New York and California focus on incentivizing more Distributed Energy Resources in the Distribution grid

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Meet the Author:

An IEEE Fellow, electricity industry visionary, and leader, Dr. Mani Vadari delivers strategic services to a global set of utilities, vendors, and service providers seeking deep subject matter expertise in setting the business and technical direction to develop the next-generation electric/energy system. As a Business Architect, Dr. Vadari has been delivering solutions focusing on Transmission/ Distribution/ generation operations, Energy markets, and Smart Grid for over 35 years. In addition, he is an Adjunct Professor at Washington State University and an Affiliate Professor at the University of Washington. He has published two popular books, "Smart Grid Redefined: Transformation of the Electric Utility" and "Electric System Operations – Evolving to the Modern Grid, 2nd Edition", in addition to over a hundred industry papers, articles, and blogs. His books are serving as textbooks at several universities in the US and around the world

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The electric grid is changing in ways that we cannot yet imagine. Smart Grid technologies such as Distribution Automation and Smart Meters are making it possible for other new technologies such as storage, Demand Response, and other forms of distributed generation as they become a serious force for change in the utility industry.

The United States specifically and the world in general is seeing a tremendous growth in a variety of distributed sources of energy and new sources of consumption as well. This is because the technologies associated with Distributed Energy Resources (DER) are also not staying still. They are getting better, they are getting cheaper and new technologies are making it easier to integrate into the grid. Examples of these include everything from photovoltaics, distributed storage, electric vehicles (along with the possibility of vehicle-to-grid storage), fuel cells and even demand response.

Is this it, just a technology pure play?? No – not even close. New York and California have decided to change the rules of the game completely.

New York was influenced by the devastation caused by Super-Storm Sandy along with other factors such as (1) increasing dependence on high-quality electric supply by both residential and business customers, (2) need for new reliability and resilience approaches in response to the likelihood of increasingly severe storms and heat waves, (3) rapid declines in costs and increased capabilities of DER which is expected to drive increased DER penetration and (4) Continued competitive pressure on the state's economy.

California, on other hand is influenced by its environmental and energy policies combined with customer choices enabled by innovation. Its transition towards a substantially more decentralized future is creating an opportunity to significantly reduce greenhouse gases by harnessing the value of energy across the grid from customers at the edge through the bulk power system. Essential to achieving this outcome is enabling customer choice via an electric distribution system that becomes an open, integrated electric network platform that is more than smart.
Both initiatives are looking to:

- *Address locational benefits and costs of distributed resources and enable seamless DER integration.*
- *·Expedite DER participation in wholesale markets and resource adequacy, unbundle distribution grid operations services, create a transparent process to monetize DER services and reduce unnecessary barriers for DER integration.*
- *An independent technology neutral electric distribution Service Operator (DSO) with an expanded role in utility distribution operations while avoiding any operational conflicts of interest.*
- *Build customer and market confidence in the expanded role of DERs by increasing utilities' experience relying on DER for expanded uses in distribution planning and operations, increasing customer awareness, interest, and confidence in DER and developing familiarity with new DER-oriented markets*

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However, they deviate in other areas – and could possibly learn from each other. The areas of divergence include:

- *The NY Divergence:*
  - *The NY DSP mechanism visualizes a distribution level market sending real-time price signals to settle the market and planning level price signals to encourage investment.*
  - *NY is heavily focused on interface and system standards including the behavioral characteristics that DERs need to exhibit – connection characteristics.*
  - *NY has a belief that its DER penetration objectives can be reached with existing designs, better automation, and more sophisticated DSP systems.*
- *The CA Divergence*
  - *CA believes that its distribution system planning, design, and investments should move towards an open, flexible, and node-friendly network system (rather than a centralized, linear, closed one) that enables seamless DER integration.*
  - *The distribution system design should eventually converge to include water, gas, and other services.*
  - *CA also believes that they should expedite DER's participation in wholesale markets and resource adequacy and unbundle distribution grid operations services.*

Conclusions and closing thoughts:

Both NY and CA have taken a significant leap forward in reimagining the distribution grid. They have put forth bold and innovative ideas that will unfold over the next year or two as the stakeholder process comes to near-term and long-term plans. These two initiatives have the potential to set the stage for reimagining the future of the distribution grid for the next 20-50 years.

I have always believed that increasing the penetration of DER should never be the main objective. Developing a roadmap that will make the grid more flexible, reliable, resilient, efficient, sustainable, and affordable all to support the customer's changing needs should be the objective.