



## NYSP21 Performs Grid Energy Storage System Evaluation for Genesis Energy Systems

Genesis Energy Systems, LLC. (Genesis) is a Yonkers based battery system manufacturer that is integrating Lithium Ion battery components, including Lishen LFP cells, into modular energy storage systems. Genesis has developed electric grid energy storage technology to address the needs of grid energy providers by contributing clean electrical power, meeting peak energy demand while displacing less environmentally friendly peaking power sources.

New York State (NYS) is incentivizing clean energy innovation under the 2015 "Reforming the Energy Vision" (REV) strategy. The REV strategy has a goal to reduce greenhouse gas (GHG) emissions by 40% from the energy sector by 2030. One proposed digital energy resource (DER) project being explored in the New York City (NYC) region by Consolidated Edison is the reallocation of peak electricity production. The proposed reallocation would use battery storage systems that would charge during off peak hours and then provide energy during peak demand times.

### CHALLENGE

Genesis plans to store electrical energy produced during "off-peak" generation, capturing energy derived from renewable sources. This "clean" energy will be stored in a Genesis module and made available to meet peak demand at a later time. According to Genesis, their new technology will provide a cleaner and more cost effective alternative for deployment in areas with high grid energy demand.

Genesis requested New York State Pollution Prevention Institute (NYSP21) to assist in three areas:

- Analyze the total annual peak energy demand in the NYC region
- Quantify the potential for fossil fuel use and air emissions avoided with the application of Genesis "Grid Energy Storage Systems"
- Support system safety testing under the Consolidated Edison/ NYSERDA 2016 Battery Energy Storage Safety (BESS) testing program prior to installation in NYC buildings

### SOLUTION

NYSP21 at Rochester Institute of Technology (RIT) supported Genesis by conducting an environmental assessment of the potential avoided fossil fuel use in the NYC region by implementing Genesis grid energy storage. NYSP21 also contracted DNV-GL test labs to evaluate Genesis's new Lithium Ion based grid energy storage module by executing the BESS test procedures.

### CHALLENGE

- Genesis wanted to confirm performance of their grid energy storage system, using Lishen LFP cells, capturing energy derived from renewable sources during "off-peak" generation
- NYSP21 worked with DNV-GL to evaluate the environmental and safety impact of Genesis grid energy storage system

### SOLUTION

- NYSP21 conducted an environmental assessment of the potential avoided fossil fuel use in the NYC region by implementing Genesis grid energy storage
- NYSP21 contracted DNV-GL to evaluate the Genesis safety under BESS protocols

### RESULTS

- Potential to displace over 2.0 million gallons of diesel fuel annually when using Genesis energy storage systems to meet the NYC peak energy demand, currently powered by diesel generators
- Corresponding reduction in CO2 green house gas (GHG) air emissions of >18,000 metric tons of diesel CO2 emissions annually, by switching from the current diesel generator method to Genesis energy storage systems in NYC during peak energy demand
- Genesis energy storage systems met BESS safety protocol, as administered by DNV-GL



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## RESULTS

There were several key findings of the potential reduction in diesel fuel use and air emissions due to the environmental assessment conducted by NYSP2I.

- Considering the equivalent amount of diesel fuel saved by utilizing battery storage in place of diesel generators, up to a peak energy demand of 26.5 GWh, there is potential to displace over 2.0 million gallons of diesel fuel annually when using battery storage systems to meet the NYC peak energy demand, currently powered by diesel generators.
- There is a corresponding annual reduction in CO<sub>2</sub> green house gas (GHG) air emissions of >18,000 metric tons of diesel CO<sub>2</sub> emissions by switching from the current diesel generator method to battery storage systems in NYC during peak energy demand.
- DNV-GL published test results for Lithium Ion, Lead Acid and Vanadium redox batteries indicate the following. Please refer to the complete published study: <https://www.dnvgl.com/energy/themes/energy-storage.html>

DNV-GL concluded the following based on BESS testing:

- » The Genesis product exhibited emission of toxic and flammable gases similar to the other batteries tested.
- » The peak flame temperatures of the Genesis product were lower than the average of the group of batteries evaluated.
- » Water was a sufficient extinguisher to cool and extinguish fires consuming the Genesis product as it was for the other batteries tested.

Genesis anticipates an increase in total product sales, and is targeting the addition of 35 jobs in NYS to support increased manufacturing and applications of their Grid Energy Storage System.

## TESTIMONIAL

“NYSP2I provided a significant level of support in helping us confirm the environmental and safety impacts of our energy storage system. As a result of their assistance, we plan to market and commercialize our system, resulting in cleaner grid energy throughout New York State.”

– Joseph Barrella, President  
Genesis Energy Systems, LLC.

## NYSP2I PARTNERS

R·I·T

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University at Buffalo  
The State University of New York

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New York Manufacturing Extension Partnership

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