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Editorial

Global Net-Zero Carbon Emission by 2070: a distant dream

The UN Climate Change Conference (COP29) concluded on 24 November 2024 with a new finance goal to help countries to protect their people and economies against climate disasters, and share in the vast benefits of the clean energy boom. With a central focus on climate finance, COP29 brought together nearly 200 countries in Baku (Azerbaijan) and reached an agreement to provide 300 billion USD finance to developing countries annually by 2035 and secure efforts of all actors to work together to scale up finance to developing countries, from public and private sources, to the amount of USD 1.3 trillion per year by 2035. "This new finance goal is an insurance policy for humanity, amid worsening climate impacts hitting every country," said Simon Stiell, Executive Secretary of UN Climate Change. Stiell also acknowledged, "The agreement reached in Baku did not meet all Parties' expectations, and substantially more work is still needed next year on several crucial issues". World leaders at COP29 were joined by civil society, sub-nationals, business, Indigenous Peoples, youth, philanthropy, and international organizations. More than 55,000 people attended COP29 to share ideas, solutions, and build partnerships and coalitions. COP29 marked a significant milestone as dedicated spaces were created to ensure the meaningful participation of children within the Youth-led Climate Forum for the first time. Four children, including the youngest (just 10 year old), took on roles as moderators and speakers, engaging directly with Parties and observer organizations. Their participation highlighted the importance of inclusivity and intergenerational collaboration in driving climate action.

The COP29 Summit concluded with an extension of one day with mixed reactions by the developed countries and the United Nations displaying a sense of achievement, who hail the deal as "start of a new era of climate finance" and "insurance policy for humanity," respectively. Contrarily, the reaction by the negotiators from developing countries including India, expressed dissatisfaction on the outcome of the summit, yet with a sense of satisfaction for managing to reiterate their long-time held principle stand on the course of climate action. The main issue of dissatisfaction among the developing countries is allocation of funds required for energy transition to combat the climate change and achieve net zero carbon emission by 2070 through stage-wise shelving out the use of non-renewable energy resources (coal and petroleum). This action needs funding by the developed countries amounting to 1 trillion USD in a phased manner until 2035 for implementing new strategies by the developing countries. The developing countries including India feel that the Rich Countries fell drastically short of their commitments to support the developing countries. The COP29 Summit set a climate finance goal of "at least $300 billion annually by 2035" and launches the "Baku to Belém Roadmap (Brazil) to 1.3 Trillion." India out rightly rejected the package. Chandni Raina, an official representative of India, said, "*The amount does not address the needs and priorities of developing countries and is incompatible with the principle of Common but Differentiated Responsibilities (CBDR) and equity, regardless of the battle with the impact of climate* change*". "I regret to say that this document is nothing more than an optical illusion. This, in our opinion, will not address the enormity of the challenge we all face. Therefore, we oppose the adoption of this document*," Indian delegation representative Chandni Raina told the closing plenary session of the summit.

India's principle stand at the summit has drawn support from a host of developing countries, which claim the allocated fund is insufficient to meet the needs of the developing and under developed countries. At the summit, India also pointed out at unequal focus on mitigation by developed countries, ignoring the concepts of per capita contribution to carbon emission and the history of the developed countries' responsibility for climate action as the crux of the problem, however, this was ignored and the focus was shifted to mitigation alone.

IS ENERGY TRANSITION DRIVEN BY CLIMATE FINANCE?

India is committed to address the climate change issue and is heavily investing in renewable energy; still fossil fuel resources dominate its development path. Like India, Fossil fuel energy resources drive China's development. Both these countries together host 35.5% of the world population and are among the major countries contributing to carbon footprints including USA. Any forced fast transition to cleaner energy would affect billions who in these countries are dependent on fossil fuels as a key source of development and livelihood. According to conservative estimates, about 20 million people in India earn their livelihood from coal-related industries and allied associates. Although, South Africa and Indonesia have entered into an agreement on coal focussed Just Energy Transition Partnership (JETP), India and China

cannot afford to enter into this agreement with ever-increasing energy demand vis-a-vis their fast increasing population.

India's renewable energy capacity grew by 250 % between 2014 and 2021. The country now ranks fourth in renewable energy installed capacity in the world. By 2030, it hopes to achieve 500 GW of non-fossil-based electricity generation capacity. At the same time, India's reliance on coal continues to grow, with new mines opening and production increasing. India does not expect such reliance to end in the near future even until 2070. India is fast growing and yet developing economy, can't afford forced energy transition. Speaking about the outcomes of COP29 at a session, Leena Nandan, Secretary of Environment, Forest and Climate Change Ministry said the Cop29 conference, which was anticipated to focus on implementation, fell short of expectations. "*This was to be an enabling COP, a COP which was going to be focused on the means of implementation and, what are means of implementation other than funds and resources. In addition, here it was that we found semantics and not solutions. We found rhetoric and not results. And that has been the biggest disappointment*," she added, the sentiment was echoed across the Global South.

Fig. 1: Five Sub-divisions of Asia. Reference: United Nations Statistics Division – Standard Country and Area Codes Classifications. The UNSD notes "the assignment of countries or areas to specific groupings is for statistical convenience".

GLOBAL SOUTH SCENARIO

According to the United Nations Trade and Development (UNCTAD), the Global South broadly comprises Africa, Latin America and the Caribbean, Asia (excluding Israel, Japan, and South Korea), and Oceania (excluding Australia and New Zealand). Most of the Global South countries commonly have low standard of living, which includes having lower incomes, extreme poverty, high population growth rates, inadequate shelter, limited educational opportunities, and poor health systems, poor urban infrastructure and other related issues. The Global South consists of the world's developing and least developed countries. The Global South classification, as used by governmental and developmental organizations, was first introduced as a more open and value-free alternative to "Third World". These countries have also been described as being newly industrialized or in the process of industrialisation, many of them were former subjects of colonialism. These countries are poorer and heavily dependent primarily on their largely agrarian-based economic sectors. Behind, both China and India in the development process, sub-Saharan Africa's population had increased to 1.20 billion in 2022 and is forecast to rise to 2.17 billion by 2050 and 3.57 billion by 2100. The region's urbanisation, industrialisation and energy consumption per person is even lower than China and India, which is going to increase substantially in future.

SOUTH ASIA AND EAST ASIA ENERGY SCENARIO

South Asia has a peninsula-like shape bordered by the Indian Ocean to the south, the Bay of Bengal to the east, and the Arabian Sea to the west. The region includes the Indian subcontinent and surrounding countries. South Asia includes Sri Lanka, Bangladesh, India, Afghanistan, Pakistan, Bhutan, Nepal, Iran, and the Maldives. The region covers roughly 3,218,688 Km^2 area and has a population of more than 2.074 billion (¼ of the world), the most densely populated region in the world. The current population of **South Asia** is **2,074,434,296** as of Saturday, December 28, 2024, based on the latest United Nations estimates, which is equivalent to 25.29% of the total world population.

East Asia is a geographical region of Asia including China, Japan, Mongolia, North Korea, South Korea, and Taiwan and includes Hong Kong and Macau, special administrative regions of China. The economies of China, Japan, South Korea, and Taiwan are among the worlds'

largest and most prosperous. East Asia borders North Asia to the north, Southeast Asia to the south, South Asia to the southwest, Central Asia to the west and Pacific Ocean to the east.

East Asia is spread over 11,840,000 Km^2. The current population of East Asia is 1,654,175,130 as of Saturday, December 28, 2024 (20.29% of the world), based on the latest United Nations estimates. East Asia is second in ranks in Asia among sub-regions by Population.

Both, South and East Asia together constitute 45.68% of the total World population. India and China the two most populous countries in world together constitute 2.87 billion people and account for about 25.17% population of the world and 60% of Asian population. Both are developing countries whose economic development is non-renewable driven energy resources. China and India are the two most populous countries in the world, with India hosting to about 1.45 billion people and China hosting to 1.42 billion as of December 2024. In 2022, fossil fuels accounted for 82% of primary energy consumption in China and 88% in India, including 70% of total electricity generation in China and 77% in India. The population of both the countries were each similar to the total for countries in the Organisation for Economic Cooperation and Development (OECD) (1.38 billion). But total primary energy consumption in China (159 exajoules) and India (36 exajoules) was far lower than in the OECD (234 exajoules). Each person in China consumed only 66% of the energy as their counterparts in the OECD and India consumes just 15%. These are the over estimates about the consumption of energy services locally because both countries and especially China export a large proportion of their energy-intensive manufactured output to the OECD. Continued modernisation in China and India will lead to more and more consumption of energy.

In the OECD, growing production from renewables and especially gas has decreased consumption of coal and to a lesser extent oil. Although, this has enabled a reduction in greenhouse emissions but total energy consumption has continued to increase rapidly in China (average of 3.1% per year) and India (3.8% per year). Renewable resources and gas have served as supplements to other fossil fuels but not replacement, ensuring energy remains affordable and reliable in the backdrop of increasing demand. China and India's current trajectory for energy consumption has remained parallel to that of USA or Western Europe between the 1950s and 1970s, a period of rapid growth in economic output, living standards and energy use. In the Euro-Atlantic economies, rapid growth in total energy demand required more energy from all sources; consumption from fossil fuels continued to rise in absolute terms even as its share was reduced relatively. U.S. coal consumption continued to increase in absolute terms until around 2010 even though it was losing relative share of the energy mix to oil from around 1910 and gas from 1980. China and India appear to be moving along the same trajectory, increasing their use of indigenous coal even as they import more oil and gas, use more nuclear power, and invest in renewable generation from wind, solar and hydro. Eventually, China and India's energy consumption from fossil fuels is likely to reduce only when renewables will substitute for fossil fuels rather than just supplement them. However, given their current position in the historical development process, that point is likely to be distant in the future for China and likely more distant for India. Since 2018, China's solar generation capacity has increased by 26% per year, wind generation capacity by 18% per year, while thermal capacity has grown by just 4% per year. Similarly, India's solar generation capacity has grown by 25% per year; wind has grown by 5% per year, while coal has risen by 1% a year.

In practice, China and India, following the historical and current example of the OECD nations, have prioritised increasing access to energy services and ensuring energy remains affordable and reliable. China, USA and India use more fossil fuels than the rest of the world combined (Table 1). Together, these countries consume 54% of the world's fossil fuels, according to the Global Material Flow Database developed by the UN Environment Programme (2019). China generated 37% of global wind and solar electricity in 2023. Despite this growth, China relied on fossil fuels for 65% of its electricity in 2023, making it the world's largest emitter. Its per capita power sector emissions were more than double the global average. Most of the electricity in China comes from coal power, which accounted for 62% of electricity generation in 2021which contributes a big part of greenhouse gas emissions by China. China leads the world in coal consumption with an estimated 4.4 billion short tons in 2023. In terms of oil consumption, the country consumed over 14.3 million barrels per day and increased its natural gas consumption by 13% in 2022. In India, total energy consumption per capita reached 0.8 tonnes of oil equivalent (toe) in 2023, half the Asian average. Electricity consumption per capita reached 985 kWh in 2023. Total energy consumption continued to grow significantly (6.5%/year since 2020, of which 5% in 2023), reaching 1.14 giga-tonnes of oil equivalent (Gtoe) in 2023. Nearly 80% of total electricity generated (utility and captive) in India is from coal and it is the main source of the nation's greenhouse gas emissions.

China has more than 80 percent of the world's solar manufacturing capacity (2024). The scale of China's renewables sector output has driven down prices worldwide, and this is a key factor in

reducing the cost barrier to renewable systems for poorer countries.

Table 1. World Scenario: about 85 percent of our energy comes oil, natural gas, coal. China and U.S. Account for Nearly Half of Global Fossil Fuel Use (12 August 2024)

Country	Oil (Exajoules)	Coal
China	33	92
U.S.	36	8
India	11	22
Russia	7	4

UNACHIEVABLE DECARBONISATION TARGETS

The highly ambitious goal includes decarbonising energy to 50% and achieving 500 GW of fossil fuel-free generating capacity by 2030. Meeting 50% of India's energy needs from renewable sources by 2030 is an ambitious, may be distant future achievable target, given the current growth trends and government commitments. However, this will require addressing challenges related to grid integration, financing, and policy support. Petroleum is a major energy source in India after coal. Petroleum provides fuel for heat and lighting lubricants for machinery and raw materials for a number of manufacturing industries. In India by 2050, oil and natural gas will remain the largest energy sources.

25 countries and European Union committed a “no new coal” pledge at the COP29 climate summit not to build any new unabated coal-power plants, in a push to accelerate the process to phase out fossil fuel. The developing countries including India, China, and even USA opposed this pledge. India, China and Saudi Arabia have also opposed the attempts to stress a clear and identified pathway for reducing use of fossil fuels. A global pledge taken at the Glasgow Climate Summit in 2021 to cut emissions by phasing out coal has failed and its use has increased in the countries including China and India, the two most populous countries in the world, which are justified in the absence of any assistance committed by the developed countries to achieve energy transition. India is urging that developed countries have exploited the global carbon budget but failed to meet their commitment to climate finances, and are wrong fully demanding that developing countries restrict their fossil fuel use (Reference: Proceedings in the International Court of Justice). Policymakers from OECD countries use the U.N. conference process and other diplomatic forums to press China and India to speed up their transition from fossil fuels to zero-emission alternatives. However, such advice can sound at best impractical and at worst, an effort to force them to accept structurally lower living standards.

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