Q. Please state your name, occupation, and business address?

A. My name is Doug Staker. I am the Vice President of Sales and Business Development and the Co-founder of Demand Energy Networks, Inc. ("Demand Energy"), which is located at 24001 E. Mission Avenue, Liberty Lake, Washington. Demand Energy is an intelligent energy storage solutions provider.

Q. On whose behalf are you appearing in this proceeding?

A. I am appearing on behalf of the New York Energy Consumers Council, Inc. ("NYECC"). NYECC's members represent a broad spectrum of energy buyers, including hospitals, universities, financial institutions, residential and commercial property managers, public benefit corporations, energy service companies, and energy consultants.

Q. Have you previously submitted testimony in a proceeding before the New York State Public Service Commission ("PSC" or the "Commission")?

A. No, I have not previously submitted testimony before the Commission. However, on January 29, 2016, I was a participant on the REV Track 2 Technology Panel held at the Commission's offices in Albany, New York on behalf of Demand Energy. I will participate on a similar panel on May 26,2016 in regards to energy storages applicability under the Clean Energy Standard at the Commission's office in New York City.

Also, earlier this year, Demand Energy proposed a demonstration project to Con Edison for REV and responded to a RFI from Con Edison on its proposed demonstration project. NYECC supports Demand Energy's market based approach because it dovetails with further improving upon Standby Rates for customers on those rates and better valuing the system benefits provided by such customers as well as dovetailing with the Commission's vision in REV in favoring market based approaches for the transformation of the electric grid. Although Con Edison recently rejected Demand Energy's proposed demonstration project, NYECC believes that Demand Energy's approach, which is market based, is the direction that the Commission is moving towards in the REV proceeding and that the best aspects of a market based approach should continue to be explored in rate cases and in the REV and in any other REV proceeding the Commission may create for such a purpose.

Q. Please describe your educational background and relevant work experience.

A. I received a Bachelor of Science degree in Mechanical Engineering from the University of Idaho in Moscow, Idaho in 1982. I have worked in various capacities in the energy sector since 1989. For two decades I was employed by Itron, Inc. in various capacities culminating in my

last five years as Vice President/General Manager directing Itron's international business unit in which I led 125 employees across nine regional subsidiaries in Mexico, Brazil, the Netherlands, the United Kingdom, France, Qatar, Australia, Taiwan and Japan. When I left Itron in 2009, I co-founded Demand Energy as a startup business. A copy of my Curriculum Vitae accompanies this testimony as Exhibit ___ (DS-1).

Q. What is the relationship between Demand Energy and the NYECC?

A. Demand Energy is a member of the NYECC.

Q. What is the purpose of your testimony on behalf of NYECC?

A. The purpose of this testimony on behalf of NYECC is to propose further improvements to the Company's Standby Rates by having the Company improve upon its practices for Standby Rates as well as to propose a voluntary load reduction rate for Standby Rate customers, which is market based and results in higher system capacity and supports lower cost distribution consistent with the Commission's articulated goals in the REV proceeding in which the customer is no longer viewed statically and solely as a recipient of service but as a resource to the electric system as well.

Q. Why do the Company's Standby Rates need to be further improved?

A. Further improvements to these rates are needed in order to secure sufficient customer investment in distributed generation through improvements upon the economics of such projects so as to forward the REV agenda and realize the REV policy objectives of the Commission and the anticipated benefits to customers fostered by these policy objectives. Significantly, the Commission stated in its Order Adopting Terms of Joint Proposal to Extend Electric Rate Plan, Issued and Effective June 19, 2015 regarding the Joint Proposals recommendation that the Commission allow the Company to provide Standby customers of Con Edison and NYPA the opportunity to earn performance-based credits against their contract demand charges based on the performance of their generating facilities, that "[p]arties recognize that this is not a comprehensive solution for properly valuing contributions by Distributed Energy Resource (DER) providers, but rather an interim measure designed to capture data and allow for a more robust design process in future proceedings before the Commission. This credit program will allow generators to show they can perform reliably as distribution level system assets and help significantly advance the policies outlined in the REV proceeding."

Q. Has the Commission said anything more recently regarding the need to further improve Standby Rates?

A. Yes, it has. In its recent Order Adopting a Ratemaking and Utility Revenue Model Policy Framework, Issued May 19, 2016, the Commission stated that "[t]he impact of standby rates depends heavily on the percentage allocation matrix that is used to allocate the costs of the local facilities and the shared facilities to the contract demand and daily as-used demand charges, respectively." Accordingly, the Commission stated that the cost allocation methodology for Standby Rates needs to be refined because current Standby tariffs developed more than ten years ago and which are based upon negotiated agreements may no longer represent either the state of the system or the public interest. The Commission also stated that the development of the current rates did not contemplate the high levels of DER penetration and integration that are anticipated in REV. The Commission is requiring utilities, including Con Edison, to file within 60 days of the Order, recent studies supporting its cost allocation methodology and update values. Con Edison has been directed in the Order to include discussion of the following in its filing: "a rate that rewards customers that engage actively with the utility to provide system value; a reduction in the percentage of costs allocated to the

contract demand with a corresponding increase in the allocation of costs to the daily as-used demand charges; a potential distinction between new load and existing load, with a phase out period for new load status; and a method which first identifies the marginal cost-of-service and then applies an adder for non-capital related cost recovery."

Q. What are the best practices for the further improvement of Standby Rates being advocated by NYECC?

A. NYECC is requesting the following further improvements of the Company's Standby Rates based on some of the best practices in the industry. First, Standby Rates can be improved further by having them weighted more toward As-used demand charges rather than the contract demand. Second, Standby Rates can be further improved by having demand charges better reflect the lower actual probability than is currently reflected in rates that an emergency outage will occur during a period of grid peak demand. Finally, Standby Rates can be improved upon by either eliminating demand ratchets, or by limiting their use to a reasonable short term period such as thirty days.

Q. Has the Commission indicated any support for any of these proposed further improvements of Standby Rates?

A. Yes. In its recent May 19, 2016 Order in REV, mentioned previously, the Commission stated that "distributed generation that is integrated into system planning and operations will provide system benefits for all customers, and will result in fewer fixed or long term marginal utility costs and more short term operating expenses. Standby tariffs should allow for the potential of a customer actively engaged with the utility and contributing value to the distribution system. Further, greater levels of DER mean that the risk that all standby demand will occur simultaneously and produce an unplanned coincident peak is lower, so a probabilistic analysis of the likelihood that the DER resources will fail at peak should be considered when allocating costs to standby rate customers."

Q. Why are you proposing a voluntary load reduction rate for Standby Rate customers?

A. A variable Standby Rate for delivery charges would be the first example of how marginal costing based on location and time of use can function as a price incentive on the distribution level. It has been successfully implemented in the supply market and I believe it will prove beneficial under a DSPP environment. Energy storage as a grid resource has proven that it can deliver benefits in improving grid operations. For example, Con Edison recently decided to deploy 11 MW

in BQDM. A challenge that was posed by Governor Cuomo's Office in the summer of 2012 is how to build market based pricing structures to support the earning mechanisms for cost recovery for installation of storage systems. Experience with day ahead hourly pricing for energy supply has fostered an understanding of the benefits of locational based marginal pricing. Congestion based pricing allows leveraging the power of digital technology to drive savings for customers and enables reacting quickly and intelligently to the elements that drive the basis of price variability. Developing hourly based pricing for delivery charges would be foundational in helping the market adapt and understand variable pricing with both a locational element and a time based element that represents the true costs for the delivery of energy and power.

Q. Are the proposed best practices and the proposed voluntary load reduction rate for Standby Rate customers mutually exclusive or are they additive?

A. NYECC believes that the continued progression in Standby Rates through the specified best practices as well as movement toward a voluntary load reduction rate will continue the substantive progress sought for these rates by the Commission.

Q. Should the Standby Rate reliability credit take into account only the DG unit?

A. No. The Commission in the previously referenced REV Order stated that this argument ignores a central tenet of REV, which is that a variety of DER resources and customer activities should be encouraged, to produce desired outcomes" and that "a customer with a distributed generator that is combined with storage, demand reducing technology, or any other means of responsive demand reduction, produces reliability as well as a 100% reliable generation unit."

Q. Has the Commission said anything else in its recent REV order regarding the Standby Rate reliability credit?

A. Yes, the Commission said that for Con Edison, revisions related to the reliability credit shall be incorporated into its current rate filing and made effective January 1, 2017.

Q. Should demand levels be normalized for weather?

A. At this stage of development of improving the Standby Rates I would say no -- that doing so is premature in the absence of an improved upon, and functional, set of Standby Rates.

Q. What are some of the current impediments to fostering end user savings that hourly based pricing for delivery charges would address?

A. As we look to develop market based pricing for encouraging the deployment of behind the meter Distributed Energy Resources we are basing our concepts on our 8 years of market experience. The Con Edison/NYSERDA Demand Management Program (DMP) incentive for energy storage was very beneficial in aiding the capital cost of deploying energy storage. Even though the $2100/kW incentive covered half of the installed cost, a business case that will drive savings for the end user is still challenging during this early phase of the storage industry. Requiring Full Power bulk discharge, which requires the storage system to operate at full operating power from 2 pm to 6 pm supports System grid relief but it does not allow the customer that elected to participate to drive any savings from demand charge reduction during the summer when rates are the highest.

Q. What first step are you proposing towards moving to market based demand pricing?

A. I am proposing a path that builds off the structure of Con Edison's existing Standby rates. The current Standby rate can be very advantageous for this purpose because it moves from a monthly 24/7

demand charge to a rate design that has a daily charge, which allows operational savings every weekday. It also allows operational flexibility, in that operations can be switched to a bulk discharge to be compliant with a Demand Response event with only a penalty of losing one day of As-used demand charges. The next logical step is to build a new rate that supports energy storage operations by pricing the benefits derived from load reduction to reflect their locational based and time dependent value. It is now reasonable to take the daily-as-used demand charge and divide the amount across the 14-hour target operating day (8 am to 10 PM). As we dissect this rate across 14 hourly time segments, we suggest that there are 4 hours that should be priced the highest in order to incent load reduction when it has the greatest value to Con Edison's system. Con Edison's networks have different peak time periods throughout the operating day. See (Exhibit __ DS-2), regarding Con Edison networks and their different peak time periods for the event call windows of the Company's Demand Response Commercial System Relief Program (CSRP). The locational element of our proposed rate design would allow higher hourly prices that correspond with network peak where the service is located.

Q. Explain the basics of the proposed rate structure?

A. The basics of the proposed rate structure are set forth in Exhibit __ DS-3. A sample hypothetical rate is provided in the exhibit demonstrating the premise of the proposed rate reflecting a lower contract demand delivery charge and a higher As-used demand charge that is applicable during peak hours of the Con Edison network that service is connected to. Network to network, prices will vary, reflecting the locational peak periods of participants in each particular network. This market-based rate encourages load reduction by pricing delivery charges the highest during the 4 hours of the local network peak. In exchange for the savings derived by customers moving to this new rate design, Con Edison would be allowed to set the schedule of the storage system to be compliant with the needs of load reduction under both the Distribution Load Relief Program (DLRP) and Commercial System Relief Program (CSRP). This is similar to other critical peak power pricing that is operated in other markets. In order to quell any commercial account concerns about this control option, Con Edison should be limited to exercising this control to no more than 20 days a year. If more days are needed for grid stress relief, additional compensation could be developed. Much like the results of the NYISO's energy supply market, eventually demand could be

managed by increasing the hourly delivery pricing during the needed hours of load relief.

Q. Why do you think the Commission would be receptive to your market based approach for a new Standby Rate?

A. The market based approach proposed is consistent with the Commission's Order adopting Regulatory Policy Framework and Implementation Plan, issued on February 26, 2015, the Commission stated as follows: *"If, for example, the 100 hours of greatest peak demand were flattened, long term avoided capacity and energy savings would range between $1.2 billion and $1.7 billion per year. Avoided line losses achieved by distributed generation can further improve system efficiency. Total line losses cost approximately $200-400 million per year. Beyond these examples of direct cost reductions, markets established under REV will enable a range of options that will reward customers for participating in system optimization, and assist in control of customer bills."*

Q. What are the benefits and services that can be derived in utilizing storage in the proposed market based approach?

A. The delivery of electricity is the perfect just-in-time inventory system. By bringing in the element of storage, we move to a managed inventory system that allows optimization of the various components

of the energy supply chain in meeting the needs of the digital power grid. The following benefits and services are contemplated:

- **Asset Deferment**: Battery Energy storage has proven that it can provide the load relief needed to reduce peak loading on the grid. It can also allow idle generation to operate during off-peak hours, transmit energy through the T&D system when line losses are lowest and cached at the edge of the grid to released during the peak hours of the day. Moving energy through the transmission and distribution system off-peak has the potential of deferring the need to expand T&D capacity in order to accommodate peak power requirments.
- **Improved Capacity Factor**: Storage reduces peak loads during peak periods and increases loads during underutilized times, thereby leveling the overall load profile and improving the capacity factor.
- **Resiliency and Critical Load Support**: Storage integrated properly allows for resiliency and continuity of service of a set of critical loads during a power outage.
- **Line Loss Reduction**: Storage can reduce Peak loads which will reduce the energy lost from the transmission and distribution of energy.
- **DR Response:** Under this Standby Load Reduction Rate, Con Edison would be able to set the load reduction schedule on Critical Power

days. There will be a 20 event limit and if additional days are necessary additional incentives would be provided.

- **GHG Reduction-Peaker to Base Generation-** Implementing load reduction during peak periods and storing the energy off-peak when the most efficient generators are being used reduces Green House Gas (GHG) emissions. Using a market based metric for the value of carbon reduction would allow for a Market Based Earnings metric for customers.
- **Sustainable Capacity:** Storage provides the benefit of being able to time shift solar energy consumption to a time period when it has higher economic value in providing both Capacity and Energy.
- **Customer Acquisition Cost:** Con Edison has an extensive customer outreach network. By reducing the customer acquisition cost of third parties like Demand Energy, a fee could be paid in cases where Con Edison provides contacts that result in deciding to install energy storage.
- **Financing Fees:** Con Ed could provide on bill financing which could derive interest payments and tax equity benefits depending upon the finance structure.
- **Master Metered Shared Savings Lease Option:** Master metered accounts have difficulty in deploying capital for energy efficiency

projects due to their tenants' lease structures. Many tenants have language to share in any energy cost savings. This makes for long payback period to cost justify these projects. Demand Energy has proposed both a new operational model and ownership model that support a shared savings model across Con Edison, 3rd Party financing, and the building owner.

- **Electronic Bill Presentment and Payment:** In its proposed demonstration project, Demand Energy has offered to provide bill presentment information and to develop an electronic payment option reducing Con Edison's cost and improved cash flow.

Q. Are there other long term benefits that customers and Con Edison can expect from utilizing storage in the proposed market based approach?

A. Yes. The most important benefit that will be derived from this approach is the customer confidence in storage that storage provides the load management needed to provide electricity savings; can be installed in buildings, quickly and safely; runs behind the scenes making the operation transparent. With hourly pricing available for both supply and delivery, the storage system can optimize customer savings while delivering load relief to the distribution grid during the peak hours of operation); provides a source of safe critical power; can

be controlled by the utility without any interruption and can become part of the utility's energy ecosystem. In addition, this rate design will enable Con Edison to step towards the transactional energy market place envisioned in REV and its role as the Distribution Service Platform Provider ("DSPP") promoting a market for integration of distributed energy resources that can be managed via a price signal to result in the desired grid loading that is required to keep a highly distributed intermittent renewable energy system in a stable, cost optimized environment. This market based approach to rate making will demonstrate that load is reactive to price and can be controlled by intelligent energy storage systems; that market pricing can incent where load relief is needed and storage can be strategically deployed in selected regions to reduce or eliminate the need for further expensive grid upgrades improving system capacity factors; that Performance Based Rate making can be developed and utilities rewarded for *de facto* optimization of the grid managed as the DSPP; that load management provides system and cost benefits for all customers; and will help reduce the expense of building operations to meet the peak in all three components of generation, transmission, and distribution.

Q. How much energy storage capacity do you envision going forward based upon the market based approach proposed?

A. The delivery of the top 10% to 20% of the peak load is marginally more expensive for the entire energy delivery system. Building capacity to support peak loading drives a low utilization factor for all capital deployed to meet the peak. Based upon the PSC's comment regarding the flattening of the 100 hours of greatest peak demand and long term avoided capacity and energy savings would range between $1.2 billion and $1.7 billion per year, the top 100 hours of loading in the CECONY territory equals 1.8 GW (13.2-11.4 GW) of load or about 13% of peak. While storage could cover all of this peak load reduction, a more practical goal of 1 GW of storage (or solar and other DG+storage) seems reasonable. The NY-BEST 2016 roadmap outlines the goal of 2 GW of storage capacity on the grid by 2025 and 4 GW on the grid by 2030. Since Zone J is the largest load zone in New York, it seems plausible that the goal in NYC equal half of these targets for the same time frame. Con Ed has referenced a goal of 300 MW over 5 years for DMP II and the Con Ed DR programs achieved 137 MW for the CSRP program and 232 MW for the DLRP program. New York has 638 MW of solar PV deployed with a goal of 3 GW by 2022. If Zone J represents 30% of the total load in NY State, it is one of the most

expensive zones to deliver energy, a goal of 1 GW of distributed solar in Zone J is attainable. Incentives and encouragement of solar, distributed generation and storage solutions that deliver firm capacity and the ability to time shift resources to when it adds the most value for the Company's local networks makes good sense. This is especially true in the more residential networks (located in Staten Island, Brooklyn, Queens, and Westchester) where the system peak occurs between 7 pm and 11 pm.

Q. Are energy storage costs expected to decrease over time?

A. With the cost of storage systems projected to follow similar cost reductions as solar, multiple analysts see a 50% reduction in costs with improved performance over the next 10 years. With these price points and the growing challenges of peak loading, the fundamental economics will improve dramatically, driving new revenue streams for Con Edison and a dramatic shift to demand side management that will allow distributed resources to become a central part of overall grid management. Given the density of the population, age of the infrastructure, and current congestion in the greater NYC area, this provides tremendous confidence in growth and likely one of the most compelling markets worldwide. Con Edison taking a leadership role in

this emerging market - provides a compelling opportunity to be a core enabler and beneficiary of this transformation.

In the electric utility world, there have been many examples of technology improving with performance and reducing in cost as the market adapts technology. The market for smart metering demonstrated this over the past 10 years and it is too common in the storage world to reference the parallels of storage with distributed solar in regards to solutions that have achieve cost reduction with volume deployments

Q. Does this conclude your testimony?

A. Yes.