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Analyzing the Role and Importance of Energy in Achieving Sustainable Development in Asia Pacific

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Abstract

Asia Pacific, a vast region comprising 45 countries and home to 60 percent of the world's population, as well as accounting for 35 percent of the global GDP, is now poised to contribute a staggering 70 percent to the global economic growth in 2023[1]. This remarkable growth over the past four decades has predominantly relied on the region's abundant natural resources. However, with the expansion of both the economy and population, the demand for energy has surged.

In 1994, the region underwent a significant transformation, shifting from a net energy exporter to a net energy importer. This shift resulted in various social and environmental consequences, accompanied by associated costs primarily stemming from the increased reliance on fossil fuels. Consequently, numerous cities now grapple with alarmingly high levels of air pollution, while greenhouse gas emissions continue to soar. On the other hand, the lack of access to modern energy sources has put lives and livelihood of people in danger, by, increasing hinderance for the underprivileged from accessing development opportunities, exacerbating gender inequality and a mirage of other challenges.

Thus, there exists an urgent and compelling necessity to implement a comprehensive transition towards a sustainable energy system that can not only address these pressing challenges but also pave way for the fulfilment of sustainable development goals.

INTRODUCTION

Energy is an important source for every country, as it supports economic growth and critical infrastructure for maintaining stability and security domestically. Likewise, it provides foundation for development. Therefore, securing a reliable, secure and affordable energy supply is a prerequisite for economic growth of a nation or region and for alleviating poverty.

Historically, Asia- Pacific region has relied on its vast resource of fossil fuels and other natural resources to fulfil its energy needs. In 1990, the Asia-Pacific region was a net energy exporter, with net energy exports totaling 179 million tons of oil equivalent (Mtoe). However, by 1994, the region had transitioned into a net energy importer, and the total energy import significantly increased from 27.0 Mtoe in 1994 to 410 Mtoe in 2014[2].

This increase in demand of energy in Asia- pacific region comes on the back of increased economic activity and population growth. In recent times, Asia pacific region has emerged as a global economic power house,

[1] Lexology, (May, 2023) APAC and Africa: Bright Spots in Global Economy https://www.lexology.com/library/detail.aspx?g=9d326e23-f850-470a-8898-404a3ce34ae9#:~:text=APAC%20has%20recently%20been%20described,the%20course%20of%20the%20year.

[2] Asian Development Bank, Improving Energy security and Reducing Carbon Intensity in Asia and the Pacific, 2009, https://www.adb.org/sites/default/files/publication/27532/improving-energy-security-reducing-carbon-intensity.pdf

accounting for 35 percent of the world's GDP with a remarkable average growth of 4.5 percent per year since 2000[3]. This GDP growth combined with increasing population, rapid urbanization and expanding industrialization have dramatically increased the demand of energy in region, at almost 3.3 percent per year during the past decade. As a result, the region's reliance on imported fossil fuels for energy production has increased multifold, exacerbating the energy security concerns along with it.

Another major threat to the energy supply and infrastructure arises from the perennial issue of climate change. The Asia Pacific region is most vulnerable to climate change, more than any other region in the world. There are many factors contributing to this vulnerability. To begin with, the region is highly depended on natural resources and most countries in the region are still dependent on agricultures as the primary source of economic activity. Further, the region also includes large number of countries with densely populated coastal areas and weak infrastructure, putting the lives and livelihood of large number of people at risk. Lastly, there is high rate of poverty, illiteracy and lack of public infrastructure. All these factors combined with pandemic disruptions has exacerbated the impact of climate change in the region. Climate change impacts the finances and economy combines. According, to a 2020 Mckinsey report, Asia Pacific is expected to lose $1.2 trillion each year in capital stock until 2050 due to flooding alone. This will drastically impact the financing needed for development and growth of the region.

Additionally, Asia Pacific is a major contributor to the issue of climate change. The region has emerged as the largest emitter of CO_2 gas, mainly due to the burning of fossil fuels. The region produces more that half of global Greenhouse Gas (GHGs) emissions. If analysed in global context, the European and North and Central American regions contribute about 16 percent. This is mainly because of heavy reliance of the region on coal for electricity and heating. As the region inhabits multiple developing economies including India, Vietnam, Indonesia etc the demand for fossil fuels and subsequent GHG emissions will only increase. Asia will continue to expand and so will the risks and associated costs.

Therefore, to reduce the region's contribution to climate change, a first step is to prioritize energy efficiency and renewable energy.

Current distribution of energy supply and energy consumption is not uniform in the Asia pacific region. The region consists of countries with both abundant and insufficient energy resources, therefore, giving rise to a unique challenge in the process of transitioning energy sector for sustainable development. Nevertheless, the sector has undergone a series of changes in last two decades. Factors such a economic growth, restructuring and size of the middle class, rapid urbanization and technological innovation have altered the energy consumption patterns.

Previously, progress has been achieved in renewable energy, energy efficiency, and remote community energy provision. Promising technologies, including energy storage, electric transport, and advanced efficiency, can greatly aid sustainable energy use. However, additional efforts, scaling up, and innovative approaches are vital to meeting Sustainable Development Goal 7 and Paris Agreement targets. In this context the, diverse resources and capacities across countries and subregions form a solid basis for regional cooperation to propel the Asia-Pacific energy transition.

2030 AGENDA OF SUSTAINABLE DEVELOPMENT: SDG7

While the concept of energy transition has been discussed since the early 2000s, as the issue of climate change started gaining prominence, it was first time codified in 2015, in the 2030 Agenda for Sustainable Development under the Sustainable Development Goal 7 (SDG7).

SDG 7 states that," to ensure access to affordable, reliable, sustainable, and modern energy for all". Energy was also recognized as the key enabler of SDGs, including those for poverty, food, health, education, gender and social equality, water and sanitation, climate and sustainable cities. Further commitments to sustainable energy

[3] ESCAP, (April,2018), Energy Transition Pathways https://www.unescap.org/publications/energy-transition-pathways-2030-agenda-asia-and-pacific-regional-trends-report-energy

were also made in the paris Agreement on Climate Chane, with each country submitting a pledge through nationally determined contributions (NDCs)[4].

In order to fulfil these commitments, the Asia Pacific region faces the four major interlinked challenges:

- Energy supply- ensuring adequate energy supply that meets the demands including the renewed demand of universal access to modern energy.
- Energy security- Strengthening energy security by ensuring self-reliance.
- SDG 7 goals- ensuring the fulfillment of SDG7 goals by achieving universal access of modern energy, increasing the share of renewable energy in the energy mix, and significantly improving the energy efficiency.
- Emission mitigation- Reducing the emissions in energy sector through NDCs by 2030.

PROGRESS OF SDG7 IN ASIA PACIFIC: LATEST DEVELOPMENTS

Access to Energy

Asia Pacific region lacks in terms of equitable energy access to all. More than 350 million people in the region have limited access to energy while 150 million have no energy at all[5]. Progress on access to energy has been rapid across developing Asia and Pacific, reaching an overall electrification rate of 96% in, a 16% increase from 2010 estimates[6]. However, the electrification rate in individual developing economies vary greatly and many power systems and unreliable and are hampered with insufficient supply. The main agenda of the government of these developing countries, remains, to ensure adequate, reliable and affordable universal access to electricity.

Additionally, another challenge for the developing countries of Asia Pacific, is lack of access to clean fuels and technologies for cooking, heating and cooling in both rural and urban areas. These countries are far behind in reaching the target of universal access to clean cooking by 2030 as 1.6 billion people have no such access, representing 43 percent population of the region[7].

This widespread and persistent unequal access to clean fuel and electricity is the biggest roadblock in the developing countries of Asia and the Pacific in achieving the NDC commitments for universal access to clean energy by 2030.

Energy Security

In addition to providing access to energy, countries in the Asia and Pacific region (DMCs) need to ensure the security of their energy supply. This is important to support their ongoing economic growth and meet the increasing demand resulting from population growth and urbanization. The population in the region has been growing at a rate of 1.7% per year from 1990 to 2019. Urbanization has also been on the rise, increasing from 36% in 1990 to 51% in 2019. Meanwhile, the region's gross domestic product (GDP) has been growing at an average of 6% per year from 1990 to 2019. In the same period, the primary energy supply in the region increased by about 4% per year.

To sustain this economic growth and urbanization, there is a need to develop affordable and reliable energy systems with a significant increase in electricity-generating capacity. The power systems should be flexible enough to balance fluctuations in both demand and supply. According to the International Energy Agency (IEA)

[4] Dzebo, A., (2017), Exploring connections between the Paris Agreement and the 2030 Agenda for Sustainable Development. https://www.sei-international.org/mediamanager/documents/Publications/SEI-PB-2017-NDCSDG-Connections.pdf

[5] ADB,(November, 2022), Strategy 2030 Energy Sector Directional Guide, Strategy 2030 Energy Sector Directional Guide—Inclusive, Just, and Affordable Low-Carbon Transition in Asia and the Pacific (Volume 2) (adb.org)

[6] International Energy Agency. (2020). World Energy Outlook 2020: Access to Electricity Database World Energy Outlook 2020 (windows.net)

[7] United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), (2021), Asia Pacific Energy Portal.

sustainable development scenario, the installed electricity-generating capacity in the region would need to increase by about 7% per year, reaching 6,113 gigawatts by 2030 from 3,386 gigawatts in 2019. Notably, solar, wind, and hydropower capacity would grow at a rate of 11% per year[8].

Fostering sustainable practices to mitigate emissions in Asia Pacific

2030 Agenda emphasizes the importance of addressing climate change, promoting environmental sustainability, and building resilience in Asia and the Pacific for a prosperous and sustainable future.

The developing countries in the region have not contributed significantly to historical emissions causing the current climate crisis, however, in recent time, their emissions have become substantial, and they are highly vulnerable to its impacts. Without intervention, Asia and the Pacific will suffer more than other regions from climate change, air pollution, and biodiversity loss.

Coal and other fossil fuels have been crucial for energy access and economic development in the region, but their use harms the environment and accelerates climate change. In 2019, Asia and the Pacific accounted for about 50% of global carbon dioxide emissions from fossil fuel combustion. Fossil fuel combustion also leads to local air pollution, harming public health and ecosystems. Several cities in the region are among the most polluted in the world. Therefore, the energy sector in Asia and the Pacific plays a crucial role in directly responding to climate change and building resilience.

The region still has higher energy intensity compared to the global average, indicating significant potential for energy efficiency improvements. Accelerating progress in energy efficiency can address energy security, access, and bring cost and environmental benefits. Climate change increases the frequency and intensity of extreme weather events, posing risks to many developing countries. Rising sea levels, changes in rainfall patterns, cyclones, floods, landslides, droughts, and heatwaves disproportionately affect Pacific countries, small island states, and certain areas in South Asia. Insufficient consideration of climate and disaster risks in infrastructure planning leads to losses from disasters. Climate change impacts and ecosystem disruptions can severely affect livelihoods, food security, and human health.

Therefore, it is crucial to carefully locate and design clean energy projects to minimize conflicts with land use and preserve natural and cultural values. Upholding the integrity of ecosystems enhances their resilience and supports the socioeconomic systems and community health they sustain. Furthermore, it is essential to consider the environmental impact of disposing of clean energy equipment, such as solar panels, wind turbine blades, and batteries, when developing clean energy projects. Developing countries need support in establishing proper disposal mechanisms and managing related costs.

Enhancing disaster resilience in the energy sector requires measures like grid redundancy and underground cabling. While these measures may seem costly for DMCs prioritizing service extension and grid strengthening, not investing in resilience can lead to higher costs in the long run due to infrastructure failures and rebuilding after extreme events. Resilience goes beyond physical infrastructure durability; it encompasses inclusive infrastructure that helps vulnerable segments of society withstand shocks.

THE CHANGING ENERGY LANDSCAPE AND OPPORTUNITIES

Over the past decade, there have been significant changes in the energy landscape, including a global commitment to universal energy access, climate change mitigation, and advancements in low-carbon technologies. Asia and the Pacific have made progress in economic development and energy modernization during this time.

[8] UNESCAP, (2021), Regional Trends Report: Shaping a Sustainable Energy Future in Asia and the Pacific Shaping a sustainable energy future in Asia and the Pacific : a greener, more resilient and inclusive energy system | ESCAP (unescap.org)

The costs of renewable energy technologies have been decreasing rapidly

Between 2010 and 2019, the costs of solar and wind power significantly dropped, making them more competitive with traditional fossil fuel generation[9]. However, integrating intermittent sources like solar and wind into the grid requires grid-scale storage and alternative generation capacity. These additional components increase the overall cost of renewable energy deployment. Factors such as the COVID-19 pandemic and supply chain issues have also affected the price of renewable energy technologies, slowing down their growth.

Apart from established technologies, emerging low-carbon technologies are maturing and can contribute to the clean energy transition

Battery energy storage systems, electrification, carbon capture, use, and storage (CCUS), green ammonia, hydrogen, advanced biofuels, and other innovations offer solutions for decarbonizing industries, long-range transport, and heating and cooling systems. A

Digital and smart technologies have also rapidly developed and matured alongside renewable energy advancements

Digitalization plays a vital role in energy transition, enabling decarbonization and decentralization. It brings benefits like improved data collection, information processing, and decision-making, enhancing system visibility, reliability, flexibility, and resilience. Technologies such as blockchain, artificial intelligence, mobile connectivity, drones, big data analytics, and business platforms have transformative potential in the energy sector, but they also introduce operational risks, including cybersecurity and supply chain vulnerabilities.

CHALLENGES, DRAWBACKS AND & ISSUES

Undoubtedly, there are several challenges that countries face as they embark on the journey towards green energy. Firstly, the fiscal space available for investment has been constrained due to the COVID-19 pandemic. The implementation of expansive fiscal measures to support businesses and households has led to deteriorating fiscal positions. Furthermore, economic activities have been impeded by measures taken to contain the spread of the virus. In Asia, fiscal deficits during the period of 2019-2021 have been even more severe than those experienced during the Global Financial Crisis, presenting a significant obstacle to the green energy transition.

Secondly, the global economy experienced significant upheaval due to Russia's invasion of Ukraine, resulting in a surge in oil and commodity prices. This volatility in prices affects Asia and the Pacific region, which heavily relies on oil imports. To mitigate the vulnerability arising from such price fluctuations, it becomes imperative for the region to invest in energy efficiency and renewable energy. This diversification of the energy supply mix with cost-effective and environmentally friendly resources is crucial.

In the short term this transition will hamper the economic growth but in the long-term it will support sustainable development and equitable distribution of energy.

[9] International Renewable Energy Agency (IRENA),(2020), Renewable Power Generation Costs in 2019 Renewable Power Generation Costs in 2020 (irena.org)