

Agriculture Market Evaluation

Advancing Agriculture Energy Technologies (AAET), Agriculture Technical Services, and Greenhouse Lighting and Systems Engineering (GLASE) Consortium

Market Update 1

Appendices to the Final Report

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NYSERDA Record of Revision

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Appendix A: Additional Results

The Market Evaluation Team presented the results to NYSERDA Staff and the GLASE Consortium team on March 8, 2023. This appendix contains the additional findings from the surveys the Market Evaluation Team completed as part of the market evaluation of NYSERDA's Agriculture Initiatives: Agriculture Energy Audit and Greenhouse Lighting and Systems Engineering (GLASE) Consortium.

Agriculture Energy Audit Additional Results

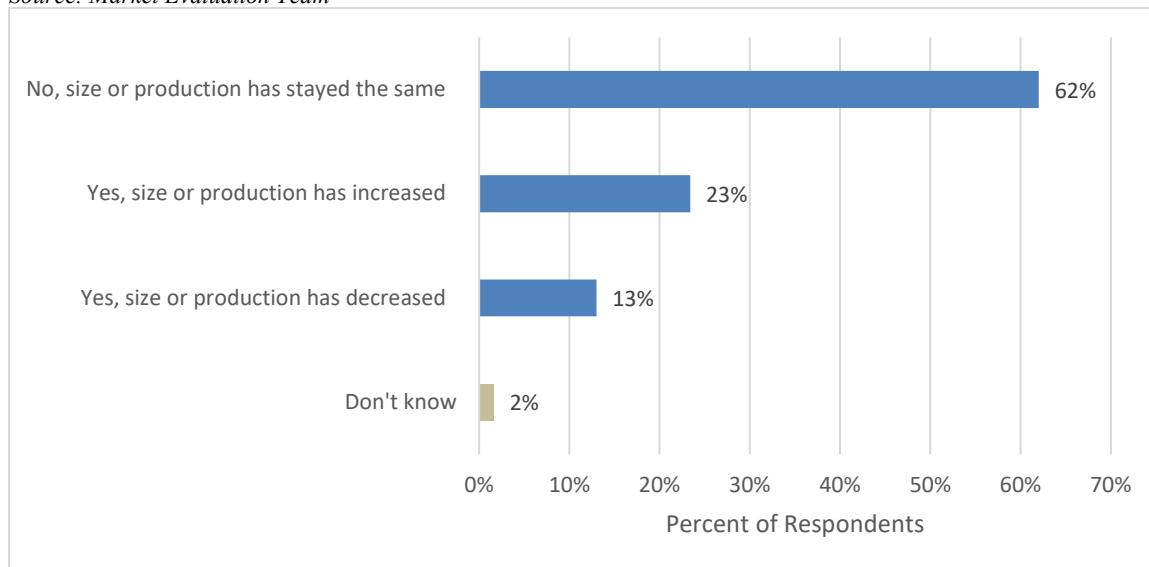
Participant Background

As Figure A-1 shows, nearly two-thirds of respondents reported that their operation's size or production has stayed the same since their audit while 23% of respondents report that size or production has increased, almost double the frequency of respondents reporting that size or production has decreased since their audit.

Figure A-1. Farm Size or Production Change (n=308)¹

Nearly two-thirds of respondents reported no change in the size or production of their operation.

Source: Market Evaluation Team



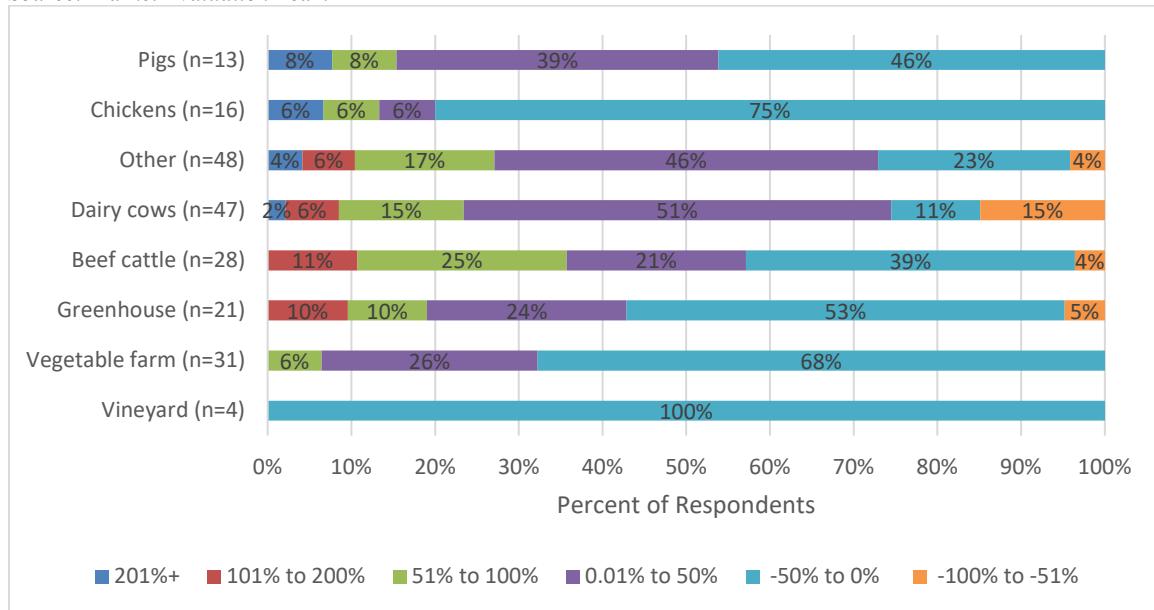
¹ Q5. Have there been any major changes to the size or production of your operation (increased, decreased, or stayed the same) since the last time you had an audit done?

Among survey respondents who experienced changes to their size or production since the audit, most respondents characterized growth in their operation, as Figure A-2, with commodities like beef cattle (11%) and greenhouses (10%) were most likely to report growth of 101% to 200%, twice the frequency of dairy cows (6%) or ‘other’. Operations that reported declines in size or production were most frequently vineyards (100%), chickens (75%), vegetable farms (68%), and greenhouses (58%).

Figure A-2. Percent Change in Agricultural Operation Since Audit²

Operations with pigs, dairy cows, beef cattle, and ‘other’ commodities were most likely to report increases in production size; vineyards, vegetable farms, and greenhouses were most likely to report declines in production.

Source: Market Evaluation Team



The Market Evaluation Team found that 96% of farms or production operations audited were reported to still be in operation.³

² Q6. Please complete the table with information about how your agricultural operation has changed since your last audit.

³ Q7. Is the agricultural facility located at [PIPE IN ADDRESS FROM FEAT] still operational?

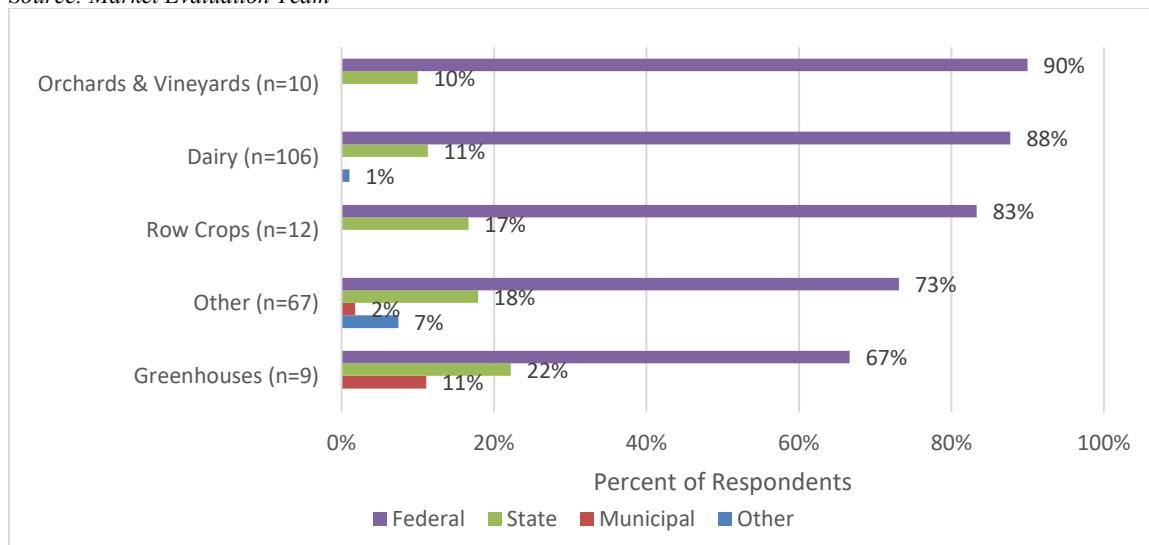
COVID-19 Impacts

As Figure A-3 shows, when asked which types of relief they had applied for, respondents commonly reported applying for Federal relief, with at least two-thirds of each commodity reporting they had. Greenhouses were at least twice as likely as Dairy (11%) or Orchards & Vineyards (10%) respondents to report applying for State relief and were also the most likely to have applied for Municipal COVID relief (11%).

Figure A-3. Type of COVID-19 Relief Applied for by Commodity⁴

Orchards & Vineyards and Dairy operations were most likely to have applied for COVID-19 relief; federal relief was the most applied for type of relief with two-thirds or more of each commodity reporting applying for federal relief.

Source: Market Evaluation Team



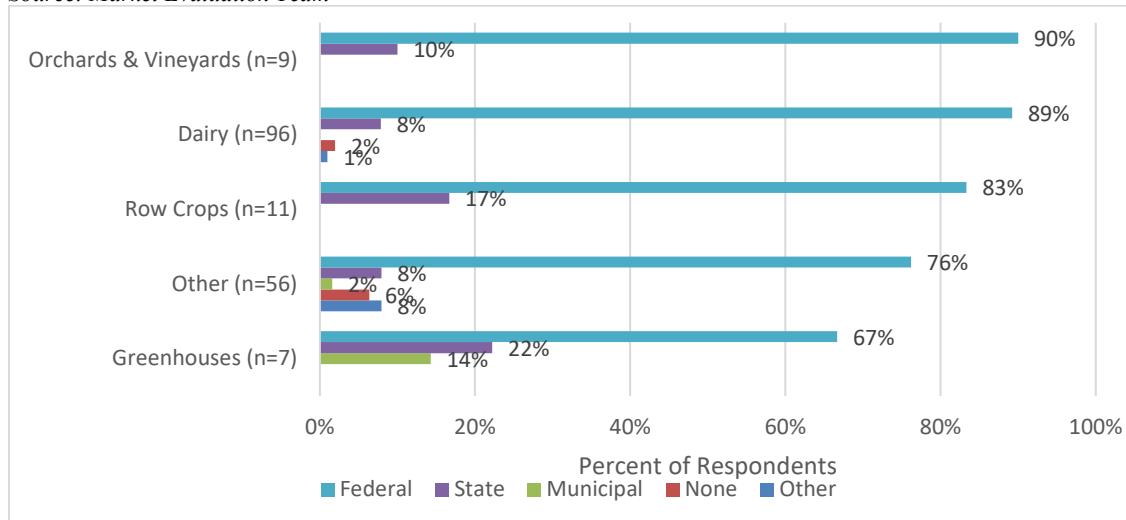
As Figure A-4 shows, when respondents who had received COVID-19 relief funds were asked if they used any of their funds to upgrade technologies in their facilities, most respondents reported that they had not. As shown in Figure A-4, Greenhouse respondents (14%) most frequently reported using relief funds to upgrade technologies, 5 points higher than Row Crops (9%) and more than three times the frequency of Other (4%) or Dairy (4%) respondents.

⁴ Q31. Please indicate the types of COVID-19 relief you applied for. (select all that apply) Q31 by commodity results are statistically significant at the 95% CI with a p-value of .000.

Figure A-4. COVID-19 Relief Received by Commodity

Orchards and vineyards and Dairy operations were most likely to receive COVID-19 relief funds with nearly 90% reporting receiving federal relief; Greenhouses were the least likely to receive federal relief but most likely to receive state and municipal COVID-19 relief.

Source: Market Evaluation Team

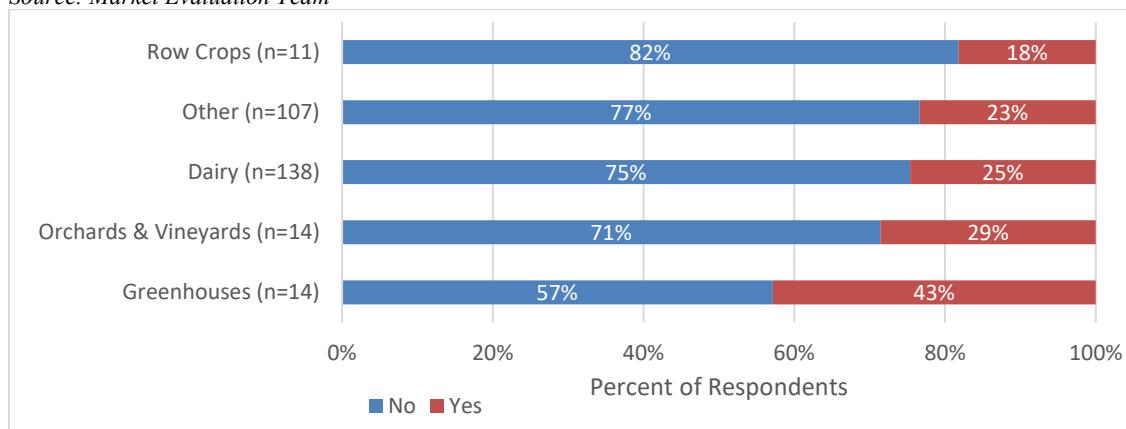


Survey respondents were asked if they had installed any other energy efficient technologies not recommended in the audit. Most respondents (57% to 82% by commodity), as Figure A-5 shows, had not installed energy efficient technologies beyond those recommended in the energy audit. Greenhouse respondents were most likely (43%) to install energy efficient technologies not suggested in the audit, more than double the frequency of Row Crop respondents (18%).

Figure A-5. Installation of Other Energy Efficient Technologies by Commodity⁵

Greenhouses were the most likely to report installing other energy efficient technologies at 43% reporting they had.

Source: Market Evaluation Team



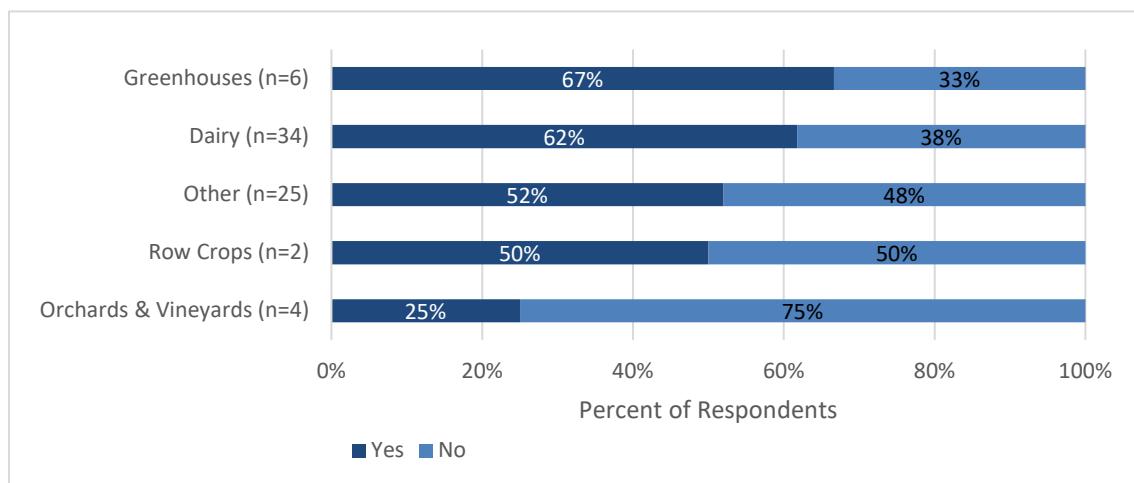
⁵ Q18. Have you installed any other energy efficient technologies in your agriculture facility that were not suggested in the audit?

Of those who had installed other energy efficient technologies, when asked if the Agriculture Energy Audit Program had influenced their decision to do so, Greenhouse (67%) and Dairy (62%) respondents were the most likely to report that they were influenced while Orchards & Vineyards (25%) reported influence at less than half the frequency of Greenhouse and Dairy respondents, as Figure A-6 shows.

Figure A-6. Audit Program Influence to Install Additional Technologies by Commodity⁶

Greenhouses and Dairy respondents were most likely to report Audit program influence on their decision to install additional technologies; at least half the respondents reported Audit program influence, except Orchards & Vineyards.

Source: Market Evaluation Team



GLASE Consortium Additional Results

GLASE Impacts on Business

Interviewed GLASE members were asked about the impacts of GLASE on their business decisions.⁷ Growers reported the development of technology-based relationships, using LED light spectrum for growing strawberries in CEAs/greenhouses, and joining a trial with lighting as the control variable as impacts of GLASE on their business. One grower reported directly factoring GLASE knowledge into their decision-making.

⁶ Q19. Did your participation in NYSERDA's Agriculture Energy Audit Program influence your decision to install the additional technology(ies) that were not suggested in the audit?

⁷ II2. Has your organization made any business decisions (plans for retrofits, controls purchases, etc.) because of your GLASE membership?

When asked about their influence on other CEA facilities or greenhouses in New York State,⁸ three out of five growers reported knowledge of such influence including that they encouraged other greenhouses and vertical farms to produce crops more efficiently and to integrate combined heat and power into their operations. One grower could not comment for legal reasons.

When interviewed, GLASE members were asked about the installation of any energy efficiency technologies or the incorporation of any practices because of their GLASE membership.⁹

Growers were most likely to report that they had installed energy efficient technologies or incorporated practices due to their GLASE membership with four growers reporting ‘yes’ and one reporting ‘no.’ Of those who said yes, two growers incorporated LED lighting, one grower shifted from glycol-cooled light to a heat-sync light, and one grower installed combined heat and power which has saved 2% to 4% of their energy costs.

Relationships Developed

Through their GLASE Consortium membership, growers were most likely to report having developed relationships,¹⁰ with four out of five growers reporting ‘yes.’ Of the relationships forged, growers reported those with other growers or farmers, universities and professors at universities, researchers, lighting manufacturers, and well-funded venture capital companies.

Two growers also reported having forged relationships with suppliers or vendors¹¹ through GLASE. One grower reported developing a relationship with ENSAVE and one grower developed a relationship for product distribution.

Other Impacts on Business

When asked if their GLASE membership impacted their business in other ways, four growers reported ‘yes’ and one reported ‘no.’¹² Growers reported that business impacts have been

⁸ II5. Can you think of any influence your facilities have had on other CEA facilities or greenhouses in the state of NY because of your GLASE membership?

⁹ II3. Has your organization installed any energy efficiency technologies, incorporated any practices, etc. because of your GLASE membership?

¹⁰ II1. Through your GLASE Consortium membership, have you developed any relationships?

¹¹ II4. Did you obtain any of your suppliers or service providers because of your GLASE membership? Please elaborate if possible.

¹² II10. Has your GLASE membership had any other impacts on your business? [IF YES] Would you please explain the impact your GLASE membership has had on your business? Would you say the impacts on your business have been positive, negative, or a combination of the two?

positive, including implementing changes from researchers found through GLASE to address growing challenges and providing insight into the direction of the industry. One grower noted that GLASE prevents decisions from being made in a vacuum and leads to better informed decisions.

Growers also reported GLASE technologies and gap analysis surveys have helped their businesses. GLASE program staff, and Erico Mattos in particular, have assisted members in answering difficult questions.



Appendix B: Agriculture Energy Audit Program Survey Instrument

Agriculture Energy Audit Program Participant Survey

Market Update 1

Prepared for:



Submitted by:

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Boulder, CO 80302

303.728.2500
guidehouse.com

DRAFT: 18 October 2022

Introduction

This document includes Guidehouse's draft survey instrument for the Agriculture Energy Audit Program Participant Survey.

Guidehouse will utilize Qualtrics to administer the online survey. Recruitment of respondents will occur through three emails and two phone calls. For those that do not take the survey online, Guidehouse plans to call the participants so that they can take the survey over the phone. The survey will be tested in advance of full deployment and may be modified after deployment to enhance the number of completed interviews. Compiled survey results will be presented to NYSERDA and summarized in the final report. Table B-1 identifies the survey characteristics while Table B-2 outlines the survey research objectives.

Table B-1. Survey Characteristics

The Market Evaluation Team contacted all 908 Ag Audit participants between 2017 and 2020, aiming for a census of the group, to understand Ag Audit program participation, to estimate direct and indirect impacts, to learn about the participant experiences and process improvements and interest in installing on-site renewables, and to understand COVID-19 impacts on participants.

| Characteristics | Description |
|----------------------------|---|
| Statement of purpose | To understand participation in the program, to estimate direct and indirect impacts, to learn about the participant journey through the program and how processes can improve, to learn about interest in installing on-site renewables, and to gain knowledge about the impacts of COVID-19 on participants. |
| Qualified respondent | A grower or farmer that has participated in NYSERDA's Agriculture Energy Audit Program in 2017, 2018, 2019, or 2020. |
| Sample Size | Ideally, a census; all participants from previous audits conducted in the years 2017, 2018, and 2019, and 2020 will be contacted |
| Target number of completes | Population size is: 85 audit participants from 2020 151 audit participants from 2019 288 audit participants from 2018 384 audit participants from 2017 |
| Estimated survey length | 30 minutes |
| Survey timeline | Q4 2022 |
| Question categories | Introduction: Q1-Q2b; Participant Background: Q3-Q7; Program, Process, and Communication: Q8-Q14a; Impacts: Q15-Q23a; Renewables: Q24-Q27; COVID-19 Impacts: Q28-Q34; Account Information Check: Q35-Q40 |

Table B-2. Survey Research Objectives

Survey research objectives aimed to understand direct and indirect impacts of the Ag Energy Audit program, process and program experiences and improvements, and COVID-19 impacts as well as to understand differences between disadvantaged community regions and non-disadvantaged community regions.

| Evaluation Questions | Survey Questions |
|--|----------------------|
| Direct Impacts | |
| What is the measure adoption rate WITH EnSave administrative assistance (i.e., within the first year after the audit) of Agriculture Energy Audit Program? | Q15, Q17 |
| What are the estimated direct impacts of technologies installed WITH EnSave assistance from Agriculture Energy Audit Program? | Q15, Q17 |
| Indirect Impacts | |
| What is the measure adoption rate WITHOUT EnSave administrative assistance (i.e., after the end of the first year after the audit) of Agriculture Energy Audit Program? | Q18-23b |
| What are the estimated indirect impacts (i.e., WITHOUT EnSave assistance) from Agriculture Energy Audit Program? | Q18-23b |
| Program, Processes, and Improvements | |
| Are there any process improvements for Agriculture Energy Audit Program? | Q8-14a |
| What was the impact of COVID-19 on participants/members related to the initiatives? | Q28-34 |
| Are Ag Tech Services – Audit participants aware of and interested in solar siting opportunities? | Q24-27 |
| Are there any differences in measure adoption or attitudinal responses from farms in disadvantaged communities and non-disadvantaged communities (if data available to compare)? | Q1-Q40, NYSERDA data |

Draft of E-mail Language – Online Survey (Initial E-mail)

From: Jeremy Simpson <noreply@qemailserver.com>

Sent: Tuesday, February 8, 2022 11:46 AM

To: John Doe <john.doe@gmail.com>

Subject: Complete a short survey about your participation in NYSERDA's Agriculture Energy Audit Program

Reply to: NYSERDAsurvey@guidehouse.com



Dear [Contact Name],

The New York State Energy Research and Development Authority (NYSERDA) is conducting research to understand the awareness and use of different energy technologies and resources in New York State's agriculture sector. As part of this research, we are conducting a short survey with farmers and agricultural producers that participated in NYSERDA's Agriculture Energy Audit Program.

According to our records, you or your organization participated in this Audit Program in the last 5 years, and I am writing to ask for your participation in this important survey. This survey will help NYSERDA to better understand the types of technologies used by agriculture producers like you, and to improve its programs and resources that support the agricultural industry in New York State.

This survey should take less than 30 minutes to complete, and you will receive a \$25 electronic gift card as a thank you for your time if you complete the survey.

You can complete the survey by following these instructions:

Option 1. Complete the survey online at: **www.tinyurl/farmsurvey**
To begin the survey, enter your Access Code / PIN.
Your Access Code / PIN is: <<CODE>>

Option 2. Call APPRISE toll-free at 1-888-434-8008 to complete the survey by telephone.
You may call APPRISE any time between 8:30 a.m. to 5 p.m. EST Monday-Friday.

NYSERDA has partnered with Guidehouse, Inc. and APPRISE to conduct this survey. The information you provide will be kept confidential to the extent permitted by law including but not limited to the Freedom of Information Act (FOIA). The analysis will only use summary level data and will not identify individual respondents.

Thank you for your time and participation with this important research effort. If you have questions while taking the survey, contact NYSERDAsurvey@guidehouse.com. If you have any questions about the purpose of the study, please contact me.

Sincerely,

Jeremy Simpson

NYSERDA

jeremy.simpson@nyserda.ny.gov

518-862-1090 extension 3234

Follow this link to the Survey

[Survey Link]

Follow the link to opt out of future emails:

[Opt out / click here to unsubscribe]

This electronic message may contain privileged or confidential information. If you are not the intended recipient of this e-mail, please delete it from your system and advise the sender.

Draft of E-mail Language – Online Survey (Reminder E-mail)

From: Jeremy Simpson <noreply@qemailserver.com>

Sent: Tuesday, February 8, 2022 11:46 AM

To: John Doe <john.doe@gmail.com>

Subject: Reminder: Complete a short survey about your participation in NYSERDA's Agriculture Energy Audit Program

Reply to: NYSERDAsurvey@guidehouse.com



Dear [Contact Name],

A few days ago, we reached out to you about how the New York State Energy Research and Development Authority (NYSERDA) is partnering with Guidehouse, Inc. to understand the awareness and use of different energy technologies and resources in New York State's agriculture sector. As part of this research, we are conducting a short survey with farmers and agricultural producers that participated in NYSERDA's Agriculture Energy Audit Program.

According to our records, you or your organization participated in this Audit Program in the last 5 years, and I am writing to ask for your participation in this important survey. This survey will help NYSERDA to better understand the types of technologies used by agriculture producers like you, and to improve its programs and resources that support the agricultural industry in New York State.

This survey should take less than 30 minutes to complete, and you will receive a \$25 electronic gift card as a thank you for your time if you complete the survey.

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Sincerely,

Jeremy Simpson
NYSERDA
jeremy.simpson@nyserda.ny.gov
518-862-1090 extension 3234

Follow this link to the Survey

[Survey Link]

Follow the link to opt out of future emails:

[Opt out / click here to unsubscribe]

This electronic message may contain privileged or confidential information. If you are not the intended recipient of this e-mail, please delete it from your system and advise the sender.

Survey

Thank you for taking time to complete this survey. We appreciate you!

This survey is being conducted on behalf of the New York State Energy Research and Development Authority (NYSERDA). Your input and information will help NYSERDA to better understand the types of energy efficient technologies and resources used in New York State's agricultural sector, and to improve its programs and resources that support the agricultural industry in New York State. As part of this research, NYSERDA is reaching out to past participants of their Agriculture Energy Audit Program. You may also know this NYSERDA program by the names of FlexTech and FlexTech Ag Services.

The survey should take you less than 30 minutes to complete. You can go back to previous responses at any point during the survey by clicking the back arrow on the bottom left of the screen. You can return to the survey at a later time by going back to the survey URL. All responses will be kept confidential to the extent permitted by law and reported in aggregate without individual respondents or firms identifiable. You will also be asked to provide electricity and gas utility information requested by NYSERDA as part of your participation. By agreeing to take this survey, you are also agreeing that these data will be shared with NYSERDA for use.

If you have questions while you are taking the survey, please e-mail
NYSERDAsurvey@guidehouse.com.

If you agree to participate, please enter your Access Code / PIN:

Introduction

Q1. According to our records, you or your organization participated in the NYSERDA Agriculture Energy Audit Program in **[PIPE IN YEAR FROM DATE FROM IN FEAT]** for your facility located at **[PIPE IN ADDRESS FROM FEAT]**. Is that correct?

- Yes (1)
- No (2) **[SKIP TO TERMINATE 1]**

Q2. Are you the person at your organization that was most involved in the NYSERDA Agriculture Energy Audit Program and with the technologies in the facility that consume energy (e.g., lights, heating systems, or cooling systems)?

- Yes (1) **[SKIP TO Q3]**
- No (2)

Display This Question:

If Q2 = No

Q2a. In the previous question, you indicated that you are not familiar with the technologies in the facility that consume energy and/or that you are not the person at your organization that was most involved in this NYSERDA program. Can you provide the contact information for the person at your organization that was most involved in NYSERDA's Agriculture Energy Audit Program and is familiar with the technologies in that facility that consume energy?

- Yes (1)
- No (2) **[SKIP TO TERMINATE 2]**

Display This Question:

If Q2a = Yes

[OPEN ENDED RESPONSE with three boxes, one for "Name" that only allows text, one for "Phone Number" that only allows numbers and validate using appropriate phone number length, and one for "Email"]

SKIP TO TERMINATE 2 after completion of Q2b

Q2b. Please provide the name, phone number, and e-mail address, if possible, of the contact person that you indicated in the question above.

Name: _____ **[FILL IN, data validation with letters only]**
Phone Number: _____ **[10-digit number FILL IN, data validation with numbers only and a need for 10 numbers]**
Email: _____ **[FILL IN]**

Thank and SKIP TO TERMINATE 2

Participant Background

The next set of questions is going to ask you for some background on your agricultural business.

Q3. Which of the following does your agricultural operation located at [PIPE IN ADDRESS FROM FEAT] have? (Select all that apply.)

- Dairy cows (1)
- Beef cattle (2)
- Chickens (3)
- Pigs (4)
- Vineyard (5)
- Greenhouse (6)
- Vegetable farm (not a greenhouse) (7)
- Other [Please describe] [FILL IN] (97)
- None [MUTUALLY EXCLUSIVE; SKIP TO TERMINATE 3] (8)

Display This Question:

If Q3 = 1-7, 97 [CARRY ANSWERS FORWARD, include fill box for text]

Q4. In the previous question, you selected what your agriculture operation has. Please, quantify each selection you made with the number of animals (cows, beef, chickens, and/or pigs) or acres of land (vineyard, greenhouse, and/or vegetable farm):

Table 1. Agricultural Operation Commodity

Survey respondents were asked about commodities produced on their farm operation including animals, vegetables, and other.

| Agricultural Operation | Amount |
|--|--------|
| Dairy cows (count) | |
| Beef cattle (count) | |
| Chickens (count) | |
| Pigs (count) | |
| Vineyard (acres) | |
| Greenhouse (acres) | |
| Vegetable farm (<i>not a greenhouse</i>) (acres) | |
| Other (count/acres) [FILL IN] | |

Q5. Have there been any major changes to the size or production of your operation (increased, decreased, or stayed the same) since the last time you had an audit done?

- Yes, size or production has increased (1)
- Yes, size or production has decreased (2)
- No, size or production has stayed the same (3) [SKIP TO Q7]
- Don't know (98) [SKIP TO Q7]

Display This Question:

If Q5 = 1 or 2, else skip to Q7

SHOW OPTIONS SELECTED/WITH ANSWERS IN Q4 ONLY

Q6. Please complete the table with information about how your agricultural operation has changed since your last audit.

Table 2. Change in Agricultural Operation Since Audit

Survey respondents were asked to quantify changes to the size of their identified commodities by percent.

| Agricultural Operation | How much has the amount changed since your last audit (by percentage) Please add negative sign for any decreases? | What year did the change occur? [Allow for 4-digit answers] |
|--|---|---|
| Dairy cows (count) | [WHOLE NUMBER NUMERICAL ANSWER] % | |
| Beef cattle (count) | [WHOLE NUMBER NUMERICAL ANSWER] % | |
| Chickens (count) | [WHOLE NUMBER NUMERICAL ANSWER] % | |
| Pigs (count) | [WHOLE NUMBER NUMERICAL ANSWER] % | |
| Vineyard (acres) | [WHOLE NUMBER NUMERICAL ANSWER] % | |
| Greenhouse (acres) | [WHOLE NUMBER NUMERICAL ANSWER] % | |
| Vegetable farm (<i>not a greenhouse</i>) (acres) | [WHOLE NUMBER NUMERICAL ANSWER] % | |
| Other (count/acres) [FILL IN] | [WHOLE NUMBER NUMERICAL ANSWER] % | |

Q7. Is the agricultural facility located at [PIPE IN ADDRESS FROM FEAT] still operational?

- Yes (1)
- No, it is no longer operational (2) [SKIP TO TERMINATE 3]

○

Program, Process, and Communications

The next set of questions is going to ask you about the program, its process, and communications.

Q8. On a scale from **1 to 5** with '**1**' being **Very Dissatisfied** and '**5**' being **Very Satisfied**, please indicate your level of satisfaction with the following NYSERDA Agriculture Energy Audit Program elements:

Table 3. Program Aspect Satisfaction

Program aspect satisfaction reported on a scale from 1 – Very dissatisfied to 5- Very satisfied for elements including auditor performance, energy savings from installed recommended measures, and sufficiency of program issue resolution.

| NYSERDA Program Element | 1 Very Dissatisfied | 2 Somewhat Dissatisfied | 3 Neither Satisfied nor Dissatisfied | 4 Somewhat Satisfied | 5 Very Satisfied | 97 Not Applicable | 99 Prefer Not to Answer |
|--|------------------------|----------------------------|---|-------------------------|---------------------|----------------------|----------------------------|
| Ease of application process | | | | | | | |
| Quality of auditor's performance | | | | | | | |
| Energy savings from measures installed as a direct result of the audit (if applicable) | | | | | | | |
| Adequacy of the communication from program staff | | | | | | | |
| Comprehensiveness of program staff's knowledge about the program offering and options | | | | | | | |
| Sufficiency of the resolution of program issues | | | | | | | |
| Overall satisfaction with the program | | | | | | | |

Display This Question:

If Q8 = 1 OR 2 FOR ANY ITEMS

If Q8 = 3 – 5, 97, OR 99 then skip to Q10

Q9. Please, further explain or share your experience that has led to any dissatisfaction (indicated by a '1' or a '2') noted in the previous question. **[OPEN ENDED RESPONSE]**

Q10. Would you recommend the NYSERDA Agriculture Energy Audit Program to a facility owner or farmer?

- Yes (1)
- No (2)

Q11. Have you recommended the NYSERDA Agriculture Energy Audit Program to a facility owner or farmer?

- Yes (1)
- No (2)

Display This Question:

If **Q10=2**

Q11a. Why would you not recommend the NYSERDA Agriculture Energy Audit Program to a colleague? **[OPEN ENDED RESPONSE]**

Q12. What action(s) could NYSERDA take to improve the program or its processes? **[OPEN ENDED RESPONSE]**

Q13. Please indicate the top three ways that you think NYSERDA should share and communicate information about the Agricultural Audits program with agricultural producers and farmers. **[ALLOW A MAXIMUM SELECTION OF THREE]**

- General Program Emails (1)
- Mailers and Paper Brochures (2)
- NYSERDA Website announcements (3)
- Agricultural Trade Shows (4)
- Calls with or visits from energy auditors (5)
- Calls with NYSERDA program staff (6)
- Other (97) **[OPEN TEXT RESPONSE]**

Q14. Which of the financial resources below are you aware of for installing energy efficient technologies in the agriculture sector? *Select all that apply.*

- Federal incentives and assistance programs, such as the USDA Environmental Quality Incentives Program or USDA Rural Energy for America Program (1)
- State incentives and assistance programs (2)
- Utility programs, such as energy efficiency programs offered by National Grid, New York State Electric and Gas, Rochester Gas & Electric, Central Hudson Gas & Electric, or Con Edison (3)
- Other **[FILL IN] (97)**
- Not aware of any (4)

Q14a. Other than the NYSERDA Agriculture Energy Audit Program, have you ever participated in an energy efficiency program for an agriculture-related project?

- Yes [FILL IN] (1)
- No (2)
- I don't know (98)

Impacts

The next set of questions is going to ask you about which energy efficient technologies you have implemented since receiving the NYSERDA energy audit.

Q15. Our records indicate that the following technologies were recommended to you as part of NYSERDA's Agriculture Energy Audit Program. For each technology, please confirm if you have or have not installed that technology in your facility. If you ultimately uninstalled a technology, please indicate "installed" for the purposes of this question. **[PROGRAMMER: FILL IN TECHNOLOGY LIST BASED ON PIN NUMBER FOR TECHNOLOGIES INSTALLED ACCORDING TO FEAT].**

Table 4. Audit-Recommended Energy Efficient Technology Installation

Survey respondents reported installation status – installed, did not install, don't know - of Audit-recommended measures.

| Technology | Did you Install in Facility? Currently <i>Installed</i> <i>(1)</i> |
|---------------------|---|
| | <i>Did not install (2)</i> |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |
| [Fill in from FEAT] | [Installed/Did Not Install/I don't Know] |

Q15a. You previously confirmed installation of the below technologies. For each technology that you **installed** include the time of installation, notice of change in energy use after installation, and time of uninstallation, if applicable. **[PROGRAMMER: FILL IN TECHNOLOGY LIST BASED ON PIN NUMBER FOR TECHNOLOGIES INSTALLED ACCORDING TO FEAT].**

Table 5. Characteristics of Audit-Recommended Energy Efficient Technologies

Survey respondents reported year and season of installation, observed change in energy use, and year and season of uninstallation of the measure, if applicable.

| Technology | Year of installation? | Season of installation? | Noticed a change in energy use? | Year of uninstallation? | Season of uninstallation? |
|---------------------|---|---|---------------------------------|---|---|
| | [DROP DOWN for individual Year, "2017"- "2022"] | [DROP DOWN FOR Season, "Winter", "Spring", "Summer", or "Autumn"] | | [DROP DOWN for individual Year, "2017"- "2022"] | [DROP DOWN FOR Season, "Winter", "Spring", "Summer", or "Autumn"] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 1. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 2. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 3. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 4. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 5. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 6. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 7. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 8. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |
| [Fill in from FEAT] | [DATE FILL BOX, YYYY] | [DROP DOWN] | 9. <input type="checkbox"/> | [DATE FILL BOX, YYYY] | [DROP DOWN] |

Display This Question:

If Q15 = 1 for ANY technologies, carry forward technologies with 1 or 3 selected to Q16 table

If Q15 = 2 or 98 for ALL technologies, SKIP to Q18

Q16. Please identify what type of incentives you received (e.g., federal, state, or utility incentives) to implement measures at this site. Incentives refer to cash rebates, tax credits, or bill credits. (For each technology, select all that apply)

Incentives refer to cash rebates, tax credits, or bill credits.

Table 6. Incentives Received for Measure Implementation

Respondents reported the source of incentives – federal, state, or utility – used for measure implementation.

Display This Question:

If Q15 = 2 or 98 for ALL technologies, SKIP to Q18

Q17. For the following technologies, you indicated you noticed a change in energy use after installation. For each technology, indicate an increase and/or decrease in energy use and whether that energy change is seasonal. (Check all that apply) **[CARRY FORWARD ANSWERS FROM Q15]**

Energy use refers to the amount of energy (e.g., kWh or therms) used at your facility. Changes in energy use may be noticed on your utility bill. [PROGRAMMER: DROPDOWN BOX FOR INSTALLED IN FACILITY OPTIONS]

Table 7. Observed Changes in Energy Use Resulting from Installed Technologies

Respondents reported observed increase or decrease in energy use for each measure and the seasonality of that change.

| Technology | Increase in energy use | Decrease in energy use | Energy savings is seasonal. Check if Yes. |
|---------------------|------------------------|------------------------|---|
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |

Q18. Have you installed any other energy efficient technologies in your agriculture facility that were not suggested in the audit?

- Yes (1)
- No (2)

Display Questions 18a-20:

If Q18 = Yes (1)

If Q18 = No (2), then skip to Q21

Q18a. Please describe the energy efficient technologies you installed that were not suggested in the audit, including the month and season of installation. **[OPEN ENDED RESPONSES in tables with and MM/YYYY for each technology])**

Table 8. Installed Energy Technologies Not Suggested in Audit

Technologies installed that were not suggested in the audit and the year and season of installation.

| Technology | Year of installation <i>[DROP DOWN for individual Year, "2017"- "2022"]</i> | Season of installation <i>[DROP DOWN FOR Season, "Winter", "Spring", "Summer", or "Autumn"]</i> |
|-----------------------|--|--|
| [Open Ended Response] | DROP DOWN [YYYY] | DROP DOWN |
| [Open Ended Response] | DROP DOWN [YYYY] | DROP DOWN |
| [Open Ended Response] | DROP DOWN [YYYY] | DROP DOWN |
| [Open Ended Response] | DROP DOWN [YYYY] | DROP DOWN |
| [Open Ended Response] | DROP DOWN [YYYY] | DROP DOWN |
| [Open Ended Response] | DROP DOWN [YYYY] | DROP DOWN |

Q19. Did your participation in NYSERDA's Agriculture Energy Audit Program influence your decision to install the additional technology(ies) that were not suggested in the audit?

- Yes (1)
- No (2)

Q20. Have you noticed a change in your energy consumption after installing these technologies?

- Yes (1)
- No (2)
- I don't know (98)

Display Questions Q20a and Q20b:

If Q20 = Yes (1)

If Q20 = No (2) or I don't know (98), then skip to Q21

Q20a. You indicated you noticed a change in energy consumption after additional technology installation. Please indicate the type of change that you noticed.

- Increase (1)
- Decrease (2)
- Both (3)

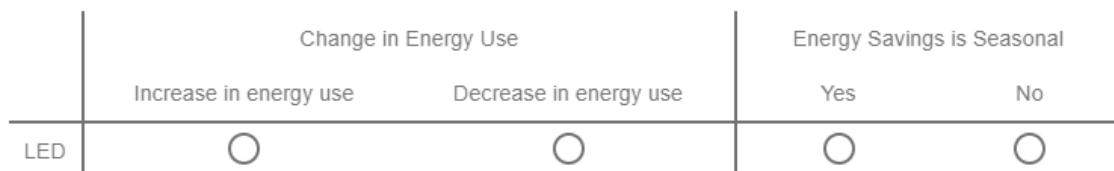
Q20b. Do you notice seasonal energy cost changes that resulted from additional technology installation?

- Yes (1)
- No (2)
- I don't know (98)

Screenshot for Q20, 20a, 20b:

Figure 1. Change in Energy Use and Seasonality of Energy Change

Survey-displayed question on change in energy use and seasonality of the change due to installing technologies not recommended in the audit.



Q21. Has your farm experienced any changes in **operations or production** that increased or decreased your energy use? These changes could be long- or short-term and could include the number of animals, buildings added or expanded, retrofits, equipment decommissioning, etc.

- Yes (1)
- No (2)

- I don't know (98)

Display This Question:

If Q21 = Yes (1)

If Q21 = No (2) or I don't know (98), then skip to Q22

Q21a. Please share more about the **operations or production changes** since the installation of the previous technologies. What has changed? When did these changes occur? **[OPEN ENDED RESPONSE]**

Q22. Have you noticed any **operations or production impacts** since installing these technologies not relating to energy use? These impacts could include more milk per cow, more produce per square foot, reduced maintenance, etc.

- Yes (1)
- No (2)
- I don't know (98)

Display This Question:

If Q22 = Yes (1)

If Q22 = No (2) or I don't know (98), then skip to Q23

Q22a. You indicated noticing **operations or production impacts** outside of energy use. Please share with us what non-energy impacts have you noticed.

[OPEN ENDED RESPONSE]

Q23. Did you share or discuss any of your audit recommendations with other farmers or agricultural producers at other facilities in New York State?

- Yes (1)
- No (2)
- I don't know (98)

Display This Question:

If Q23 = Yes (1)

If Q23 = No (2) or I don't know (98), then skip to Q24

Q23a. To your knowledge, were any energy efficient measures installed by another farmer or agricultural producers at other facilities as a result of sharing that information? These energy efficiency measures could include retrofits, new heating or cooling measures, etc.

- Yes (1)
- No (2)
- I don't know (98)

Renewables

NYSERDA would like to learn more about renewable projects at agriculture facilities and how NYSERDA can help.

Q24. Have you been approached by commercial wind or solar developers about potential opportunities on your agricultural properties or facilities at this facility site?

- Yes (1)
- No (2)

Q25. Did you install any wind or solar technology at your facility in New York State?

- Yes (1)
- No (2) **[IF NO, SKIP TO QUESTION 26]**

Display This Question:

If Q25 = Yes

If Q25 = No then skip to Q26

Q25a. , did you add wind, solar, or both?

- Wind (1)
- Solar (2)
- Both wind and solar (3)

Q25b. , how much energy capacity (in kW) did you add?

- Wind: _____ kW [DISPLAY ONLY IF Q25a = 1 or 3; WHOLE NUMBER NUMERICAL ONLY]
- Solar: _____ kW [DISPLAY ONLY IF Q25a = 2 or 3; WHOLE NUMBER NUMERICAL ONLY]
- Don't know (98)

Q25c. Why did you choose to install wind, solar, or both wind and solar? **[OPEN ENDED RESPONSE]**

Display This Question:

If Q24 = Yes (1) AND Q25 = No (2)

Q26. You indicated in the previous question that you were contacted by a wind or solar developer, but you did not add any wind or solar technology to your facility in New York State. Would you please tell us any barriers that are preventing you from adopting wind or solar technology? **[OPEN ENDED RESPONSE]**

Q27. Are you interested in speaking with someone about on-site wind or solar to see if they could be a good fit for your site in New York State?

- Yes (1)
- No (2)

COVID-19 Impacts

Q28. Have the COVID-19-related shutdowns and policies affected your agricultural or business operations in New York State?

- Yes (1)
- No (2)

Display This Question

If Q28 = Yes (1), then display Q29

If Q28 = No (2), then skip to Q30

Q29. Please indicate the aspect of your business impacted by COVID-19.

Table 9. Business Aspects Impacted by COVID-19

Respondents reported the impact of COVID-19 on business aspects from ability to invest in energy efficiency on their farm to financial standing and demand of products on a scale from 1 – Very negatively to 5 – Very positively.

| Business Aspect | 1 Very Negatively | 2 Negatively | 3 Neither Impacted Negatively or Positively | 4 Positively | 5 Very Positively | Not Applicable | 99 Prefer Not to Answer |
|--|-------------------------|-----------------|---|-----------------|-------------------------|-------------------|-------------------------------|
| Ability to invest in energy efficiency on the farm | | | | | | | |
| Financial standing | | | | | | | |
| Ability to maintain all employees | | | | | | | |
| Demand of product | | | | | | | |
| Supply of materials to operate | | | | | | | |
| Other Business Aspect: [FILL IN] | | | | | | | |

Q30. Did you apply for any COVID-19 relief (Municipal, State, or Federal) for your agricultural operation or business?

- Yes (1)
- No (2) **[IF NO, SKIP TO ACCOUNT INFORMATION CHECK]**

Display This Question:

If Q30 = Yes, then display Q31

If Q30 = No, then skip to Q35

Q31. Please indicate the types of COVID-19 relief you applied for. (select all that apply)

- Federal (1)
- State (2)
- Municipal (3)
- Other (please specify) **[FILL IN] (97)**

Display This Question:

If Q31 = Yes, then display Q32

If Q31 = No, then skip to Q35

Q32. Please indicate the types of relief you received. (Select all that apply) **[CARRY ANSWERS FORWARD FROM Q16]**

- Federal (1)
- State (2)
- Municipal (3)
- Other (please specify) **[FILL IN] (97)**
- None (4)

Display This Question

If Q32 = Yes to ANY answer, then display Q33

If Q32 = None (5), then skip to Q35

Q33. In the previous question, you indicated receiving COVID-19 relief funds. Did you use any of the COVID-19 relief money to update any of the technologies to be more energy efficient in your facility in New York State?

- Yes (1)
- No (2) **[IF NO, SKIP TO ACCOUNT INFORMATION CHECK]**

Display This Question:

If Q15 = 1 or 3 for ANY technologies AND Q33 = Yes (1), then display Q34

[CARRY ANSWERS/TECHNOLOGIES FORWARD FROM Q15]

If QQ33 = No (2), SKIP to Q35 15 = 2 or 98 for ALL technologies, SKIP to Q18

Q34. Earlier in the survey, you indicated updating some of your technologies. Please indicate any technology that was replaced or updated a result of receiving COVID-19 relief funds. **[CARRY FORWARD ANSWERS FROM Q15 LIST]**

Table 10. Technologies Replaced or Updated using COVID-19 Relief Funds

Technologies replaced or upgraded and year and season they were replaced or upgraded using COVID-19 relief funds.

| Technology | Replaced/Upgrade/NA [DROP DOWN] | Year Replaced/Upgraded | Season Replaced/Upgraded |
|---------------------|------------------------------------|---------------------------|-----------------------------|
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |
| [Fill in from FEAT] | | | |

Account Information Check

One of our goals for this program is to estimate savings associated with the NYSERDA Agriculture Energy Audit Program. Given this goal, we would like to request some information regarding your utility accounts.

NYSERDA requests permission to access historic utility data for the accounts associated with the address provided. By selecting "I consent" below, I authorize the New York State Energy Research and Development Authority (NYSERDA), and its designated representatives, to access energy billing and consumption data for the site identified. As an authorized representative of the site, I authorize NYSERDA, and its designated representatives, to access and use any available energy consumption information and data. I understand this information will be used to evaluate energy use patterns for the purpose of measuring energy performance and determining the potential and actual energy savings resulting from evaluated or implemented energy projects. I understand that NYSERDA is subject to the NYS Freedom of Information Law, Public Officers law, Article 6, and that NYSERDA cannot guarantee confidentiality of any information submitted.

As a thank you for sharing your historic utility data, NYSERDA will add \$10 to your gift card in addition to the \$25 for completing the survey.

Q35. Do you consent to sharing your historic utility data?

- Yes, I consent (1)
- No, I do not consent (2)

Display This Question:

If Q35 = 2, then display Q36

If Q35 = 1, then skip to Q37

Q36. Those are all the questions we have. Thank you for your help!

Would you like to receive the \$25 e-gift card or online debit card, or credit to donate to a charitable organization, at [\\${e://Field>Email}](#) or at another email address? You will receive the gift card in your email within a week.

- Yes, please send the gift card to [\\${e://Field>Email}](#) (1)
- Please send the credit for the e-gift card, online debit card or charitable donation to another email address (please specify): (2)

[open response text option] @ [open text response]

- No thanks, I do not wish to either receive the gift card to use or to send a charitable donation (3)

Display This Question:

If Q35 = 1, then display Q37

If Q35 = 2, then skip to CLOSE

Q37. What kind of fuel do you have at your facility? Select all that apply.

- Electricity (1)
- Natural gas (2)
- Other fuel, please specify: **[OPEN TEXT RESPONSE]** (3)

Display This Question:

If Q37 = 1, then display Q38, if else SKIP to Q39

Q38. Please list the name of your electric utility along with your account numbers.

Electric Utility

- Electric Utility Company Name: _____ **[FILL IN, data validation with letters only]**
Electric Utility Account Number: _____ **[FILL IN, data validation with numbers only]**
If NYSEG or RG&E – POD #: _____ **[FILL IN, data validation with numbers only]**

- I don't have this information on hand right now. Please email me so I can send it to you:
_____ @ _____

Display This Question:

If Q37 = 2, if else SKIP to Q40

Q39. Please list the name of your natural gas, or other space and process fuel supplier, utility along with your account numbers.

Natural Gas Utility

- Natural Gas Utility Company Name: _____ [FILL IN, data validation with letters only]
Natural Gas Utility Account Number: _____ [FILL IN, data validation with numbers only]
If NYSEG or RG&E – POD #: _____ [FILL IN, data validation with numbers only]
- I don't have this information on hand right now. Please email me so I can send it to you:
_____ @ _____

Display This Question:

If Q37 = 3, if else SKIP to Q42

Q40. Primary Space and Process Fuel Supplier: If you heat by a fuel other than natural gas or electricity, provide the following:

- Company Name: _____ [FILL IN, data validation with letters only]
Account Number: _____ [FILL IN, data validation with numbers only]
- I don't have this information on hand right now. Please email me so I can send it to you:
_____ @ _____

Display This Question:

If Q35 = 2

Q41. You have declined to share your historic utility data with NYSERDA but for completing the survey, we would like to give you a \$25 e-gift card.

Would you like to receive the \$25 e-gift card at \${e://Field/Email} or at another email address? You will receive the gift card in your email within a week.

- Yes, please send the gift card to \${e://Field/Email} (1)
- Please send the credit for the e-gift card to another email address (please specify): (2)
[open response text option] @ [open text response]
- No thanks, I do not wish to either receive the gift card to use or to send a charitable donation (3)

Display CLOSE

Q42. Those are all the questions we have. Thank you for your help!

Would you like to receive the \$35 (\$25 for the survey with an additional \$10 for sharing your historic utility data) at \${e://Field>Email} or at another email address? You will receive the gift card in your email within a week of receiving the requested historic utility data.

- Yes, please send the gift card to \${e://Field>Email} (1)
- Please send the credit for the e-gift card, online debit card or charitable donation to another email address (please specify): (2) **[open response text option]** @ **[open text response]**
- No thanks, I do not wish to either receive the gift card to use or to send a charitable donation (3)

Display CLOSE**Terminations/Close**

TERMINATE 1: We appreciate your interest in taking the survey, however we are currently only reaching out to farmers and agricultural producers that have participated in NYSERDA's Agriculture Energy Audit Program. Thank you for your time. If you think you are receiving this message in error, please contact: NYSERDAsurvey@guidehouse.com.

TERMINATE 2: We appreciate your interest in taking the survey. This survey is intended for someone in your organization familiar with the NYSERDA's Agriculture Energy Audit Program and the technologies in your facility that consume energy. We request that you please reach out to the inbox at: NYSERDAsurvey@guidehouse.com. If you think you are receiving this in error, please contact: NYSERDAsurvey@guidehouse.com. Thank you.

TERMINATE 3: We appreciate your interest in taking the survey, but we are only reaching out to agricultural facilities in New York State that are currently in operation. If you think you are receiving this message in error, please contact: NYSERDAsurvey@guidehouse.com.

CLOSE: This concludes the survey. Thank you for your participation. If you have any questions about this survey or how your responses to this survey will be used, please contact:
NYSERDAsurvey@guidehouse.com.



Appendix C: Agriculture Energy Audit Program Survey Instrument Utility Questions Only

Agriculture Energy Audit Program – Utility Account Information Survey

Market Update 1

Prepared for:



Submitted by:
Guidehouse, Inc.
1375 Walnut Street
Suite 100
Boulder, CO 80302

303.728.2500
guidehouse.com

DRAFT: 21 November 2022

Introduction

This document includes Guidehouse's draft survey instrument for the Historic Utility Account Information Follow-up Survey to the Agriculture Energy Audit Program Participant Survey.

Guidehouse will utilize Qualtrics to administer the online survey. Recruitment of respondents will occur through three emails and two phone calls. For those that do not take the survey online, Guidehouse plans to call the participants so that they can take the survey over the phone. The survey will be tested in advance of full deployment and may be modified after deployment to enhance the number of completed interviews. Compiled survey results will be presented to NYSERDA and summarized in the final report.

Table C-1 identifies the survey characteristics and Table C-2 identifies survey research objectives.

Table C-1. Survey Characteristics

The Market Evaluation Team contacted all 908 Ag Audit participants between 2017 and 2020, aiming for a census of the population that completed the Ag Energy Audit survey but wished to share some or all of their utility account information at a later time.

| Characteristics | Description |
|----------------------------|--|
| Statement of purpose | To understand program participants' utility usage and changes since their NYSERDA Agriculture Audit program participation. |
| Qualified respondent | A respondent to the NYSERDA Agriculture Audit Program 2022 survey but opted to share their historic utility account information at a later date. |
| Sample Size | Ideally, a census of all participants from previous audits conducted in the years 2017, 2018, and 2019, and 2020 who completed a survey and desired follow-up contact to give their utility information will be contacted. |
| Target number of completes | Population size is: 85 audit participants from 2020 151 audit participants from 2019 288 audit participants from 2018 384 audit participants from 2017 |
| Estimated survey length | 5 minutes |
| Survey timeline | Q4 2022 |
| Question categories | Account Information Check: Q1-Q4 |

Table C-2. Survey Research Objectives

Survey research objectives aimed to obtain utility account information from survey respondents who had previously completed a survey but wished to give their account information after completing the survey.

| Evaluation Questions | Survey Questions |
|-----------------------------|---------------------|
| Utility account information | Q1-Q4, NYSERDA data |

Draft of E-mail Language – Online Survey (Initial E-mail)

From: Jeremy Simpson <noreply@qemailserver.com>
Sent: Tuesday, February 8, 2022 11:46 AM
To: John Doe <john.doe@gmail.com>
Subject: Utility Follow-up: NYSERDA Agriculture Audit Program Survey

Reply to: NYSERDAsurvey@guidehouse.com



Dear [Contact Name]

Thank you for taking the NYSERDA Agriculture Energy Audit Program survey! When you completed the survey, you indicated that you wanted to send your utility account information at a later date. This email is our ask for you to complete this step in the survey process using the link below.

You can complete the survey by following these instructions:

Option 1. Complete the survey online at: www.tinyurl/farmsurvey
To begin the survey, enter your Access Code / PIN.
Your Access Code / PIN is: <<CODE>>

Please provide your utility account information via this secure Qualtrics survey link by 12/15/2022 in order to receive your full \$35 gift card (\$25 as a thank you for taking the survey + \$10 for providing utility account information) via email. If we do not hear from you by that date, then we will release your \$25 gift card.

Sincerely,

Jeremy Simpson
NYSERDA
jeremy.simpson@nyserda.ny.gov
518-862-1090 extension 3234

Follow this link to the Survey
[Survey Link]
Follow the link to opt out of future emails:
[Opt out / click here to unsubscribe]

This electronic message may contain privileged or confidential information. If you are not the intended recipient of this e-mail, please delete it from your system and advise the sender.

Draft of E-mail Language – Online Survey (Reminder E-mail)**From:** Jeremy Simpson <noreply@qemailserver.com>**Sent:** Tuesday, February 8, 2022 11:46 AM**To:** John Doe <john.doe@gmail.com>**Subject:** Reminder: Utility Follow-up: NYSERDA Agriculture Audit Program Survey**Reply to:** NYSERDAsurvey@guidehouse.com

Dear [Contact Name]

Thank you for taking the NYSERDA Agriculture Energy Audit Program survey! When you completed the survey, you indicated that you wanted to send your utility account information at a later date. This email is our ask for you to complete this step in the survey process using the link below.

You can complete the survey by following these instructions:

Option 1. Complete the survey online at: www.tinyurl/farmsurvey

To begin the survey, enter your Access Code / PIN.

Your Access Code / PIN is: <<CODE>>

Please provide your utility account information via this secure Qualtrics survey link by 12/15/2022 in order to receive your full \$35 gift card (\$25 as a thank you for taking the survey + \$10 for providing utility account information) via email. If we do not hear from you by that date, then we will release your \$25 gift card.

Sincerely,

Jeremy Simpson

NYSERDA

jeremy.simpson@nyserda.ny.gov

518-862-1090 extension 3234



Agriculture Energy Audit Program – Utility Account Information Survey

Follow this link to the Survey

[Survey Link]

Follow the link to opt out of future emails:

[Opt out / click here to unsubscribe]

This electronic message may contain privileged or confidential information. If you are not the intended recipient of this e-mail, please delete it from your system and advise the sender.

Survey

Thank you for taking time to complete this survey. We appreciate you!

This survey is being conducted on behalf of the New York State Energy Research and Development Authority (NYSERDA). Your input and information will help NYSERDA to better understand the types of energy efficient technologies and resources used in New York State's agricultural sector, and to improve its programs and resources that support the agricultural industry in New York State.

As part of this research, NYSERDA is asking that you submit your historic utility account information, by sharing your utility name and account information. When you took the NYSERDA Agriculture Energy Audit Program survey, you indicated that you wanted to send your utility account information at a later date. This email is our ask for you to complete this step in the survey process using the link below.

The survey should take you less than 5 minutes to complete. You can go back to previous responses at any point during the survey by clicking the back arrow on the bottom left of the screen. You can return to the survey at a later time by going back to the survey URL. All responses will be kept confidential to the extent permitted by law and reported in aggregate without individual respondents or firms identifiable. By agreeing to take this survey, you are also agreeing that these data will be shared with NYSERDA for use.

If you have questions while you are taking the survey, please e-mail
NYSERDAsurvey@guidehouse.com.

If you agree to participate, please enter your Access Code / PIN:

Introduction

Q1. What kind of fuel do you have at your facility? Select all that apply.

- Electricity (1)
- Natural gas (2)
- Other fuel, please specify: **[OPEN TEXT RESPONSE]** (3)

Display This Question:

If Q1 = 1, then display Q38, if else SKIP to Q3

Q2. Please list the name of your electric utility along with your account numbers.

Electric Utility

- Electric Utility Company Name: _____ **[FILL IN, data validation with letters only]**
Electric Utility Account Number: _____ **[FILL IN, data validation with numbers only]**
If NYSEG or RG&E – POD #: _____ **[FILL IN, data validation with numbers only]**

Display This Question:

If Q1 = 2, if else SKIP to Q4

Q3. Please list the name of your natural gas, or other space and process fuel supplier, utility along with your account numbers.

Natural Gas Utility

- Natural Gas Utility Company Name: _____ **[FILL IN, data validation with letters only]**
Natural Gas Utility Account Number: _____ **[FILL IN, data validation with numbers only]**
If NYSEG or RG&E – POD #: _____ **[FILL IN, data validation with numbers only]**

Display This Question:

If Q1 = 3, if else SKIP to CLOSE

Q4. Primary Space and Process Fuel Supplier: If you heat by a fuel other than natural gas or electricity, provide the following:

- Company Name: _____ **[FILL IN, data validation with letters only]**
Account Number: _____ **[FILL IN, data validation with numbers only]**

Close

Those are all the questions we have. Thank you for your help! You can expect to receive your gift card(s) via email in the next week or two!



Appendix D: GLASE Consortium Member Interview Guide

NYSERDA GLASE Consortium Member Interview Guide

Prepared for:
NYSERDA



Submitted by:
Guidehouse
1375 Walnut Street
Suite No. 200
Boulder, Colorado 80302
303.728.2500
guidehouse.com

Interview Overview

Table D-1 describes the interview attributes and objectives.

Table D-1. Interview Characteristics

The Market Evaluation Team aimed for a census of the GLASE Consortium members, contacting all 26 members between May 2022 and June 2022 and interviewing 14 members.

| Attributes | Description |
|----------------------------|---|
| Statement of purpose | To understand the indirect impacts of the GLASE Consortium, to assess the impact of COVID-19 on members' participation in the Consortium, and to better address the concerns of disadvantaged communities through research or offerings to members. |
| Qualified respondent | Participant in NYSERDA's GLASE Consortium |
| Target number of completes | Census (likely up to 26) |
| Estimated interview length | 45 minutes |
| Interview timeline | May – June 2022 |
| Sample | Census of GLASE Consortium members |

Research Objectives

Table D-2. Interview Research Objectives

Interview research objectives aimed to understand GLASE members' awareness, influence, and experience due to their membership, communication needs, indirect impacts of membership, impacts of COVID-19 on members, and lighting technologies used and marketed by members.

| Research Objective | Interview Questions |
|--------------------------------------|---------------------|
| Introduction | I1-I4 |
| Awareness, Influence, and Experience | A1-A5 |
| Indirect Impacts | II1-II10 |
| Outreach and Communications | O1-O4 |
| COVID-19 Impacts | C1-C4 |
| Lighting Technologies | L1-L15 |
| Wrap-Up | W1 |

Interview Body

Introduction

Thank you for participating in the NYSERDA GLASE Consortium and for participating in this interview. We greatly appreciate your time to discuss your experience as a member in NYSERDA's GLASE Consortium. The goal of this interview is to learn more about the impacts of the GLASE Consortium on members, to assess the impact of COVID-19 on members' participation, and to better address the concerns of disadvantaged communities. *Disadvantaged communities* as those that bear the burdens of negative public-health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high concentrations of low- and moderate-income households. NYSERDA is using the interim definition for disadvantaged communities as those that are located within census block groups that meet HUD 50% AMI (area median income) threshold and those located within New York State Opportunity Zones. We seek your honest feedback, and your responses will be shared only with the research and program teams. The information you provide will be kept confidential to the extent permitted by law including but not limited to the Freedom of Information Act (FOIA). The interview will take about 30-45 minutes.

Before we begin, do you have any questions for me?

[Interviewer Notes: Make a list of any concerns/issues that are mentioned during the interview guide. The final question will ask if it is okay to share these issues with NYSERDA so they can reach out to resolve.]

[ALL] I1. To start, could you describe your role at [Organization] and your role in GLASE?

- a. Name:
- b. Organization name:
- c. Role in organization:
- d. Role in consortium:
- e. GLASE membership start date:
- f. Is your organization a greenhouse, controlled environment agriculture (CEA) facility, or indoor farm (e.g., does your organization grow food or plants)?

[GROWERS] I2. Could you please tell us how many CEA facilities you have and whether they are greenhouses or indoor farms?

- a. Number of Greenhouses and/or indoor (CEA) facilities:
- b. Total canopy area in square feet across all of your facilities in New York State:
- c. Total lit area across all of your facilities in New York State:
- d. When did you install the lighting and/or lighting control systems that you currently have at your facility?

[NON-GROWERS] I3. Could you please provide a little more information about your organization?

- a. Lighting manufacturer, controls & automation, engineering, Ag information:
- b. Business locations in New York State:
- c. Do you conduct business within New York State?
If Yes, what percentage of your business is conducted within New York State?

[GROWERS] I4. What types of crops do you grow in your facility or facilities located in New York State?

- Strawberries
- Tomatoes
- Lettuce
- Leafy greens
- Microgreens
- Ornamental (e.g., flowers, plants)
- Spinach
- Cucumbers
- Peppers
- Herbs
- Hemp
- Other [FILL IN]

Awareness, Influence, and Experience

I would like to use this opportunity to discuss with you the reasons you/your organization chose to become a GLASE member, as well as your overall experience as a member.

[ALL] A1. How did your organization learn about NYSERDA's GLASE Consortium

[ALL] A2. Why did your organization become a member of GLASE?

[ALL] A3. What barriers, if any, do you see with joining the GLASE Consortium?

[ALL] A4. GLASE has a wide range of benefits for its members, but we would like to know which are beneficial to you/your organization. Please indicate which of the benefits listed below apply to your organization. Which are the three most critical benefits?

Table D-3. GLASE Benefits

Interviewed GLASE members were asked to rank their top three most used and useful benefits – from access to technical and webinars libraries to free admission to workshops to voting rights - of their GLASE membership.

| Listed as Benefit | Uses Benefit | Ranking | | |
|---|--------------|---------|---|---|
| | | 1 | 2 | 3 |
| Access to the entire Technical Bulletins library | | | | |
| Access to the entire Webinars library | | | | |
| Free admission to GLASE workshops | | | | |
| Access to all GLASE technologies and developed tools | | | | |
| Access to the New York State Greenhouse and Database Benchmark tool | | | | |
| Participation in the training sessions | | | | |
| Access to GLASE sponsored research data and intellectual properties (IPs) | | | | |
| Exclusive access to GLASE developed IP | | | | |
| Participation at the quarterly meetings | | | | |
| Participation at the in-person meetings | | | | |
| Voting rights | | | | |
| One annual consultation | | | | |
| Other | | | | |

[ALL] A5. Are there any activities or other services that GLASE does not offer that would be beneficial to your organization??

Indirect Impacts

Now I am going to ask you a few questions about the impacts from your membership in GLASE.

[ALL] II1. Through your GLASE Consortium membership, have you developed any relationships?

[GROWERS] II2. Has your organization made any business decisions (plans for retrofits, controls purchases, etc.) because of your GLASE membership? [Probe: what decisions, why]

[GROWERS] II3. Has your organization installed any energy efficiency technologies, incorporated any practices, etc. because of your GLASE membership? [Probe: what technologies, what was replaced, how many, what practices, what was happening before, do you have any estimates of energy savings (kWh or gas)]

[GROWERS] II4. Did you obtain any of your suppliers or service providers because of your GLASE membership? Please elaborate if possible.

[GROWERS] II5. Can you think of any influence your facilities have had on other CEA facilities or greenhouses in the state of NY because of your GLASE membership?

[NON-GROWERS] II6. Has your organization made any business decisions because of your GLASE membership? [Probe: what decisions, why]

[NON-GROWERS] II7. Has your organization incorporated any energy efficiency technology designs, practices, etc. because of your GLASE membership? [Probe: what type of designs/practices, why, estimation of size or impact]

[NON-GROWERS] II8. Did you obtain any of your customers because of your GLASE membership? Please elaborate if possible. [Probe: how many, what type, why]

[NON-GROWERS] II9. Can you think of any influence your organization has had on CEA facilities or greenhouses in the state of NY because of your GLASE membership? [Probe: why, what was the impact]

[ALL] II10. Has your GLASE membership had any other impacts on your business?

[IF YES] Would you please explain the impact your GLASE membership has had on your business? [Probe FOR NON-GROWERS: did sales go up/down, why]

Outreach and Communications

GLASE is interested in understanding how it can improve its communications and offerings to members.

[ALL] O1. How can GLASE better address concerns of disadvantaged communities through the research they conduct and offerings to members?

[ALL] O2. Do you participate in webinars and/or read technical publications?

- a. [IF YES] What aspects of webinars or technical publications that you find to be the most valuable?

- b. [IF NO] Would you be interested in participating in those or similar initiatives?
 (If the interviewee needs an example: GLASE recently put on a free webinar called “Funding Opportunities for Controlled Environment Agriculture Energy Efficiency” and a technical article about greenhouse lighting strategies.)

[ALL] O3. GLASE is exploring different research areas as part of its work. Which of these research areas would be of interest to you? Select all that apply. Then ask Why they are interested/they find it important.

Table D-4. Research Areas of Importance to Members

Interviewed GLASE members were asked which research areas – from dynamic LED systems to AI/data analysis and hemp – they have an interest in GLASE’s further exploration of and why each identified area is important.

| Research Area | Why Is It Important? |
|---|----------------------|
| The development of high efficiency dynamic LED systems | |
| Spectrum or irradiance optimization and plant sensing | |
| Energy efficacy and radiometry | |
| Carbon dioxide enrichment studies | |
| Experiments with lighting and control systems | |
| Engineering and modeling of technologies and facilities | |
| Piloting and demonstrating technologies in facilities | |
| Hemp/cannabis | |
| AI/data analysis | |

[ALL] O4. Where do you get information on the latest agriculture technologies, market updates, and news? (Read off list of sources of current GLASE outreach efforts)

- a. NYSERDA website
- b. Newsletters
- c. LinkedIn
- d. Facebook
- e. Trade publications
- f. Other: [FILL IN]

COVID-19 Impacts

We'd also like to learn about the impact of COVID-19 on your business and membership in the GLASE consortium.

[ALL] C1. Did COVID-19 impact your membership in the GLASE consortium? [IF YES] How did COVID-19 impact your membership? [Probe: Did you have to change your participation in GLASE as a member or reconsider the membership?]

[ALL] C2. Were there projects or activities that you were unable to complete because of COVID-19?

- a. If yes, how were those projects impacted?

[ALL] C3. Was there anything that would have made it easier to participate in GLASE Consortium with consideration to COVID-19? [Probe: Would it have been helpful for the GLASE Consortium to communicate more directly about COVID-19 impacts on the agriculture sector as a whole or within the GLASE membership community?]

[ALL] C4. Did you/your organization receive any COVID-19 relief funding?

[IF YES] How did the relief funding help you/your organization? [Probe: how did that relate to GLASE]

Lighting Technologies

[GROWERS] Now, I would like to ask you questions about the lighting technologies and controls in your greenhouses/CEA facilities. I am going to walk through a table of lighting technologies available for use in the market, and I would like for you to identify any and all lighting technologies currently used in any of your greenhouses or indoor CEA facilities in New York State, as well as their control strategies.

[GROWERS] L1. Please identify lighting technologies currently used in any of your facilities in New York State.

Table D-5. Lighting Technologies in Use by GLASE Members

Interviewed GLASE members were asked which types of lighting and lighting controls are in use in their facilities (for growers).

| Lighting | Specific Technology | Lighting Controls | | | |
|-------------------------------------|------------------------------|-------------------|--------------------------------|-------------------------------|-------|
| | | Timer | Threshold (light intensity) | Daily Light Integral (DLI) | Other |
| Fluorescent | | | | | |
| | Linear fluorescent T12 | | | | |
| | Linear fluorescent T8 | | | | |
| | Linear fluorescent T5 | | | | |
| | Circline fluorescent | | | | |
| | Cold cathode fluorescent | | | | |
| | Compact fluorescent (CFL) | | | | |
| | Other | | | | |
| Halogen | | | | | |
| High- or Low-pressure Sodium | | | | | |
| | High-pressure sodium | | | | |
| | Low-pressure sodium | | | | |
| | Other | | | | |
| Incandescent | | | | | |
| LED | | | | | |
| | Screw-in LED | | | | |
| | Tube LED | | | | |
| | LED fixture/troffer | | | | |
| | Other | | | | |
| | Color tunable | | | | |
| | Dimmable | | | | |
| Mercury Vapor | | | | | |
| Metal Halide | | | | | |
| | Pulse-start | | | | |
| | Standard | | | | |
| | Other | | | | |
| Natural Lighting | | | | | |
| Other: | | | | | |

[GROWERS] L2. What time of year is the lighting usage highest in your indoor CEA facilities or greenhouses in New York State?

- a. January-March
- b. April-June
- c. July-August
- d. September-December

[GROWERS] L3. During the time of year when the lighting usage is highest in your facilities, what would you estimate is the average number of hours per day that the lights are on?

[GROWERS] L4. How much electricity (in kWh) do you estimate your facility typically uses per month during colder months (between October–March)? If you have multiple facilities, please estimate an average.

[GROWERS] L5. How much electricity (in kWh) do you estimate your facility typically uses per month during warmer months (between April–September)? If you have multiple facilities, please estimate an average.

[GROWERS] Based on your selection, please rank your top three highest usage months.

[GROWERS] How much electricity do you typically use during these months?

[GROWERS] L6. Which of the following factors, if any, are important to your company when considering lighting and control system upgrades to your facilities? Select all that apply.

- a. Upfront costs for the equipment/project
- b. Payback period
- c. Energy efficiency of the equipment
- d. Light brightness, color, and range
- e. Lighting heat output
- f. Lighting equipment appearance
- g. Impact on crop yield
- h. Ease of use
- i. Other, please describe:

GLASE has developed advanced energy-efficient lighting and control systems for CEA facilities, designed high efficiency and dynamic LED systems, and pinpointed spectral combinations and intensities to optimize crop growth and biological efficacy.

[GROWERS] L7. Are you familiar with any of the following products or services produced by the GLASE Consortium? If you are, please indicate if you have installed any in your facility in New York State.

Table D-6. GLASE Products and Services

Interviewed GLASE members were asked which GLASE-developed products and services they are aware of and, for growers, have installed.

| Product/Service | Aware of | Installed |
|--|----------|-----------|
| Dynamic Light and Shade System Implementation (LASSI) | | |
| Integrated Light and CO2 controls (CO2-LASSI) | | |
| Day ahead market price (prioritizing energy use according to pre-determined day ahead market pricing structures) | | |
| Tunable LED light modules | | |
| Greenhouse light spectrum sensing system | | |
| Remote sensing plant chlorophyl fluorometer | | |

[GROWERS] L8. What benefits do you see with adopting lighting and control systems developed by the GLASE Consortium?

[GROWERS] L9. What barriers do you see with adopting lighting and control systems developed by the GLASE Consortium?

[NON-GROWERS] I am going to walk through a table of lighting technologies available for use in the market, and I would like for you to identify any and all lighting technologies that your organization currently works with (i.e., sells, produces, or advocates use of) in New York State, as well as the control strategies you would implement for each?

[NON-GROWERS] L10. Please, identify lighting technologies that your organization currently works with (i.e., sells, produces, or advocates use of) in New York State.

Table D-7. Lighting Technologies Marketed by GLASE Members

Interviewed GLASE members were asked which types of lighting and lighting controls they market (for non-growers).

| Lighting | Specific Technology | Lighting Controls | | | | Being Replaced |
|-------------------------------------|---------------------------|-------------------|-----------------------------|----------------------------|-------|----------------|
| | | Timer | Threshold (light intensity) | Daily Light Integral (DLI) | Other | |
| Fluorescent | | | | | | |
| | Linear fluorescent T12 | | | | | |
| | Linear fluorescent T8 | | | | | |
| | Linear fluorescent T5 | | | | | |
| | Circline fluorescent | | | | | |
| | Cold cathode fluorescent | | | | | |
| | Compact fluorescent (CFL) | | | | | |
| | Other | | | | | |
| Halogen | | | | | | |
| High- or Low-pressure Sodium | | | | | | |
| | High-pressure sodium | | | | | |
| | Low-pressure sodium | | | | | |
| | Other | | | | | |
| Incandescent | | | | | | |
| LED | | | | | | |
| | Screw-in LED | | | | | |
| | Tube LED | | | | | |
| | LED fixture/troffer | | | | | |
| | Other | | | | | |
| | Color tunable | | | | | |
| | Dimmable | | | | | |
| Mercury Vapor | | | | | | |
| Metal Halide | | | | | | |
| | Pulse-start | | | | | |
| | Standard | | | | | |
| | Other | | | | | |
| Natural Lighting | | | | | | |
| Other: | | | | | | |

[NON-GROWERS] L11. Are you aware of any types of lighting technologies being replaced through retrofits in CEA facilities or greenhouses in New York State?

If yes: Would you please use the table to indicate which technologies are being replaced through retrofits? [NOTE: Use the table above to indicate if that technology is being replaced.]

[NON-GROWERS] L12. When marketing your products or services, do you advertise a certain energy savings (e.g., percent savings, energy/fixture, energy/unit of grow area, etc.)? If so, what are the energy savings marketed? [NOTE: technology with energy savings.]

[NON-GROWERS] L13. Compared to before your products and services, how much electricity (in kWh) do you estimate your products or services save your CEA facilities during colder months (between October–March) and during warmer months (between April–September)? Estimates are acceptable.

[NON-GROWERS] L14. What do you think is important for facility owners to consider when looking into energy efficient lighting and control system upgrades?

GLASE has developed advanced energy-efficient lighting and control systems for CEA facilities, designed high efficiency and dynamic LED systems, and pinpointed spectral combinations and intensities to optimize crop growth and biological efficacy.

[NON-GROWERS] L15. Are you familiar with any of the following products or services produced by the GLASE Consortium? If you are, please indicate any that you/your organization sells/produces.

Table D-8. GLASE Products and Services

Interviewed GLASE members were asked which GLASE-developed products and services they are aware of and, for non-growers, sell or produce.

| Product/Service | Aware of | Sells/Produces |
|--|----------|----------------|
| Dynamic Light and Shade System Implementation (LASSI) | | |
| Integrated Light and CO ₂ controls (CO ₂ -LASSI) | | |
| Day ahead market price (prioritizing energy use according to pre-determined day ahead market pricing structures) | | |
| Tunable LED light modules | | |
| Greenhouse light spectrum sensing system | | |

Wrap-Up

Before we end our conversation today, I would like to take a moment to ask you about a few things you mentioned earlier.

W1. [If interviewee mentioned issues, challenges, confusion, etc.] Through our discussion, you mentioned [reference notes throughout interview] [issues/challenges/confusion]. Would it be okay if I shared these [concerns/frustration/lack of clarity] with NYSERDA so they can reach out to you to help resolve these?

Appendix E: GLASE Consortium Member Interview Recruitment Email

To: John Doe <john.doe@gmail.com>

Subject: GLASE Member Interviews for Market Evaluation

Dear GLASE Member,

As part of the GLASE initiative, NYSERDA has retained Guidehouse as an independent program evaluator to estimate the indirect impacts on members. This purpose of this market evaluation is to better inform NYSERDA of the current agriculture market in New York for the purpose of tracking market progress over time, such as for market awareness or adoption of energy efficiency technologies. Part of Guidehouse's work will involve conducting interviews with current GLASE members to learn more about the impacts of the GLASE Consortium, to better address the concerns of disadvantaged communities, and to assess the impact of COVID-19 on participation. I ask that you provide the Guidehouse team with timely coordination in the scheduling of and participation in your individual interview. You can expect the interview to take 30-45 minutes to complete. Below is a list of times that the Guidehouse team has set aside of interviews. Interview slots will be filled on a first-come, first-serve basis and will be confirmed by a team member. Please select up to five available times by sending your preferred times to:

Emi Moore

evmoore@guidehouse.com

If you choose not to self-schedule by close-of-business on Tuesday (03MAY22), someone from the Guidehouse team will reach out to set up an interview time with you, however options may be more limited at that time. Should you have further questions about the interview process, please don't hesitate to contact me at the number below. We look forward to working with you.

Sincerely,

Erico Mattos, Ph.D.

Executive Director

Greenhouse Lighting and Systems Engineering (GLASE)

Phone: +1 302-290-1560

Appendix F: GLASE Consortium Member Interview Follow-Up Email

To: John Doe <john.doe@gmail.com>

Subject: GLASE Member Interviews for Market Evaluation

Dear GLASE Member,

I am reaching out to you on behalf of NYSERDA. I work for Guidehouse, an independent program evaluator hired by GLASE to estimate the indirect impacts of the GLASE initiative on its members.

Part of Guidehouse's work involves conducting an individual interview with current GLASE members to learn more about the impacts of the GLASE Consortium, to better address the concerns of disadvantaged communities, and to assess the impact of COVID-19 on participation.

Our team would like to schedule an interview with you. This interview should take 30-45 minutes to complete. The Guidehouse teams has set aside various times to accommodate these interviews, see below. Our team would greatly appreciate it if you would please respond to this email with a few times that work for you and the team will do their best to accommodate your wishes. If none of these times work for you, please let us know. Should you have any questions about the interview process, please don't hesitate to contact me.

Table F-1. Table of Available Interview Times

Lists the initially offered available interview times during May 2022.

| Day | Time (EST) |
|-------------------------|------------|
| Tuesday, May 10, 2022 | 8AM-9AM |
| Tuesday, May 10, 2022 | 9AM-10AM |
| Tuesday, May 10, 2022 | 10AM-11AM |
| Tuesday, May 10, 2022 | 11AM-12PM |
| Tuesday, May 10, 2022 | 12PM-1PM |
| Tuesday, May 10, 2022 | 3PM-4PM |
| Tuesday, May 10, 2022 | 4PM-5PM |
| Tuesday, May 10, 2022 | 6PM-7PM |
| Wednesday, May 11, 2022 | 9AM-10AM |
| Wednesday, May 11, 2022 | 10AM-11AM |
| Wednesday, May 11, 2022 | 11AM-12PM |
| Wednesday, May 11, 2022 | 3PM-4PM |

| | |
|-------------------------|----------------|
| Wednesday, May 11, 2022 | 4PM-5PM |
| Wednesday, May 11, 2022 | 5PM-6PM |
| Wednesday, May 11, 2022 | 6PM-7PM |
| Thursday, May 12, 2022 | 9AM-10AM |
| Thursday, May 12, 2022 | 10AM-11AM |
| Thursday, May 12, 2022 | 11AM-12PM |
| Thursday, May 12, 2022 | 1PM-2PM |
| Thursday, May 12, 2022 | 2PM-3PM |
| Thursday, May 12, 2022 | 3PM-4PM |
| Thursday, May 12, 2022 | 4PM-5PM |
| Friday, May 13, 2022 | 10AM-11AM |
| Friday, May 13, 2022 | 11AM-12PM |
| Friday, May 13, 2022 | 12PM-1PM |
| Friday, May 13, 2022 | 1PM-2PM |
| Friday, May 13, 2022 | 2PM-3PM |
| Friday, May 13, 2022 | 3PM-4PM |
| Friday, May 13, 2022 | 4PM-5PM |
| Monday, May 16, 2022 | 9AM-10AM |
| Monday, May 16, 2022 | 10AM-11AM |
| Monday, May 16, 2022 | 12:30PM-1:30PM |
| Monday, May 16, 2022 | 2PM-3PM |
| Monday, May 16, 2022 | 4PM-5PM |
| Monday, May 16, 2022 | 5PM-6PM |
| Monday, May 16, 2022 | 6PM-7PM |
| Tuesday, May 17, 2022 | 9AM-10AM |
| Tuesday, May 17, 2022 | 10AM-11AM |
| Tuesday, May 17, 2022 | 11AM-12PM |
| Tuesday, May 17, 2022 | 12PM-1PM |
| Tuesday, May 17, 2022 | 4PM-5PM |
| Tuesday, May 17, 2022 | 5PM-6PM |
| Tuesday, May 17, 2022 | 6PM-7PM |
| Wednesday, May 18, 2022 | 8AM-9AM |
| Wednesday, May 18, 2022 | 9AM-10AM |
| Wednesday, May 18, 2022 | 10AM-11AM |
| Wednesday, May 18, 2022 | 11AM-12PM |
| Thursday, May 19, 2022 | 12PM-1PM |
| Thursday, May 19, 2022 | 1PM-2PM |
| Thursday, May 19, 2022 | 3PM-4PM |
| Thursday, May 19, 2022 | 4PM-5PM |
| Friday, May 20, 2022 | 10AM-11AM |
| Friday, May 20, 2022 | 11AM-12PM |
| Friday, May 20, 2022 | 12PM-1PM |
| Friday, May 20, 2022 | 1PM-2PM |

| | |
|-------------------------|-----------|
| Friday, May 20, 2022 | 2PM-3PM |
| Friday, May 20, 2022 | 3PM-4PM |
| Friday, May 20, 2022 | 4PM-5PM |
| Monday, May 23, 2022 | 12PM-1PM |
| Monday, May 23, 2022 | 1PM-2PM |
| Monday, May 23, 2022 | 4PM-5PM |
| Monday, May 23, 2022 | 5PM-6PM |
| Tuesday, May 24, 2022 | 8AM-9AM |
| Tuesday, May 24, 2022 | 9AM-10AM |
| Tuesday, May 24, 2022 | 10AM-11AM |
| Tuesday, May 24, 2022 | 11AM-12PM |
| Wednesday, May 25, 2022 | 8AM-9AM |
| Wednesday, May 25, 2022 | 9AM-10AM |
| Wednesday, May 25, 2022 | 10AM-11AM |
| Wednesday, May 25, 2022 | 11AM-12PM |

Appendix G: GLASE Consortium Indirect Impact Methodology

To: **Jeremey Simpson, NYSERDA**

From: **Matt Rankins and Beth Davis, Guidehouse**

Date: **February 21, 2022**

Re: **NYSERDA Agriculture GLASE Initiative: Proposed Indirect Impacts Methodology**

The purpose of this memo is to outline the methodology Guidehouse will employ to assess indirect impacts from NYSERDA's Greenhouse Lighting and Systems Engineering (GLASE) initiative. Per Guidehouse's Agriculture Technical Services, AAET & GLASE Evaluation Plan – Update 1 dated November 23, 2021, the approach and results of the GLASE indirect impacts will be more qualitative using GLASE member interview responses. The indirect impacts from an organization's GLASE membership may be energy savings and/or non-energy impacts. Guidehouse does not anticipate converting qualitative responses into savings values (e.g., MWh MMBtu) at this time.

Step 1: Guidehouse reviewed the current GLASE member organizations and categorized them into the following two primary groups for the purposes of the sources of indirect impacts:

1. Grow Facility (CEA facilities or greenhouses)
2. Non-Grow Facility (e.g., manufacturers, auditors, engineering firms)

See Appendix A for the list of GLASE member organizations from the GLASE website and their categorization.

Step 2: Guidehouse brainstormed some possible expected indirect impacts for each member category (grow facility and non-grow facility). Guidehouse will ask targeted questions based on the potential indirect impacts and more open-ended questions to learn about unexpected indirect impacts. Possible expected indirect impacts include:

- Grow facilities: Lighting technologies or controls strategies implemented because of the facility's GLASE membership, influence of CEA facilities that are GLASE members on other non-GLASE member grow facilities to implement energy saving technologies or strategies, relationships developed because of GLASE, business decisions because of GLASE

- Non-grow facility: Lighting technologies, controls strategies, and/or engineering practices incorporated into their business because of the organization's GLASE membership, relationships developed because of GLASE, business decisions because of GLASE, customer acquisition because of GLASE, influence on CEA facilities or greenhouses because of GLASE

There is inherent potential overlap in indirect impacts between “grow facilities” and “non-grow facilities”. Guidehouse will endeavor to identify any overlap through the interview process.

Step 3: Guidehouse developed an interview guide to be administered to all current members of the GLASE consortium. Table G-1 details the data collection activity specifics.

Table G-1. Details of Primary Data Collection Activities for the GLASE Initiative

Primary data collection activities included a census of 26 GLASE members who were contacted via email up to three times and via phone up to two times.

| Planned Research Approach | Target Group/Population | Estimated Population Size | Estimated Sample Size | Sampling Method | Primary Sampling Unit | Recruitment |
|---------------------------|-------------------------|---------------------------|-----------------------|-----------------|-----------------------|---|
| Interview | GLASE members | 26 | 26 | Census | Member | Participants will be contacted up to three times by email and up to two times by phone. |

All members will be asked some of the same sets of questions, while each of the two above groups will be asked additional sets of questions that pertain to their specific industries. Table G-2 denotes the labeling system used in the GLASE Interview Guide to indicate which questions will be asked of grow facilities, non-grow facilities, and all members.

Table G-2. GLASE Interview Guide Question Denotation

Interview questions were asked based on grower or non-grower membership status within GLASE; some questions were asked of all interviewees.

| Label for Questions asked to Grow Facilities | Label for Questions asked to Non-Grow Facilities | Label for Questions asked to all GLASE Members |
|--|--|--|
| [GROWERS] | [NON-GROWERS] | [ALL] |

Step 4: Indirect impacts findings from the GLASE member interviews will be aggregated and summarized in the Indirect Impacts Tool. As noted previously, the results from GLASE member interview responses are anticipated to be more qualitative than quantitative. Guidehouse does not anticipate converting qualitative responses into savings values (e.g., MWh, MMBtu) as a part of this evaluation.

Appendix H: Disposition for Agriculture Energy Audit Program Survey and GLASE Consortium Member Interviews

Agriculture Energy Audit Program

The Market Evaluation Team completed 331 surveys with participants in the Agriculture Energy Audit Program. Table H-1 details the survey characteristics, including the purpose of the survey, definition of a qualified respondent, targeted number of completes, achieved number of completes, median time in survey, and survey timeline. The survey disposition is in Table H-2-Table H-4 and includes the full picture of the survey efforts, including those surveys completed but not ultimately included in the analysis such as those screened out due to unfamiliarity with the program, no longer operational, non-participants, and not agricultural operations ('not ag').

Table H-1. Survey Characteristics

The Market Evaluation Team contacted all 908 Ag Audit participants between 2017 and 2020, aiming for a census of the group.

| Characteristic | Description |
|----------------------------|---|
| Statement of purpose | To understand participation in the program, to estimate direct and indirect impacts, to learn about the participant journey through the program and how processes can improve, to learn about interest in installing on-site renewables, and to gain knowledge about the impacts of COVID-19 on participants. |
| Qualified respondent | A grower or farmer that has participated in NYSERDA's Agriculture Energy Audit Program in 2017, 2018, 2019, and 2020. |
| Sample Size | Ideally, a census of all participants from previous audits conducted in the years 2017, 2018, 2019, and 2020 will be contacted |
| Target number of completes | Population size is: 85 audit participants from 2020 151 audit participants from 2019 288 audit participants from 2018 384 audit participants from 2017 |
| Estimated survey length | 30 minutes |
| Survey timeline | Q3 2022 |
| Question categories | Introduction: Q1-Q2b; Participant Background: Q3-Q7; Program, Process, and Communication: Q8-Q14a; Impacts: Q15-Q23a; Renewables: Q24-Q27; COVID-19 Impacts: Q28-Q34; Account Information Check: Q35-Q40 |

Table H-2. Final Disposition Report – Total Survey Responses

The survey received 331 responses, a 36% completion rate; 84% of those completing the survey desired a gift card and 28 survey responses were ultimately unusable because they were screened out due to lack of familiarity, were no longer operational, did not participate, or are not an agriculture operation.

| Total Survey Responses ^a | 331 | 100% |
|---|-----|------|
| Completed; all questions answered; Would like to receive gift cards | 277 | 84% |
| Completed; all questions answered; does not want a gift card | 26 | 8% |
| No longer operational; does not receive gift card | 11 | 3% |
| Non-participant; does not receive gift card | 6 | 2% |
| Not familiar; screened out; does not receive gift card | 6 | 2% |
| Not ag; does not receive gift card | 5 | 1% |

^a This table contains the total number of survey responses achieved - including those screened out, no longer operational, non-participant, and not ag – to reflect the efforts of the Market Evaluation Team.

Table H-3. Final Disposition Report – Utility Data Collected

One-third of survey respondents were willing to share some or all utility data at the time of taking the survey; 40% did not wish to share utility data; and one-third were willing to share some or all utility data via follow-up contact.

| Completed Surveys ^a | 303 | 100% |
|---|-----|------|
| Shared utility data at time of survey ^b | 108 | 36% |
| Willing to share utility data with follow-up email ^c | 105 | 35% |
| <i>Shared via follow-up utility survey or email</i> | 37 | - |
| Unwilling to share utility data | 120 | 40% |
| | | |
| Utility data provided ^d | 111 | - |
| Electric | 108 | - |
| Natural Gas | 12 | - |
| Fuel by Alternative Provider ^e | 66 | - |
| Other fuel source ^f | 66 | |
| <i>Propane</i> | 35 | 53% |
| <i>Diesel</i> | 24 | 36% |
| <i>Heating oil</i> | 20 | 30% |
| <i>Wood</i> | 5 | 8% |
| <i>Gasoline</i> | 5 | 8% |
| <i>Corn</i> | 1 | 2% |
| <i>Coal</i> | 1 | 2% |

^a This table contains information only for the 303 completed surveys that contained answers to all questions, were not screened out (not familiar), and did not cite their farms as non-participants, no longer operational, or not ag.

^b Shared at least some utility data at the time of the survey; this number may also count survey respondents who wished to supply gas or alternative fuel source information at another time. Total utility account information supplied will not equal the sum of the electric, natural gas, and fuel by alternative providers listed as most respondents reported multiple fuel sources and account numbers.

^c Includes respondents who wish to share utility information at another time, even if they shared some of their utility information at the time of the survey.

^d Utility data provided Total will note the sum of each utility account provided; most respondents have more than one source of fuel, with more than half citing an alternative fuel source in addition to having electricity and/or natural gas accounts.

^e 'Fuel by Alternative Provider' generally indicates fuel provided by private sources such as propane or diesel companies but does not include sources such as burning gasoline or diesel obtained from a gas station or refuse burned on the property including wood and corn.

^f 'Other fuel source' contains all sources cited by respondents, including those who use fuel unassociated with an alternative fuel provider (such as propane) and those who use alternative fuel providers. Therefore, the percent for each 'Other fuel source' is based off the total respondents reporting another fuel source (n=66).

Table H-4. Final Disposition Report – Completed Survey Responses by Farm Type
Dairy represented nearly half of survey responses and ‘Other’ represented more than one-third of survey responses.

| Respondents by Farm Type ^a | 327 | |
|--|-----|-----|
| Dairy | 156 | 47% |
| Orchards and Vineyards | 17 | 5% |
| Greenhouses | 16 | 5% |
| Row Crops | 11 | 3% |
| Unassociated with commodity | 4 | 1% |
| NA | 1 | 1% |
| Other (specific other items listed below) ^b | 126 | 38% |
| <i>Maple Syrup</i> | 27 | 22% |
| <i>Horses</i> | 12 | 10% |
| <i>Goats</i> | 11 | 9% |
| <i>Fruit</i> | 8 | 6% |
| <i>Sheep</i> | 7 | 5% |
| <i>Grain crops</i> | 6 | 5% |
| <i>Hay</i> | 3 | 3% |
| <i>Farm to Table Restaurant and Kitchen / Brewery</i> | 2 | 2% |
| <i>Christmas trees / trees and shrubs</i> | 2 | 2% |
| <i>Turkeys</i> | 2 | 2% |
| <i>Alpacas</i> | 2 | 2% |
| <i>Florist, flowers</i> | 2 | 2% |
| <i>Anaerobic digester</i> | 1 | 1% |
| <i>Ducks</i> | 2 | 2% |
| <i>Emus</i> | 1 | 1% |
| <i>Mushrooms</i> | 1 | 1% |
| <i>Pumpkins</i> | 1 | 1% |
| <i>Beekeeping</i> | 1 | 1% |
| <i>Heifers and bulls</i> | 1 | 1% |

^aIncludes all survey respondents, even if they were ultimately screened out of the survey.

^bThis total will exceed the number of ‘Other’ responses because some respondents have multiple different aspects to their farms (i.e., many crops, types of animals, etc.).

Table H-5. Survey Responses by Contact Effort

Phone call efforts contributed 77% of all surveys completed while emails contributed 27%.

| | Count | Percentage |
|--|-------|------------|
| Survey Responses by Contact Effort^a | 331 | 100% |
| Phone calls (Market Evaluation Team Survey Contractors) | 213 | 77% |
| Email | 73 | 27% |
| QR Code | 15 | 5% |
| ‘Anonymous’ but unassociated with Market Evaluation Team Survey Contractors IP Address | 30 | 11% |
| | | |
| Survey Responses to Total Population Size | 331 | |
| Total Population Size (Audits) | 908 | 36% |

^a Total includes respondents screened out of the survey.**Table H-6. Participant Population Totals by Farm Type and by Audit Numbers**

The full sample of Ag Audit participants; more than half of all audits occurred with Dairy operations, one-third occurred with ‘Other’ production operations, and Row Crops operations represent the fewest audits at less than 4% of all audits conducted.

| Commodity | Number of Unique Farms | Number of Audits (status 13/14/15) ^a |
|----------------------|------------------------|--|
| Dairy | 436 | 465 |
| Greenhouses | 58 | 69 |
| Orchards & Vineyards | 46 | 47 |
| Row Crops | 29 | 31 |
| Other | 279 | 293 |
| NA | 3 | 3 |
| Total | 851 | 908 |

^a Audit project statuses of 13 (Application Closed – Not Implementing), 14 (Application Closed – Unresponsive), and 15 (Application Closed – Project Completion) indicate projects where the auditor has closed the project application and is no longer contacting the customer.

Table H-7. Utility Information and Survey Completes by Stratum: Audit Year

About one-third of each audit year cohort responded to the survey, ranging from 33% for the 2018 audit year to 39% for the 2017 audit year.

| Audit Year | Responses | Total Audits | Actual % | Responses w/Utility info | % Responses w/Utility info | % Responses w/Utility Info Compared to Total Audits |
|------------------------|-----------|--------------|----------|--------------------------|----------------------------|---|
| 2017 | 148 | 384 | 39% | 48 | 32% | 13% |
| 2018 | 96 | 288 | 33% | 35 | 36% | 13% |
| 2019 | 52 | 151 | 36% | 16 | 30% | 11% |
| 2020 | 29 | 85 | 34% | 12 | 41% | 15% |
| Unassociated with Year | 4 | - | - | - | - | - |
| TOTAL | 331 | 908 | 37% | 111 | 34% | 13% |

Table H-8. Utility Information and Survey Completes by Stratum: Commodity^a

Dairy and ‘Other’ respondents made up the largest proportion of all responses – more than two-thirds - and of all utility information provided – more than 80%.

| Commodity | Responses | Total Audits | Actual % | Responses w/Utility info | % Responses w/Utility info | % Responses w/Utility Info Compared to Total Audits |
|----------------------|-----------|--------------|----------|--------------------------|----------------------------|---|
| Dairy | 156 | 465 | 34% | 49 | 31% | 11% |
| Greenhouses | 16 | 69 | 23% | 8 | 50% | 12% |
| Orchards & Vineyards | 17 | 47 | 36% | 7 | 41% | 15% |
| Row Crops | 11 | 31 | 35% | 6 | 55% | 19% |
| Other | 126 | 293 | 43% | 41 | 33% | 14% |
| NA | 1 | 0 | - | - | - | - |
| Total ^b | 327 | 908 | 36% | 111 | 34% | 13% |

^aTotals include ALL survey responses tied to years and/or commodities – even if the responses resulted in a screen-out for any reason.

^bTotal does not include responses (4) unattached to a commodity label.

GLASE Consortium Member Interviews

The market evaluation team completed 14 interviews with participants in the Agriculture Energy Audit Program. Table H-9 details the interview characteristics, including the purpose of the interviews, definition of a qualified respondent, targeted number of completes, achieved number of completes, time to complete the interview, and interview timeline. The interview disposition is in Table H-10 and Table H-11.

Table H-9. Interview Overview and Characteristics

A census approach was taken for sampling the 26 GLASE members for interviews and 14 GLASE members completed an interview with the Market Evaluation Team.

| Characteristic | Description |
|----------------------------|---|
| Statement of purpose | To understand the indirect impacts of the GLASE Consortium, to assess the impact of COVID-19 on members' participation in the Consortium, and to better address the concerns of disadvantaged communities through research or offerings to members. |
| Qualified respondent | Participant in NYSERDA's GLASE Consortium |
| Target number of completes | Census (26) |
| Completed interviews | 14 |
| Survey length (median) | 45 minutes |
| Survey timeline | May 2022 – June 2022 |
| Sample | Census of GLASE Consortium members |

Table H-10. Disposition Report – Completed Interviews by GLASE Membership Category

Premium CEA Member was the only GLASE membership category that did not see at least half of its members complete a GLASE member interview with the Market Evaluation Team.

| GLASE Membership Category | Number of Members | Completed Interviews | Actual % Completed |
|----------------------------|-------------------|----------------------|--------------------|
| Premium Industry Member | 2 | 1 | 50% |
| Standard Industry Member | 10 | 5 | 50% |
| Supporting Industry Member | 5 | 3 | 60% |
| Premium CEA Member | 7 | 3 | 43% |
| Standard CEA Member | 2 | 2 | 100% |
| Total | 26 | 14 | 54% |

Table H-11. Interview Disposition Report – Completed Interviews by Member Category

Over half of both grow facilities and non-grow facilities member categories completed GLASE member interviews with the Market Evaluation Team.

| Member Category | Number of Members | Completed Interviews | Actual % Completed |
|---------------------|-------------------|----------------------|--------------------|
| Grow Facilities | 9 | 5 | 56% |
| Non-Grow Facilities | 17 | 9 | 53% |
| Total | 26 | 14 | 54% |