

2020 Energy Storage Market Evaluation

Appendices to the Annual Report

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Notice

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Appendix A: Acronyms and Abbreviations

C&I	Commercial and industrial
BOS	Balance of system
BTM	Behind the meter
DES	Distributed energy storage
FDNY	New York Fire Department
FTM	Front of the meter
HVAC	Heating, ventilation, and air conditioning
kW	Kilowatt(s)
kWh	Kilowatt-hour(s)
Li-ion	Lithium ion
MW	Megawatts
NYSERDA	New York State Energy Research and Development Authority
OEM	Original equipment manufacturer
PE	Professional Engineer
PV	Photovoltaic
W	Watt(s)

Appendix B: 2020 Survey Instrument

Programming Notes:

Purple text in { } brackets indicates programming logic.

Numbers contained in parentheses indicate code values.

Closed bullets indicate single answer response options, while open bullets indicate multiple response options.

Dashed lines indicate a page break.

Start of Block: Respondent Company Profile and Introduction

Introduction We are collecting data on Energy Storage (ES) systems that have been installed or contracted for in New York in 2020. Our data collection is focused on ES utilized primarily for load management or grid services rather than installed primarily for backup power or resilience. NYSERDA will use this data to identify cost trends, market insights, and key market barriers, which will inform and guide NYSERDA's energy storage program. We appreciate your participation in this critical data collection effort.

If you cannot complete the survey in its entirety or you accidentally exit the survey mid-course, you can resume the survey where you left off by clicking the link from your invitation email or hitting the back button.

Q442 What is your company's name?

Q1.2 What is your firm's role in the market for energy storage systems? [Check all that apply]

{Multiple responses allowed}

- Manufacturer (1)
 - Distributor (2)
 - Sales (3)
 - Integrator (4)
 - Developer (5)
 - Installer (6)
 - Financier (7)
 - Other (specify) (8) _____
-

End of Block: Respondent Company Profile and Introduction

Start of Block: Installation Activities

Q2.1 Please respond to the following questions for energy storage projects that meet **all** of the following criteria:

- Energy storage primarily for load management or grid services
- [In 2020 only] Installed or contracted and submitted for permitting and interconnection
- Located in New York State

Please only include projects that your company was the lead contractor on.

How many total projects meet all of the above conditions? If none, please enter 0.

In front of the meter (1) _____

Behind the meter (2) _____

{ If no projects are entered (FTM=0 & BTM=0), skip to Q3.2. Following questions are displayed only if the respondent indicates their company has qualifying 2020 projects. }

End of Block: Installation Activities

Start of Block: Pt. 2: Installation Activities

Q2.5 Approximately what percent of your New York State customers that have received energy storage proposals since January 2020 have received contracts?

- % (1) _____
- Prefer not to answer (2)

Q2.6 Of those 2020 New York State projects with executed contracts, what percent are waiting for permits to be approved?

- % (1) _____
- Prefer not to answer (2)

End of Block: Pt. 2: Installation Activities

Start of Block: Primary Use Case

Q4.1&2 Next are some questions about the primary use case (geographic location, customer type, technology, system location and size) of energy storage systems your company installed or

contracted and submitted for permitting and interconnection in 2020 in New York State. Please define your primary use case. Choose one from each drop down list below.

Customer Type

▼ Drop down menu including the following:

- Utility customer (1)
 - NYISO (2)
 - Industrial customers (3)
 - Commercial customers (4)
 - Residential customers – single family (5)
 - Residential customers – multi-family (6)
-

Q4.3 Geography

▼ Drop down menu including the following:

- New York City (1)
 - Westchester County (2)
 - Long Island (3)
 - Other locations in NYS (4)
-

Q4.4 Technology

▼ Drop down menu including the following:

- Lithium Ion (1)
 - Lead Acid (2)
 - Thermal (3)
 - Other (4)
-

Q4.5 System Location

▼ Drop down menu including the following:

- Behind the meter (1)
 - Front of the meter (2)
-

Q4.6 Average system size

- Average kW (4) _____
- Average kWh (5) _____

End of Block: Primary Use Case

Start of Block: Total Installed Cost - Primary Use Case

Q5.1 You have defined your **primary use case** as:

- Customer type: {carry forward selected customer type}
- Geography: {carry forward selected geography}
- Technology: {carry forward selected technology}
- System location: {carry forward selected system location}
- Average kW: {carry forward selected average kW}
- Average kWh: {carry forward selected average kWh}

For your primary use case, what is the average total installed cost \$/kWh?

Total includes all costs for hardware, engineering and construction, and soft costs.

\$/kWh (1) _____

Q5.2 For your primary use case of energy storage systems in New York State in 2020, which percentage is constituted by the following: [Sum to 100%]

Hardware cost (*Battery modules, inverter, containerization, controller, power control, HVAC system, meter, insulation. Excludes upgrades required for permitting or interconnection approval.*): _____ (1)

Engineering and Construction cost (*Design, site preparation/survey, transportation, PE approval, testing, electrician and installation labor, wiring, fencing, testing, commissioning, and*

enrollment in energy markets. Excludes upgrades required for permitting or interconnection approval.): _____ (2)

Permitting cost (Including application fees, responding to requests for additional information, studies, and unique safety protections required from the AHJ beyond the requirements of IFC 2021). : _____ (3)

Interconnection cost (Including application, and required upgrades or studies cost). : _____ (4)

Customer acquisition/Site acquisition cost : _____ (5)

Finance cost (Including origination fee ONLY) : _____ (6)

Total : _____ {Automatically summed}

Q5.3 How did New York-specific factors impact NY energy storage projects (e.g. NY permitting rules, NY utilities) in 2020?

Q5.4 How did broader global factors impact NY energy storage projects in 2020 (e.g. supply chain delays, COVID-19 shutdowns)?

Q5.5 Please note that NYSERDA may reach out to you to discuss factors that impacted energy storage projects in 2020 in more detail. Are you the appropriate person to answer additional questions?

- Yes (1)
- No (2)

{Display if Q5.5=No (2)}

Q5.6 Please provide the contact information for the person at your organization who can provide additional detail:

- Name: (1) _____
- Phone number: (2) _____
- Email address: (8) _____

End of Block: Total Installed Cost - Primary Use Case

Start of Block: Cycle Time and Staff Time - Primary Use Case

Q6.1 Next are some questions about the project cycle time for the primary use case for energy storage systems your company installed, or contracted and submitted for permitting and interconnection in 2020 in New York State. This cycle time is incurred up to and including system commissioning.

You have defined your **primary use case** as:

- Customer type: {carry forward selected customer type}
- Geography: {carry forward selected geography}
- Technology: {carry forward selected technology}
- System location: {carry forward selected system location}
- Average kW: {carry forward selected average kW}
- Average kWh: {carry forward selected average kWh}

What is the overall project cycle time for your primary use case, from initial engagement to system commissioning? Please round to the nearest month.

- Number of months: (1) _____
- Prefer not to answer (2)

Q6.2 For your primary use case in New York State in 2020, please list the average cycle time for various stages. We understand there are many factors that influence the cycle time, but we'd like you to provide your best estimate in months.

_____ Length of time for customer acquisition/site acquisition: from initial engagement to contract execution (1)

_____ Length of time from contract execution to system commissioning (3)

_____ Length of time to obtain electrical, building and/or fire department permits (4)

_____ Length of time to obtain zoning and other siting approvals (if required) (8)

_____ Length of time to obtain interconnection approval from utility (9)

End of Block: Cycle Time and Staff Time - Primary Use Case

Start of Block: Secondary Use Case

Q7.1 Do you have a secondary use case for energy storage systems in New York State in 2020?

- Yes (1)
- No (2)

{Display if Q7.1=Yes (1)}

Q7.2 Are you willing to answer cost questions about that secondary use case as well?

- Yes (1)
- No (2)

{If no, skip to Q3.1. Following questions are displayed only if the respondent indicates they are willing to answer questions about the secondary use case.}

Q7.3 Please define your secondary use case.

Customer Type

▼ Drop down menu including the following:

- Utility customer (1)
- NYISO (2)
- Industrial customers (3)
- Commercial customers (4)
- Residential customers – single family (5)
- Residential customers – multi-family (6)

Q7.4 Geography

▼ Drop down menu including the following:

- New York City (1)
- Westchester County (2)
- Long Island (3)
- Other locations in NYS (4)

Q7.5 Technology

▼ Drop down menu including the following:

- Lithium Ion (1)
- Lead Acid (2)
- Thermal (3)
- Other (4)

Q7.6 System Location

▼ Drop down menu including the following:

- Behind the meter (1)
- Front of the meter (2)

Q7.7 Average system size

- Average kW (3) _____
 - Average kWh (4) _____
-

Q7.8 You have defined your **secondary use case** as:

- Customer type: {carry forward selected customer type}
- Geography: {carry forward selected geography}
- Technology: {carry forward selected technology}
- System location: {carry forward selected system location}
- Average kW: {carry forward selected average kW}
- Average kWh: {carry forward selected average kWh}

For your secondary use case, what is the average total installed cost \$/kWh?

Total includes all costs for hardware, engineering and construction, and soft costs.

- \$/kWh (1) _____

Q7.9 For your secondary use case of energy storage systems in New York State in 2020, which percentage is constituted by the following: [Sum to 100%]

Hardware cost (*Battery modules, inverter, containerization, controller, power control, HVAC system, meter, insulation. Excludes upgrades required for permitting or interconnection approval.*): _____ (1)

Engineering and Construction cost (*Design, site preparation/survey, transportation, PE approval, testing, electrician and installation labor, wiring, fencing, testing, commissioning, and enrollment in energy markets. Excludes upgrades required for permitting or interconnection approval.*): _____ (2)

Permitting cost : _____ (3)
(*Including application fees, responding to requests for additional information, studies, and unique safety protections required from the AHJ beyond the requirements of IFC 2021.*) : _____ (7)

Interconnection cost (*Including application, and required upgrades or studies cost.*) : _____ (4)

Customer acquisition/Site acquisition cost : _____ (5)

Finance cost (*Including origination fee ONLY.*) : _____ (6)

Total : _____ {Automatically summed}

Q7.10 Is the project cycle for your secondary use case longer or shorter than the primary use case?

- Longer; please estimate the % increase in time: (1)

- Shorter; please estimate the % decrease in time: (2)

- About the same (3)
- Don't know (4)

End of Block: Secondary Use Case

Start of Block: Business Strategies

Q3.1 What percent of your energy storage systems in New York State in 2020 have each of the following types of contractual arrangements?

	{FTM response option only displays for respondents who indicated their company has qualifying 2020 FTM projects.} In front of the meter (%) (1)	{BTM response option only displays for respondents who indicated their company has qualifying 2020 BTM projects.} Behind the meter (%) (2)
Third party ownership (1)		
Site or end user ownership (2)		
Performance contracting or shared savings (3)		
Total {Automatically summed}		

Q3.2 What percent of your energy storage customers in New York State in 2020 are in each of the following sectors? [Sum to 100%]

- Single family to four plex residential : _____ (1)
 Multifamily (five or more units) : _____ (2)
 Commercial (not utility) : _____ (3)
 Industrial (not utility) : _____ (4)
 Utility : _____ (5)
 Municipal, University, Schools, or Healthcare ("MUSH") : _____ (6)
 Other (specify) : _____ (8)
 Total : _____ {Automatically summed}

Q3.3 Which of the following benefits are important in closing the deal for your energy storage customers in New York State in 2020? [Check all that apply]

{Multiple responses allowed}

- Investment tax credit (1)
- Demand charge management (2)
- Demand response payments (3)
- Distributed generation integration (4)
- Non-wires alternative services (5)
- Any other benefits you typically promote (specify): (6)
- Don't know (7) {Mutually exclusive}
- Prefer not to answer (8) {Mutually exclusive}

End of Block: Business Strategies

Start of Block: Closing

Q8.1 Is there anything about your experience completing energy storage projects in New York State that we have not discussed today, or that worked well or didn't work well, that you would like to convey to NYSERDA?

End of Block: Closing