

Slow Advancements in Sustainable Energy

Taking stock of SDG 7 progress in Asia and the Pacific



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Summary

The Asia-Pacific region is falling short on achieving many aspects of Sustainable Development Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all. A rapid acceleration of national efforts is needed to increase access to electricity and clean cooking methods, enable the uptake of renewables at greater shares, and deploy at scale energy efficient systems and technologies across sectors.

Notable efforts have been made across the region to expand access to electricity through the extension of national power grids and the provision of off-grid energy solutions. Although the data suggests that universal access to electricity is within reach, significant efforts are needed to close the gap of approximately 126 million people, mostly located in rural areas and poorer nations, who remain without an electrical connection. At the same time, many households with a connection face inadequate, unreliable, or unaffordable service, limiting the socioeconomic benefits that can be realized from electricity use.

Clean cooking is beginning to gain widespread attention by policymakers, but achieving universal access at the regional level by 2030 is highly unlikely. An estimated 1.3 billion people continue to rely on dirty and polluting fuels and cookstoves, with significant health implications, particularly for women and children. The most recent years have seen a falling number of people transition to clean cooking, a reversal of a previously improving trend. Several examples of national policies and initiatives to switch households to clean options, such as LPG or electric cooking, demonstrate the ability of governments to enact change in this sector. However, reaching the poorest households, and supporting them to make a complete shift to clean options, will require addressing the affordability barrier.

Significant strides have been made in the development and deployment of renewable energy in recent years, particularly wind and solar. Thus, the share of renewables has begun to increase. However, new capacity is concentrated in a handful of countries, while the scaling of renewables remains a technical and financial challenge to many. Outside the power sector, renewable energy remains insignificant. Many renewable energy targets are not being met, and, at the same time, regional policymakers are far from abandoning fossil fuels. Recent economic slowdowns and fuel price increases have led some nations to ramp up domestic production and use of fossil fuels. Net zero targets remain sufficiently far in the future, many economies face increased debt burdens related to the COVID-19 pandemic, and recent price increases and inflation have left policymakers grappling with pressing social and economic concerns, putting into question the amount of attention renewables will be paid in the immediate term.

Energy efficiency, which can play a major role in meeting growing energy demand, achieving climate objectives, increasing economic efficiency, and mitigating the impact of elevated energy prices, has not been scaled to the levels needed to realize its considerable benefits. Measures such as the introduction of minimum energy performance standards and labeling are supporting progress, but the regional rate of energy intensity reduction continues to slow as the global rate of improvement needed to achieve SDG 7 increases. Greater focus is needed on developing national strategies for scaled energy efficiency efforts, along with the electrification of end uses, including transport.

Asia-Pacific countries face a multitude of challenges in achieving their national and global sustainable energy goals. Yet, more ambitious approaches are needed to achieve SDG 7 by 2030. The inclusive intergovernmental platform offered by ESCAP offers opportunities for open dialogue and information exchange, while ESCAP's knowledge products, technical assistance and capacity-building services can support nations to accelerate their energy transition.

Abbreviations

ASEAN	Association of Southeast Asian Nations
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ESCO	Energy service company
EV	Electric vehicle
GDP	Gross domestic product
GW	gigawatt
Kg	kilogram
LPG	Liquid Propane Gas
MEPS	Minimum energy performance standards
NDC	Nationally Determined Contribution
PMUY	Pradhan Mantri Ujjwala Yojana
SDG 7	Sustainable Development Goal 7

I. Introduction

The COVID-19 pandemic ushered in a widespread contraction of Asia-Pacific economies, and heavily disrupted the energy sector, particularly with the slowdown of industrial activities and transportation. Many governments provided financial support to households, subsidizing electricity and LPG to maintain affordability for consumers as businesses and livelihoods were also threatened. At the same time, energy providers experienced reduced revenues as energy consumption plummeted, sending some into financial distress. While the gas and oil sectors struggled over the past couple of years, the renewable energy sector proved to be highly resilient.

As the impacts of the pandemic wane, economies are rebounding, with many seeing energy consumption surpassing pre-pandemic levels. Renewables and energy efficiency gained the attention of many governments as part of stimulus and recovery packages, and COP 26 brought on a wave of new clean energy targets and net-zero commitments. Still, investments have not increased significantly, and recent spikes in energy prices have prompted a deepened emphasis on domestic energy production, including fossil fuels, to increase energy security.

The conflict in Ukraine has brought on a new wave of uncertainty for a sustainable energy transition. Economies highly exposed to increases in global coal, oil and gas pricing are suffering trickle down

effects, seeing costs rise not only for energy, but also for food, fertilizers and trade-related transport. For many nations, economic recovery is expected to slow with economic stresses experienced across multiple sectors; all at a time when greater commitments and accelerated actions are needed to meet the SDG energy access, renewable energy, and energy efficiency targets by 2030, and to achieve net zero by mid-century as set out in the Paris Agreement and Glasgow consensus.

Energy affordability is a rising concern for both households and nations, and even more than before, poorer nations will be reliant on international financial and technical support to advance the sustainable energy agenda. Prior to the Ukraine crisis, fiscal spaces were already highly constrained from compressed economies and increased debt burdens from pandemic-recovery borrowing. COVID-19 remains a threat, and with the recent sharp rise in energy prices, the critical social and economic challenges that governments must face have only expanded. Without adequate support, nations are likely to fall back on existing energy development strategies unaligned with achieving SDG 7 and the Paris Agreement.

II. SDG 7 Progress

A. The region continues to advance toward universal electrification, but needs to target higher tiers of access

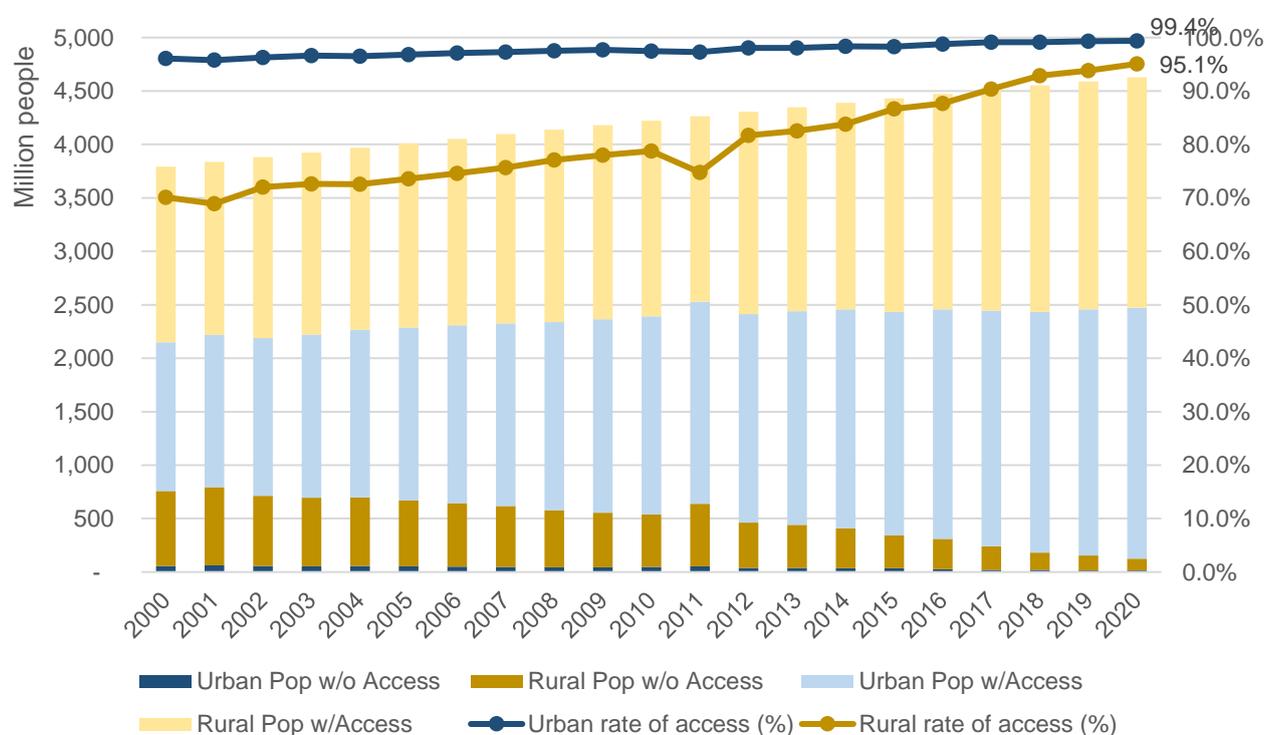
Amongst the target objectives of SDG 7, electrification is the area where the Asia-Pacific region has made the strongest gains. In 2020,

the regional rate of access to electricity reached 97.3 per cent, and universal access by 2030 is within reach.

The electrification of urban areas continues to inch closer to universal access, reaching 99.4 per cent in 2020, while headway is being made in rural areas, which stood at 95.1 per cent that same year (figure 1). The number of people in the Asia-Pacific region who remain without an electrical connection is approximately 126 million people, with this remaining deficit concentrated in low and lower-middle income countries, mostly in rural areas.

Electrification in urban areas is nearly universal, and gaining in rural areas.

Figure 1: Urban and rural populations with and without access to electricity, rates of access, 2000-2020



Source: World Bank and ESCAP

Government efforts have expanded electrification

Many nations of the region have demonstrated notable accomplishments. Several large population countries are well on track to achieve universal access, including Bangladesh, India, Indonesia and the Philippines. At the same time, rapid progress has been made in a number of large deficit countries, allowing them to achieve, or move closer to universal access. Timor-Leste is the region's fastest electrifying nation (figure 2), and raised the national access rate from just 38 per cent in 2010 – near the bottom regionally – to 96 per cent in 2020. Still, some nations continue to struggle, and efforts need to be increased in countries such as Pakistan, Myanmar and the Democratic People's Republic of Korea.

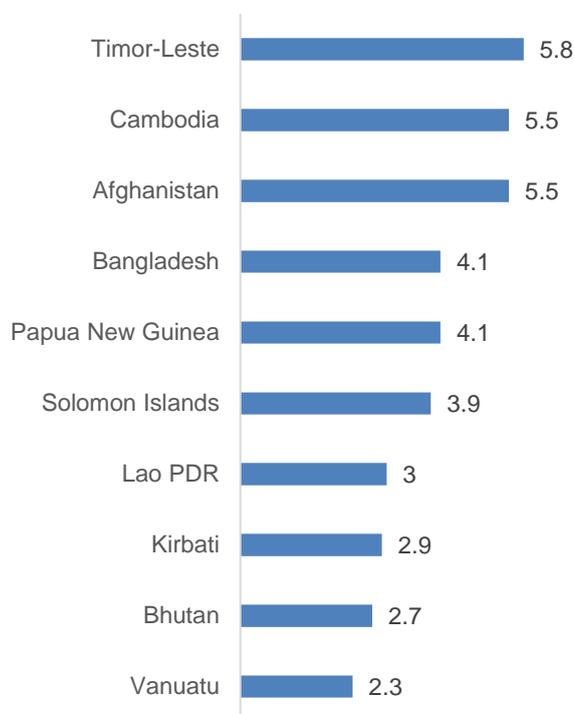
The growing rates of electrification can be attributed to significant government efforts to expand and upgrade national power grids, while introducing, often with the help of the private sector, decentralised household and community systems in hard-to-reach areas. Additionally, the rising rate of urbanization has brought more people to densely populated and more easily-connected regions. In 2000, less than four out of ten people lived in cities. By 2020, that had risen to more than five out of ten.

End-of-line and off-grid households remain the largest challenge

Since the mid-2000s, the average number of people gaining access to electricity has held relatively steady, with the majority located in urban areas. However, the most recent period of 2018-2020 has shown a slowdown (figure 3), which can in part be explained by the increasing difficulty and investment needed to reach similar numbers of people in increasingly dispersed and remote locales.

Rapid progress has advanced several economies toward universal access.

Figure 2: Top ten countries for annualized increases in electrification 2010-2020 (per centage points)



Source: World Bank

Reaching end-of-the-line and off-grid households of the region with adequate, reliable and affordable electricity is the greatest challenge to achieving universal access. While many successes have been recorded with the implementation of decentralised household and community systems, such as solar home systems and mini-grids, the remaining challenges to providing high quality energy services in these regions are many. The long-term, sustainable operation of rural decentralised systems, and the provision of more than the lowest tier levels of energy access have proven difficult in some contexts. The many different public, private and international actors in the rural and decentralised electrification sector has introduced numerous business models and technical approaches, even within the same country. A lack of service and equipment standards makes the bundling of regular maintenance activities for systems spread across regions difficult and financially inefficient, and leaves communities vulnerable to the business failures of small operators and suppliers.

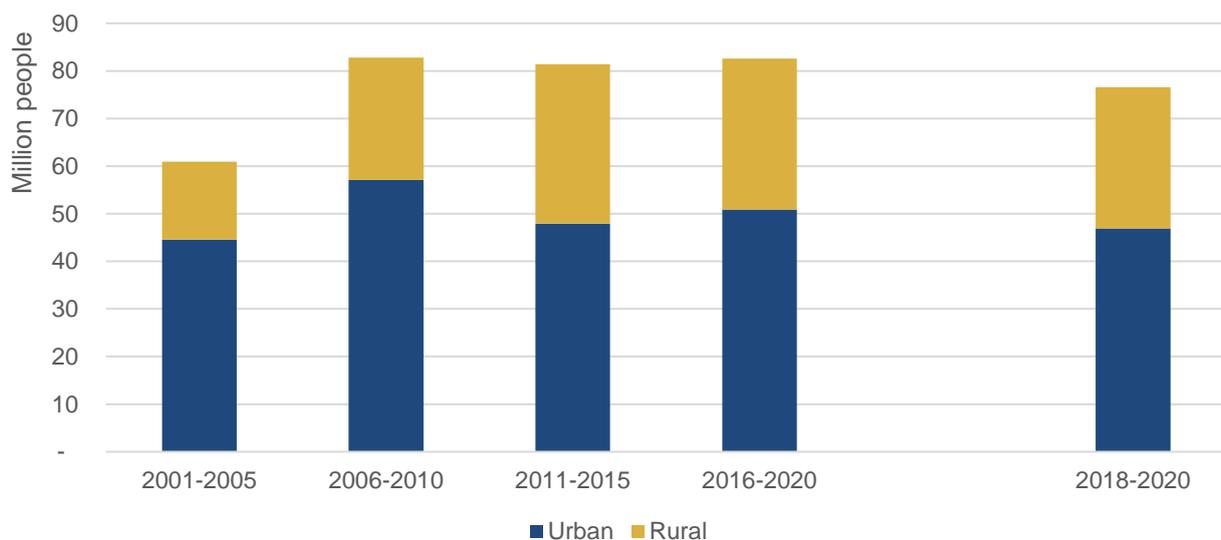
The sustained business operations of small energy systems, which struggle to operate profitably in low-demand settings, is often tied to the ongoing support of donors or service subsidies. Service and equipment providers that lack profitability may cease operations, leaving households or communities without access to maintenance services or needed replacement parts. While the success of new electrical connections is recorded, the failure of those connections is often not. In addition, communities considered electrified, but facing operating and maintenance challenges are likely to experience barriers in gaining further investments. This has been the case in some regional communities where programmes invested in renewable mini-grids but failed to fully plan for long-term operation, leaving households to revert to old technologies or acquire their own solar home systems when the mini-grids failed.

Beyond connections, higher tiers of energy access are needed

As the region moves toward universal access, it is important that policy attention be paid to assuring equitable and high-quality access. Even if a household is considered electrified, the quality and affordability of the energy service may fall short of levels needed to meet social and economic development needs. Rural areas are more prone to outages, while decentralized systems may be low capacity or experience extended outages as operators encounter operational or maintenance challenges. These areas often also pay higher rates for lower tiers of electricity access, further widening both the affordability and the socioeconomic opportunity gaps. Expanded national electrification plans are needed that target both affordability and achieving upper tiers of energy access, with special attention for off-grid communities and households where energy access challenges are most pronounced.

Annual electrification gains remain generally steady and favour urban areas.

Figure 3: Asia-Pacific urban and rural populations' average annual gains in electrification



Source: ESCAP based on World Bank

B. New approaches are emerging to address the extensive clean cooking challenge, but the transition is too slow

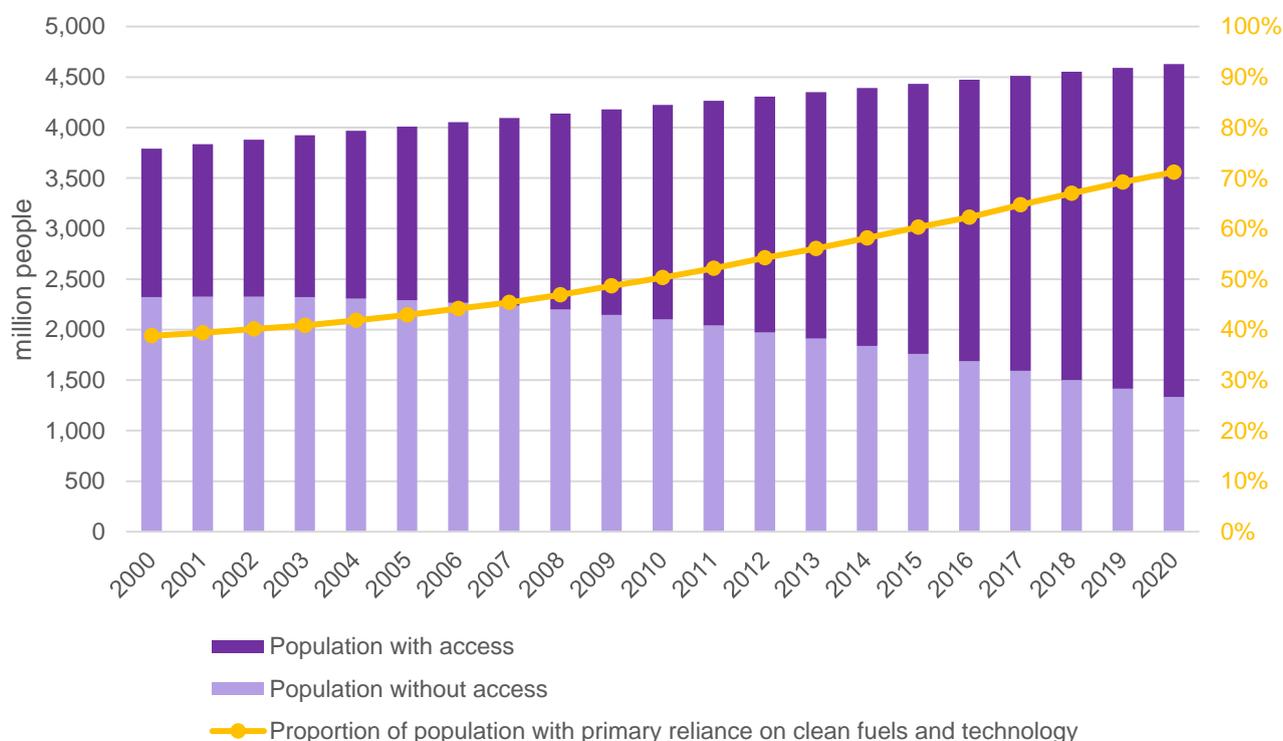
Access to clean cooking fuels and technologies is finally beginning to gain widespread attention amongst Asia-Pacific policymakers. However, the complex and multi-faceted aspects of the clean cooking challenge – technology, household decision-making, cultural preference, affordability, and convenience –

combined with low levels of investment, mean that progress is slow and the region is far from being on-track to achieve universal access by 2030.

In 2020, primary reliance on clean cooking fuels and technologies (clean cooking) reached 71 per cent in the Asia-Pacific region (figure 4), in line with the long-term steady trend of slow improvement. Between 2015 and 2020, 622 million people gained access to clean cooking, and although the access gap is narrowing, in 2020, an estimated 1.3 billion people continued to rely on dirty and polluting fuels and cookstoves. As with electrification, the region's continued urbanization has played a role in raising the share of population transitioning to clean options. Clean cooking access rates correlate with development status and geographic attributes.

Despite rising population, the share of population with access to clean cooking is also gaining, but not fast enough.

Figure 4: Population with and without access to clean cooking, and access rate, 2000-2020



Source: ESCAP and World Bank

Clean cooking access rates correlate with development status and geographic attributes

National rates of access to clean cooking in the region generally correlate with the income levels. High income economies enjoy universal access, while poorer economies experience significant access deficits. Progress in upper middle income economies has been steady in recent years, reaching 82 per cent in 2020 (figure 5). Lower middle income economies are advancing at the region’s fastest pace as a group, though face a higher deficit share, closing in at 59 per cent. Low income economies face the greatest access gap, with just 32 per cent of the population reliant on clean cooking methods, along with a slow rate of progress. Difficult geography and small populations with low energy demand are hurdles to establishing energy distribution and cooking appliance supply chains. Small island developing States (SIDS), which have these two characteristics, can be considered amongst the most challenged economies in the Asia-Pacific region in terms of advancing clean cooking, as populations are small and

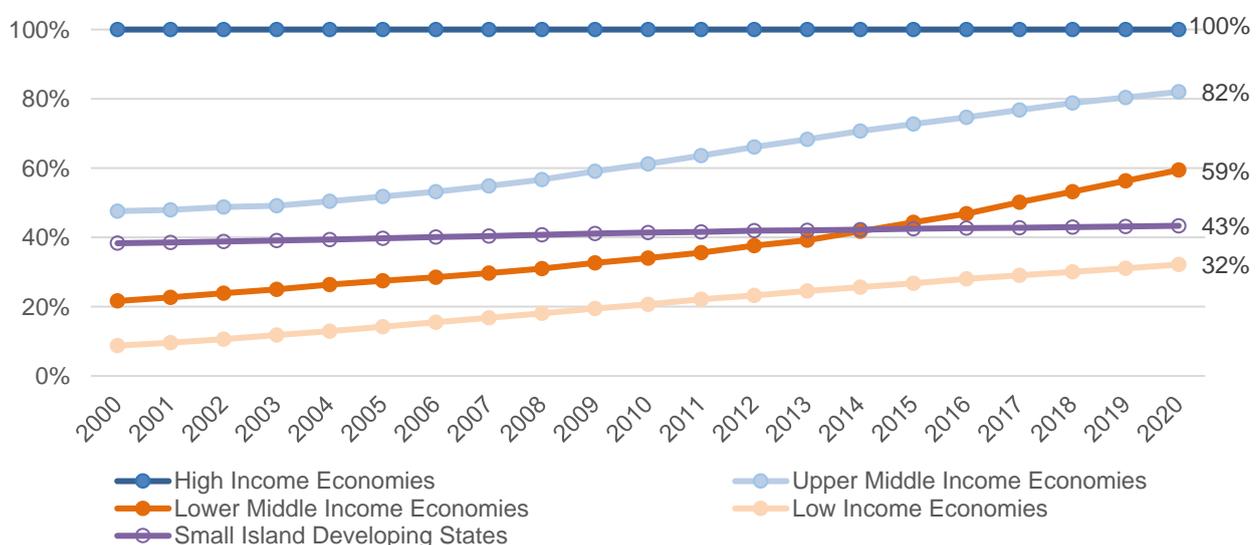
often dispersed across atolls. At the same time, these nations pay high prices for energy imports, raising the affordability barrier. The result is a flat rate of improvement.

Slowing progress in transitioning households to clean cooking

With large shares of populations to transition to clean cooking methods, and a narrowing timeframe for achieving universal access, efforts are needed to accelerate the uptake of clean cooking solutions, such as LPG, biogas and electric cooking. Instead, the number of people in the Asia-Pacific region who have gained access has declined in recent years (figure 6). In 2017, the estimated annual number of people who made the transition topped 136 million, but by 2020, had fallen to 118 million. And while the data has yet to demonstrate their impacts, the pandemic and recent increases in fuel prices have only added to the challenge. Households faced financial and logistical barriers as they went into lockdowns and supply chains were disrupted, sending many back to reliable but unhealthy traditional methods. Without a significant ramp up in the immediate term, hundreds of millions of people will remain reliant on polluting and unhealthy cooking fuels and technologies in 2030.

Access to clean cooking is stratified by economic development status.

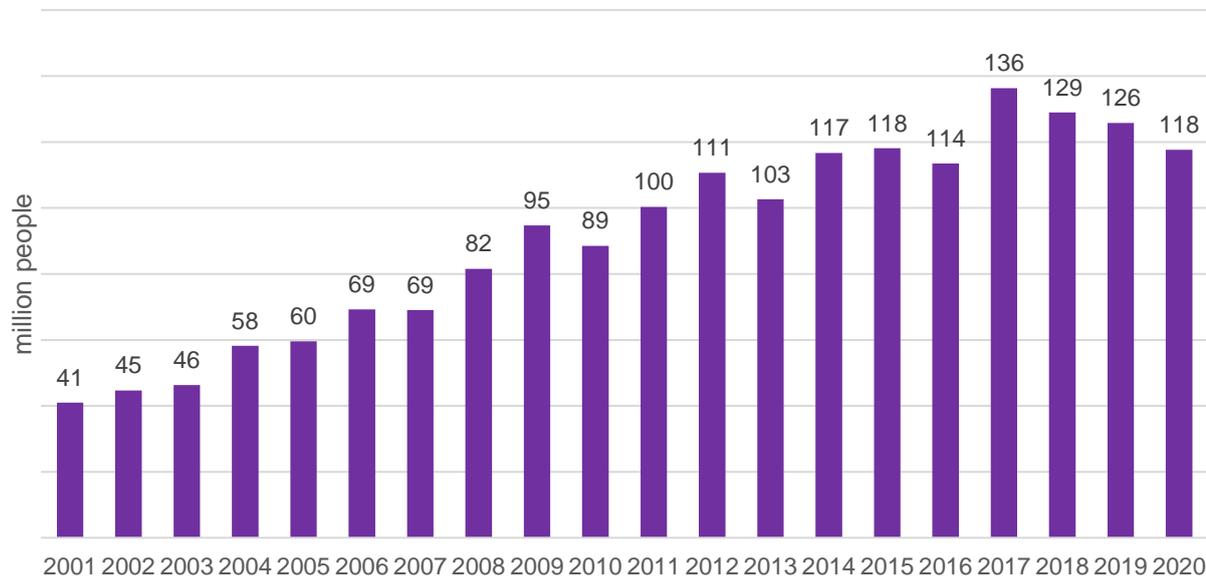
Figure 5: Proportion of population with primary reliance on clean fuels and technology, by characteristic group, 2000-2020



Source: World Bank

Annual number of people gaining access to clean cooking shows recent decline.

Figure 6: Annual Asia-Pacific gains in access to clean cooking, 2001-2020



Source: ESCAP based on World Bank

Affordability and continued fuel stacking are key barriers to be eliminated

The country with the largest clean cooking deficit in the region and globally is India, where 548 million people lack access. India is also the world's fastest improving nation, increasing access by an average of 4.4 per centage points between 2016 and 2020, and offers some valuable lessons for the region. The country's rate of progress can be attributed to the large-scale Pradhan Mantri Ujjwala Yojana (PMUY) initiative. Under the programme, low-income households receive a free stove, regulator and 5kg cylinder, along with the first LPG refill. In total, as of January 2022, one hundred million connections to LPG had been made, with women as the account holders.

While the programme has been a large success and provides an example of an innovative approach to the cooking challenge, the initial free connections have not been enough to sustain

LPG usage amongst a notable share of users. LPG cylinder refill rates suggest fuel stacking and the continued use of fuel wood, while, according to one study, 25 per cent of beneficiaries never returned for a refill. When fuel stacking continues alongside the use of a clean cooking method, health benefits are limited. Financial support, such as targeted subsidies, are essential to accelerating the transition to clean energy, along with greater efforts to support complete transitions for cooking, lighting and heating.

To help address the cooking affordability gap in India, distributors have introduced smaller, cheaper cylinders, which have been highly popular amongst PMUY beneficiaries, especially in times of elevated prices. Offering smaller cylinders is also a successful strategy used by companies in the Philippines to help low-income households make the transition to cleaner cooking methods. To increase cylinder refills, distribution companies throughout the region have begun to offer scheduled home deliveries to reduce the time and effort for households.

Electric cooking and biogas offer additional options

Electric cooking, previously considered unfeasible for widespread use, is emerging as a viable option as nations expand and strengthen power supplies and distribution. Electric cooking eliminates cooking-related indoor emissions and associated health risks, and, with a reliable power supply, also provides a high level of consumer convenience.

Electric cooking is gaining increased government support for several reasons. Nations with surplus power supplies, such as Nepal, Bhutan and Indonesia, are promoting electric cooking to address not only the power surplus, but also to conserve constrained foreign currency reserves, reduce dependency on fuel imports, and lower vulnerability to supply disruptions and fluctuating market prices. Nepal has set a target of 25 per cent of households reliant on electricity for cooking by 2030. Indonesia, well-regarded for its successful kerosene-to-LPG fuel switching programme that contributed to a rapid rise in clean cooking access, is now promoting an LPG-to-electricity stove switch by offering free induction stoves and electricity subsidies. India, under its “Go Electric” campaign is also promoting electric cooking.

For many Asia-Pacific countries, however, the key constraint to promoting electric cooking is weak power distribution systems, particularly in rural and remote areas. However, by addressing the capacity and reliability of grid systems, nations have the opportunity to advance energy access by simultaneously raising electricity access tier levels, while opening the door to the increased electrification of cooking.

Biogas is playing a role in rural areas where agricultural and livestock wastes are abundant. Cambodia, India, Lao PDR and Vanuatu are examples of nations with current programmes and targets for deployment of biodigester technologies to provide households and small businesses with waste-to-energy solutions. Biogas projects are also important to medium and large enterprises, with installations at livestock farms, agricultural processing facilities, landfills and solid waste

treatment plants. Still, with feedstock costs to consider and limited distribution capabilities, the application of biogas is largely constrained to on-site usage and where sufficient, low-cost waste feedstock is being produced.

A lack of standards slows progress

Insufficient focus has been paid to the development and distribution of highly efficient and affordable clean cooking appliances, and government support is needed to establish robust supply chains for clean cooking fuels and technologies. Appliance efficiency, and by extension operational affordability, lowered emissions, and health benefits, is critical. Yet, widespread government adoption of ISO standards for clean cookstove testing and performance, which align with WHO indoor air quality targets, has not occurred.

The most viable and affordable clean cooking options vary by locale and national context, but government support is needed in three key areas. Firstly, establishing standards for cooking appliances. Secondly, clean cooking planning. Nations in general have a poor grasp on the cooking needs of populations in different locales, and have not developed financing and subsidy mechanisms to support households to transition from traditional to modern energy. Thirdly, investment into clean cooking markets. Public private partnerships are needed to ensure that clean cooking energy and technologies reach households in a reliable, affordable, and convenient manner.

C. While some high and middle income countries are seeing fast growth, the region as a whole is falling short on renewable energy

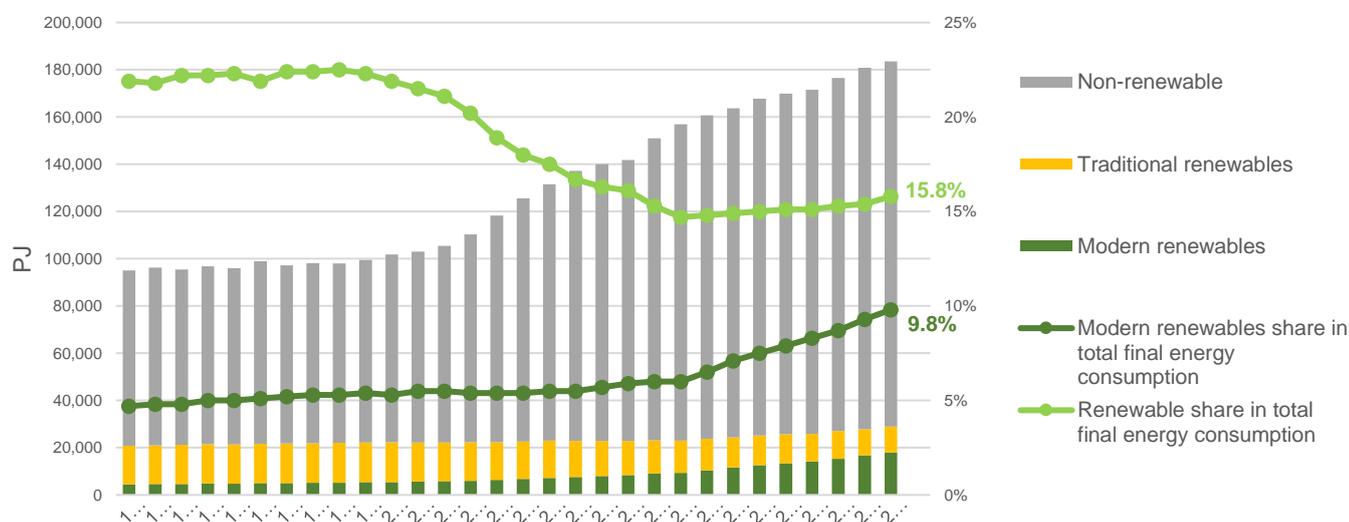
Asia and the Pacific has abundant renewable energy resources. However, until recent years, the renewable energy share of the Asia-Pacific region’s final energy consumption was on a steep downward trend as the region experienced rapid development largely fueled by coal, oil, and gas. Only when the use of modern renewable energy resources, such as hydro, wind and solar biomass began to ramp up, did the overall renewable energy use trend flatten and begin to rise. In 2019, modern renewable energy accounted for 9.8 per cent of total final energy consumption in the region, helping drive the total renewable share, including both modern and traditional forms, to a 10-year high at 15.8 per cent.

While renewables are rapidly being added to the power sector, renewable energy in the Asia-Pacific region remains concentrated in the heat sector, which includes both the traditional use of biomass in households, and modern applications, such as biomass-fired industrial heat and solar hot water. Decline in the use of traditional biomass has contributed to the overall drop in the share of renewables, but modern applications of renewables, particularly in the power sector, are now driving a clear upward trend in renewable energy consumption (figure 8).

A few countries, such as Indonesia and Malaysia, have pushed palm-oil based biofuel development for both domestic markets and export, helping the transport sector develop a small but growing share of renewable energy use. At the same time, the electrification of transport is starting to gain momentum, and has been boosted by recent high energy prices. In Thailand, surging crude oil prices are pushing up energy bills, prompting several key property developers to start including solar roofs and EV chargers in new houses.

Growth in modern renewables has reversed a decline in renewable energy’s share of energy consumption.

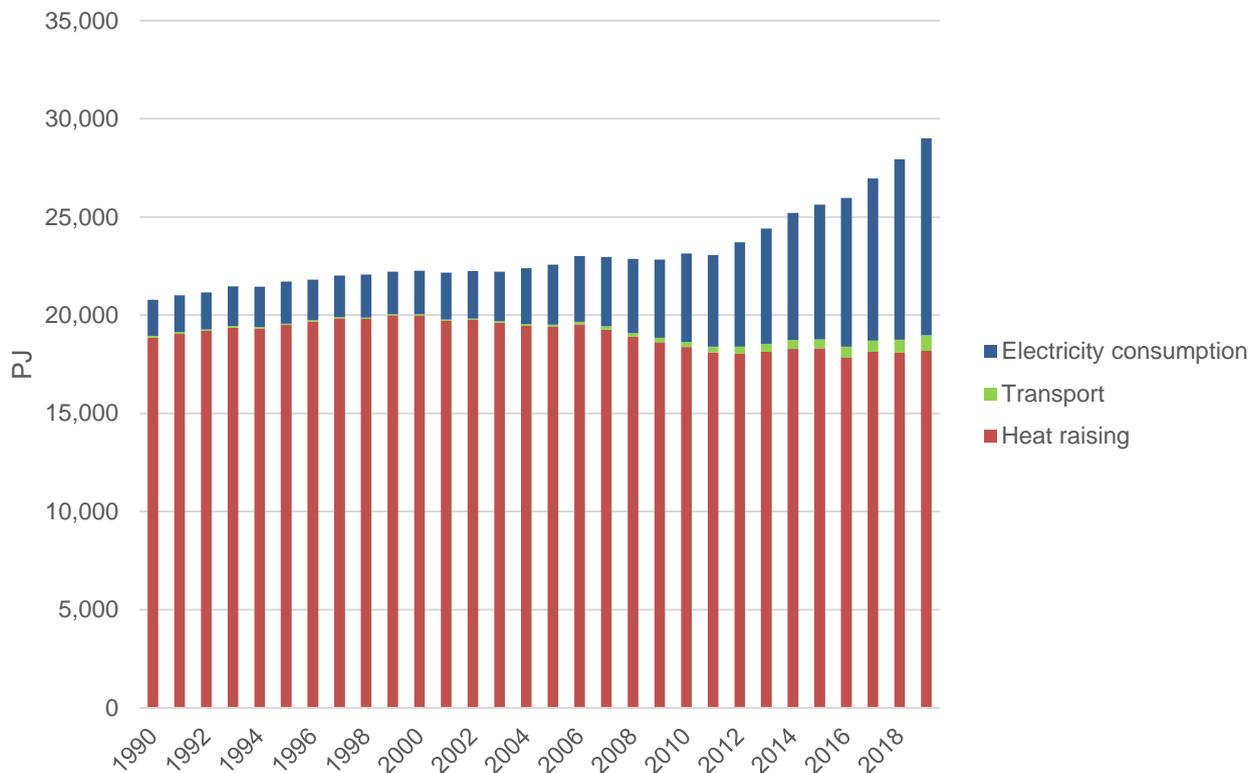
Figure 7: Asia-Pacific final energy consumption and renewable shares, 1990-2019



Source: IEA and UN Statistics Division

Renewable electricity drives the rise of renewable energy consumption.

Figure 8: Final consumption of renewable energy, by sector, 1990-2019



Source: IEA and UN Statistics Division

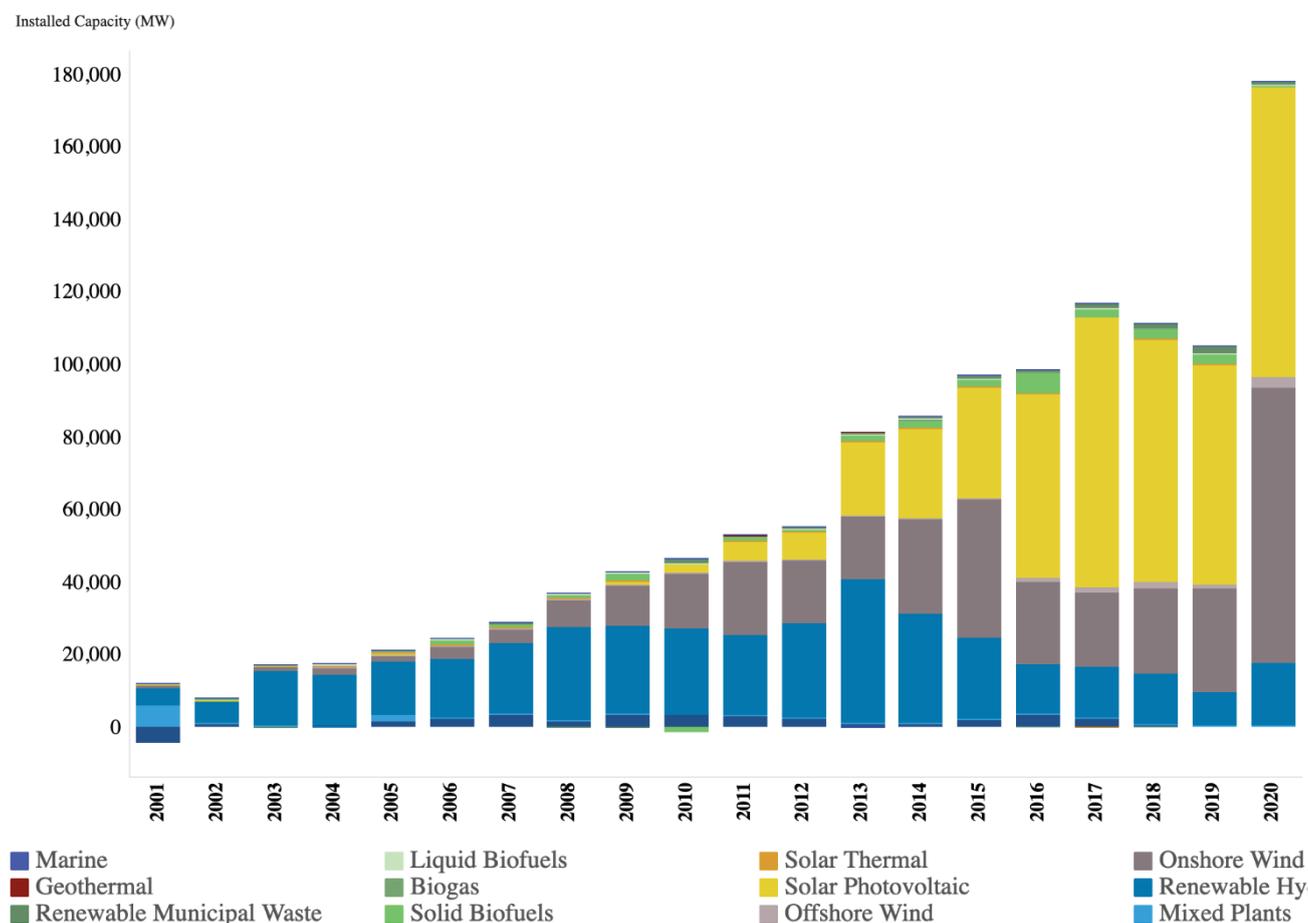
A shifting renewable energy mix

Hydropower has long formed the foundation of the region's modern renewable energy mix, and ongoing development has been strong. Due to hydropower installations, Turkey had the largest increase in modern renewable shares globally in 2019. However, as potential dam sites dwindle in number and climate change and shifting hydrological conditions are increasingly rendering

this energy source unreliable, hydropower development has slowed. Wind and solar now represent the greatest shares in new Asia-Pacific installed renewable capacity (figure 9). In 2020, for the first time, solar and wind combined cumulative capacity exceed hydropower (figure 9). This was in due to continued strong solar installations across the region and a jump in wind installations in China. That year, regional renewable energy installations were approximately 79 GW each for wind and solar, while hydro installations totaled 17 GW.

Wind and solar dominate renewable capacity additions.

Figure 9: Renewable energy net additions, 2001-2020



Source: IRENA

Renewable energy capacity development is concentrated in wealthier nations

China is both the global and regional powerhouse in terms of renewable energy technology development and deployment. In 2019, the nation consumed one-fifth of global modern energy and was responsible for more than half of new renewable energy generation. India and Turkey have also seen large scale installations in the recent period.

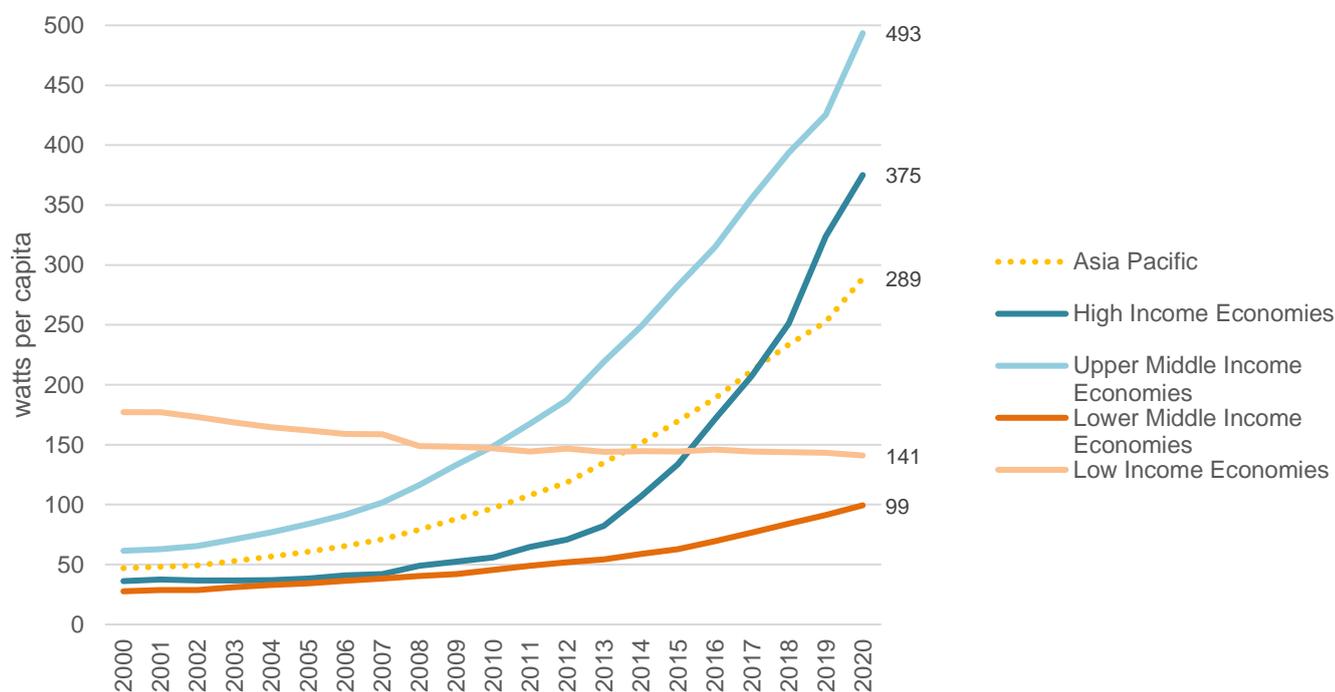
While per capita installed renewable generating capacity has increased more than six-fold for the Asia-Pacific region as a whole, a clear divide

exists in the pace of progress between wealthier and poorer nations. High income and upper middle income economies are experiencing rapidly rising renewable electricity generating capacity, while lower middle income economies are progressing at a slow rate, and low income economies are regressing (figure 10).

Poorer countries generally have few actors in the renewable energy space, limiting domestic technical and financial capacities. Therefore, investors are needed who can provide both the capital and the know-how. These countries must look to international players, but also compete with nations that may have better track records in terms of project implementation and credit worthiness.'

Poorer countries are struggling to increase renewable electricity generating capacity.

Figure 10: Per capita installed renewable electricity generating capacity, 2000-2020



Source: IRENA

In terms of investment, international financial flows to Asia-Pacific developing countries in support of clean energy research and development and renewable energy production fell significantly in 2019 for the second year in a row to \$3.4 trillion, the lowest level since 2010 and just over one third of peak investment of \$9.3 trillion in 2017.

Arriving at a point of investment readiness often means first investing in the institutional and technical capacities within a nation, identifying suitable areas for development, establishing mid-to long-term targets and plans for both supply and grid systems, and developing country-specific strategies to stimulate investment. While many Asia-Pacific nations are on the path to creating a favorable investment environment, others require support.

Cambodia has demonstrated how pilot projects can be used to test investment readiness. Lessons learned from a 2016 10 MW solar farm helped inform the development of a 100 MW solar park currently under construction. The park is the first of its kind in Cambodia, and at the time of auction, achieved the lowest ever tariff in South-

East Asia, helping kickstart a move from feed-in tariffs to competitive auctions in the region. Asia and the Pacific currently leads the world in renewable energy auctions.

Policymakers are far from abandoning fossil fuels

Growing pressures to take action on climate change, along with the increasing affordability of renewable energy, have led to energy development plans increasingly focused on the uptake of solar, wind, hydro and other renewable resources. However, the region has not turned its back on fossil fuels, which have served as the backbone of the region's economic growth. In 2020, in Bangladesh, China, Indonesia, the Philippines, the Republic of Korea, Thailand, Tajikistan and Viet Nam coal energy supplies reached nationally historic high levels.

China's 14th five-year plan (FYP) for the energy sector was released in March 2022, and while targeting the large scale installation of wind and

solar, the plan also looks to increase oil and gas production, while continuing the use of coal, including as a flexible power source to balance variable renewable energy sources.

The cost of renewable energy deployment continues to be a barrier for many countries. A 2022 survey of energy sector actors from South-East Asia illustrates some perspectives within the region. Despite evidence that solar, in most contexts, is cheaper and faster to deploy, thirty per cent of respondents answered that coal will provide the most affordable electricity in their country in 2022. Although solar and wind energy pricing has continued to fall, only 21 and 4 per cent of respondents replied that solar and wind would be most affordable, respectively. At the same time, half of respondents identified natural gas as a bridge to displace coal over the coming two or three decades.¹

Many factors influence the cost of renewable energy, such as land, financing labor and feedstock costs. More efforts are needed at the national level to better understand the business models that can efficiently deliver added renewable capacity in the most cost-efficient manner. At the same time, replacing fossil fuels in heat and transport sectors must receive greater policy attention, by learning from regional examples and exploring opportunities in both the direct and indirect use of renewables through the electrification of end uses.

Nations are falling short of renewable energy targets

While exceptions exist, much of the region is struggling to achieve renewable energy targets. For example, in South-East Asia, the aspirational 23 per cent renewable energy target for ASEAN regional primary energy and 35 per cent for electricity by 2025 are unlikely to be achieved. According to data from the ASEAN Centre for Energy, as of 2019, the renewable share of primary energy and installed capacity were 14 and 29 per cent, respectively.

In many cases, Asia-Pacific nations have

established clean energy targets in national plans, or within their submitted NDCs, without first having the necessary planning and policy alignment to achieve them. Targets are not enough, and without policy and investment alignment, the momentum of continued fossil fuel development will be difficult to slow, as 'South-East Asia demonstrates: coal, oil and gas are expected to comprise approximately 69 per cent of capacity additions in 2022. A clear need exists to recalibrate national and subnational targets to support NDC commitments, while building the planning and regulatory base needed to provide stable and predictable policy and investment environments.

The policy environment for renewable energy is mixed, but, promisingly, significant legislation and is underway in many countries. Updated NDCs and recently adopted net zero targets are expected to bring more ambitious clean energy strategies. For example, Indonesia is expected to pass its New and Renewable Energy Law in 2022, helping build a more predictable investment environment for the renewable energy sector. Cambodia has embraced clean energy as a means of building back better from the pandemic and is developing a 20-year Power Development Plan to increase renewables, while also ramping up energy efficiency across the country utilizing revolving funds.

Large, interconnected power grids are a key enabler to the uptake of more renewables in the power sector. Several Asia-Pacific nations are looking to increase connectivity between isolated national systems and neighboring countries. These efforts will help stabilize and provide flexibility to the power systems, thus allowing for larger shares of renewable energy, particularly variable sources such as solar and wind. For example, in Indonesia, a nation with abundant renewable energy resources, the state power utility has plans for a supergrid that includes inter-island and cross-border electricity interconnections that will intersect with the larger ASEAN Power Grid.

Addressing some of the region's investment and financing shortfalls are several new initiatives. The ASEAN Catalytic Green Finance Facility will help de-risk green infrastructure projects and mobilize public and private financing. At the same time, the

¹ ASEAN Centre for Energy (2022). ASEAN Energy in 2022: Regional Survey Results. Jakarta. Available at

<https://accept.aseanenergy.org/asean-energy-in-2022-regional-survey-results/>.

ADB-backed Energy Transition Mechanism is looking to utilize market-based approaches to support the early retirement of coal powerplants in the region. Other promising developments include the Regional Comprehensive Economic Partnership (RCEP), a free trade agreement between 10 South-East Asian economies and Australia, China, Japan, New Zealand and the Republic of Korea, which came into force in 2022 and is expected to support the energy transition with new levels of regional cooperation, strengthened trade, and expanded investment opportunities.

D. Energy efficiency is insufficiently deployed within Asia-Pacific economies

The Asia-Pacific region accounts for nearly two-fifths of the world's GDP and nearly half of energy consumption. It continues to gain shares in these areas and therefore plays a critical role in the achievement of the global energy efficiency target.

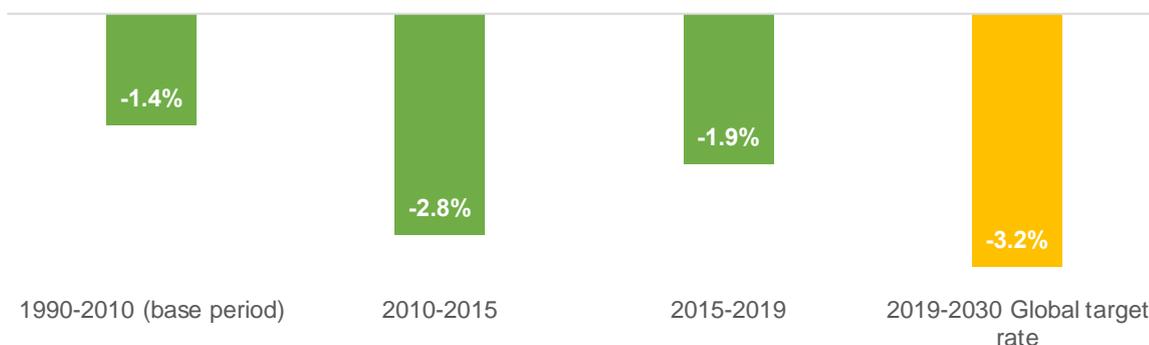
The rate of primary energy intensity improvement – defined as the per centage decrease in the ratio of total energy supply per unit of gross domestic product (GDP) – in the Asia-Pacific region has slowed in recent years. Thus, the global gap continues to widen between the present rate of progress and that which is needed to achieve the SDG 7 target of doubling the rate of global energy efficiency improvement by 2030. Without a significant acceleration of progress in energy efficiency, both the region and the World will fall short.

Because of slow progress, the global target rate for energy intensity improvement has been increased to 3.2 per cent annual improvement from 2019 to 2030. In terms of how Asia-Pacific nations have contributed to achieving the global objectives, between 2010 and 2019, only China, Indonesia, and Japan improved at a rate exceeding the global target, pointing to the need for other Asia-Pacific countries to focus more efforts on energy efficiency.

Energy efficiency is a cost-effective measure for freeing up energy supply, more of which is needed amongst the many economies of the region facing growing energy demand. Energy efficiency is also a key to decarbonization, and responsible for the largest share of emissions savings in scenarios related to limiting global warming to 1.5 degrees Celsius. In a post-pandemic recovery and high energy cost context, it is an important pathway to lowered energy use and costs, boosted economic productivity, and increased energy security.

The pace of energy intensity improvement has slowed, falling well short of the global target.

Figure 11: Asia-Pacific growth rate of primary energy intensity, by period, and global 2019-2030 target



Source: IEA and UN Statistics Division

However, in comparison to other aspects of the energy sector, energy efficiency has not been provided with the level of attention or implementation needed to realize its development benefits. Countries of the region are gaining ground in introducing minimum energy performance standards (MEPS) across equipment types, but more needs to be done to not only tighten standards, but also raise awareness of the benefits of high-efficiency choices through labeling, consumer awareness campaigns, and incentives for energy efficient choices.

Rapid growth in cooling demand and the use of inefficient technologies is putting a strain on some regional power systems. Much progress has been made in recent years to introduce standards and labeling for air conditioning and refrigeration. However, technology standards remain low in many contexts, while a lack of harmonized testing and labeling requirements between countries inhibits technology trade and development.

In addition, most Asia-Pacific governments lack robust data on cooling demand across subsectors – such as building space cooling, mobile air conditioning, and food and healthcare cold chains – preventing robust planning and policy development.

At the same time, the COVID-19 pandemic has raised barriers to the expansion of energy efficiency in the region, which has seen a decline in investment due to competing public sector interests. Investments in industrial and commercial sectors were constricted during the pandemic as economic activities were scaled back during lockdowns and supply chain disruptions impacted service and product delivery. At the same time, businesses facing financial hardships scaled back investments, while the erosion of credit worthiness of those businesses, due to lower economic activity, has made financing more difficult for some.

Challenges exist in delivering energy efficiency at scale

Energy efficiency deployed at scale with the support of government initiatives and incentives is necessary for nations to realize its many benefits. One means of energy efficiency delivery has been through ESCO-based models, but for many Asia-Pacific contexts, these have not resulted in the needed pace or scale of improvements. Challenges to ESCOs include lack of opportunity identification, financing hurdles, and skepticism among building and facility owners regarding investment returns. Small projects undertaken individually can be difficult to implement in a cost-effective manner. Performance-based models often employed by ESCOs can be problematic to finance based on low lender confidence and perceived high risks, while also leading to debates with owners on the calculation of cost savings.

Greater focus is needed on developing national strategies for scaled energy efficiency efforts. One pathway includes targeting large-scale projects or a series of similar facilities in a sector. For example, China has achieved impressive industrial energy savings by first applying energy performance requirements to the largest operators in a sector, followed by the introduction of requirements to smaller actors. Across industries, benchmark performance levels have been regularly adjusted to meet increasingly ambitious energy efficiency targets. Under the country's recently released 14th five-year plan for the energy sector, the country is looking for a significant increase in energy efficiency and plans to lower its energy consumption per unit of GDP by 13.5 per cent during the 2021-2025 period, in part through a new series of sector targets.

Projects focused on a standardized approach to improving or replacing consistent technologies that can be aggregated, for example municipal street lighting, boilers for industries, and motors, is another approach. Rather than projects focused on, for example, a single residential development, focusing on the entirety of a real estate portfolio, or all residential buildings of a certain profile in a district enable a large-scale initiative. In these cases, bulk procurement can offer savings that lower investment

risks. India offers an example, whereby it has used bulk procurement to purchase and make available energy efficient light bulbs, motors, and air conditioning units at significantly reduced costs.

As nations look to economic recovery and grapple with high energy prices, energy efficiency offers an important opportunity. Some of the key advantages of energy efficiency is that most aspects are based on existing, proven technologies, that can be deployed relatively quickly and are available to all.

Electric transport is poised to improve transport efficiency

Electric and hybrid electric vehicles generally provide higher fuel-equivalent efficiency over conventional counterparts, while also offering emissions, air quality and potential renewable energy storage benefits. Many Asia-Pacific nations are mobilizing toward the adoption of e-vehicles (EVs), including light-duty passenger cars, medium and heavy-duty commercial trucks, and two- and three-wheeled vehicles. Present high fuel prices and growing energy security concerns are giving EVs an additional boost.

Leading global market is China, which produces more than half of the world's EVs, and plans to grow its electric fleet by 36 per cent from 2021 to 2025. The country is also a global leader in electric bus and commercial vehicle manufacturing. The nation has one of the world's most extensive charging station networks, but manufacturers are also mainstreaming battery-swapping for passenger and commercial vehicles, helping address one of the main barriers to uptake – convenience. The comparatively high purchase cost of EVs, also an obstacle for consumers, is being addressed by a key player in the Chinese EV market, which sells cars without batteries and instead offers a battery-as-a-service subscription, lowering both upfront and operational costs.

In India, the “Go Electric” campaign aims to boost confidence in electric vehicles, and EV policies

are being drafted in a number of Indian States. Charging and battery-swapping stations are set to expand in the capital city, while a solar-based EV charging station and plans for the installation of regular stations along the Delhi-Chandigarh highway have created the nation's first e-vehicle friendly highway under the FAME-1 (Faster Adoption and Manufacturing of (Hybrid) & Electric Vehicles in India) scheme. At the same time, EV investments at several airports in the country are transforming commercial fleets and helping push these facilities toward net-zero.

In Indonesia, motorcycles are more numerous than cars, and state-owned oil and gas companies and EV manufacturers are looking to cooperate to develop electric motorcycles and EV battery swapping networks. In Malaysia, a highway operator and the country's power utility are looking to create a network of electric vehicle charging stations.

III. Policy Responses and Recommendations

I. Aim for higher-tier levels of electricity access

An electrical connection is just an initial step in meeting the energy access challenge. Realizing the full social and economic benefits of electricity requires the provision of sufficient capacity, continuous service, reliability, and affordability. Governments should establish plans that work toward the provision of upper tier levels of electricity access.

II. Standardize off-grid electricity supply technologies and business models

Off-grid systems face a number of challenges in the provision of high-quality energy services. Standardization of technologies and business models can facilitate scaled service delivery and ongoing operational and maintenance business models.

III. Consider electric cooking options in parallel with electrification

As power grids are expanded and strengthened to reach distant regions and accommodate renewable power supplies, electric cooking is becoming a more viable solution to the clean cooking challenge. Integrating electric cooking into grid planning and energy access efforts can support the efficient delivery of energy access targets.

IV. Establish standards for cooking appliances aligned with WHO indoor air quality targets

To achieve the needed health benefits for households, especially women and children, Governments should seek to align cooking

appliance standards for efficiency, emissions, safety and other qualities with those developed by the International Organization for Standardization (ISO), which also meet WHO indoor air quality targets.

V. Synchronize renewable capacity and grid development planning and implementation

The smooth integration of variable renewable energy requires strengthened grid systems. Synchronized planning and implementation can help avoid challenges faced when variable renewable capacity development outpaces the grid's ability to balance new supply.

VI. Promote end-use electrification, renewables in transport and heat raising

Electrification of end uses is one of the easiest means of decarbonising economies, and leverages the strides made in introducing renewables to the power supply, while also allowing for overall efficiency gains.

VII. Re-calibrate national and subnational targets to align with NDC commitments

Achieving SDG 7 and NDC commitments requires the alignment of policies and targets at national and subnational levels. In addition, the multifaceted and integrated nature of sustainable energy and climate objectives requires cross-sectoral collaborative approaches that bridge various government agencies.

IV. Conclusion and Way Forward

Greater commitments and actions through regional cooperation are needed to achieve SDG 7

The region stands at a critical point where the energy pathways chosen in the post-pandemic period will determine whether SDG 7 is achievable by 2030. Despite the fact that the pandemic and high energy prices have reduced fiscal spaces and shifted policy priorities to economic recovery, greater commitments and actions for sustainable energy are needed.

However, countries are not uniformly equipped with the policies, capacities, or financing mechanisms needed to support accelerated progress. At the same time, vulnerable economies are likely to be left behind in the energy transition unless they receive increased support. This is where regional cooperation can play a facilitating role.

Asia-Pacific nations face common energy challenges, and increased cooperation, open dialogue, and information exchange can contribute to speeding up the pace of the sustainable energy transition. Regionally, ESCAP is the most inclusive intergovernmental platform, and supports

sustainable energy with knowledge, technical assistance, and capacity-building services linked with the implementation of global and regional objectives. ESCAP is also facilitating SDG 7 roadmap development. To date, nine nations and a number of municipalities have undergone energy and emissions modeling, and economic and policy analysis to determine the best pathways forward for advancing energy access, renewable energy, and energy efficiency within unique national and subnational contexts. Additionally, in 2022, the Indonesia G20 presidency offers prospects for greater regional and global cooperation through its prioritization of the energy transition with focuses on energy access, technology and financing.

The current global state of affairs has placed multifaceted pressures on policymakers that may encourage continued reliance on existing models of energy policy and planning. However, not orienting toward modern, sustainable and equitable energy systems will likely prove to be a major disadvantage in the long-term. Achieving SDG 7 is a monumental task, but the growing know-how and increasing number of support mechanisms available to nations means less risk exists in adopting more ambitious policies and plans for action.

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