Financing clean energy transitions in Asia and the Pacific

Note by the secretariat

Summary

Mobilizing investment in support of efforts to achieve Sustainable Development Goal 7 is crucial if the region is to implement the 2030 Agenda for Sustainable Development and fulfil its climate ambitions. Governments can support the mobilization of such investment by reducing barriers and enhancing the risk and return profile of clean energy projects, as well as by promoting the use of catalytic financing tools. Improving access to finance, particularly for underserved markets and technologies, requires enabling policy environments that are comprehensive, cohesive and predictable, alongside the active engagement of the private sector and financial market participants.

In the present document, several priorities and opportunities are identified to enable member States to finance clean energy transitions in line with national commitments. Participants in the Third Asian and Pacific Energy Forum may wish to review the findings and recommendations contained in the document and provide guidance on the future work of the secretariat.
I. Introduction

1. The mobilization of investment and finance is critical for achieving the Sustainable Development Goals and putting energy systems on more secure and sustainable pathways.

2. In 2019, the Economic and Social Commission for Asia and the Pacific (ESCAP) estimated that an additional $1.5 trillion in investments would be required every year in order to meet the Goals by 2030, compared with the baseline scenario.\footnote{Economic and Social Survey of Asia and the Pacific 2019: Ambitions beyond Growth (United Nations publication, 2019).} This investment gap translates into roughly one dollar per person per day, or 5 per cent of the region’s gross domestic product (GDP). For the least developed countries, the gap was found to be much higher, at 20 per cent of GDP.

3. Investments in efforts to provide affordable and clean energy for all (Goal 7) accounted for over $0.4 trillion, or nearly 30 per cent of the investment gap. With energy contributing 80 per cent of the region’s greenhouse gas emissions, investments made to achieve Goal 7 are clearly also linked to success in climate action (Goal 13).

4. It is urgent to mobilize investments for clean energy transitions. While more clean energy technologies can now be deployed more cheaply than in the past, persistent underinvestment in some areas combined with rising sustainability ambitions and energy security concerns have kept investment gaps wide. Notably, 39 member States have adopted net zero or carbon neutrality goals, which entails a comprehensive transformation of their energy systems.

5. In the present document, the secretariat has assessed that the regional annual energy investment gap will be around $0.8 trillion by 2030. Addressing the cost and availability of financing is a crucial aspect of mobilizing investments. Energy transitions involve a shift from spending on fossil fuels to spending on capital-intensive clean technologies, the economics of which are more sensitive to financing costs. But financial conditions have tightened globally, and fiscal resources are often constrained. While there is no shortage of global capital, there is a shortage of clean energy investment opportunities with adequate risk and return characteristics. Investment-grade policies and approaches that create bankable pipelines of projects and crowd in private capital are essential.

6. In the present document, the secretariat aims to provide an update on the financing of clean energy transitions in Asia and the Pacific. It takes stock of the latest investment and financing trends and projections for putting the region on a sustainable pathway. It assesses key energy investment and financial system issues and suggests priorities and solutions for addressing them.

II. Energy investments and financing: trends and outlook

7. In recent years, Asia-Pacific economies have boosted investments in the energy sector, despite a downtick in 2020, to nearly $1.2 trillion in 2022. Since 2015, the rise has been led by investments in renewable power, the capital spending for which has more than doubled, and end-use sectors, including those aimed at improving the efficiency and availability of electric...
vehicles. Investments in clean energy now make up two thirds of all investments in the energy sector, up from less than half in 2015. In 2022, the Asia-Pacific region accounted for 45 per cent of global energy and nearly half of global clean energy investments.

8. Nevertheless, capital expenditures remain insufficient and misaligned with regional sustainability goals. Nearly 15 per cent of investments are in coal-related sectors – mining and coal power generation – for which Asia and the Pacific accounts for 90 per cent of the world’s spending. Electricity grid investment – a critical enabler for the adoption of renewables – has fallen over the past decade. Moreover, much of the progress that has been made in clean energy investments has been concentrated in just a few markets. For example, in China, investments in clean energy account for over 70 per cent of all investments in the energy sector, while in the rest of the region that proportion is less than 60 per cent on average.

9. Under all scenarios, energy investments in Asia-Pacific countries will need to rise substantially from today’s levels to meet energy security and sustainability goals. However, the diversity of the economies in the region, the heterogeneity of modelling approaches and data constraints create challenges for presenting comprehensive and comparable regional outlooks. In the present document, the secretariat has assessed investment estimates from publicly available sources. Baseline energy investment projections for Asia and the Pacific – from scenarios based on current and planned policies – point to regional annual energy investment rising to between $1.5 trillion and $1.6 trillion by 2030 (figure I). Meeting Goal 7 targets and aligning economies with net-zero emissions objectives, however, require annual energy investments to grow to between $2.2 trillion and $2.4 trillion by 2030, with 90 per cent of these investments to be made in clean energy, depending on the pathway and level of ambition.

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2 These estimates have been calculated by downscaling global investment projections in line with recent data for Asia and the Pacific.
**Figure I**
Investments in energy in Asia-Pacific countries 2015–2022 and projected estimates for 2030


**Note:** Historical levels of energy investment are estimated based on data for the IEA “Asia-Pacific” and “Eurasia” regions, which are not fully aligned with the ESCAP “Asia and the Pacific” region.

10. In the present document, the secretariat calculates that the regional annual energy investment gap will be around $0.8 trillion by 2030. Capital spending would need to double by 2030 compared with 2022 levels to meet ambitious climate goals.

11. To put these numbers in context, in 2019, ESCAP found that, in emerging and developing Asia-Pacific economies, the investment gap for achieving Goal 7 would be equal to $434 billion annually by 2030. Based on its sustainable development scenario, in 2021, the International Energy Agency (IEA) calculated that this would mean an additional $10 billion for universal access to electricity, $2 billion in clean cooking solutions, $242 billion in renewable energy and $180 billion in energy efficiency. Under that same scenario, IEA projected that investments in energy in those economies would

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3 *Economic and Social Survey of Asia and the Pacific 2019.*
amount to around $1.2 trillion by 2030, with 85 per cent of that amount going to clean energy.  

12. More recently, IEA has estimated that, under its net-zero emissions by 2050 scenario, the global energy investment gap would reach around $1.7 trillion annually by 2030, that capital spending would be over 50 per cent higher than under its stated policies scenario and that clean energy would receive 90 per cent of all energy investments in 2030.  

13. The International Renewable Energy Agency has estimated that, under its 1.5°C scenario, the global energy investment gap will amount to $1.7 trillion annually to 2050, which is nearly 50 per cent higher than under its planned energy scenario. Of the $4.3 trillion in clean energy investments needed annually until 2030 to keep temperatures from increasing by no more than 1.5°C above pre-industrial levels, almost 45 per cent is projected to be in renewable power and grids and nearly 55 per cent in end-use sectors and in improving efficiency, with a small share going to the generation of clean hydrogen and carbon capture.  

14. In an analysis that is more targeted in terms of geographic and sectoral scope, the Asian Development Bank has estimated that, under its accelerated net zero pathway scenario, investments in the supply of clean electricity in developing Asian countries will be $0.7 trillion annually between 2020 and 2050, i.e. one third higher than under its current policies scenario and 50 per cent higher compared with 2021 levels.  

15. In addition to identifying how much investment is required, it is also important to understand the sources of such financing in order to encourage the flow of capital with appropriate characteristics. Sources of financing are defined by:  

(a) Type of structure: whether an investment appears on a company or consumer balance sheet and is financed from retained earnings or corporate financing or whether it does not appear on a balance sheet and is financed through a project or third-party arrangements;  

(b) Type of instrument: the mix of debt and equity that developers, households and companies use to structure the investment, as well as any grants or guarantees that are used to enhance an instrument’s bankability;  

(c) Type of provider: whether the investment comes from private sources (e.g. companies, commercial banks, investors or consumers) or public sources (e.g. State-owned enterprises or public financial institutions);  

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4. IEA, Financing Clean Energy Transitions in Emerging and Developing Economies (Paris, 2021). In this publication, IEA refers to three forward-looking scenarios: the net-zero emissions by 2050 scenario, the sustainable development scenario and the stated policies scenario (for more information on those scenarios, see pp. 23 and 24 of the publication).  


8. IEA, Financing Clean Energy Transitions in Emerging and Developing Economies.
(d) Origin of provider: whether the investment comes from inside or outside the country receiving the investment.

16. While the public sector continues to play a key role in funding the enabling infrastructure and providing incentives, most financing for clean energy will need to come from private sources. Over the past decade, in fact, private capital has financed half of all climate change-related investments.\(^9\) IEA estimates that, for emerging and developing economies to meet their sustainable development and climate goals, private sources of funding will need to provide nearly 60 per cent of all investments in clean energy by 2030.\(^10\)

17. Given the limited fiscal space that exists in many countries of the Asia-Pacific region, public sources of capital are set to play a more targeted and catalytic role through blended finance mechanisms, including concessional funds, co-investments, guarantees and technical assistance. The success of the energy transition will depend on enhancing the availability of such mechanisms.

IIII. **Key issues in financing clean energy transitions**

18. The financial case for private investment in clean energy transitions depends in large part on risk perceptions and return expectations, which in turn influence the cost of capital for project developers and investors.

19. While challenging to track, the cost of capital for clean energy remains relatively high in emerging and developing economies, reflecting the perception that such investments are open to elevated risks.\(^11\) A high cost of capital has a greater impact on the economics of projects aimed at generating power from renewable sources than on projects aimed at generating power from fossil fuels because of the capital-intensive nature of the technology involved. This puts clean energy at a competitive disadvantage in cases where financing is tight.

20. There is evidence that investing in clean energy can provide higher risk-adjusted returns compared to investing in fossil fuel-based assets.\(^12\) However, such performance depends on taking action to manage investment risks, support adequate returns and reduce barriers, including by considering the following issues:

   (a) Country-level factors, such as sovereign risk, interest rates and currency volatility;
   (b) Technological readiness and operational performance;
   (c) Enabling policies and regulations, including system planning, market structure and administrative requirements;

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\(^12\) Imperial College and IEA, “Climate infrastructure investing: risks and opportunities for unlisted renewables” (March 2022).
(d) Project-level cash flows, including commercial arrangements for pricing and purchasing and the degree of industry competition;

(e) Integration issues around grid infrastructure and system operations;

(f) Financial system issues that influence the availability and diversity of sources of finance.

21. These issues and their status in Asia and the Pacific are examined below, in the context of financing clean energy transitions, from both an energy investment and a financial systems perspective.

A. Energy investment issues

22. Long-term commitments to financing energy transitions rely on the presence of comprehensive national planning strategies that focus on energy efficiency, the electrification of end-use sectors, clean power and clean fuels. Such integrated energy strategies are lacking in many Asia-Pacific countries.

23. Several cross-cutting barriers also inhibit clean energy project development. These include inefficient fossil fuel subsidies and the absence of carbon pricing, which can tilt the economic playing field against clean energy. Constraints to financing the relatively risky, early stages of clean energy project development can be exacerbated by inadequate regulatory frameworks, including onerous permission, licensing, land acquisition and grid connection processes.

24. While Asia-Pacific economies have made significant progress in expanding access to electricity, 67 million people, mostly in rural areas and lower-income countries, remain without such access. This situation stems from the slow expansion of centralized power grids and constraints in the roll-out of mini-grids and off-grid clean electricity. Progress in the use of clean fuels and technologies for domestic cooking, heating and lighting too remains off track, with 1.2 billion people still cooking with polluting fuels and technologies. Globally, around $41 billion and $4.5 billion are required annually as investments in access to electricity and clean cooking, respectively, to meet energy access goals by 2030.13

25. Projects aimed at increasing access to energy suffer from a lack of scale and elevated investment risks, which push up financing costs. Uncertainties around grid expansion and the insufficient regulation of mini-grids can pose challenges to efforts to generate financing. Many low-income consumers lack formal creditworthiness, which undermines their ability to take out loans at reasonable rates. Most projects depend on equity financing, which is expensive, or grants, which are scarce.

26. While there is considerable potential for adopting novel financing approaches such as pay-as-you-go microfinancing for decentralized solutions, programmatic approaches to financing are rarely taken, especially in the areas of integrated electrification and clean cooking applications in high-impact markets.14


14 Sustainable Energy for All and Climate Policy Initiative, Energizing Finance: Understanding the Landscape (2021).
27. Investment in renewable energy has risen rapidly in Asia-Pacific countries, reaching over $335 billion and accounting for around 55 per cent of the global total in 2022. If China and India are subtracted from that total, however, the region accounts for less than 20 per cent of all investment in renewable energy.

28. During the period 2013–2020, private sources accounted for 75 per cent of global renewable energy investment; some technologies with long lead times, such as hydropower and geothermal, relied more on capital from State-owned enterprises and public financial institutions.\(^\text{15}\) By 2020, over 60 per cent of investments in renewable energy were financed by modifying balance sheet structures, although project-based financial transactions remained prevalent. While utility-scale investments in all renewable sources of power became popular, debt played a greater role in financing investments in onshore wind than in solar photovoltaics. Throughout Asia and the Pacific, such investments depended on domestic sources of capital (figure II).\(^\text{16}\)

Figure II
Share of renewable energy financing from domestic and international sources, by destination region, 2013–2020

![Graph showing share of renewable energy financing from domestic and international sources, by destination region, 2013–2020](image)


Note: The regions indicated in the figure are those used in the above-mentioned report of the International Renewable Energy Agency and the Climate Policy Initiative and are not aligned with the ESCAP “Asia and the Pacific” region.

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\(^{15}\) While the investments were labelled as having been made in renewable energy in general, 90 per cent of the investment data pertain specifically to renewable power, in other words to renewable electricity generation.

29. Despite the falling cost of renewable technologies, it remains difficult for emerging and developing economies to access long-term, low-cost loans. While lenders seek to enter into well-designed contracts with creditworthy borrowers, bankability issues often arise from weak pricing and remuneration frameworks; the insufficient standardization of common contingency, risk mitigation, dispute resolution and other contractual clauses; and perceived cash-flow risks. The unavailability of grid infrastructure and land, as well as equity shortfalls for early-stage project development, remain persistent barriers in many markets.

30. Such factors have contributed to a relatively elevated weighted average cost of capital in South-East Asia, equal to 8–11 per cent for utility-scale solar photovoltaics and 9–12 per cent for onshore wind.\(^{17}\)

31. Despite the fact that continuous expansions and upgrades are required to meet new demand and integrate renewables, regional investment in electricity grids has declined in recent years to around $145 billion.

32. The sources of most transmission and distribution investments in Asia and the Pacific are carried out based on the balance sheets of single-buyer, often State-owned, utilities. The Climate Compatible Growth initiative estimates that only 40 per cent of the required grid investments in emerging markets and developing economies globally are eligible for private finance. Moreover, climate finance is largely closed off to grid investments.

33. The ability of utilities to recover their fixed investment costs through cost-reflective electricity tariffs is a major determinant of their financial sustainability and ability to invest. However, in 2021, consumers in at least 14 Asia-Pacific economies benefited from electricity price subsidies, which can undermine utility finances and distort consumption and investment signals.\(^{18}\) Network planning remains inadequate in some countries and grid projects, particularly for large-scale transmission and cross-border connectivity, are subject to long development lead times.

34. Investments in utility-scale battery storage, a technology that is still in the early stages of development but is seen as a crucial enabler of power system flexibility and renewables integration, was equal to less than $10 billion in 2022. The investment case for electricity storage, including pumped hydro plants, is complex and depends on mechanisms for monetizing multiple value streams. These include grid and ancillary services, capacity provision, demand shifting and avoided grid investment. Uncertainty over such revenue means that most financing in Asia-Pacific economies has, to date, relied heavily on public sources or direct incentives.

35. Regional investment in clean fuel supply has mostly concentrated on liquid biofuels and biogas, but there is a strong policy momentum for the development of low-emissions hydrogen – from renewable power with electrolysis or natural gas processing with carbon capture – and related applications for hydrogen use.

\(^{17}\) Imperial College and IEA, “ASEAN renewables: opportunities and challenges” (March 2023).

36. This momentum has supported the development of a global pipeline of over 680 large-scale hydrogen projects, with planned investments worth $240 billion and a production capacity of over 26 million metric tons by 2030.19 The Asia-Pacific region, which accounts for nearly 30 per cent of those planned investments, is second only to Europe. That said, a final investment decision has been made in only 13 per cent of projects, due to high upfront costs and uncertainty over demand and policy support.

37. Projects in energy end-use sectors tend to be smaller, less standardized and more reliant on balance sheet financing structures than projects addressing energy supply. Energy end-use investment in Asia-Pacific countries has grown from $165 billion in 2015 to nearly $260 billion in 2022, with most of the expansion coming from capital spending on transport electrification and overall energy efficiency.

38. In transport, electric vehicle purchases have surged, albeit unevenly. It is notable that in more mature Asian markets – China, Japan and the Republic of Korea – the total cost of owning passenger electric vehicles is approaching parity with the cost of owning internal combustion engine vehicles. The economics of adopting electric vehicles in India, in South-East Asian countries and in other emerging and developing economies more generally are less attractive.20

39. In most markets, slow investment activity stems from constrained consumer access to low-cost credit, insufficient purchasing incentives to defray upfront capital costs and delays in the roll-out of charging infrastructure. For other low-carbon mobility modes of transport, such as rail and mass transit, financing often depends on governmental and municipal budgets, which also face constraints.

40. Investments in low-carbon and more energy-efficient buildings depend strongly on energy codes and standards that promote efficient construction practices and designs, including for key equipment such as air conditioners. The investment case for efficiency upgrades to buildings relies on the ability of consumers and developers to monetize energy savings with the aid of measurement and verification techniques, but many of them lack the information or technical capacity to do so.

41. A variety of financing approaches exist, but the availability of these options, which also apply to other areas of efficiency, depends on the maturity of the local market and financial ecosystem (figure III). While third-party financing mechanisms such as energy service companies can help to overcome upfront financial constraints for consumers and provide technical know-how for project development, their roll-out across the region has been uneven.

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Figure III
Financing energy efficiency: a ladder of options

Higher market maturity
Access to commercial financing

Advanced commercial or project financing
Vendor credit, leasing
Commercial financing, bonds
Partial risk guarantees
Credit lines with commercial banks
Credit lines with development banks
Public or super energy service companies
Energy efficiency revolving funds
Utility (on-bill) financing
Budget financing, grants with co-financing
Grants

Lower market maturity
Public financing

Source: Adapted from World Bank, “Western Balkans: scaling up energy efficiency in buildings” (2014).

42. Many Asia-Pacific economies rely on coal to fuel industrial facilities, particularly in the energy-intensive steel, cement and chemical production sectors. Financing the transformation of these sectors relies on industrial company balance sheets and policies such as the introduction of energy performance standards and carbon pricing. Scaling up investments depends on companies managing to attract external capital and on the availability of commercial arrangements, including through energy service companies, to provide support.

43. While efficiency and electrification investments provide the basis for achieving Goal 7, many of the industrial technologies needed to meet ambitious climate goals remain at an early stage of market readiness and require further innovation. The development of industrial clusters with shared infrastructure for the capture, utilization and storage of carbon and for the generation of hydrogen may help to lay the groundwork for financing those technologies at scale, but such developments are not yet widespread in Asia and the Pacific.

B. Financial system issues

44. In addition to the above-mentioned energy issues, the state of development of the financial system, the macrofinancial conditions, the orientation of financial ecosystems towards meeting sustainability goals and the availability of clean energy financing from international sources all play key roles in mobilizing investments.

45. The ability of Asia-Pacific economies to fund clean energy transitions with low-cost domestic sources of capital strongly depends on the state of development of their financial system. The availability of debt and equity from private institutions, the existence of liquid capital markets and access to diverse financial sources are hallmarks of a supportive and enabling environment.

46. By assessing indicators such as the share of private credit to GDP and the share of stock market capitalization to GDP, countries such as Australia, China, Japan, Malaysia, the Republic of Korea, Singapore and Thailand all display a high level of financial system development relative to the global average.
47. However, many Asia-Pacific economies lack robust banking systems and capital markets while having institutional barriers in the finance sector. Some local financial institutions lack the capacity and expertise to evaluate clean energy projects, which have less of a track record compared with other types of assets. When loans are available, they often do not match the requirements of utility-scale renewable power projects, in other words long-term loans in the local currency. Borrowing costs can also be prohibitively high for consumers and small and medium-sized enterprises looking to make efficiency upgrades or purchase electric vehicles.

48. Shifting macrofinancial conditions can exacerbate such structural issues. Following a decade of low interest rates, borrowing costs around the world surged in 2022 as central banks sought to stem economy-wide inflation.

49. In Asian and Pacific economies, 10-year government bond yields rose by 1 to 3 percentage points in China, India, Indonesia, Malaysia, the Republic of Korea and Thailand, among others. As rates increased more rapidly in the United States of America, some national currencies depreciated significantly against the United States dollar. Amid capital flight and depreciation risks, central banks may look to keep interest rates relatively high.

50. Such conditions pose challenges to financing clean energy transitions, particularly for emerging and developing economies. Across the region, rising rates are exacerbating public debt burdens, which are at their highest level since 2008. Nineteen Asia-Pacific countries are now rated at high risk of debt distress. A mismatch is emerging between the borrowing ability of countries and the capital structure of clean energy projects, which typically depend on a significant share of debt to keep financing costs relatively low.

51. Governments may also face pressure to limit clean energy incentives, including cross-border assistance, and to slow direct investments in electricity grids and energy access, which depend on public financing.

52. Rising interest rates can translate into a higher cost of financing for clean energy projects, which can undermine their economics. In countries such as Australia, the Republic of Korea and Viet Nam, changes in benchmark interest rates in 2022 could translate into a 10–25 per cent increase in the levelized cost of electricity for a new onshore wind farm investment, depending on local conditions. All of this speaks to the importance of managing the risks associated with clean energy projects to limit the impacts of shifting economic conditions.

53. International capital markets represent potentially large pools of low-cost capital for clean energy projects. Sustainable debt instruments (e.g. green, social, sustainability, sustainability-linked and transition instruments) are in high demand from investors, and $1.5 trillion in bonds and loans were issued globally in 2022.

54. In the Asia-Pacific region, the issuance of green, social and sustainability bonds has risen rapidly over the past decade. In 2022, it declined somewhat but remained robust at $190 billion. Still, issuance has been concentrated in relatively few markets with well-developed frameworks. Notably, China, the Republic of Korea and Japan collectively account for over

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22 International Monetary Fund, “Climate finance monitor”, 1 February 2023.
three quarters of the green, social and sustainability bonds issued in the region since 2014 (figure IV).

Figure IV
Green, social and sustainability bond issuance in the Asia-Pacific region, 2014–2022

![Chart: Annual green, social and sustainability bond issuance](chart.png)

**Source:** Calculations based on data from the Climate Bonds Initiative Interactive Data Platform, available at [www.climatebonds.net/market/data](http://www.climatebonds.net/market/data) (accessed on 30 May 2023).

55. Sustainable debt issuance in emerging and developing economies has been limited to those countries with relatively advanced domestic capital markets and investment-grade sovereign credit ratings (e.g. India, Indonesia, Malaysia, Philippines, Thailand and Türkiye). In general, developing countries need more robust frameworks for labelled instruments and taxonomies for sustainable financing.

56. While institutional investors, including pension funds, insurance companies, asset management entities and sovereign wealth funds, are active in listed equity and debt markets, direct investments in clean energy projects by these capital market players remain rarer owing to the high perceived risks and transaction costs, as well as the rules governing asset allocation and fund investments.

57. A common risk identified by international investors pertains to exchange rate volatility, which can significantly affect returns when revenues and financing are denominated in different currencies. In many countries, there is no suitable source of financing for projects in the local currency and the market offers only a few risk management tools to hedge long-term currency exposure.

58. In conjunction with good energy policies, financial mechanisms backed by public sources can help to manage investment risks for private actors and catalyse project development. Such mechanisms include international
development financing and blended financing – the use of catalytic capital from public or philanthropic sources to increase private sector investment in sustainable development – that enhance project bankability, help in the management of complex transitions and support transformations at the early stages of technology readiness, such as in the case of industrial decarbonization.

59. However, the latest data on international public financial flows to Asia-Pacific developing countries in support of Goal 7 show a downward trend, with levels falling by 60 per cent since 2017 (figure V). Moreover, as global blended finance commitments for climate investment declined between 2019 and 2021 compared with the period 2016–2018, in part owing to the coronavirus (COVID-19) pandemic, in Asia and the Pacific those levels fell from over 40 per cent to nearly 30 per cent.23

Figure V
International public financial flows to developing countries in Asia and the Pacific in support of clean energy research and development and renewable energy production, by subregion


IV. Priorities and potential solutions

60. The present section highlights priorities and potential solutions to help to mobilize investment and to address the key issues affecting the financing of clean energy transitions in Asia and the Pacific. As in the previous section, opportunities are presented from both an energy investment and a financial systems perspective, in the recognition that an approach that integrates both perspectives would best support investment in clean energy transitions.

A. Energy investment priorities

61. Improving conditions for early-stage clean energy project development involves addressing the regulatory environment for development and streamlining administrative barriers. The creation of government one-stop shops that provide, in an integrated manner, planning and administrative services, including for granting permits, acquiring land and establishing grid connections, can make it easier to speed up projects. Good examples of such entities in the region have emerged in Bangladesh and India.

62. Meeting the growing requirements for private financing identified in section II would benefit from a reform of market structures and ownership rules in such a way as to enhance private sector participation and increase competition.

63. Designing effective regulatory frameworks to support public-private partnerships and involve private investors at the early stages of clean energy development is a powerful means of enabling investments in projects. Examples include the roll-out of competitive auctions for renewable power procurement and new ownership and operating models for the development of transmission grids.

64. Well-designed and bankable commercial arrangements and remuneration schemes that allocate risks appropriately among public and private actors are critical to creating profitable investment opportunities that provide investors with an adequate and reasonable return on capital. Creating transaction templates with standardized contractual features can help to reduce negotiation costs.

65. Competitive auction mechanisms like these have supported investments in renewable power, at a reduced cost, in Cambodia, India and Kazakhstan. Direct purchase contracts between clean energy supply projects and corporations have also emerged as a key investment enabler around the world but require additional regulatory clarity if they are to be used at scale in Asia and the Pacific.

66. In order to allocate and manage risks, Governments should make every effort to put State-owned enterprises on a firmer financial footing, especially in cases where they must act as creditworthy purchasers of power or fuels, such as for State-owned utilities or large industrial players. Improving the cost-reflectiveness of electricity tariffs and reforming inefficient fossil fuel subsidies would help to bolster State balance sheets.

67. Reorienting State-owned enterprises’ strategies towards clean energy procurement and working, with international partners, on ways to refinance debt burdens and to address legacy fossil fuel contracts and assets are also critical to enhancing the role of State-owned enterprises in financing clean energy transitions.
68. Governments should consider ways to enable private investment in sectors that are traditionally dominated by public spending. An example is the financing of grids. In Asia and the Pacific, some countries have successfully attracted private financing for grid investment, but this has been the exception, not the rule. Understanding the various models for enabling the use of private financing in grid investment is key if Governments are to scale up the investments required to successfully integrate larger shares of variable renewable energy resources. Such models have been employed in Australia, India and the Philippines.

69. Governments should work with the financial sector to develop and implement new methods for assessing the impact of grid investments on climate change, as that would provide an avenue to unlocking climate financing for grids. They should also explore planning and commercial arrangements that give better value to the services provided by assets that enable battery storage and demand-side response, for example, in order to stimulate investment in power system flexibility. For example, India has held hybrid renewables-plus-storage auctions while Viet Nam has integrated storage in its electricity planning.

70. In addition, innovative business models and new financial instruments would help to accelerate financing for mini-grids and the off-grid sector. Such investments could be coupled with those for electric cookstoves. A more programmatic approach to financing is required to scale up a range of clean cooking technologies and fuels in high-impact markets. Such financing could have co-benefits and leverage synergies for the achievement of other Sustainable Development Goals, such as Goal 5 on gender equality.

71. Boosting energy efficiency and electrification investments in end-use sectors depends on the implementation of robust minimum energy performance standards and building codes, the roll-out of equipment labelling and certification schemes and the increased deployment of a range of commercial arrangements and financing solutions, including energy service company business models, green instruments and consumer credit lines from financial institutions.

72. Notably, the creation of super energy service companies in some markets, such as India, and the use of their bulk procurement capabilities for the purchase and distribution of efficient lighting, energy management equipment, air conditioners, smart metres and distributed solar photovoltaic applications has enabled the uptake of clean energy technologies in buildings and industry at dramatically lower costs.

73. Some States, including China, the Republic of Korea and Thailand, have been successful in spurring investment in electric vehicles and mobility solutions by setting incentives that help to offset the initial purchasing costs and by supporting the development of local supply chains in the form of industrial development and critical resource management. The shift towards electric vehicles could be enabled by integrating electric vehicle charging stations into grid plans and investment frameworks. In parallel, diversifying funding and revenue models would help to better finance electric mass transit.

74. Technology development and sectoral decarbonization efforts would benefit greatly from an increase in joint ventures and partnerships between public and private players for research, development and demonstration, especially in areas such as battery storage technologies, low-carbon fuels and emissions abatement in carbon-intensive sectors. Such engagement has the potential to lead to innovation spillovers and support new industries.

75. Policies that support the effective allocation of risks for new commercial-scale projects that are aimed at generating hydrogen with lower carbon emissions, promoting carbon capture and storage technologies and sharing infrastructure around industrial clusters will play a vital role in realizing economies of scale and attracting new, external sources of capital.

76. Considering the prominent role that the Asia-Pacific region plays in exporting manufactured goods and the high levels of investment in its manufacturing industries, making trade and investment more climate-smart will be key to decarbonizing industry in the region. There is significant potential to use foreign direct investment for cleaner products and processes; to date, such investment has been unevenly distributed across the region.

77. Implementing carbon pricing policies can provide clearer signals for clean energy investment and improve public finances. Implementing carbon border adjustment mechanisms, as has been done in Europe, could give businesses investing in decarbonization a competitive advantage. However, to reap such benefits, it is necessary to improve and harmonize regulations across countries and improve the capacities of Governments to implement carbon pricing policies. Harmonizing national carbon markets is a promising way forward in developing effective carbon pricing policies.

78. It is also possible to promote the financing of emissions reductions through the purchase of carbon credits, as has been done in Thailand, where the acquisition of such credits by a European country is helping to fund the roll-out of electric buses in Bangkok. Scaling up such transactions depends on continued progress in the standardization, monitoring and verification of high-quality credits.

B. Financial system priorities

79. Alongside the development of integrated energy strategies, the preparation of country-level financing strategies that include actions to bolster investment from domestic and international sources of capital would provide clearer signals of government commitment to clean energy transitions.

80. The capacity of domestic banks and financial regulators to evaluate clean energy opportunities and integrate sustainability standards within standard lending and investment practices and norms needs to be strengthened. Boosting long-term local currency debt financing, making lower-cost financing more accessible for consumers and small and medium-sized enterprises, and attracting patient equity capital would enhance the financing terms for clean energy investments in many instances.

81. At the same time, domestic financial institutions and corporations can set energy transition targets and develop strategies with milestones for improved emissions performance, energy use, renewable energy uptake and capital allocations to support these goals. Such road maps provide clear signals

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about the size and scope of private entities’ commitments to developing clean energy markets.

82. International investors can share critical knowledge about ways to package effective deals in-country, which can support skills transfer and capacity-building for local investors. Addressing country-level risks and regulatory barriers that inhibit cross-border investment is essential. The dissemination of better data about the cost of capital for clean energy projects, especially in emerging and developing economies, would bolster these efforts.

83. Financing efforts aimed at achieving Goal 7 targets in the face of tightening macrofinancial conditions would benefit from a multi-pronged approach. Governments could reduce their fiscal burden by refraining from making costly fossil fuel subsidies. They could also do more to address the specific risks associated with clean energy project development and support the growth of local supply chains, which could in turn help to provide a buffer against currency volatility.

84. Creditors and borrowers could restructure debt terms and make greater use of instruments such as climate-linked loans or debt-for-climate swaps.

85. Governments could further catalyse investment through the targeted use of public funds, including in their international development efforts and through the deployment of blended finance mechanisms to enhance the bankability of large-scale infrastructure projects, encourage financing where revenue models are more challenging to evaluate (such as in the context of energy efficiency projects) and support transformations at the early stages of technology readiness (such as in the decarbonization of heavy industry and heavy transport).

86. Grants can play a powerful role in catalysing investment in challenging areas. Making grants more widely available and providing technical assistance are critical measures to mobilize investment in underserved markets and population segments, for example to improve access to electricity and clean cooking facilities for rural populations.

87. Financial measures can help to kick-start clean energy development at the critical early, pre-investment stages of projects. Project preparation facilities too are essential for channelling international capital and valuable technical assistance. Examples of such facilities in the Asia-Pacific region are InfraCo Asia, Infrastructure Asia and the Southeast Asia Clean Energy Facility. Creating a regional “small ticket” financial mechanism that brings together project developers and financiers and provides grants to defray upfront risks could further catalyse investment in Asia and the Pacific.26

88. The world’s multilateral development banks are set to play an important role in allocating and delivering this catalytic funding, as well as in providing capacity-building and technical assistance on the ground. In order to carry out this role, however, multilateral development banks require increased financial firepower, larger balance sheets, stronger mandates and the ability to take on

risks, finance emissions reductions and promote sustainable development that is aligned with ambitious climate goals.\textsuperscript{27}

89. In order to attract more funds from the capital markets and institutional investors, which represent well over $100 trillion in assets under management, Governments need to improve their domestic capacity and establish more robust and better harmonized frameworks for sustainable finance, including standards for green, social and sustainability instruments and taxonomies to help guide capital allocation. In South-East Asia, a subregional taxonomy for sustainable finance has been issued to harmonize the language used and to guide borrowers and investors in allocating capital and in carrying out climate risk assessments and sustainability evaluations.

90. Refinancing operational assets can help to lower the cost of capital for clean energy projects. It can also help developers to recycle their capital into new investments and institutional investors to gain exposure to clean energy without bearing the full weight of the construction risk. This approach includes the acquisition of utility-scale renewable power projects and the aggregation and securitization of smaller-scale clean energy projects, such as for distributed solar photovoltaics and energy efficiency. Scaling up such transactions, which are more prevalent in Europe and North America, requires more mature financial and clean energy markets.

91. As investors increasingly factor sustainability into their financing decisions, countries and companies with high carbon footprints may face constraints in gaining access to financing. Sustainable finance frameworks should also encourage performance-based capital allocations that support genuine shifts and decarbonization in sectors with more challenging transition pathways, such as oil and gas or energy-intensive industries. For example, several cement companies around the world have issued sustainability-linked bonds, the interest rates of which are tied to future reductions in emission intensity.

92. New public-private financing partnerships are required to support a system-wide approach to energy planning and financing that addresses legacy fossil fuel assets, helps to fund transitions for emissions-intensive sectors and supports just transitions in a way that also take into consideration affected workers and communities.

93. Notably, innovative financial mechanisms and international support are required for the managed phasing out of coal, including by repurposing, refitting or retiring assets and transitioning to renewable energy. It is critical to provide integrated support to workers and communities to ensure that these energy transitions are just and inclusive. At the same time, financial regulators and private financial institutions should continue to take steps to support transactions for the managed phasing out of coal in a credible and accountable manner.

94. The just energy transition partnerships that have recently been announced in Indonesia and Viet Nam have a strong potential to demonstrate the validity of adopting an integrated approach to scaling up renewables, phasing out coal and supporting just transitions for workers and communities, and provide models that can be replicated globally. Just energy transition partnerships can have a catalytic effect by producing a transactional template for other countries to find cost-effective financing from multiple sources,\textsuperscript{27}

\textsuperscript{27} Rockefeller Foundation, “Reimagining the role of multilateral development banks” (2021).
considering the needs and objectives of different types of investors. However, their success hinges on the speed and effectiveness of implementation.

V. Conclusions

95. The present document contains several priority areas for Governments to consider in accelerating the energy transition in line with climate commitments and the Sustainable Development Goals. Mobilizing investment in support of Goal 7 in particular is crucial if the region is to fulfil its climate ambitions. Key to achieving these targets is improving the cost and availability of finance for clean energy technologies and enabling infrastructure.

96. Improving access to financing, particularly for underserved markets and technologies, requires the development of enabling policy environments that are comprehensive, cohesive and predictable and that benefit from coordination across different parts of government and the active engagement of the private sector and financial market participants.

97. To this end, there is significant potential for greater cooperation between decision makers in the energy and financial spheres, as well as among decision makers in countries with different income levels and fundraising capabilities.

98. The Third Asian and Pacific Energy Forum will provide an opportunity to review the progress made in financing clean energy transitions. It will also provide a platform for member States to engage in high-level discussions on how to guide decision-making to mobilize investment in clean energy transitions in the region while further developing the regional energy finance agenda.

99. The participants in the Third Forum may wish to review the findings and recommendations contained in the present document and provide guidance on the future work of the secretariat.