

U.S.-INDIA STRATEGIC CLEAN ENERGY PARTNERSHIP SUSTAINABLE GROWTH PILLAR

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U.S. TRADE AND DEVELOPMENT AGENCY

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PARTNERSHIP OVERVIEW

OUTLINE

The long history of energy cooperation between the United States and India have powered lives and livelihoods. On the margins of the April 2021 Leaders' Summit on Climate, President Biden and Prime Minister Modi announced the launch of a new bilateral partnership to advance shared climate and clean energy goals. The US-India Climate and Clean Energy Agenda 2030 Partnership includes the Strategic Clean Energy Partnership (SCEP) which was earlier established as the Strategic Energy Partnership in 2018 and had replaced the US-India Energy Dialogue, the previous intergovernmental engagement for energy cooperation. The revitalized SCEP will continue to advance energy security and innovation with greater emphasis on electrification and decarbonization of processes and end uses, scaling up emerging clean energy technologies, while finding solutions for hard-to-decarbonize sectors. Engagement with the private sector and other stakeholders will remain a priority.

STRATEGIC CLEAN ENERGY PARTNERSHIP PILLARS



THE JOURNEY SO FAR



PILLAR OVERVIEW

The Sustainable Growth (SG) Pillar under the US-India Strategic Clean Energy Partnership takes a broader role in advancing low-carbon development and improving inclusive and sustainable economic growth through climate responsive strategies, long-term plans, and energy data management. India is well on its way to leverage its expanding and diverse economy, capitalize on its demographic dividend and benefit from its rapid urbanization. The country's growth could be further enhanced by addressing energy issues along with ensuring financial and environmental sustainability as a climate responsible country. India is prioritizing strategies which could improve energy security, reliability, and affordability, universal energy access, and resiliency of energy systems to cyber-attacks and extreme weather events. Such strategies also help maintain water and food security over the long-term, reduce health impacts of air pollution, and support environmental stewardship.

The broad scope of the Sustainable Growth Pillar includes, but is not limited to:

- Improving inclusive and sustainable economic growth by enhancing long-term energy development plans and strategies through robust energy planning which should be based on better energy data management and analytical tools
- Developing tools/models and analysis for evidence-based planning and policy making
- Conducting cross-sectoral analysis of energy policies on broader development goals, including energy-water-food-nexus, air pollution, energy access, low-carbon growth, and decarbonization of transport, buildings, and industry
- Promoting collaboration between Indian and U.S. research institutions for enhancing modelling capabilities and tools for low-carbon development, decarbonization, and just transition.

Focal Areas of the Pillar



Energy Data Management



Energy Modeling



Low-carbon Technologies and Decarbonization



Just Transition from Coal

U.S.-INDIA SCEP MINISTERIAL CHAIRS



Jennifer M. Granholm
Secretary
U.S. Department of Energy



Hardeep Singh Puri
Minister of Petroleum and Natural Gas & Minister of Housing and Urban Affairs Government of India

RENEWABLE ENERGY PILLAR CO-CHAIRS



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Deputy Assistant Administrator
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ACTION PLAN

By improving long-term energy development plans and strategies, the Sustainable Growth Pillar contributes to India's inclusive and sustainable economic growth agenda. This broader goal will be met through increased collaboration between Indian and U.S. institutions on energy data management; the development of tools/models and analysis for evidence-based planning and policy making; cross-sectoral analysis of energy policies on broader development goals; and the accelerated adoption of low-carbon technologies that will accompany the decarbonization of critical sectors such as transportation, industry, power, and buildings. The Sustainable Growth pillar action plan 2023-24 will prioritize the following areas:

ENERGY DATA MANAGEMENT (EDM)



There are various competing fuels based on biomass such as bioethanol, biomethanol, bio-CNG, biomass-to-power and green hydrogen. In this regard, EDM would focus on data related aspects of bioenergy in collaboration with EIA and US national labs to enable sharing of best practices and learnings.

ENERGY MODELING



The SG pillar intends to leverage the expertise of US laboratories for climate and energy modeling, as well as to expand research areas in the India Climate and Energy Modelling Forum (ICEMF). The ICEMF set up by NITI Aayog will assume a larger role in systems modeling and analysis in the Government of India's decision-making processes. Its role is to enhance the level of engagement among modelers, researchers, and policymakers. For 2023-24, a webinar series on various climate and energy related topics would be taken up. The partnership will focus on capacity building/master class on GCAM to be able to assess low-carbon technologies in an integrated manner, considering energy, emissions, water, and agriculture. Given the critical importance of the buildings sector, NITI Aayog shall work with USAID on sharing tools and best practices for modeling and analytics of energy consumption in the building sector and long-term planning. The impact of technologies needs to be assessed over their lifetime to arrive at robust estimates of impact in terms of emissions. The action plan for 2023-24 shall include sharing of tools and knowledge for Life Cycle Assessment of low carbon technologies emissions and costs for an integrated assessment of these technologies.

LOW CARBON TECHNOLOGIES



Exploring the possibility of collaboration and coordination with respect to the policy landscape for Carbon Capture Utilization and Storage (CCUS).

STAKEHOLDER ORGANIZATIONS

- Ministry of Statistics and Programme Implementation
- Ministry of Petroleum and Natural Gas
- Ministry of New and Renewable Energy
- Ministry of Environment, Forest and Climate Change
- Ministry of Coal
- Ministry of Power
- Bureau of Energy Efficiency
- Central Electricity Authority
- NITI Aayog
- U.S. Department of Energy (US DoE)
- United States Agency for International Development (USAID)
- Pacific Northwest National Laboratory (PNNL)
- National Renewable Energy Laboratory (NREL)
- Energy Information Administration (EIA)



MAJOR HIGHLIGHTS

PROMOTION OF LOW CARBON TECHNOLOGIES



Launch of Investment landscape report on e-mobility in Mumbai, India 15th March' 23 (Photo Credit: SAREP)

Launch of investment landscape report on the e-mobility sector in India: USAID's SAREP during the E-mobility Investment Mobilization Platform event on March 15, 2023, launched a comprehensive Investment Landscape Report on the E-mobility Sector in India prepared in collaboration with Invest India. During the event more than 150 meetings between high potential E-mobility investee companies and prospective investors were facilitated. A pipeline of 24 relevant, high-potential investment opportunities were identified and one-on-one interactions with 27 investors were facilitated. SAREP is now continuously engaging with these stakeholders to bring a number

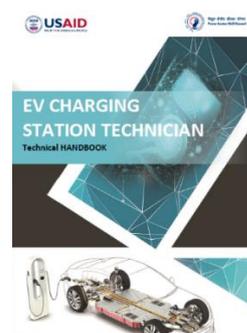
of these transactions to close. Based upon the interest of the entities, SAREP has shortlisted 3 entities for providing dedicated technical assistance to raise capital. The cumulative value of capital raise for the 3 entities is around USD 350mn in the next 6-8 months.

Creation of a dedicated E-mobility AIF: SAREP is currently working with Tata Cleantech Capital for this initiative and plans to create/structure an AIF dedicated to E-mobility. The AIF shall provide debt financing to OEMs, aggregators and the operators operating in the space of 2W,3W, 4W, e-buses and charging infra. Discussions have been held with the target borrowers to assess the market potential and identify the quantum of capital requirements. Based on these discussions, the size of the AIF has been assessed as USD 300mn for the first close. The fund shall result in CO2 abatement, reduction in fuel imports, creation of jobs and enable crowding-in of more capital. The financial model and pitch deck have been finalized and investor outreach is currently ongoing. So far, we have received positive interest from 6 investors and discussions have been held with them. Subsequent discussions with 2-3 investors are being planned to move ahead.

Accelerating National E-bus Programme of CESL: The National Electric Bus Program (NEBP) run by Convergence Energy Services Ltd (CESL) envisages deployment of 50,000 electric buses in the next 2-3 years. USAID's SAREP is working with CESL in modifying the bid documents and subsequent selection of the private operators for the e-bus bids under NEBP.

Developing Implementation Model for 'Charging as a Service': Availability of electric charging infrastructure (especially in the cities) is emerging as one of the major challenges in accelerated adoption of e-mobility. USAID's SAREP has commenced working with CESL to aggregate the demand for charging infrastructure from different ULBs, and empaneling private charge point operators, who can install charging stations and operate for 8-10-year period.

EV Charging Station Technician Handbook: In collaboration with Power Sector Skill Council, USAID's SAREP developed an EV Charging Station Technician Technical Handbook. The objective of this handbook is to help develop a skilled cadre of technicians to install, commission and operate the growing number of EV charging stations. The training content is designed to enhance capacity of human resources for installation, operation, and maintenance of various types of EV charging stations. The handbook meets the complete requirements of qualification pack-based training delivery of Electric Vehicle Charging Station-Technician job roles and will utilize it for future training of trainers and building capacity of technicians in this emerging technology. The handbook was launched at South Asia Clean Energy Forum (SACEF) in May 2023.



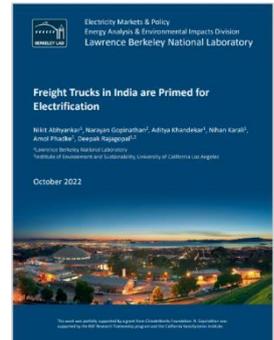
MAJOR HIGHLIGHTS

Assisting Indian Railways in implementation of EV Policy:

USAID's SAREP continued its engagement with Indian Railways (IR) on the implementation of its EV policy, involving EV vehicle uptake by railway personnel and EV charging station for deployment in railway stations. SAREP developed comparative analysis of different business models for charging station deployment, revenue-sharing model recommended by the Ministry of Power, and the land lease models proposed under the IR's EV policy and provided recommendations to the Indian Railways.

Electrifying Freight Trucks in India:

The Department of Energy supported a technoeconomic analysis of electrifying freight trucks in India, implemented by Lawrence Berkeley National Laboratory. The study, published in October 2022, found that advances in battery technology and dramatically decreased battery costs in recent years open up an opportunity to make electrification of heavy freight trucks more viable. The report demonstrates that with the right policies and incentives, battery electric trucks could be more affordable to operate than diesel, and could significantly reduce GHG emissions, oil imports, and the cost of freight movement in the country. The study suggests next steps for freight electrification for heavy-duty vehicles and a similar analysis is underway for medium-duty trucks.



Capacity Building and Knowledge Exchange:



Government of Bhutan delegation visit to EV battery swapping station in Delhi NCR, India (Photo Credit: SAREP)

Under the India Climate and Energy Modelling Forum (ICEMF), NITI Aayog and USAID jointly conducted knowledge-sharing sessions on various climate and energy topics, facilitated by both U.S. and Indian institutions.

Additionally, USAID's SAREP facilitated a regional knowledge exchange study-trip of Royal Govt of Bhutan delegates from June 6-9, 2023. During the visit, SAREP supported delegates in learning about the EV landscape in India, the EV financing ecosystem, and

SAREP's interventions on e-mobility. The delegation interacted with multiple government and private stakeholders in the EV sector and visited charging stations and recycling/repurposing research and development units in Delhi.

Launch of South Asia Group for Energy (SAGE 2.0):

The second phase of South Asia Group for Energy (SAGE 2.0) was launched on May 2, 2023 at the South Asia Clean Energy Forum. SAGE is a consortium consisting of USAID, the United States Department of Energy, and three Department of Energy National Laboratories: the Lawrence Berkeley National Laboratory, the National Renewable Energy Laboratory, and the Pacific Northwest National Laboratory. The South Asian Group for Energy represents excellence in U.S. research and international cooperation in the energy sector. It will partner with the governments of South Asia to support implementation of research, analysis, and capacity-building activities focused on energy sector opportunities throughout South Asia. US labs including PNNL and NREL are in discussion with NITI Aayog on the way forward on a number of activities identified under the sustainable growth working pillar.



The South Asia Group for Energy (SAGE) launch on May 2, 2023 (Photo Credit: SAREP)



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