



Industry Advisory Council
(a Greening the Grid/RISE initiative)



International Experiences in Grid level Energy Storage and Applicability for India

Friday, November 30, 2018 | 3:00 p.m. – 5:00 p.m.

India International Centre

Background –

Renewable energy has surged to become the fastest growing source of electricity in the India today. Globally, two-thirds of new power investments through 2040 are projected to be wind and solar. Non-fossil fuels -- renewables, nuclear and large hydroelectric power plants -- will account for more than half (56.5%) of India's installed power capacity within the 10 years to 2027. That shift is transforming the grid as we know it, providing fast-growing amounts of low-cost clean energy and decarbonizing the grid.

However, developing renewable resources presents a new set of technological challenges not previously faced by the grid: the location of renewable resources far from population centers, and the variability of renewable generation. Although small penetrations of renewable generation on the grid can be smoothly integrated, accommodating more than approximately 30% electricity generation from these renewable sources will require new approaches to extending and operating the grid.

Greater uncertainty and variability can be dealt with by switching in fast-acting conventional reserves as needed on the basis of weather forecasts on a minute-by-minute and hourly basis; by installing large scale storage on the grid or; by long distance transmission of renewable electricity enabling access to larger pools of resources in order to balance regional and local excesses or deficits. At present, renewable variability is handled almost exclusively by ramping conventional reserves up or down on the basis of forecasts. However, as renewable penetration grows, storage and transmission will likely become more cost effective and necessary.

Proposed Event –

As renewable generation grows it will ultimately overwhelm the ability of conventional resources to compensate renewable variability, and require the capture of electricity generated by wind, solar and other renewables for later use. Transmission level energy storage options include pumped hydroelectric, compressed air electric storage, and flywheels. Distribution level options include: conventional batteries, electrochemical flow batteries, and superconducting magnetic energy storage (SMES). Batteries also might be integrated with individual or small clusters of wind turbines and solar panels in generation farms to mitigate fluctuations and power quality issues. Although grid storage requires high capacity and long lifetimes, it often allows a stationary location and housing in a controlled environment, very different from the conditions for portable or automotive storage. The Roundtable hence aims, through discussions, to focus on:

- International Experiences and Regulatory framework for energy storage for grid applications
- Business models as they pertain to India market
- Supply chain for manufacturing battery storage units
- Next steps for India

3:00 pm – 3:05 pm Welcome Remarks by Yash Kansal, Convener, USISPF IAC GTG

3:05 pm - 3:15 pm Keynote Remarks by Michael Satin*, USAID on the Greening the Grid Programme

3: 15 pm – 3:25 pm Remarks by GTG RISE*

3:25 pm – 4:25 pm Moderated Roundtable – International Experiences and Applicability for India

Proposed Participants –

- Dean Koujak, Navigant
- Alan Greenshields, Innolith
- Jitendra Nalwaya, BSES Power
- Vibhu Kaushik, Southern California Edison
- Kiran Kumaraswamy and Rupam Raja, Fluence
- Sylvester Lepcha, Sterlite
- Nilesh Kane, Tata Power
- Surbhi Goyal, World Bank

4:25 pm – 4:45pm Q&A

4:45 pm – 5:00 pm Summing Up and Vote of Thanks by IAC / USISPF