

The International Solar Alliance and South Asia

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Summary

The International Solar Alliance (ISA), founded by India in partnership with France, has an important objective: massive deployment of solar energy by mobilising US\$1 trillion (S\$1.3 trillion) of investments by 2030 and reducing the cost of finance and technology through the joint efforts of its members. The ISA has made some progress since its inception, particularly in Africa but less so in South Asia. It has, however, a long way to go in meeting its objectives. It needs to overcome several challenges, including geopolitical ones, some of which are specific to South Asia.

Introduction

In June 2024, Nepal's House of Representatives passed a proposal to ratify the 'Framework Agreement on the establishment of the International Solar Alliance (ISA)' (hereinafter referred to as the Framework Agreement).¹ With this, Nepal became the sixth country in South Asia to become a full member of the ISA. Bangladesh, Bhutan, India, the Maldives and Sri Lanka are the five other South Asian countries that are members of the ISA. With six out of eight South Asian nations joining the alliance, the region's strong commitment to the initiative is clearly evident.

Will the South Asian countries benefit from their ISA membership? What are the prospects and challenges of their ISA membership? This paper is an attempt to examine these questions. To undertake this exercise, the paper begins with a brief discussion of the motivations behind the establishment of the ISA and the content of the Framework Agreement. This provides the basis for analysing the prospects and challenges of South Asian countries' membership in the ISA, which the paper undertakes in the subsequent section. We end the paper with a few concluding thoughts.

The International Solar Alliance

The ISA was launched by India, in collaboration with France, at the 2015 Paris Climate Conference. India's leadership in the initiative was driven in part by its broader geopolitical ambitions.² Amidst the growing importance of the need to scale up solar energy development and use in the face of the climate crisis, India saw an opportunity to form the

¹ 'Agreement Related to Establishment of International Solar Alliance (ISA)', House of Representatives, Nepal, 2024, <https://hr.parliament.gov.np/en/bills/6B7BnOTt>.

² Sarang Shidore and Joshua W Busby, 'One More Try: The International Solar Alliance and India's Search for Geopolitical Influence', *Energy Strategy Reviews* 26 (August 2019): 100385, <https://doi.org/10.1016/j.esr.2019.100385>.

ISA and provide global leadership in one aspect of climate governance.³ Initially, the ISA membership was open only to member states of the United Nations (UN) lying fully or partially between the Tropic of Cancer and the Tropic of Capricorn.⁴ In late 2018, it was opened for membership to all UN member states.⁵

The objective of the ISA is to collectively address the key common challenges faced by the ISA member countries in scaling up solar energy as per their needs.⁶ They intend to achieve this by undertaking joint efforts to reduce the cost of finance and technology, mobilising more than US\$1 trillion (S\$1.3 trillion) of investments by 2030 and paving the way for future technologies adapted to their needs.⁷ The idea is that better harmonisation and aggregation of demand for solar finance, technologies, innovation or capacity building of solar resource-rich countries would help lower costs, increase quality and bring reliable and affordable solar energy for all.⁸

India's leadership in the ISA does not entail taking the responsibility of providing large-scale financial and technical support to all countries. India does not have the material capability to do so. As stated in the Framework Agreement, the budget and financial resources of the ISA comprise mainly voluntary contributions by its members, partner countries, the UN and its agencies, other countries and the private sector, and a corpus fund. India made an initial contribution of US\$16 million (S\$21.45 million) to establish the corpus fund and US\$11 million (S\$14.75 million) to build infrastructure and meet recurring expenses for the first five years until 2020-21.⁹ India has also committed an annual funding of US\$13 million (S\$17.43 million) for three years from 2023 to 2025.¹⁰

Until 30 September 2023, there was US\$36.46 million (S\$48.88 million) in the ISA Corpus Fund.¹¹ The ISA also receives grants from its member countries, global foundations and other international organisations to run its programmes, activities and initiatives. It collaborates frequently with the World Bank and the Asian Development Bank (ADB) in undertaking projects. So far, commitments for ISA grants have not been substantial, and actual disbursements are even less.¹² The ISA needs to make significant progress in the mobilisation of resources for its programmes and activities.

³ Vyoma Jha, "Soft Law in a Hard Shell": India, International Rulemaking and the International Solar Alliance', *Transnational Environmental Law* 10, no. 3 (November 2021): 517, <https://doi.org/10.1017/S2047102520000400>.

⁴ 'Framework Agreement on the Establishment of the International Solar Alliance (ISA)', International Solar Alliance, 2016, <https://isolaralliance.org/uploads/docs/04519cec12c15e9bc80ad92b3cb10e.pdf>.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

⁹ 'Update on the Status of the ISA Corpus Fund, Voluntary Contributions by the ISA Member Countries, and Resource Mobilisation', International Solar Alliance, Sixth Session of the Assembly of the International Solar Alliance, 2023, https://isaassembly.org/pdf/english/28.%20Agenda%20Item%2021.%20Update%20on%20the%20status%20of%20the%20ISA%20Corpus%20Fund%20Voluntary%20Member%20Contributions%20and%20Resource%20Mobilisation_ISA_A.06_WD.14.pdf.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

Capacity building is an important part of the ISA's work. It aims to provide support for institutional and human capacity building, particularly to the least developed countries and the small island developing states, for the deployment of solar power.¹³ Therefore, the ISA's progress needs to be assessed also in terms of the capacity-building support it has provided to its member states in their solarisation efforts.

South Asia's Solarisation Initiatives

According to a World Bank report, South Asia has outstanding potential in solar photovoltaic (PV) capacity, with only sub-Saharan Africa having a greater potential than South Asia.¹⁴ However, the South Asian countries have not harnessed enough of this potential. In recent years, they have been taking initiatives to develop and expand the use of solar power, although at varying speeds and scales. We briefly discuss some of the solarisation initiatives of the South Asian countries that are ISA members.

Bangladesh

Bangladesh has the largest off-grid solar power programme in the world.¹⁵ Launched in 2003, the country's Solar Home Systems initiative has provided electricity to over four million rural households, significantly improving the quality of life in off-grid areas.¹⁶ These efforts have also enhanced rural productivity by enabling small businesses to operate more efficiently. There was also a surge in rooftop solar installation in Bangladesh in 2023, but with a total rooftop solar installed capacity of less than 200 megawatts (MW), Bangladesh is still far away from realising its potential.¹⁷ According to various studies, Bangladesh can generate at least 50 gigawatts (GW) of solar power.¹⁸ As of March 2025, Bangladesh had a total peak solar power installed capacity of 1,264 megawatt peak (MWp), of which 383 MWp is off-grid and 881 MWp is on-grid.¹⁹ By 2030, the country aims to generate a total of around 2,300 MW of solar energy.²⁰

Bhutan

¹³ 'Capacity Building', International Solar Alliance, https://isa.int/capacity_building.

¹⁴ Juraj Betak, Marek Caltik, Tomas Cebecauer, Daniel Chrkavy, Branislav Erdelyi, Konstantin Rosina, Marcel Suri and Nada Suriova, 'Global Photovoltaic Power Potential by Country', Energy Sector Management Assistance Program (ESMAP), 2020, <https://documents.worldbank.org/curated/en/466331592817725242/Global-Photovoltaic-Power-Potential-by-Country>.

¹⁵ 'Bangladesh Solar Home Systems Provide Clean Energy for 20 Million People', World Bank, 7 April 2021, <https://www.worldbank.org/en/news/press-release/2021/04/07/bangladesh-solar-home-systems-provide-clean-energy-for-20-million-people>.

¹⁶ Anil Cabraal, William A Ward, V Susan Bogach and Amit Jain, *Living in the Light: The Bangladesh Solar Home Systems Story*, A World Bank Study (Washington, DC: World Bank, 2021), <https://hdl.handle.net/10986/35311>.

¹⁷ Shafiqul Alam, 'Rooftop Solar Can Be Central to Bangladesh's New Energy Order', Institute for Energy Economics and Financial Analysis, 24 January 2024, <https://ieefa.org/resources/rooftop-solar-can-be-central-bangladeshs-new-energy-order>.

¹⁸ Ibid.

¹⁹ Government of Bangladesh, Sustainable and Renewable Energy Development Authority, National Database of Renewable Energy, <https://ndre.sreda.gov.bd/index.php?id=8>.

²⁰ Eric Koons, 'Solar Energy in Bangladesh: Current Status and Future', *Energy Tracker Asia*, 9 June 2024, <https://energytracker.asia/solar-energy-in-bangladesh-current-status-and-future/>.

Until recently, hydropower was the only renewable energy resource for Bhutan. During the wet season, the country has surplus hydropower, which it exports to India. However, in the lean season, it needs to import electricity from India. Therefore, to meet its electricity demand in the dry season without imports and also to provide electricity access to its population living in far-flung rural areas, Bhutan has started focusing on solar energy development. The country has an actual potential of developing 12 GW of solar power, of which an extremely small amount has been exploited as off-grid, solar home systems.²¹ The 22-23 MW Sephu Solar Project, which is expected to come online in 2025, will be Bhutan's first utility-scale alternative renewable power plant.²²

India

India has made tremendous progress in solar power development. Its solar power installed capacity increased from 2.82 GW in 2014 to more than 100 GW in 2025.²³ This, however, is still a small fraction of its 750 GW solar potential.²⁴ The country has an ambitious target of achieving 280 GW of solar capacity by 2030.²⁵ India's progress in solar energy has significantly influenced South Asia's solar trajectory.

The Maldives

The Maldives' installed electricity capacity, as of July 2024, is 600 MW, including 68.5 MW from solar PV and the rest from diesel plants.²⁶ An additional 90 MW of solar power is under development, which is expected to start generating power by 2028. There are projects aimed at creating hybrid solar PV-diesel systems to significantly reduce the Maldives'

²¹ Anis Zaman and Charlotte Yong, *SDG7 Roadmap for Bhutan: Energy Pathways for the 2030 ESCAP Agenda*, ST/ESCAP/3003 (United Nations Publications, 2022), https://www.moenr.gov.bt/wp-content/uploads/2018/07/SDG7-Roadmap-for-Bhutan_Final.pdf

²² Asian Development Bank, 'Delivering Clean and Sustainable Energy Through Solar Power in Bhutan', video, 18 November 2024, <https://www.adb.org/news/videos/delivering-clean-and-sustainable-energy-through-solar-power-bhutan>.

²³ Ministry of New and Renewable Energy, Government of India, 'India Achieves Historic Milestone of 100 GW Solar Power Capacity: With 100 GW Solar Power Achieved, India Is Moving Towards Energy Independence and a Greener Future: Union Minister Pralhad Joshi', *Press Information Bureau*, 7 February 2025, <https://pib.gov.in/PressReleasePage.aspx?PRID=2100603>.

²⁴ Rajiv Ratna Panda and South Asia Regional Initiative for Energy Integration Clean Energy Ministerial Regional and Global Energy Interconnection Initiative (RGEI), 'One Sun One World One Grid: Energy Integration in South Asia', Presentation, Clean Energy Ministerial's Regional and Global Energy Interconnection (RGEI) Initiative, 4 March 2021, <https://sarepenergy.net/wp-content/uploads/2022/12/presentation-09march.pdf>.

²⁵ Ministry of New and Renewable Energy, Government of India, 'Government Is Committed to Provide Energy and Food Security: Union MoS Shri Bhagwanth Khuba', *Press Information Bureau*, 30 July 2023, <https://pib.gov.in/PressReleaselframePage.aspx?PRID=1944075>.

²⁶ Ministry of Climate Change, Environment and Energy, Republic of Maldives, *Paving the Way for a Just Energy Transition in Maldives: Road Map for the Energy Sector 2024–2033*, November 2024, <https://www.environment.gov.mv/v2/wp-content/files/publications/20241107-pub-energy-roadmap-maldives-2024-2033-.pdf>.

reliance on imported diesel. Projects such as ASPIRE²⁷ and POISED²⁸ illustrate the Maldives' commitment to building a sustainable energy future by integrating solar solutions into its energy mix.

Nepal

Similar to Bhutan, hydropower is Nepal's chief clean and renewable energy source. Nepal has surplus hydroelectricity during the monsoon season, which it exports to India. However, it fails to meet its domestic demand for hydroelectricity during the lean season, making electricity imports from India mandatory. Estimates of Nepal's solar energy potential vary from a little more than 2 GW to more than 47 GW.²⁹ The Alternative Energy Promotion Centre has been instrumental in advancing off-grid solar home systems and solar mini-grids in remote areas of Nepal. In recent years, Nepal has also turned its attention to developing utility-scale solar energy projects to address the hydroelectricity shortfall in the lean season. However, solar energy projects in Nepal have suffered from geopolitical competition between China and India.³⁰

Sri Lanka

The share of renewable energy in Sri Lanka's total energy supply in 2021 was 37 per cent.³¹ However, the share of solar in the total renewable energy supply in Sri Lanka in 2021 was only two per cent. An estimate puts Sri Lanka's solar power potential at 16 GW.³² The country has added 200 MW of solar energy to its national grid and is working to increase this to 1 GW by 2025 and 1.5 GW by 2030 through the 'Battle for Solar Energy' project.³³

²⁷ World Bank Group, *Maldives – Accelerating Sustainable Private Investments in Renewable Energy (ASPIRE) Project*, Washington, DC: World Bank Group, <http://documents.worldbank.org/curated/en/402251468300650153>

²⁸ Ministry of Environment and Energy, Ministry of Finance and Treasury, Republic of Maldives, and Asian Development Bank, 'Environmental and Social Safeguard Monitoring Report', *Maldives: Preparing Outer Islands for Sustainable Energy Development Project*, 2021, https://www.adb.org/sites/default/files/project-documents/46122/46122-003-esmr-en_5.pdf.

²⁹ Madhushree Mitra, Nayan Ranjan Singha, and Pijush Kanti Chattopadhyay, 'Review on Renewable Energy Potential and Capacities of South Asian Countries Influencing Sustainable Environment: A Comparative Assessment', *Sustainable Energy Technologies and Assessments* 57 (June 2023): 103295, <https://doi.org/10.1016/j.seta.2023.103295>; and Deependra Neupane, Sagar Kafle, Kaji Ram Karki, Dae Hyun Kim and Prajal Pradhan, 'Solar and Wind Energy Potential Assessment at Provincial Level in Nepal: Geospatial and Economic Analysis', *Renewable Energy* 181 (September 2021): 278–91, <https://doi.org/10.1016/j.renene.2021.09.027>.

³⁰ Ramesh Kumar, 'Nepal's China-India Love-triangle Impacts Investment', *Nepali Times*, 28 April 2024, <https://nepalitimes.com/news/nepal-s-love-triangle-with-china-and-india-impacts-investment>.

³¹ International Renewable Energy Agency, 'Sri Lanka: Energy Profile', *IRENA*, 2023, https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Asia/Sri-Lanka_Asia_RE_SP.pdf

³² Ibid.

³³ Isuru Koswatte, Janith Iddawala, Rekha Kulasekara, Praveen Ranaweera, Chamila H Dasanayaka and Chamil Abeykoon, 'Can Sri Lanka Be a Net-zero Nation by 2050?—Current Renewable Energy Profile, Opportunities, Challenges, and Recommendations', *Cleaner Energy Systems* 8 (June 2024): 100126, <https://doi.org/10.1016/j.cles.2024.100126>; and Ministry of Power and Energy, Sri Lanka, 'Sooriyabala Sangramaya: Battle for Solar Energy', Sri Lanka Sustainable Energy Authority, <https://www.energy.gov.lk/en/soorya-bala-sangramaya>.

The ISA's Activities in South Asia

The ISA works in partnership with its member countries and global stakeholders to develop and implement the following nine programmes:³⁴

- Scaling Solar Applications for Agricultural Use
- Affordable Finance at Scale
- Scaling Solar Mini Grids
- Scaling Solar Rooftops
- E-Mobility and Storage
- Solar Parks
- Solarising Heating and Cooling Systems
- Solar PV Battery and Waste Management
- Solar for Green Hydrogen

The solarisation initiatives that the South Asian countries have pursued so far, some of which have been briefly mentioned in the preceding section, fall within these nine programmes. However, not all the solarisation initiatives that the South Asian countries have taken can be attributed to the ISA. While a few of them could be a result of their ISA memberships, the rest were initiatives taken by the countries before becoming ISA members.

An examination of the ISA Solar Finance Database³⁵ shows that a majority of the solar programmes, including promotion, training and infrastructure development, have taken place across Africa and Europe. Such activities in South Asia remain comparatively limited. Nonetheless, the ISA has been providing support to the South Asian countries in several other ways.

The ISA signed a Country Partnership Agreement (CPA) with Bangladesh in February 2023, following which a comprehensive solar roadmap for Bangladesh was prepared.³⁶ The agreement also included collaboration between the ISA and Bangladesh in the installation of 12 trolley-mounted portable solar irrigation systems of about two kilowatts (kW) capacity, 12 portable solar paddy threshers of about two kW capacity for the Bangladesh Rice Research Institute, a portable solar drinking water plant of about 1.5 kW capacity, two rooftop solar projects with a capacity of 22 kW, a solar cold storage, a rooftop project at a railway station, a floating solar project, and the conversion of two manually operated sluice gates to solar-powered auto sluice gates.³⁷

Bhutan also signed the CPA with the ISA in April 2024. According to Bhutan, its collaboration with the ISA has been beneficial, “particularly in regulatory support and scaling up solar

³⁴ ‘Programmes’, International Solar Alliance, <https://isa.int/programmes>.

³⁵ ‘Solar Finance Database’, International Solar Alliance, 31 July 2023, https://isa.int/solar_finance_database.

³⁶ International Solar Alliance, Annual Report 2023, 2024, https://isa.int/uploads/publication_pdf/1716362059ar5.pdf

³⁷ ‘Country Partnership Agreement Inked to Attract Investment in Solar Projects’, *The Business Standard*, 23 February 2023, <https://www.tbsnews.net/bangladesh/energy/country-partnership-agreement-inked-attract-investment-solar-projects-589446>.

energy in agriculture through cold storage and Agri-PV solutions”.³⁸ Sri Lanka has collaborated with the ISA in distributing solar applications for rural livelihood projects, including floating solar projects, mini-grids, pumping, and cold storage.³⁹

Similarly, the ISA has several collaborative initiatives, one of which is the Solar Technology Application Resources Centre (STAR-C). According to the ISA, a STAR-C is “a training, knowledge, and expertise hub on solar energy and a go-to place for the member countries at regional and country levels to meet countries’ capacity-building needs by building capable solar workforces, sensitising policy makers and financial institutions, incubating enterprises, standardising products and services, and creating knowledge repository on information/data related to solar energy.”⁴⁰ Of the 10 STAR-Cs operational as of March 2025, two are in South Asia – one in Bangladesh and the other in Bhutan.

India, the country that conceptualised the ISA and has been spearheading it has been undertaking several activities in the country to enhance solar deployment. One of the prominent ones among them is the establishment of the Green Hydrogen Innovation Centre that the ISA developed together with India’s Ministry of New and Renewable Energy and the ADB.⁴¹

Prospects of the ISA to South Asia

Expanding solar deployment across South Asia is critical to meeting the region’s rising energy demands while reducing dependence on fossil fuels and meeting its clean energy targets. As an intergovernmental alliance with over 100 member countries, the ISA provides a dedicated platform for advancing solar energy adoption through policy support, financing mechanisms, and capacity-building initiatives.

The ISA’s focus has largely been on off-grid, decentralised solarisation. In South Asia, where a huge number of people still live in remote, rural areas and are not connected to the grid, off-grid solar connections are essential to reduce gaps in energy access.

One of the key prospects of the ISA in South Asia lies in pooling resources and achieving economies of scale.⁴² Coordinated efforts in solar manufacturing, technology standardisation, and joint procurement could lower costs and improve solar deployment efficiency. By leveraging the ISA’s technical assistance programmes, countries in the region could develop bankable project pipelines, attract private-sector investments, and mitigate policy and financial risks that have hindered solar expansion. The ISA’s initiatives, such as the

³⁸ Royal Government of Bhutan, ‘Country Statement of Bhutan – 7th Session of ISA Assembly on 4th Nov 2024 in New Delhi, India’, *Press Release*, International Solar Alliance, 4 November 2024, https://isa.int/uploads/isa_country_statements_file/1734070115Bhutan.pdf.

³⁹ Government of Sri Lanka, ‘Seventh Session of the Assembly of the International Solar Alliance’, *Press Release*, International Solar Alliance, 4 November 2024, https://isa.int/uploads/isa_country_statements_file/1734346563Sri_Lanka.pdf

⁴⁰ ‘Solar Technology Application Resource Centre (STAR-C)’, International Solar Alliance, <https://isa.int/star-c>.

⁴¹ Ibid.

⁴² ‘International Solar Alliance Appoints Dr Ajay Mathur as Newly Elected Director General at First Special Session of the ISA Assembly’, *Press Release*, International Solar Alliance, 15 February 2021, <https://www.isolaralliance.org/uploads/docs/9e1d37de908be8140c9baa0a22310f.pdf>.

Global Solar Facility and the Ease of Doing Solar, could be instrumental in helping countries streamline regulatory frameworks, address investment risks, attract private investments, provide security to the investments, and accelerate project implementation.⁴³ India provides a good example of solar energy development through private sector investments.

A number of international and intergovernmental organisations have partnered with the ISA, and this is expected to grow further. While many South Asian countries have been advancing solar deployment with the technical and financial support of several international and intergovernmental organisations at the individual level, their membership in the ISA is expected to provide a further boost to their initiatives. For example, the International Water Management Institute, which has partnered with the ISA, undertook scoping studies on solar water pumps (SWPs) in Bangladesh, Bhutan, India, the Maldives, Nepal and Sri Lanka and submitted them to the ADB, which is another ISA partner that would provide the financial support in installing the SWPs.⁴⁴

The South Asian countries could also benefit from the ISA's support in capacity building and technology transfer. Through targeted training programmes, policy advice and knowledge-sharing platforms, there are prospects for the South Asian nations to enhance their domestic expertise in solar project development, grid integration and financing mechanisms.

The prospect of South Asian regional solar connectivity aligns with the ISA's vision of 'One World, One Sun, One Grid', which promotes transnational solar energy integration. A South Asian regional grid could enable cross-border energy trade, balance supply and demand fluctuations, and improve overall grid resilience. Existing energy partnerships, such as the trilateral agreement between Nepal, Bangladesh and India,⁴⁵ provide a foundation for expanding solar energy exchange across the region.

Beyond technical and economic benefits, the ISA's involvement in South Asia could strengthen regional cooperation and energy diplomacy. Collaborative solar initiatives could serve as a mechanism for fostering trust and reducing geopolitical tensions, particularly in a region marked by historical rivalries. With the ISA's support in mobilising finance, advancing policy reforms, and scaling infrastructure investments, South Asia has the potential to make huge strides in solar energy and drive sustainable growth while reinforcing regional energy security.

Challenges to South Asia in Benefiting from the ISA

So far, the ISA's interventions are largely focused on decentralised solar solutions, including in South Asia, where the ISA's activities have been limited compared to Africa. This approach

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Puspa Sharma, 'Tripartite Pact on Electricity Trade: Climate Challenges Remain', Institute of South Asian Studies, 8 October 2024, <https://www.isas.nus.edu.sg/papers/tripartite-pact-on-electricity-trade-climate-challenges-remain/>.

has not translated into a broader transformation of the region's solar landscape.⁴⁶ While off-grid initiatives have brought electricity to remote communities, they do little to support the kind of large-scale integration required for industrial and urban energy needs. The challenge is compounded by outdated transmission networks and a lack of investment in modernising grid infrastructure, which limits the capacity to absorb and distribute increased solar generation effectively. The ISA's broader vision of global solar connectivity underscores the importance of transnational energy cooperation. This is not possible without utility-scale solar power and grid infrastructure expansion.

Financing constraints impede the region's ability to capitalise on the ISA's initiatives. Access to affordable capital remains a critical barrier, as high borrowing costs and the absence of structured green financing mechanisms deter private sector investment. Although the ISA has introduced initiatives such as the Global Solar Facility, their impact in South Asia so far has been muted due to regulatory uncertainty and fragmented policy frameworks that create significant risks for investors.

The unpredictability of approval processes, along with bureaucratic inefficiencies, discourages long-term financial commitments. For instance, while small-scale solar home systems have flourished in different countries of the region, large-scale projects often stall due to the complexity of securing permits and the absence of streamlined investment policies.⁴⁷ Similarly, ambitious solar expansion plans have been undermined by weak inter-agency coordination and a lack of policy clarity.⁴⁸ Without a more comprehensive financial architecture that de-risks solar investments and facilitates capital flow, South Asia's ability to transition towards a solar-driven energy future will remain constrained.

In addition to financial and regulatory challenges, domestic and regional political dynamics continue to hinder effective solar energy cooperation in South Asia.⁴⁹ Geopolitical tensions have long obstructed opportunities for cross-border energy trade, which might make regional solar integration an arduous task. Unlike elsewhere, such as in Europe, which has successfully established a common energy market through regulatory standardisation and institutional coordination, South Asia lacks a structured approach to transnational energy collaboration. The absence of institutional mechanisms to harmonise energy policies across countries further exacerbates the problem, preventing the development of a cohesive regulatory framework that would enable large-scale solar investments to thrive. As a result, cross-border electricity trade remains fragmented, limiting the potential for a unified solar

⁴⁶ 'Solar for All: Boosting Solar Investment in Least Developed Countries and Small Island Developing States', International Solar Alliance, <https://isolaralliance.org/uploads/docs/063636f10954e174f5cc119a961111.pdf>.

⁴⁷ Organisation for Economic Co-operation and Development (OECD), *Linking Renewable Energy to Rural Development*, OECD Green Growth Studies (Paris: OECD Publishing, 2012), <http://dx.doi.org/10.1787/9789264180444-en>.

⁴⁸ Ryan Stock, Sumit Vij and Asif Ishtiaque, 'Powering and Puzzling: Climate Change Adaptation Policies in Bangladesh and India', *Environment, Development and Sustainability* 23, no. 2 (February 2021): 2314–36, <https://doi.org/10.1007/s10668-020-00676-3>.

⁴⁹ Robert F Ichord Jr, 'The Geopolitics of the Energy Trilemma in South Asia', Atlantic Council, 12 April 2023, <https://www.atlanticcouncil.org/blogs/southasiasource/the-geopolitics-of-the-energy-trilemma-in-south-asia/>.

energy network. It remains to be seen whether the ISA can play a role in facilitating meaningful cross-border energy integration within South Asia.

Moreover, the absence of China from the ISA adds a layer of complexity to South Asia's solar strategy, given China's dominance in the global solar industry and its substantial involvement in most of the South Asian countries' energy infrastructure through the Belt and Road Initiative (BRI).⁵⁰ As the world's largest manufacturer of solar panels and a key financier of solar infrastructure, China plays an indispensable role in shaping the renewable energy trajectory of not only the South Asian countries but also many others around the world. Six South Asian countries, excluding Bhutan and India, are participants in the BRI. They have benefited, or are likely to benefit, from Chinese-backed solar investments. These countries, except Afghanistan and Pakistan, are also members of the ISA.

China's absence from the ISA or the lack of a formal ISA-BRI partnership might create strategic ambiguity for these countries. Navigating between ISA-driven initiatives and China-supported solar projects could present a policy dilemma, as they must balance competing investment pathways while ensuring energy security. The lack of a structured framework to facilitate cooperation between the ISA and Chinese solar initiatives further complicates regional energy diplomacy, reinforcing existing inefficiencies in South Asia's solar transition.

Conclusion

Harnessing the power of the sun for clean energy transition has been a focus of several countries around the world, including in South Asia. While countries with the financial and technical resources have made significant progress in solar energy deployment, others without the means have faced several constraints. The ISA, which seeks to propel solar energy through capacity building, demand aggregation to lower costs, and mobilise investments by addressing risks, is a welcome initiative in this regard. Its activities in several African countries show that the ISA has the potential to make significant contributions to South Asia's transition to solar energy as well. However, there are also challenges. India's ambition for geopolitical influence is a major reason for India's leadership in the ISA and for making it a treaty-based organisation. However, it does not have the characteristics of a treaty, particularly because there are no binding obligations and constraints on its members.⁵¹ As its name suggests, it is an alliance, a soft mechanism for collaboration. How successful it can be in the absence of binding provisions is an important question.

The ISA seeks to attract mainly private investments in solar projects. There are significant hurdles in attracting private investments in several countries, including in South Asia. Therefore, addressing constraints to investments is an important area that the ISA needs to focus on. Another important factor in the success/failure of the ISA, particularly in South Asia, is the prominent presence of both China and India in the region and their competition for influence. Whether and how the countries in the region will be able to balance their

⁵⁰ Atmaja Gohain Baruah, 'How Can India Become a Global Leader in Solar Power Generation?', *Economic and Political Weekly*, 11 January 2019, <https://www.epw.in/engage/article/india-global-leader-solar-energy-g20>.

⁵¹ Ibid.

membership in the ISA and China's potential support in their solar energy transition will probably determine the outcomes that the ISA seeks to deliver in South Asia.

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