RMI

Fact Sheet

Clean Power for Growth

The Roles and Risks of Gas Power in Supporting Growing Economies

Introduction

As the world decarbonizes, it must also improve energy access. Even as the energy transition is undoubtedly accelerating, the need remains to simultaneously reduce energy poverty and provide access to reliable electricity for much of the world's population.

These two investment priorities are complementary—not conflicting. The discourse that has shaped electricity investment priorities for economic development in the Global South remains regrettably rooted in status quo thinking and 20th century technologies. Too often, strategies that prioritize carbon-free electricity resources are characterized as sacrificing development needs to meet climate targets. Natural gas, and often its globalized liquefied natural gas (LNG) supply chain, is promoted as the de facto solution for power system investment in growing economies, especially as a replacement for coal.

But times, and technologies, have changed. Renewables and enabling technologies like battery storage have matured in the past decade, and they can now contribute meaningfully to grid investment strategies that meet three critical needs for economic development: reliability and security of electricity supply, speed of deployment, and cost-effectiveness of energy delivery. While every country has diverse local needs, the weight of evidence is shifting toward renewables being the star players, with leak-free gas in a supporting role at best, for nearly every geography's electricity access pathway.

The Opportunity of Clean Power for Growth

Modern renewables and associated technologies like battery storage can deliver three key outcomes for economic development:

Reliability

Renewables and storage are playing ever-larger roles in the grids supporting developing economies. These technologies are meeting near-term reliability needs, such as the **hybrid facilities selected** in South Africa's recent emergency reliability procurement, and powering the grids of **Sint Eustatius** and **Saba** for the entire day without any diesel generation online. They are also helping to serve the growing electricity needs of countries such as Ghana, which is **planning to build only renewables through 2025**.

Where grids lack existing dispatchable capacity, either hydro or thermal, there may be a case for additional investment in thermal resources (including **certified, leak-free** gas) to support near-term reliability needs. However, as the 2021 blackouts in Texas show, relying on gas alone for reliability means that **gas infrastructure failures can cascade** and disable the grid, even in places with local resources and reserves. Further, **recent modeling of a decarbonized US power system** shows that a 90% carbon-free electricity grid can be reliable even without renewables being fully backed up by fossil resources.

Speed

Renewables and storage can be deployed rapidly and modularly to meet near-term needs as well as sustained growth. Even large-scale projects can be deployed quickly: in 2017, the world's largest storage project at the time was deployed in Australia in **less than 100 days**, much faster than traditional electricity sources and rivaling deployment times for ship-based gas generators. In 2020, **Vietnam installed over 6 GW of solar**, tripling its solar capacity in a single year.

Cost-Effectiveness

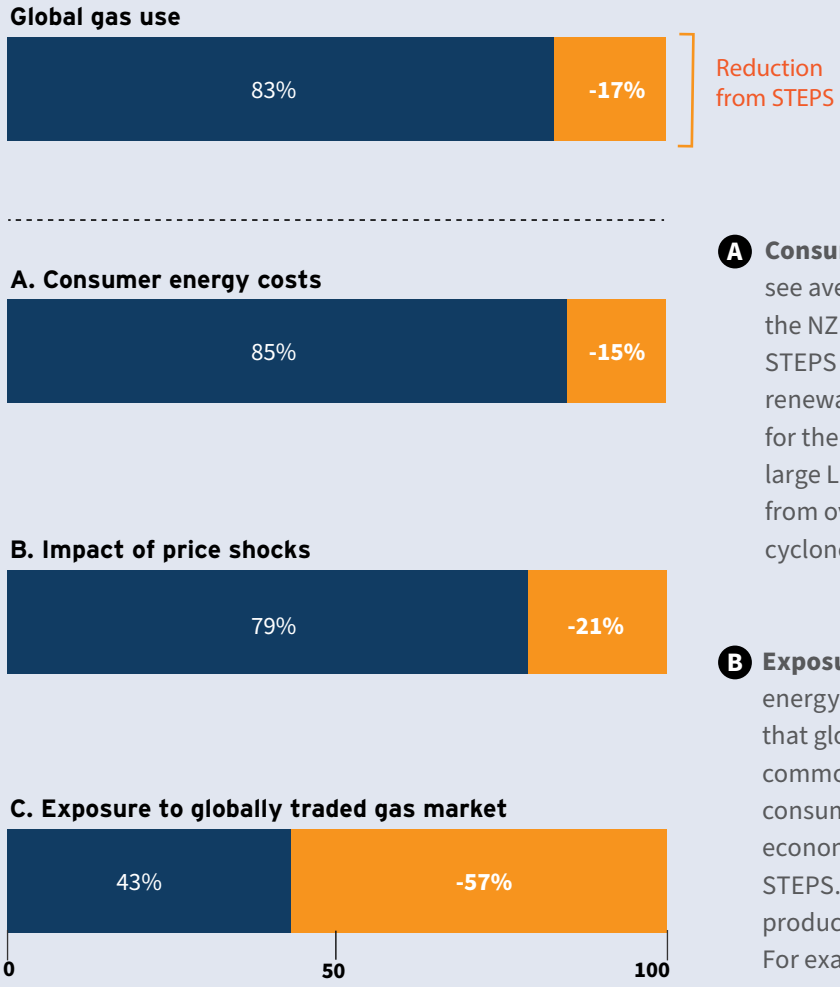
From gas producers like **Malaysia** to importing islands like **Jamaica**, recent procurements show that renewables are the lowest-cost source of electricity, sometimes costing just half as much as gas. Hybrid renewable and storage plants are now also competitive; India held the **world's largest renewables auction** last year, which set the record for the lowest price for a renewable hybrid plant, lower even than coal.

Risks of a Gas-Heavy Strategy

Decisions made in the next few years will affect development outcomes for billions across the globe in the coming decades. While many different technologies may well support near-term development targets, their mid- and long-term effects are likely to diverge widely. Given the large investments required for gas infrastructure, especially LNG, planners must weigh the potential of gas power investments to deliver development outcomes in the near term against its longer-term costs and risks.

Selected 2030 outcomes associated with reducing gas use consistent with IEA Net Zero Emissions scenario

The International Energy Agency (IEA) ***World Energy Outlook 2021*** characterizes the risks of overreliance on gas for emerging markets and developing economies. Comparison between the IEA's Net Zero Emissions (NZE) scenario, in which renewables dominate electricity supply by 2030 and gas plays a minor role, and the business-as-usual Stated Policies (STEPS) scenario with a heavy role for gas reveals outcomes for the Global South in three key areas:



A **Consumer prices:** Developing economies would see average household energy spending levels in the NZE scenario approximately 15% lower than STEPS in 2030, driven by the adoption of low-cost renewables. These savings do not even account for the common **cost overruns and delays** of large LNG projects or the risks of supply disruption from over half of LNG terminals already at risk of cyclones and coastal flooding.

B **Exposure to price volatility:** Because renewable energy has stable costs once built, IEA calculates that global price volatility in gas and other energy commodities would have a 21% lower impact for consumers in emerging markets and developing economies in the NZE scenario as compared to STEPS. This risk can affect customers in gas-producing countries as well as importing countries. For example, even with plentiful domestic supply, US households will face **30% higher energy bills** in winter 2021 as a result of extreme weather and the recent global commodity price shocks.

C **Technology lock-in inconsistent with long-term cost or security goals:** The economies of scale associated with LNG projects encourage **investments of $500 million or more** in terminals alone. Prioritizing LNG investment as a cornerstone of a development strategy is equivalent to placing an irreversible bet on gas being the long-term solution to a country's energy needs. This concentrates risk into a single commodity, and often a single supplier, and precludes options to adopt lower-cost resources as renewable and storage prices continue to fall. With continued global LNG investment, both importing and exporting countries face risks from global gas price volatility and potential supply disruption.

Conclusions and Recommendations

IEA's estimates suggest that development strategies that prioritize a heavy role for gas would, by 2050, expose ~$140 billion per year of power sector gas use in developing economies to price volatility and supply risk, whether through malice (e.g., geopolitical unrest), mishap (e.g., facility failures), or climate mayhem (e.g., extreme weather). On the other hand, minimizing gas's role consistent with achieving a net-zero emissions global economy by 2050 can support meeting >60% of the electricity needs of emerging markets and developing economies with local renewables, helping ensure energy security by design for the billions of global citizens who need it most.

To select a pathway most appropriate for each geography that realizes these benefits, national energy decision makers and other stakeholders should:

- **Utilize modern planning and procurement strategies** that accurately represent the capabilities of carbon-free electricity resources in supporting system reliability, and abandon the legacy prioritization of "baseload" power stations in system planning. Where system planning indicates a need for firm generating capacity from gas or other resources, carefully evaluate all options using **competitive procurement structures** that let both carbon-free and fossil resources compete on a level playing field.

- **Prioritize a flexible grid expansion strategy** that balances expedient options for electricity access and growth against medium- and long-term costs and risks. For instance, emphasize modular and flexible investments in renewables that are likely to fall in cost over time, as opposed to large and irreversible bets on fossil resources whose costs are likely to remain structurally higher. Consider options, including from development funders, to cover any near-term **"green premium"** associated with investment in lower-risk, renewables-based options for expanding energy access.

To learn more about RMI's research and resources regarding this topic, please contact Vikram Singh at vsingh@rmi.org

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.