ACCELERATING PROGRESS IN SDG 7 (ACCESS TO AFFORDABLE AND SUSTAINABLE ENERGY) IN SOUTH AND SOUTH-WEST ASIA SUBREGION

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Foreword

The Development Papers Series of the Economic and Social Commission for Asia and the Pacific, Subregional Office for South and South-West Asia (ESCAP-SSWA) promotes and disseminates policy-relevant research on the development challenges facing South and South-West Asia. It features policy research conducted at ESCAP-SSWA as well as by outside experts from within the subregion and beyond. The objective is to foster an informed debate, exchange good practices and build a subregional knowledge pool on development policy challenges facing the subregion.

In this series, authors Ubaid Ur Rehman Zia and Dr. Hina Aslam focus on the progress and challenges of Sustainable Development Goal 7 in South and South-West Asia (SSWA). In the rapidly evolving landscape of SSWA, affordable, reliable, and sustainable energy is not just an aspirational target but a development imperative. Energy is the lifeblood of economic growth, a catalyst for poverty reduction, and a beacon for improving overall human welfare. However, beyond these immediate benefits lies the undeniable fact that sustainable energy plays a paramount role in mitigating the effects of climate change. In a world grappling with the multifaceted challenges of COVID-19, geopolitical tensions, and the looming spectre of climate change, cooperative strategies that prioritize the transition to renewable energy sources become even more crucial.

Many countries have announced how they will reduce their carbon footprints under the Paris Agreement, and hence this paper can also provide some roadmap to policymakers on reducing carbon footprints through subregional and regional cooperative measures. Nevertheless, the diversity and disparity within the SSWA subregion, both economic and cultural, often accentuate the challenges. While nations like Bhutan, Bangladesh, and India have made laudable strides in energy infrastructure and the adoption of renewable resources, others grapple with the dark shadows of energy poverty and inadequate electrification. Such disparities, while concerning, also present opportunities. The achievements of some countries serve as beacons for others, illuminating pathways that can be adapted, adopted, and innovated upon. Moreover, it becomes evident that subregional collaboration is not just beneficial — it is fundamental. By sharing best practices, bolstering energy trade, and consolidating subregional energy management strategies, the countries of SSWA can not only achieve the targets of SDG 7 but also build a more resilient and prosperous future for their people.

This comprehensive paper serves as both a mirror and a map. The paper also benefitted from comments that the authors received in discussions of the South and South-West Asia SDG Forum. It reflects the current status of SDG 7 across the diverse nations of SSWA while also charting a path forward. The proposed recommendations, from harnessing technological innovations to

fostering deeper subregional cooperation, underscore the essence of unity in action. As we delve deeper into the nuances of this study, let us remember that the journey towards a sustainable energy future is not one that any nation can walk alone. In the shared challenges and aspirations of the SSWA region lies the potential for shared progress and prosperity.

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Accelerating Progress in SDG 7 (Access to Affordable & Sustainable Energy) in the South and South-West Asia

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Abstract

This study investigates the progress of the South and South-West Asia (SSWA) subregion in achieving Sustainable Development Goal 7 (SDG 7), which targets equitable access to affordable, reliable, and sustainable energy. The SSWA subregion, characterized by its vast economic and cultural diversity, faces an escalating energy demand due to its rapid economic growth, making the realization of SDG 7's sub-targets, including universal energy access, increased renewable energy use, and energy efficiency enhancement, crucial. While some countries, such as Bhutan, Bangladesh, and India, have exhibited commendable progress, challenges like energy poverty and reliance on traditional energy sources persist. These issues are further exacerbated by global crises like COVID-19, climate change impacts, and the geo-political tensions, which have collectively contributed to increased volatility in energy prices. This paper comprehensively analyses SDG 7 status across SSWA countries and offers strategic recommendations including harnessing innovations and technology, seeking support from financial institutions and multilaterals, and fostering cross and subregional cooperation to ensure a collaborative and sustainable energy future for the subregion.

JEL Codes(s): L30, L38, L78, L94

Key words: Climate Change; COVID19; SDG7; Sustainable Development; CCC Crisis; Energy Crisis

[1]The paper was drafted by Ubaid Ur Rehman Zia and Dr Hina Aslam under the guidance of Rajan Sudesh Ratna, Deputy Head and Senior Economic Affairs Officer, ESCAP-SSWA, and the supervision and review of Leila Salarpour Goodarzi, Associate Economic Affairs Officer, ESCAP-SSWA. The paper benefitted from the comments and assistance of Economic Affairs Interns, Matthew Amalitinga Abagna, Laura Hagspiel, and Simon Salvi. The paper benefitted from comments and inputs from colleagues from ESCAP Energy Division. An earlier version of the paper was presented at the Sixth SSWA SDG Forum, organized by ESCAP, the Government of Pakistan, and the Sustainable Development Policy Institute (SDPI) in Islamabad, 5-7 December 2022 and benefitted from the discussion. The views expressed in this paper are those of the authors and do not necessarily reflect the views of the United Nations Secretariat.

1. Introduction

Sustainable Development Goal 7 (SDG 7) aims to ensure equitable access to affordable, reliable, and sustainable modern energy for all while fostering economic growth, improving living conditions, and safeguarding the environment. In the context of South and South-West Asia (SSWA), where energy demand is rapidly escalating[2], achieving the sub-targets of SDG 7 is of paramount importance. These sub-targets encompass universal energy access, expanding renewable energy use, and enhancing energy efficiency.

Access to affordable and reliable energy underpins economic growth and poverty reduction. Enabling improved energy access stimulates economic activities, job creation, and sectoral productivity, ultimately leading to poverty alleviation. Modern energy services also elevate the quality of life for individuals and communities, with reliable electricity supporting healthcare, education, and communication, bolstering human welfare. Additionally, transitioning to sustainable energy sources, particularly renewables, becomes pivotal in addressing climate change and reducing greenhouse gas emissions, propelling SSWA towards a more sustainable and climate-resilient future. Collaborative efforts between subregional countries offer better pathways to bolster energy security, amplify energy trade, and disseminate energy management best practices.

SSWA is marked by pronounced economic and cultural diversity, with member countries varying in economic development levels and population sizes. While certain nations have made substantial strides in energy infrastructure and access, others continue to confront energy poverty and inadequate electricity availability. Many of the region's population relies on traditional and inefficient energy sources, resulting in adverse health effects and environmental degradation. Despite these challenges, select subregional countries have made noteworthy progress in achieving SDG 7. For instance, Bhutan has attained zero carbon dioxide emissions, and Bangladesh and India have invested significantly in renewable energy sources[3]. These efforts have increased renewable energy capacity and reduced reliance on fossil fuels. Extension of electricity and modern energy services to remote areas has been pursued through off-grid solutions and decentralized energy systems. Furthermore, adopting energy efficiency measures across sectors has been embraced to minimize wastage and promote sustainable consumption patterns.

However, challenges persist. Ensuring energy access for all, especially low-income communities, remains an obstacle due to prohibitive costs and the substantial investments required for sustainable energy projects. Inconsistent and unclear energy policies and regulations hinder private sector participation, while the expanding energy to remote areas is impeded by inadequate existing infrastructure.

This paper analyses SDG 7 status in SSWA countries, namely: Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka, and Türkiye. After evaluating their progress

[2] Chen (2022)
[3] World Bank (2022)

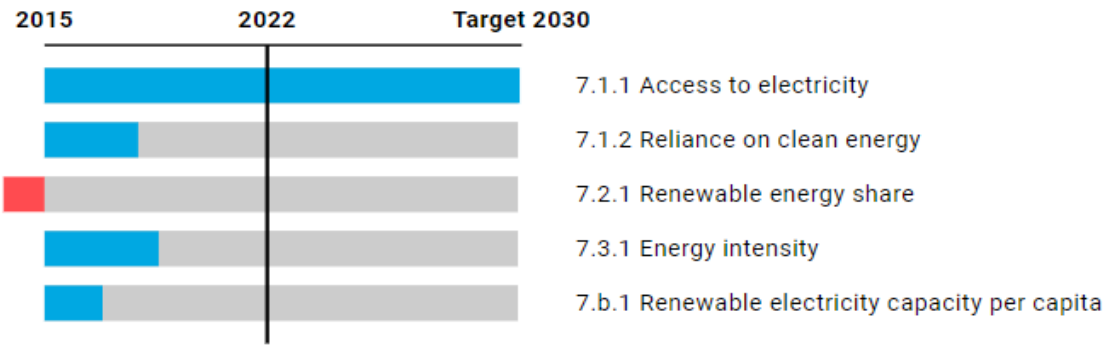
across various indicators of SDG 7, the study recommends recovery strategies in the face of compounded challenges posed by COVID-19, the geo political tensions, and climate change. Key objectives encompass assessing progress, identifying best practices, and suggesting collaborative mechanisms to support SSWA in attaining SDG 7.

2. Access to Affordable, Reliable and Sustainable Energy and Sustainable Development

Energy security is central to socioeconomic development, especially in the backdrop of COVID-19, climate change impacts, and the conflict between Russia and Ukraine – also commonly known as the "Triple C crisis". Given the limited fiscal space and capacity to absorb the socioeconomic shocks and social vulnerabilities, these challenges are further pronounced for developing countries with compounded crises[4], further disrupting the modest gains in economic growth, health, education, and livelihoods and their ability to meet SDG goals and targets. As per the "*Asia and the Pacific SDG Progress Report 2023",* the progress towards all 17 SDGs in the Asia-Pacific regions has been slow, increasing from 4.4% in 2017 to 14.4% in 2022, depicting the region to be missing the 2030 target by several decades[5]. The long-lasting impacts of the pandemic, rising inflation, economic recession, and environmental distress, along with global, regional and national conflicts and tensions have seriously halted the progress of SDGs in the region.

Countries in the SSWA are grappling with extraordinary challenges that border on their national security including energy, water, climate, and food. Unfortunately, there has been a considerable negative trend and regression towards achieving SDGs 13 and 14, which focus on climate action and water. Despite some positive progress in achieving SDG 7, mainly seen in the access to electricity, the progress on the other sub-targets is far from the target as highlighted in Figure 1. While there is a steady increase in total Renewal Energy (RE) capacity per capita, the share of RE has significantly reduced, with countries missing the opportunity to transition to green energy after COVID-19.

Figure 1: The Progress of SDG 7 in SSWA



Source: UN ESCAP (2024)

[4] IEA, (2022)
[5] ESCAP (2023)

The heavy reliance on fossil fuels for energy production and consumption remains a prevalent characteristic in the energy mix of various countries in the region leading to sluggish progress towards fulfilling SDG 7.3, despite the pledges to transit to cleaner energy by some countries in the subregion during COP 26 – demonstrated in Table 1. According to ESCAP statistics, the total renewable electricity capacity of SSWA grew by only 10% on average (from 83 kilowatts per capita in 2019 to 91.7 in 2021)[6]. Figure 2 also indicates that most countries in the region still rely heavily on non-renewable sources of energy. This situation significantly impacts the region's social and economic indicators, including access to affordable energy (SDG 7), food security (SDG 2) and poverty reduction (SDG 1). More efforts are required to address these challenges and accelerate sustainable development in the region.

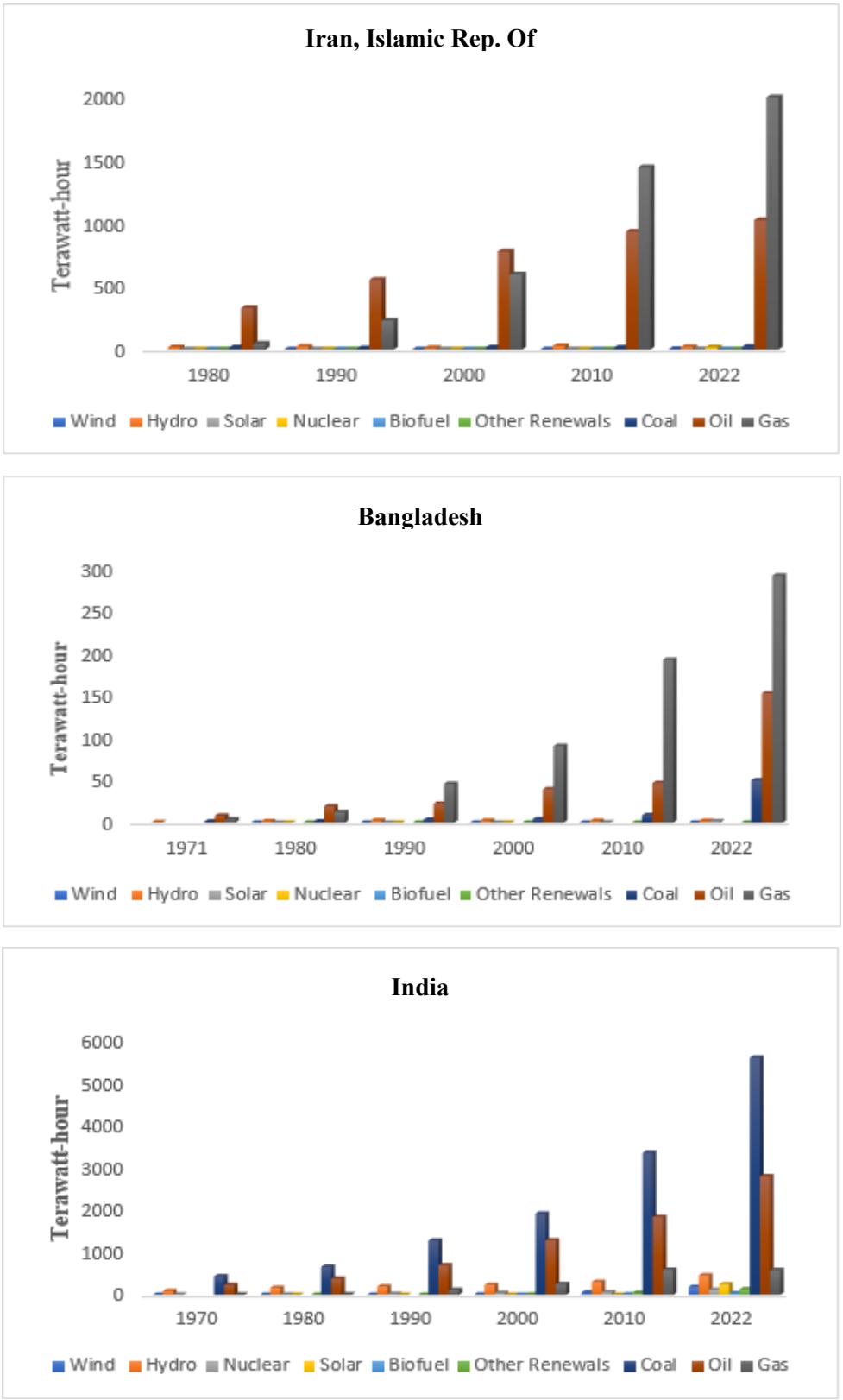
Table 1: SSWA Countries Pledges at COP26

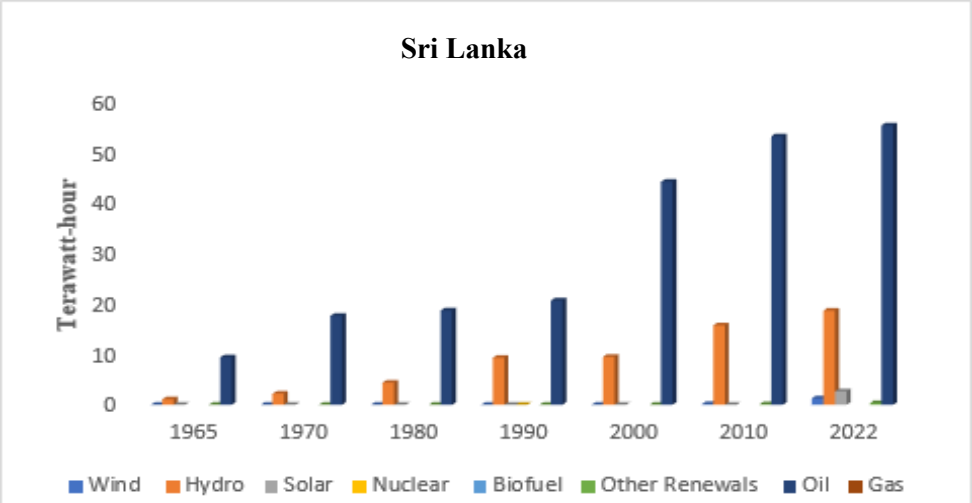
SN	Country	COP26 Pledges
1	Afghanistan	• Achieving the target of net zero emissions by 2050
2	Bangladesh	• Reduce carbon emissions by 21.85% by 2030[7] • Achieving the target of net zero emissions by 2030
3	India[8]	• Reach 500GW non-fossil energy capacity by 2030. • 50 per cent of its energy requirements from renewable energy by 2030. • Reduction of total projected carbon emissions by one billion tons from now to 2030. • Reduction of the carbon intensity of the economy by 45 per cent by 2030, over 2005 levels. • Achieving the target of net zero emissions by 2070
4	Maldives	• Achieving the target of net zero emissions by 2030 • To phase out the use of coal power by 2030
5	Nepal[9]	• Remain cumulatively 'net zero carbon' from 2022-2045 and become carbon negative after that.
6	Pakistan	• Achieving the target of net zero emissions by 2050 • To reduce global methane emissions by at least 30 percent from 2020 levels by 2030[10]
7	Sri Lanka[11]	• Shifting contribution of renewable energy sources by 70% by 2030 • Reducing carbon emissions by 14.5% by 2030
8	Türkiye	• Achieving the target of net zero emissions by 2053

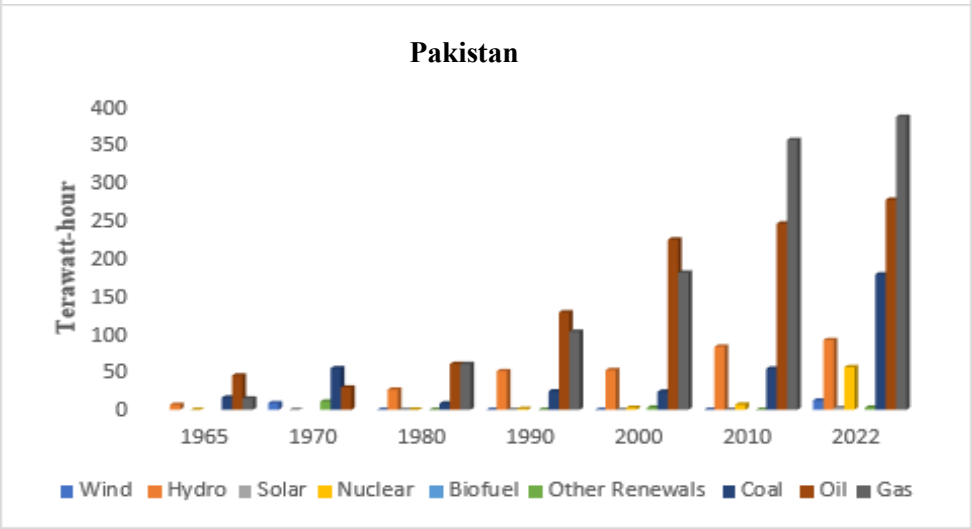
Source: Compiled from different sources – COP26 Pledges Infographic, Al Jazeera (2021), and individual sources where relevant

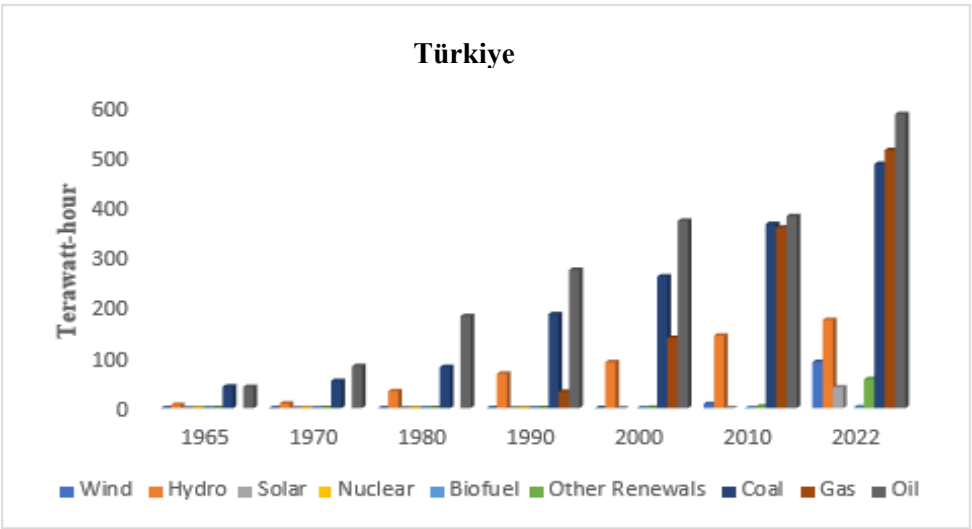
[6] Detailed data is available at https://dataexplorer.unescap.org/
[7] Ministry of Environment, Forest and Climate Change (2022)
[8] PIB Delhi (2022)
[9] Climate Action Tracker (2023)
[10] IEA (2023a)
[11] Padukkage (2022)

Figure 2: Primary Energy Consumption by SSWA Countries









Source: Energy Institute (2023)

Note: The primary energy is shown based on the substitution method which considers inefficiencies in energy production from fossil fuels.

2.1 Economic Impacts

The economic downturn resulting from the pandemic was severe, particularly at the beginning when partial or complete lockdowns were in place. In India, the GDP in the first quarter of 2020 dropped by almost 24% compared to the 3.9% growth rate in 2019[12]. The Maldives also witnessed a GDP drop of almost 50%. According to the 2023 IMF's World Economic Outlook, the general debts of the government in the region also increased[13]. Further breakdown was caused by a major drop in energy demand, leading to major challenges such as drops in revenues, high investment needs to counter COVID-19, reduced international trade, and challenges in operationalizing revenue collection schemes.

The economic impacts were further escalated to common households. Estimates from the International Energy Agency's World Energy Outlook Report, indicate that around 110 million people in Asia and Africa lost their ability to pay for basic energy commodities[14]. For SSWA, the number of people living on less than $1.9/day increased by 58 million, which constitutes a significant increase in global poverty[15]. The impact was further compounded by climate change, as the region was highly vulnerable to its effects, with the World Bank estimating that it suffered a loss of 230,000 lives and over $45 billion in damages in 2009[16]. In the summer of 2022, both India and Pakistan faced challenges from extreme heat waves, leading to increased demand for energy services. In 2022, Pakistan faced historically worst flooding with adaptation costs extending beyond $40 billion[17]. This flooding also had a severe impact on the energy infrastructure, destroying several mini and micro hydropower plants.

In parallel, the consumer price inflation in the SSWA region was exacerbated by three major factors, namely a global financial contraction, the Russia-Ukraine War and the Chinese economic slowdown. In Afghanistan, inflation has shown an increasing trend since the beginning of the year. Based on statistics available for July 2022, consumer price index (CPI) inflation was at 18.3 percent, driven mainly by high inflation in the food segment[18]. Inflation in Bangladesh accelerated to 9.52 percent in August 2022, the highest in 10 years, mainly driven by higher food prices[19]. Similarly, nominal food price inflation in Sri Lanka reached 85.6% in October (year-on-year basis)[20]. India's consumer food price inflation increased from 3.8% in 2022 to 6.6% in 2023 (average over the first 8 months)[21]. Driven by high CPI values, household spending on energy services has significantly increased during the second quarter of 2022.

[12] MOSPI (2024)
[13] Salgado & Anand (2023)
[14] IEA (2022b)
[15] OECD (2020)
[16] World Bank (2009)
[17] World Bank (2022b)
[18] ADB (2023)
[19] Bangladesh Bank (2023)
[20] Central Bank of Sri Lanka (2022)
[21] Economic Times India (2024)

2.2 The Impact of the Crisis on Energy Security: Trade and Prices

Following the invasion of Ukraine in the first quarter of 2022, global energy and electricity prices skyrocketed, with varying impacts on the overall SSWA region. Indian imports increased from a low base at the start of the war, peaked in June-July and remained constant afterwards. The Russian share of India's oil imports increased from 2% in February 2022 to 23% in November[22]. For Iran, the Russia-Ukraine war had multi-dimensional prospects. Firstly, both Russia and Iran were already competing in Chinese oil markets. Secondly, the sanctions placed on Russia increased the economic prospects for Iran in European countries to fill the market. Türkiye also increased its purchase of Russian oil due to deep price discounts. During the six months from June through November, the country imported an average of 399,000 b/d of Russian crude, up sharply from the levels seen the year before, prior to Russia launching its invasion of Ukraine[23].

For the rest of SSWA, Russia's invasion of Ukraine had negative consequences. Bangladesh, an oil-importing nation, was already under strain from hefty import duties. According to the Bangladesh Petroleum Corporation, it was losing almost Tk 19 crore every day[24]. The rising oil price had a cascading effect on the cost of other necessities, such as gas and fertilizer, among others. The government increased diesel prices by around 23% in November 2021, which has contributed to increased transportation costs and the prices of other goods and services. Pakistan's energy market was substantially disturbed, with a record increase in oil and gas prices. However, at the start of 2023, Pakistan initiated ties with Russia for the import of oil and gas, with the first consignment expected to arrive in March 2023. They also wish to satisfy 35% of their total energy imports from Russia[25].

The SSWA subregion, which is a net importer of commodities, is heavily impacted by the Russia-Ukraine War as it led to rising commodity prices. While inflation in the subregion was high relative to similar regions, the war has exacerbated the situation about energy. Natural gas prices reached a record high in many countries, with global oil prices also reaching the highest levels since the Global Financial Crisis in 2008. In just one month's conflict, global natural gas prices increased by almost 160%, while coal and oil increased by 33% and 75% respectively[26]. Similarly, the European gas and electricity prices increased by 115% and 237%, respectively[27].

Given the import-oriented supply chains of most SSWA countries, similar impacts were observed in the subregion. Electricity prices in Pakistan increased by almost 72.5%[28]. The unaffordability of Liquified Natural Gas (LNG) and coal led to power outages, and a doubling of the power tariff which, again, caused electricity to become more expensive for households and industry. With LNG becoming more expensive and out of reach, Pakistan is considering more oil imports to substitute

[22] Paul (2023)
[23] Mathonniere (2022)
[24] Khatun (2022)
[25] Jamal (2023)
[26] Yuksel & Kilic (2022)
[27] Gazzani & Ferriana (2022)
[28] Rehman (2022)

gas demand. In late 2022, the government of Bangladesh also announced that it would increase its electricity prices by almost 20% at the wholesale level, driven by the global increase in energy prices[29].

Among SSWA countries, Sri Lanka was the most hard-hit, eventually having to declare bankruptcy. The Ceylon Electricity Board (CEB), which suffered a first-quarter loss of 65 billion rupees ($185 million), requested an 835% price increase for energy consumers. The CEB's proposal to raise electricity rates by 229% was opposed in August, still capping rate increases at 75%[30]. In November, Bangladesh also cancelled a spot market tender due to the high gas price, which caused a severe energy shortage in the country. To cover this energy shortage, Bangladesh was forced to buy LNG at a price five times higher than it was in early 2020. The government has had to triple energy subsidies to maintain prices at an affordable level, and was expected to double the subsidies again in the upcoming 2022-2023 budget. To deal with the high price of imported LNG, the Bangladesh Energy Regulatory Commission has recommended increasing electricity rates by 58%[31].

Figure 3: Shop Keeper Filling Paperwork Using Bottle Lamp During the Power Crisis

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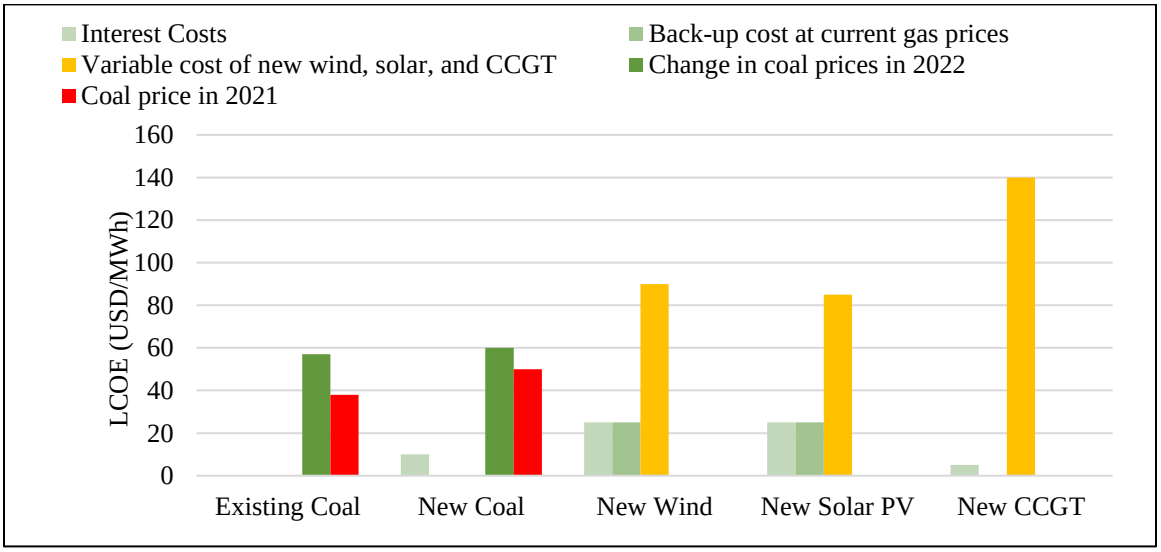
In Nepal, the coal cost of $67 a ton (until a year ago) rose to $400, iron ore was priced at $160 a ton, and the price of a ton of soybean increased from $1,150 to $1,800[32]. The increased energy

[29] The Business Standard2023)
[30] Samarawickrama (2022)
[31] Das (2022)
[32] Nepali Times (2022)

prices have also strongly hit many areas of India. Despite government support, fuel and power prices rose five times faster than overall CPI from January 2021 to August 2022, with the poorest households in Delhi, for example, spending roughly 25% more on fuel and electricity in 2022 relative to 2021, and 50% more than during 2020[33]. Many countries have viewed fossil fuels, particularly coal, as the less expensive and more accessible energy source throughout the present economic crisis. Yet, Figure 4 details the effects of rising fuel costs and interest rates on the levelized cost of energy from various sources. Although coal is the most affordable source, as can be seen from the figure, it is highly susceptible to price volatility. So, at present costs, investments in renewable energy (solar and wind) would be more appealing than the new coal-based electricity. When the possibility of excess capacity or stranded assets is taken into account in long-term assessments, the feasibility of solar and wind investments appears more appealing. The fact that India is now estimated to be amongst the cheapest locations globally for new RE projects (both for solar PV and wind power plants) is a testament to this paradigm shift[34].

Figure 4: Increase in Levelized Cost of Electricity across the SSWA Subregion (2021-2022)



Source: Values calculated by authors for SSWA based on the methodology in World Bank (2024a)

The subregion's immense hydropower potential can also be utilized to produce sustainable, environmentally friendly electricity for domestic and industrial uses. Nepal and Bhutan have extra hydropower potential and can be tapped by countries like India and Bangladesh if the needed infrastructure and cooperation is put in place. This has already begun via cross-border electricity trade between India and Bhutan, as detailed in Box 1, and should be scaled up regionally where feasible. Hydrogen also represents a great opportunity in the transition to renewable energy and offers an attractive path for diversification for SSWA countries. It is carbon-free, sustainable and, abundant. The International Solar Alliance can facilitate this by helping states and private investors

[33] Heinemann & Heilmann (2023)
[34] Heinemann & Heilmann (2023)

mobilize financial resources for the cross-border infrastructure in the area of renewal energy particularly solar in the subregion.

Box 1: Cross-Border Electricity Trade: Bhutan and India

Bhutan, leveraging its abundant hydropower resources, has been exporting electricity to India since their first cooperation in 1961. Bhutan's export of hydroelectric power to India not only helps meet India's energy demands but also provides Bhutan with a vital revenue stream. A key milestone in their cooperation came in 1987 with the commissioning of the 336 MW Chhukha Hydropower Project, Bhutan's first major power project, funded by India with 60% as a grant and 40% as a loan. In July 2006, Bhutan and India formalized their collaboration with the Agreement on Cooperation in Hydroelectric Power (HEP), setting a framework for future projects.

Since then, this enduring partnership has led to the development of several hydropower projects, including the recent commissioning of the 720 MW Mangdechhu Hydroelectric Power Project in 2022. Hydropower sales now form the largest part of Bhutan's GDP and its most significant export, constituting approximately 63% of total exports.

Looking ahead, both nations are committed to expanding their energy trade, further enhancing their cooperative efforts, enhancing energy security, and fostering cross-border collaboration.

Source: Compiled from the Royal Bhutanese Embassy (2024), and Ministry of External Affairs (2024)

Figure 5: Unit-1 of the 336 MW Chhukha Hydro Electric Project

Progress on SDG 7 in SSWA Countries

Under the UN framework, SDG 7 is divided into three key primary indicators i) Energy Access, achieving universal access to affordable, reliable and modern energy services ii) Energy Efficiency, doubling the rate of energy efficiency (measured in terms of primary energy by GDP), and iii) Renewable Energy – to increase the share of renewable energy in total final energy consumption, by 2030.

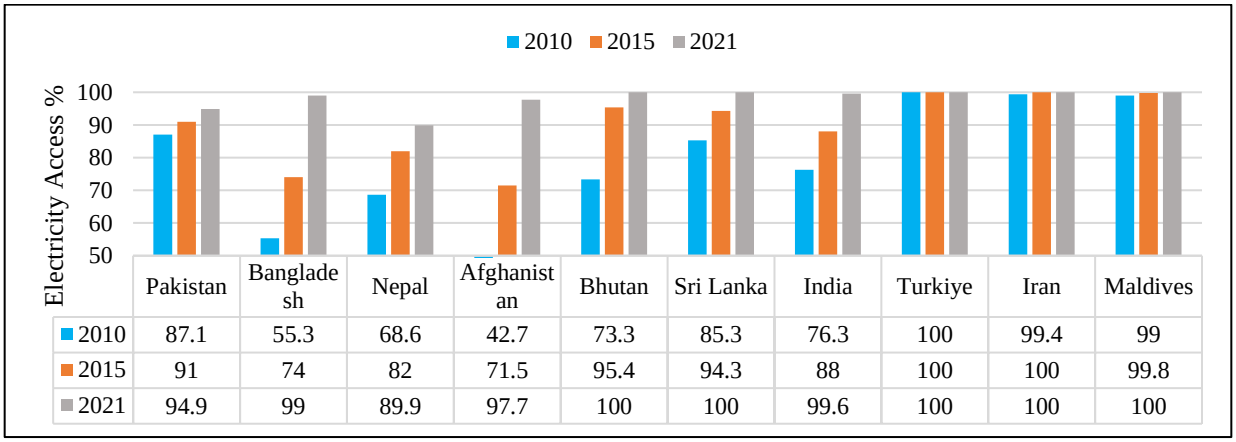
3.1 Access to Affordable Energy

Energy access under SDG 7 is monitored as rates of electrification and rates of primary reliance on clean fuels and technologies for cooking. Figure 6 highlights the access to electricity of SSWA countries and their progress over the past two decades[35]. In 2021, the average access to electricity in SSWA countries was 98.11%, increasing with an annual compound growth rate of 2.02%. Türkiye, Bhutan, Sri Lanka, Iran, and Maldives were the five countries that have 100% access to electricity, while Nepal has the lowest access at 89.9%. Afghanistan demonstrated the highest percentage increase, with access increasing from only 42.7% in 2010 to 97.7% by 2021.

However, energy access not only means whether a household, business, or school has energy access, but also how this access translates into services, and how "useful" and "usable" these services are. The numbers highlighted above (other than for the case of Pakistan) represent access to just Tier-1 electricity. This does not take into consideration reliability and availability challenges, such as power outages and fluctuations, particularly in rural areas. The data also includes off-grid solutions, such as mini/micro hydropower plants & solar PV systems. The low-tier access could mainly provide lighting support to those households and is not reliable or sufficient to be used in productive sectors such as small local industries, workshops, or even small-scale pumps.

[35] World Bank (2024b)

Figure 6: Electricity Access of SSWA Countries

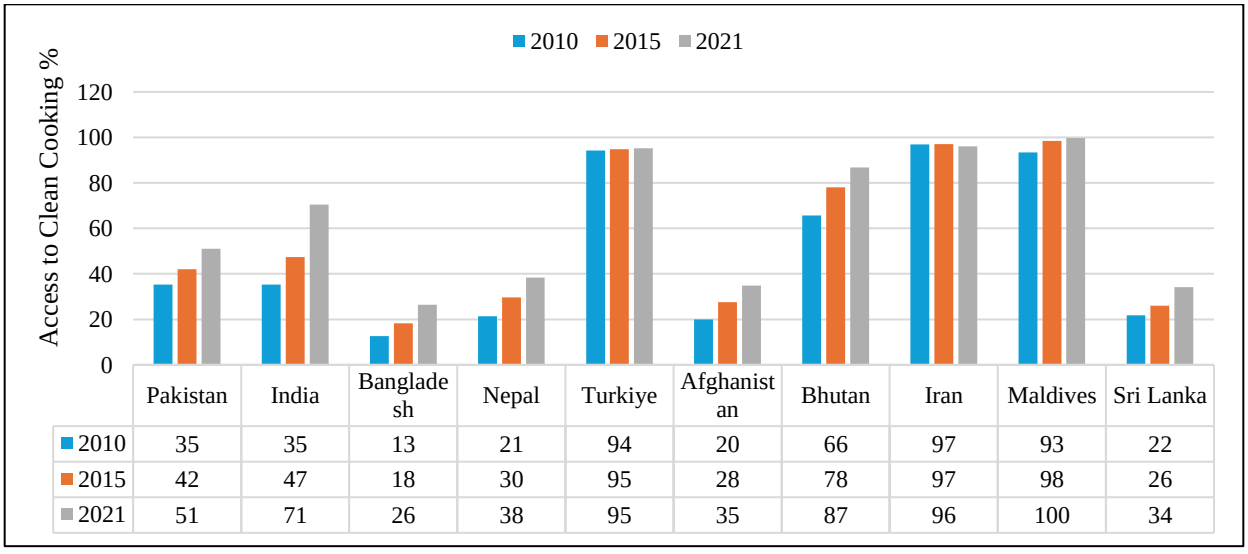


	Pakistan	Bangladesh	Nepal	Afghanistan	Bhutan	Sri Lanka	India	Turkiye	Iran	Maldives
2010	87.1	55.3	68.6	42.7	73.3	85.3	76.3	100	99.4	99
2015	91	74	82	71.5	95.4	94.3	88	100	100	99.8
2021	94.9	99	89.9	97.7	100	100	99.6	100	100	100

Source: Data from World Bank (2024c), "Access to electricity (% of population)" [Accessed on 02.09.2024]

Compared to electricity access, the progress towards achieving access to clean fuels and technologies in SSWA is rather limited. Figure 7 demonstrates the progress of SSWA countries over the past decade towards access to clean fuels and technologies for cooking. On average, around 63% of the region's population in 2021 has access to clean fuels, versus 50% access in 2010. This is a Compound Annual Growth Rate (CAGR) of around 2%. As of 2021, Maldives is the only country that has achieved 100% access, closely followed by Iran (96%), and Turkiye (95%). Bangladesh has the lowest access to clean technology, with access rising from 13% in 2010 to 26% in 2021. Access to clean cooking is below 50% in Sri Lanka, Afghanistan, and Nepal.

Figure 7: Clean fuel access for cooking of SSWA Countries



	Pakistan	India	Bangladesh	Nepal	Turkiye	Afghanistan	Bhutan	Iran	Maldives	Sri Lanka
2010	35	35	13	21	94	20	66	97	93	22
2015	42	47	18	30	95	28	78	97	98	26
2021	51	71	26	38	95	35	87	96	100	34

Source: Data from the World Bank (2024f) "Access to clean fuels and technologies for cooking (% of population)" [Accessed on 29.08.2024]

The low access of clean fuel in SSWA is mainly associated with high reliance on the agriculture sector, where rural residences are mainly using traditional biomass for their energy needs. This primarily involves the inefficient combustion of residues and woody biomass for household cooking and heating.

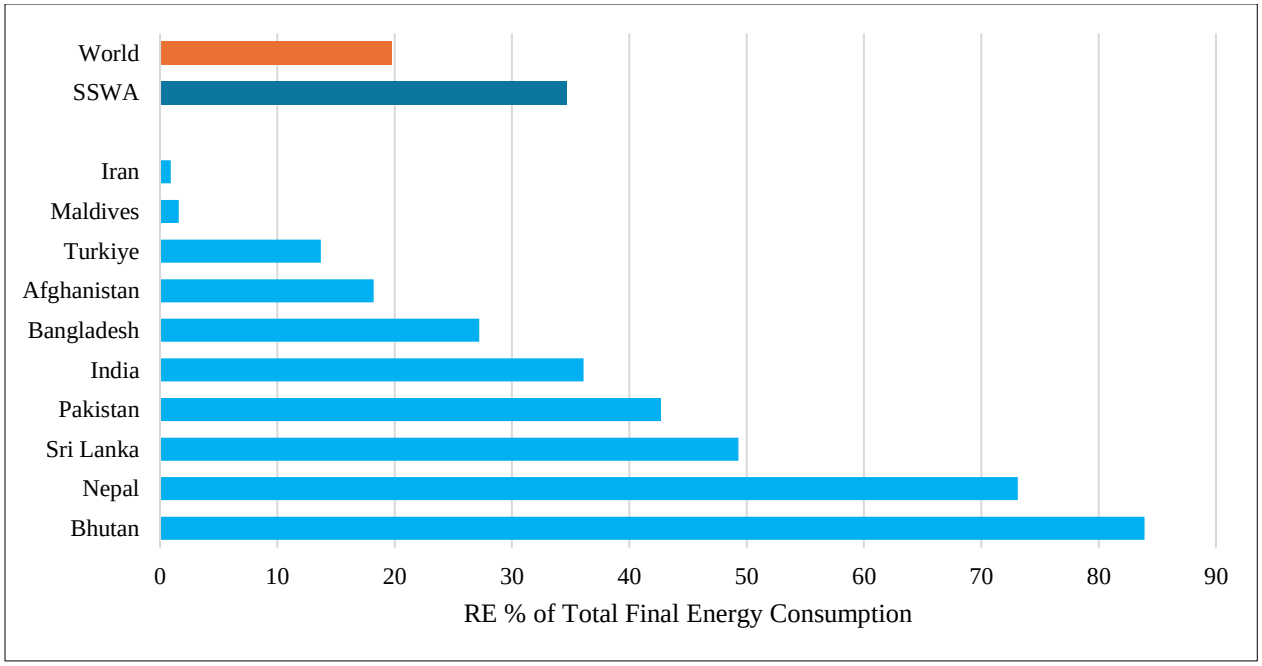
3.2 Renewable Energy

Progress on Renewable Energy (RE) consumption use (as a percentage of total final energy consumption) is defined here under two scenarios according to the World Bank data: one including biomass, and one excluding biomass as a renewable energy source. Modern biomass use involves the commercial use of biomass in plants as well as its use after conversion to biogas. The conventional use of biomass involves its open burning which is inefficient and environmentally hazardous. Further, many countries in SSWA, such as Pakistan, do not quantify the non-commercial use of biomass (open burning) as a renewable energy source in their generation mix.

When biomass is included as a renewable energy source, in 2019, the SSWA subregion had an average RE share of almost 26.5% in its total final energy consumption, against the global average of almost 27%[36]. Further, as per the World Bank's "Renewable energy consumption (% of total final energy consumption)" dataset[37], in 2020, Bhutan has the highest share at 83.9% RE, closely followed by Nepal (73.1%), and Sri Lanka (49.3%). As of 2020, Iran and Maldives have the lowest RE share of only 0.9% and 1.6% respectively. On average for the SSWA countries, this measure has remained largely stagnant over the past decade. However, countries such as Bangladesh, Nepal and Sri Lanka have experienced sizeable decreases owing to the transition from inefficient biomass to modern energy services for cooking and heating.

[36] IEA (2024)
[37] World Bank (2024d)

Figure 8: Share of Renewable Energy in Final Energy Consumption in SSWA Countries



Source: Data from World Bank (2024d), "Renewable energy consumption (% of total final energy consumption)" [Accessed on 29.08.2024]

Without classifying non-commercial biomass as a renewable energy source, SSWA countries have an average renewable energy share of 12.9% in final energy consumption, up from 9.3% in 2010. This is a minor shift, primarily by the countries with agriculture-based economies. Sri Lanka has the highest (28.4% share), while Bangladesh has the lowest (0.4%) share of RE in their final energy consumption[38], against a 2030 target of 10%.

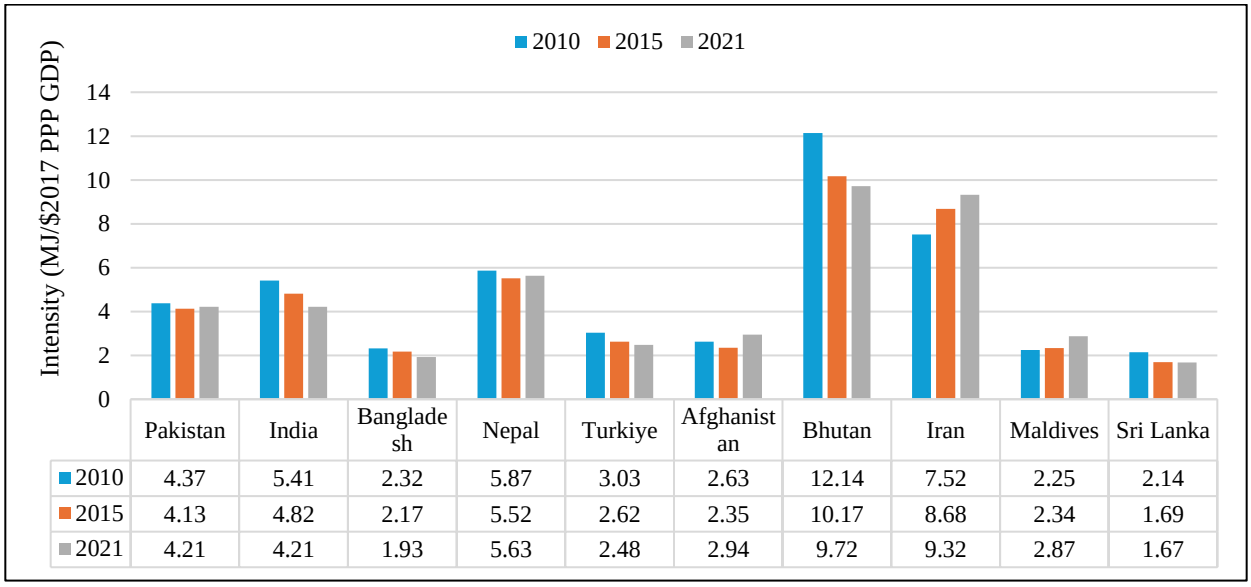
3.3 Energy Intensity

Energy intensity under SDG 7 is defined as the amount of primary energy required to produce a dollar of GDP. Figure 9 shows the energy intensity values for SSWA countries. On average, the SSWA region has an energy intensity value of 4.7 MJ/$2017 PPP GDP in 2020, slightly below the global average of 5.3 MJ/$2017 PPP GDP – which likely reflects lower levels of industrialization in many SSWA economies. As of 2021, Sri Lanka has the lowest (1.67), Bhutan (9.72) and Iran (9.32) have the highest energy intensity values. Iran has seen the highest increase in energy intensity in the past 10 years (7.52 in 2010 to 9.32 in 2021). The lower energy intensity values, however, do not necessarily indicate a widespread adoption of energy-efficient appliances. In the case of Sri Lanka, the low value is attributed not only to key energy efficient measures (such as mandatory energy management standards and sector-specific efficiency programs) but also to the country's low transport needs (due to its smaller size) and, more importantly, its low level of

[38] ESCAP (2024b)

industrialization. Conversely, in Iran, the increase in energy intensity is primarily linked to significant developments in its industrial sector.

Figure 9: Energy Intensity values of SSWA Countries



	Pakistan	India	Bangladesh	Nepal	Turkiye	Afghanistan	Bhutan	Iran	Maldives	Sri Lanka
2010	4.37	5.41	2.32	5.87	3.03	2.63	12.14	7.52	2.25	2.14
2015	4.13	4.82	2.17	5.52	2.62	2.35	10.17	8.68	2.34	1.69
2021	4.21	4.21	1.93	5.63	2.48	2.94	9.72	9.32	2.87	1.67

Source: Data from the World Bank (2024d), "Energy intensity level of primary energy (MJ/$2017 PPP GDP)" [Accessed on the 29.08.24]

The progress of SSWA countries regarding energy intensity has remained limited over the past decade. According to the authors' calculation, to achieve SDG 7, the global energy intensity values must decrease at an annual growth rate of 3.2% until 2030 (the value which was calculated to be 2.6% between 2010-30[39]).

3.4 Overall Progress and Impact on SDG 7

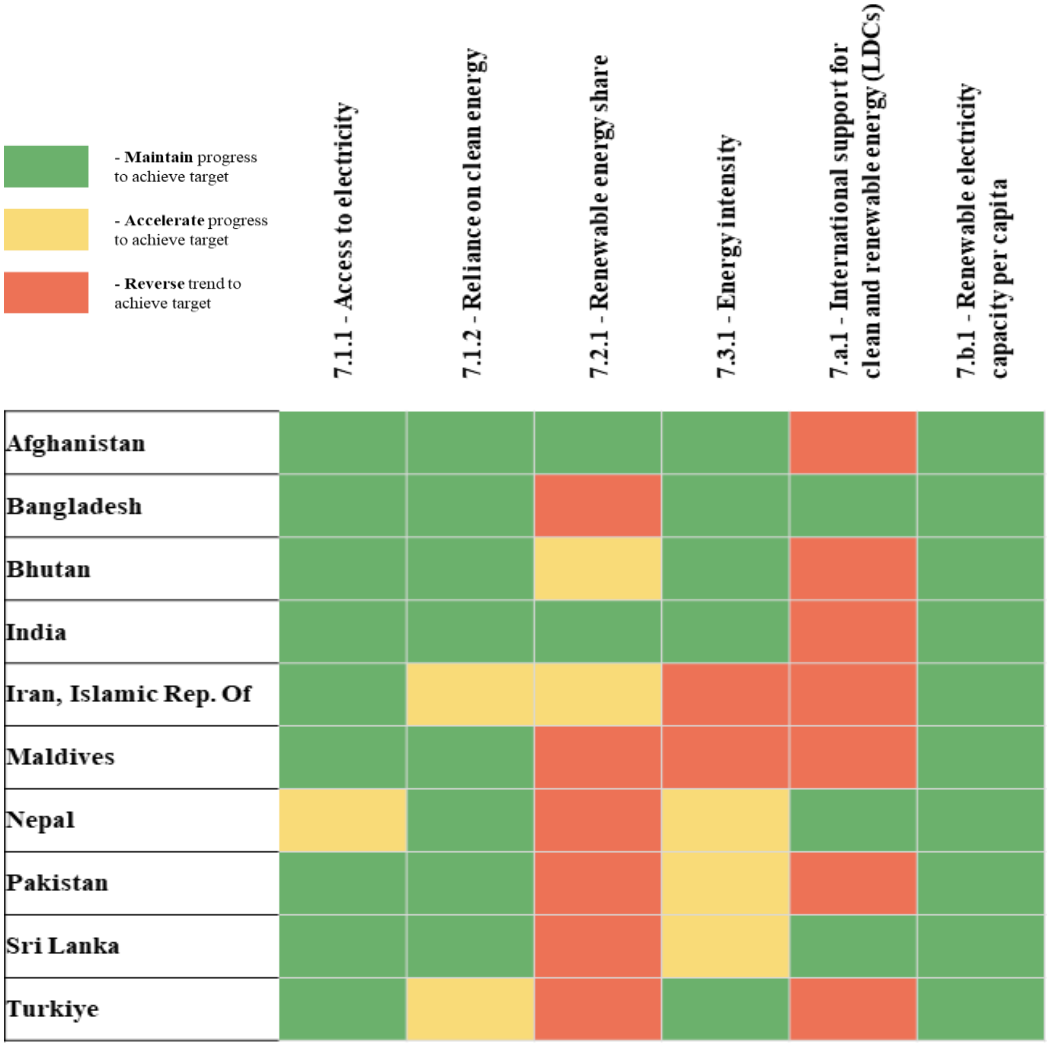
Based on the evidence above, it is clear that the SSWA subregion is strongly impacted by the global acceleration of climate change, and the recent food and energy crises, which have intensified inflation and resulted in severe socioeconomic consequences – particularly for vulnerable groups.

In terms of SDG 7, the region is progressing better in achieving access to electricity and energy, however, the provision of reliable and cheap energy is still challenged due to the Russia-Ukraine War. The subregion is still unable to harness the potential of variable energy sources including solar and wind – largely owing to technical, economic, financial, and political factors, such as global price inflation, supply chain disruption, domestic political uncertainties and constraints, energy infrastructure issues, energy economics challenges, and the circular debt of countries. The energy mix and planning in the SSWA region are still predominantly based on fossil fuels, mainly

[39] IEA (2023b)

coal, oil and gas (as shown in section 2.2). The subregion must accelerate the transition of their systems through technological and innovative transformations. The cost of solar power and lithium-battery technology has fallen by more than 85 per cent, and the cost of wind power by about 50 per cent[40]. This reflects a huge opportunity for green economic growth which can create jobs and foster long-term resilience and benefits. Given the opportunity, the region can attract financial investments in the RE sector to decarbonize their power systems, with improved access to energy sources, better affordability and reliability, and improved health benefits from avoiding air pollution caused by using fossil fuels.

Figure 10: Snapshot of SSWA Progress to SDG 7



Source: Compiled from data in ESCAP (2024a)

[40] IRENA (2021)

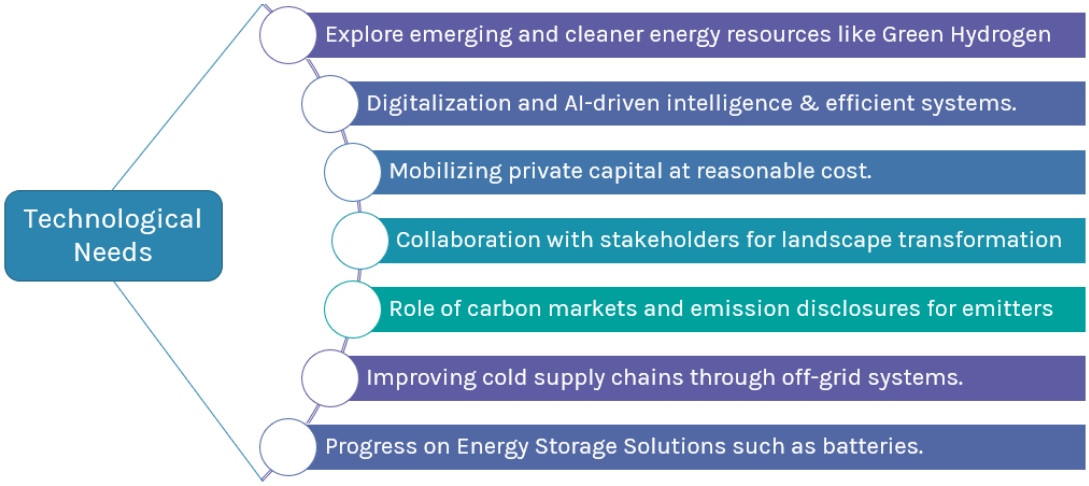
3. Best Practices and Way Forward for SSWA: Role of Regional Cooperation

As access to clean energy is being revolutionized through huge investment opportunities, the countries in SSWA have high RE potential to generate socio-economic benefits, while providing reliable and affordable electricity to people. India is ranked amongst the top places in the world to invest in solar power[41]. However, the subregion can only effectively harness the rich potential of RE by overcoming the challenges associated with phasing out fossil fuels, an unstable grid, investment deficits, and bureaucratic challenges. International cooperation and support is key to solving these common challenges, including the high cost of renewable energy; lack of sustainable business models and financial incentives to attract renewable energy and energy efficiency investments; market distortions and inefficiencies due to fossil fuel subsidies; and non-monetized carbon externalities.

4.1 Enabling Transformations through Innovations and Technology

For the commercial energy in SSWA that is dominated by fossil fuels, these transformational systems can pave a way forward which is more inclusive, secure, cost-effective, and sustainable. Significant changes are being undertaken in the way energy systems perform, fueled by trends including a rise in digitalization, the decentralization of power generation, and the increasing electrification of end-use sectors. In most of these SSWA countries, this technological advancement is below the level required for them to reach targets enshrined in the SDG goals or country-specific climate goals. Key technological avenues that can enable the shift in SSWA are highlighted in Figure 11 below.

Figure 11: Technology and Innovation for Sustainable Energy Transition



[41] EY (2024)

Source: Aslam (2022)

4.2 Role of Multilateral and Financial Institutions

Financial institutions and multilaterals can also support a collaborative energy transition. One such approach is the recent Asian Development Bank (ADB) flagship initiative, the Energy Transition Mechanism (ETM)[42], to sustainably retire and repurpose coal power assets for clean energy. Under that, the ADB established the ASEAN Catalytic Green Finance Facility[43] to increase green infrastructure investments in Southeast Asia, with further ADB Ventures[44] to support technological and innovative solutions to achieve the SDGs. This provides a great opportunity for countries to harness their RE potential, particularly given the levelized cost of electricity production is decreasing, with modern methods becoming cheaper than coal power. This is being translated into tangible livelihood benefits, more employment opportunities, and repurposed assets in more clean power plants[45].

The challenges surrounding grid instability and transmission lines are crucial to address while ensuring reliable access and clean energy sources to power grid systems. The cross-border electricity trade (CBET) is a significant step in enhancing transnational power grids, under electricity trade agreements and other energy cooperation instruments within SARRC ECO[46]. Prevalent global examples of emerging cross-border electricity trade are detailed in Boxes 2 and 3. Utilizing these frameworks for sharing RE technologies and best practices could further accelerate the transformation. This requires deep collaboration between federal and provincial governments, businesses, the private sector, and civil society actors to work towards providing access to finance, skills and knowledge to build their technological capacity, and to improve electricity access via clean sources.

Figure 12: Solar Home System Program by Public-Private Partnership in Bangladesh

[42] ADB (2024)
[43] ADB (2023b)
[44] Shah (2014)
[45] Examples include Enel and EDP repurposing Teruel and Sines coal plants in Spain and Portugal, respectively
[46] Shah (2014)

Box 2: LTMS-PIP

The **Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP),** which came into force in June 2022, established a multilateral cross-border power trading arrangement between Lao PDR and Singapore – the first involving four ASEAN countries. For Singapore, which ranked fifth in Asia-Pacific for energy imports in 2021, this project also represents the first ever import of renewable energy into the country, with 100MW of hydropower being transported through existing infrastructure systems in Thailand and Malaysia.

Although this accounts for a minor portion of total domestic electricity consumption in Singapore, estimated at 53.5 TWh in 2021, the LTMS-PIP should serve as a pathfinder towards the implementation of a regional ASEAN Power Grid (APG) which aims to expand multilateral electricity trading to deliver energy security, improve sustainability, and enhance interconnectivity between partners.

Source: Compiled from the Government of Singapore (2024), IEA (2024b), EMA (2024)

Figure 13: Nam Ou 1 Dam in Northern Laos

© The New York Times (2019) / Sergey Ponomarev

Box 3: Kenya-Ethiopia Interconnector & Eastern Africa Power Pool

The Ethiopia-Kenya Power Interconnector is a major infrastructure project aimed at enhancing electricity trade between East African Countries. More specifically, it is a 1,045 kilometer high-voltage direct current transmission line linking Ethiopia and Kenya. The project was completed in 2021. This project aims to strengthen the regional power grid by enabling the efficient use of Ethiopia's hydropower resources and reducing energy costs in Kenya.

This initiative is part of the broader Eastern Africa Power Pool integration, which aims to connect power systems across the East African nations Ethiopia, Kenya, Tanzania, Uganda and Rwanda. This plan is endorsed by the member governments and prioritized these transmission interconnections as the backbone for developing the regional power market.

Source: Compiled from the KETRACO (2024), and AFD (2024)

Figure 14: Power Lines Spanning the Kenya-Ethiopia Electrical Interconnection

© AFD (n.d.)

4.3 Role of Cross- and Sub-Regional Cooperation

SDG 7's importance to SSWA cannot be overstated, as it is a key driver for economic growth, poverty alleviation, and environmental protection in the region. The progress made in expanding renewable energy and improving energy efficiency is commendable, but challenges related to funding, access, and governance demand continuing efforts. Collaborative actions from governments, private sectors, and international organizations are essential to overcoming these obstacles and achieving SDG 7's vision of affordable and clean energy for all in SSWA.

Addressing this crisis against the backdrop of compounding challenges requires a multi-dimensional and multi-stakeholder strategy, ranging from measures to conserve energy through efficiency improvements, to diversifying the energy supply chain. With respect to SSWA, subregional cooperation can play an instrumental role in enhancing energy security and facilitating a transition. These recommendations are short-medium and medium-long-term interventions, where regional bodies, such as ESCAP, can act as an important supporting partner for countries in harnessing best practices and opportunities from several key initiatives:

- Considering the diverse needs and societal overlay of the subregion, ensuring just and affordable energy remains a key component of the transition. The entire cycle requires the technological deployment and use of sustainable fuels to replace existing infrastructures, such as hydrogen-based gas turbines, CCUS, and more hybrid technologies to support the systems. Given these impose substantial costs, financial investments are required to rapidly transform systems more efficiently. Technological up-scaling is needed by transferring technology to countries via skills and financial assistance, thus equipping them with the necessary technical and human resources. While these challenges exhibit different levels of vulnerabilities due to many crises, an **"SSWA Action Plan for Energy Cooperation"** is required to benchmark the key targets, to reduce the subregion's energy intensity, and increase the share of RE in primary energy. The platforms such as SSARC should be utilized to align the energy planning of different countries across the region to allow transparent and rigorous mechanisms to advance energy access and transition.

- Given the dynamism of the subregion, a well-coordinated **"Long-Term Roadmap for Deployment of Clean Energy Sources"** can be distributed to intra-regional actors to promote further cooperation. This may require a more participatory approach of SSWA to other Asia Pacific regions, to collectively dismantle barriers in achieving SDG goals.

- With the prevailing issues of grid infrastructure and management of RE with baseloads, such as in the case of solar and wind, the concept of **"subregional grid integration benefits"** is still underestimated. For the region to thrive whilst meeting the SDG 7 targets, there are diverse resources and market conditions which can be addressed through a harmonized system, and a common vision, which can lead to plans and policies around

which individual countries can coordinate. This could be achieved through coordinating an energy security plan, with potential knowledge sharing and capacity building, along with joint investment opportunities. The regional agreements like CAREC, CASA100, etc. should be depoliticized to allow smoother cooperation on energy security issues which are impeding the socio-economic development of the region.

- More severe barriers, like technical, financial, and regulatory issues are underlying risks caused by weak governance, and institutional inefficiencies, such as licensing of renewable energy projects. While addressing these challenges, there is an utmost **need to equip the domestic financial institutions of the region with strong technical expertise and knowledge to demonstrate the strong financial feasibility of RE projects in the subregion**. These could be supported with strong policy levers and incentives for de-risking mechanisms to allow the full potential of clean sources to be utilized for access and reliability of energy.

- While the perception of energy security is still pinned to the security of fossil-fuel supply based on domestic reserves and resources, the governments need capacity to understand the connection between energy and developmental policies and initiatives to overcome the non-technical challenges – such as those associated with subregional interests and the subregions' political economy. A platform for SSWA countries with knowledge and data sharing opportunities, with intraregional experiences and best practices, can serve as a dedicated regional body to ensure effective monitoring and implementation of SDG 7 in the region, eventually aiding the entire Asia Pacific region to plug data gaps and resource constraints reflected in a **"Subregional (SSWA) Energy Tracker"**. The tracker could provide a system to track the way energy and power are being supplied, used and marketed, along with grid integration systems and connectivity with other power systems, including transport, industries, and businesses. These could be supported by alternative means of access and resource-sharing opportunities.

- **Regional cooperation could also entail encouraging the establishment of regional standards** based on best practices around energy efficiency, energy supply chain management, resource allocations, and system and sector efficiencies linked to economic efficiency. This could help promote transparency and data availability for the enhanced monitoring and implementation of strategies and policies for effective energy planning. This can aid in improving socio-economic outcomes in the region. Some examples of measures can be gathered from times of crisis – for example, Pakistani provincial governments ordered all commercial activities (mainly shops) to be closed by 09:00 pm (PKT)[47]. Similar measures were adopted in India and Bangladesh. Capacity building campaigns and awareness schemes were also launched to conserve energy, particularly in

[47] The Express Tribune (2022)

the summer season with high cooling loads[48]. Energy efficiency across the commercial sector was promoted through the use of innovative financing tools, such as financing models, subsidy schemes, use of efficiency appliances, and fuel switching. These examples are simple forms of promoting efficiency measures and can be adopted by other countries tackling similar/common challenges.

- **A cross-regional coalition could be formed to support trade facilitation for SDG 7,** including costs related to RE equipment, raw materials and resources. This could include General Trade Facilitation, Digital Trade Facilitation, Sustainable Trade Facilitation and Other Trade Facilitation mechanisms covering both binding and non-binding WTO TFA measures, as well as measures beyond the scope of the WTO TFA which can help reduce costs, increase opportunities for small and medium-sized enterprises (SMEs), and spark competitiveness, productivity, and innovation. In doing so, this could provide the power markets with strategies and information to improve market competitiveness. This may include distributing best practices to allow countries to learn from improving their prior methods of augmenting market competitiveness through low-carbon solutions. Building energy networks between Laos and Singapore is an example where countries within, and outside, their regions have the potential to collaborate on energy transitions.

- **For cross or subregional cooperation,** intergovernmental alliances of the regional coalitions can include members of G20, ASEAN, APAC, and GCC states can work together in strengthening cross-regional cooperation to reduce the cost of global energy transitions. The proposed ASEAN–GCC framework for free trade and investment[49] is an example of a coordinated model to shape aid to non-G20 nations or organizations, and enhance South-South cooperation via the sharing of knowledge and information for energy planning.

[48] IEA (2023)
[49] ASEAN (2023)

4. Conclusion

SDG 7 aims for universal access to affordable, reliable, and sustainable energy, which is fundamental for economic growth, elevating living standards, and environmental conservation. This becomes especially critical in the context of SSWA, a subregion characterized by rapid energy demand and a diverse mix of economic and cultural profiles. Although countries like Bhutan, Bangladesh, and India have made significant advances in sustainable energy practices, many areas in the subregion still grapple with energy poverty and dependence on traditional, inefficient energy resources.

External challenges, particularly the triad of the Covid-19 pandemic, the geo-political tensions, and climate change impacts have underscored the complexity of achieving SDG 7 in the subregion. Rising energy prices and consumption, catalyzed by these events, act as a stark reminder that energy security and sustainability are not isolated goals, but ones deeply intertwined with global socio-political and environmental dynamics. Nevertheless, amidst these challenges, there exist lights of hope. The noteworthy investments by countries like Bangladesh and India in renewable energy sources, Bhutan's remarkable achievement of zero carbon emissions, and innovative off-grid solutions reaching the most remote locales exemplify the subregion's potential and commitment to the SDG 7 vision.

A multi-pronged approach is required to accelerate progress towards achieving SDG 7 and mitigate the aforementioned challenges. Harnessing innovations and technology can catalyze the required transformations, making energy solutions more accessible and efficient. Also, financial institutions and multilateral entities must be more proactive, fostering collaborations to support the energy transition in SSWA. Furthermore, subregional cooperation is important in ensuring affordable clean energy. By sharing best practices, leveraging collective strengths, and collaboratively navigating the complex energy landscape, the SSWA subregion can ensure equitable access to affordable, reliable, and sustainable energy for all, ultimately realizing the aspirations of SDG 7.

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