Comments of Viridity Energy Solutions Inc.

Viridity Energy Solutions Inc. submits these Comments in response to the Staff's Request for Comments concerning aspects of energy storage in New Jersey.

1. Essential Services: Energy Storage systems can provide power for essential services, by being connected to loads (electricity consuming devices) that can provide essential services. For example, if an energy storage facility had been in service during Superstorm Sandy, such a facility could have powered these loads when the grid was otherwise unavailable to do so. By way of example, critical hospital equipment could be connected to a battery and be served by the battery even if power from the grid is interrupted.

Energy storage systems can be used to offset peak loads in two specific modes. First, the battery can be connected to the grid and dispatched to discharge energy whenever PJM directs that it do so. Second, the battery can be connected to any electricity-consuming device owned by an end-use customer, and the battery can be discharged by the customer and thus reduce power taken from the grid. In both instances the discharge of the battery can be done during PJM peak hours.

2. Energy storage systems are particularly useful for providing frequency regulation service to PJM. Batteries can respond in milliseconds to PJM dispatch instructions and thus can go from charging to discharging instantaneously if required by frequency regulations needs.

3. Energy storage resources can stabilize the electric distribution system by reducing load on the system when required by the electric distribution system. There are two modes for this service: the battery can be connected directly to the distribution system and dispatched by the electric distribution company as needed or the battery can be connected to load and dispatched as needed so as to reduce power flows on the distribution system.

4. Batteries are being deployed both nationally and in New Jersey. Viridity owns three operating batteries in New Jersey today. Viridity is operating two 20 MW batteries and one 1.5 MW battery in New Jersey currently. These batteries are providing frequency regulation and are capable of providing peak capacity services as well. Statistics are widely and publicly available about the growth of storage nationally.

5. The benefits to ratepayers, local governments, and electric public utilities associated with the development and implementation of additional energy storage technologies fall into a number of categories: smaller electric bills; additional reliability of service.

Customers can own or lease a battery and use it to reduce their electric bills. The mode for the reduction will be battery discharge at the time of PJM peaks so as to reduce the generation portion of the customers load and battery discharge at the time of distribution peaks to reduce the distribution demand charge portion of the customers electric bill. Alternatively, the customer can sell the battery output to PJM and receive a check.

6. The reduction in generation and distribution peaks not only benefits the customer owning or hosting the battery, it also benefits the general body of ratepayers by increasing the system load factor and reducing peak load stresses, which means that the system overall (generation and distribution both) are being used more efficiently. In addition, battery projects can make it possible for ratepayers to forego high-cost substation upgrades and replacements, saving scarce real estate and instead significantly reduce costs compared to substation upgrades.

7. Local governments can own or host batteries and garner for themselves and their taxpayers the cost reduction or revenue generation opportunities noted above. Several municipalities have in fact done so.

8. Batteries contribute to greater reliability of the grid and to customer service in two ways. First, batteries represent a more distributed, less centralized, resource and thus offer greater geographic diversity to the grid. Consider the difference between ten 20 MW batteries and one 200 MM central generating station in terms of loss of load. Second, batteries contribute to greater reliability when they are connected behind the meter because they can continue to provide service when the grid is down.

9. It is not possible here to define the optimum points of entry into the electric distribution system for distributed energy resources. However, the State’s electric distribution companies might be ordered to provide a listing of the most expensive system upgrades in their ten-year plans – this list might well indicate the locations where storage can be deployed as cost-effective non-wires alternatives.

10. As indicated above, deployment of storage either behind the meter or onto the distribution system can reduce the cost of distribution system upgrades and can improve the reliability of distribution service.

11. The most efficient and cost-effective manner of introducing storage into the distribution system is via competitive requests for proposals. Competitive RFPs bring the power of competition to bear on prices and quality. Absent a competitive process, a buyer does not know if it has received the best

possible price or quality offering. Moreover, a competitive process shifts the risk and cost of mistakes to sellers rather than buyers.

12. Viridity suggests that a broad definition of energy storage is appropriate, such as: 'A resource capable of receiving electric energy and storing it for later use.' This definition would include behind the meter applications. This is appropriate given that approximately fifty percent of deployments will be behind the meter and behind the meter applications hold great value for end users. Similarly, this definition encompasses co-located storage which may be charged by renewable resources, such as solar or wind generation. This aspect of the definition makes sense because solar/ wind/ storage combinations further all relevant state goals, including those associated with storage deployment and renewable energy deployment.

13. A reasonable duration target for storage is an interesting question. In effect, the question raises the issue of the relationship between a batteries MW and MWH capacity. In a nutshell, a battery's MWH capacity can be discharged rapidly (short duration) or slowly (long duration). For example, a 20 MW battery can be fully discharged in one hour or it can be discharged over five hours at the rate of 4 MM per hour.

14. The State should not apply any duration to its deployment goals. Different durations serve different purposes, all of which may support valid policy goals. For example, a shorter duration is appropriate for the PJM energy and ancillary services markets. Indeed, there can be virtually no duration associated with a battery that is properly serving the frequency regulation market; the battery may be called upon to switch from charging to discharging mode in matter of seconds. A longer duration (perhaps 4 hours) might be appropriate for the capacity market. But all of these markets are needed and there is no reason to state a particular duration which makes more sense for one market and less for the others. And establishing a particular duration for measurement purposes may not even be required. Perhaps the goal can simply be measured in terms of MW deployed?

Viridity Energy Solutions, Inc.

Respectfully submitted,