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**` Massachusetts Department of**

**Energy Resources (DOER)**

**Solar Massachusetts Renewable Target Program (SMART)**

**June 2025**

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# Introduction

The Massachusetts Department of Energy Resources has tasked BW Research to collect data relevant to the implementation of the Solar Massachusetts Renewable Target (SMART) program. BW Research seeks to collect data on the project costs and cost factors of SMART projects from active industry participants in Massachusetts. **The information collected will directly inform incentive amounts and potential program enhancements, so your participation is crucially important.**

*BW Research Partnership is collecting these survey responses on behalf of the Department of Energy Resources pursuant to G.L. c. 25A, § 7 and shall keep individual responses confidential to the extent permitted by law, but may release aggregates and analysis of survey responses.*

**The survey will be emailed to you within the next week.** While we aimed to ask as few questions as possible, the questionnaire can be quite detailed, especially for respondents with experience with a wide range of SMART eligible solar and battery storage projects. **We have made the survey easier for respondents from last year, and the survey should take between 15-35 minutes depending on the respondent.**

At the end of the survey you will be asked if you are interested in a follow up phone interview. This interview is entirely optional, but can help the research team better understand the particular challenges that the solar industry in Massachusetts is facing at this point in time.

If you have any questions, please do not hesitate to reach out to the project manager, Nate Hunt, at [nhunt@bwresearch.com](mailto:nhunt@bwresearch.com).

# Screener Questions

1. Does your firm conduct any solar or solar plus storage related work in the state of Massachusetts?
   1. Yes
   2. No (TERMINATE)
   3. Don’t know/ Refused (TERMINATE)
2. Which of the following industry descriptions best describes your organization’s focus in the solar industry? (Allow multiple responses)
   1. Developer
   2. Installer/ Engineering Procurement and Construction (EPC)/ Integrator
   3. Operations and Maintenance (O&M) provider
   4. Project management
   5. Equity investor
   6. Tax equity investor
   7. Lender/ debt provider
   8. Wholesale market participant
   9. Service provider (engineering, legal support, permitting support)
   10. Project host
   11. Project aggregator
   12. Other (please specify):
   13. Not sure [TERMINATE]

* Total installed cost - costs associated with installing the photovoltaic system, and include equipment, labor, engineering, permitting, customer acquisition, marketing, interconnection and any other costs that apply in Year 0 of the project cash flow.
* Total fixed costs - annual costs associated with the operation and maintenance of the photovoltaic system over the lifetime of the project.
* Total solar photovoltaic plus energy storage installed cost - cost of purchasing and installing all photovoltaic and battery-related equipment, including labor and other associated costs.
* Total energy storage fixed costs - annual costs associated with the operation and maintenance of the energy storage system over the lifetime of the project.
* Solar photovoltaic financing data – project financial and debt structure.

1. Please select the following solar system production and project costs that you are able to accurately provide data on: (Please select all that apply)
   1. Total installed cost
   2. Total fixed costs (Operations and Maintenance costs)
   3. Total solar photovoltaic plus energy storage installed cost
   4. Total energy storage fixed cost
   5. Solar photovoltaic financing data
   6. Solar photovoltaic type of ownership information
   7. No, but I can provide you with the contact information for someone that does (Collect email THEN TERMINATE)
   8. Don’t know/ Refused (TERMINATE)

**PIPE IN OPTIONS FROM SC**

1. Are you able to provide **exact** solar system project costs in dollars, financial and debt structures for the following: (select all that apply)
   1. Yes, total installed cost
   2. Yes, total fixed costs (Operations and Maintenance costs)
   3. Yes, total solar photovoltaic plus energy storage installed cost
   4. Yes, total Energy storage fixed cost
   5. Yes, I can provide Solar photovoltaic financing data
   6. Yes, I can provide Solar photovoltaic type of ownership information
   7. No
   8. Don’t know/ Refused

**LIMIT SE TO 3 COLUMN OPTIONS AND 3 ROW OPTIONS**

1. For each of the following project types, please indicate the photovoltaic project size categories that your firm is engaged in: (SELECT ALL THAT APPLY)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | ≤ 27.5 kWdc residential projects (≤ 25 kWac) | ≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) | >27.5-275 kWdc projects (>25-250 kWac) | >275-600 kWdc projects (>250-500 kWac) | >600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) | >1.2-6.5 MWdc projects (>1-5 MWac) | Don't know/ Refused |
| Ground-Mount solar |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Brownfield Solar |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Landfill Solar |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Solar Canopy |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Rooftop Solar | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Dual-use Agricultural Solar |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Low-Income Residential Solar (for below 25 kW) | 1 |  |  |  |  |  |  |
| Floating Solar |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Projects Serving Public Entities |  | 2 | 3 | 4 | 5 | 6 | 7 |
| Pollinator-Friendly Solar |  | 2 | 3 | 4 | 5 | 6 | 7 |

**LIMIT SF TO TWO COLUMN OPTIONS AND TWO ROW OPTIONS**

1. For each of the following solar plus energy storage project types, please indicate the photovoltaic project size categories your firm is engaged in:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ≤ 27.5 kWdc residential projects (≤ 25 kWac) | ≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) | >27.5-275 kWdc projects (>25-250 kWac) | >275-600 kWdc projects (>250-500 kWac) | >600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) | >1.2-6.5 MWdc projects (>1-5 MWac) | We do not work with these projects | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 25% of Nameplate (kW), 4-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 25% of Nameplate (kW), 6-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 50% of PV Nameplate (kW), 2-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 50% of PV Nameplate (kW), 4-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 50% of PV Nameplate (kW), 6-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 100% of PV Nameplate (kW), 2-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 100% of Nameplate (kW), 4-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 100% of Nameplate (kW), 6-hour duration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

## Section 1: TOTAL INSTALLED COST

***Please provide additional data and information requested to the best of your knowledge to update our data. The data referenced here is from the National Renewable Energy Laboratory (NREL) Annual Technology Baseline (ATB) dataset for 2025***

**ASK Q1 IF SD=**1. **OTHERWISE SKIP**

**PIPE IN SE=1 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** what are the estimated **total installed costs?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity($ per Kilowatt DC) |
| Rooftop Solar |  |
| Low-Income Residential Solar (for below 25 kW) |  |

**PIPE IN SE=1 OPTIONS**

**SKIP Q2 IF SD=1**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** would you say that the **Cost per DC Kilowatt** that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **total installed costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| Rooftop Solar **($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| Low-Income Residential Solar **($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q3 IF SD=1 OTHERWISE SKIP**

**PIPE IN SE=2 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** what are the estimated **total installed costs?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity($ per Kilowatt DC) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |  |
|  |

**PIPE IN SE=2 OPTIONS**

**SKIP Q4 IF SD=1**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** would you say that the **Cost per DC Kilowatt** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **total installed costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

**ASK Q5 IF SD=1 OTHERWISE SKIP**

**PIPE IN SE=3 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** what are the estimated **total installed costs?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity($ per Kilowatt DC) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=3 OPTIONS**

**SKIP Q6 IF SD=1**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** would you say that the **Cost per DC Kilowatt** that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **total installed costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q7 IF SD=1 OTHERWISE SKIP**

**PIPE IN SE=4 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** what are the estimated **total installed costs?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity($ per Kilowatt DC) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=4 OPTIONS**

**SKIP Q8 IF SD=1**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** would you say that the **Cost per DC Kilowatt** that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **total installed costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q9 IF SD=1 OTHERWISE SKIP**

**PIPE IN SE=5 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** what are the estimated **total installed costs?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity($ per Kilowatt DC) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=5 OPTIONS**

**SKIP Q10 IF SD=1**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** would you say that the **Cost per DC Kilowatt** that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **total installed costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q11 IF SD=1 OTHERWISE SKIP**

**PIPE IN SE=6 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** what are the estimated **total installed costs?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity($ per Kilowatt DC) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=6 OPTIONS**

**SKIP Q12 IF SD=1**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** would you say that the **Cost per DC Kilowatt** that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **total installed costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** |  |  |  |  |  |  |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

## Section 2: TOTAL FIXED COSTS (O&M COST)

**INCLUDE DEFINITION OF WHAT THIS INCLUDES, POSSIBLY CHANGE HEADING TO TOTAL O&M.**

**ASK Q13 IF SD=2 OTHERWISE SKIP**

**PIPE IN SE=1 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** what are the expected **total fixed (operations and maintenance) costs?**

|  |  |
| --- | --- |
|  | Total fixed cost by capacity ($ per kW-year) |
| Rooftop Solar |  |
| Low-Income Residential Solar (for below 25 kW) |  |

**PIPE IN SE=1 OPTIONS**

**SKIP Q14 IF SD=2**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt (kWdc)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about the expected **total fixed (operations and maintenance) costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| Rooftop Solar **($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| Low-Income Residential Solar **($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q15 IF SD=2 OTHERWISE SKIP**

**PIPE IN SE=2 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** what are the expected **total fixed (operations and maintenance) costs?**

|  |  |
| --- | --- |
|  | Total fixed cost by capacity ($ per kW-year) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=2 OPTIONS**

**SKIP Q16 IF SD=2**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt (kWdc)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about the expected **total fixed (operations and maintenance) costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q17 IF SD=2 OTHERWISE SKIP**

**PIPE IN SE=3 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** what are the expected **total fixed (operations and maintenance) costs?**

|  |  |
| --- | --- |
|  | Total fixed cost by capacity ($ per kW-year) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=3 OPTIONS**

**SKIP Q18 IF SD=2**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt (kWdc)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about the expected **total fixed (operations and maintenance) costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q19 IF SD=2 OTHERWISE SKIP**

**PIPE IN SE=4 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** what are the expected **total fixed (operations and maintenance) costs?**

|  |  |
| --- | --- |
|  | Total fixed cost by capacity ($ per kW-year) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=4 OPTIONS**

**SKIP Q20 IF SD=2**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt (kWdc)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about the expected **total fixed (operations and maintenance) costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q21 IF SD=2 OTHERWISE SKIP**

**PIPE IN SE=5 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** what are the expected **total fixed (operations and maintenance) costs?**

|  |  |
| --- | --- |
|  | Total fixed cost by capacity ($ per kW-year) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=5 OPTIONS**

**SKIP Q22 IF SD=2**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** would you say that the **Costs per DC Kilowatt (kWdc)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about the expected **total fixed (operations and maintenance) costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q23 IF SD=2 OTHERWISE SKIP**

**PIPE IN SE=6 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** what are the expected **total fixed (operations and maintenance) costs?**

|  |  |
| --- | --- |
|  | Total fixed cost by capacity ($ per kW-year) |
| Ground-Mount solar |  |
| Brownfield Solar |  |
| Community Shared Solar (*Minimum 40% low income offtakers*) |  |
| Landfill Solar |  |
| Solar Canopy |  |
| Rooftop Solar |  |
| Dual-use Agricultural Solar |  |
| Floating Solar |  |
| Projects Serving Public Entities |  |
| Pollinator-Friendly Solar |

**PIPE IN SE=6 OPTIONS**

**SKIP Q24 IF SD=2**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** would you say that the **Costs per DC Kilowatt (kWdc)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about the expected **total fixed (operations and maintenance) costs?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| **Ground-Mount solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Brownfield Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Community Shared Solar (*Minimum 40% low income offtakers*) ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Landfill Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Solar Canopy ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Rooftop Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Dual-use Agricultural Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Floating Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |
| **Projects Serving Public Entities ($4.50 per Kilowatt DC)** |  |  |  |  |  |  |
| **Pollinator-Friendly Solar ($4.50 per Kilowatt DC)** | 0 | 1 | 2 | 3 | 4 | 5 |

## Section 3: Total Solar PV plus Energy Storage System Cost

**ASK THIS BY PROJECT TYPE NOW**

**ASK Q25 IF SD=3 OTHERWISE SKIP**

**PIPE IN SF=1 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** what are **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity ($ per Kilowatt DC) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=1 OPTIONS**

**SKIP Q26 IF SD=3**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q27 IF SD=3 OTHERWISE SKIP**

**PIPE IN SF=2 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** what are **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity ($ per Kilowatt DC) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=2 OPTIONS**

**SKIP Q28 IF SD=3**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q29 IF SD=3 OTHERWISE SKIP**

**PIPE IN SF=3 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** what are **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity ($ per Kilowatt DC) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=3 OPTIONS**

**SKIP Q30 IF SD=3**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q31 IF SD=3 OTHERWISE SKIP**

**PIPE IN SF=4 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** what are **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity ($ per Kilowatt DC) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=4 OPTIONS**

**SKIP Q32 IF SD=3**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q33 IF SD=3 OTHERWISE SKIP**

**PIPE IN SF=5 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** what are **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity ($ per Kilowatt DC) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=5 OPTIONS**

**SKIP Q34 IF SD=3**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** would you say that the **Costs per DC Kilowatt** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q35 IF SD=3 OTHERWISE SKIP**

**PIPE IN SF=6 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** what are **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |
| --- | --- |
|  | Total installed cost per capacity ($ per Kilowatt DC) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=6 OPTIONS**

**SKIP Q36 IF SD=3**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** would you say that the **Costs per DC Kilowatt** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected total solar photovoltaic plus energy storage installed cost?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

## Section 4: Total Energy Storage Fixed Cost

**INCLUDE DEFINITION OF WHAT THIS INCLUDES, POSSIBLY CHANGE HEADING TO TOTAL O&M, INCLUDING REPLACEMENT COSTS HERE. ASK THIS BY PROJECT TYPE NOW**

**ASK Q37 IF SD=4 OTHERWISE SKIP**

**PIPE IN SF=1 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** what are **the expected incremental total annual operations and maintenance cost of adding an energy storage system?**

|  |  |
| --- | --- |
|  | Battery Storage only total fixed annual cost by battery capacity ($ per kWh) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=1 OPTIONS**

**SKIP Q38 IF SD=4**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc residential project (≤ 25 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt hour (kWh)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected incremental fixed cost of adding an energy storage system?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q39 IF SD=4 OTHERWISE SKIP**

**PIPE IN SF=2 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** what are **the expected incremental fixed cost of adding an energy storage system?**

|  |  |
| --- | --- |
|  | Battery Storage only fixed cost by capacity ($ per kWh) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=2 OPTIONS**

**SKIP Q40 IF SD=4**

1. The following table includes the project types your firm works on in Massachusetts. For a **≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt hour (kWh)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected incremental fixed cost of adding an energy storage system?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q41 IF SD=4 OTHERWISE SKIP**

**PIPE IN SF=3 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** what are **the expected incremental fixed cost of adding an energy storage system?**

|  |  |
| --- | --- |
|  | Battery Storage only fixed cost by capacity ($ per kWh) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=3 OPTIONS**

**SKIP Q42 IF SD=4**

1. The following table includes the project types your firm works on in Massachusetts. For a **>27.5-275 kWdc projects (>25-250 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt hour (kWh)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected incremental fixed cost of adding an energy storage system?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q43 IF SD=4 OTHERWISE SKIP**

**PIPE IN SF=4 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** what are **the expected incremental fixed cost of adding an energy storage system?**

|  |  |
| --- | --- |
|  | Battery Storage only fixed cost by capacity ($ per kWh) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=4 OPTIONS**

**SKIP Q44 IF SD=4**

1. The following table includes the project types your firm works on in Massachusetts. For a **>275-600 kWdc projects (>250-500 kWac) that you are developing,** would you say that the **Costs per DC Kilowatt hour (kWh)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected incremental fixed cost of adding an energy storage system?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q45 IF SD=4 OTHERWISE SKIP**

**PIPE IN SF=5 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** what are **the expected incremental fixed cost of adding an energy storage system?**

|  |  |
| --- | --- |
|  | Battery Storage only fixed cost by capacity ($ per kWh) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=5 OPTIONS**

**SKIP Q46 IF SD=4**

1. The following table includes the project types your firm works on in Massachusetts. For a **>600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) that you are developing,** would you say that the **Costs per DC Kilowatt hour (kWh)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected incremental fixed cost of adding an energy storage system?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

**ASK Q47 IF SD=4 OTHERWISE SKIP**

**PIPE IN SF=6 OPTIONS**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** what are **the expected incremental fixed cost of adding an energy storage system?**

|  |  |
| --- | --- |
|  | Battery Storage only fixed cost by capacity ($ per kWh) |
| 25% of PV Nameplate (kW), 2-hour duration |  |
| 25% of Nameplate (kW), 4-hour duration |  |
| 25% of Nameplate (kW), 6-hour duration |  |
| 50% of PV Nameplate (kW), 2-hour duration |  |
| 50% of PV Nameplate (kW), 4-hour duration |  |
| 50% of PV Nameplate (kW), 6-hour duration |  |
| 100% of PV Nameplate (kW), 2-hour duration |  |
| 100% of Nameplate (kW), 4-hour duration |  |
| 100% of Nameplate (kW), 6-hour duration |  |

**PIPE IN SF=6 OPTIONS**

**SKIP Q48 IF SD=4**

1. The following table includes the project types your firm works on in Massachusetts. For a **>1.2-6.5 MWdc projects (>1-5 MWac) that you are developing,** would you say that the **Costs per DC Kilowatt hour (kWh)** starting costs that accompany each project type below are accurate, slightly higher (10-20%), somewhat higher (21-50%), or much higher (51% or more) when thinking about **the expected incremental fixed cost of adding an energy storage system?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Lower | Accurate | Slightly higher (20% or less) | Somewhat higher (21-50%) | Much higher (51% or more) | Don't know/ Refused |
| 25% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 25% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 50% of PV Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of PV Nameplate (kW), 2-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 4-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |
| 100% of Nameplate (kW), 6-hour duration (4.50 per kWhdc) | 0 | 1 | 2 | 3 | 4 | 5 |

## Section 5: Solar Photovoltaic Financing Data

**ASK Q73 IF SD=7 OTHERWISE SKIP**

**PIPE IN SE OPTIONS**

1. The following table includes the project sizes your firm works on in Massachusetts. Please enter **the expected financing terms.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Percentage of capital stack that is debt financed (via loan) | Loan term (years) | Interest Rate (% per year) | Don’t know/ Refused |
| ≤ 27.5 kWdc residential project (≤ 25 kWac) |  |  |  |  |
| ≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) |  |  |  |  |
| >27.5-275 kWdc projects (>25-250 kWac) that |  |  |  |  |
| >275-600 kWdc projects (>250-500 kWac) |  |  |  |  |
| >600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) |  |  |  |  |
| >1.2-6.5 MWdc projects (>1-5 MWac) |  |  |  |  |
| Low Income Solar Tariff Generation Units |  |  |  |  |

## Section 6: Solar Photovoltaic Ownership

**ASK IF SE=1**

1. Consider a residential photovoltaic project (≤ 27.5 kWdc residential project (≤ 25 kWac) please enter **the typical financing terms** for each ownership structure**.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Owned by the homeowner and financed through a local community bank | Owned, installed and maintained by a 3rd-party with nationally-based investors and with a lease or power purchase agreement with the homeowner | Don’t know/ Refused |
| Percentage of capital stack that is debt financed (via loan) | \* | \* | \* |
| Loan term (years) | \* | \* | \* |
| Interest Rate (% per year) | \* | \* | \* |
| Don’t know/ Refused | \* | \* | \* |

**ASK IF SE=2 OR 3 OR 4 OR 5 OR 6**

1. Consider a non-residential and/or commercial and industrial scale photovoltaic project, please enter **the expected financing terms** for each ownership structure**.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Non-residential project, owned by a 3rd Party National Based Investor | Non-residential project, Local Investor Owned | Non-residential project, Local Investor owned by a tax-exempt entity | Don’t know/ Refused |
| Debt Fraction/ Permanent Financing (%) | \* | \* | \* | \* |
| Loan term (years) | \* | \* | \* | \* |
| Interest Rate (% per year) | \* | \* | \* | \* |
| Don’t know/ Refused | \* | \* | \* | \* |

## Section 7: Closing Questions

1. Does your company work more often with residential, commercial/industrial, or utility scale photovoltaic projects?
   1. Residential
   2. Commercial/Industrial
   3. Utility
   4. All about equally
   5. Don’t know/refused
2. Including all full-time and part-time employees, how many **permanent** (non-contract or temporary)employees work at your current location? Please include any employees working remotely who report out of this location.

Record # of employees \_\_\_\_\_\_\_\_

**SKIP Q53 IF SE = 1 ONLY**

1. For projects greater than 25kWac, how many solar projects at your organization do you anticipate will be ready to submit an application to the SMART program during the following timeframes? *Please only include projects will be application-ready, meaning they have site control, right to construct, an executed interconnection agreement, and are prepared to submit within the program guidelines.*

|  |  |  |
| --- | --- | --- |
|  | Total number of Projects | Total Capacity (kWdc) |
| Please enter the number of projects and capacity of application-ready projects **in 2025**: |  |  |

|  |  |  |
| --- | --- | --- |
| Please enter the number of projects and capacity of application-ready projects **in 2026**: |  |  |

|  |  |  |
| --- | --- | --- |
| Please enter the number of projects and capacity of application-ready projects **in 2027**: |  |  |

1. In the next two years, how will the early phase out of Inflation Reduction Act tax credits through the One Big Beautiful Bill affect your organization's development of solar projects in Massachusetts?
   1. A significant portion of planned projects (75% to 100% of projects) will likely be cancelled
   2. Most of our planned projects (50% to 74% of projects) will likely be cancelled
   3. Some of our planned projects (25% to 49% of projects) will likely be cancelled
   4. A small amount of our planned projects (less than 25% of projects) will likely be cancelled
   5. We would not be affected or cancel any of our projects
   6. We will have more projects in the next one to two years
   7. Don’t know/ Refused
2. On average, how long does it take your organization to develop solar projects of the following SMART Program size categories, from initial site identification through permission to operate?

**ASK BY PROJECT SIZE AND PROJECT TYPE**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Less than three months | Three to six months | Six months to one year | More than 1 year but less than 3 years | Between 3 to 5 years | Greater than 5 years |
| ≤ 27.5 kWdc small commercial or industrial projects (≤ 25 kWac) | 1 | 2 | 3 | 4 | 5 | 6 |
| >27.5-275 kWdc projects (>25-250 kWac) that | 1 | 2 | 3 | 4 | 5 | 6 |
| >275-600 kWdc projects (>250-500 kWac) | 1 | 2 | 3 | 4 | 5 | 6 |
| >600 kW-1.2 MWdc projects (>500 kW-1.0 MWac) | 1 | 2 | 3 | 4 | 5 | 6 |
| >1.2-6.5 MWdc projects (>1-5 MWac) | 1 | 2 | 3 | 4 | 5 | 6 |

1. What are the most significant factors that impact your project development timelines from initial site identification through permission to operate?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_