

*BRI Benefits Series***EMPLOYMENT**

This analysis is part of a series of policy briefs on a high-quality, sustainable low-carbon transition in the BRI countries. To view the other briefs, please visit our webpage. Technical background information regarding the model and scenario(s) used in this analysis are provided in methodological appendix.

Summary

While a low-carbon transition can accelerate growth opportunities for green industries, it can also entail significant economic decline for fossil fuel industries. Some of the Belt and Road Initiative (BRI) partner countries that are dependent on fossil energy will be particularly impacted by the shift from fossil fuel industries to green industries. In this policy brief, we assessed employment-related economic and social problems in the BRI region under a 1.5°C aligned scenario. Our results suggest that a BRI low-carbon transition will create green job opportunities across multiple sectors, as the total green job opportunities are estimated to reach 32 million in 2050, about a three-fold increase from today's value. More importantly, the number of new jobs in green industries far exceeds the number of jobs lost in the fossil fuel industries, indicating that a low-carbon transition in the BRI region will have positive effects on local employment.

1. Background

Existing research shows that a low-carbon transition in the Belt and Road Initiative (BRI) region can bring new growth opportunities, especially in green industries, such as renewable energy, electric vehicles and energy efficiency.¹ The rapid development of green industries will create numerous employment opportunities directly and indirectly along the supply chain, such as equipment manufacturing, distribution, maintenance, and warranty work required for renewable energy development. In addition, the growth of green industries can boost existing economic activities in other sectors, improve the quality of jobs, and ease the pressure of unemployment. Current research shows that China's investment in the renewable energy industry will create nearly 23,000 jobs in Pakistan, Poland and South Africa by 2018.² This example reflects how a low-carbon

transition in the BRI region would promote the rapid development of green industries and provide jobs.

However, some key regions are highly dependent on fossil energy, which means that they would experience higher levels of employment loss in fossil fuel industries as a result of a low-carbon transition. For example, as the world's largest coal exporter, Indonesia has major fossil energy resources and fossil fuel industries are the backbone of its local economic development. In particular, the coal industry has created a large number of jobs. In 2019, Indonesia's total coal export volume accounted for a quarter of the world's total, and the output value of the coal industry accounted for 4% of the local GDP, providing nearly 120,000 positions.^{3, 4} For regions like Indonesia, a low-carbon transition would significantly impact fossil fuel employment.

2. Research results

2.1 *BRI low-carbon transition will create green job opportunities across multiple sectors*

A low-carbon transition in the BRI region will promote local green industries, and create a substantial number of jobs. Total green job opportunities in the BRI region are estimated to reach 32 million in 2050, about a three-fold increase from today's value (see Figure 1). Of the total green job opportunities, 20% are related to charging infrastructure and battery manufacturing for electric vehicles (EV), 67% are from renewable energy sectors, and 13% are from the energy efficiency sector and biomass production.

As EVs grow rapidly in the coming decades, green job opportunities related to EV charging infrastructure and battery manufacturing are estimated to increase by more than four fold, from 1.6 million in 2020 to 6.2 million in 2050. Among these EV job opportunities, 27% are manufacturing jobs, 9% are construction and installation jobs, and 64% are operation and maintenance jobs. China, Sub-Saharan Africa, Middle East and Northern Africa take the lead in creating EV-related green jobs.

The deployment of renewable energy is estimated to increase green job opportunities in the power sector, from 6 million in 2020 to 21 million in 2050. Wind and solar sectors lead the growth in employment opportunities, creating more than 12 million positions in 2050. High penetration of renewable energy also drives up the demand for energy storage, creating 2.5 million additional jobs related to energy storage in 2050. The expansion of transmission networks contributes 3 million additional job opportunities, with 24.1% in manufacturing, 25.5% in construction and installation, 31.1% in operation and maintenance jobs, and 19.4% in other types of jobs. China, Europe, and Latin America are the top three regions for generating green jobs in the power sector.

Energy efficiency jobs are expected to increase from 800,000 in 2020 to 3 million in 2050. In the energy efficiency sector, manufacturing jobs, construction and installation jobs, and operation and maintenance jobs account for 65.7%, 18.2%, and 16.1%, respectively. China, Europe, and Latin America lead the way in creating energy efficiency jobs. However, energy efficiency jobs only account for a small portion of the total number of green jobs, at 5% in 2020 and 10% in 2050.

In addition, some BRI regions such as China, Europe, and South Asia have additional employment opportunities from regional trade (e.g., battery and EV charging station construction, raw materials renewable energy plants manufacturing).

Figure 1: Total green job opportunities in the BRI region by year (in millions of jobs)

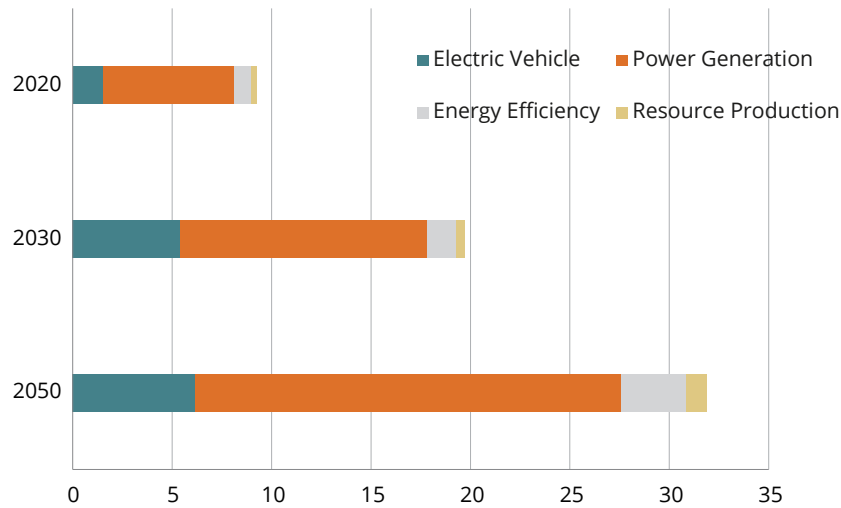
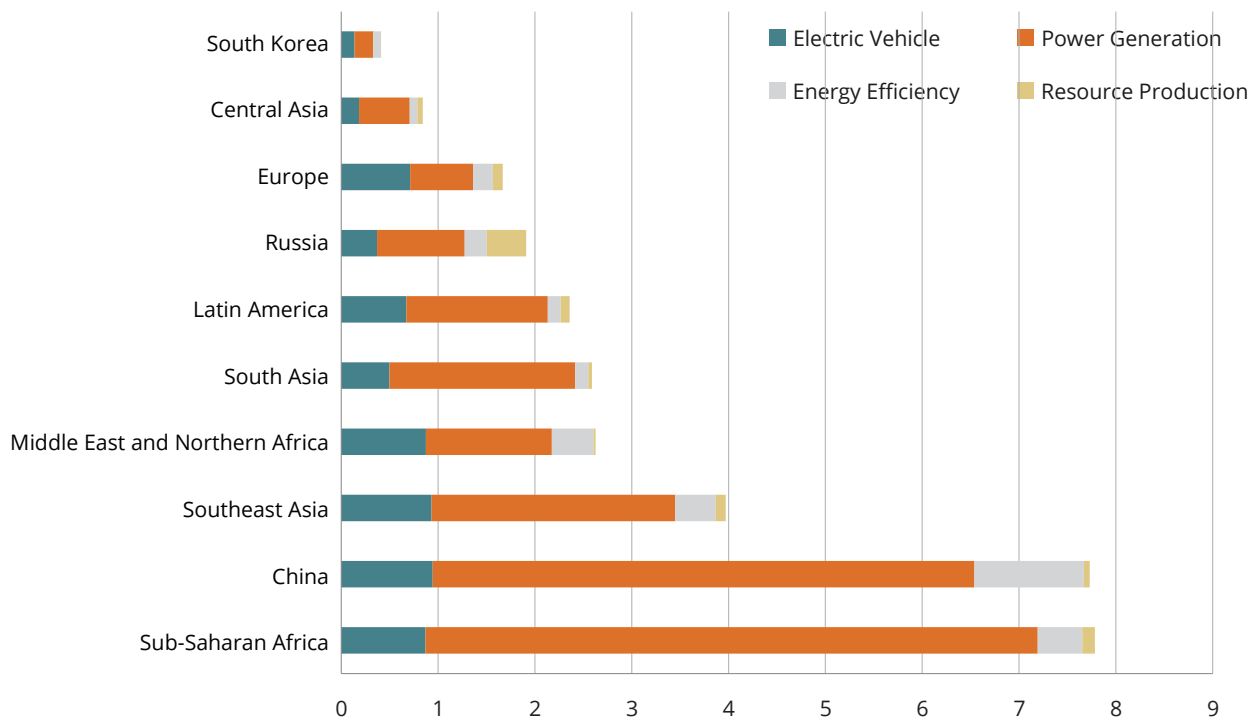


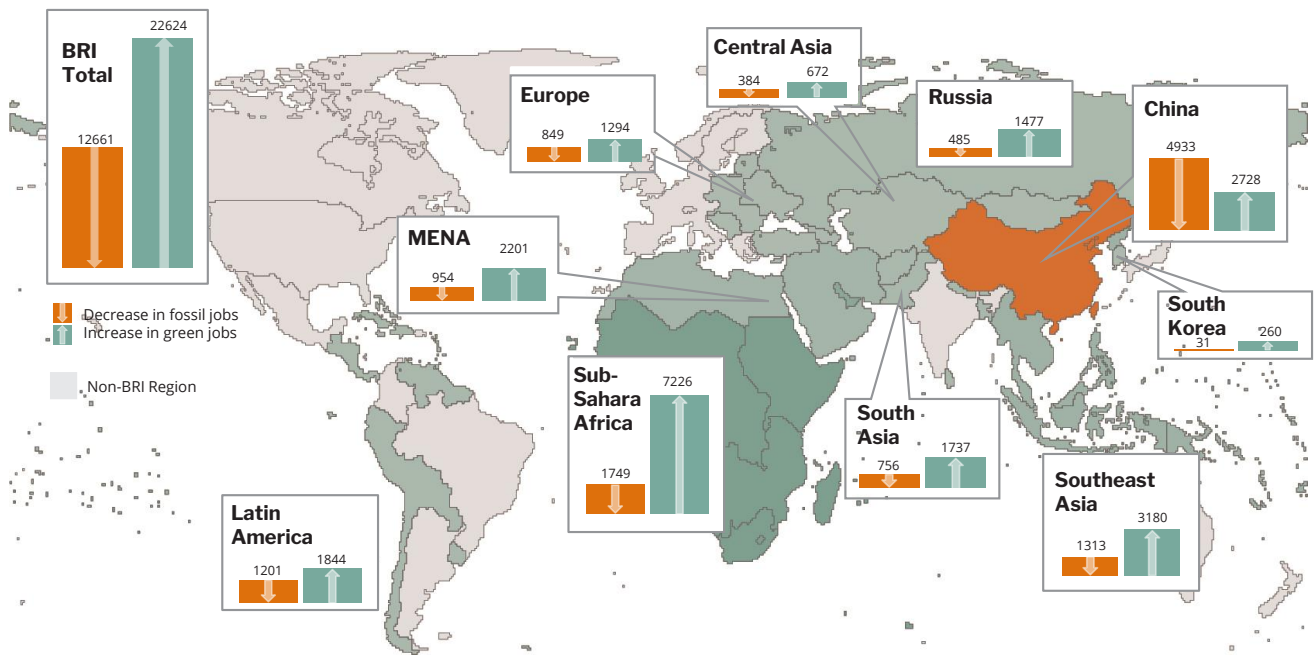
Figure 2: Total green job opportunities by sector and by BRI region in 2050 (in millions of jobs)



2.2 Through a low-carbon transition in the BRI region, green job growth offsets fossil job losses.

While a low-carbon transition in the BRI region will reduce employment opportunities in the fossil fuel industries, there is a net growth in employment due to the jobs created in green industries. Job opportunities in the fossil fuel industries, including fossil fuel production and power generation, are expected to decline by 78.9%, from 16.1 million in 2020 to 3.4 million in 2050. However, these losses are offset by green job growth in all BRI regions except for China (see Figure 3). Compared to 2020, most regions can more than double their green job opportunities in 2050. Sub-Saharan Africa, with an increase of 7 million green job opportunities, has the largest gain in green employment across all BRI regions. Regions like Central Asia, Russia, Europe have more than a four-fold growth in green job opportunities.

Figure 3: Changes in green and fossil employment opportunities from 2020 to 2050 by BRI region (in thousands of jobs)



Note: The employment calculation in this study uses the factor method (refer to the methodology appendix for details). Due to the lack of differentiated employment factors for green industries by country, this study refers to Ram et al. (2020) study.⁵ The same employment factors were used for the same technology in different regions, which may result in significant deviations in employment calculations in some areas. We will continue to improve this in future research.

3. Policy implications

A low-carbon transition in the BRI region would have positive effects on local employment. While achieving BRI region climate targets, the transition can also bring about positive social and economic impacts. Based on our research results, we make the following policy recommendations:

BRI countries should address potential social and economic issues related to replacing fossil fuel industries, while also taking active measures to promote green industries as new engines of economic growth. The phase-out of fossil fuel technologies will depreciate the capital value of these assets, which may lead to stagnation or regression in the local economy. Therefore, it is necessary to develop appropriate local economic policies to lessen the impacts of these side effects. At the same time, the emergence of green industries will require large investments and corresponding policies to accelerate development and deployment.

The development of green industries will also create demand for new products and services, and BRI countries should prepare for the transformation of industrial chains. For example, the development of new energy systems will shift demand from fuel-intensive industries to material-intensive industries. The upstream mining and processing of raw materials and mineral resources, the manufacturing of components for midstream power generation technology, and the construction and operation of downstream power plants will all develop rapidly. Therefore, governments need to clearly understand the needs and characteristics of industrial development associated with green industries, and build a new development model suitable for local areas.

BRI countries should respond to the demand for jobs by implementing relevant measures, including investment in human capital and workforce training. Emerging green industries can create many high-skill and high-quality jobs to cover the employment losses caused by replacing fossil fuel industries. However, the skill requirements vary widely between the two industries. Given that the large-scale transition is likely to bring about labor supply bottlenecks, governments must ensure that workers who need re-employment are trained, and that workers who cannot be re-employed receive social security assistance.

Finally, BRI countries should coordinate among government agencies, universities, training institutions, and businesses to ensure large-scale supply and continuous support of the workforce. In particular, government support will be important for leading the coordination, addressing the concerns of stakeholders and ensuring that the system achieves long-term, win-win cooperation.

References

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