Community Planning for Solar: Conducting Focus Groups for Solar Planning

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Colby College

NREL Technical Monitor: Sara Farrar

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Guide

Conducting Focus Groups for Solar Planning

Community Planning for Solar

UMassAmherst

Clean Energy Extension

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The *Community Planning for Solar* project team included UMass Clean Energy Extension (CEE), the UMass Department of Environmental Conservation, Colby College Department of Environmental Studies, the Massachusetts Department of Energy Resources (DOER), the Massachusetts Department of Agricultural Resources (MDAR), the Pioneer Valley Planning Commission (PVPC), the Franklin Regional Council of Governments (FRCOG), the Western Massachusetts Community Choice Energy Task Force, UMassFive College Credit Union, Northeast Solar, PV Squared, Co-op Power, and the Massachusetts towns of Blandford, Wendell and Westhampton.

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The outline below summarizes the *Community Planning for Solar* steps and associated documents. For more information, please visit our website at ag.umass.edu/solarplanning.

Community Planning for Solar: Toolkit Steps and Documents

1. Gather your planning team and set goals

a. Guide: Community Planning for Solar - Toolkit Overview
b. Fact Sheet: Forming a Collaborative Community Solar Planning Team

2. Conduct a solar resource and infrastructure assessment

a. Fact Sheet: The Electric Grid, Distributed Generation, and Grid Interconnection
b. Guide: Conducting a Solar Resource and Infrastructure Assessment
c. Template: Solar Resource and Infrastructure Summary
d. Example: Solar Resource and Infrastructure Report

3. Evaluate solar financing and ownership options

a. Guide: Understanding and Evaluating Solar Financing and Ownership Options
b. Fact Sheet: Solar Financing and Ownership Options
c. Financial Tool: Solar Financing and Ownership Options: Cash Flow Model

4. Assess community preferences regarding solar development and financing

a. Guide: Defining Realistic Solar Development Options
b. Example: Realistic Solar Development Options
c. Fact Sheet: Assessing Community Preferences Regarding Solar Development
d. Guide: Conducting Focus Groups for Solar Planning — You Are Here
e. Guide: Conducting a Community Solar Survey
f. Template: Community Solar Survey

5. Develop a *Community Solar Action Plan* to guide solar decision-making and development

a. Guide: Compiling a Community Solar Action Plan
b. Example: Community Solar Action Plan

6. Keep your *Community Solar Action Plan* current

a. Fact Sheet: Monitoring, Evaluating, and Updating Your Community Solar Action Plan

TERM	MEANING
Photovoltaic (PV)	Photovoltaic (PV) systems are solar arrays composed of panels that generate electricity from sunlight. These panels are a different type of technology than the types of panels used in "solar hot water" or "solar thermal" systems.
Capacity	Capacity of a solar array is a description of the instantaneous power output of the panels at top production (i.e., in full sun). It is typically measured in kilowatts (kW) or megawatts (MW). A residential-size solar system is typically 5-10 kW in capacity. Large, ground-mounted solar arrays in Massachusetts are often 1 MW or greater in size.
Annual Generation or Annual Energy Production	The annual generation or annual energy production (AEP) of a solar array is a measure of the yearly electricity output produced by the panels. It is typically measured in kilowatt-hours (kWh) or megawatt-hours (MWh). In New England, annual generation is approximately equal to the array's capacity (in DC) *14% * 8,760 hours per year.
Voltage	Voltage of an electric power line can be thought of as the equivalent of pressure in a water line. The voltage of transmission and distribution power lines is typically measured in kilovolts (kV). One kilovolt is equivalent to 1000 volts (V). In residential use in the United States, electrical wires within a household carry electricity at 120 V.
Three-Phase vs. Single-Phase Power Lines	Distribution lines are either three-phase lines or single-phase lines; the "phase" describes the distribution of power across them. Single-phase lines typically have one line that carries power and one neutral line. Three-phase lines have three wires which are all carrying power out of phase with each other, exactly 120 degrees apart; in some configurations, there is also a fourth neutral and line and ground. The practical implication is that three-phase lines provide a more consistent source of electricity and are better able to handle higher electricity loads. They typically are used to serve commercial and industrial buildings and can power large industrial electric motors. Single-phase lines are suitable for serving residential lighting and heating loads. Three-phase lines can also accommodate larger inputs of energy from distributed electricity generation facilities (such as solar arrays) than single-phase lines.
Abbreviations & Acronyms	
AC	AC is the abbreviation for *alternating current*, the type of electricity flowing into the grid from a solar array, after it has gone through an inverter.
CEE	UMass Clean Energy Extension
DC	DC is the abbreviation for *direct current*, the type of electricity produced by solar panels. The DC capacity of a solar array is a good indication of its size, and footprint on the landscape.
DOER	Massachusetts Department of Energy Resources
kV	kilo-volt, a standard unit of voltage
kW	kilowatt, a standard unit of solar PV capacity
kWh	kilowatt-hour, a standard unit of electricity production or consumption
MDAR	Massachusetts Department of Agricultural Resources
MVP	Municipal Vulnerability Preparedness plan, a municipal planning document
MW	megawatt, a standard unit of solar PV capacity, equal to 1000 kw
MWh	megawatt-hour, a standard unit of electricity production or consumption, equivalent to 1000 kwh
NREL	National Renewable Energy Laboratory
OSRP	Open Space and Recreation Plan, a municipal planning document
SEIN	Solar Energy Innovation Network, a program of the National Renewable Energy Laboratory, funded by the U.S. Department of Energy's Solar Energy Technologies Office
sf	square feet

Table of Contents

Introduction

This guide is designed to assist community officials, volunteers, and regional planning agency staff in conducting preliminary community meetings to learn about attitudes towards solar energy in your community. The guide will provide the key steps, timelines, facilitators' guide, and tips for hosting successful focus groups. Focus groups are meetings with a small group that represent a diversity of perspectives in your community. These differ from an open meeting in that focus groups include very specific questions that are prepared in advance, and all participants are given time to respond and understand various perspectives about solar energy. The guide concludes with a suggested template for reporting the results of your focus group or community meeting to your community more broadly.

Holding community focus groups is part of assessing community preferences, as part of the *Community Planning for Solar* toolkit (ag.umass.edu/solarplanning). This guide is designed to help municipalities in Massachusetts and other states proactively plan for solar development in their communities. For more information, visit the UMass Clean Energy Extension (CEE) website (ag.umass.edu/clean-energy).

Purpose of the Guide

This document is intended to provide a practical guide for implementing focus groups in communities that are considering proactively planning for solar development. The guide offers suggestions for organizing, facilitating, and reporting of focus group meetings.

A Focus on Solar PV in Rural Communities

In this guide, we focus specifically on solar photovoltaic (PV) development for electricity generation, although a similar approach could potentially be used for other clean energy technology planning. This project focuses on rural communities, although many aspects of this approach would be applicable to suburban or urban communities.

Associated Documents

Two additional components of the *Community Planning for Solar* toolkit will also help guide you through assessing community preferences. These include the following:

- *Assessing Community Preferences Regarding Solar Development* Fact Sheet (Step 4, Item c)
- *Conducting a Community Solar Survey* Guide and associated Template (Step 4, Items e & f)

Choosing to Host Focus Groups

The choice to host one or more focus groups should be made based on your goals for community engagement. Please refer to the *Assessing Community Preferences Regarding Solar Development* Fact Sheet to review other choices to engage with community members.

Focus groups are an excellent choice when you are hoping to gain in-depth information about people's specific concerns, and why they may feel that way. It can help you understand the nuanced reasons *why* people may support or oppose solar developments in a certain location or under certain circumstances. Focus groups can also help build rapport among community members as

active participants in the decision-making process for solar energy siting. Focus groups can help identify the information, terminology, and options that should be included in the *Community Solar Survey*. For example, you may learn about locations for solar siting that had not been previously considered, common terminology used by community members to describe aspects of solar development, or common questions which arise and should be addressed as part of background information provided in the survey.

Focus groups are best used in conjunction with other methods to assess community preferences more widely, such as a survey or open community meetings. Using a combination of methods provides an opportunity to explore both the breadth, and depth, of the various perspectives in your community.

Selecting and Inviting Participants for Focus Groups

You should first decide how many focus groups you would like to hold. Depending on the size of your town, anywhere from 1-4 should suffice. A focus group should ideally have 6-10 participants, to enable lively discussion. If many invitees are interested in participating, consider hosting a second focus group instead of hosting one very large group, which can fail to meaningfully engage all participants.

Recruitment for focus groups should emphasize gaining a wide variety of perspectives. These are not "random" samples of your community – rather, the solar planning team should aim to gather diverse perspectives. Otherwise, you run the risk of missing a key perspective, or could generate a lack of trust in the process by not being inclusive.

You may wish to invite a few individuals to the meeting, and then ask those individuals for further recommendations. This is a helpful way to engage more community members and signal that you value the feedback of your participants. It is not suggested to leave the meeting open for anyone to drop in, but instead to a have a selected group pre-registered to attend.

Here is a sample message to send to invited participants:

Greetings,

The town of *(town)* is working to develop a plan regarding future solar development within the community. As the Commonwealth of Massachusetts sets state renewable energy targets, we anticipate growing interest in solar in *(town).*

Our group is represented by (*list all affiliations*). We are working with (*town)* to help bring community preferences into the planning process for solar energy within the town.

We are writing to invite you to participate in a small "focus group" meeting to discuss solar development in *(town)*. This meeting will be part of a two-step process to assess community preferences regarding solar: first, we are holding a series of *(# of*) "focus group" meetings with small groups of residents to learn more about solar energy; second, we will conduct an online survey, open to all town residents [or: second, a community-wide survey will be mailed to all town residents].

This meeting is (*date, time, location*). We hope this first meeting can help us better understand the variety of perspectives about solar energy within your community. We will also provide a brief overview of the planning process for solar energy in *(town)* at the beginning of the meeting.

If you want to learn a little more about the project, you can view our website here, or view the FAQ document attached (*link to some information about your project if any)*.

Participation is entirely voluntary, and it is completely fine if you choose not to attend. If you would like to participate, please use the link below to indicate your availability, and we'll send the meeting information in the coming days.

(*link for registration*)

Thank you for considering participating; we look forward to hearing your thoughts about solar development in *(town)*.

Focus groups are ideally conducted in-person at a location convenient to community members. A modest budget to cover snacks is a small way to reward participants. If an in-person meeting is not possible or not preferable, a web video conferencing program can be used and participants can join from the comfort of home. Note that this may disadvantage individuals that do not have reliable internet access.

Timing for focus groups can be challenging, as participants often have different work schedules. Early evening is often a good time. Note that meetings held in the middle of a work day will favor people who hold jobs with a high degree of flexibility and may exclude those in service jobs or workers who might need to take unpaid leave to attend such a meeting.

Participants should be given a brief agenda and any supplementary materials in advance of the meeting. See Appendix B for an example of advance material that could be provided to participants.

Facilitation

It is generally recommended that a single facilitator be assigned to run the focus group, with one or two people dedicated to notetaking. Because of the potentially contentious nature of meetings surrounding planning, the solar planning team may choose to hire a neutral, third-party facilitator. If this is not possible, a community member with experience in neutral facilitation, such as a Town Moderator, may be able to fill the role. The facilitator should be prepared to control the participation, rules, and civility, and to follow the agenda.

Participation and Ethics

Participants will ideally have pre-registered for the meeting. You should expect a small amount of attrition. When participants arrive, you should have an ethics plan in place for how you will handle consent, confidentiality, and data management. You will also need to let participants know whether you will record the meeting. Recording the meeting has the benefit of precise transcripts, but participants may not be comfortable with recordings. A good compromise is having more than one dedicated note-taker, or committing to destroying the recording after notes have been taken**.** Some important process considerations include:

> **Consent:** You might want to consider having participants sign a "consent" form whereby you state that they are voluntary participants in your meeting and are free to leave at any time. A sample consent form is provided in Appendix A; note that this was tailored to meet the requirements of an academic institution; you may choose different verbiage for your consent forms.
>
> **Confidentiality**: Focus groups are not confidential, and various power dynamics can be at play within the room. You will need to set expectations upfront with the group about whether participants are permitted to discuss the meeting after the fact. A common community agreement is that participants are welcome to discuss who attended and what was said, but not who said what; however, you may choose any arrangement that fits the context.
>
> **Data Management:** You should be prepared to share with participants what you will do with the data collected. A common arrangement is that the notes are collected and held by one trusted individual or group and summaries of the meetings are released in summary, without attribution of certain comments to specific people. This will help participants speak more freely.

Note that ethical considerations can be handled by a trained researcher. Many University researchers are certified by an ethics board meeting the requirements set forth by the U.S. Department of Health and Human Services. Partnering with a local university may be advantageous.

Rules and Civility

The facilitator should set ground rules for the meeting. These are important to establish upfront, in the event you need to cut off a discussion or change direction. These may be set in advance, or you may wish to solicit additional rules. A list of suggested rules are as follows:

- Be present. Put away phones and other distractions as you are able.

- Practice democracy of time. Speak up if you have been quiet, step back if you are dominating the conversation.
- When you have an alternative or dissenting perspective to add, please use "Yes, and…" instead of "no" or "but."
- Respect confidentiality.

Agenda

The agenda should provide enough detail for participants to follow, and for facilitators to keep to the time available. An "internal" agenda can be useful to provide the facilitator prompts and possible follow-up questions, while the external agenda shared with participants might only include the major topics that will be discussed and critical details about the event. That external agenda should be shared in advance with participants. Below is a sample facilitator's guide and an agenda to share with focus group participants. The facilitator's guide contains sample discussion prompts about solar energy in the community, as well as follow-up questions that can be asked if fitting. Facilitation is often reactive – more or less time may be spent on a question as the flow of conversation waxes and wanes. The sample facilitator's guide and agenda provided are for a 90-minute meeting from 5:30 – 7:00pm; 2 hours is the maximum recommended meeting duration.

Writing Questions

If you choose to write your own questions, rather than use the ones provided, it is important to test out these questions in advance to make sure they are clean, understandable, and unbiased. For example, the questions provided in the facilitator's guide went through several months of revision and testing before being used in an actual focus group. Each question, or question with some follow-up prompts, takes at least 10-15 minutes to facilitate in a focus group. You therefore should plan on ~4-5 major questions with some follow-up prompts prepared, to enable a more detailed discussion and to make sure that the information you are requesting is in discussion. In general, open-ended questions are best, avoiding yes/no. You can use prompts such as "tell us more about that" or "why do you feel that way," as examples of how to draw more information about a topic. It is helpful to have additional questions prepared and also be sure to know which questions should be prioritized should the conversation on one topic extend particularly long.

Facilitation Considerations and Tips

While each focus group meeting is unique, certain strategies can help achieve the meeting goals and keep the meeting focused on the task. Consider the following strategies that can serve to keep all participants engaged, provide space for everyone to participate equally, and build a safe and inclusive environment.

- **Journaling:** Some participants need time to gather thoughts before speaking publicly, and others may benefit from the action of writing down their thoughts. You might provide 30 seconds or so for journaling after the first question to give people a chance to warm up to the meeting. This can be used throughout the meeting to encourage participation, as needed.
- **Complexity/Technical Questions:** We recommend avoiding all questions regarding technical potential, solar capacity, or nuanced discussions that require participants have some background knowledge in solar. Engaging in these topics will quickly alienate those without this knowledge and may suppress further engagement. You can help prepare

participants with technical information or other reading material about the study. These materials can be distributed in advance of the focus group meeting (see Appendix B for an example of an informational document that was distributed in advance of solar energy planning focus group meetings).

- **"Parking Lot":** It is inevitable to have one or more topics arise that are outside the scope of the meeting, or too technical. To avoid derailing the meeting, it is suggested to acknowledge the comments or questions, and then put their question into the "parking lot" – e.g., a committee member can follow up with that participant to elaborate as appropriate.
- **Maintaining Neutrality:** It is important that the facilitator does not have a vested interest in the outcome of the meeting; in other words, that the facilitator is viewed as a neutral entity. As a neutral entity, it is important that the facilitator does not correct participants (other than to clarify items), and makes sure that all perspectives are heard, acknowledged, and respected in the same way. This also serves to build trust and inclusivity.
- **Time Allotment:** Some topics will generate very interesting discussion; it is recommended that you plan in advance which questions are most important, so that you can be sure to allow for depth of responses there, even if another topic, possibly tangential, is encouraging discussion.

FACILITATOR'S GUIDE Page 1/3

Community Planning for Solar Focus Group

Date; time

Location

Overview:

This focus group will be conducted over approximately 90 minutes. The following questions will guide discussions by the focus group participants. Each participant will be asked to look at each question from the perspective of assisting the Solar Planning Committee with the development of relevant and effective survey questions for a widely distributed survey of community preferences regarding solar development. The focus group participants will assist in identifying points of confusion or gaps in community understanding of solar development in their town.

Facilitators and Research Team:

Meeting Goals:

1. Share background about planning process, approach, intent of the focus group
2. Understand local issues and conditions
3. Ask participants to describe enabling and limiting parameters for solar development in their community
4. Understand participants' community/regional/state visions for solar and the tangible actions needed to advance them
5. Understand criteria that need to be communicated/included to make choices about solar development scenarios (amount of solar, type of solar development)
6. Frame the various options for solar development of undeveloped land types in their town, and identify relative preferences for solar on those spaces
7. Learn initial reactions to various ownership options and associated costs; identify points of confusion and clarification
8. Understand who else should be engaged to help inform solar planning within the town

Desired Outcomes:

1. Participants will feel engaged in laying the foundation for community choice in solar development
2. Participants will spread the word through community and encourage participation in the survey
3. Solar Planning Committee leaves with clear understanding of how to frame the survey to the community

FACILITATOR'S GUIDE Page 2/3

Sample Meeting Agenda – Detailed Version for Facilitator

5:30- 5:35 Welcome & Meeting Goals – led by meeting host or facilitator

1. Thank participants
2. State high-level objective: learn about solar development in your town; guide future engagement with community members to identify preferences that may help in the planning process.
3. The meeting is being recorded. A summary of this meeting will be emailed to you.

5:35 - 5:45 Introductions – led by Facilitator

- Prompt introductions – everybody states name
- Icebreaker: something you like about your town
- Role as facilitator; Ground rules

5:45 - 5:50 Project Background

1. Review the project goals, funding, timeline
2. Share the project partners (as applicable)
3. Discuss state/federal policy for solar development; development in rural communities to date, and future growth in MA, now a challenge in rural communities.
4. Present high-level outputs of the project, e.g., town solar capacity, solar scenarios, location preferences, etc.
5. Segue into discussion questions

5:50 - 6:05 Large Group Discussion Question: What are your feelings about solar development in your town? What are some of the positives? What are some of the negatives?

Give participants **30sec** to organize thoughts/write responses to the prompt before discussion

[if appropriate - pick up on the financial aspects]. We heard several mentions of financial benefits. What types of financial benefits would you like to see go to your community? Where could money that results from solar development be used in your town?

[follow-up question] Are there other non-financial benefits that could be provided to your town? (e.g., if needed to start discussion - ownership of solar project, resilience, climate change adaptation, jobs, environment, less waste) - o*pen floor for discussion.*

[follow-up question] How could solar in your town support resilience for key buildings or facilities? [clarify that this could mean back-up power during outages]

[30 sec] Time for anyone to share additional thoughts from journaling

FACILITATOR'S GUIDE Page 3/3

6:05 - 6:25 **State policy is driving solar development into rural towns. What opportunities and challenges do you think these policies create for your town?**

Optional follow-up questions below, as appropriate:

[follow-up question] How important is it to offset town energy usage with solar generation?

[follow-up question] How do you feel about your town generating more energy than it uses, to meet the needs of the broader Western Massachusetts region?

[follow up question] How do you feel about your town supplying more solar than it needs, to supply larger cities and meet state renewable energy targets? For example, how do you feel about having more solar in your town to supply the broader Commonwealth's energy needs and help meet the state's clean energy goals?

[30 sec] Time for anyone to share additional thoughts

6:25- 6:35 **What spaces are more important than others, to keep intact? If you wanted to develop more solar in your town, what are some potential sites that are more suitable, or less harmful, than others for solar projects?**

If you are not getting any suggestions for which sites are preferred:

[probe]: what about farmland? Forest? Roadside? Scenic vistas? How about solar development if combined with areas set aside for protection?

[follow-up as needed] brownfields, disturbed land, farmland, rooftops, parking lots……

[follow-up as needed] what do you see as the tradeoffs of developing green space for solar?

[30 sec] Time for anyone to share additional thoughts

6:35 - 6:55 **To date, solar development has been largely driven by solar developers outside the community. In general, what do you think you or other community members' role should be in solar development in your town?**

6:55 - 7:00 **Wrap Up**

Is there anything we should have asked, but did not?
Is there anything else you'd like to add?
Thank people, review next steps.
Who else should we reach out to?

Adjourn.

SAMPLE AGENDA Page 1/2

Community Planning for Solar Focus Group

Date; time

Location

Overview:

This focus group will be conducted over approximately 90 minutes. The following questions will guide discussions by the focus group participants. Each participant will be asked to look at each question from the perspective of assisting the Solar Planning Committee with the development of relevant and effective survey questions for a widely distributed survey of community preferences regarding solar development. The focus group participants will assist in identifying points of confusion or gaps in community understanding of solar development in their town.

Facilitators and Solar Energy Planning Committee:

Meeting Goals:

1. Share background about planning process, approach, intent of the focus group
2. Understand local issues and conditions
3. Ask participants to describe enabling and limiting parameters for solar development in their community
4. Understand participants' community/regional/state visions for solar and the tangible actions needed to advance them
5. Understand criteria that need to be communicated/included to make choices about solar development scenarios (amount of solar, type of solar development)
6. Frame the various options for solar development of undeveloped land types in their town, and identify relative preferences for solar on those spaces
7. Learn initial reactions to various ownership options and associated costs; identify points of confusion and clarification
8. Understand who else should be engaged to help inform solar planning within the town

Desired Outcomes:

1. Participants will feel engaged in laying the foundation for community choice in solar development
2. Participants will spread the word through community and encourage participation in the survey
3. Solar Planning Committee leaves with clearer understanding of how to frame the survey to the community

SAMPLE AGENDA Page 2/2

5:30 Welcome & Meeting Goals

Introductions and Ground Rules

Project Overview

5:50 Facilitated Group Discussion

What are your feelings about solar development in your town? What are some of the positives? What are some of the negatives?

State policy is driving solar development into rural towns. What opportunities and challenges do you think these policies create for your town?

What spaces are more important than others, to keep intact? If you wanted to develop more solar in your town, what are some potential sites that are more suitable, or less harmful, than others for solar projects?

To date, solar development has been largely driven by solar developers outside the community. In general, what do you think you or other community members' role should be in solar development in your town?

6:55 Wrap Up

7:00 Adjourn

Reporting Findings

Reporting the results of a focus group meeting will require carefully analyzing the multiple perspectives and identifying key themes that emerged, areas of commonality, and areas where differing perspectives are held. Many resources exist to help with the analytical process, and both consultants and University researchers are trained to analyze and report findings if you choose to seek external support.

The results are typically reported in a summary written document. The responses to each of your major questions can be summarized independently, with one or more paragraphs written that capture the full diversity of perspectives, which perspectives were dominant, and areas of agreement or disagreement. Use of quotes by a participant can sometimes capture the group sentiment better than a summary, and are often included, without name attribution. Careful notetaking or recording is needed to enable the use of direct quotes.

The report can be distributed as a summary document to all participants, and can be made publicly available.

FOCUS GROUP REPORT TEMPLATE

Community-Informed Solar Siting and Financing Focus Group

1. Introduction
    a. One paragraph outlining the purpose of the focus group meeting, the planning process, and how the focus group report will be used.

2. Background & Methods
    a. Who participated?
    b. How did you recruit your participants?
    c. Why you conducted the focus group
    d. Describe the format, location, facilitation, etc.

3. Executive Summary
    a. Up to 1 page with primary findings
    b. Only include main points, no quotes from participants

4. Body
    a. This section is the majority of the report. Organization might be by major "theme" that was found, or it could sequentially go through each question and summarize responses.

5. Summary
    a. One paragraph of important findings and key points

6. Recommendations
    a. Next steps
        i. Survey to entire community, etc.

Here are some examples of how you might summarize your data, addressing some of the key questions in the focus group meeting:

Question: What are your feelings about solar development in your town? What are some of the positives? What are some of the negatives?

This question was posed for two reasons – first, as a relatively "easy" question to start discussion and warm up the atmosphere, and second, to get a sense of major issues that would come up. Many of the follow up major discussion points later in the meeting were started here. This was meant to be a brainstorm session. Lists of the major pros and cons follow.

Positives

- Climate change – long-term climate protection
- Resiliency – protect the town against disturbances
- Everyone needs to do their part in energy production
- Economic resiliency – residents can earn revenues during "bad" farming years; allow landowners to stay on their land
- Lots of built/marginal land available for solar
- Opportunity for dual use
- Good use of land, compared to other types of development
- Visual amenity

Negatives

- Aging infrastructure → roofs cannot support PV panels
- Aging infrastructure → 3-phase lines are insufficient
- Forests should be avoided
- Lack of community benefits, such as no tax revenue
- Town lacks control
- Creates divisive community feelings
- Soil erosion from installation
- May take farmland out of production
- Habitat changes; fencing creates barriers to wildlife corridors
- Visual disamenity, industrialization
- Safety – fire hazard
- Developer has the upper hand

Question: How important is it to offset the town's energy use with solar? Is that important or not?

Respondents started to address this question earlier in the focus group meetings, and the facilitator was able to draw on that and ask for more detail.

Most residents expressed a strong sense of community and connection to the **people** and to the **land** in their town. For example, several individuals noted that solar energy provides an

opportunity for less fortunate residents to earn money by leasing land, which would enable them to remain in the community. This sense of community is a strong fabric in which members refer back to regularly.

Several town members addressed the urgency of meeting climate goals and that to do so, everyone must do their part. This includes each town taking responsibility for the energy use as a municipality, and as individuals. As one member stated:

> *"I strongly feel that we have an obligation to do our part in making sure that there's plenty of renewable energy capacity. I know there's a lot of debate of what our part is - is it satisfying our demand, or being an exporter? The positive is that it's one of the better uses of land, second only to forest and farming. It feels like a good way for land owners to stay on their land; there's a lot of folks who are having economic hardship and are not able to extract money from their land. Having some panels is a good way to smooth out variability in agricultural growing seasons - having a baseline of solar income to work off of in a bad year."*

However, the sense of community in terms of drawing lines around a town boundary for solar generation did not resonate with most members as a framing for meeting energy needs. About half of participants noted that solar is extractive and they prefer to have installations in other towns, so as not to impact their resources or natural capital. These participants urged that developers look for more developed areas, rather than rural areas first, which garnered a high amount of enthusiasm in the group:

> *"Going back to your idea of what we define as community, it feels arbitrary to me to draw a line around [town]. It seems to me that some areas are better than others. I don't know if offshore wind plays into your numbers. I think we should look at a bigger use areas outside of [town], because there are probably better places to site solar than in the forest. … this a regional issue and should be addressed regionally and not town by town."*

> *"I just think that there is so much land developed everywhere throughout our state that already has buildings, parking lots, rooftops. I think [town] resource is one that towns like ours shouldn't focus on. There are other resources our town provides. We pay more taxes because we have land that is developed - I think we are doing our share to protect that resource for everyone. It's a resource that provides oxygen and air cleaning and carbon sequestration, habitat, recreation - those are huge resources that are so precious, and are not going to come back if we give them up for some other resource. It replaces a resource with a different resource, and I don't see them as equal."*

However, another community member did clarify that the intent should not just be to push solar into cities:

> *"It's not just about pushing solar into cities, but also underutilized industrial spaces from the industrial past throughout the state. [Other location], warehouse spaces that are now defunct. Installing solar could be a part of a mixed development plan throughout those areas - it's not just about pushing it into cities."*

Finally, the concept of meeting a certain solar capacity – e.g., megawatts to offset energy use – was not well received. This came up several times, and was specifically tied to the fact that the community was not directly receiving those benefits, and that a solar developer was earning revenues at the expense of the town. That is, meeting climate goals is not a driving reason for giving up land; the energy production must be tied back to the town.

> *"I'm curious about the sense of solar in [town], meeting [town] needs or meeting the Commonwealth and beyond's needs. A lot of commercial solar in [town] is an extractive industry - it doesn't provide a lot of benefits, except maybe to the landowner on which it sits. There's not much of a tax contribution from the town from solar, it's not a good tax revenue source, and the town does not have any control over the energy produced by solar. It doesn't increase resilience in the town because it doesn't stay in the town. When you say 100MW, and 9MW supplies the town…* ***I think what's important is: What's benefitting and going to the community, not that solar in [town] meets a particular number."***

This conversation ended with a couple of residents explicitly requesting that energy sources are matched to town availability, rather than a "one-size-fits-all" approach of solar. The benefits of offshore wind to meet climate goals was expressly mentioned, as well as moving solar to towns with more built infrastructure.

Question: If there were reasons to develop in [town], what would those reasons be? Are there other places to develop more solar - what other sites might be more suitable?

Most participants shared that their favorite part of their town was the natural beauty, and especially the mature forests. There was consensus that the forest is one of the town's best assets. This shared enjoyment of forest led to discussion regarding the primary negative feelings about solar in the town: the possibility for clear cutting of mature forest. There was widespread recognition that forested areas would be targeted for solar development, yet the majority of respondents indicated fairly adamantly that the forest should not be touched.

When prompted about some locations for solar development that might be preferable to mature forest, several suggestions were made regarding the town's brownfield, roadsides, areas underneath high-tension power lines, and within less "valuable" ecosystems. For example:

> *"You know, cutting down mature forests, probably the worst place to put solar. But, replacing some early transitional habitat with solar or some kind of scrub the trees that are 20 years old, maybe not the worst place to put solar and not the best, but you know - we got to make some compromises."*

A few members also referred to the climate benefits of forest versus the climate benefits of solar. Several participants explicitly brought up carbon sequestration as an important climate strategy that is overlooked in favor of energy infrastructure development, and others wanted to know the direct tradeoffs of cutting forest for solar – that is, which has a better climate benefit.

> *"Politically, and on the media, there's a lot of emphasis on cutting back emissions and none at all on sequestration. We have to reach carbon net zero in a certain period of time, and sequestration has a lot to do with that."*

A few residents also mentioned interest in exploring opportunities in dual-use solar, which would be especially valuable to those in town who raise livestock and need land for grazing. This was also proposed as an attractive idea to those who are struggling financially, and might be able to gain some income from solar developers using their land.

> *"It feels like a good way for landowners to - to you know, be able to stay on their land. There's a lot of a lot of folks who are having economic hardship and aren't really able to you know to extract money from their own land, even folks who are doing, you know, agriculture, having some panels can be a good way to sort of smooth out the you know the variability and you know growing seasons agricultural. If you have a bad year, you might have sort of a baseline of solar income to work off."*

Other town members repeatedly referred back to "resiliency" as a potential benefit. As currently developed, solar is grid integrated and not providing power back-ups in the wake of storms or outages, but a few members noted that there was opportunity:

> *"Forests provide services to the planet and the commonwealth that should be recognized and acknowledged, even in the context of doing things for climate change. It would be nice if that got equal weighting as a town's contribution. If you have solar on your house, which I do, we get the solar and the benefit, and if we put in a battery, we get resilience. I don't feel that the town gets much benefit from an outside industrial application. The energy is just being extracted. Maybe if we could strengthen the grid in our own area, that might make it better."*

Question: To date, solar development has been largely driven by solar developers outside the community. In general, what do you think you or other community members' role should be in solar development in your town?

Several community members expressed that they pay higher property taxes in order to have large tracts of conserved forest, and are therefore committed to protecting this resource throughout the duration of their residency in the town. Where residents pay higher taxes directly, it was also noted by several residents that forested land is relatively "cheap" and is therefore likely to be targeted by a solar developer.

> *"I personally would go so far as to say my opinion would be that state incentives should only be targeting developed areas for solar, because the reasons why developers say they need to be in our towns and take forest land is because it's cheaper much, much, much cheaper, for some reason, than developing on top of a building and it doesn't - doesn't seem clear to me why that would be. I don't know the ins and outs of development and cost analysis of all that, but that is the reason why they say - why would they come, all the way out here? Like, clearly it's cheaper."*

This led to concerns expressed by a few people that "the solar industry" would be extractive towards them, only using their town without providing any incentives to the community.

The majority of respondents stated that solar development does not provide any tax revenues for the community.

> *"Commercial solar that wants to locate in (town) is simply an extractive industry that wants to use our space and doesn't produce much of a benefit for the community, other than maybe the rental that goes to the landowner on whose property that sits. There's a not much of a tax refund - you know contribution to the town from solar. For some reason it's not a good tax revenue source for the town and the town doesn't have any control over the use of the energy it doesn't produce resilience for the town because it's not going to the town, so that that concerns me."*

The unique structure of "PILOT" programs, or "payments in lieu of taxes," can be structured in various ways. The perception of land value and local revenues could provide some insights as to ways to structure arrangements with solar developers to provide direct financial benefits for communities. In addition to the tangible financial components, several residents affirmed that solar development can being a more insidious aspect to town planning, by introducing a controversial subject in which opinions are strongly held on both sides of the issue.

> *"The negative is that it creates a lot of conflict in our town. There are many people who are on different sides of the issue, and there have been strong debates that haven't always been too friendly. It's hard for us as a community to navigate that without things getting nasty."*

While divisive issues may be more common in larger regions, small towns that rely extensively on a shared sense of community may be particularly sensitive to conflict.

Finally, respondents addressed the ac-hoc nature of solar planning to date, and how it creates a situation that is not strategic, not in the best interest of the town.

> *"The way that it's being done in an ad-hoc way - our solar mandate is so tiny. Whenever a landowner is interested in selling or renting, wherever they happen to be is where the solar could be, rather than us being systematic about identifying a hierarchy of best to worst places and do some kind of collective action to make sure that those are the places where solar gets done."*

This final comment sums a major initiative and purpose to this project, which is to support towns in proactively planning for solar, to maximize community benefits and approach solar in a way that is preferable to the community.

In summary, understanding the varied and nuanced perceptions of community members can be illustrative of town sentiment towards solar. This information may be used to design specific questions to ask in a survey to the entire community; for more information, see *Conducting a Community Solar Survey*. Alternatively, it could be used to further develop resources to address knowledge gaps. These summaries can also be used in discussions with solar energy developers, local, regional, and state government or planning entities, or in larger community meetings to start discussions around specific concerns or opportunities.

APPENDIX A – Consent Form Example

Consent Form for Participation in a Research Study

Researcher(s):
Study Title:

1. What is this form?
This form is called a Consent Form. It will give you information about the study so you can make an informed decision about participation in this research. We encourage you to take some time to think this over and ask questions now and at any other time. If you decide to participate, you will be asked to sign this form and you will be given a copy for your records.

2. What are some of the important aspects of this research study that I should be aware of?
We are seeking to learn about your opinions around solar development in your town. We plan to generate a report that identifies specific concerns and preferences of community members, as well as identify various options for financial benefits from solar development for your town. You are not required to join this meeting, nor sign this document, but if you choose to join the meeting, we are required to obtain your consent by signing this form. Your participation is limited to the 90-minute meeting, but you are welcome to (but not expected to) follow up with the research team and offer additional insights after the meeting. The risks are that you will be asked about your opinion of solar energy in a meeting with other residents, and while we will establish ground rules for confidentiality, the nature of a meeting means that there is some risk of breach of confidentiality. We believe this risk is minimal and have outlined the study procedures below. You may not personally benefit from this research, but your community will benefit, in that decisions about solar development can be made with more information about your preferences.

3. Why are we doing this research study?
The purpose of this research study is to investigate and understand the preferences of stakeholders living in rural areas of Massachusetts with regard to potential solar installations, community solar projects, and future renewable energy installations in your town.

4. Who can participate in this research study?
Anyone over the age of 18 with an address in (town) is encouraged to participate.

5. Where will this research study take place and how many people will participate?
If you agree to take part in this study, you will be asked to participate in an online "focus group" – in the format of a meeting with specific questions. You may do this anywhere that you have an internet connection. The focus group will be recorded via audio for internal note-taking purposes only; the recording will not be published publicly. Approximately 10 participants will be invited to this meeting.

6. What will I be asked to do and how much time will it take?
If you agree to take part in this study, you will be asked to answer some questions pertaining to solar installations in Massachusetts and your town. It will be 90 minutes in duration. We will first

confirm that you agree to participate in the meeting, and that you are 18 or older and live in (town). We will then ask a series of questions that you will discuss with other participants. You are not required to answer any question you are not comfortable with.
At the end of the meeting, we will provide you with an opportunity to follow-up with us via email with any additional feedback you may want to provide. We will also contact you to let you know when we have drafted the results of the study and let you know that we will be hosting an open community meeting for discussion. You are not required to participate in this meeting.

7. Will being in this research study help me in any way?
You may not directly benefit from this research; however, we hope that your participation in the study may help guide the equitable development of future renewable energy projects in Massachusetts.

8. What are my risks of being in this research study?
We believe there are minimal risks associated with this research study; however, you may be inconvenienced by offering your time for this study. All results from the meeting will be summarized – therefore your specific comments will not be attributed to you - however a risk of breach of confidentiality always exists. We have taken the steps to minimize this risk as outlined in a section below.

9. How will my personal information be protected?
Your privacy and confidentiality is important to us. The following procedures will be used to protect the confidentiality of your study records, including registration forms, consent forms, notes from the meeting and audio recording with transcription. The researchers will keep all study records in an online storage service that is password protected. The audio recording and all electronic forms with identifiable information will be destroyed 6 years after the close of the study. All electronic files, including registration forms, consent forms, audio recording transcript, and notes form the meeting will be through (location). Any computer hosting such files will also have password protection to prevent access by unauthorized users. Only the members of the research staff will have access to the passwords. At the conclusion of this study, the researchers may publish their findings. Information will be presented in summary format and you will not be identified in any publications or presentations.

Please be advised that although the researchers will take every precaution to maintain confidentiality of the data, the nature of focus groups prevents the researchers from guaranteeing confidentiality. The researchers would like to remind participants to respect the privacy of your fellow participants and not repeat what is said in the focus group to others.

10. Will my information be used for research in the future?
Identifiers (anything that links the research to you) might be removed and the de-identified information may be used for future research without additional informed consent from you.

11. Will I be given any money or other compensation for being in this research study?
No, you will not be compensated for participating in this focus group.

12. Who can I talk to if I have questions?
Take as long as you like before you make a decision. We will be happy to answer any question you have about this study. If you have questions about this project or if you have a research-related problem, you may contact (names, contact info).

13. What happens if I say yes, but I change my mind later?
You do not have to be in this study if you do not want to. If you agree to be in the study, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate.

14. Subject statement of voluntary consent
When signing this form, I am agreeing to voluntarily enter this study. I have had a chance to read this consent form, and it was explained to me in a language which I use. I have had the opportunity to ask questions and have received satisfactory answers. I have been informed that I can withdraw at any time. A copy of this signed Informed Consent Form has been given to me.

_____ *(initial here)* I agree to maintain the confidentiality of the information discussed by all participants and researchers during the focus group session.

If you cannot agree to the above stipulation please see the researcher(s) as you may be ineligible to participate in this study.

_____	_____	_____
Participant Signature:	Print Name:	Date:

By signing below I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

_____	_____	_____
Signature of Person Obtaining Consent	Print Name:	Date:

APPENDIX B – Reading Materials in Preparation for Focus Group

This is an example of reading material that can be provided in advance of a focus group, to inform all participants about the project prior to facilitation. The information should be adjusted to fit the aims of your study.

Clean Energy Extension

Project Brief

Community Solar Planning – Focus Group Introduction

Thank you for participating in this focus group! This community discussion of solar development is part of a community-driven solar photovoltaic (PV) siting and financing project led by UMass Clean Energy Extension. Photovoltaic, or "PV," systems are solar arrays composed of panels that generate electricity from sunlight. They are a different type of technology than panels used in "solar thermal" systems which can be used to heat water.

As part of this project, we are holding focus group meetings via Zoom in each participating municipality (Blandford, Wendell, Westhampton). Focus groups will run 90 minutes and will be carefully facilitated by experienced meeting facilitators from the Rocky Mountain Institute. We will also offer an online survey later this spring for everyone living in your town, which will be informed by this focus group.

Project Overview

UMass Clean Energy Extension is leading this project to develop "bottom-up" solar siting processes driven by community residents and municipal officials, and to offer models for evaluating financing mechanisms that can keep solar benefits within the community.

As part of this project, we will complete a solar PV infrastructure and resource assessment for your town, develop alternative scenarios of solar development within the community, hold community focus group meetings and distribute a survey to assess community preferences, develop alternative financing options that keep economic benefits local, and ultimately produce an actionable plan to help guide town planning for solar development.

Through this pilot program, we will be developing a set of planning tools that can be implemented across the Northeast to ensure that solar projects are well-sited, in line with community preferences, and providing local economic benefits.

UMassAmherst
Clean Energy Extension

The Center for Agriculture, Food and the Environment

In addition to participants from each town, other project partners include:

- UMass Department of Environmental Conservation
- Colby College Department of Environmental Studies
- Massachusetts Clean Energy Center, Massachusetts Department of Energy Resources, Massachusetts Department of Agricultural Resources
- Pioneer Valley Planning Commission, Franklin Regional Council of Governments
- Western Massachusetts Community Choice Energy Task Force
- UMassFive College Credit Union
- Northeast Solar, PV Squared, Co-op Power

This work is funded through a grant from the U.S. Department of Energy's National Renewable Energy Laboratory Solar Energy Innovation Network, in its "Solar in Rural Communities" program. The project will be completed in June 2021.

Community Solar Resources, Infrastructure, and Financial Modeling

Over the past 8 months, we have been working through the technical aspects of this project. We completed a solar resource and infrastructure assessment in each town, which included review of applicable bylaws and planning documents, identification of relevant infrastructure, and quantification of potential resources available for different solar development types.

We also estimated the technical potential for different types of solar development in your community, which may include solar energy on household rooftops, parking lot solar canopies, development on land that is already impacted by other development, as well as undeveloped parcels. We are currently examining areas that may be appropriate for important emergency resiliency benefits to the town.

Furthermore, we are exploring options for each town to achieve energy self-sufficiency - meaning that your town generates enough solar energy to meet 100% of town needs; we are also looking at scenarios where the town could contribute to regional energy goals, and statewide goals - meaning the town could generate more than the 100% needed for town self-sufficiency.

Finally, we are developing alternative financing strategies that can help small towns retain community benefits of solar development.

We are hoping to gain your input on how the community perceives solar energy, such as best areas to develop solar, how much solar is ideal, and how you might want to see benefits coming to the town. Those are some of the questions we will explore at the focus group meeting, and also in teh online survey that will be sent out later this spring.

We will share all of our results to each community at the conclusion of the project, which may help your town create actionable plans for proactively addressing solar energy in your community.

For more information about the project, please contact one of the research leads, Dr. Dwayne Breger (dbreger@umass.edu), Dr. Zara Dowling (zdowling@eco.umass.edu) or Dr. Alison Bates (alison.bates@colby.edu).