources (e.g., storage, electric vehicles, behind-the-meter solar)



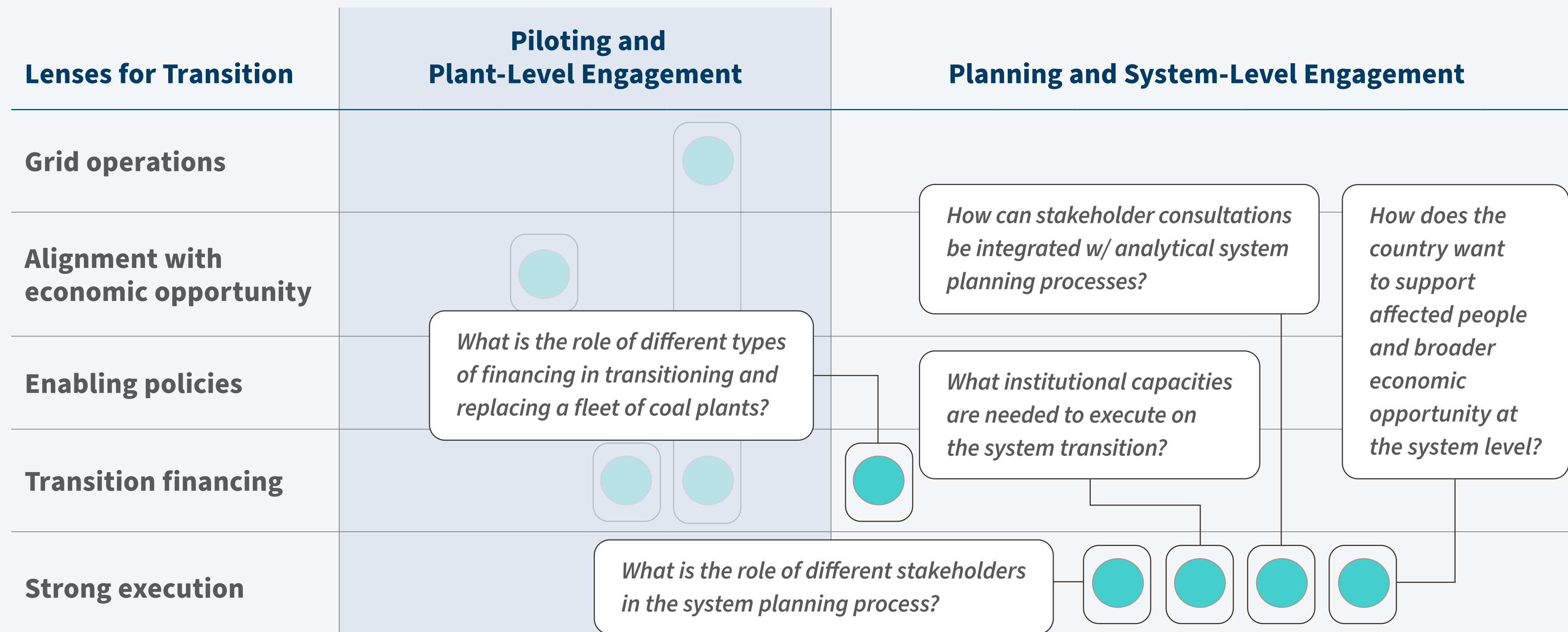
The answers to other questions are **somewhat understood**, with insights that are beginning to emerge. These areas need **further testing, research, and analysis.**

Example Question    
  Applicable Lens    
  Somewhat Understood



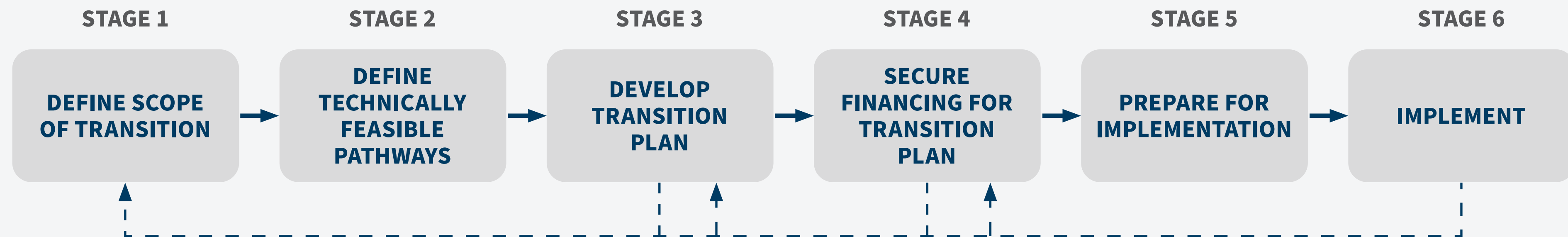
The answers to other questions are **somewhat understood**, with insights that are beginning to emerge. These areas need further testing, research, and analysis.

Example Question    
  Applicable Lens    
  Somewhat Understood



As an example, RMI shares a **high-level process** for how pilots can interact with and inform investment planning processes. More thought and consideration is needed from stakeholders as they begin implementation.

SYSTEM PLANNING



PLANT LEVEL

**“EARLY WIN”  
COAL TRANSITION  
PILOT**

Pilot projects to kick-start stakeholder interest, generate early learnings, and build trust and momentum in the broader transition effort.

**“NEW FRONTIER”  
COAL TRANSITION  
PROJECT**

Pilot projects that explore new frontiers of the country’s coal-to-clean transition (e.g., pathways to repurposing coal plants) and begin answering unanswered questions.

**Finally, the answers to a subset of questions are not well understood at all. Significant attention, planning, and resourcing is needed here.**



Example Question



Applicable Lens

■ Not Understood

Lenses for Transition	Piloting and Plant-Level Engagement	Planning and System-Level Engagement
Grid operations		<p><i>How can policymaking, raising transition capital, and maintaining grid operations interplay? How can they be sequenced to support economic opportunity and climate ambition?</i></p>
Alignment with economic opportunity		
Enabling policies		<p><i>How can the transition support the financial stability of key companies and sovereigns?</i></p>
Transition financing		
Strong execution		



As an example, RMI shares a process for how policymaking, transition capital, and grid operations can be sequenced to support economic opportunity and climate ambition. This process demonstrates how key questions for the transition interconnect. Further work is needed – more knowledge sharing, scaling of solutions, and original research – to deepen and accelerate implementation.

