



CEO
CAUCUS
INTERNATIONAL SOLAR ALLIANCE



Driving Solar Energy Revolution: Growth Insights for Global Impact

Private Sector Roundtable, New York

July 15, 2024 | 8 am-9:30 am ET

Venue: Harvard Club 35 W 44th St, New York





Background:

Over the last decade, there has been a significant growth in investments in renewable energy. The ratio of investment in clean power to fossil fuel-generated power in 2015, which was estimated to be roughly 2:1 is expected to reach 10:1 in 2024. Of the \$2 trillion that is expected to be invested in clean energy, solar photovoltaic (PV) technology is expected to surpass \$500 billion this year.

However, there has been a significant imbalance in the distribution of these funds, with emerging markets and developing economies outside of China likely to receive only 15% of the total investments. Further, the concentration of PV manufacturing technologies in a handful of companies has proven to be a hurdle for many countries looking to develop their own domestic solar PV supply chain. This disparity is further exacerbated by the concentration of over 80% of PV supply chains in a single country.

The International Solar Alliance (ISA) constituted a high-level forum of select CEOs, to forge a greater understanding of crucial issues and achieve quantum growth in solar energy. The forum will help garner insights into developing a diversified and resilient global supply chain, support technological innovations, access and assist in mobilizing capital, while mapping out an enabling policy environment. With these founding objectives, ISA officially launched the CEO Caucus with a virtual meeting on the 6th of June 2024.

The New York roundtable was the third in the series, focusing on bottlenecks in the solar industry. It brought together industry leaders, and key stakeholders from intergovernmental bodies, solar manufacturing, solar development, finance, and clean technologies sector to deliberate a smoother transition to green energy. (The list of participants is appended)





Context:

Dr. Ajay Mathur, Director General (DG), ISA, highlighted that despite receiving nearly one-third of the total renewable sector investments in 2023 - amounting to \$300 billion - the solar sector is witnessing a widened financial chasm.

A substantial 74% of these investments are flowing towards financing projects in OECD regions and China, while the energy-deficient African continent received a meager 3%. The irony is that Africa is among the regions with the most favorable environments for solar.

Sharing insights from his conversations with industry leaders, Dr. Mathur noted that hesitation due to concerns about non-payment of dues appears to be the primary deterrent, even though actual recorded default cases are below 2%. The skepticism, however, is not entirely misplaced, as payment delays have been recorded on a fairly regular basis.

To ease the situation, he informed the participants that ISA, along with the World Bank, is in the process of creating a Global Solar Facility to provide guarantees to the private sector for investing in small-scale solar projects. Dr. Mathur emphasized the goal of increasing solar capacity deployment to 600GW annually, up from the current levels that are in the range of 60-100 GW.

He listed three major areas of concern that need immediate attention:

- Geographical imbalances
- Sectoral imbalances accentuated by the tussle between the utility sector and community solar programs
- Manufacturing consolidation





Dr. Mathur acknowledged that establishing a manufacturing production unit was a daunting task. He noted that the current consolidation of the manufacturing capacity and supply chain choke points can be partly attributed to years of outsourcing by many regions, driven by short-term economic benefits. He emphasized that reviving domestic manufacturing would require robust policy frameworks and suggested implementing policies similar to the USA's Inflation Reduction Act (IRA) and India's Performance-Linked Incentives (PLI), which have been fairly successful.

The DG concluded by reiterating the vision behind the formation of the CEO Caucus and provided an overview of ISA's planned flagship initiative to strengthen solar startups in Africa, Asia-Pacific, and Latin America through outreach and investment camps. He expressed gratitude for the ever-growing support to organizations such as ISA, the Global Solar Council, and Climate Exchange and concluded by inviting attendees to the Solar festival to be held in New Delhi in September.





Key deliberations:

The roundtable discussed four critical themes:

1. Building domestic manufacturing units across regions and diversification of the supply chain:

Key issue:

Least Developed Countries (LDCs), and Small Island Developing States (SIDs) possess the potential for establishing manufacturing units and supply chain partnerships. However, they suffer from two critical drawbacks -- high upfront costs of equipment, and ill-equipped workforce -- which need critical resolution.

Points of discussion:

a) Policy frameworks and incentives:

African nations neither lack the ambition nor the resources for the green transition. Despite possessing abundant solar irradiation and critical mineral resources, there is a lack of a clear domestic policy framework to promote production. Many nations including the US, Canada, and European countries have pledged support but await enabling regulatory frameworks to initiate action. In this regard, adaptation of policies on the lines of the India PLI scheme, and the US's IRA would be helpful. Similar incentivization schemes can help make manufacturing units more attractive to promoters and investors.

b) Knowledge transfer:

Authorities in LDCs and SIDs often lack resources to train technical workforce, which is a great impediment to sustained development. For achieving speed and efficiency in meeting the energy goals, strict adherence to deadlines, and technical know-how, a standardized training program for the workforce is essential.



2. Financing and Capacity building:

Key Issue:

Investors who are pouring in funds for utility-scale projects in the developed nations are hesitant to invest in LDCs and SIDs, especially in community solar projects.

Points of Discussion

a) Guarantees and risk mitigation:

Community projects have a slim chance of attracting investments because they lack the scalability needed to meet the minimum funding requirements, which are often in the hundreds of millions of dollars. Skepticism also surrounds utility-scale projects in African nations due to delays and repayment issues. Risk mitigation schemes can be put in place to safeguard private investors to serve as guarantors to reassure potential investors.

b) Narrative building:

While incentivizing solar has resulted in investment growth, it is limited due to competition from other energy resources. The continuance of fossil fuel incentives can be seen as a lack of faith in renewable energy to emerge as a total replacement for conventional sources. Marketing and narrative building around the success of renewable energy is crucial in countering incentives for fossil fuels.

c) Reconciling decarbonization with development agendas:

Merging decarbonization into the development agenda will result in aligning forces for action. Multinational companies and foreign investors are on a constant lookout for sustainable investment opportunities. Countries that integrate decarbonization into their development strategies can attract more FDI, as investors seek to align their portfolios with sustainability goals. Corporations decarbonizing their portfolios through a shift to green energy paves the way for blended finance & public-private investment partnerships and are crucial for sustainable project funding, particularly in developing countries where public funding is insufficient. Alterra, a \$30 billion climate fund made solely for the decarbonization initiative is an excellent example of the decarbonization initiative's capability of mobilizing finance.



3. Technological challenges:

Key issue:

Although the price of solar has plummeted in the last few years, it remains prohibitively high for people residing in LDCs, who spend almost 70% of their income on food and fuel. Moreover, transmission technology today remains underutilized, primarily due to the usage of separated standalone systems for transmission of renewable energy like wind and solar which individually operate at an average efficiency rate of 33%. The focus should instead be on integrating transmission lines with the aim of unified distribution and most efficient utilization.

Points of Discussion

a) Innovation in battery technology:

In the past few years, remarkable strides have been achieved in battery technology. With the amount of lithium used in batteries going down by 10-15%, the cost of energy storage has been reduced. Moreover, initial strides have been achieved in the development of sodium-ion batteries, the technology which, if proven to be worthy of implementation, would bring the price of batteries down by 20-30%.

Advancement in storage solutions is crucial given the intermittent nature of solar energy. Hence, the most obvious solution is to store excess energy for later use. However, this requires significant energy storage capabilities, which adds substantial costs to our energy system. Reducing battery costs can lower the overall cost of deployment, making it a more viable option for LDCs.

b) Integration of transmission lines:

As stated above, the biggest issue with renewables like solar is that they are weather sensitive, unlike fossil fuels which provide the same kind of output irrespective of the time or weather. Therefore, to maintain regular supply with renewables, a combination of solar and storage along with wind is predominantly used. However, they have different transmission lines working only on a fraction of their capacity. Setting up transmission lines is resource intensive and having three different transmission lines working at 33% efficiency results in inflated energy costs. A combination of these lines would have sizable cost efficiency.



4. The tussle between community-scale and utility-scale projects:

Key issue:

Community solar and other distributed energy resources increase the resilience of the nation's electric grid. Instead of relying on a single generation source for a large region, distributed solar energy systems like community solar provide energy sources to surrounding communities. A backup energy source can supply access to power that will support community needs. Community solar can be strategically sited or include storage to help reduce the duration of a grid outage or prevent interruptions in electricity delivery. Even with all the benefits of decentralized and inclusive development, community solar has not witnessed its deserved growth and has lagged behind utility scale projects due to the following reasons:

Points of Discussion

a) Scalability constraints:

Even though utility-scale projects added 60% of the new energy generation capacity in the US in the previous year, community projects lagged as they were not considered to be scalable. While states like New York see a dwindling demand for community solar, the California Public Utilities Commission (CPUC) recently decided to expand its community solar programs.

Set to double the capacity of the Disadvantaged Community Green Tariff Program (DAC-GT) to 144 MWs, the move will directly benefit approximately 45,000 additional low-income customers with a 20% electricity bill subsidy. The enhanced Green Tariff Program now includes battery storage options and broader eligibility, while a new Community Renewable Energy Program dedicates 51% of its capacity to low-income subscribers and allows community choice aggregators to participate.

Equal emphasis on utility and community projects helped California lead the nation in solar deployment with 35,000 MW of installed solar capacity, providing nearly 30% of the state's electricity generation.

Replication of the successful model of California in other parts can help address the problem and ensure growth.



b) An Ideal way to solve for overcapacity:

The adoption of Community solar broadens the consumer base and fuels demand.

The access to low-cost energy they provide to renters, low-income households, and small businesses fosters support for green transition which in turn can help pool together numerous small investments from individual participants, creating significant collective demand for PV panels. This aggregated demand can absorb the excess supply of solar panels and solve for utilization of the surplus of panels.

c) Distributed generation solving for transmission problem

Deployment of solar projects closer to the user base substantially decreases the overhead cost of transmission. Decentralized mini and microgrids can additionally solve the energy crisis seen in LDCs by making them more affordable which will help in reaching our goal faster





Annex 1: List of Discussants and Participants





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1. Ms. Riddhima Yadav, Vice President, Brookfield Asset Management
2. Ms. Caroline Abramo, CEO, Pana Low Carbon Economy Investments
3. Mr. Richard Edelman, CEO, Edelman
4. Mr. Gurpreet Brar, Special Projects, Office of CEO, Edelman
5. Mr. Raphael Carty, Callida Energy and Professor, NYU Stern
6. Ms. Petal Gahlot, Permanent Mission of India to the UN
7. Mr. Chandrasekar Govindarajalu, Practice manager, ESMAP, World Bank
8. Dr. Stephen Hammer, CEO, The New York Climate Exchange
9. Mr. Andrew Kern, Vice President, Energy Markets, Bright Power
10. Mr. Binaya Pradhan, Consul General, India
11. Mr. Bill Sisson, Executive Director, North America, World Business Council for Sustainable Development





Annex 2: Event Background Note





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Driving Solar Energy Revolution: Growth Insights for Global Impact

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Context

What are the vital lessons that the world can learn from the US private sector's impressive growth in promoting solar energy? ISA is pleased to organize this roundtable to understand the mechanisms and facilitate ways to operationalize them.

The world needs to rapidly ramp up clean energy, specifically solar energy deployment to keep the 1.5°C climate goal within reach. Simultaneously, it must address the conundrum of the concentration of production facilities in a few specific regions, with critical demand lying far away.

Global investments are also on the increase with the solar energy value chain having crossed the \$300 billion mark in 2022. However, the investments are highly skewed toward advanced economies and China. The two regions, i.e., Asia Pacific and Europe & North America, accounted for 55% and 33% of global project development investments.

According to IEA's report, "Renewables 2023: Analysis and forecasts to 2028", the global manufacturing capacity of solar PV will reach 1100 GW at the end of 2024, roughly thrice the projected demand. The current manufacturing capacity is estimated to be 800 GW with China still accounting for 80-95% of the world share.

This concentrated over-capacity has significantly depressed prices of PV modules, making solar deployment costs significantly lower. However, the geographic concentration of manufacturing capacity leaves the world susceptible to uncertainties arising from logistical constraints, inequitable access, and geo-political turbulence.



Leaders at COP28 had pledged to add 600 GW of solar power annually till 2030 to meet global Net Zero targets, highlighting the enormity of the task at hand. However, at this critical juncture where all efforts must be focused on mitigating the threat of climate change, solar module manufacturing overcapacity is proving to be a deterrent for potential investors, depriving the world of clean energy wins.

In order to progress, the world needs to approach solar deployment with a three-pronged focused strategy:

- 1: Strengthening of domestic manufacturing units along with diversification of supply chains;
- 2: Financial assistance and investments targeted towards resource-poor regions; and
- 3: Technological advancements including those in storage, which make solar deployment at scale feasible.

As a global leader, the United States of America has achieved significant progress in every aspect of the three-pronged strategy mentioned above.

The USA has recently witnessed a “manufacturing resurgence” in the solar sector which has helped build a robust supply chain. The U.S. International Development Finance Corporation (DFC), Millennium Challenge Corporation (MCC), and Export-Import Bank (EXIM) have proven to be key institutions promoting foreign industrial sustainability including clean energy initiatives. With nearly half of all solar cell efficiency world records being achieved by the U.S. Department of Energy's Solar Energy Technologies Office (SETO) awardees, U.S.A's technological prowess is paving the path for the world to tread.



The Meeting

The private sector roundtable hosted by ISA on July 15th, 2024, in New York, aims to discuss the opportunities and challenges to create networks for collaboration among US private sector companies in solar manufacturing, technology, and finance. In this third discussion under the CEO Caucus series, our aim is to gain perspectives from the US private sector's technological advancement, financing initiatives, and the creation of a sustainable production industry. In addition, we aim to foster collaborations that can spread these learnings to the developing world.

The participants for this session will include leaders from the private sector in the U.S. working on clean technologies, finance, solar manufacturing and deployment, renewable energy companies, and leaders from global conglomerates with significant Net Zero commitments.

Themes of deliberations

This high-level forum will facilitate discussions among Industry leaders and experts from the solar manufacturing, technology, and finance to identify areas of opportunity and collaboration.

The forum will deliberate on the following questions:

1. What are the targeted measures to boost clean energy and provide safeguards against unfair competition and the glut of PV panels in the market? What is the best approach to propagate these measures without disrupting the global solar growth momentum?
2. What are the prevalent bottlenecks - like scarcity of manufacturing equipment and access to technologies - that are hampering diversification of manufacturing capacity?
3. What support measures do private investors need to create a robust finance ecosystem to mobilize investments at scale and empower the growth of resilient global solar supply chains?
4. How can economically supportive initiatives like community solar projects be effectively replicated on a global scale to make PV access affordable for all? Additionally, how can such projects and microgrids stimulate demand for solar energy and address grid-related issues that are currently slowing down PV installations?
5. What are some of the strategic actions and initiatives needed to upscale PV research to develop next-generation solar and energy storage technologies, globally?

The roundtable is an invite-only closed-door discussion that will follow Chatham House rules. This is a part of the CEO Caucus, ISA's initiative to engage with the private sector. The key take-aways from this discussion will be incorporated in a pathway document, which will be unveiled at the first International Solar Festival to be held in New Delhi in September 2024.



Annex 3: Event Series Note





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CEO Caucus:
A Global High-Level
Consultative Platform for
Industry Collaboration



1. Building an industry collective to unlock full capacity of solar

Achieving net-zero emissions by mid-century to maintain the 1.5-degree Celsius climate target is critically dependent on a successful transition to clean energy. To achieve this transition, and meet the goal of tripling renewables by 2030, it is essential to add at least 600 GW of solar power annually from 2023 to 2030, requiring investments of USD 500 billion per year. However, the road to accelerate solar deployment remains full of obstacles. There's a need to create a diversified and more resilient global solar manufacturing supply chain, conditions to unlock financing and for fostering technological innovations, and to strengthen solar powered applications as demand drivers to boost deployment of solar at scale across the world. The private sector plays a critical role across all these aspects and their perspectives on these issues are essential for framing the way forward.

To catalyze this, the International Solar Alliance (ISA) is constituting high-level forum of select Leaders to deliberate on measures and potential collective action for addressing challenges to unlock the full potential of the sector. The 'CEO Caucus' will provide industry leaders with a platform to collaborate with key stakeholders to create pathways for global growth through interventions across the solar value-chain. In this process, ISA will also collaborate with like-minded organisations from across the world to achieve its mission of facilitating the private sector for accelerating clean energy transitions.

This initiative is in continuation to ISAs on-going efforts to further strengthen public-private partnerships to enhance adoption of solar energy across the globe.





2. A consultative platform to build pathways for global growth

The CEO Caucus will bring together global leaders working on clean technologies, solar manufacturing and deployment, renewable energy companies, and leaders from global conglomerates with significant net-zero commitments. The platform will enable targeted discussions on the shared challenges within the industry, foster private sector's engagement with key policymakers and propose solutions to accelerate the adoption of solar energy across regions

ISA will conduct a series of roundtables under the 'CEO Caucus' and also gather global viewpoints on the solar sector on the sidelines of ISA's Regional Committee meetings (RCMs). The discussion points from each session will be developed into specific discussion notes. Finally, all of the topics and suggestive measures covered in every meeting will be combined into a "*Pathway Document*", outlining a suggested path forward for all stakeholders—both private and public—to promote the growth of solar markets.

This platform will serve as an ongoing forum, continuously engaging with stakeholders to develop and actualize a comprehensive roadmap for expanding solar adoption.

3. Key themes of discussion for the CEO Caucus

1. Expanding the global footprint of solar manufacturing

The main challenge in manufacturing is that it is highly concentrated in specific regions which can lead to supply chain disruptions. Through initiating deliberations, ISA wants to boost the global footprint of solar manufacturing. Direct support measures for solar manufacturing play a key role in incentivizing the exponentially large scale-up needed for new market entrants to be competitive. However, some of these measures can be perceived as protectionist. Furthermore, concerns are increasing about recyclability, waste, and the total life cycle footprint of solar modules and other components. Therefore, ISA CEO Caucus will work towards designing a holistic strategy for solar manufacturing, targeting both upstream and downstream parts of the value chain.

2. Unlocking capital to propel solar manufacturing led growth

One of the major obstacles to developing resilient global solar supply chains is the lack of adequate financing for solar manufacturing. Support for both capital and operating expenses is especially crucial in emerging markets. Currently, financing for solar manufacturing is concentrated in a few countries, and the significant multi-billion dollar investments required for polysilicon, wafer/ingot, and cell production pose an even greater challenge for smaller and less developed nations. Innovative ways of capital deployment can help overcome these challenges and drive ecosystem growth by propelling solar manufacturing. There is a significant opportunity for nations and international institutions to gradually increase their investments in clean energy manufacturing within their energy portfolios.

3. Fostering technological innovations

Emerging markets that have significant plans for solar installation may have limited expertise and R&D funding to develop solar supply chains domestically. Research on next-generation higher-efficiency technologies, including interdigitated back-contact cells, which supersede existing crystalline silicon cells are even more concentrated with only few countries. Further, critical equipment (particularly in the polysilicon, wafer/ingot and cell manufacturing) are often bottlenecked, with a small number of suppliers worldwide. Emerging markets may be challenged in procuring or gaining access to this equipment. Therefore, there is a need to increase access to technology for all regions through collaborative action.

4. Applications oriented demand generation

Market depends on demand and therefore countries may consider offering "guaranteed demand" to manufacturers setting up new capacity, as a buyer of last resort at a guaranteed price, but only after market forces have been exhausted. Further, the 'CEO Caucus' can look at leveraging the platform for cross-sectoral partnerships and engagements to foster application-based demand generation in the solar sector.



4. Series of consultative forum

Leading up to the Solar Festival and at the Festival, a series of roundtable sessions will be organized. Below is the proposed calendar for this year under the first CEO's Caucus.

1. Private Sector Roundtable- June 6, 2024 (Virtual)
2. Private Sector Roundtable - June 13, 2024 - Brussels, Belgium
3. Private Sector Roundtable - July 15, 2024 - New York, USA
4. Private Sector Roundtable - August 5, 2024 - Africa (Virtual)
5. Private Sector Roundtable - August 14, 2024 - Sydney, Australia
6. **Solar Festival - September 5-6, 2024: A high-level plenary, building on the Private Sector Roundtable series, with select CEOs, will be convened on September 5, 2024. The Pathway document will be released at the festival*.**

