



# BRICS Energy Report

## 2022



# ACKNOWLEDGEMENTS

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BRICS ERCP would like to express gratitude to China Chairmanship for leading the preparation of the Report. Overall guidance was provided by the Deputy Director General Wei Xiaowei, National Energy Administration of the People's Republic of China.

# WELCOME REMARKS





## **Adolfo Sachsida**

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**Minister of Mines and Energy of  
the Federative Republic of Brazil**



I would like to commend the Chinese Chairmanship for their leadership and coordination of BRICS in 2022.

BRICS Energy cooperation has been an important instrument in the discussion and promotion of our countries' energy transitions. Considering the pivotal role of energy for economic development, as well as the energy growth potential within BRICS, we believe that our shared efforts will play a crucial role in providing our customers with clean, secure and affordable energy, while also promoting technological innovation and cooperation.

In this context, I am happy to say the BRICS Energy Report presents us with valuable information to explore new pathways in the energy sector, serving as a tool for exchanging experiences and investment opportunities.



**Shulginov Nikolay**

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**Minister of Energy of  
the Russian Federation**

Development of the energy dialog within BRICS has consistently based on equality and mutual respect of interests. The Russian Federation is interested in maintaining a balance between meeting the challenges of the energy transition, the need to strengthen energy security and provide the economies and population with affordable resources.

Instability in the global energy markets caused by the negative impacts of the COVID-19 pandemic, under investment and geopolitical tensions, requires intensified international cooperation in order to ensure global energy security, socio-economic progress and the sustainable development goals.

We should respond promptly to the current challenges including through expanding mutual support and cooperation, as well as by strengthening our countries' roles in the international arena in order to find fair and efficient solutions.

Russia does support a full-scale development of the BRICS Energy Research Cooperation Platform and welcome an edition of the annual "BRICS Energy Report" that, no doubt, has become the flagship product of the BRICS ERCP research activities. Joint analytical publications by the BRICS countries help to define promising cooperation directions, as well as to reveal to the world community our views on the development of the global energy sector.

I express my gratitude to China's BRICS Chairmanship in 2022 for an integrated approach to the development of energy cooperation and proposing new initiatives that will contribute to strengthening the five-party interaction.



**Shri R.K. Singh**

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**Minister of Power and New and  
Renewable Energy, Government of  
the Republic of India**

Energy is a significant part of the economic development of any country. BRICS cooperation on energy is an essential agenda of the member countries. Strengthening of collaboration and safeguarding of the common interests of the member countries through the BRICS platform is key to this cooperation. The energy sector is witnessing significant transition in pursuance of commitments to reduce greenhouse gas emissions under the Paris Agreement. Therefore, restructuring the power sector, phasing down old and inefficient fossil fuel based power production, and large-scale uptake of renewable energy are essential to achieve such goals.

Even as the Covid-19 pandemic-led disruption dominated 2020, India stayed on track to achieve the NDC goals. Effective implementation of energy efficiency and energy conservation endeavours by States has ensured that the pace and direction of such activities are not compromised. As per the updated NDC, India is committed to reducing Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level and achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. I am hopeful that the BRICS Energy Report 2022 will strengthen the BRICS Energy Research Cooperation Platform (ERCP) and enhance BRICS's contribution to agenda concerned.



**Zhang JianHua**

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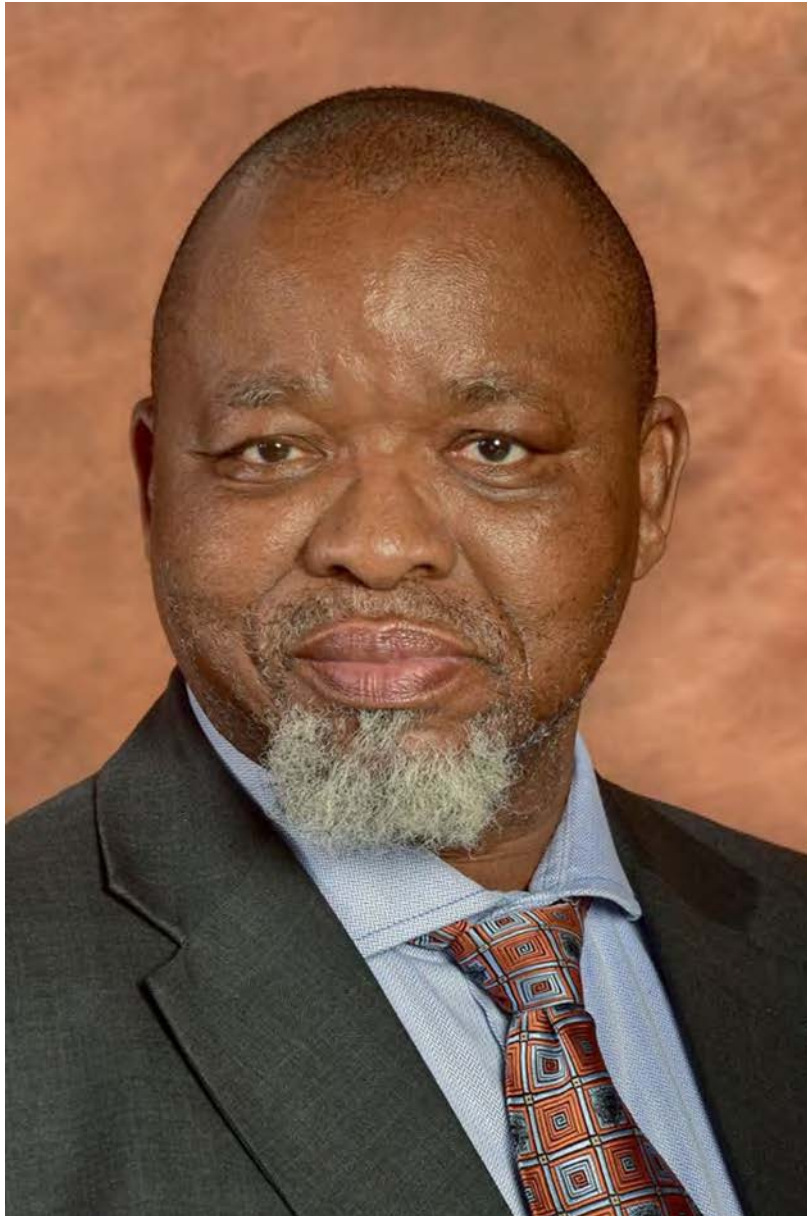
**Administrator of National Energy  
Administration of  
the People's Republic of China**

Having gone through a glorious journey of 16 years together, the BRICS countries have supported each other and emerged as an important force shaping the evolution of the international landscape. Their voice and influence in global governance have been on the rise steadily. Energy is a priority of cooperation among the member countries. It is of great significance to the global economy for the BRICS to work together to address risks and challenges, promote the establishment of a reliable, stable and affordable energy supply system, and jointly maintain an open, transparent and efficient international energy market.

In recent years, the BRICS countries have promoted green and low-carbon development. Their firm determination and pragmatic measures in boosting clean energy transition have contributed to the global response to climate change and carbon neutrality goals. As the world's largest energy producer and consumer, China is steadfast in advancing green and low-carbon energy transition, boosting energy security, strengthening energy technology innovation, deepening international energy cooperation, and achieving carbon peaking and neutrality in an orderly manner, thus demonstrating the wisdom and sense of responsibility of China as a major country in addressing climate change with practical actions and remarkable fruits.

This year, under the leadership of President Xi Jinping, the "BRICS China Year" has been full of highlights, with fruitful results. The BRICS countries have forged ahead together in energy cooperation and overcome many difficulties to jointly complete the BRICS Energy Report 2022, which has further enriched their achievements on the energy research cooperation platform. The report is of vital significance for the BRICS to do better in basic information and data sharing, to deepen practical cooperation in the energy sector and to jointly participate in global energy governance.

China is willing to work with all BRICS partners, take measures to maintain the security and stability of energy supply and energy market, give full play to the respective advantages of all member countries in such areas as energy resources, technology, industry, market, and capital, consolidate the existing cooperation foundation and take the initiative to expand the scope of cooperation so as to jointly promote global economic recovery and long-term stable development.



**Samson Gwede Mantashe**

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**Minister of Mineral Resources and  
Energy of  
the Republic of South Africa**





# INTRODUCTION

The BRICS countries have become dominant players in the energy landscape over the past 16 years. In the past 16 years, we have witnessed continuous improvement of the BRICS cooperation mechanism, expansion of collaboration areas, and enhanced global influence, which shows unique charm in maintaining and practicing multilateralism.

In 2009 in Yekaterinburg, since the first BRICS Summit, all BRICS have expressed the interest for energy co-operation of energy and energy efficiency. In the Delhi Declaration 2012, the BRICS leaders emphasized the need for energy co-operation within the BRICS framework. The first meeting of BRICS Energy Ministers was held in Moscow in 2015, a Memorandum of Understanding on energy conservation and energy efficiency between the BRICS ministries has been signed, the MoU also provided for exploring the possibility of further institutionalization of energy co-operation within the framework of BRICS.

In the Xiamen Declaration of 2017, BRICS leaders encouraged continued dialogue on the establishment of a BRICS Energy Research Co-operation Platform (BRICS ERCP). In 2018, Johannesburg Summit agreed the establishment of BRICS ERCP Platform. In 2019, the Terms of Reference of BRICS ERCP was approved by the BRICS Energy Ministers.

In 2020, at the Russian Presidency year, the BRICS ERCP launched the BRICS Energy Report 2020, Road Map for BRICS Energy Cooperation up to 2025 and BRICS ENERGY Technology Report, which included technological cooperation, digitalization, renewable energy, cooperation roadmap 2025 on energy sectors development in the BRICS countries. In 2021, at the Indian Presidency year, the BRICS ERCP launches the BRICS Energy Report 2021, BRICS Energy Technology Report 2021 and BRICS ENERGY RESEARCH DIRECTORY Book 2021 which included energy sector development, sustainability commitment, and sustainable global development and BRICS ERCP experts' directory book.

In 2022, at the Chinese Presidency year, BRICS countries jointly completed BRICS Energy Report 2022. The reports present the latest development in energy field of BRICS countries, which include the overview of energy development, technology innovation, policies and objectives, energy sustainability, energy security, prospects for BRICS co-operation. To advance BRICS energy cooperation, the report proposes that BRICS think tanks make collaborative research under ERCP on such topics as energy cooperation, energy investment, energy market stability as well as technology support for participating in global energy governance, to enrich and expand the areas of cooperation prioritized in the energy cooperation roadmap. BRICS countries have large populations, enormous economic output, and abundant energy resources. By enhancing energy cooperation across the board and

leveraging their respective strengths in the global context of energy transition, BRICS countries will contribute greatly to global energy sustainability. This report is presented as one of the outcomes of the 7th BRICS Energy Ministerial Meeting.

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# Brazil

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## I. OVERVIEW OF ENERGY DEVELOPMENT

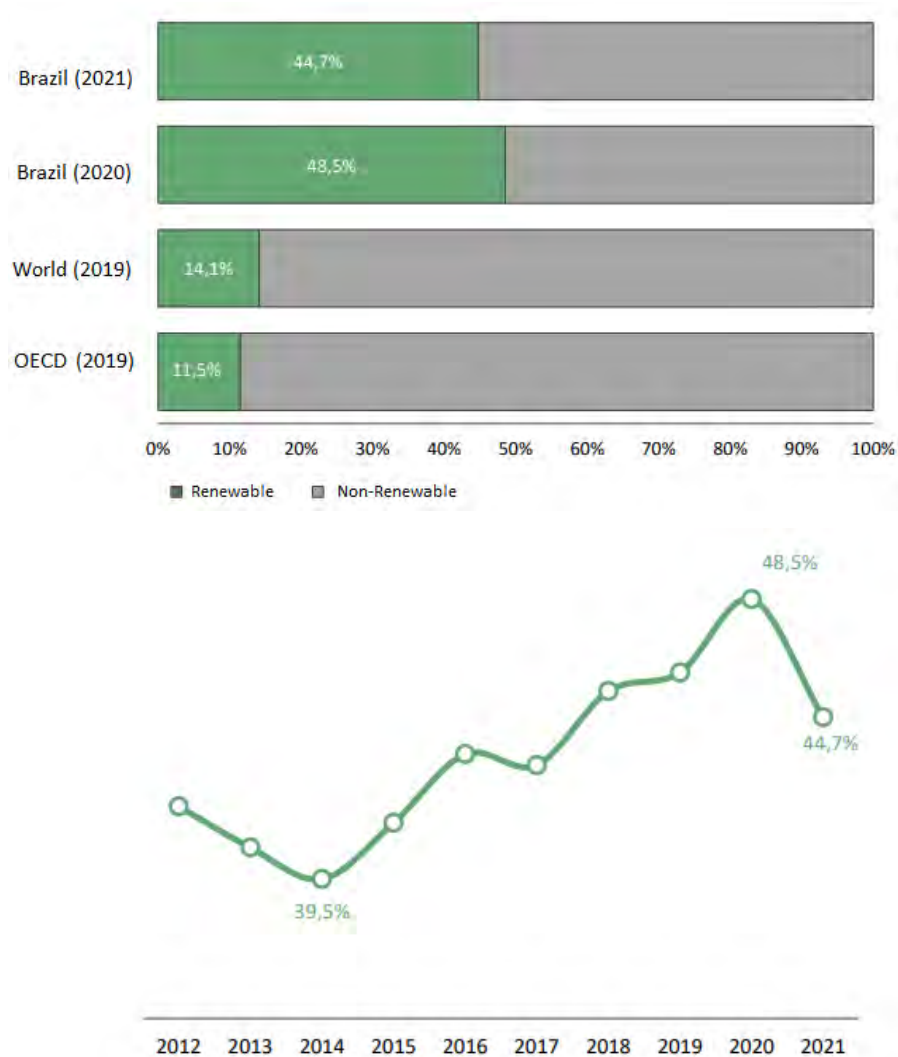
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### 1. Brazilian Matrices

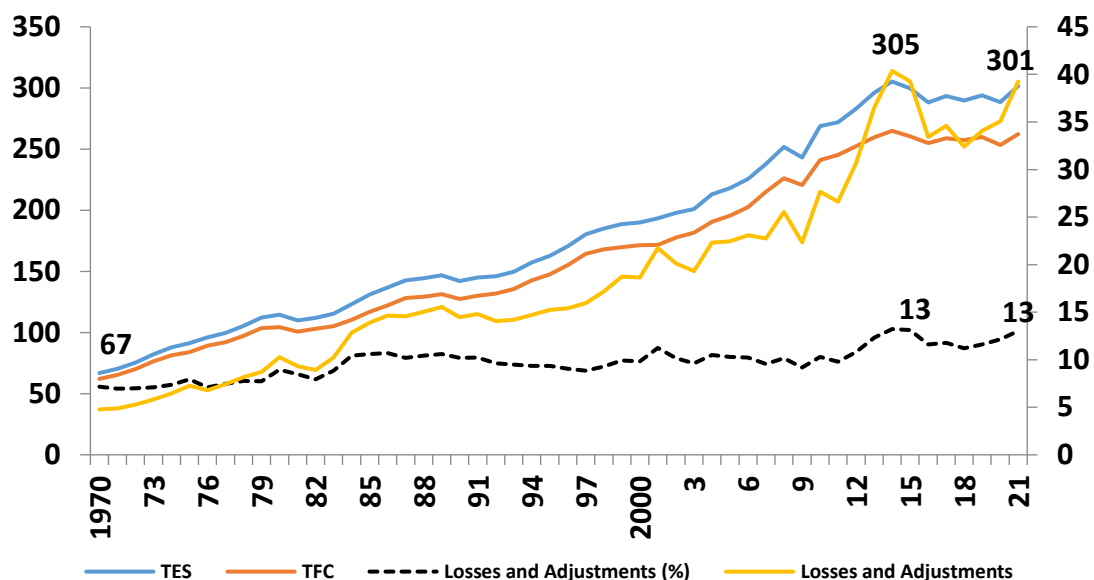
#### Total Energy Supply

In 2021, the Total Energy Supply - TES (Fig. 1.1-1 and Fig. 1.1-2) reached 301.5 million tons of oil equivalent ( $10^6$  toe), indicating a growth of 4.5% compared to the previous year. The renewable's share in the energy matrix was mainly affected by the drop in the supply of hydroelectricity, associated with water scarcity and the activation of thermoelectric plants for compensation. However, the increase in wind and solar sources in the generation of electricity (zero loss) and bio diesel contributed to keeping the Brazilian energy matrix at a renewable level of 44.7%, much higher than that observed in the rest of the world.

**Figure 1.1-1 Renewable share in Total Energy Supply**



Source: International Energy Agency (IEA) and Energy Research Office (EPE)

**Figure 1.1-2 Total Energy Supply (TES) and Total Final Consumption (TFC) - 106 toe**

Source: SIE Brazil

The difference between the Total Energy Supply and the Total Final Consumption (including the energy sector's own consumption), results from losses in the energy transformation and distribution processes. Brazil, highly reliant on electricity supply from hydropower plants, has low generation by thermoelectric plants and, as a result, has a level of losses much lower than the world average. Worldwide, the percentage of total losses in relation to supply is more than twice the Brazilian indicator.

### Total Electricity Supply

Part of the total energy supply refers to the electricity demand, called the total electricity supply (Fig. 1.1-3), considering the entire amount of electricity necessary to supply Brazil's demands. In this case, there was an increase in domestic supply of 25.7 TWh (+3.9%) compared to 2020. The main highlight was the advance in generation based on natural gas (+46.2%), to face the water scarcity, since the hydraulic generation reduced 8.5%, following the fall in imports (-6.5%), whose primary origin is Itaipu.

Regarding intermittent renewable sources, wind generation reached 72 TWh – growth of 26.7%. Wind power installed capacity reached 20,771 MW, a 21.2% increase. Solar generation reached 16.8 TWh (centralized generation and MMGD), representing an increase of 55.9% compared to the previous year. As a result, the share of renewables in the electricity matrix stood at 78.1% in 2021.