

Policy Brief Series:

FACILITATE HIGH-QUALITY, SUSTAINABLE GROWTH THROUGH A LOW-CARBON TRANSITION IN THE BELT AND ROAD INITIATIVE COUNTRIES

Key messages:

The Belt and Road Initiative (BRI) partner countries represent over 63% of the global population and 61% of global greenhouse gas (GHG) emissions, but only 38% of global GDP. Economic development, therefore, remains a high priority for many partner countries, especially for low-income, less-developed Asian and African regions. China's recent commitments to ending overseas coal development and promoting South-South climate cooperation open up important opportunities to help the low-income partner countries take on high-quality, sustained growth.

This analysis demonstrates that pursuing the low-carbon development path will generate broad societal benefits for BRI partner countries. By assessing different 1.5C-compatible pathways through a comprehensive lens, we evaluate not only GHG emission reductions but also other environmental, social, and economic outcomes. **We find that the low-carbon transition brings large improvements in 12 indicators between today and different 1.5°C futures, including air quality, health, employment, energy security, and consumer well-being.** Specifically, it will:

1. Generate large air quality and health benefits, where PM2.5 and Ozone concentrations decrease by 36% and 22%, respectively, and premature mortality decreases per 100,000 people by 32% from today to 2050;
2. Shift employment opportunities from the fossil fuel to green industries, where green jobs increase by 254% between 2020 and 2050, and job growths in renewables, energy storage, electric vehicle batteries and infrastructure are much higher than job losses in the fossil industry;
3. Need a just transition to address stranded assets, employment losses, and reduced trade revenue for fossil fuel exporting economies;
4. Enhance energy security by reducing reliance on fossil fuel imports and exposure to international market fluctuations, and by increasing electricity access for consumers;
5. Affect food security due to complex interlinkages between energy, land, and water systems, especially when relying on land-based mitigation strategies;
6. Require \$1.1 trillion of investment per year to scale up renewable deployment and improve efficiency and infrastructure, where BRI can provide an important channel for climate finance.

Introduction

The Belt and Road Initiative (BRI) has become the world's largest platform for international development and cooperation, with the participation of over 140 countries. BRI partner countries represent over 63% of the global population but only 38% of the global GDP¹⁻² (Figure 1). Economic development, therefore, remains a high priority for many partner countries, especially for low-income, less-developed Asian and African regions. Moreover, BRI countries together consume 57% of global primary energy, dominated by fossil fuels, and account for 61% of global greenhouse gas (GHG) emissions.³⁻⁴ If fossil-dependent growth continues, BRI countries will become major GHG emitters and prevent the global 1.5C temperature goal from being reached. Taking the low-carbon transition is critical in addressing global climate change, but more importantly, it also strongly supports countries' own priorities in pursuing high-quality and sustained growth, cleaner environments, and improved well-being for their people.

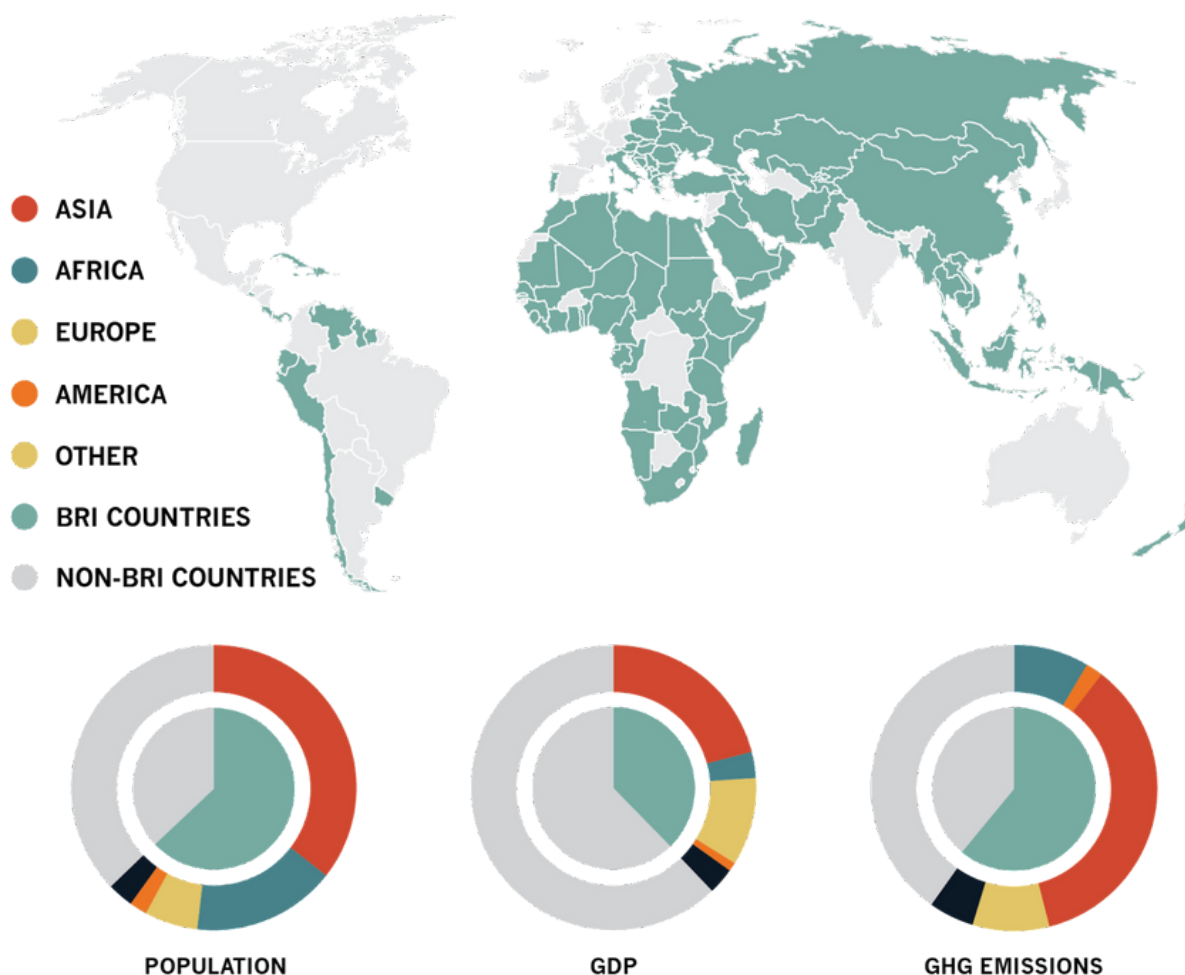


Figure 1. Overview of BRI partner countries. Partner countries are highlighted in the map. Pie charts show the share of BRI population, GDP, and GHG emissions by region to global total.

Since its announcement in 2013, BRI has facilitated over \$9.2 trillion of trade flows between China and the partner countries, and \$789 billion of investment to support infrastructure development,⁵ contributing substantially to the economic development of the global south, and bringing new opportunities to improve the global supply chain. While early BRI investments focused more heavily on carbon-intensive infrastructure, recent investments have begun to shift toward more sustainable infrastructure. In 2020, 57% of China's energy investment in BRI countries went to renewables.⁶ China has pledged to stop building new coal-fired power projects abroad and to support other developing countries' sustainable, low-carbon energy transition. In its latest Nationally Determined Contributions (NDC) submitted at the United Nations Climate Change Conference (COP26) in Glasgow, BRI was also called out as the key platform for China's South-South climate cooperation.⁷ These commitments open up important opportunities to help the BRI partner countries take on high-quality, sustained growth.

To better understand whether and how the low-carbon transition can support countries to fulfill their strong development needs, this analysis looks at BRI countries' low-carbon future with a comprehensive lens. We first develop long-term, low-carbon pathways for BRI countries using a global integrated assessment model (the Global Change Analysis Model, GCAM). **We then evaluate these pathways through a multidimensional framework that considers a broad set of development considerations, including seven development priorities across environmental, social, and economic dimensions, measured by 17 indicators (Figure 2).**

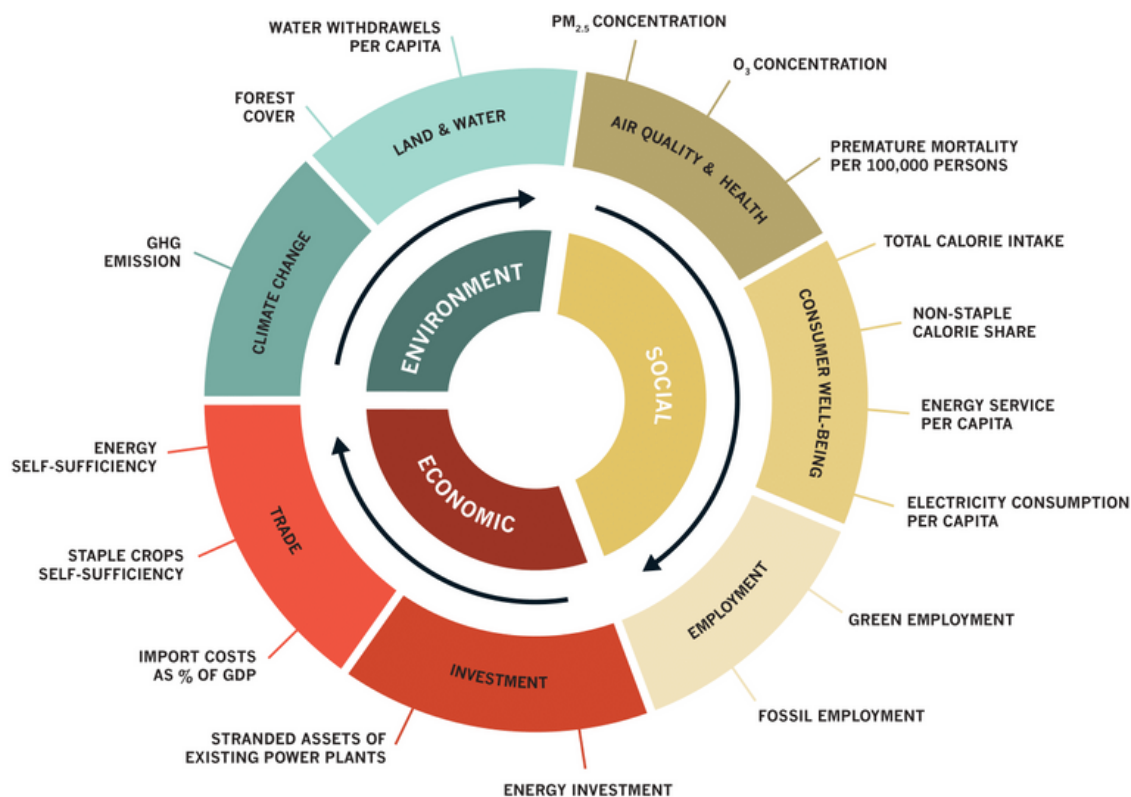


Figure 2. Research framework. We use the multidimensional framework to assess 1.5°C-compatible pathways through a comprehensive lens. It includes seven development priorities across environmental, social, and economic dimensions, measured by 17 indicators.

Progress in each metric is quantified between today and 2050 under 1.5°C. We also explore several variations in terms of the reliance and strategies of negative emissions.

Results

Overall, we find that a low-carbon investment and development strategy can bring large societal benefits for BRI partner countries, with consistent improvements in 12 of the indicators between today and 2050 across all 1.5°C scenarios, including air quality, health, employment, energy security, and consumer well-being. Negative consequences are concentrated in the fossil fuel industry. Outcomes on land, water, energy, and agriculture trade are highly interconnected and have large uncertainties across scenarios and regions.

The low-carbon transition is necessary for continued improvement in air quality. PM2.5 and Ozone concentrations decrease by 36% and 22%, respectively, between 2020 and 2050 (Figure 3). The air quality improvement also lowers premature mortality per 100,000 people by 32%, despite rapidly aging populations expected in BRI countries. *Read more in the Air Quality and Public Health brief from the series.*

The low-carbon transition also generates a large number of new green job opportunities for BRI countries, making up for job losses in the fossil industries. Employment from renewable energy, energy storage, electric vehicle batteries and charging facilities, and energy efficiency sectors increases by 254% between 2020 and 2050 (Figure 3). Overall, energy-related employment opportunities increase by 9 million, with a complete shift from fossil fuels to green industries, where green job growth is 1.6 times more than fossil job losses. *Read more in the Energy Employment brief from the series.*

The low-carbon transition also enhances energy security for BRI countries by increasing energy self-sufficiency at the national level and by increasing electricity access for consumers. As countries move toward domestic renewable energy resources, global trade in fossil fuels will decline rapidly. Fossil energy importers, such as China and South Korea, reduce their reliance on imports and their exposure to international market fluctuations. *Read more in the Energy Security brief from the series.*

Meanwhile, negative consequences from the low-carbon transition are expected to be concentrated in the fossil fuel industry and impact the fossil-dependent economies more heavily. These impacts include an 81% reduction in fossil-related jobs, the stranding of 24% of existing fossil power assets, and reduced export revenue for fossil energy exporters (i.e., Indonesia, the Middle East, Russia, and others). It highlights the importance of implementing a just transition for BRI countries. *Read more in the Just Transition brief from the series.*

The low-carbon transition also affects food security due to complex interlinkages between energy, land, and water systems, especially when relying on land-based mitigation strategies. At the national level, agriculture imports increase for most BRI countries, driven by rising food demand from a growing population, and reduced cropland for agricultural commodities due to land-based mitigation activities such as bioenergy and afforestation. This potential trade-off also affects consumer food security in terms of total calorie consumption and the share of non-staple calorie intake. *Read more in the Land Use & Water brief and the Food Security brief from the series.*

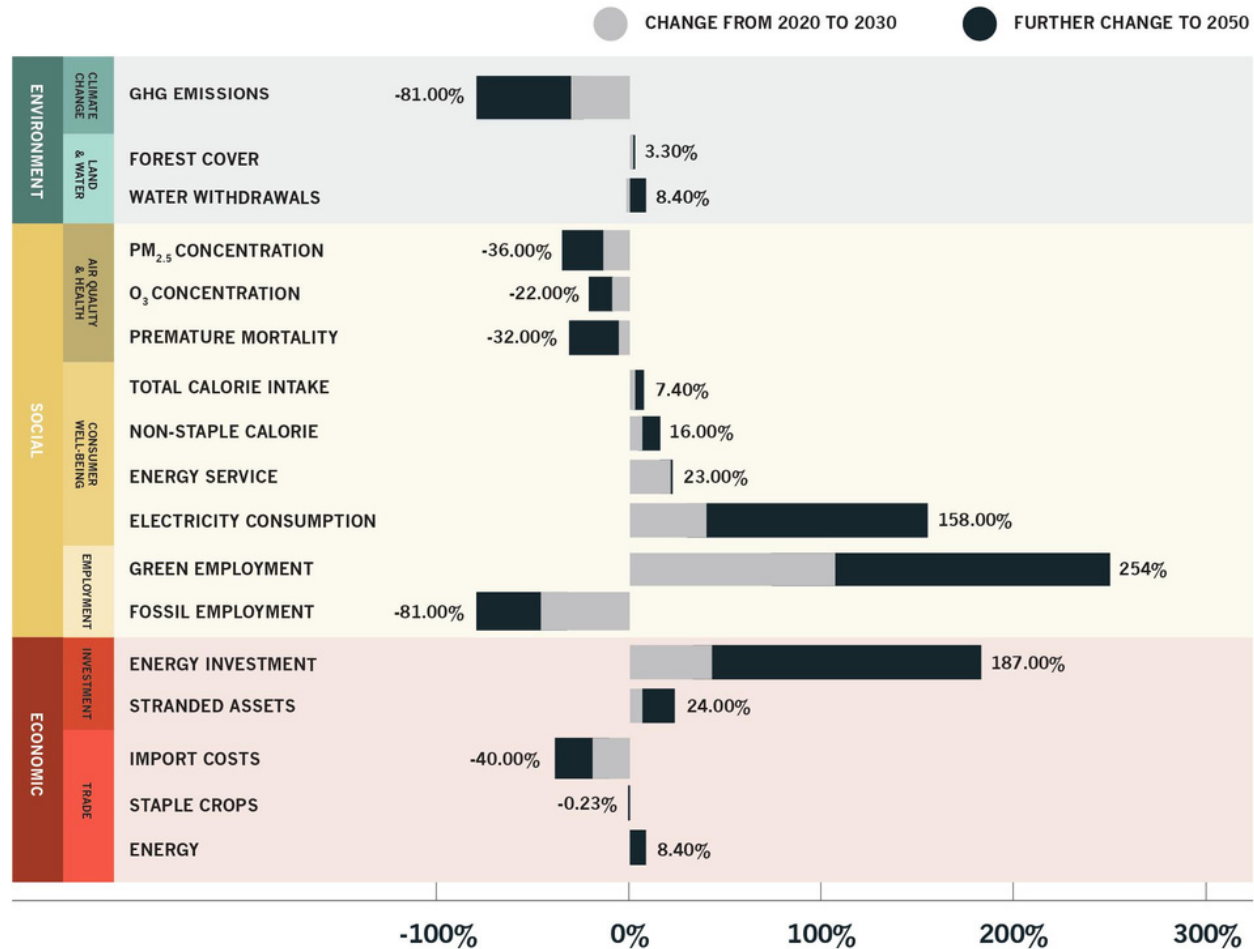


Figure 3. Percent changes in 17 environmental, social, and economic metrics for aggregate BRI countries between 2020 and 2050 under 1.5°C. Light gray bars show changes from 2020 to 2030, dark gray bars show additional changes from 2030 to 2050, and numbers show the total changes from 2020 to 2050.

Policy Implications

The low-carbon future is highly aligned with BRI countries' sustained, high-quality growth, which leads to a cleaner environment, upgraded industry and technology, and improved people's well-being. Our analysis emphasizes the integrated, holistic approach of the low-carbon transition. The strong synergies between emissions reduction and sustainable development provide a strong motivation for the BRI countries to enhance climate ambition and pursue a new growth path. Enhanced cooperation among the partner countries will help responses to various shared challenges, including climate change, energy security, food security, supply chain constraints and vulnerability, and so forth. The comprehensive assessment of low-carbon transition pathways can help identify the synergies across multiple development needs and thus the policy priorities. Each country, based on its own industrial structure, energy resource availability, and development needs, should explore new drivers for sustained green growth, take advantage of the synergies, and address the trade-offs with additional policies.

Green climate finance needs to be accelerated for the low-carbon transition, and BRI can provide one important channel, among others, to facilitate climate finance toward partner countries' low-carbon transition. Our results indicate that approximately \$1.1 trillion (in 2010 US\$) per year between 2020 and 2050 is needed to transition the power sector to low-carbon technologies for the entire BRI region. However, many BRI countries do not have the required resources to make the transition and need financial assistance from international sources. Strong and stable policy signals can help facilitate more investments in low-carbon technologies and infrastructure in power generation, end-use electrification, energy efficiency, carbon removals, and non-CO₂ emissions reductions, especially from the private sector. Specific policy instruments include, but are not limited to, carbon pricing, green finance standards, project environmental and climate risk assessments, information disclosure, as well as phasing out public finance for fossil fuels projects. It is necessary to encourage more countries, regions, and relevant institutions to join the BRI green investment principles and to expand investment in green infrastructure and projects.

The low-carbon transition needs to be implemented in a just way, which requires additional policy and fiscal support to reduce the negative impacts on fossil fuel-based communities and economies. The phase-out of fossil fuels is a complex and lengthy process that requires structural changes in carbon-intensive industries and fossil-dependent economies, and may affect near-term energy affordability, particularly for low-income groups. Comprehensive policy packages should address various transition challenges regarding the consumers, the workforce, the business, the environment, and the economy. Education and retraining programs and relocation compensation can help laid-off workers find new job opportunities. Fossil plants and coal mine reclamation are needed to restore the local environment. Infrastructure investment, business development plans, and policy incentives can help diversify the local economy. During the process, it is critical to engage governments, the private sector, research, local communities, civil society, and other stakeholders to achieve an inclusive and resilient just transition solution.

BRI can provide one of many important platforms to facilitate and strengthen bilateral and multilateral climate cooperation among countries. Many BRI countries do not have the required resources for making the low-carbon transition and would require substantial international support on finance, technology, and capacity. Through BRI, China aims to enhance South-South climate cooperation and make its investment practices more climate-responsible, and ecologically and socially beneficial for the host countries. Moreover, beyond BRI, one possibility is to explore how to connect different international efforts for climate cooperation, such as the European Union's "Global Gateway" and the United States' "Rebuild a Better World". Major economies with comparative advantages in capital, technology, and human capacity can jointly help support the low-carbon transition in developing and low-income countries, and at the same time, facilitate industrial upgrades and technology advancement domestically.

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[This is an overview of a policy brief series that assesses the broad societal implications of the low-carbon transition in the “Belt and Road Initiative” countries. Upcoming briefs include Air Quality and Public Health, Energy Employment, Just Transition, Energy Security, Food Security, and Land Use and Water.]

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