

Delegation Summary



U.S. DEPARTMENT OF
ENERGY



Government of India
Ministry of Power

Central Electricity Authority

India Energy Storage Delegation to USA

13-17 May 2024

Under the US-India Energy Storage Taskforce (ESTF)

Facilitated by



India Energy Storage Delegation Program to USA

13-17 May 2024 || Program Details

Richland & Spokane, Washington

Mon, May 13
(10am-6pm)

Site visit to Washington State University (WSU) Tri-Cities

Richland, WA

Meet with WSU and PNNL researchers, tour facilities, and learn about WSU work on energy storage systems, DOE Innovation Energy Prize work, Hydrogen Hub efforts, and related clean energy R&D

Tues, May 14
(10am-5:30pm)

US-India Workshop (as part of US-India Energy Storage Taskforce)

Grid Storage Launchpad (GSL) Facility Tour

Forum Welcome Reception

Richland, WA

**Wed, May 15 -
Thu, May 16**

PNNL Energy Storage Safety & Reliability Forum

Richland, WA

Fri, May 17
(8am-3pm)

Full Day Site visit in Spokane - Tour of Avista Utilites (TBC)

*Spokane, WA**

Meetings at WSU-Spokane on energy storage systems

Meeting with Avista Utilities

Delegation will be free after 3 pm

**Note: Richland to Spokane is roughly a 2 ½ hr drive. Transportation will be provided departing at 8am, meetings will begin around 11am.*

***Spokane International Airport (airport code: CEG) offers more flight options than Tri-Cities.*

Day 1 (13th May 2024) Visit to WSU Tri-Cities

The Day was the first day of the delegation to the WSU Tri-Cities Campus on 13th May 2024. The meeting started by giving the Overview of WSU and WSU Tri-Cities by WSU Tri-Cities Chancellor Sandra Haynes. She mentioned the history of Washington State University and WSU Tri-Cities. She also mentioned joint institutes including Advanced Grid Institute.



Dr. Jillian Cadwell, WSU Tri-Cities Provided the overview of WSU Tri-Cities, US DOE Inclusive Energy Innovation Prize. Dr. Jillian mentioned about Empowering Students: Future STEM Workforce Members, Clean Energy Ambassadors Network (CEAN) and its members.

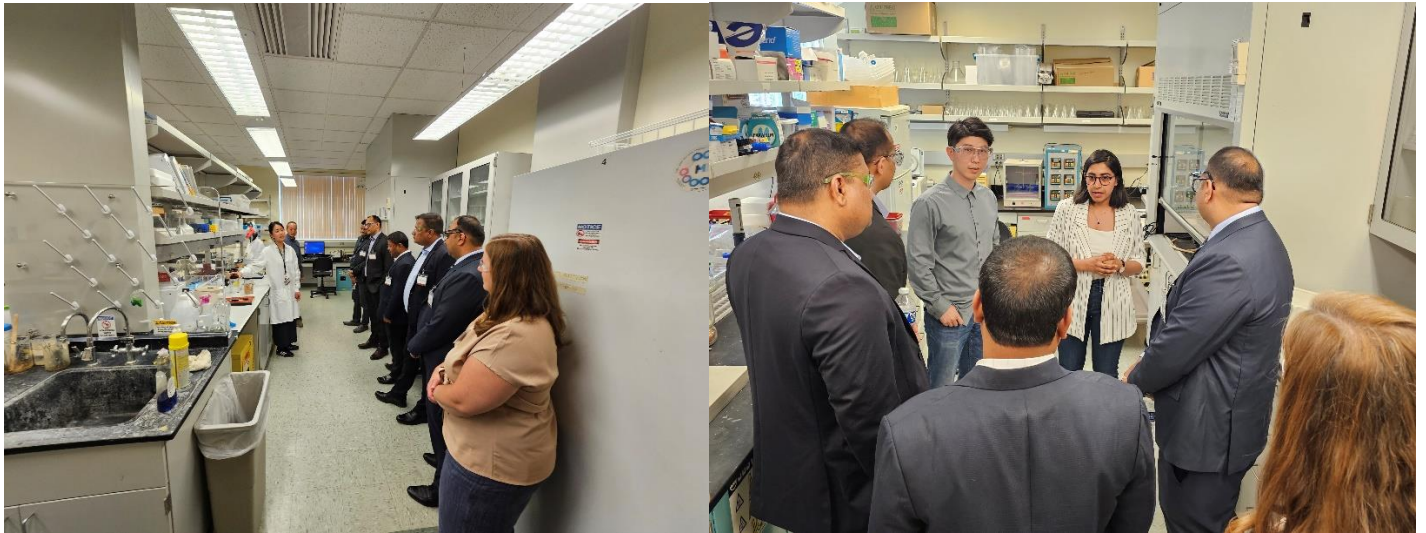
Dr. Su Ha from Gene and Linda Voiland School of Chemical Engineering & Bioengineering, Washington State University shared knowledge on various and focused on Production of Compressed Hydrogen, Regenerative Fuel Cell and CO₂ Capture and Utilization.

Dr. Anamika Dubey presented on PNNL/WSU Advanced Grid Institute (AGI), its structure, appointees, and priorities. Dr. Mani V Subramanian from Energy Systems Innovation Center (ESIC) gave thrust areas of ESIC such as (1) Microgrids and IBRs, (2) Reliability and Resilience (3) Grid Edge/Privacy/Cybersecurity, (4) AI and ML Applications, (5) Workforce 2.0.

Dr. Noel N. Schulz, Bob Ferguson Endowed Professor Inaugural Director, Institute for Northwest Energy Futures (INEF) shared the progress of the UI-ASSIST Program with India. Dr. Kate McAteer, WSU Tri-Cities and Dr. Jamie Holladay, PNNL mentioned about their collaboration with DOE's Hydrogen Hub.

The key participants from India for the day include Kuldeep Rana (MNRE), Debi Prasad Dash (IESA), Naresh Telgu (Adani) and Jatin R. Agarwal (Tridiagonal Solutions).

The second half of the day included the WSU Tri-Cities lab visit and reception at the Wine Science Center with DOE, PNNL and WSU Tri-Cities Leaders and Monday's Speakers



For any queries reach us at contact@indiaesa.info

Day 2 (14th May 2024) US-India Workshop (as part of US-India Energy Storage Taskforce) at PNNL

The Welcome address was given by Vince Sprenkle, Director of Grid Storage Launchpad, PNNL to all the participants of the Taskforce meeting. Eric Hsieh, Deputy Assistant Secretary for Energy Storage, Office of Electricity, DOE, & US co-chair gave the opening remarks and the progress and objective of the workforce.

In the absence of Rajesh Kumar, Chief Engineer, Central Electricity Authority, & Indian ESTF Co-Chair, Kuldeep Rana, Scientist F, Ministry of New and Renewable Energy (MNRE), ESTF Steering Committee Member, India side gave the opening remarks and mentioned the need of the taskforce.

Imre Gyuk, Chief Scientist, Office of Electricity, DOE presented virtually the success of the Energy Storage Expert Webinar Series and themes of all past webinars and how it's become an important knowledge platform for industry stakeholders of both countries.



Mohamed Kamaludeen, Director for Energy Storage Validation, Office of Electricity, DOE, & US Steering Committee shared the presentation on Accelerating Next Generation Energy Storage Development, U.S Storage Landscape and Energy Storage Grand Challenge.

Kuldeep Rana, Scientist F, Ministry of New and Renewable Energy also presented India's ACC-PLI Scheme and India's effort to Accelerate Next Generation Energy Storage Development. Debi Prasad Dash, Executive Director, IESA presented the progress of India-US Energy storage Taskforce progress and an overview of the Stationary Storage market in India. Naresh Telgu, Chief Operating Officer of

Adani presented India's roadmap, market dynamics of Pumped hydro storage and Adani's current project in PHESS.

Vince Sprenkle, PNNL and his team presented the PNNL Research on Energy Storage, including Safety and Reliability. Jeremy Twitchel, PNNL also presented on Grid Modelling and Planning of Storage. WSA Prof. Noel Shultz presented the progress of the UI-ASSIST Smart Grid and Energy Storage Program and the energy storage projects undertaken through this funding program in the USA and India.

In the afternoon the delegation joined the Safety & Reliability Forum Social Event at the Wine Science Center. The key participants from India for the day include Kuldeep Rana (MNRE), Debi Prasad Dash (IESA), Naresh Telgu (Adani), Jatin R. Agarwal (Tridiagonal Solutions) Sachin Jain (G Power).



Day 3-4 (15th – 16th May 2024) was focused on to attend 8th annual Energy Storage Safety & Reliability Forum

The key participants from India for both days include Rajesh Kumar, (CEA, Govt of India, Suresh Annepu, (MoP), Kuldeep Rana (MNRE), Debi Prasad Dash (IESA), Naresh Telgu (Adani), Jatin R. Agarwal (Tridiagonal Solutions)

The safety and reliability forum were an excellent opportunity to understand global safety standards, and also to know various solutions and visit the expo.

There was also a meeting arranged on Day 3 (15th May) between Eric Hsieh, Deputy Assistant Secretary for Energy Storage, Office of Electricity, DOE, & US co-chair & other DOE members and Rajesh Kumar, Chief Engineer, Central Electricity Authority, & Indian ESTF Co-Chair and India side Steering committee members with the presence of ESTF Secretariat representative Debi Prasad Dash, IESA. Key discussion points include.

- DoE will invite ESTF members and officials for various DoE-sponsored events throughout the year
- DoE will share the energy storage public platforms developed by its labs for the usage of Indian members.
- India ESTF chair mentioned the need for a prototyping centre and invited DOE to develop a satellite Lab in India.
- India ESTF Chair also mentioned the need for the joint pilot for tech validation in the space of energy storage and opportunities for technology transfer between India and the USA in this sector.

On day 4 (16th May), the India delegation team also visited the Grid Storage Launch pad lead by Vince Sprenkle, Director of Grid Storage Launchpad, PNNL.





DRAFT

Day 5 (17th May) Visit to Spokane - Tour of Avista Utilities

The key participants from India for both days include Rajesh Kumar, (CEA, Govt of India, Suresh Annepu, (MoP), Kuldeep Rana (MNRE), and Debi Prasad Dash (IESA). The team understands the complexity of the utility and resilient microgrid cluster development and the deployment of thermal storage and grid-scale energy storage projects.

