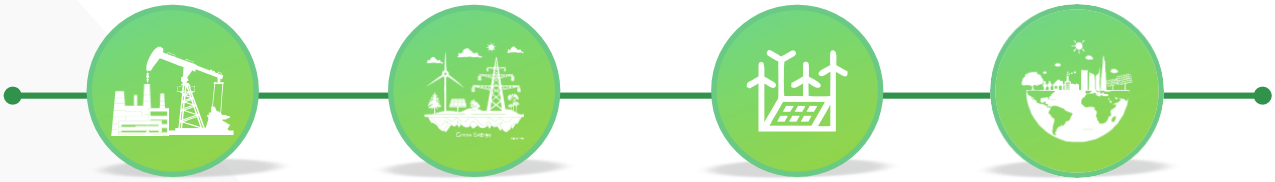
U.S.-India Strategic Clean Energy Partnership

Sustainable Growth Pillar

Highlights

The U.S.-India Strategic Clean Energy Partnership (SCEP), led by President Biden and Prime Minister Modi, aims for deeper and more meaningful engagement through Government and Private Sector Cooperation using an integrated interagency approach. The SCEP's focus is achieve ambitious climate and clean energy targets and to strengthen bilateral collaboration across climate and clean energy. It also positions India as a key partner in the Asia Enhancing Development and Growth through Energy (EDGE) initiative. The SCEP is coordinated by the U.S. Department of Energy and the Ministry of Petroleum and Natural Gas, Government of India (GOI).

Strategic Cleans Energy Partnership



Oil and Gas Pillar

Power and Energy Efficiency Pillar

Renewable Energy Pillar

Sustainable Growth Pillar

The Sustainable Growth (SG) Pillar

The broad scope of the SG Pillar includes improving inclusive and sustainable economic growth by enhancing long-term energy development and plans and strategies through energy data management; tools/models and analysis for evidence-based planning and policy making; cross-sectoral analysis of energy policies on broader development goals, including energy-water-food-nexus, air pollution, energy access; collaboration between Indian and U.S. research institutions, enhance modeling capability and enhance geo spatial tools for renewable energy planning and deployment.

The collaboration also focuses on development and deployment of low-carbon and environment-friendly technologies. NITI Aayog and the U.S. Agency for International Development (USAID) co-chair this pillar.

The SG Pillar brings together Indian and U.S. researchers and decision makers to collaborate in three focal areas:

1. Energy data management
2. Energy modeling
3. Low-carbon technologies

Key Highlights

- NITI Aayog and USAID created the Indian Energy Modeling Forum (IEMF) in 2019, a new platform for policy makers, industry, researchers, and international institutions to collaborate on key energy and environmental research questions to inform decision making. This can help the government of India with their net-zero planning, including India's Nationally Determined Contribution and Long-Term Strategy which will both be released in the next year.
- The Indian agencies, including Ministry of Statistics and Programme Implementation (MoSPI), have benefitted from the cooperation in improving the energy data system under the SG Pillar work, including the new Energy Dashboard and improvements in underlying data such as data for oil, gas and coal. India now has high quality consolidated data from across data agencies that is shared in the Dashboard, and there is strengthened capacity to improve data, including on oil, gas, coal, and biomass.
- Study tours, webinars and workshops have strengthened capacity on energy data management and improved coordination between Indian data agencies and relationships with US organizations, such as the Energy Information Administration.
- Five peer-reviewed journal articles and over ten reports were produced as a result of SG Pillar activities.
- Indian research institutes enhanced their capacity for modeling. This includes significant work on model development, strengthened skills to conduct multi-model analysis that informs policy, and a training series to utilize US DOE energy modelling tools.
- One research example is the study done between NITI Aayog and the U.S. Department of Energy's Pacific Northwest National Laboratory (PNNL) to understand how climate change is impacting space cooling in India. This work will help the GOI with their net-zero planning, including India's Nationally Determined Contribution and Long-Term Strategy which will both be released in the next year.
- Institutionalizing the India Energy Modeling Forum has created significant synergies on the research topics which would be relevant for the energy sector.

Energy Modeling

In India's fast-growing economy, energy modeling is critical in informing important policy and market questions. Both the government and the private sector need the ability to understand trends and the implications of decisions in a complex but interconnected world. The SG Pillar modeling initiative has enhanced India's ability to incorporate analysis into energy decision making. This includes improving cooperation and coordination between the modeling teams and building capacity of Indian institutions in energy, water, transportation, and other related areas of analysis.

Recognizing the importance of energy modeling to India's future energy and environmental decision making, NITI Aayog and USAID convened the First Indian Energy Modeling Forum meeting in March 2019.

In July 2020, NITI Aayog announced the launch of the IEMF governance bodies, including an Advisory Board with numerous ministries and several industry representatives, a Steering Committee with leading research institutions and NITI Aayog, and an International Advisory Board. The IEMF Steering Committee created five Tasks Forces to focus on specific research questions:

- Task Force 1. Net Zero Pathways;
- Task Force 2: Energy-Water-Land-Food Nexus and Air Quality-Energy Nexus;
- Task Force 3: Economic Analysis;
- Task Force 4a: Demand Side Analysis – Transport;
- Task Force 4b: Demand Side Analysis – Industry;
- Task Force 5: Energy Security.

IEMF Meeting - March 2019

"The IEMF seeks to provide a platform for leading experts and policy makers to study important energy and environmental issues and ensure induction of modelling and analysis in informed decision making process."

Dr. Rajiv Kumar, Vice Chairperson, NITI Aayog

"Today we launch a new phase of the U.S.-India energy cooperation, one which will take this partnership to the next level."

Mark A. White, USAID/India Mission Director

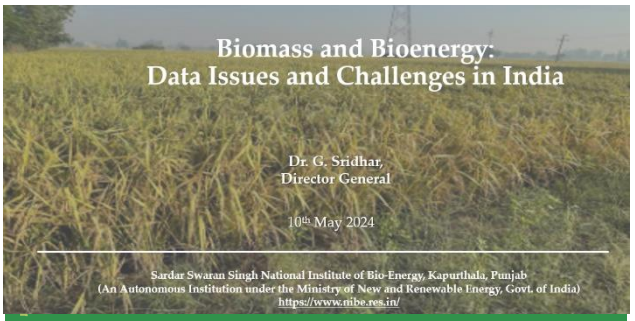
Energy Modeling (cont.)

In 2024, NITI Aayog and PNNL worked together to understand how climate change is impacting space cooling in India. This analysis provided additional insights on the development of India's energy system as it transitions to achieve net zero by 2070. In CY25, the joint-analysis results will inform India's national climate policy in-particular their 2025 NDC submission and Long-term Strategy (LTS). These insights can provide context for potential increases in energy consumption, which can result in increased emissions if they are not planned for. Concern about poor data on climate impacts, economic, and trade implications has hindered Indian policy making around climate in the past, so this analysis can help inform robust climate decision making in India.

Energy Data Management

Publicly available energy data is a critical factor in supporting investment decisions. Reliable, consistent, and easily accessible data are important to understanding energy security risks, formulating energy and environmental sector policies, and making rational business decisions. Availability of energy data requires institutional mechanisms and processes to collect, process, and disseminate data in a timely manner. U.S. Energy Information Administration (EIA), USAID, and PNNL worked with Indian partners to improve energy data and build capacity for energy data management. Under this bilateral cooperation, NITI Aayog along with the MoSPI, line ministries and Prayas were able to improve energy data. SG Pillar activities resulted in several peer-reviewed publications and reports to document findings, revealed data gaps, and proposed a concrete way to improve energy data management in India. Based on the previous work of PNNL and EIA, Prayas developed India Energy Dashboards 2.0.

Based on the analysis conducted under the SG Pillar activities, NITI Aayog prepared recommendations on supply and demand sides of energy data management to assess available data formats, identify data gaps and suggest framework for strengthening data management. The focus of the SG Pillar is to improve the energy data management systems through transfer of best practices from the U.S. to India. Indian agencies are not required to share their data with U.S.



NITI Aayog data energy experts met with the Energy Information Agency (EIA) to learn about biomass energy data management in a webinar organized by PNNL. . The webinar included speakers from the EIA and India's National Institute of Bio-Energy (NIBE), who discussed information on biomass data gaps, methodologies to collect biomass data, and lessons learned from using these methods.

Low Carbon Technologies

U.S.-India cooperation is expanding assistance to a variety of stakeholders, including Indian central and state governments, utilities, and regulators to develop frameworks, tools, and demonstrations for scaling up low- carbon technologies.

Technologies include clean fuels, electric mobility, battery storage, energy efficiency, and smart grid.

"Emissions from transport have grown faster than those from any other sectors over the past 30 years and climate change cannot be stopped without decarbonizing transport," says NITI Aayog CEO Amitabh Kant.

Four Indian modeling teams and PNNL have collaborated on a study to compare the emissions mitigation potential of various decarbonization strategies for India's transport sector. One of the scenarios the teams have examined is electrification of on-road transport. The team will continue collaboration to analyze the energy and emissions effect of decarbonization technologies in other sectors.

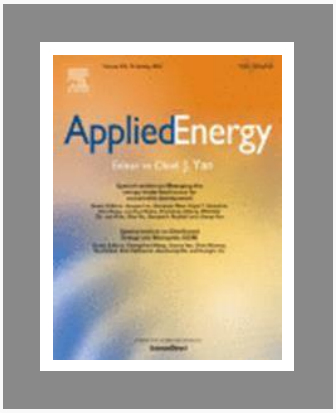
NITI Aayog released the report on November 7, 2019. The study is an example of close cooperation between the modeling teams, NITI Aayog, USAID, and the Shakti Sustainable Energy Foundation.

Key Sustainable Growth Pillar Activities in the Coming Year

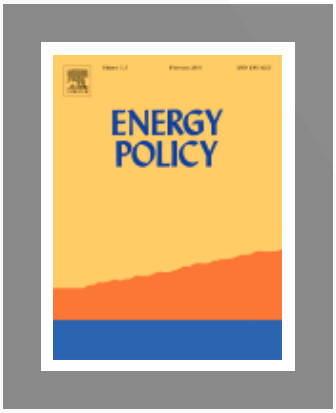
- Support the strengthening of the India Energy Data Management system to improve energy data availability, accessibility, and consistency for policymakers and public.
- Collaborate on analysis that evaluates the impacts of a net-zero 2070 future on energy, emissions, water, and land.

Low carbon technologies such as electric vehicles

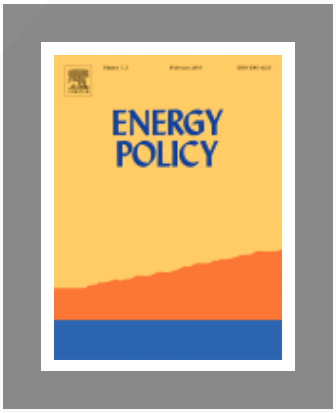
Key Publications



Water for electricity in India: A multi-model study of future challenges and linkages to climate change mitigation



Effective energy data management for low-carbon growth planning: An analytical framework for assessment



A multi-model assessment of energy and emissions for India's transportation sector through 2050