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Bankability of Electricity Transmission, Storage and Distribution Infrastructure

- Secretary Moniz and Congresswoman Maloney, it is an honor to be invited here to speak about the opportunities for improving and accelerating investment in the US grid system and in the new age of grid storage that is approaching.
- My name is Humayun Tai, and I am a Senior Partner at McKinsey & Company. McKinsey is a global consulting firm that services private, public and non-profit sectors across many areas. I am a leader in McKinsey's Global Energy and Materials practice and specifically, I lead our work on Transmission, Distribution, emerging grid technologies and customer in North America. I am also a leader in our Clean Technologies practice. In my capacity, I serve energy companies, utilities, regulatory agencies and private equity firms within the sector.
- The issue of investment in Transmission, Storage and Distribution is critical for the future of the industry which is facing unprecedented change as I will describe. There are a confluence of forces driving new needs for investments in this sector and there are multiple barriers and challenges in getting these investments made. Resolving this challenge requires elevating attention --and raising this at the QER is an important opportunity.

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- In the interest of time, I will make 3 statement that synthesize the perspective I will put forward; I will then drill down into each of these:
  - First, despite the negative to flat growth in demand, the industry faces the need for significant investment in Transmission, Distribution and Storage infrastructure
  - Second, while I believe there is sufficient capital appetite for the types of investments in the sector, current market characteristics make it challenging to earn appropriate risk/adjusted returns on these investments; this is particularly the case for Transmission, and Storage, but is also true in particular for the more pure play distribution utilities

- This issue becomes more exacerbated as we think of new costs that need to be covered within the system—for example, costs which include hazard risks and new forms of ancillary services even at the distribution level
- These market characteristics that I mentioned come in various forms that I will describe later
- Finally, to focus on driving bankability in the sector, the alignment of risk-adjusted returns will require a set of approaches that tackle the market characteristics; I will mention a sub-set of these ideas later

■ Now, allow me to flesh out these points in the remaining few minutes

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■ **First, the situation**: the need for growth in Transmission, Distribution and Storage investments is significant. The reasons are important to mention given they represent a confluence of several important and parallel trends.

- First, the known issue of aged infrastructure; on average, system investments in T&D across asset categories have lagged in the last 15 years and this is reflected in reliability and asset demographic trends
- Second, renewables growth fuelled by cost efficiencies in large-scale renewable technologies, RPS standards and environmental stipulations on fossil fuel are pushing the needs for building transmission to connect advantaged renewables locations
- Third, micro and macro misalignments between load growth pockets and historic investment pockets in T&D results in congestion –and this needs to be resolved through grid rehabilitation
- Fourth storage will be a game-changer and recent cost efficiency improvements along with state-level push for inclusion of storage (as in California) are going to bring storage as a critical resource into the picture
- Fifth, resilience of the grid in the wake of recent hazard events such as superstorm Sandy or Hurricane Katrina have raised significant discussion about elevating grid design and maintenance to new standards to withstand future, unpredictable hazards
- Finally, we are entering an unprecedented era where behind-the-meter opportunities are poised to proliferate as a distributed grid grows; new products and solutions for demand aggregation, distributed solar PV, and energy efficiency will require ensuring grid balancing and reliability at a local level (NYS example)

- It's also important to mention that while the needs for investments are increasing, demand growth will continue to be flat or slightly negative hence rate pressures will increase

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- So while I've now described the need for investments in the sector, my next point is that investments are challenged because the risk-adjusted returns do not bear out in Transmission, Storage and Distribution often for reasons that are both specific as well as general to these three sub-sectors
- In saying this, I do suggest that there is capital sufficiency in the market; in other words, there are a variety of financial players that are interested in the concept of large, rate-compact based infrastructure investments and the risk diversification value these provide
- However, there are a number of market factors that inhibit aligning risk and return in the market and these fall in several categories
  - First, there is the issue of regulatory lag which contributes to the asymmetric nature of risk in the sector
  - Second, there is always the risk of "physical misalignment" that emanates through origination to commissioning of these assets. What I mean by physical misalignment is the situation when the project's boundaries are challenged throughout the development stages to a set of known factors including NIMBY and federal vs. state.vs. local jurisdiction debates
  - Third, for storage in particular, the appetite for technology risk is cautious at best--this is because while the "end-state" of storage is truly gamechanging, the pathway to getting there is perceived to have unclear cost/benefit; but without getting storage development through this pathway, we won't attain the end-state benefits
  - Fourth, the issue of funding resilience and hazard risks is contentious; no common approaches exist and little has been done to demonstrate the rate-payer impacts of these investments; but these costs are real and need to be addressed. We have done significant work on the Gulf Coast and other regions that demonstrates the rate payer benefits of these investments
  - Fifth, overall we are slow in regulatory innovation. With grid dynamics shifting from centralized to distributed, and with the need for increasing grid resilience, we need to think more innovatively how we balance investment prudency with a long-term view performance for the ratepayer as the industry changes

fundamentally. We need to think through new incentive-based models can facilitate these new investments

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- Given the market characteristic challenges I describe let's think of approaches which can help accelerate development of transmission, storage and distribution infrastructure—with or without the regulatory adjustments that are needed
- There are several types of approaches which would be good to consider and amongst a broader set, let me close my remarks by ending with a few of these:
  - First, and very tactically, it would be interesting to discuss funding mechanisms that cover regulatory lag events; for example, could there be financing coverage provided to a transmission project where there is risk of NIMBY-related delays?
  - Also, trying to create a standardized approach for investment in system resilience could help accelerate state-level regulatory understanding; this could entail establishing engineering standards for infrastructure or it could even involve co-financing the first few years of initiatives to demonstrate the rate-payer impact of resilience infrastructure
  - Sticking with the theme of resilience, another approach could be pooling of resilience funds across utilities then match this with national funding to create a broader pool of resourcing for targeted use
  - On storage, accelerating demonstration projects with partial financing in conjunction with RTOs could be very helpful
  - In the area of a decentralizing grid, as the boundary for behind-the-meter activities and bi-directional power flows increases complexity, creating funding vehicles that facilitate solutions to manage the complexity from a technical and a market perspective could be interesting. These vehicles could be jointly publicly and privately financed as there are many private sector companies—for example grid technology companies—that are looking for opportunity to apply new solutions they are developing
  - While not in the immediate scope, driving energy efficiency investments upstream in the value chain (e.g OEMs, distributors, real estate agencies, appliance repair owner) with private sector involvement vs. direct end-user subsidies at the consumption point will also be an interesting approach to improve impact and cost-effectiveness of EE spend

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- The list goes on, but I will stop here. Simply put, given the need for investments and the challenges that inhibit these investments, there is a broad set of solutions that need to be considered that could work despite the challenge of flat load growth.