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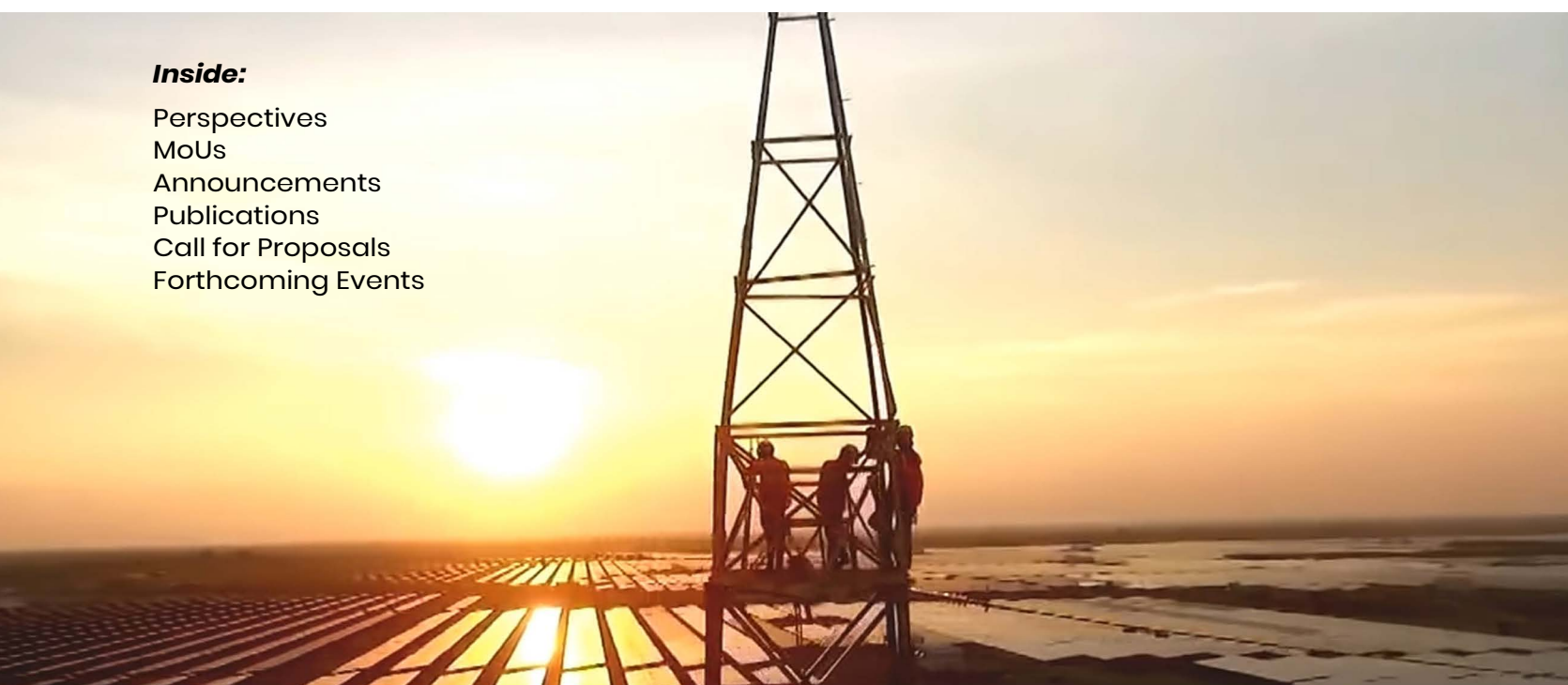
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Role of India’s Diplomatic Initiative ‘International Solar Alliance (ISA)’ in addressing Global Renewable Energy Development

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The human race faces numerous challenges and issues in attaining harmony between the environment, economy and society in the current century. Our planet is experiencing the critical challenges of increasing environmental pollution, massive climate change, species extinction, depleting resources and many other global concerns. To combat and address these emerging global challenges, a global acceptance and application of the concept of sustainable development is required.

The idea of ‘Sustainable Development’ was widely disseminated under the ‘World Conservation Strategy’ in the early 1980s.¹ The World Commission on Environment and Development’s 1987 Brundtland Report² ‘Our Common Future’, defines sustainable development as “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”. Renewable energy sources such as solar, wind and geothermal are widely explored for sustainable development.

Solar energy is one of the most abundant, inexhaustible and clean energies that can readily transfer in any other forms of energy such as thermal, electrical, mechanical and chemical.³ In the current state of environmental degradation and increasing global warming, nations worldwide have realized the significance of renewable energy. As a result, the countries are aligning themselves with a renewed focus on renewable sources of energy.

India also plans to reduce its carbon footprint by 33–35% by 2030 (as compared to 2005 levels). It aims to meet 40% of its electricity needs from non-fossil fuel sources with an ambition to create 450 gigawatts (GW) of renewable energy capacity by 2030. A share of 280 GW is expected to be from solar, thus requiring a 25 GW capacity increase each year. To achieve this, in 2011, India launched the ‘National Solar Mission’ to promote solar power in the country. The Ministry of New & Renewable Energy (MNRE) on 12-12-2014 rolled out [the scheme](#) for ‘Development of Solar Parks and Ultra Mega Solar Power Projects’. [Bhadla Solar Park](#) in Jodhpur, India, with a total capacity of 2.25 GW across 14,000 acres, is the [largest solar farm](#) in the world to date. [Patoda Solar Park](#), the largest private-sector solar energy park, has also been established in Maharashtra,

to support the solar power sector in India. Thus, India is running the world's largest clean energy programme to achieve 175 GW of renewable capacity, including 100 GW of solar power by 2022.

Both the Central and State governments are collectively implementing the solar mission in urban and rural India (Figure 1). It has played a significant role in achieving rural electrification. India has also set up more than 50 photovoltaic power plants across the nation.⁴ MNRE has launched a number of [schemes](#) such as Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) scheme, Atal Jyoti Yojana (AJAY), etc. to scale up the access to clean energy for rural areas.

As of 2019, India is amongst the top 5 countries worldwide in cumulative renewable energy capacity (globally ranked 4th, next to China, US and Brazil); cumulative solar photovoltaic capacity (globally ranked 5th, next to China, US, Japan and Germany) and annual solar PV capacity (globally ranked 3rd next to China and US).⁵ The solar power of India has become one of the fast-developing industries in India.

As per March 2021 data, India has installed a solar capacity of 40.97 GW.⁶ In the 2021–22 union budget, a capital infusion of ₹10 billion in Solar Energy Corporation of India (SECI) and ₹15 billion in the Indian Renewable Energy Development Agency (IREDA) has been announced. This will enable SECI to tender for 15 GW of new solar energy generation capacity and reduce CO₂ emissions by 28.5 million tonnes per year.

Although India has made substantial progress in the field of solar power, it still faces numerous impediments. The most pressing challenges⁷ are listed below:

- Land scarcity for installation of solar power plants and solar grids;
- Inadequate resources, mainly financial resources and research infrastructure to develop cost-competitive and efficient solar photovoltaic technological products to address highly dense population needs;
- Lack of scale-up of solar power technologies due to weak interconnect between industry and government;

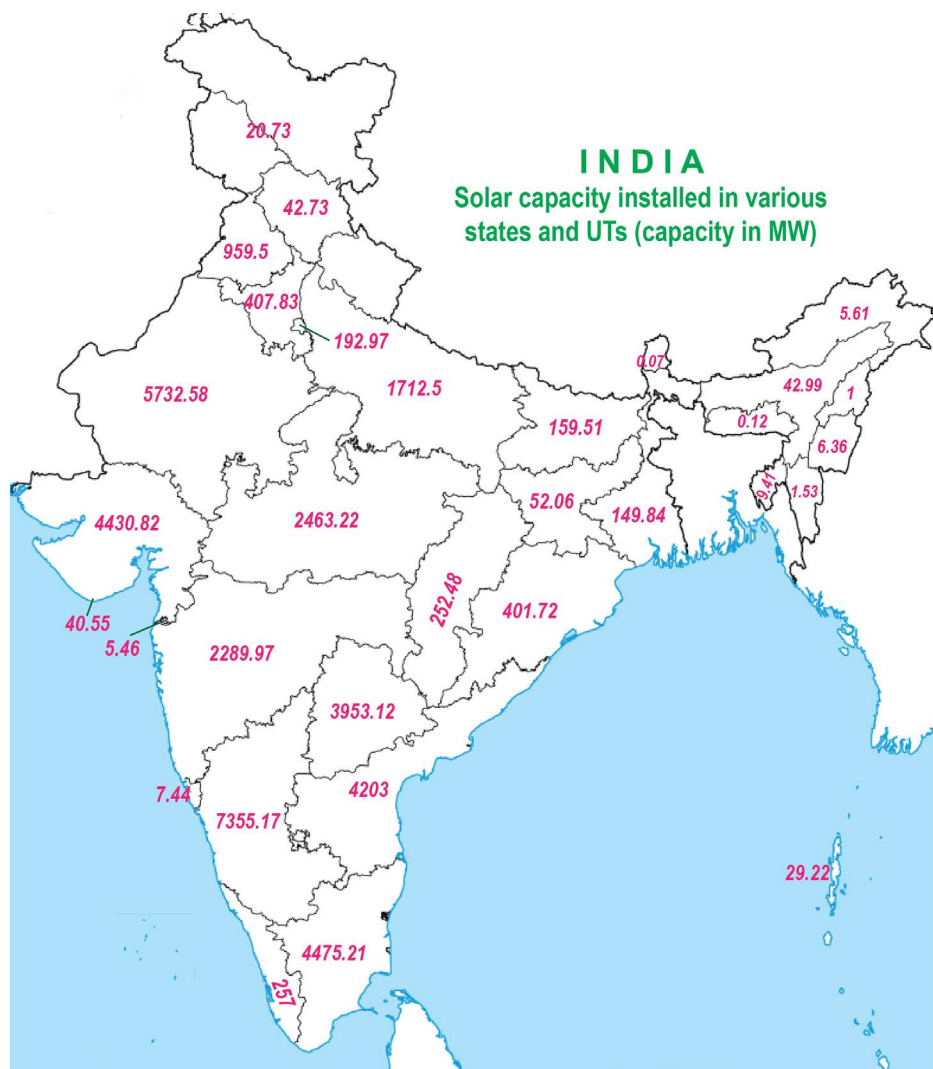


Figure 1. Solar capacity installed in States and Union Territories of India as on 31 March 2021
(Data source: <https://mnre.gov.in/solar/current-status/>)

- The complex structure of subsidy due to the involvement of multiple agencies;
- Lack of training and capacity building in this particular domain;
- Inadequate consumer awareness and usage.

To overcome the above-mentioned hindrances, the government has implemented financial support mechanisms and incentives to strengthen the country's solar energy sector. For example, it has introduced a renewable energy certification, capital subsidies, viability gap funding, assured power purchase agreement for solar power projects and 100% foreign direct investment (FDI) to install solar power plants.^{8,9} Likewise, strategies should be devised for small and big industries to shift to solar power from their existing non-renewable sources of energy.

India has taken the lead in establishing a diplomatic science channel by bringing solar resource-rich countries* together to formulate the '[International Solar Alliance](#)' (ISA). The ISA was launched in 2015 in Paris, France through the Paris Declaration on ISA dated 30 November 2015. It was formulated to connect countries globally and undertake joint efforts for massive deployment of solar energy and develop futuristic sustainable technologies as per country needs and demands. The signing of the 'Framework Agreement on the establishment of the International Solar Alliance' was officially introduced in 2016. To date, 98 countries have signed the framework agreement and 80 countries out of these signatory countries have ratified the same. 2018 was a golden year for ISA, where its roots were further strengthened. ISA got registered with the United Nations (UN; under Article 102, UN Charter). Government of India (Gazette of India notification on application of UN (privileges and immunities) Act, 1947) officially recognized ISA and '[Headquarter Agreement](#)' was signed. ISA is governed through a standing committee and the regional committees (set up for Africa, Asia and Pacific, Europe and others, and the Latin America and the Caribbean regions), with India as a Chair and France as a Co-chair.

ISA is evolving as a cooperation platform for its member countries to attain solar-friendly technology roadmaps, create policies and regulatory frameworks for strengthening the solar energy sector, and creating global coherence on common standards related to the solar sector. ISA has partnered with nearly 32 international organizations (such as International Energy Alliance, France; UN Environment, Kenya; Green Climate Fund, S. Korea; The World Bank, US and many others)[#] and 19 corporate partners to create and mobilize USD 1000 billion investment in the solar sector in its member countries by 2030. The key programs and initiatives of ISA to promote and adopt technologies and capabilities of the solar sector are listed in Table 1.

Table 1. Key Programmes and Initiatives of ISA

| S. No. | Programme/ Initiative | Brief Details |
|--------|--|--|
| 1 | Solar Risk Mitigation Initiative (SRMI) | The initiative was launched in collaboration with the World Bank (WB) and the Agence Francaise de Développement (AFD) to develop a Bankable Solar Program exclusively for developing countries and aims to leverage private sector investments in the same. |
| 2 | Scaling Solar Applications for Agriculture Use (SSAAU) | The program focuses on providing energy access (mainly through solar water pumping systems) for agricultural purposes in member countries. ISA undertook four-country missions at Benin and Uganda, Mali, Niger and Togo, to give critical insights and support for the solar water pumping program. |
| 3 | Solar Cooling Initiative | It aims to assist member countries in developing solar energy-linked cooling systems and cold chains for agricultural purposes. |

*Countries that lie either completely or partly between the Tropic of Cancer and the Tropic of Capricorn

[#]<https://isolaralliance.org/partners/organisations>

| | | |
|---|---|--|
| 4 | Mini-grids Programme | The scaling of the solar mini-grid initiative was undertaken as a diplomatic mission where 36 countries visited model plants of the solar mini-grid and understood the fundamental mechanisms associated with that. It also prepared a model framework for creating this mini-grid in member countries to assist member countries in taking the process forward. |
| 5 | Roof-top projects | ISA is providing assistance and support for the preparation of solar rooftop projects in select member countries. ISA has also facilitated the installation of this rooftop in select countries under agreement. |
| 6 | Scaling Solar E-Mobility & Storage | ISA has undertaken elaborative studies on assessing the capacities and capabilities of member countries in domains of solar electric mobility and storage. ISA is also benchmarking existing technologies on solar e-mobility and related technologies to replicate best practices and models in member countries by their needs and demands. |
| 7 | Solar Park Concept in Cluster/Group of ISA Member Countries | ISA has initiated a development plan for creating large-scale solar generation capacity in member countries that can be managed and governed through bi-lateral, regional and inter-regional connections. Initially, ten countries (Togo, Mali, Ghana, Sudan, Egypt, Malawi, Sri Lanka, Uganda, Rwanda and Cuba) will formulate the solar park concept. |
| 8 | ISA Solar Awards | ISA incentivizes exemplary work carried out in the solar sector by providing specific financial awards and recognitions to the individual or the organization. |

In addition, ISA has also created the 'ISA Solar Technology and Application Resource Centre (ISTAR C)' to provide a technical support system to its member countries. The Centre offers necessary support as solar finance for the deployment of solar technologies, research and innovation activities in the solar energy sector and building capacity in the particular domain. Under the 'Indian Technical and Economic Cooperation (ITEC) Scheme', the Government of India has actively undertaken training programs in solar energy for other member countries. In 2018-19, the National Institute of Solar Energy, Gurugram, through the ITEC scheme, trained 133 candidates from over 25 countries. To build the capacity in the solar sector, ISA has also commenced the 'ISA Solar Fellowship for Mid-career Professional'. In addition, India has started a dedicated 'Master's degree in Renewable Energy Management and Economics', and over 21 candidates from 18 member countries are currently pursuing this course. In the wake of COVID-19, to digitally connect all the member countries, ISA, in support of the European Union, has created an online platform, '[Infopedia](#)', to disseminate knowledge, information and best practices in the solar sector amongst its member countries.

The ISA has evolved as an engaging diplomatic channel for promoting and facilitating the solar energy sector across the globe. In the next five years, ISA aspires to attain universal membership to all the UN member countries, achieving financial sustainability (by various mechanisms such as membership fee and grants received by the host countries), optimizing resource mobilisation to member countries (especially to Least Developed Countries- LDCs and small island developing states- SIDS) and reaching the target of 1001 solar projects in member countries. These will attract investments and create employment opportunities in the solar sector in the near future. ISA is one of the largest and most significant thematic science diplomatic missions to promote the solar sector globally. ISA has adopted a broad vision of working towards a solar future and inducted a multidimensional approach to promote science diplomacy for building global solar capacity. It is creating innovative avenues to provide financial and technical support for solar projects, enhance policy support for the solar sector in member countries, and ensure economic sustainability and strengthened governance of ISA holistically.

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largely (~75%) on non-renewable energy sources for generating electricity. However, its policy advocates decreasing dependency on fossil fuels and producing maximum electricity from renewables. Wind and solar power are the two sectors where Australia can take a lead in a coordinated and integrated manner. It demands favourable energy policy developments at the sub-national level and technological progress for these two RE sources. Thus, Australia must scale up investments in modern energy systems to swiftly transition to a net-zero future.

Intriguingly, it is the state/territory governments who have made considerable efforts and introduced various ambitious policies to achieve their sustainability objectives. Australia's RE capacity has increased multifold over the past decade (Figure 1). The year 2020 saw a substantial jump of 3.7% in its total electricity generation from renewables (27.7% of the total electricity production). In 2020, Australian Energy Regulator (AER) approved a major electricity sector transformation project. The new grid interconnector between South Australia & New South Wales (NSW) is predicted to reduce power bills for consumers, alleviate wholesale electricity costs and consequently reinforce Australia's energy transformation towards a low carbon emissions future.

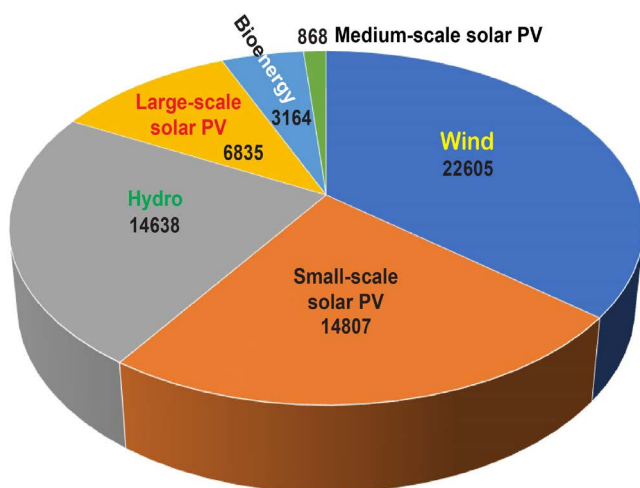


Figure 1. Australia's renewable energy generation capacity (in GWh) from six different technologies (Source: Clean Energy Australia Report, 2021)

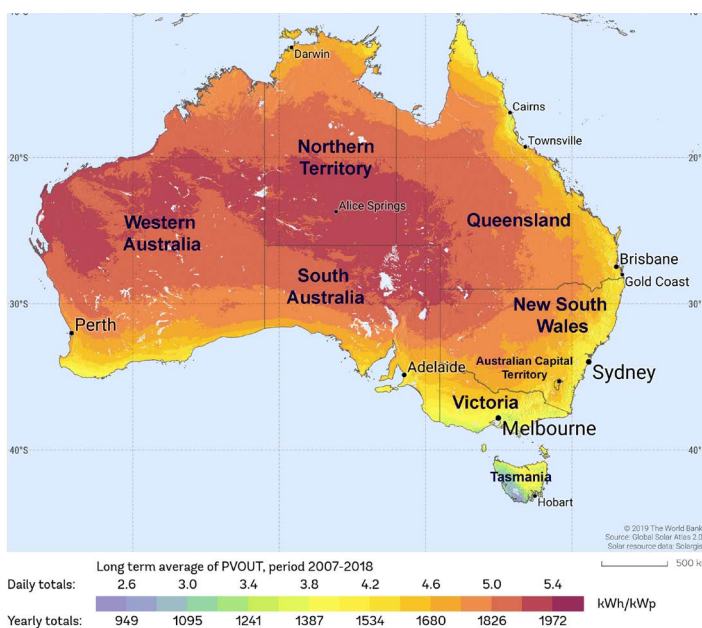


Figure 2. Solar photovoltaic power potential of Australia (Source: Global Solaris Atlas 2.0)

Australia possesses one of the highest rates of rooftop solar installations in the world. It is estimated that in eastern and southeastern Australia only, solar photovoltaics (PV) has the potential to generate almost 72,000 terawatt-hours (TWh) per year (Figure 2). This is around [270 times](#) Australia's total annual electricity generation (265 TWh in 2019) and 2.7 times the world's total annual electricity generation (just over 27,000 TWh in 2019). In 2020, 3 gigawatts (GW) of new solar capacity was added to Australian rooftops shattering the previous record of 2.2 GW in 2019. As on 30 June 2021, Australia's cumulative installed rooftop solar capacity stood at 14.9 GW as it has installed 2.88 million rooftop solar systems. The [success](#) of distributed solar PV in Australia may be credited to numerous factors among which socket parity, simple administrative procedures for installation, several support schemes (e.g. States' feed-in-tariffs, rebates and interest-free loans) and a high proportion of single-family homes. The rooftop solar PV costs just a quarter to half of the retail electricity prices. This cost advantage indicates that RE is set to proliferate in Australia. It has led to various smart initiatives in other parts of the country as well.

Wind energy accounts for over 35% of all RE generation and 8% of all electricity generated in the country. In the wind sector, Australia has added 1 GW of new capacity in 2020 and commissioned 10 new wind farms. In the last decade (2010–2020), the annual wind capacity has increased from 159 megawatts (MW) to 1097 MW while the cumulative installed capacity has made a remarkable leap from 1840 MW to 7376 MW. According to the Australian Energy Market Operator (AEMO), close to 95% of the electricity of Australia's main wholesale electricity market in the eastern and southeastern regions could come from RE in 2040. Recently, Tasmania became the first Australian state to generate 100% of its electricity from renewables.

The AEMO has identified 35 possible REZ candidates in eastern and southeastern Australia. The NSW Government's Electricity Infrastructure [Roadmap](#) set out a plan to deliver the state's first 5 Renewable Energy Zones (REZs). These will play an essential role in producing 12 GW of new transmission capacity and would aid in phasing out the State's existing power stations that depend on non-renewable sources. The construction of the first REZ is set to begin in 2022. The Port Augusta Renewable Energy Park (PAREP) is a unique hybrid renewable energy development combining wind and solar PV technology. It is one of the new breeds of renewable projects and when completed will be one of the southern hemisphere's largest hybrid renewable power stations.

The battery storage sector in Australia is gaining momentum. In 2020, the sector grew from 100 MW/129 MWh to 150 MW/194 MWh. It plans to add 595 MW of new capacity through its 16 utility-scale batteries which are under construction. The Hornsdale Power Reserve in South Australia is home to the world's largest lithium-ion battery. In early 2021, a plan to install a 1.2 GW battery in NSW has been announced by RE developer CEP. Furthermore, Empowering Homes Battery Loan programme launched in 2020 which provides interest-free loans of up to \$14000 to install a solar PV and battery system or \$8000 to retrofit a battery to an existing solar PV system has proven to be a game-changer.

With a keen focus on export opportunities to various neighbouring countries, Australia is boosting its "Hydrogen Action Plan". In particular, South Australia is following the plans of converting excess RE electricity into stored hydrogen. The State of Queensland has set up the \$11 million Queensland Hydrogen Industry Development Fund for green hydrogen. Similarly, a \$7 million Renewable Hydrogen Fund has been created by the State of Western Australia.

The Federal government has also initiated many schemes. While the [Emissions Reduction Fund](#) incentivises Australian companies to minimise the amount of GHGs they produce, the [Renewable Energy Target scheme](#) emboldens the additional generation of electricity from renewables. The [Safeguard Mechanism](#) requires Australia's largest GHG emitters to keep their net emissions within a permissible limit. The government is also drafting a regulatory framework for [offshore renewable energy projects](#), including offshore wind. The federal government is also collaborating with other countries to deploy clean energy technologies. In 2020, Australia signed an [MoU](#) with Singapore to work on low emissions fuels and technologies, including clean hydrogen and ammonia. The government is also funding a joint project of Glencore and China Huaneng Group to cooperate on the carbon capture utilization and storage (CCUS) project in Queensland, Australia.

Additionally, several energy providers in Australia have launched their virtual power plants, procuring excess electricity generated from bundles of rooftop solar assets and then on-selling to consumers and businesses. However, the most rapid gains are being made in renewable energy storage. The path to 2050 is a long one and Australia must continue to devise suitable strategies to decarbonize and achieve global net-zero emissions by 2050.

Scientific Cooperation and Domestic Policies for Decarbonizing Economies in Latin America. The cases of Colombia and Argentina

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Introduction

According to the latest report of the Intergovernmental Panel on Climate Change (IPCC), presented on 9 August 2021 and prepared by scientists from all over the world, the climate crisis 'is widespread, rapid and intensifying'.¹ Some of the effects such as the rise in the sea level will take thousands of years to reverse, and others like accelerated warming and the increase in global average temperatures will be irreversible unless effective and urgent measures are taken.

This is the framework for the variety of measures that governments around the world are beginning to adopt to contribute to the decarbonization of their economies, focused both on establishing international scientific cooperation links in environmental matters and on modifying the domestic production matrix. In this article, we briefly review the central policies of two Latin American countries, Colombia and Argentina, to encourage the decarbonization of their economies. It would need international cooperation and sustained efforts to reduce greenhouse gas (GHG) emissions. Table 1 depicts the annual CO₂ emissions from the burning of fossil fuels for energy and cement production in South American countries.

Table 1. South American countries annual carbon dioxide (CO₂) emissions (million tonnes) from the burning of fossil fuels for energy and cement production and per capita CO₂ emissions (tonnes) (Data source, 2019: <https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>)

| | Brazil | Colombia | Argentina | Peru | Venezuela | Chile | Ecuador | Bolivia | Paraguay | Uruguay | Guyana | Suriname |
|--------------------------------------|--------|----------|-----------|-------|-----------|-------|---------|---------|----------|---------|--------|----------|
| Annual CO ₂ emissions | 465.72 | 102.20 | 178.94 | 54.53 | 116.69 | 84.27 | 40.54 | 22.57 | 8.27 | 6.38 | 2.39 | 2.61 |
| Per capita CO ₂ emissions | 2.21 | 2.03 | 4.00 | 1.68 | 4.09 | 4.45 | 2.33 | 1.96 | 1.17 | 1.84 | 3.05 | 4.48 |

Colombia: Advancing Energy Transition through Science Diplomacy and International Cooperation

Colombia is a leader in Latin America in the energy transition² and by 2022, it aims to generate 12% of its electricity from solar, wind, and biomass projects. About 69% of its annual electricity generation is from hydropower. However, diversification towards non-conventional sources of energy will require the adoption of new technologies and regulatory frameworks for its implementation.

In 2014, Law 1715 was enacted which encourages the integration of non-conventional renewable energies to the Colombian energy mix, incentivise private capital investment in renewable energy integration and provides alternative energy options even to non-interconnected areas of Colombia. Following this law, the Government of Colombia (2018-2022) has shown its interest in designing a proposal to modernize the institutional and regulatory framework that facilitates the country's energy transformation, through the incorporation of new agents, technologies, and transactional schemes in the energy markets. This has been expedited by Colombia's interest in 4.0 technologies, oriented towards transformed and innovative industries.³ In 2019, Law 1964 was sanctioned which aims to generate schemes to promote the use of electric and zero-emission vehicles. Colombia's UPME (Mining and Energy Planning Unit) conducted its first renewable energy auction in 2019 and awarded contracts for solar and wind projects with an aim to increase its renewable energy sources capacity to 2250 MW. These auctions [context, design and results](#) were analysed by USAID and International Renewable Energy Agency (IRENA).

In 2021, Colombia received two important international recognitions thanks to its interest in advancing towards the energy transformation of its territories. Colombia was invited by the United Nations to lead the Global Dialogue on Energy Transition along with nine other countries, in the High-Level Dialogue on Energy in September 2021.⁴ Moreover, at the General Assembly of IRENA, it was chosen as the main member of its Council representing Latin America.⁵

Colombia has developed policies and roadmaps with international support through science diplomacy schemes and international cooperation. In 2020, with the financial support from the World Bank and the Inter-American Development Bank (IDB), Colombia organized an international mission for energy transformation, creating alliances between national and international experts, to advance towards a roadmap to implement the required adjustments in the electricity market.⁶ Specifically, the mission aimed at solving two central questions: How to ensure that the regulation allows innovation or the introduction of new technologies with sufficient agility without compromising reliability, and what should be the institutional and regulatory framework to ensure that the market benefits the user and generates efficient prices for the demand? This

Mission has provided answers, especially regarding the modernization of distribution networks, also in terms of coverage and subsidies as well as the opening of new markets.⁷ In 2021, the country also signed an international cooperation agreement with Denmark to boost and promote technical cooperation and joint implementation of programs and activities in energy efficiency, renewable energy and electric mobility.⁸

Yergin⁹ states that Colombia has projected an increase in its share of non-conventional renewable energies from less than 1% to more than 12% in the energy matrix by 2022; as well as reducing GHG emissions from 20% to 51% by 2030. In 2021, Law 2099 was enacted, which aims to modernize current legislation and dictate other provisions for the energy transition, the promotion of the energy market through the use, development and promotion of non-conventional energy sources.¹⁰ The public and private bodies need to explore new financing mechanisms to make viable projects in solar, wind, biomass, geothermal and tidal energy. A 2020 [report](#) suggests options for commercial and industrial companies to procure renewable electricity in Colombia. Although Colombia has advanced regulations and documents with guidelines, thanks to international cooperation with various entities and experts to support the transition to cleaner energies, only the next few years will tell us if these regulatory advances will have an impact in line with the diversity of regions and challenges the country faces in energy matters.

Argentina: Domestic and International Initiatives for the Decarbonization of the Economy

Argentina is the third-largest economy in Latin America, after Brazil and Mexico. It signed the Paris Agreement on Climate Change at the UNs Framework Convention on 22 April 2016 and ratified it on 21 September 2016. Argentina with its Nationally Determined Commitment (NDC) pledged to adopt a low-carbon agenda while maintaining its economic growth, food and job security for the population.

Argentina has been raising the environmental issue agenda for some years now. Since 1994, the National Constitution recognizes the right to enjoy a healthy environment and its preservation in Article 41. However, the issue has recently gained greater prominence in public policy. So much so that 2017 was declared the year of renewable energies, and in recent years, several policies aimed at the decarbonization of the economy have been promoted, demanding increased participation of scientists. To reduce its net emissions by 2030, Argentina is focusing on its energy sectors, agriculture, forests, transport, industry, health care and waste. In February 2021, Argentina became the first country in the world to include [health care decarbonization](#) in its global climate commitment.

In July 2021, the Argentinian Ministry of Production presented the 'Green Productive Development Plan' to decarbonize the economy and achieve an ecological transition. It contemplates the replacement of hydrocarbon energies through renewable energies, hydrogen, lithium, electric vehicles, etc., and it also seeks to generate macroeconomic and social conditions of sustainability. To this end, it proposes to allocate 10 billion pesos (more than 100 million USD) and implement policies such as financing for green small and medium enterprises (SMEs), training, technical assistance, Good Trade seal, and business rounds.¹¹

This Plan had as immediate antecedent, the forum 'Towards a National Hydrogen Strategy 2030' held in May 2021, attended by politicians, government officials, businessmen, scientists, and ambassadors from countries such as Germany, Japan and South Korea. Also, as part of this strategy, an increase in the participation of nuclear energy is sought. In this sense, the future installation of two more nuclear power plants that will double the existing atomic energy participation was announced.¹² Argentina is also running a [project](#) with support from Global Fuel Economy Initiative (GFEI) to improve fuel efficiency in the vehicle fleet.

In turn, the foreign policy has increased environmental, scientific and technological cooperation with countries having experience in this area, especially Germany, with whom the environmental issue has been

defined as a central axis of bilateral cooperation. Thus, in January 2020, the Argentina's Ministry of Science, Technology and Innovation (MSTI) signed a scientific cooperation agreement with the European country to study oceans, biomass, and environmentally friendly production models.¹³ Likewise, in June of this year, the 'Future Forum', a bilateral cooperation initiative between both countries, was launched. This forum focuses on two main axes: Industry 4.0 and the development of renewable energies.¹⁴

Argentina's agriculture and livestock (along with forestry and other land uses) emit ~ 46% of total national GHG emissions. The livestock sector is responsible for 41% of the direct methane and nitrous oxide emissions in agriculture. Being the world's third-largest producer of soybean and the sixth-largest producer of beef, these sectors require special attention. The associations of agricultural producers introduced a private sector initiative 'The Argentine Carbon Neutral Agriculture Programme (PACN, as per its Spanish acronym)' that aims to export food, beverages and bioenergies that will reduce and compensate for the amount of GHGs emitted during their life cycle. Finally, some of the scientists who participated in the United Nations IPCC report drafting are presently policy advisors to the national MSTI that facilitates the dialogue between the scientific community and public policies design.¹⁵

However, one of the obstacles we have to overcome to implement these initiatives effectively is a national productive matrix strongly based on the extractivism of natural resources. This implies deepening debates on incorporating more productive actors in the decarbonization of the economy and considering international cooperation practices that take into account local needs, overcoming the adoption of technological solutions not adapted to our realities.

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MoUs Signed

Cabinet approves MoU between India and Kingdom of Denmark on Cooperation in the field of Health and Medicine

In an official statement on 14 July 2021, the Union Cabinet approved the Memorandum of Understanding (MoU) between the Ministry of Health & Family Welfare, Govt. of India and the Ministry of Health of Denmark on cooperation in the field of health and medicine. The bilateral MoU will encourage cooperation between both countries

through joint initiatives and technology development in the health sector. It will strengthen bilateral ties between India and Denmark. It will also facilitate in improving the public health status of the people of both countries.

Cabinet approves MoU between Indian Institute of Space Science and Technology (IIST) and the Delft University of Technology (TU Delft), the Netherlands for Research Collaboration

On 4 August 2021, the Union Cabinet approved the MoU between the Indian Institute of Space Science and Technology (IIST) and The Delft University of Technology (TU Delft), for carrying out the academic programmes and research activities involving students and faculty members in each institution. The signing of this agreement shall enable pursuing the following potential interest areas of cooperation

such as exchange of faculty members, students and researchers, scientific materials, publications and information, joint research meeting, PhD program, and Dual Degree/Double Degree programme. The signed agreement will provide impetus to explore new research activities and application possibilities in the field of Science and Technology.

Cabinet approves MoU between India and USA on Cooperation in the field of Geology

The Union Cabinet, on 18 August 2021, gave its approval for signing the MoU between the Geological Survey of India (GSI), Ministry of Mines, the Govt. of India, and the Florida International University (FIU) board of trustees on behalf of its Department of Earth and Environment, College of Arts, Sciences and Education, the United States of America on cooperation in the field of Geology. The MoU will provide an institutional mechanism between the two

institutions on cooperation in the field of Geology. The objectives of the MoU are to understand the geologic and tectonic environment of the generation and emplacement of post-collisional magmatism in India-Asia Collision margin in particular and to construct a model of post-collisional magma genesis in continental collision zones in general and to construct the geologic and tectonics of the Eastern Himalayan Syntaxis.

Cabinet approves MoU between the Indian Council of Medical Research (ICMR), India and the GARDP Foundation on Antimicrobial Resistance Research and Innovation, Switzerland

On 18 August 2021, the Union Cabinet approved an MoU signed between the ICMR, India and the GARDP Foundation on Antimicrobial Resistance Research and Innovation, Switzerland to strengthen the relations within the framework of the international scientific and technological collaboration and to promote cooperation in fields of mutual interest. The MoU was signed by India in March 2021. This MoU will further strengthen relations between India and Switzerland within the framework of international

scientific and technological cooperation in fields of mutual interest. The ICMR-GARDP collaborations will include establishing a strategy and modalities for financial and in-kind contributions by both parties to ensure the success of the joint objectives. Funding may be provided directly to the other party or the third parties engaged in projects. All financial and in-kind contributions will be subject to separate legally binding agreements.

MoU Signed between All India Institute of Ayurveda and Western Sydney University, Australia to appoint an Academic Chair in Ayurveda

All India Institute of Ayurveda under the Ministry of Ayush, signed an MoU in coordination with NICM Western Sydney University, Australia on 7 September 2021 (virtual mode), to appoint an Academic Chair in Ayurveda. The new Academic Chair will undertake academic and collaborative research activities in Ayurveda, including herbal medicine and yoga, as well as design academic standards and short-term/medium-term courses and educational guidelines. This Chair will also conduct workshops/seminars/conferences on Ayurveda; advocate the safe and

effective use of Ayurveda Systems in Australia; identify academic and research programs on Ayurveda, their strengths and gaps; provide tutorials to students, including the promotion of research activities and innovations in Ayurveda in India; provide academic leadership demonstrating and fostering excellence in teaching research and policy development related to Ayurveda, within the robust Australian regulatory framework, to develop strategies to promote the translation and integration of well evidence-based Ayurveda medicines into

Cabinet approves MoU between India and Italian Republic on Cooperation in the field of Disaster Risk Reduction and Management

The Union Cabinet approved the MoU between the National Disaster Management Authority (NDMA) of the Republic of India and the Department of Civil Protection of the Presidency of the Council of Ministers of the Italian Republic on cooperation in the field of disaster risk reduction and management.

The MoU seeks to put in place a system, whereby both India and Italy will benefit from the disaster management mechanisms of each other and it will help in strengthening the areas of preparedness, response and capacity building in the field of disaster management.

Department of Animal Husbandry and Dairying, India signs MoU with Bill & Melinda Gates Foundation to support India's Livestock Sector

The Department of Animal Husbandry and Dairying (DAHD), Govt. of India and Bill & Melinda Gates Foundation have signed a multi-year MoU to work together on sustainably improving India's livestock sector to support the nation's food and nutritional security, and protect the economic wellbeing of small-scale livestock producers. Through this collaboration, Bill & Melinda Gates Foundation will provide technical assistance for the design and delivery of new technologies

and implementation of best practices that are relevant in the local context. The joint support programs will be directed at improving livestock health, production, and animal nutrition, identifying scientific and technological solutions for major infectious diseases, providing technical assistance in translational sciences, identifying opportunities for scientific and technological collaboration, and implementing the One Health framework.

Translational Health Science and Technology Institute (THSTI), DBT signs MoU with the Nanogen Pharmaceutical Biotechnology JSC, Vietnam

The Translational Health Science and Technology Institute (THSTI), Department of Biotechnology, M/o Science & Technology, Govt. of India has entered into a research collaboration with Nanogen Pharmaceutical Biotechnology JSC, a Vietnamese pharmaceutical company that is developing a new

vaccine for COVID-19. His Excellency Pham Sanh Chau, the Ambassador of Vietnam to India, led a team that visited THSTI on 23rd September 2021, to sign MoU between THSTI and the Nanogen Pharmaceutical Biotechnology JSC. THSTI has been at the forefront of research for COVID-19 vaccines.

MoU signed between Zoological Survey of India and the Natural History Museum of United Kingdom

The Zoological Survey of India (ZSI), Kolkata and the Natural History Museum (NHM), London signed an MoU on 24 September 2021 on a virtual platform. Both the institutes are going to be mutually benefited from faunal diversity research through scientific exchange. This collaboration will benefit both institutions as millions of vital collections are present in NHM, London and ZSI. It includes materials that are important nationally and across the world for understanding and conserving biodiversity, curing

natural resource loss and sustainable management of bio-resources as well as the impact of climate change. The MoU is expected to bring together practising taxonomists, conservation biologists, biodiversity managers, policymakers and other stakeholders of both the country for discussing, networking and identifying gap areas to formulate the strategies for long term scientific documentation as well as conservation of faunal diversity through international exchange.

Announcements

Call for Applications: “CASE Fellowship on Building Decarbonization for the Bureau of Energy and Technology Policy”

Submission deadline: 19 November 2021

Further information at:
<https://ctcase.org/case-fellowship-call-for-applications/>

Call for Papers: “Re-envisioning STEM Education and Workforce Development for the 21st Century”

Submission deadline: 23 January 2022

Further information at:
<https://www.sciencepolicyjournal.org/sigma-xi-stem-ed-workforce-issue.html>

Call for Papers: “Science Diplomacy in the Global South”

Submission deadline: 31 January 2022

Further information at:
<https://academic.oup.com/spp/pages/call-for-papers>

Publications

Alejandro A (2021) **Diversity for and by whom? Knowledge production and the management of diversity in international relations.** *International Politics Reviews*. <https://doi.org/10.1057/s41312-021-00114-0>

Arnaldi S, Lombardo A, Tessarolo A (2021) **A preliminary study of science diplomacy networks in Central, Eastern and South-Eastern Europe.** *Humanities and Social Sciences Communications*, 8: 168. <https://doi.org/10.1057/s41599-021-00847-1>

Bonilla K, Cabrera J, Calles-Minero C, Torres-Atencio I, Aquino K, Renderos D, Alonzo M (2021) **Participation in Communities of Women Scientists in Central America: Implications From the Science Diplomacy Perspective.** *Frontiers in Research Metrics and Analytics*, 6: 661508. <https://doi.org/10.3389/frma.2021.661508>

Brodt L, Kibble M, Namdeo S, Varpahovskis E (2021) **ITER as a Science Diplomacy Case Study: Success or Failure?** <https://www.insscide.eu/results/warsaw-science-diplomacy-school/wsds-student-takes-articles-by-the-alumni/article/wsds21-student-takes-iter-sd-success-or-failure>

Kontar YY, Ismail-Zadeh A, Berkman PA, Duda PI, Gluckman P, Kelman I, Murray V (2021) **Knowledge exchange through science diplomacy to assist disaster risk reduction.** *Progress in Disaster Science*, 11: 100188. <https://doi.org/10.1016/j.pdisas.2021.100188>

Kunkel S (2021) **Science Diplomacy in the Twentieth Century: Introduction.** *Journal of Contemporary History*, 56(3): 473–484. <https://doi.org/10.1177/00220094211006762>

Martin M, Chaverneff F, Iyengar S, Gregorian OP (2021) **Understanding and Meeting the Challenges of Displaced Scientists in the 21st Century.** <https://www.sciencediplomacy.org/article/2021/understanding-and-meeting-challenges-displaced-scientists-in-21st-century>

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Šime Z (2021) **EU-India relations in the multi-vector matrix of science diplomacy and Asia-Europe Meeting.** *Research in Globalization*, 3: 100057. <https://doi.org/10.1016/j.resglo.2021.100057>

Tay A (2021) **How science diplomacy can help navigate the post-pandemic world.** <https://www.natureindex.com/news-blog/how-science-diplomacy-can-help-navigate-the-post-pandemic-world>

Call for Proposals

DST - Inria Targeted Programme

Last date: October 7, 2021

Further information at: http://cefipra.org/document/8th_Call_for_Proposals_in_DST-INRIA_Targeted_Programme_final.pdf

Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellowships 2021

Last date: October 12, 2021

Further information at: https://eeas.europa.eu/delegations/india/100797/msca-postdoctoral-fellowships-2021-applications-are-open-europes-prestigious-postdoctoral_en

Indo-German Science, Technology Centre (IGSTC) Industrial Fellowship

Last date: October 29, 2021

Further information at: https://www.igstc.org/home/industrial_fellowships

India-U.S. Collaborative Vision Research Program. Funding Opportunity Announcement-2021

Last date: November 8, 2021

Further information at: <https://dbtindia.gov.in/sites/default/files/FOA%20Indo-US%20Vision%202021%28with%20Annexure%29.pdf>

Swiss Government Excellence Scholarships 2022-2023

Last date: November 12, 2021

Further information at: www.sbf.admin.ch/scholarships_eng

DST-DAAD Project-based Personnel Exchange Programme

Last date: November 19, 2021

Further information at: https://dst.gov.in/sites/default/files/DST_DAAD_PPP_2020-21%20%282%29-converted.pdf

Austria-India Joint Call

Last date: November 26, 2021

Further information at: https://dst.gov.in/sites/default/files/Joint%20Call-Austria-India_final-converted.pdf

ASEAN-India Collaborative R&D Scheme

Last date: December 31, 2021

Further information at: <https://aistic.gov.in/ASEAN/aistdfCollaborative>

BIRAC Announces Call for under Proposal Product Commercialization Program Fund

Last date: December 31, 2021

Further information at: https://birac.nic.in/cfp_view.php?id=39&scheme_type=29

Forthcoming Events

GESDA Annual Summit

Date: October 7–9, 2021

Further information at:

<https://gesda.global/>

Science, Technology and Human Rights Conference 2021

Date: October 21–22, 2021

Further information at:

<https://www.aaas.org/events/science-technology-and-human-rights-conference-2021>

AGU Fall Meeting: Science and Society

Date: November 13–17, 2021

Further information at:

<https://www.agu.org/Fall-Meeting>

AAAS Science & Technology Policy Leadership Seminar

Date: November 15–18, 2021

Further information at:

<https://www.aaas.org/programs/office-government-relations/science-technology-policy-leadership-seminar>

13th Canadian Science Policy Conference

Date: November 22–26, 2021

Further information at:

<https://sciencepolicy.ca/conference/cspc-2021/>

Tip Conference 2022: “Building A Sustainable Knowledge Infrastructure On Transformative Innovation Policy”

Date: January 17–21, 2022

Further information at:

<https://www.tipconsortium.net/experiment/tip-conference-17-21-january-2022-building-a-knowledge-infrastructure-on-transformative-innovation-policy/>

This Science Digest is open to new ideas, valid criticism and constructive feedback. If there is any science diplomacy/ policy related event which requires wider outreach, please share it with us. We welcome your articles/ feedback/ suggestions at scidip@niscair.res.in



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