Good morning Chairman Upton, Ranking Member Rush, and members of the Energy and Power Subcommittee of the House Committee on Energy and Commerce. My name is Val Jensen and I am Senior Vice President for Customer Operations at ComEd. We are one of the largest electric utility companies in the nation, delivering power to 3.8 million homes and businesses in Chicago and northern Illinois. Thank you for the opportunity to testify today as your Committee explores technology's role in empowering energy consumers.

We have immersed ourselves in the policy implications of our dynamic energy environment, and I'm pleased to report that the Illinois legislature has provided us the opportunity to unlock new levels of value and choice for our customers. ComEd is completing a $2.6 billion investment program to modernize our electric grid with infrastructure investments, including a smart meter for every customer. At a time when our economy was in a trough, ComEd created thousands of jobs through this grid modernization. This modernization program is also significantly improving service and reliability and giving customers more choice and control over their energy use.

ComEd now has access to an abundance of data regarding our customers' power usage and can use it to help them manage their energy usage, energy efficiency and bills, while preserving security and privacy. For example, our peak time savings program enables participants to earn a credit on their energy bill for voluntarily reducing energy use during peak time savings hours. Smart Meter Connected Devices give customers access to near real-time electricity usage information by connecting in-home wireless devices to their smart meter. Also, through hourly pricing, our customers can pay the hourly market price for electricity and manage energy costs by shifting energy use to lower-priced times.

While we will continue to invest in the grid, technology is marching on and it is time for reinvention. We can, and we must, anticipate and embrace the inevitable advancement of technology and data, because it decreases costs and puts increasing control, convenience and choice into the hands of customers. Advances in solar generation and storage, electric vehicle technologies, and their supporting platforms, are giving consumers and businesses the opportunity to customize their energy sources. Consumers' ability to make better, more informed choices continues to increase as prices of these technologies decrease.

Our industry has a choice, too. Innovate — or go the way of the Rolodex and the pay phone. We believe that the electric grid is, and will continue to be, the foundation — the backbone — for economies around the country. The one-hundred-year old grid powered our economy in the 20th Century while also generating vast improvements in quality of life. It connects massive generating stations capable of powering each and every machine and device that uses electricity in every home and business. The central question we must now address is: How can we make the next transformational step in order to create a lasting, technology-enabling clean grid that is affordable to customers while growing with them to fuel their changing expectations and needs?

I. KEY TRUTHS SHAPING THE CUSTOMER AND ENERGY LANDSCAPE

The electric power grid network is enormous, representing hundreds of billions of dollars of investment. It is 99.9 percent reliable. It is pervasive, adaptive and constantly evolving and being reshaped by the progress of technology and the pull of changing customer preference and behavior.

As our utility network is at the edge of another evolutionary jump, ComEd has embraced four core realities:

1. Technology will continue to get smarter, faster, cheaper and more pervasive – Arguably the most important truth is that technology advancement underpins every significant societal improvement since the beginning of human history. The continued, inevitable advancement of the power of technology and decreases in its cost will put increasing control, convenience, and choice into the hands of customers. Current advances in solar generation, storage, and electric vehicle technologies, and in the organizing platforms that optimize these resources, are giving consumers and businesses the opportunity for unprecedented customization of their energy sources, and their ability to make better, more informed choices continues to increase as the cost of these technologies decrease. This opportunity extends to nearly every aspect of our customers' lives as digitization, automation, and miniaturization offer people and businesses more control and flexibility in how they manage their daily lives and operations. Technology innovation provides new solutions to old problems, and is helping to break down the barriers to an energy future where customers demand — and deserve — the speed and quality of service they receive in virtually every other aspect of their lives. We don't even know what the next new technology will be in 10 years, but we know it is coming and we know we need to be ready for it.

2. Data is exploding –The mechanisms by which we capture data are improving. The number of devices that surround us, capturing personal, environmental, operational, relational, locational, and every other type of data are innumerable, ostensibly providing us everything we need to know. While all these devices provide data, it must still be organized into information that is useful and valuable through aggregation, analysis, and socialization on a platform that provides the necessary connectivity. Consequently, the more data we collect, the greater the utility we derive from the technology collecting and organizing that data, especially

with improvements in data analytics and artificial intelligence that enable the personalization of technology. The Nest thermostat and the Alexa personal assistant provide examples of data's ability to enrich our lives through devices that anticipate our needs. The data we collect from millions of smart meters in ComEd's territory, which we leverage to improve operational efficiencies, is also provided back to our customers through mechanisms such as Green Button Connect, which allows customers to share their usage data with third party providers. Through the smart meter program technology, ComEd can also remotely check a meter for service trouble when a customer reports an outage. When a customer outage is reported, a signal or "ping" is sent to the smart meter. This reporting functionality was recently named Program of the Year for Customer Engagement at the 2017 DistribuTECH Conference. When used as a tool, data and its utilization lay at the intersection of commercial and consumer benefits. At the same time, utilities must increasingly recognize the necessity for responsible security of data and personal privacy.

3. Everything is connected – Just as data imbues technology with greater utility, the amalgamation of data from similar and disparate spheres of our lives lends greater value to the data itself. This is a significant motivator for the increasing pervasiveness of connected devices in our homes, cities, and workplaces. In addition, the increasingly mobile nature of our lives, with advances in smartphones, tablets, wearables, and other mobile devices necessitates our ability to capture information and manage the functions of technology in a decentralized way. The expansion of the Internet-of-Things ("IoT") and artificial intelligence supports this, and as this network continues its dramatic growth, businesses and individuals will continue the cycle of technology innovation to find even more novel applications.

4. *Customers will increasingly demand the ability to exercise control over their lives by being given real choices* - The velocity of technology innovation, the expansion of data capture

and analysis, and the ubiquity of connected devices have given our customers more choice, more control, and more convenience than ever before, and because of that, our customers *expect* more choice, more control, and more convenience as it relates to the products and services that they consume.

These four truths have had a tremendous impact on the preferences of the customers and communities that we serve. Taken together, these truths also represent the powerful force that is rendering our existing business model obsolete.

II. A NEW UTILITY BUSINESS MODEL

Since its inception, a pipeline model has characterized the utility business. Our job was to distribute and sell kilowatt-hours and ancillary services — a linear process. However, we envision a new business model that accommodates customer expectations and maximizes the value we are creating for our customers, communities, economy, and the environment.

Here at ComEd, we're initiating our delivery system's shift from today's pipeline architecture — moving central-station power across wires to customers at the other end — to a platform architecture, which is the business architecture of the 21st century. This new model is more decentralized, distributed, and democratic.

Under this model, the utility will move from energy delivery to energy democratization, using our infrastructure to create a market that customers can access to buy and sell energy and energy services. Utilities would then be compensated with fees on transactions and charges for services they provide.

The success of any platform model — of any business model actually — hinges on its ability to help customers do a job. The key is understanding what that job is.

Unfortunately, as an industry, we've largely forgotten or ignored that wisdom. We have been preoccupied with kilowatt-hours and kilowatts, volts and vars because producing those is our job. Our customers have their own jobs to do and just happen to need electricity and power and voltage to help do them. In most cases, they need less and less of the commodities our industry produces, and increasingly there are places besides the utility to get these commodities. Witness the fact that it takes 60 percent less energy to drive the same growth as it did in the mid-1970s.

What isn't going away are customers' needs. In fact, those needs have proliferated and become increasingly sophisticated as the four technology truths show themselves throughout the economy. Satisfying customer needs — producing energy services —still requires a variety of inputs like power, current, voltage, equipment, data and labor. Those inputs need to arrive with extremely low latency and very high reliability and resiliency.

The emerging platform model fosters interactions between the utility, producers of products and services, and our consumers and energy producers. As with Facebook and the iPhone, the value of the platform is in the number of transactions it generates. Each breakthrough app we download increases the value of our smart phone with accessibility, convenience, and — ironically — communication. Value will be created and captured in dynamic and personalized ways without compromising the security, reliability, and resiliency of our electricity supply. That said, there will be the continued need for strong, central energy generation and transmission. Without it, the grid can't deliver on its promises to customers.

The platform becomes the place customers can come to acquire the things they need to produce the energy services they want. Today, the utility platform provides some of these inputs, but if the platform remains limited in what it offers, value will be drained from the utility to fill

someone else's value pool. We need to re-envision our platform as the place where customers come to find everything they need to meet their energy service needs; however they want to meet them.

III. THE UTILITY OF THE FUTURE

This platform is the foundation of ComEd's vision of the Utility of the Future. As we seek to maintain the customer as the central motivation for everything we do as a company, we envision a future that accommodates these preferences and maximizes the value we are creating for our customers, our communities, and our economy.

While we believe that the function of our industry, and the electric grid that we steward, are at the threshold of a fundamental evolution, there are many elements of this transition to the utility of the future that resemble the beginnings of our industry. A primary motivator for the early innovations that would become the grid we have today was the invention of the lightbulb. The grid was merely a vehicle for extending the benefits of light — productivity, and safety and security after daylight hours — into the home and workplace. Similarly, our current reimagining of the future grid is largely driven by technology advances in photovoltaic systems and battery storage among other inventions. Technology and innovation are essential elements of the future grid. Again, advancing technology holds the potential to enhance productivity, and safety and security.

Furthermore, while establishment of the grid served the major purpose of lighting the world at night, it made possible a myriad of additional innovations that could not have been conceived during the grid's early days. Electricity in the home made possible the electrification of nearly every aspect of daily life and supported the advent of refrigerators, washers, dryers, dishwashers, and on and on. In this way, it provided a platform upon which much of America's

mid-20th century economy was built. Likewise, as we look toward the future of the grid, while our primary objective will always be the provision of safe and reliable electric power to our customers, we allow for new ways in which the grid, as the enabling, organizing platform for the increasingly connected economy, can deliver new and unexpected value to our residential and commercial customers. We see a future where more of the economy is electrified in areas such as transportation, heavy machinery, and ports.

The utility of the future will likely see a greater proliferation of DER**,** distributed-energy resources. Much of this increase in DER penetration will be attributed to customization reflecting more customer choice, control, and convenience — value propositions aligned with, for example, customer-sited generation and energy storage, or grid-sited energy storage. Increases in the adoption of DER may also provide an opportunity to mitigate climate change impacts. As it accelerates, this transition will impact the utilization of the grid, as customers and utilities come to better understand, measure, and apply energy use where it has the greatest value to all customers and communities, not just those with the means or desire for specific outcomes.

The rise of DER will fundamentally change the role of consumers on the system. Given the intermittency of renewable energy sources, there will still be significant reliance on the grid by these customers, but with generation capabilities these *consumers* will be more appropriately recognized as *prosumers* (consumers AND producers). The grid could conceivably look less like a pipeline that delivers electrons from a central station to residential and commercial customers, and more like a network of prosumers relying on the organization and operational standards of a platform that optimizes their opportunities and provides the data and information needed to make informed decisions.

Over time, with increasing numbers of active prosumers on this network, innovative new products and energy-linked services will develop, and a cycle of innovation, cost improvement, and economic development will be set in motion. This network, if appropriately planned and executed, should enable optimization of resources in real-time into the consumption point (with time/location/feature-based granularity), improving overall system utilization. A distribution market platform and other means of integrating this transaction-based or "transactive" market into distribution system operations will increasingly be needed to facilitate providing customers service beyond the existing standards.

Prosumers will likely be able to transact with one another in both real-time and forward markets based on highly differentiated preferences regarding reliability, quality, environmental friendliness, and timeliness. These transactions may even occur at the device level, as the sophistication of the IoT universe continues its dramatic expansion and smart devices in the home and workplace continue to proliferate. The degree to which these transactions are automated or require human intervention will depend entirely on customer preference.

Transactions on the grid of the future will not be limited to prosumers. There will be a host of additional market participants, including entire communities, which will transact on the grid for the purpose of developing their own energy-related solutions by providing value-added products and services. Products related to solar and energy storage or services related to energy efficiency ("EE") and demand response ("DR") can be offered in an increasingly customized way due to their access to increasingly granular customer data. The resulting interdependence inherent in these interactions enables market participants to not only gain value from, but also provide value to, one another and their communities. In this future, businesses of all sizes, situated across a broad range of industries and communities, are in a position to innovate, create

jobs, and drive the economy forward by developing and attracting business from the smallest incubator to the largest industrial plant.

In sum, the powerful force of customer preference will shape the utility of the future and result in demand for access to a wide variety of services that the grid operator can effectively provide in such a way that it will no longer be characterized as a simple two-way exchange of value between the utility and the electricity consumer. Rather, it should evolve toward a platform serving the utility, producers of value-added products/services, and their consumers/prosumers. The linear two-way phone call, by way of example, evolves into a Skype platform that allows communication by many more participants in a variety of ways.

IV. POLICY CONSIDERATIONS

For this vision to succeed, and capture as much customer value as possible, we need policymakers at the state and local level, where we are regulated, as co-developers. After all, the utility industry will remain an industry imbued with the public interest. This commitment to the public interest also translates into an obligation to find ways for everyone, including the less fortunate, to enjoy the benefits of this new technologically advanced grid.

The superstructure for this model is the interlocking set of statutes, regulations, rules and orders that constitute utility regulatory policy. Our industry is subject to that policy, and any transformation will continue to be the product of a complex choreography of public and business interest.

The platform model represents not just a shift in value from the centralized to the distributed; it offers the opportunity to unlock significant new value through new types of

transactions that technology enables. But while technology might lead, regulation rules when it comes to how the value will flow.

Our industry's existing business model was forged in a world that rewarded increasing electricity consumption, because average price decreased as sales increased. That world is gone. We don't expect to see sales growth return to any extent. New policies, then must address:

- How to set prices in a distribution services/platform business
- How to define standard service in a way that incents us to customize service to align with customer needs, and
- How to treat utility investments that carry risk

It may be useful to look to the states for examples of policies that support customer needs and demands. Together, the Illinois legislature and ComEd have already looked beyond the Smart Grid. Working together with a wide range of stakeholders, we developed the Future Energy Jobs Act ("FEJA"), a statute that will be recognized as a landmark in our Utility of the Future scenario.

The IL legislation allows utilities to capitalize and earn a return on energy efficiency program expenditures. When combined with new decoupling provisions, this means that energy efficiency is now as financially important to utilities as traditional grid investments. Under FEJA, funding for energy efficiency nearly doubles, from $250 million to $400 million annually by 2030, creating more than $4 billion in consumer savings and reducing the CO2 equivalent to removing 18 million cars from the road. As a result, ComEd's customer energy efficiency program, already one of the largest in the country, will almost double in size. Since its inception in 2008, ComEd's energy efficiency program has saved customers over $2 billion. For the seventh time and fourth consecutive year, the U.S. Environmental Protection Agency awarded

ComEd with the 2016 ENERGY STAR® Partner of the Year – Sustained Excellence Award for its Energy Efficiency Programs. We look forward to continuing our significant progress in this arena.

FEJA also made important changes to the state's renewable energy funding mechanisms. The net result is that we expect to see thousands of megawatts of utility-scale, community and rooftop solar developed over the next decade. Rebates for installation of smart inverters will be available to our customers. These rebates will also be capitalized, allowing us to effectively earn returns on distributed solar.

Finally, FEJA will spur economic development as it provides up to $10 million in funding for job training programs across Illinois, as solar and energy efficiency jobs emerge in the years ahead. The Act also restarts ComEd's CARE programming to support veterans and active or disabled military personnel (CHAMP), seniors and families, local nonprofits, and low-income customers. CARE programming will provide $50 million over five years in financial assistance.

In total, the enactment of this IL statute transformed our distribution utility into an energy service utility and provided the incentive to continue building the platform that will enable more energy efficiency and distributed solar transactions.

V. CONCLUSION

The Utility of the Future is based on the continued, inevitable advancement of the power of technology and decreases in its costs that will put increasing control, convenience and choice into the hands of customers; the need to organize, utilize and share with customers the exploding level of data available on the Smart Grid; and the growth in interconnected devices that will provide customers with more choice, control and convenience — and to expect it.

ComEd appreciates the opportunity to participate in the Committee's discussion of how customer demands are changing the utility industry. We're eager to work with the Committee and other stakeholders to develop a shared perspective on the need for and desired direction of change in the business and regulatory models to ensure the realization of the Utility of the Future.