

## Report Launch Event and Panel Discussion on Electric Vehicles and Utility – scale Storage Integration in Distribution Network

On the side-lines of the U.S. India Strategic Energy Partnership (SEP) Ministerial

Under Greening the Grid (GTG) Program  
A Joint Initiative of USAID and Ministry of Power

Date: July 13, 2020.

Time: 6-8 PM (IST) / 8:30-10:30 AM (EDT)

### Featuring Keynote Speakers



**Michael Satin**  
Director, CLEED,  
USAID/India



**Amal Sinha**  
CEO, BSES Rajdhani  
Power Limited



**Ghanshyam Prasad**  
Joint Secretary, MOF, GOI

### Esteemed Panelists and Speakers



**Shubhanshu Patnaik**  
Senior Advisor, GTG RISE  
Initiative and Partner, Power  
& Utilities, Deloitte India



**Vibhu Kaushik**  
Director - AMSE, Southern  
California Edison (SCE), U.S.



**Adarsh Nagarajan**  
Group Manager, NREL, U.S.



**Abhishek Ranjan**  
AVP, System Operation & Head  
Renewable and DSM Initiatives, BRPL



**Anish Mandal**  
Electricity Markets Lead,  
GTG-RISE Initiative and  
Director, Deloitte India



## Q&A Summary

S. No.	Questions & Answers
1.	<p><b>Question:</b> What are the impacts of EV market penetration on the load curves of an urban area?</p> <p><b>Answer:</b> Higher EV market penetration can be incorporated through TOU rates, incentives, and managed charging. Workplace charging programs can help EV charging during the day when there is excess solar generation (duck curve).</p>
2.	<p><b>Question:</b> Which type of batteries has more potential? Flow batteries?</p> <p><b>Answer:</b> Different applications need different technologies. For the applications at distribution level lithium-ion is mostly sufficient. Also, lithium-ion has high energy density compared to other technologies.</p>
3.	<p><b>Question:</b> How the grid infrastructure planning Is been done by BRPL keeping in view the expanding E-Rickshaw &amp; electric 4W/2W?</p> <p><b>Answer:</b> Grid infrastructure planning is a yearly process based upon grid / DT loading and expected load growth. As per Supply Code Regulations, the grant of connections is planned and implemented. Besides, we have also advocated the need for managed charging and TOU rates for EV, in order to avoid if unnecessary network upgrade, which other will lead to underutilized assets, high technical losses and increased tariff burden on consumers.</p>
4.	<p><b>Question:</b> How is it that ramping rate is increased when everyone is buying electricity?</p> <p><b>Answer:</b> The point was made not on ramping rate, but on proxies used for pricing the ramp rate in absence of Ancillary Market; As ramp in the system will be mostly be required when generation from solar resources come online (in morning hours) and your system peak also increases; also in early evening hours when solar power recedes and evening system peak is observed. Despite the diversity present in the Indian system, the timing when ramp will be required in the system, is mostly common across the country. Hence</p>

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	to avail the necessary ramp required in the system (in absence of flexible resources in own portfolio of DISCOM), the ramp needs to be procured through market; hence there is an increased chance that market prices realized during these times of the day could be high and in absence of a suitable market mechanism today, the proxy which has been used is the DSM price vector.
5.	<p><b>Question:</b> How far the strategy of Utility Scale Storage is integrated into long term planning for energy and CEA's planning process?</p> <p><b>Answer:</b> Central Electricity Authority (CEA) of India's optimal generation mix report considers utility scale storage in their optimization engine.</p>
6.	<p><b>Question:</b> Does distribution company need dynamic grid load balancing features from EV charger management system?</p> <p><b>Answer:</b> It's not a necessity at this point but may make business sense at certain point of EV penetration and improvements to battery technology and V2G technology adoption.</p>
7.	<p><b>Question:</b> What role real time power markets can play to encourage deployment of energy storage?</p> <p><b>Answer:</b> RTM is an important enabler in accessing the market on real time for either charging your BESS or sale of electricity in RTM from BESS depending on price trends.</p>
8.	<p><b>Question:</b> As we focus 30% EV by 2030, at what penetration level of EV, do we expect the impact on distribution network would be high and BESS inclusion would be justifiable?</p> <p><b>Answer:</b> Impact on distribution network depends on multiple aspects - existing network conditions, planned ex capital expenditure program, margin availability in existing infrastructure, increased load experienced by network due to EVs, impact of such load when EVs are charged during various period of the day, penetration level of EVs, etc. All these need to be modelled in the system and studied under various scenarios to understand the impact of EVs and ESS.</p>
9.	<p><b>Question:</b> Whether this would be rational to deploy pilot study in public utilities as well. Every DISCOM have different load curve so benefit of ESS varies</p> <p><b>Answer:</b> There are several modelling studies going on for each state also to understand the usability and economic feasibility of BESS.</p>
10.	<p><b>Question:</b> Whether the regulatory framework enabling the transaction framework for EV and DISCOM deliberated?</p> <p><b>Answer:</b> The Paper makes a recommendation that such dialogues need to be initiated by Distribution Utilities with the Regulator through evidence-based studies/ pilots, etc. Here are several modelling studies going on for each state also to understand the usability and economic feasibility of BESS.</p>
11.	<p><b>Question:</b> What is the maximum capacity of the charging station allowed inside the city?</p> <p><b>Answer:</b> There is no upper limit specified. However, the same shall be limited by available network capacity at the location of proposed installation.</p>
12.	<p><b>Question:</b> How would you suggest weaving in NWA's like DR, DERs/ EV/ Storage to integrated grid planning? Any specific AI/ML models being leveraged to optimize network augmentation?</p> <p><b>Answer:</b> SCE is building a suite of engineering and planning software's use last 7 years of SCADA and Smart Meter data, clean that data through automated algorithms, use it to generate hourly (8760) forecast of load and DER generation for each circuit for next 10 years. These forecasts are used to run load flows on</p>

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	each distribution circuits against various load growth and DER growth scenarios to identify system upgrade needs. Identified system upgrades are then solved through least cost solutions including DR, DERs, and traditional wires solutions.
13.	<p><b>Question:</b> How to bring standardization and robust regulatory framework for EV deployment?</p> <p><b>Answer:</b> Multiple stakeholders need to act in a coordinated fashion for a robust regulatory framework to be devised. Distribution Utilities need to initiate dialogues and propose rate basing of infrastructure, ToU tariff framework, managed charging framework, etc. Similarly, Ministry of Power, through a policy guideline (like National Tariff Policy) could include a guidance for the Regulators to consider rate basing of infrastructure; State agencies and distribution utilities could commission various pilots, the outcome of which will lead to evidence based advocacy with Regulators, etc.</p>
14.	<p><b>Question:</b> Which software was used to assess the size of battery?</p> <p><b>Answer:</b> National Renewable Energy Laboratory (NREL), U.S.A. developed its own code for this functionality.</p>
15.	<p><b>Question:</b> Whether BESS is cost parity with conventional power?</p> <p><b>Answer:</b> There are several modelling studies going to understand the economic feasibility of BESS; BESS cost parity is realized on number of factors - how future price reductions take place; offtake (demand) of BESS; alternatives to BESS; technological innovations, policies and regulations etc.</p>
16.	<p><b>Question:</b> Which types of storage technology recommended by this report?</p> <p><b>Answer:</b> This report does not compare storage technologies and hence there are no recommendations. This report evaluates techno-economic analyses for lithium-ion technology.</p>
17.	<p><b>Question:</b> In this study whether V to G &amp; G to V impact is consider for EV system??</p> <p><b>Answer:</b> No.</p>
18.	<p><b>Question:</b> Which type software used for sizing storage capacity? Can I find this report?</p> <p><b>Answer:</b> As an implementer for USAID's GTG-RISE, Deloitte used its own proprietary software for storage modelling including optimal sizing, siting and undertaking the economic value analysis for Battery Storage. The 'White Paper on Electric Vehicle Charging Infrastructure' can be accessed here <a href="https://www.gtg-india.com/wp-content/uploads/2020/07/EV-White-paper-Revised-13-07-2020.pdf">https://www.gtg-india.com/wp-content/uploads/2020/07/EV-White-paper-Revised-13-07-2020.pdf</a></p>
19.	<p><b>Question:</b> What are the challenges that you see in the staged deployment of batteries as the Li-ion batteries make and model changes or upgraded once a year?</p> <p><b>Answer:</b> Staging battery energy storage is cost effective based on the study. However, the recommendation should be validated with a real-world application. Due to real-world implications the savings might be reduced a bit when compared with the findings in the report.</p>
20.	<p><b>Question:</b> Whether local electricity market and balancing at local level are key requirements for alleviation of impacts on distribution ne?</p> <p><b>Answer:</b> Electricity market could be still operating at national level, as we have today; Balancing the grid at local level and maintenance of certain category of reserves at regional/ state level have also been envisaged by the Regulator, System Operator and policy makers.</p>
21.	<p><b>Question:</b> How can we build a reliable and strengthened grid given the upcoming loads and sources of energy such as EVs and RE respectively?</p>

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	<p><b>Answer:</b> RE can help with grid reliability if they are incorporate in distribution system planning, forecasting, load flow calculations etc. EVs can help with load management through managed charging programs starting with incentives and up to full managed charging.</p>
22.	<p><b>Question:</b> What should DISCOMs do to be future ready for DER integration including EV and Battery?</p> <p><b>Answer:</b> Invest in Engineering &amp; Planning tools at hourly resolution, Smart Meters, ADMS, high speed low latency communication systems, distribution automation devices to improve reliability and DER integration.</p>
23.	<p><b>Question:</b> Will COVID slowdown impact E-Mobility and RE Grid integration goals in India?</p> <p><b>Answer:</b> It may have a temporary impact on cash flow, but otherwise it is an opportunity to reset the way mobility is being viewed and actually facilitate RE integration and E-mobility adoption. We already see many countries including Europe, working in this direction.</p>

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