

Good morning. My name is Naimish Patel; I am the CEO of Gridco Systems, a provider of advanced power flow control and grid operating system technologies for the electric grid, what is termed Agile Grid Infrastructure.

Since the first electrification of street lighting in Manhattan in 1882, the electric grid in the US has become pervasive in its reach, essential to the sustainable growth of our economy and our national security, and providing a service that we are so reliant upon but often take for granted; all testament to the numerous utilities that maintain and operate our grid. Today, however, utilities are operating in a changing environment that poses a wide variety of challenges, but also opportunities for innovation. Much as our telephony system experienced a transformation in the 1990s resulting from customer adoption of computing and demand for information services, so too are we seeing the beginning of a customer-driven evolution of the electric grid. Consumers of power are increasingly also becoming producers, through adoption of rooftop solar or small-scale wind power, requiring the distribution grid to accommodate two-way power flow, in contrast to its original architecture. Customer adoption of electric vehicles is creating new demand for power, equivalent to entire homes, requiring demand control measures to avert overloading of existing infrastructure. Customer adoption of energy efficiency measures and home automation offer potential new resources that utilities can harness for systemic benefit. Finally, increasing diversification of customer demand is creating stress on regulatory frameworks that have traditionally been oriented towards 'one-service fits all' power delivery. All of these changes are compounded by the fact that centralized base-load generation and transmission capacity are growing tighter, and increasing volatility in global weather patterns is driving the need for higher levels of grid resiliency. In the face of these challenges, utilities must continue to deliver on their fundamental mission of supplying safe, reliable, and affordable electric power, while also introducing system flexibility in order to be adaptive to a more dynamic and diverse demand/supply environment. Emerging at this intersection of requirements is a historic opportunity for regulators, utilities and technology suppliers to jointly innovate.

Not surprisingly, given that the aforementioned trends are occurring at the edge of the grid where customers connect, the electric grid's distribution system is at the forefront of change. Historically, investment in the distribution system has often gone to upgrading wires, poles and transformers – what is termed grid reinforcement. While these investments in grid capacity are indeed necessary, the flexibility to accommodate a more dynamic demand/supply environment must come from investment in infrastructure that can more efficiently utilize this capacity (to contain costly capacity upgrades and therefore electricity rates) while assuring reliable delivery of high quality power in an increasingly dynamic environment. Much as the internet is based on devices that actively and dynamically manage the flow of information across fiber optic and copper wires, the electric grid will increasingly need devices to actively and dynamically manage the flow of power, under the control of a grid operating system. Fortunately, the technology building blocks to provide these functions is available, and at the cost, efficiency, and reliability the electric grid requires; power electronics to provide dynamic regulation and routing of power flows, and distributed controls that form the grid operating system to manage grid and customer-owned assets like distributed energy resources, home automation gateways, and energy storage, amongst others. It is these functions that make the grid not just smart, but Agile; it is the brains and brawn in combination that enable a cost-effective and flexible system.

We at Gridco Systems are intently focused on providing these essential building blocks of the Agile Grid. We are working with utilities throughout the nation to address the challenges of today, while providing

the foundation to adapt to the challenges of tomorrow. As with all utility investments, cost-effectiveness in the face of alternatives is an essential consideration. As such, our approach has been to deliver solutions that are more cost-effective and deliver a more compelling benefits-to-cost ratio than business-as-usual approaches, and avoiding the need for subsidies or rate increases. As such, many utilities are able to leverage existing budgets to implement our solutions to address DER integration, better asset and capacity utilization, improved energy efficiency, and higher power quality. This has resulted in jobs and economic growth not only for our company, but our ecosystem of suppliers and partners.

For the most part, the technologies required to modernize the grid are available today. Missing are the economic incentives to drive adoption of these technologies. And I am not referring to subsidies, federal or otherwise. As alluded to earlier, the regulatory compact that has guided the evolution of the distribution grid since the mid 1930s, has proved highly effective, particularly during times of simultaneous load growth and increasing economies of scale in supply, which allow for low electricity rates for end customers and reliable power delivery through continued infrastructural investment. Over the last two decades, average load growth has slowed and become less coupled with GDP growth, owing in part to energy efficiency measures and in part to an increase in the service-orientation of the US economy. Nevertheless, the reliable operation of the electric grid is as critical as ever to the growth of our economy, and as such, continued investment is essential, but *cost-effectively* so. The changes in customer use of the electric grid are by no means universal, at least for now; for example, adoption of rooftop-solar, energy efficiency measures, and electric vehicles is highly demographically correlated. As such, a relative minority, albeit a rapidly growing minority, of customers are impacting the operation of the grid, yet the costs to accommodate them are socialized across the entire customer base. Further compounding this is the fact that such customers often pay less into the system, owing to their lower consumption of energy. Let's be clear: we want the grid to accommodate such customers; they are not going away, and their investments are driven by market forces. However, the revenue a utility realizes from these customers must reflect the actual cost of service to accommodate them. As such, electric rates must be designed to account for the increasing differences in the way customers utilize the grid – the diversification of customer demand.

Conversations at the state level are occurring throughout the nation on how to evolve rate design to better align utility revenues with their underlying costs, and also how to incentivize distribution operators to evolve their networks into energy exchange platforms that are increasingly market and customer-driven. We are seeing the beginning of a new era in electric distribution; one in which the customer is center stage in driving change.

Let us not forget that modernizing our grid is critical not only for national security and economic growth here at home, but also represents an opportunity for the US to lead a global renaissance in energy services and grid infrastructure, one that will not only drive US GDP growth, but growth in exports, creating a new class of US-based industry-leading global enterprises. Let us all work together, from legislators to regulators, from utilities to their suppliers, to address customer demand and seize this opportunity for economic growth. Thank you for the opportunity to speak with you.