ON-SITE POWER EXPO

Featuring Combined Heat and Power (CHP), Solar PV, and Energy Storage
Batteries/Fuel Cells:
New York Battery and Energy Storage Technology Consortium - NY-BEST

Solar PV:
New York Solar Energy Industries Association - NYSEIA
Solar Energy Industries Association - SEIA

Combined Heat and Power (CHP):
Northeast Clean Heat and Power Initiative - NECHPI
CHP Association
World Alliance for Decentralized Energy - WADE
International District Energy Association - IDEA
On-Site Power Expo Partners

**Government:**
- U.S. Department of Energy
- U.S. Environmental Protection Agency
- NYS Department of Public Service
- NYC Department of Buildings
- NYC Retrofit Accelerator

**Utilities:**
- Con Edision
- National Grid
- New York Power Authority
- Long Island Power Authority / PSEG-Long Island

**Finance:**
- NY Green Bank
- NYC Energy Efficiency Corporation - NYCEEC

**Clean Energy Implementation Support:**
- Sustainable CUNY
- Pace Energy and Climate Center
On-Site Power Systems can positively impact your triple-bottom-line

- **Financial** - Energy cost savings
- **Sustainability** - Reduced carbon footprint
- **Reliability** - Some configurations can provide power during a utility grid outage

When considering an On-Site Power System, it is good to also consider Energy Efficiency

- Energy Efficiency is the first, best investment (upgrade to better lighting, better motors, better insulation, better appliances, etc.)
- Fulfilling your needs by using energy more efficiently will minimize the size and installation cost of an On-Site Power System
An Individual Technology can deliver a successful On-Site Power solution
- Solar PV - Photovoltaics
- Energy Storage - Batteries
- Combined Heat and Power (CHP) - Also known as Cogeneration

A Hybrid (integrated, multi-technology) On-Site Power System can offer extra value in some cases, such as
- Solar + Storage provides firm production despite periodic cloudiness
- CHP + Solar + Storage provides robust resiliency and economically vibrant flexibility

Choose from an ample cadre of competent solution providers
Energy Storage Overview

Analytical support in partnership with GridMarket.
Benefits of Using Energy Storage

What Energy Storage does for you

- Reduces Demand Charges on your electricity bill
- Allows you to participate in demand reduction programs
- Provides emergency power for lights, elevators and other critical items.
Benefits of Using Energy Storage

What Energy Storage does for the Grid

- Improving the efficiency and capacity factor (utilization) of the electric grid
- Integrating an increasing amount of renewable energy
- Enhancing the reliability and resilience of the electric grid
Peak Power is expensive

Generation and Transmission built to serve peak demand

Source: Consolidated Edison
Peak Power is expensive

A Gigawatt of capacity is used less than 24 hours a year

Source: Consolidated Edison
The Public Service Commission Estimates that the top 100 hours cost New Yorker $1.2 to $1.7 billion per year.

Source: Consolidated Edison
How reducing peak demand saves you money

Demand Charges

- Depending on your tariff, you may be paying demand charges tied to peak electricity consumption.
- If your peak usage is high at particular times of the day, an energy storage system can reduce your peaks (and demand charge).
Demand Response (DR)

- You can be paid to reduce your load at critical times. With an energy storage system, you can participate in demand response programs without adversely affecting your operations.

- DR programs are offered by both your utility to deal with local needs and the NYISO to deal with State-wide peaks.
How reducing peak demand saves you money

Reducing local grid costs

- Utilities offer location specific programs to reduce the cost of grid upgrades.
- Projects in identified areas can receive payments that offset the customers cost.
And you get resiliency

Many customers opt to connect energy storage in a way that also gives them backup power for critical infrastructure:

- Elevators
- Emergency Lighting
- Phone Charging
- Furnace (heat)
How to learn more

Talk to vendors and State resources

- NYSERDA (add websites)
- New York Battery and Energy Storage Consortium (NY-BEST)
- CUNY
- Grid Market
# 400kW/1600kWh Battery & 40kW PV Proforma

## Project Proforma

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CASH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Cost</td>
<td>-$1,920,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-$400,000</td>
<td></td>
</tr>
<tr>
<td>NYSERDA MW Block</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$28,000</td>
</tr>
<tr>
<td>ConEd DMP 2 Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$320,000</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery Demand Response Revenue</td>
<td>$117,400</td>
<td>$117,400</td>
<td>$120,922</td>
<td>$124,550</td>
<td>$128,286</td>
<td>$132,125</td>
<td>$136,099</td>
<td>$140,182</td>
<td>$144,387</td>
<td>$148,719</td>
</tr>
<tr>
<td>Battery Supply Cost Savings ICAP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$87,800</td>
</tr>
<tr>
<td>Battery Delivery Bill Savings</td>
<td>$117,741</td>
<td>$121,274</td>
<td>$124,912</td>
<td>$128,659</td>
<td>$132,519</td>
<td>$136,485</td>
<td>$140,509</td>
<td>$144,607</td>
<td>$149,151</td>
<td>$153,025</td>
</tr>
<tr>
<td>Solar Supply Cost Savings</td>
<td>$4,102</td>
<td>$4,225</td>
<td>$4,351</td>
<td>$4,482</td>
<td>$4,616</td>
<td>$4,755</td>
<td>$4,896</td>
<td>$5,044</td>
<td>$5,196</td>
<td>$5,352</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations &amp; Maintenance / Service Warranty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$-26,800</td>
</tr>
<tr>
<td>Insurance</td>
<td>-$1,920</td>
<td>-$1,978</td>
<td>-$2,037</td>
<td>-$2,098</td>
<td>-$2,161</td>
<td>-$2,226</td>
<td>-$2,293</td>
<td>-$2,361</td>
<td>-$2,432</td>
<td>-$2,505</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>-$1,920</td>
<td>-$1,978</td>
<td>-$2,037</td>
<td>-$2,098</td>
<td>-$2,161</td>
<td>-$2,226</td>
<td>-$2,293</td>
<td>-$2,361</td>
<td>-$2,432</td>
<td>-$2,505</td>
</tr>
<tr>
<td><strong>Total Net Revenue</strong></td>
<td>$348,000</td>
<td>$237,323</td>
<td>$326,721</td>
<td>$338,563</td>
<td>$348,740</td>
<td>$359,202</td>
<td>$343,178</td>
<td>$353,474</td>
<td>$364,078</td>
<td>$375,000</td>
</tr>
<tr>
<td><strong>TAX BENEFITS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal ITC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$48,000</td>
</tr>
<tr>
<td>NYC Property Tax Abatement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$6,600</td>
</tr>
<tr>
<td>Depreciation (MACRS 5-year)</td>
<td>$326,400</td>
<td>$322,240</td>
<td>$313,344</td>
<td>$187,680</td>
<td>$187,680</td>
<td>$94,656</td>
<td>$58,000</td>
<td>$108,800</td>
<td>$65,280</td>
<td></td>
</tr>
<tr>
<td><strong>Total Tax Benefit</strong></td>
<td>$326,400</td>
<td>$322,240</td>
<td>$313,344</td>
<td>$187,680</td>
<td>$187,680</td>
<td>$94,656</td>
<td>$58,000</td>
<td>$108,800</td>
<td>$65,280</td>
<td></td>
</tr>
<tr>
<td><strong>Net Project Cash Flow</strong></td>
<td>-$1,572,000</td>
<td>$326,534</td>
<td>$414,857</td>
<td>$334,810</td>
<td>$280,144</td>
<td>$288,707</td>
<td>$291,036</td>
<td>$288,196</td>
<td>$243,390</td>
<td>$255,952</td>
</tr>
<tr>
<td><strong>Total Cumulative Net Project Benefits</strong></td>
<td>-$1,572,000</td>
<td>-$1,243,466</td>
<td>-$802,609</td>
<td>-$493,759</td>
<td>-$204,655</td>
<td>-$84,052</td>
<td>$325,067</td>
<td>$533,284</td>
<td>$775,673</td>
<td>$1,041,265</td>
</tr>
</tbody>
</table>

- **Non-Discounted Payback (yrs)**: 4.71
- **Net Present Value (NPV, 0.06)**: $1,605,152
- **20-year IRR**: 18.55%

Analysis by [GRIDMARKET](#)
400kW/1600kWh Battery & 40kW PV
Demand Charge Management

Analysis by GRIDMARKET
Battery Storage: Business Case

- Simple Payback: 3-7 years
- IRR: 10-15%
- Savings to Investment Ratio: 1.5-3.0
- Positive Net Present Value
Battery Storage: Typical System Configuration & Footprints
About NY-BEST

The New York Battery and Energy Storage Technology Consortium

**MISSION:** To catalyze and grow the energy storage industry and establish New York State as a global leader.

NY-BEST will do this by:

1. Communicating information and facilitating connections
2. Accelerating Commercialization
3. Educating policymakers and stakeholders
4. Promoting New York’s capabilities and markets

If you’re interested in further information, visit [www.ny-best.org](http://www.ny-best.org)
Thank you