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Massachusetts Department of Energy Resources

A Solar Guide for Condominium Owners and Associations in Massachusetts

November 2015

ABSTRACT

This guide is designed for use by condominium owners in the Commonwealth of Massachusetts. It can help a "solar champion," an interested member of a condominium association, to explore the options for installing solar PV. The guidebook discusses certain legal aspects of condominiums, explains how a solar project fits into an association's decision making process, and provides information about ownership models for solar projects at condominiums in Massachusetts. The primary laws governing the establishment and operation of condominium associations are state-specific. While some of the information provided herein may be applicable to condominium owners considering installation of a solar photovoltaic (PV) system more generally, it should not be relied upon in jurisdictions outside of Massachusetts. This guide is for informational use only and does not constitute legal or financial advice.

A Solar Guide for Condominium Owners and Associations in Massachusetts

Powered by SunShot U.S. Department of Energy

DOER Massachusetts Department of Energy Resources

CleanEnergy States Alliance

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This guide was inspired by the work of both the City of Cambridge and Town of Brookline, Massachusetts to make solar photovoltaics (PV) more accessible to their respective residents. In 2013, the City of Cambridge, in partnership with Peregrine Energy and Zapotec, Inc., created a guide entitled *Installing Solar Electric Systems on Condominium Properties in Cambridge, Massachusetts: A Guide for Owners and Associations*. Simultaneously, David Lescohier of the Corey Hill Condominium in Brookline began writing a *Guide to Installing Solar on Condominiums* after successfully installing a solar project on his condominium building.

Many different people contributed to this guide. Emma Krause from DOER and Nate Hausman of CESA managed the preparation of the guide and served as lead editors. Maria Blais Costello and Warren Leon of CESA copyedited and reviewed the *Guide*. Meghan Shaw of the City of Cambridge reviewed the *Guide*, authored the introduction, and assisted in the overall coordination and the production of it. Mike Merrill of Merrill & McGeary authored the section on the structure of condominiums and methods for solar adoption in the condominium context. Courtney Feeley Karp and Jon Klavens of Klavens Law Group authored the sections on Massachusetts' regulatory framework for solar PV, how to structure a solar project in a condominium to take advantage of applicable incentives, and the financing options available for solar projects. Kenneth Bloom of Bloom Cohen Hayes provided tax accounting consultation.

ABOUT THE SUNSHOT INITIATIVE

The U.S. Department of Energy SunShot Initiative is a collaborative national effort that aggressively drives innovation to make solar energy fully cost-competitive with traditional energy sources before the end of the decade. Through SunShot, the Energy Department supports efforts by private companies, universities, and national laboratories to drive down the cost of solar electricity to $0.06 per kilowatt-hour. Learn more at *energy.gov/sunshot*.

DISCLAIMERS

This material is based upon work supported by the U.S. Department of Energy under Award Number DE-EE0006305.

This guide is for informational purposes only and does not constitute legal or financial advice from the City of Cambridge, DOER, CESA or the contributing businesses (Merrill & McGeary, Klavens Law Group, or Bloom Cohen Hayes). Each solar project is different and every condominium has its own governing documents. We encourage you to consult a solar contractor, lawyer, and a financial advisor to review your particular condominium project arrangement before installing a PV system.

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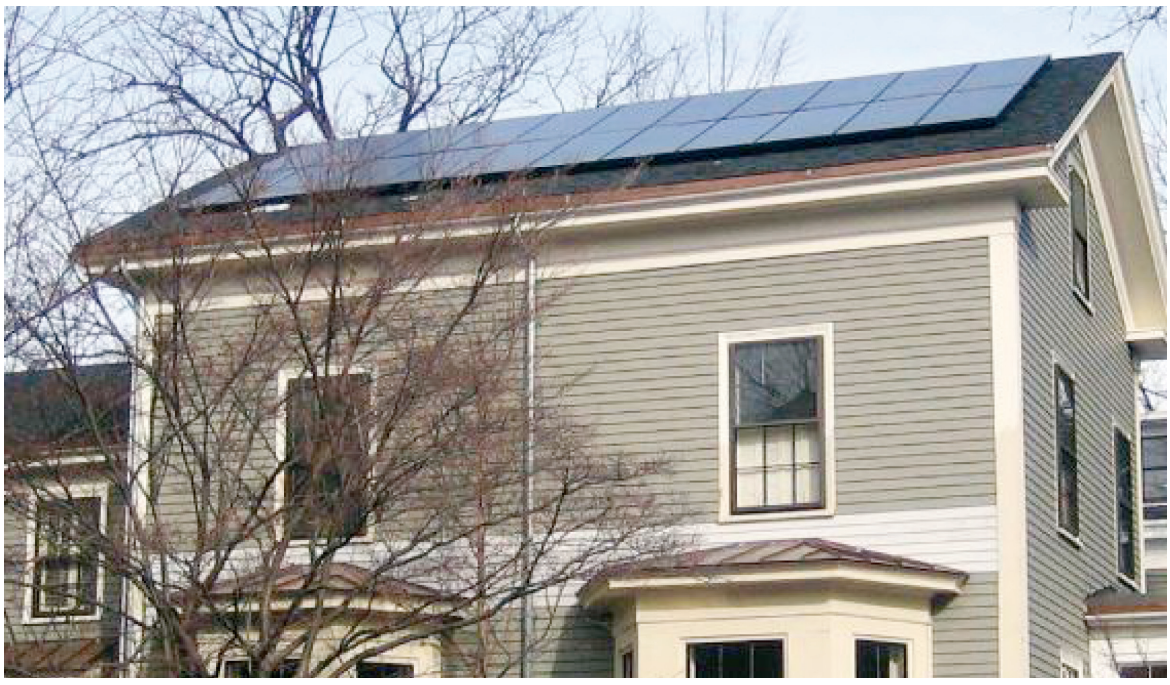
Introduction

Condominium associations can be good candidates for solar photovoltaic (PV) systems. Solar PV can help offset the electricity costs for condominium common areas or an individual condominium unit, or both, while reducing the building's carbon footprint. It can also increase a condominium's property value and reduce exposure to the risk of escalating energy costs. However, because condominium associations are governed by their own set of rules and regulations, installing solar PV in a condominium can seem overwhelming. This guidebook can help a "solar champion," an interested member in a condo association, to explore the opportunities for installing PV.

The guidebook discusses certain legal aspects of condominiums, explains how a solar project fits into an association's decision-making processes, and provides information about four primary ownership models for solar projects for condominiums in Massachusetts.

The legal and tax frameworks outlined in this guidebook are grounded in current Massachusetts state law and only apply to Massachusetts projects. As this is a general informational document, we encourage you to engage legal counsel to discuss your specific solar project.



It is important to note that each association handles decision-making, maintenance, and legal issues differently. For example, smaller associations may have more informal governing procedure and handle maintenance themselves, while larger associations may have formal governing processes and use management companies to administer Board policies and affairs. As a result, the path to gaining support for solar adoption and the processes involved for approving a solar project may vary significantly from association to association.

This guidebook focuses on rooftop-mounted PV systems. Depending on the space and physical layout of a condo building and surrounding property, installing ground-mounted PV may be desirable. Nevertheless, for the sake of simplicity and because many Massachusetts condominium associations are space constrained, this guidebook assumes that condominium solar systems will be rooftop mounted.

The path to gaining support for solar adoption and the processes involved for approving a solar project may vary significantly from association to association.

Further, this guidebook assumes that condominium PV systems, similar to the vast majority of PV systems in Massachusetts and the United States, are grid-tied systems. This means that they are interconnected into the larger electrical distribution grid. A grid-tied PV system will not function in the case of an electricity outage unless the system has an accompanying electricity storage system and the ability to "island" (disconnect from the grid).

Section 1 of this guidebook, *Is Your Building Right for Solar?*, focuses on evaluating whether installing a solar PV system is feasible on your condominium, questions you should ask, and the variables you should consider when exploring solar PV adoption. Section 2, *Project Options and Securing Association Approval*, outlines the different options for projects and necessary approvals to move each forward. Section 3, *Estimating a Solar Project's Cost and Financing*, describes the federal and state incentives that will reduce your solar system's cost and different ways to pay for your solar project. Section 4, *Project Design and Construction*, describes how to have a system installed, including how to select a solar contractor. Section 5, *Operating and Maintaining the Syste*m, provides additional information on how to get the most out of your PV system.

The appendices of this guidebook provide three tools to help adopt PV: Appendix A contains a *Condominium PV Checklist*, which provides a step-by-step approach to evaluating and proposing a possible solar PV installation; Appendix B contains language for a *Grant of Easement* document; and Appendix C contains language for a *Condominium Association Policy for the Installation of Solar Panels*.

SECTION 1

Is the Building's Roof Right for Solar?

The first step to consider in adopting PV at a condominium is to determine whether any physical or regulatory barriers exist to prevent the installation solar equipment on the roof. As a solar champion, you should take the lead in answering these initial questions as a precursor to a more detailed analysis of the feasibility of a solar project. Physical site limitations may include roof material, condition, orientation, age, and the roof's ability to support the weight of a solar PV system. Installing a solar system on the roof of a condominium property requires that the site receives enough direct sunlight, unimpeded by trees, buildings, or other structures such as chimneys. Without proper solar access, a PV system won't produce enough electricity to make the installation economically viable. Regulatory barriers may include permitting requirements and challenges in the process of connecting your PV system to the larger electric grid. See *Section 3* for more information on potential regulatory barriers.

Step 1: Assess Whether the Building's Roof Gets Sufficient Sunlight

Solar PV requires sunlight to generate electricity. To assess whether a condominium roof gets sufficient sunlight, you can request a solar feasibility assessment as part of a comprehensive home energy assessment, or you can have a solar contractor conduct a remote site assessment over the phone or using an internet applications. Most solar contractors will conduct free, basic onsite assessments to determine if the site is suitable for a PV system.

In several Massachusetts municipalities (for example, Cambridge, Boston, and Wellfleet), you can use the online Mapdwell Solar tool to view your building's solar access. Visit *www.mapdwell.com/en*, enter your building's address, and look at the color overlaying your condominium's roof to determine your solar access. The Massachusetts Clean Energy Center also provides a solar access map for some communities in the state, which can be found at *www.masscec.com/solarmap*.

- **Proceed to the next step if you find that your roof has sufficient solar access.**
- **If your condominium has insufficient solar access, the amount of electricity an onsite solar PV system would generate will not justify the cost of installing a system. Instead, you should consider making energy efficiency improvements or accessing renewable energy through other means. See Box 1.**

BOX 1

OTHER WAYS TO IMPROVE ENERGY SAVINGS

There are many ways to support the generation of electricity from renewable sources and reduce your energy usage.

- Take steps to increase the building's energy efficiency through the State's Mass Save energy efficiency program at www.MassSave.com.
- Consider installing a solar thermal system, which is sometimes feasible where solar PV is not. To learn more, visit www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/renewable-thermal.
- Consider participating in a community shared solar system. You can learn more in Section 2 and at *www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/community-shared-solar.html.*
- Investigate Mass Energy: renewable power available for purchase. You can find more information at *www.massenergy.org/renewable-energy.*

Step 2: Evaluate Whether the Building's Roof Is Ready for Solar

After determining that the building's roof gets adequate sunlight, you should review the age and condition of the roof. Check when the roof was last replaced and its suggested lifespan. Solar panels typically come with a 20–25 year performance warranty and many manufacturers offer a 10–12 year product warranty. The productive lifespan of panels can exceed both these warranties. Ideally, the remaining life of the roof will be equal to or greater than the lifetime of the PV system; otherwise, installing a solar system on the roof may create additional expense when roof replacement becomes necessary. If the building's roof must be replaced after a PV system is installed, doing so will require removing all the panels, replacing the roof, and reinstalling the panels. In that case, you should factor the cost of removing and reinstalling the solar panels into the economic analysis of the PV system or consider postponing your installation. If the condominium's roof is not suitable for a solar installation, a ground-mounted PV system may be an option.

If you live in a medium- or large-sized condominium, your association may already have conducted a reserve study, an in-depth evaluation of a property's physical components, which may include information about the condominium's roof.

If you live in a medium- or large-sized condominium, your association may already have conducted a reserve study, an in-depth evaluation of a property's physical components, which may include information about the condominium's roof. Consult with your condominium association to see if such a study has been completed.

To determine the remaining lifetime of the roof and when replacement or major repairs are likely, you should:

- ✓ Check the building's maintenance records.
- ✓ Bring in a qualified roofer, building envelope consultant, or professional engineer to provide a condition report on the roof.

Note that you may well need permission and assistance from the condominium association, management company, or both, in order to obtain relevant records and grant access to roofers and consultants to assess the condition of the building and the technical feasibility of a solar project.

When you know the condition of the roof, use the following chart to decide next steps.

Roof Condition	Options
Remaining lifetime is less than 5 years	• Replace the roof now and install solar • Wait until end of roof life to install solar.
Remaining lifetime is 5–15 years	• Replace the roof now and then install solar • Wait until the end roof life to install solar • Repair the roof to extend its life (you want at least 15 years of remaining life) and then install solar • Install solar on the existing roof (factoring in future costs to remove and reinstall solar panels when you re-roof) and replace the roof later.
Remaining lifetime is greater than 15 years	The roof may be ready for solar. Proceed to the next step.

Many associations have a roof warranty either with the contractor who installed the roof or with the roofing materials manufacturer. A warranty is a written guarantee of the integrity of a product and the manufacturer's responsibility for the repair or replacement of defective parts; it defines the limits of liability that the manufacturer or contractor assumes should problems with the roof arise. This warrant will also define specific requirements the association or unit owners must fulfill to keep the warranty in effect.

Anything placed on the roof or penetrating the roof generally has to be approved by the roofing contractor or the roofing materials manufacturer to maintain the roof warranty. Otherwise, the roof warranty may be voided, which would expose the association to additional risk and cost. The association should review the language in the existing roof warranty to understand any specific limitations that could result from installing a solar system.

A roof-mounted PV system should not increase the rate of wear of a roof and may actually decrease it by offering protection from weather. Where roof penetrations are proposed to mount a solar system, you should have specific discussions with your solar contractor about preventing leaks and ask about any warranties the solar contractor may offer related to leaks or workmanship. Systems are available that do not penetrate the roof structure. For example, ballasted systems, which are systems that sit on a roof and are held down with weights, may pose less risk of roof damage.

Step 3: Gauge the Interest of the Association Trustees and Other Unit Owners

The rooftop of a condominium building is generally considered to be a common area of the condominium association, the use of which is shared by all unit owners. Sometimes owners of the top floor units have exclusive roof rights for a roof deck or other specific uses. In such circumstances, the roof may not be treated as a common area. To learn how the roof of your condominium is treated, look at your association's master deed. Master deeds are on file at the registry of deeds. See *Section 2* below for more infor-mation about your condominium association's operating documents and the process for obtaining necessary condominium approvals.

As part of conducting your due diligence, you should evaluate the interest in installing solar among other unit owners and the association trustees. Communicate with the members of your association about your ideas for a solar project. Share the information that you have gathered.

While this guide provides general guidance for obtaining approval for a solar installation on a condominium, there are many different types of condominiums in Massachusetts. The path to gaining support and approvals can vary significantly from condominium to condominium.

Arrange face-to-face interactions to explain your idea. Listen to concerns and feedback. If asked about information you do not have yet, explain the information you will secure before any proposal is made. You might want to share this guide, your solar access assessment, or information about similar solar projects nearby. For more information on solar installation costs, visit the Massachusetts Clean Energy Center's website at: *www.masscec.com/content/commonwealth-solar-installers-costs-etc*.

Follow these steps to gauge the interest of the condominium association:

1. Take a straw poll of whether the owners will support installing a solar system on the building.
   - If you find that most of the condominimum owners are enthusiastic and look favorably upon installing solar, then continue to the next step.
   - If you learn that a majority of the condominium owners are indifferent or have negative attitudes towards installing solar, you may need to build more support for your project.
2. If there is sufficient support for installing solar, share your proposed project with the association. Get on your association's meeting agenda to explain the project and to assess the interest of other owners. Ask your association for its support as you continue your research.

If your association supports installing solar, seek out a solar contractor to address technical issues.

If your association does not support installing solar, see Box 1 for alternative actions.

Step 4: Engage a Solar Contractor to Provide Technical Advice

Once you know the building has adequate solar access, a solar-ready roof, and your association supports installing solar, enlist a solar contractor to provide expert technical advice. Although the project may still be in the planning stages, a solar contractor will likely review the potential project site to advise you, at no charge, about the feasibility of installing a solar PV system.

The contractor will determine if your building has any "show-stopper" technical issues, such as:

- Does your building have sufficient roof space for a solar PV system?
- Will the roof structure support the weight of a solar PV system?
- Are there zoning or permitting requirements that will restrict a solar project at your location?
- Is your building located in a special utility network distribution area where approval to interconnect to the grid poses challenges?

This step does not necessarily involve selecting the solar contractor that will ultimately design and install your system. The solicitation and selection process happens after the association has committed to build and is discussed separately in *Section 4*, *Project Design and Construction*. Your experience working with a solar contractor to address technical feasibility issues may help you determine whether you want to hire this contractor to design and install your solar project. Consider the following when you look for a contractor to assess project feasibility:

✓ Previous experience in commercial building or multi-unit condominium building installations

✓ Previous installation experience in Massachusetts with your utility

✓ Knowledge of local codes and ordinances and enforcement practices

If the contractor thinks that the project is viable after considering the technical issues, your next step is to seek approval from the association.

BOX 2

RESOURCES FOR SELECTING A SOLAR CONTRACTOR AND EVALUATING TECHNICAL ISSUES

- The Massachusetts Clean Energy Center's handbook on residential solar describes system fundamentals and provides tips on how to select a solar contractor: *www.masscec.com/content/residential-guide-solar-power*. Although this publication targets single-family home projects, much of the information is relevant to a condominium project.
- The Solar Energy Business Association of New England (*www.sebane.org*) and the Northeast Sustainable Energy Association (*www.nesea.org*) have designer and contractor lists on their websites. You might also contact your town's sustainability director or energy manager for help with selecting a solar contractor.
- DOER has permitting and structural review guidelines for building and wiring inspectors when permitting for solar: *www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/solar-permitting-and-structural-review-rsc2.html*.
- Some municipalities have adopted solar bylaws that provide size, scale, and slope limits on solar projects. Massachusetts has a model solar zoning bylaw that many municipalities have used as the basis for their zoning requirements. This Massachusetts model solar bylaw can give you a sense of what restrictions or requirements may be expected for a solar PV installation in your jurisdiction. The Massachusetts model solar bylaw is available at *www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/model-solar-zoning-documents.html*. This guidance also suggests checking your city or town hall zoning records as well as their zoning board to better understand your municipalities zoning laws for solar.

SECTION 2

Project Options and Securing Association Approval

Condominiums in Massachusetts are created, pursuant to the requirements of Massachusetts General Laws, Chapter 183A, by the recording of a master deed in the appropriate registry of deeds. The master deed describes the units and common areas. Condominium floor plans depicting the units and common areas are also recorded with the master deed. The master deed provides for the separate creation of the unit owners' organization to manage, maintain, and govern the condominium. The unit owners' organization is generally arranged either as a trust or an association. If it's a trust, a declaration of trust is recorded with the master deed. If it's an association, bylaws are recorded. For the sake of simplicity, this guidebook generically refers to condominium organizations as "associations."

Decision-Making in Condominiums

Whether organized as a trust or an association, a condominium's governing document provides for the election of trustees or managers and gives them broad powers to manage the common areas of the condominium. For the sake of simplicity, this guidebook generically refers to these managers as "trustees." Decisions related to a condominium's common areas and funds are made by the trustees. The trustees are elected by the unit owners at annual meetings and serve for terms of one or more years. Trustees' decisions on significant spending items or work on the property are typically made by majority vote, generally either at a trustees' meeting with a quorum present or by written consent.

Condominium documents typically stipulate that individual unit owners have no authority to make improvements to the common elements of the condominium or to legally bind the association in any manner.

Condominium documents typically stipulate that individual unit owners have no authority to make improvements to the common elements of the condominium or to legally bind the association in any manner. Instead, such authority resides in the trustees. Since a solar system requires an installation on a building roof (or grounds), which are usually common elements, the trustees must approve the plan for solar system installation in advance. The trustees, as the legal and fiduciary representatives of the association, must also approve any contract between the association and a solar contractor or utility company, as well as any permit application with the municipal inspection services or building department. All aspects of the solar system may be approved in a single vote of the trustees if the information is presented in a complete package.

Before undertaking any action to install a solar project, it is important to read your condominium's documents. Condominiums can vary in their structure and governance provisions depending on the types of buildings and use of the units. For example, some mixed-use condominiums with both residential and commercial units have both residential trustees and commercial trustees with separate budgets for each. Condominium governing documents can be amended by vote of the unit owners, so it is also important to check the records of the registry of deeds or meeting minutes to determine if any amendments have been adopted.

The way a condominium is metered may impact the arrangement of your solar project. Condominiums may vary in their utility metering structure. Some condominiums may be master metered whereby multiple condominium units are all metered cumulatively on the same meter and pay for their utilities based on some measure other than their specific electricity consumption. Other condominiums may be metered individually whereby each condominium unit owner or occupant pays for electricity based on usage.

Ultimately, it may be appropriate or even necessary to involve an attorney before all decision-making questions can be definitively resolved. The cost for legal services may be borne by the project proponent, be it an individual solar champion, a group of unit owners, or the association. Legal fees can vary, so it is wise to shop around, unless the association has a lawyer with whom it typically works.

Structuring Your Condo's PV Project

There are different ways to structure a PV project at a condominium. Depending on which type of project makes the most sense for your condominium, different approvals may be necessary. Table 1 defines the four different types of project structures:

TABLE 1

Project Type	Project Description
An association project	A solar PV system located on condominium property that serves common areas and benefits all unit owners and the association itself.
A unit-owner project	A solar PV system located on condominium common area that benefits an individual condominium unit.
A joint unit-owner project	A solar PV system located on condominium common area that serves and benefits multiple individual unit owners.
A community-shared solar project	A solar PV system located offsite that serves and benefits one or more participating condominium unit owners.

PROJECT OPTION A: ASSOCIATION PROJECT

An association project is a solar PV system placed on the common areas of the condominium for the benefit of all unit owners and the association. Usually, an association project's system will connect to the building's common meter and use the association's electric account. The value of any electricity generation that exceeds what is consumed for common area purposes could be used to benefit individual condo unit owners through net metering. Please refer to your condominium's documents for association rules. (See *Section 3* for a description of net metering.)

Typically, a majority of the trustees must approve an association project, including any contracts with solar contractors and utility companies. The installation of a PV system likely must be approved by the unit owners. Although trustees have general authority to spend common funds of the

association, pursuant to the condominium statute, unit-owner approval is also required because the expenditure is for an "improvement," as opposed to a repair. An improvement is the addition of something that did not previously exist in the condominium. Thus, a new solar PV system where one did not previously exist must be approved by a certain percentage of the unit owners.

Trustee Approval Process

Before any proposals are made or votes are taken related to the installation of an association project, interested unit owners should present the proposed solar project to the trustees, explain what the project will entail, and discuss issues that should be considered before moving forward. The project's economic analysis should also be presented. *Section 3* discusses in detail how to estimate the project's cost, including all incentives available and financing options. In addition, the solar contractor that was contacted to assess the site solar access may also provide a basic cost analysis.

By the end of the presentation to the trustees, they should have a good understanding of the proposal. Addressing all of the trustees' questions and concerns may require multiple meetings. If there are outstanding questions that need discussion or answers prior to voting, schedule as many meetings as necessary to clarify the project and to secure trustee support.

If the trustees approve the project proposal, including the economic analysis, proceed to the next step.

Unit-Owner Approval Process

Once the trustees support an association project proposal, it should be presented to the unit owners. (See Box 3 for possible meeting agenda format.) Flexibility and communication are key components to obtain the requisite level of unit-owner support. One strategy to garner support is to establish a committee of unit owners that can work with the trustees to refine the details and complete a final proposal. Through the committee's outreach, unit owners can be informed and provide input. You or other committee members should reach out to as many unit owners as possible. The proposal may need to be modified based on their feedback. After the solar champion or solar committee creates a final proposal, it should be presented at a duly called meeting of the unit owners. If practical, prior to the meeting, engage each prospective voter to assess any concerns the owner has and whether the owner is likely to support the project. The solar champion should take the time to bring each owner to "yes." Votes may also be solicited after the meeting, and it may even be necessary to go door-to-door.

For the meeting:

- ✓ Try to get all owners to attend, especially those who support the proposal.
- ✓ Provide opportunities for all owners to speak, whether or not they are in favor of the proposed project.
- ✓ Summarize all findings and discussions to date as part of your proposal. Describe the meetings held and research completed so that all the unit owners are aware of the work you've done.
- ✓ Identify any remaining uncertainties and explain how and when they will be resolved.
- ✓ Describe next steps for the project if there is agreement to move forward.

- ✓ Ask meeting participants to identify any concerns or objections they have about the proposal so you can respond to them and perhaps correct misconceptions.
- ✓ Request a vote to approve the use of the roof for a PV system and to move forward with soliciting proposals for final design and installation of the project.

BOX 3

SUGGESTED AGENDA FOR MEETING WITH UNIT OWNERS

- ✓ **Summary of the Proposal**
- ✓ **Background Information:** Findings to date, including technical matters, potential costs, and benefits.
- ✓ **Structure and Ownership of the Project**
- ✓ **Legal Questions:** Issues associated with installing a solar PV system, including bylaw amendments, ownership models within the association, legal costs and liabilities, and impacts to the roof warranty and home insurance policies.
- ✓ **Lingering Issues or Approvals Required to Proceed**
- ✓ **Next Steps**

As is the case for all improvements, Chapter 183A and the condominium master deed documents require the trustees to provide the unit owners with a plan describing the association project and its estimated cost, and then conduct a vote. If unit owners entitled to 75% or more of the undivided interest in the common elements vote to approve the association project, then the trustees may proceed with it and assess the cost to all unit owners as a common expense. If unit owners entitled to at least 50%, but less than 75%, vote for approval, those unit owners who approve may agree to allow the trustees to complete the association project and assess the cost only to the approving unit owners.

Most likely, unit-owner votes are counted by the percentage interest assigned to the units in the master deed, not necessarily one vote per unit. For example, if there are three units in the condominium, but one of the units is larger than the others, the larger unit might be assigned a percentage interest of 51% while the smaller units might be assigned percentage interests of 25% and 24%. In that case, the vote of the owner of the larger unit alone would exceed the 50% threshold, but the vote of at least one other owner would be needed to exceed the 75% threshold.

An association project can proceed and be paid for with common funds only after it has received approval of a majority of the trustees as well as the necessary approval of the unit owners. Usually, an association's solar PV system will connect to the association's utility account for the condominium common areas. If the condominium association is master-metered, the association may need to install a separate meter to track the solar production of the project.

PROJECT OPTION B: UNIT-OWNER PROJECT

A unit-owner project is a proposal by an individual unit owner to install a solar system on the common property of the condominium at the unit owner's own cost for that owner's benefit only and not for the benefit of the association at large. A majority of the trustees must approve a unit-owner project, including any contracts with solar contractors and utility companies.

Usually, a unit-owner solar system will connect to that owner's individual meter and use the owner's electric account. If the condominium is master-metered, the unit owner may need to install a separate meter to track the solar production.

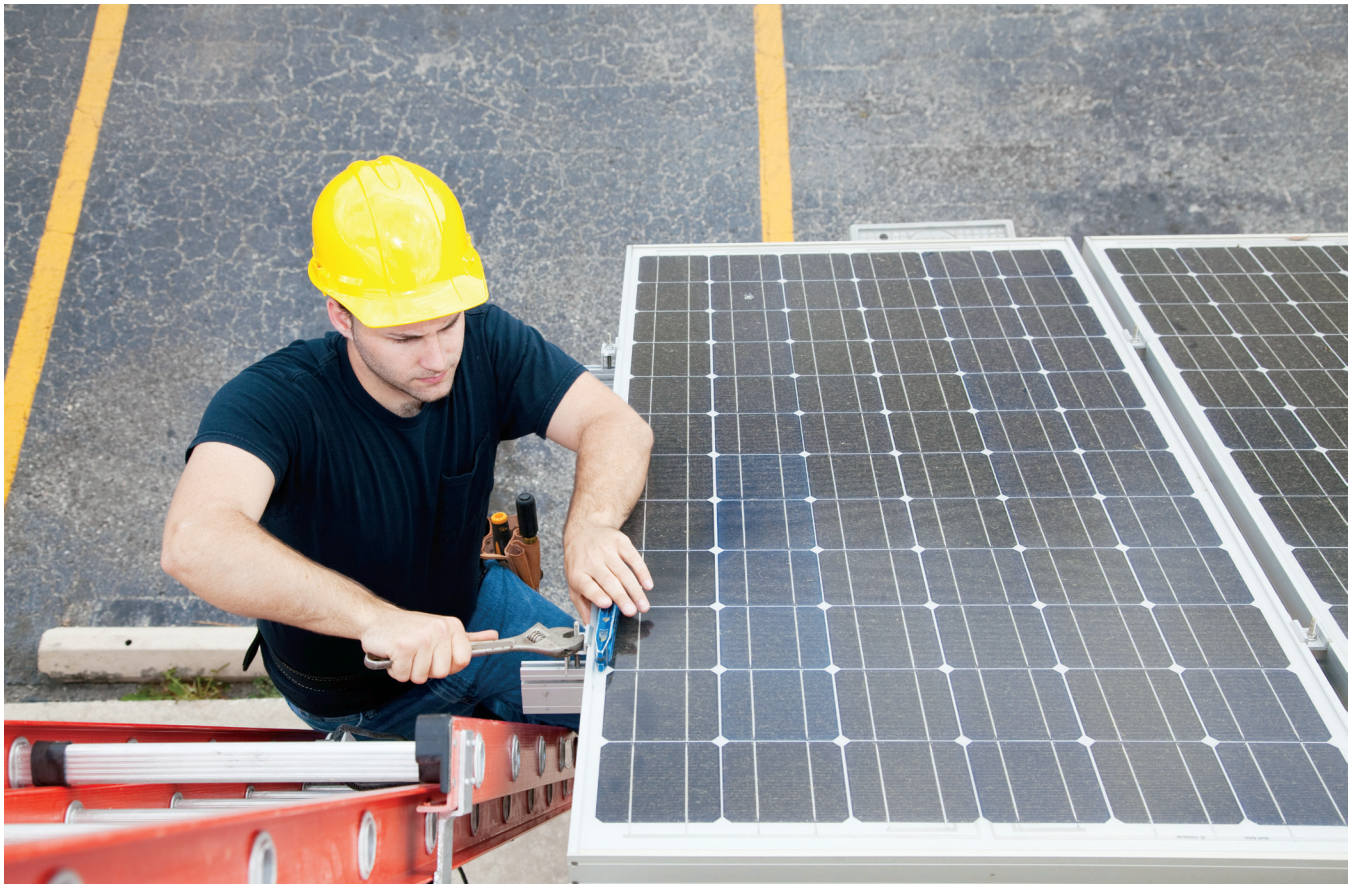
Since a unit-owner project benefits only one owner, the unit owner must obtain an easement from the trustees to authorize the installation and maintenance of the solar system. (See *Appendix B* for a sample of a Grant Easement.) There could also be a separate fee charged by the association to the unit owner for the use of the common area for this purpose. The trustees are authorized to

grant such an easement by Chapter 183A, as long as it is consented to by the unit owner's mortgagee and the owner of any unit immediately abutting the easement area. In this case, that would be the unit located immediately below the roof or adjacent to the common area depending upon the location where the solar system is to be installed.

The easement agreement must be in writing and set forth the responsibilities of the unit owner and the trustees, and it must be recorded at the registry of deeds. Chapter 183A requires that the cost of drafting and recording the easement be paid for by the unit owner. The easement agreement should be prepared by the association's lawyer and can be negotiated by the unit owner. Typically, the easement agreement includes:

- A plan for where the solar system will be located.
- An approved scope of work within the common areas to connect the PV system to the unit owner's utility meter.
- The responsibilities and obligations of both the unit owner and the trustees. For example, the unit owner might agree to pay all costs for the installation of the PV system, maintain the system going forward, and indemnify and hold harmless the trustees and the other unit owners from any costs, losses, or damages related to the installation and maintenance of the PV system.

The trustees have the authority to enforce the terms and provisions of the easement agreement, including maintaining and repairing the solar system, if the unit owner did not act in accordance with the terms of the easement agreement. Any costs incurred by the association, including



attorney's fees for the enforcement of the easement agreement, would be assessed to the unit owner and, if unpaid, collected as an unpaid common charge. Unpaid amounts due pursuant to the easement agreement would become a lien on the unit owner, which would need to be paid prior to the sale of the unit. A sample easement agreement is attached; see *Appendix B*.

Before granting a unit-owner project an easement, the trustees should review the installation plan, the utility agreement, and required permits. The trustees should also approve the contractor that will perform the installation and require satisfactory evidence of insurance. This step is important, as the solar system will be installed on the roof, which is a common area under the control of the trustees.

A request by one unit owner to the trustees to install a PV system may give rise to a discussion among the trustees and other unit owners as to how the trustees should decide to grant an easement, especially if doing so would deny other unit owners the opportunity to install a solar system or other private roof improvement. The trustees may want to adopt a broad solar PV system "policy" (see *Appendix C*), which could help establish a consistent, fair approach to PV project approvals so that future unit owners could also take part.

A unit owner who would like to install a PV system on a condominium common area should proceed in the following manner:

1. Gather support for the project necessary to secure trustee approval for the proposal.
2. Present the proposal to the trustees for approval. The trustees may want to consider adopting a broad solar PV system policy for the condominium to help ensure a consistent approach to project proposals. (See *Appendix C*.)
3. If there is sufficient trustee support, negotiate an easement agreement for the use of the common roof area. (See *Appendix B*.)

- **With the approval of the trustees, proceed with the installation. Have your solar installer apply for a building and wiring permit and coordinate the installation with your utility company.**
- **If the project does not receive trustee approval, determine why and whether it is worth proposing the idea again at a later date or pursuing an alternative project ownership structure.**

PROJECT OPTION C: JOINT UNIT-OWNER PROJECT

A joint unit-owner project is a proposal by multiple unit owners to install a shared solar system at the several owners' expense for their benefit alone and not for the benefit of the whole association. If the joint unit-owner project is located in a common area, this project would proceed in the same manner as an association project or a unit owner project. A majority of the trustees must approve a joint unit-owner project, including any contracts with solar contractors and utility companies as well as grant an easement.

A joint unit-owner solar system may connect to a new meter where all power generated will be sent to the grid and the solar electricity generated will be shared with the other project owners through net metering. This type of project would effectively function as an onsite community shared solar system. (See Project Option D section below.) Alternatively, if the building is not master-metered, a joint unit-owner PV system can connect to the individual meter of each participating owner and use each owner's electric account. If the condominium is master-metered, the unit owner may need to install a separate meter to track the solar production.

A group of joint unit owners could decide to contract for and install their own individual PV systems each of which connects to an owner's individual electricity meter, but the unit owners might be limited by available roof space and would not be able to take advantage of the economies of scale associated with installing a single, shared system.

In addition to needing an easement agreement from the association, as discussed in Option B above, a joint unit-owner project should include a project agreement among the joint unit owners describing how they will share the benefits and liabilities of the project. The agreement would be similar to a partnership agreement or LLC operating agreement in the sense that it would establish legal guidelines for the group's decision-making, capital contributions, and responsibilities.

This legal relationship within the group will be important for obtaining approval of the trustees for the joint unit-owner project. For example, the trustees may want to know what the consequences would be if and when one of the unit owners in the group sells their unit to a new owner. Would the new unit owner assume the responsibilities of the PV system entered into by the prior unit owner or would the group of participating owners assume those responsibilities?

- **With the approval of the trustees, proceed with the installation. Have your solar installer apply for a building and wiring permit, and coordinate the installation with your utility company.**

- **If the project does not receive trustee approval, determine why and whether it is worth proposing the idea again at a later date or pursuing an alternative project ownership structure.**

PROJECT OPTION D: OFFSITE COMMUNITY SHARED SOLAR PROJECT

Community shared solar projects provide a way for an association or individual unit owners to benefit from a solar system without hosting it on their building. Community shared solar may have other financing benefits.

If the association does not have suitable roof or a solar champion is unable to obtain the required project approvals, participating in a community shared solar project may be a good option. The association or individual unit owners could work with other members of the larger community or a solar developer to establish an offsite community shared solar project and participate in net metering to claim their share of the benefits from that project. Community shared solar participants would see a credit for the proportional share of the solar electricity produced by the community shared solar project on their monthly utility bill.

An association could even choose to host a community shared solar project (whether owned by the association itself or by a third-party solar developer) if it has sufficient roof space or land to support the project. Interest in the shared system could be sold to unit owners or other utility customers in the larger community outside the condominium and could potentially generate some revenue for the association. If community shared solar is a model that is of interest to you or your association, take a detailed look at the DOER model recommendations and implementation guidelines document available at *www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/community-shared-solar.html*.

SECTION 3

Estimating Project Costs and Economics

Many questions about solar PV projects relate to costs and finance: What will the proposed system cost? Are there ways to finance it? How much electricity will it generate? What is the potential value of this electricity? Are there any financial offsets or other incentives available?

The best way to answer these questions is to first identify the type of ownership for the project you are pursuing. Your project type may, in part, dictate the size of your system. After you have a sense of the type and scale of the project you would like to pursue, you can ask a solar contractor to prepare a rough cost estimate, including:

- ✓ The cost of any roof repairs and structural upgrades (if known and required).
- ✓ A description of the proposed system with installed costs, including mounting hardware, the PV modules, the inverter(s), monitoring equipment, and any other construction details associated with this particular installation.
- ✓ The value of electricity generated, including anticipated annual savings and cash flows.
- ✓ The value of any state or federal incentives available.
- ✓ Estimated payback period (how long it will take to pay back the total installed cost).

If your town is covered by the solar mapping platform, Mapdwell (see discussion on page 3), you can use the platform to estimate approximate project costs.

Available incentives may vary, but they generally fall into two categories: capital subsidies and production incentives. Capital subsidies provide value at the beginning of the solar project and reduce the project's initial cost. Production incentives provide value over a longer period of time based on the electricity generated by the system.

Financial incentives for PV projects do change over time. Check *www.dsireusa.org* or *www.masscec.com/aboutsolar* for updated information on state and federal incentives for solar PV. For more information about residential solar financing options, see *www.mass.gov/eea/dos/doer/renewables/solar/ma-solar-vp-residential-financing-guide.pdf.*

BOX 4

HOW THE ITC CAN BENEFIT CONDOMINIUM OWNERS WHO INSTALL SOLAR

According to the Solar Energy Industries Association (SEIA), individual members of a condominium association may be eligible for the residential ITC when an association installs a PV system. SEIA's *Guide to Federal Tax Incentives for Solar Energy* notes, "Owners of condominiums contribute to the upkeep of the condominiums by paying money to a condominium management association. Where such a management association spends money on installing qualified solar property, each member of the association can claim the residential solar tax credits on his or her share of that spending. However, the association must qualify as a 'homeowners' association' under section 528(c)(1) of the tax code, and 'substantially all' of the units in the condominium project must be used as residences." Consult a tax professional for advice on your eligibility for the residential ITC.

Capital Subsidies

TAX CREDITS

State and federal income tax credits may be available to those who install solar PV. Massachusetts offers a state personal income tax credit of 15% of the total cost, capped at $1,000. The federal government also provides a 30% tax credit (ITC) for the total purchase price of residential or commercial solar systems. The residential ITC is scheduled to expire at the end of 2016. The commercial ITC is schduled to be reduced to 10% at the end of 2016.

Individual condo unit owners may be able to claim a proportional share of the Massachusetts tax credit limited to an aggregate of $1,000 for a solar PV project directly owned by and benefiting the individual unit owners. Where a solar PV project is financed through a lease or power purchase arrangement and is thereby owned by a third-party solar developer (rather than owned by the association or an individual condo unit owner directly), the solar developer may be eligible to take advantage of the federal commercial ITC and pass savings through to the association.

Consult a tax professional to determine how best to take advantage of any potential solar tax benefits for a condominium project.

SALES AND PROPERTY TAX EXEMPTIONS

Massachusetts exempts solar equipment purchases from state sales tax and protects certain solar PV owners from local property tax increases. One sales tax exemption applies to renewable energy equipment used to power an individual's principal residence. Another sales tax exemption, which applies more generally to equipment used to furnish energy to end-users, may also be applicable. The property tax exemption allows owners of solar (or wind) energy equipment to avoid an increase in their property taxes due to the value added to their building by that equipment for a 20-year period. Solar champions should consult their municipal tax assessor to confirm the application of the property tax exemption.

Production Incentives

NET METERING

Net metering enables solar system project owners to use their solar electricity generation to offset their electricity consumption. Simply put, the solar owner's electricity meter runs backwards as solar electricity is generated and added to the grid.

For each monthly billing cycle, the utility calculates the net excess electricity the PV system has generated and provides a dollar billing credit for the excess generation. Each net metering credit is worth roughly what the utility charges retail customers for each kilowatt-hour of electricity. (Net metering credits generated from a PV system generally do not impact any peak demand charges that a condominium association may be subject to.) Net metering credits operate like ordinary billing credit and offset any amount payable on the utility bill.

In Massachusetts, net metering allows solar electricity production credits to be shared with anyone in the same utility service area and some ISO-New England zones including other condominium unit owners. Keep in mind, in Massachusetts, only investor owned utilities (IOUs) adhere to state net metering policy. If the condominium is located in a municipal light plant territory (MLP), then the MLP has the authority to set its own net metering policies. To learn more about state net metering laws, please visit *www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/dpu/net-metering-faqs.html.* To learn more about individual MLP net metering policies, contact your MLP directly.

For more information about SRECs and SREC Aggregators, which manage the sale of SRECs for multiple system owners, visit *www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/rps-solar-carve-outabout-the-rps-solar-carve-out-program.html.*

SOLAR RENEWABLE ENERGY CERTIFICATES

Massachusetts has a market-based production incentive program called the "Solar Renewable Energy Certificate II Program" or "SREC II Program." For energy produced by the solar facility, Solar Renewable Energy Certificates (SREC IIs) are created as separate tradable commodities. SREC IIs represent the green attributes associated with solar energy generation. State law requires utilities and other electricity suppliers to purchase SREC IIs each year to meet their renewable energy requirements. The value of SREC IIs is set through the market and there are many brokers that are available to sell SREC IIs for homeowners or otherwise assist them in finding a buyer.

Ultimately, the value of this incentive will be based either on a contract price entered into by the association or the going market price if the association chooses to sell in the open market. Solar PV systems can participate in both the net metering program and the SREC II program. For more information about the Massachusetts SREC II Program, visit *www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/rps-solar-carve-out/current-status-of-the-rps-solar-carve-out-program.html.*

It is important to note that SRECs accrue to the system owner. If the association owns the solar system, it will get the SRECs. If one or more individual unit owners own the solar system, the association will not get the SRECs; instead, they will accrue to the solar system owners.

If a solar developer owns the solar system, the SRECs will accrue to the developer. Since the value of SRECs is ultimately based on market value, some condominium associations may be more comfortable if a third-party solar developer owns the solar array and bears the risk of SREC price fluctuations.

If the project is viable based on a thorough economic analysis, determine how to pay for your solar PV system.

Paying for Your Solar Project

As PV has become more popular, the price of installing a solar system has dropped precipitously, but it still represents a significant investment for most property owners. Therefore, it's important to understand the different options for paying for a solar system, taking into account the tax and production incentives described above and the avoided electricity costs when evaluating the overall value of the system.

CASH PURCHASE

Your association may have funding available to pay for the installation of the solar PV system, or may after a unit-owner vote, assess the unit owners to pay for an association-owned project. If the trustees vote a special assessment, individual unit owners can apply for a home equity loan on their unit in order to pay for the special assessment.

Of course, the cost of a unit-owner project or joint unit-owner project will be incurred only by those individuals who have an ownership share of the project, and can be financed through savings or private loan.

SECURE A CONDOMINIUM ASSOCIATION LOAN

If your association does not have sufficient funds in reserve or does not want to levy a special assessment against the individual unit owners to pay for an association project, it may apply for a bank loan to finance some or all of the cost. Local banks may be willing to finance a solar system for an association directly or through a solar loan program. Loans made to the association should be signed by trustees in their capacities as association fiduciaries, not in their individual capacities. As such, the trustees will have no personal liability for repayment, and there is no mortgage involved in the loan. Rather, the loan will be secured by a collateral assignment of common charges to the lender, meaning that if the association fails to pay the loan, the lender can collect the common charges directly from the project owner(s) and assess additional common charges, if necessary, to repay the loan.

Local banks may be willing to finance a solar system for an association directly or through a solar loan program.

Massachusetts DOER and Massachusetts Clean Energy Center (MassCEC) are implementing a Mass Solar Loan Program for the state's residents. This loan program supports direct ownership of solar PV systems and will be available to individual condo unit owners with the condominium association's written approval. To learn more about the program, visit *www.masssolarloan.com*.

If your association decides to apply for a loan through a local bank, the association will have to provide sufficient documentation to the lender to show that it has the capacity to repay the loan. This documentation will include the association's recent budgets, income and expense analysis, common charge amounts, history of special assessments, prior loans, ratio of owner/occupants to investors and number of deficiencies in common charges. The trustees will have to work with the lender's underwriter to demonstrate that the association qualifies for the loan.

Insurance Coverage

Check with your condominium association's insurance company to confirm whether the system is protected with existing coverage or if it would require a separate rider to cover the system.

Solar Lease/Power Purchase Agreement (PPA) Models

Leases and PPAs are models in which a third-party owns a solar system sited on a host property. Under a solar lease arrangement, a host enters into a service contract to pay scheduled, pre-determined payments to a solar leasing company, which installs and owns the solar system on the host's property. With a PPA, a host contracts with a project developer that installs, owns, and operates a solar system on the host site and agrees to provide all of the electricity produced by the system to the host at a fixed per-kilowatt-hour rate, typically competitive with the host's electric utility rate.

The host benefits from the electricity generated and the lease/PPA owner is paid for their services and benefits from the ensuing incentives and tax credits. Some solar developers may offer lease or PPA options for interested condominium associations or condominium owners. Research and compare different offers among local and national solar developers to determine which may be right for your project.

SECTION 4

Project Design and Construction

After the association agrees to proceed with a project and identifies the funding for it, the prospective project owner(s), whether the association or individual unit owners, should solicit bids and select a contractor to design and install the system.

How long will it take to get a solar system installed and operational at your building? As a ballpark estimate, it might take four to ten months. See Box 5 below for a sample timeline.

BOX 5

SAMPLE INSTALLATION TIMELINE

The following timeline for a condominium project in Cambridge illustrates the effort required to bring a project to fruition. Two small PV arrays, rated at 6 kW each, were installed on the flat roof of a 15-unit condominium building in Cambridge. The building is 100 years old and underwent extensive renovation when it was converted to condominiums 10 years ago. The systems began to generate electricity in August 2012. Keep in mind that timelines will vary depending on project types and could take longer than the project outlined below. This was the project timeline:

- **October 2011**—Several members of the condominium in Cambridge decided to move forward with a PV installation.
- **November 2011**—The solar champions contacted a Cambridge firm with significant local experience and arranged a site visit. This firm was subsequently hired to design the PV systems and to coordinate the structural engineer's evaluation.
- **Mid-December 2011**—A condominium meeting was held where the plans were presented, followed by a one hour Q&A session. The proposal was received favorably, and a resolution authorizing the construction was drafted.
- **January 2012**—The project was authorized by all 15 members of the association, consistent with the condominium documents.
- **April 2012**—A final design for two 6kW systems was submitted to the City of Cambridge for a building permit and materials were ordered.
- **Mid-June 2012**—The installation on the roof began.
- **Mid-July 2012**—Construction completed after four weeks, with some delay due to rainy weather.
- **August 2012**—All permits and utility interconnections were completed by the end of the month, approximately 10 months after the initial site visit.

Selecting a Solar PV Contractor

After the association approves a specific project proposal and identifies the funding for the project, the solar champion or the association should solicit project design and installation bids from solar contractors. Installing a solar PV system on a roof is much like most other construction projects. To find a qualified contractor and obtain bids, consult *www.masscec.com/content/finding-solar-pv-installer.*

The solar contractor will be responsible for both design and construction of the project, usually handles permitting for the project, and may be familiar with state or federal incentives available. One of the contractors that could provide a quote may be the one you worked with during your feasibility assessment of the project. Although this contractor may be the most familiar with your building, we recommend getting at least two other quotes for comparison.

When asking for quotes, you should provide bidders with the information you have gathered about the project to date. Make sure the contractor confirms the accuracy of your previous findings and the viability of the project. Providing this level of specification to bidding contractors will help you get prices to compare.

In choosing a contractor, you will want to evaluate cost, qualifications, and work style. The quote with the lowest price tag might not be the best option for your building. Look for a contractor with experience installing solar in Massachusetts.

Bidding contractors should visit the site before preparing quotes in order to verify building details. These site visits should be scheduled as part of the solicitation process. Your condominium association may want to use your condominium property manager or hire a consultant to serve as the liaison between the association and the solar contractor.

In choosing a contractor, you will want to evaluate cost, qualifications, and work style. The quote with the lowest price tag might not be the best option for your building. Look for a contractor with experience installing solar in Massachusetts. Work style is also important because successful solar projects require the buyer to work closely with the contractor throughout construction. The buyer should select a contractor that understands the condominium's needs and the project's specifications (work hours, noise, parking, staging areas, building access, etc.) and is willing to cooperate.

Overview of Contractor Selection Procedure:

1. Select three qualified contractors and request quotes for the design and installation of the project.
2. Schedule site visit for bidding contractors.
3. Receive and evaluate the quotes.
4. Select your preferred contractor for the project.

GETTING THE INFORMATION YOU NEED

The following outline addresses the information the buyer will need when securing quotations and selecting a solar contractor for the project.

General Information *(to be provided to bidders)*

- Project location and brief description of the association and type of project proposed

- Electric utility servicing your condominium (e.g., Eversource, National Grid)
- Existing conditions (e.g., description of building, energy use, and roof area)
- Any known project constraints such as location within a historic district, line of sight requirements, or structural issues with the roof

Bid Logistics *(to be provided to bidders)*

- Contractors required to confirm accuracy of existing conditions
- Proposal due date
- Submission requirements
- Mandatory pre-bid site visit

Qualifications *(requested from bidders)*

- Listed on the Mass Solar Loan Program installer list (*www.masssolarloan.com*)
- Prior experience developing PV projects in comparable buildings in Massachusetts
- References regarding past performance
- Subcontractors to be used (identifying who they are and what are their qualifications)
- Proof of Liability and Workers' Compensation insurance coverage
- Proof of licensed electricians employed for project installation

Equipment and Project Specifications Proposed *(requested from bidders)*

- System size
- Estimated energy production
- Equipment to be installed (e.g., panels, inverter(s), monitoring equipment, racking, wiring)
- General layout of the project
- Warranties associated with workmanship and equipment, along with any performance guarantees, if applicable

Scope of Work *(requested from bidders)*

- Contractor responsibilities
- Proposed schedule for project completion, including progress meetings with the project owner(s)
- Recommendations to assist with the sale of SREC IIs generated by the project

Project Pricing *(requested from bidders)*

- Price for structural analysis
- Price for full design

- Price for project construction
- Line-item prices for equipment
- Schedule of payments

QUESTIONS YOU SHOULD ASK

When choosing a contractor, consider the following questions:

- ✓ Is the contractor fully experienced (*www.masscec.com/content/finding-solar-pv-installer*) and insured?
- ✓ Has the contractor had prior experience developing PV projects in comparable buildings?
- ✓ Has the contractor had successful projects in surrounding communities that demonstrate familiarity with local inspection and approval requirements?
- ✓ What do the references say about the contractor's past performance?
- ✓ Will the contractor be doing the work itself? If not, who are the subcontractors that will be used and what are their qualifications?
- ✓ Will all parties that are employed on the project carry Liability and Workers' Compensation insurance coverage?

The time from selecting a contractor to signing a contract generally takes at least two weeks, but it can take longer if contract details require negotiation. Expect to execute a single contract with the contractor that will cover both the design and construction phases of the project.

Contracting

Generally, the selected contractor will bring a contract to the buyer for execution. The association should scrutinize the proposed contract and negotiate any additional details important to the association. The project owner(s) must ensure that the contract reflects the representations made by the contractor during the proposal process and any subsequent negotiations. It should contain any requirements by the project owner(s) for how and when work is to be performed. It may be the case that the contractor's form agreement is not satisfactory and the association's counsel will need to negotiate a contract to better protect the association. Have the association's legal counsel review any contract presented before executing it.

The time from selecting a contractor to signing a contract generally takes at least two weeks, but may take longer if contract details require negotiation. Expect to execute a single contract with the contractor that will cover both the design and construction phases of the project. The contract should specify what is covered in the design phase and what is covered in the construction phase. It should include deliverables, separate prices for the design and construction phases, a clear payment schedule, warranties, performance guarantees (if applicable), and any operation and maintenance responsibilities going forward. It should also allow the project owner(s) to opt out of construction at the end of the design phase with payment for the negotiated design price (and not for the full project cost).

IDENTIFYING RESPONSIBILITIES AND DELIVERABLES

The details for both the design and construction phases covered in the contract should clearly address the following:

- ***Responsibilities***—Responsibilities of the contractor and the project owner(s).
- ***Subcontractors***—Name any subcontractors that will work on the project..
- ***Insurance***—Insurance carried by all parties, including certificates of insurance from the solar contractor and any subcontractors naming the association or specific project owner(s) as additional insured parties.
- ***Schedule and Milestones***—Start and completion dates for the design and construction phases, with specific milestones identified, including:
  - Structural engineer introduced to project owners and assessment of the roof completed.
  - Structural analysis report completed and delivered.
  - Selection and configuration of system components determined.
  - Final design documents and drawings completed.
  - Construction authorized by project owner(s).
  - Electrical subcontractor or electrical foreman introduced to project owner(s).
  - If the roof is under warranty, get a guarantee in writing that project specifications will not void the warranty and that the roofing manufacturer will keep the current warranty valid.
  - Materials delivered.
  - System racking mounted on the roof.
  - PV panels and inverter(s) installed.
  - Project commissioning completed.
  - Data monitoring of system production set up.
  - Inspections and project close out completed.
  - Operation and maintenance training made available, if applicable.
- ***Commissioning and Interconnection***—Project commissioning and interconnection approval requirements and procedures, as well as the contractor's obligation to commission the project and interconnect it.
- ***Budget***—Itemized budget, with confirmation that this includes all anticipated project costs, including structural engineering analysis, permits, and interconnection-related fees.
- ***Payment schedule***—Progress payments, including any amount to be held until the system is fully operational, inspected, and interconnected.
- ***Warranty***—Terms for the project as a whole and individual project components.

For your protection, have the association or unit owner attorney review the final contract prior to signing.

- **Do not allow construction to begin until you have fully executed a contract and receive the certificates of insurance for the contractor and subcontractors.**

System Design

After selecting the contractor and signing a contract, the contractor will prepare a final system design for review and approval. The final system design should specify the equipment to be used and the layout of the system on the roof.

The design phase should include a structural analysis of the roof. The structural analysis will determine what structural improvements, if any, will be required and what these improvements will cost. This is to ensure that the roof will be able to support the proposed solar system proposed (taking into account other weight on the roof, including potential snow load). The project owner(s) should confirm ahead of time if an allowance for this expense is included in the contract.

If structural upgrades are required, the structural engineer and contractor will determine the exact costs and provide these costs to the owner(s). Any necessary structural improvements should to be factored into the construction budget and timeline and could adversely affect the economic attractiveness of the project.

The contractor will propose the components for the system (modules, inverters, and monitoring devices) and identify where each element will be located. Some components will be on the roof while others, such as inverters and metering equipment, may be located by the electric service panel. You should talk to your solar contractor about these issues and the options associated with locating this equipment. Often, there are concerns about the equipment location and appearance. For example, should components or conduits be painted to meet the aesthetic concerns of the association?

By the end of this effort, the contractor should have a drawing set for construction.

- **If the project is no longer viable based on the design phase analysis, pay for the completed work and cancel the construction phase of the contract.**

Final Design Approval and Start of Construction Authorization

The project owner(s) should review and formally approve the design documents prepared by the contractor before construction is authorized.

Municipal Building Permitting and Interconnection Application

Your solar contractor should be responsible for submitting all paperwork necessary to start construction. This includes obtaining building and wiring permits from your municipality, and submitting an application to your electric utility for interconnection approval. The cost for obtaining building and wiring permits and any interconnection fees for the project should be included in the construction contract.

Your contractor will coordinate the completion of the necessary paperwork. For the interconnection application, the contractor will want information about the applicable utility electric account. If the PV system is interconnecting through an association's common meter, there will only be one interconnection application, signed by a trustee or another authorized agent of the association. If the system is interconnecting to individual condominium units, there will be an application for each condo unit, signed by the condominium unit owner.

Construction

The contractor and the project owner(s) should have meetings during which the contractor provides updates on construction progress. Periodic roof assessments during and after construction may be worthwhile. A construction schedule should have been included in the project contract. The contractor should be responsible for adhering to the construction schedule, and the project owner(s) should formally approve any changes to the schedule.

Commissioning the System

Once the construction is complete, the project owner(s) should require that the contractor commission the equipment to confirm that all components are operating properly.

Municipal Inspections and Interconnection

The contract should provide that the contractor's work will not be deemed complete until the municipality inspects the system and confirms that all aspects of the installation conform to Massachusetts building and electrical codes. The project will require a final wiring inspection, followed by a final building inspection. The contractor should coordinate these inspections.

The contract should provide that the contractor's work will not be deemed complete until the municipality inspects the system and confirms that all aspects of the installation conform to Massachusetts building and electrical codes.

After the inspections are successfully completed, the contractor should notifiy the participating utility. The utility must then agree that the PV system can interconnect to the power grid. The contractor should coordinate the final interconnection approval. The contractor can begin the interconnection approval process prior to obtaining to municipal permits.

When all these approvals are secured, the system can be turned on so it will produce electricity.

Project Closeout

With the project complete, the condominium's new PV system should now produce electricity. Before making a final payment, you should confirm that the contractor has adequately completed all contractual responsibilities.

As part of the project closeout process, the contractor should provide copies of technical manuals, equipment specification sheets, as-built design drawings, and warranties. The contractor should also provide training to the project owner(s) or interested parties about safety, and if applicable, system operations and maintenance.

Homeowner Insurance

The project owner(s) should notify the home insurance company and the master insurance company that the PV system has been installed on the roof. This ensures that if there are damages to the system or related to the system, you can file an insurance claim. The insurance company will confirm whether the system is protected with existing coverage or advise if a separate rider is necessary to cover the system.

SECTION 5

Operating and Maintaining the System

One of the great features of a PV system is that, once installed, it typically requires little maintenance. If performing system upkeep is a concern it may be possible to contract with your installer or a third-party to conduct periodic operations checks and system maintenance.

It is important to make sure that no shading of panels occurs over time due to vegetation growth or future placement of equipment or obstructions on the roof that block the panels from direct sunlight. Any such shading, even when it is temporary (i.e., only for a short time during the day) will reduce the electricity production of the system.

It is important to make sure that no shading of panels occurs over time due to vegetation growth or future placement of equipment or obstructions on the roof that block the panels from direct sunlight. Any such shading, even when it is temporary, will reduce the electricity production of the system.

DAS Requirement

PV systems will typically come with a Data Acquisition System (DAS) that allows for web-based data monitoring. This should have been specified in your contract. The DAS can be configured to send email alerts when the system is not working properly and requires maintenance. Talk to your contractor about email alert options. Through the internet, you can view the daily energy production as well as factors that affect production such as the amount of sunlight and the ambient air temperature.

Once a month, the DAS will report the production data from your PV system to the Production Tracking System (PTS) of Massachusetts. The PTS records solar energy production from your system every month for SREC II purposes.

Keep in mind that while solar panels themselves may have a lifespan of 30 years or more, components such as inverters may need to be replaced sooner.

APPENDIX A

Condominium PV Checklist

1. Is the Building Right for Solar?

STEP 1: CONFIRM THAT THE BUILDING GETS ENOUGH SUNLIGHT

- If the roof has good to excellent solar access, proceed to Step 2.
- If the roof has little or no solar access, the project may not be worth pursuing at this time.
- If you are unsure, ask a solar contractor to evaluate the building's solar access.

STEP 2: CONFIRM THAT THE ROOF IS READY FOR SOLAR

- If the remaining roof life is less than 5 years, replace the roof now and install solar or wait until end of the roof's life to install solar.
- If the remaining roof life is 5 to 15 years, replace the roof now and then install solar or wait until end of the roof life to install solar; or repair the roof to extend its life (there should be at least 15 years of remaining life) and then install solar; or install solar now on the existing roof (factoring in future costs to remove and reinstall solar panels when re-roofing occurs) and replace the roof later.
- If the remaining roof life is greater than 15 years, proceed to Step 3.

STEP 3: GAUGE THE INTEREST OF THE ASSOCIATION TRUSTEES AND OTHER UNIT OWNERS

- If there is sufficient support for the solar PV project idea, share it with the association trustees.
- If the association agrees that this project is worth considering further, seek out a solar contractor to provide the expert support needed to address technical questions.

STEP 4: ENGAGE A SOLAR CONTRACTOR TO PROVIDE TECHNICAL ADVICE

- After considering the following questions, if the contractor feels that the project is viable, return to the association to share information, get feedback, and seek the approvals necessary to proceed.
  - ✓ Is the building located in a special utility network area?
  - ✓ How much roof space is there for solar, eliminating areas that are shaded or have other uses?
  - ✓ Will the roof structure support the weight of the solar panels?

✓ Will the municipality's Historical Commission object to a solar project at that location? If so, see the Massachusetts solar zoning bylaw (*www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/model-solar-zoning-documents.html*) for how to address this issue.

2. Project Options and Securing Association Approval

DECIDE ON TYPE OF CONDOMINIUM PROJECT

☒ Determine what type of project makes the most sense for the condominium and secure necessary approval based on project type:

- Association Project
- Unit-Owner Project
- Joint Unit-Owner Project
- Off-site Community Shared Solar Project

☒ Estimate Project Costs and Economics

- Ask the solar contractor to prepare a rough estimate of the PV system's economics.
- Take into account the solar capital subsidies, tax credits, and production incentives that are available for solar projects.
- Assess the financing options for the PV system.

4. Project Design and Construction

SELECT A SOLAR PV INSTALLATION CONTRACTOR

- Seek out several qualified solar contractors and secure quotes from them:
  - Quotes from contractors should include pricing for both design and construction.
  - Each contractor should confirm building information and take responsibility for its accuracy.
- Schedule a site visit for prospective contractors.
- Select a contractor based on cost, qualifications, and work style.

CONTRACTING

- Review the contractor's contract and negotiate terms as necessary.
- Ensure that the contract reflects the representations made during the proposal process and subsequent negotiations.
- Ensure that the contract specifies what is covered in the design phase and in the construction phase of the project, including deliverables, separate prices for design and construction, and a payment schedule. The contract should allow the buyer to opt out of construction at the end of the design phase.

- Have your attorney review the final contract prior to executing it.
- Do not allow construction to begin until the certificates of insurance for the contractor and subcontractors are received.

SYSTEM DESIGN

- Confirm the design phase contract includes the cost for providing a structural analysis.
- If structural upgrades are required, ensure that exact costs and a full scope of work are factored into the project's construction budget and timeline.
- Have the contractor prepare design and construction drawings.

APPROVE FINAL DESIGN AND AUTHORIZE START OF CONSTRUCTION

- Review and formally approve the design documents prepared by the contractor.
- Ensure the roof warranty provider has approved contractors design documents.
- After approving the design, authorize the start of construction.

MUNICIPAL BUILDING PERMITS AND INTERCONNECTION APPLICATION

- Confirm that costs for the building and wiring permits and interconnection application are included in the contract.
- Confirm that contractor completes all the paperwork necessary to start construction, including obtaining building and wiring permits from the municipality and submitting an interconnection application to the utility.

CONSTRUCTION

- Hold regular meetings with the installation contractor to get updates on construction progress.
- Formally approve any changes to the construction schedule included in the contract.

COMMISSIONING THE SYSTEM

- Ensure that the contractor tests all equipment to verify that is operates properly.

MUNICIPAL INSPECTIONS AND INTERCONNECTION

- Ensure that the contractor arranges for municipal wiring and building inspections.
- Ensure that the contractor coordinates the final interconnection approval.

PROJECT CLOSEOUT

- Before making final payment:
  - ✓ Confirm the contractor has met all contractual responsibilities.
  - ✓ Ensure you have received technical manuals, equipment specification sheets, as-built design drawings, and warranties.
  - ✓ Insist on receiving training about safety and, if applicable, system operations and maintenance.

HOMEOWNER INSURANCE

- Notify the homeowner insurance company and the master insurance company that the PV system has been installed. Add supplemental coverage if it is adviseable.

5. Operating and Maintaining the System

- Have the PV system inspected periodically to ensure that all hardware and wiring is intact and that the system is functioning properly.
- Take care that no shading of panels occurs over time due to vegetation growth or future placement of equipment or obstructions on the roof that block the panels from direct sunlight.
- Use the web-based Data Acquisition System (DAS) to monitor energy production.
- Have the DAS configured so you receive email alerts when the system is not working properly or requires maintenance.

APPENDIX B

Example Grant of Easement

Engage your own attorney before executing any easements or legal documents

THIS GRANT OF EASEMENT ("Agreement") is made this ____ day of _____, 20__ by and between the undersigned members of the Board of Trustees of the _____Condominium Trust (hereinafter referred to as the "Board") under Declaration of Trust (the "Declaration") dated _____ and recorded with _____ Registry of Deeds (the "Registry") in Book _____, Page _____, and _____ (the "Unit Owner").

WHEREAS, the Board is the owner of the condominium known as _____ (the "Condominium"), located at _____in _____, Massachusetts , created by Master Deed recorded with said Deeds in Book ___, Page ___ (the "Master Deed");

WHEREAS, the Unit Owner is the owner of Unit _____ (the "Unit") of the _____ Condominium by unit deed dated _____ and recorded with said Deeds in Book _____, Page _____; and

WHEREAS, the Unit Owner desires to install a solar photovoltaic system (together, with all appurtenances and connections, hereinafter referred to as the "Equipment") on a portion of the common roof (the "Roof") of the Condominium building, located directly above the Unit and connecting to the Unit through other common areas of the Condominium, all as shown on the Plans, defined below (all such equipment, together with all appurtenances and connections, is hereafter referred to as the "Equipment"); and

WHEREAS, the Unit Owner has submitted plans and specifications (together, the "Plans") for installation of the Equipment on the Roof to the Board, which Plans have been approved by the Board; and

WHEREAS, the Board has agreed to grant the Unit Owner an easement to install and maintain the Equipment on the Roof above the Unit ("Easement Area") in accordance with the Plans; and

WHEREAS, the Unit is the only unit immediately adjacent to the Roof on which the Equipment will be installed and no other Unit Owners are required to consent to this grant of easement pursuant to the provisions of G.L. c. 183A, Section 5(b), as amended;[1]

1 Note that if this clause cannot be stated with certainty, the easement needs to address other required approvals.

NOW THEREFORE, in consideration of the above recitals which are hereby affirmed and for consideration of less than One Hundred Dollars ($100.00) paid, and in mutual consideration of the covenants contained herein, the parties hereto agree as follows:

1. The Board hereby grants the Unit Owner the right and easement to install the Equipment on the Roof above the Unit and to connect the Equipment to the Unit through the common areas of the Condominium in the Easement Area in accordance with the Plans and to operate, maintain, repair, replace and decommission said Equipment at any time and from time to time as deemed necessary by the Unit Owner in its reasonable discretion. The Board further grants the Unit Owner the right to access the Roof and common areas of the Condominium at any time and from time to time, upon prior notice to the Board (except in the case of emergency) in order to exercise the easement and rights granted hereunder. Installation shall remain the personal property of the Unit Owner and no part of it shall become or be deemed a fixture, notwithstanding the manner in which the Equipment may be attached to the Roof or other common areas of the Condominium and the Board shall have no right, title or interest in the Equipment or any component thereof, notwithstanding that such Equipment or portions thereof may be physically mounted or adhered to the Roof and other common areas of the Condominium. Installation shall be performed by a qualified and insured contractor, in a good and workmanlike manner and pursuant to all applicable permits required by the City/Town of _____, copies of which shall be provided to the Board prior to installation. The Unit Owners shall also provide the Board with a certificate of the contractor's insurance, in such form and amount reasonably satisfactory to the Board, naming the Board as an additional insured.

2. None of the Equipment shall constitute Common Elements of the Condominium and the Unit Owner shall be solely responsible for maintaining, repairing and replacing the Equipment as the Unit Owner deems necessary from time to time, at the Unit Owners' sole cost and expense, except for damage caused by the Board, its agents, servants and employees which damage the Board shall repair in a good and workmanlike manner within twenty (20) days of being notified of such damage by the Unit Owner. The Unit Owner shall arrange for disconnecting and temporarily removing the Equipment when requested by the Board, in its commercially reasonable discretion, solely for the purpose of repair and/or replacement of the Roof, its appurtenances or building components. The Unit Owner shall pay for all costs related thereto, including any costs of re-installation, provided that the Board shall make reasonable efforts to avoid and minimize any need for repair or re-installation.

3. The Unit Owner shall be responsible for removing snow and ice from the Easement Area, at their sole cost and expense, as directed by the Board. Upon failure to do so after reasonable notice, the Board may perform such removal of the Equipment. The Unit Owner shall not conduct or permit activities on or about the portion of the Roof on which the Equipment is located that have a reasonable likelihood of causing damage or impairment to, or otherwise adversely affecting, the Equipment. Without limiting the generality of the foregoing, the Board shall not erect or permit the erection of any temporary or permanent equipment or structures that block or impede the access of sunlight to the Equipment and the Unit Owner shall be entitled to remove, store, and dispose of any such equipment or structures that the Board does not remove within thirty (30) days of notice of the need for such removal delivered by the Unit Owner to the Board and charge all costs thereof to the Unit Owner as a common expense pursuant to Paragraph 8 below.

4. The Unit Owner shall not remove the Equipment without prior written notification to the Board, and in case of such removal, the Unit Owner shall restore the portion of the Roof and other common areas affected thereby to approximately the same condition they were in prior to the installation thereof, reasonable wear and tear and damage by fire or other casualty excepted (the "Restoration").

5. The Unit Owner shall indemnify and hold harmless the Board, its agents, servants and employees, and the other unit owners of the Condominium for and from any and all damage or loss to persons or property resulting from the installation, use, maintenance, repair or removal of the Equipment, except to the extent caused by the negligence or willful misconduct of an indemnified party hereunder.

6. Upon failure of either party (the "Defaulting Party") to perform any of its obligations pursuant to this Agreement within sixty (60) days after written notice thereof from the other party (the "Non-Defaulting Party") (except in case of emergency), the Non-Defaulting Party may proceed to perform said obligations on the Default Party's behalf. All reasonable costs incurred by the Non-Defaulting Party in the performance thereof shall be charged to the Defaulting Party and paid promptly upon request. Upon such default of the Unit Owner, the Board may also terminate the Unit Owner's rights hereunder by written notice to the Unit Owner, and require the Unit Owner to perform the Restoration.

7. The foregoing shall not be construed as a limitation of the remedies available to a Non-Defaulting Party upon a default by a Defaulting Party hereunder, at law or in equity, which remedies shall be cumulative and not exclusive.

8. The Unit Owner agrees to pay all reasonable costs incurred by the Board in connection with this Agreement, including, but not limited to, legal and professional fees as required by G.L. c. 183A. In addition, all reasonable costs incurred by the Board in the enforcement of this Agreement, including reasonable attorneys' fees, shall be assessed to the Unit Owner. Such costs, together with any other reasonable costs or expenses assessed to the Unit Owners by the Board pursuant to this Agreement, and all costs of collection (including reasonable attorney's fees), shall constitute a lien on the Unit until paid, and may be collected by the Board in the same manner as unpaid common charges.

9. The Board acknowledges and agrees that it is satisfied that the Roof of the Condominium is structurally capable of handling the Equipment and that it is not relying on any representations of Unit Owner in this regard. The Board further represents to the Unit Owner that installation and operation of the Equipment will not void any roof warranty in connection with the Roof. The Board represents and warrants to the Unit Owner that there is no existing mortgage recorded against the building of which the Roof is a part or other matter of record that might prohibit or materially interfere with this Agreement, that this Agreement has been approved by the Unit Owners in accordance with all applicable provisions of the Master Deed, the Declaration and the Bylaws of the Condominium and in accordance with applicable law, and that the Board has been duly authorized and directed to enter into this Agreement with the Unit Owner.[2]

2 Note that the Board and the Unit Owner should check the building's title for existing mortgages and other problematic items of record.

10. This Agreement shall constitute a covenant running with the land, and shall inure to the benefit of, and be binding upon, any successors in title to the Unit Owner and the Board, and may be amended only by an instrument in writing signed by the Unit Owner and the Board.

Executed under seal this _____ day of _____, 20__.

A MAJORITY OF THE TRUSTEES
OF THE CONDOMINIUM TRUST

(_____
(
(_____
(
(_____

_____ _____

Unit Owner

COMMONWEALTH OF MASSACHUSETTS

COUNTY OF _____, ss

On this _____ day of _____, 20__, before me, the undersigned notary public, personally appeared the above-named _____, Trustee as aforesaid, proved to me through satisfactory evidence of identification, which was _____, to be the person whose name is signed on the above document, and acknowledged to me that _____ signed it voluntarily for its intended purpose.

_____
Notary public

My commission expires: _____

APPENDIX C

Draft Condominium Association Policy Regarding Installation of Solar Panels

Engage your own attorney before executing any easements or legal documents.

The following Rules apply to all Solar Panel Installations. Any unit owner desiring to install a Solar Panel System in the Condominium's common areas including but not limited to the roof must complete an application in a form approved by the Trustees together with plans and specifications for the proposed installation.

1. Plans and Specifications

The Plans and Specifications for the Solar Panel System must be satisfactory to the Trustees and include at a minimum as built Plans depicting the location, size, materials and color of all Solar Panels and appurtenances such as wiring, including how and where all wiring or conduit will be anchored. A structural engineering assessment of the roof structure and an analysis of the roof warranty may also be required.

2. Installation

No installation of a Solar Panel System can be performed unless and until the Trustees have approved the application for installation including the plans and specifications, contractor's insurance and permits. Thereafter, the approval, if any, will be in the form of a recordable Easement Agreement which will be discussed below.

The Trustees may in their discretion approve or deny the application or approve the application with conditions including the payment of a fee to the Association for the exclusive use of the common area. When the application is complete the Trustees will endeavor to respond to the application within a reasonable time after submission depending upon the Trustees' meeting schedule.

3. The Easement Agreement

As a condition of approval the unit owner will be required to enter into a recordable Easement Agreement with the Trustees for the exclusive use of the Condominium's roof in a form to be determined by the Trustees.

The Easement Agreement will be prepared by the Association's counsel and will include but not be limited to the following conditions:

A. The unit owner is responsible for the cost to install, repair and maintain the Solar Panel System.

B. The unit owner is responsible for any damage attributable to the installation of the Solar Panel System and will indemnify and hold harmless the Association and the other unit owners from any harm or damage caused by the Solar Panel System.

C. The unit owner must insure the Solar Panel System at his/her cost and expense and name the Association on the certificate of insurance as an additional insured. The form and amount of the insurance must be satisfactory to the Trustees.

D. If the unit is sold or transferred, the new unit owner will be subject to the same conditions set forth in the Easement Agreement which will run with the unit.

E. All costs incurred by the Association related to the application for installation of the Solar Panel System including but not limited to the Association's attorneys fees for drafting, completing and recording the easement agreement will be paid by the unit owner.

F. If repairs to the roof are required at any time in the sole discretion of the Trustees the unit owner will be responsible for removal and replacement of the Solar Panel System within a time frame determined by the Trustees.

IV. Deposit

At the time the application is approved and the easement agreement is signed in addition to the costs forth herein the unit owner will pay a deposit of $1,000.00 to be held by the Association while the Solar Panel System is on the roof. The deposit will be refunded to the then-owner of the unit if and when the Solar Panels are removed and the roof is restored at unit owner expense to its original panel-less condition.

U.S. Department of Energy SunShot Initiative

This guide was prepared by the Clean Energy States Alliance and the Massachusetts Department of Energy Resources through the New England Solar Cost-Reduction Partnership, a project under the U.S. Department of Energy SunShot Initiative Rooftop Solar Challenge II program. The New England Solar Cost-Reduction Partnershipis working to build the regional solar market by targeting non-hardware "soft" costs for photovoltaic (PV) electricity systems and increasing coordination across Connecticut, Massachusetts, New Hampshire, Rhode Island, and Vermont.

The U.S. Department of Energy SunShot Initiative is a collaborative national effort that aggressively drives innovation to make solar energy fully cost-competitive with traditional energy sources before the end of the decade. Through SunShot, the Energy Department supports efforts by private companies, universities, and national labora-tories to drive down the cost of solar electricity to $0.06 per kilowatt-hour. Learn more at *energy.gov/sunshot*.

Massachusetts Department of Energy Resources

Creating a Cleaner Energy Future for the Commonwealth

The Massachusetts Department of Energy Resources (DOER) develops and implements policies and programs aimed at ensuring the adequacy, security, diversity, and cost-effectiveness of the Commonwealth's energy supply within the context of creating a cleaner energy future. To that end, DOER strives to:

- Ensure deployment of all cost-effective energy efficiency
- Maximize development of clean energy resources
- Create and implement energy strategies to assure reliable supplies and improve the cost of clean energy relative to fossil-fuel based generation
- Support Massachusetts' clean energy companies and spur Massachusetts' clean energy employment

DOER is an agency of the Executive Office of Energy and Environmental Affairs (EEA). Learn more at *www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/doer/*.

Clean Energy States Alliance

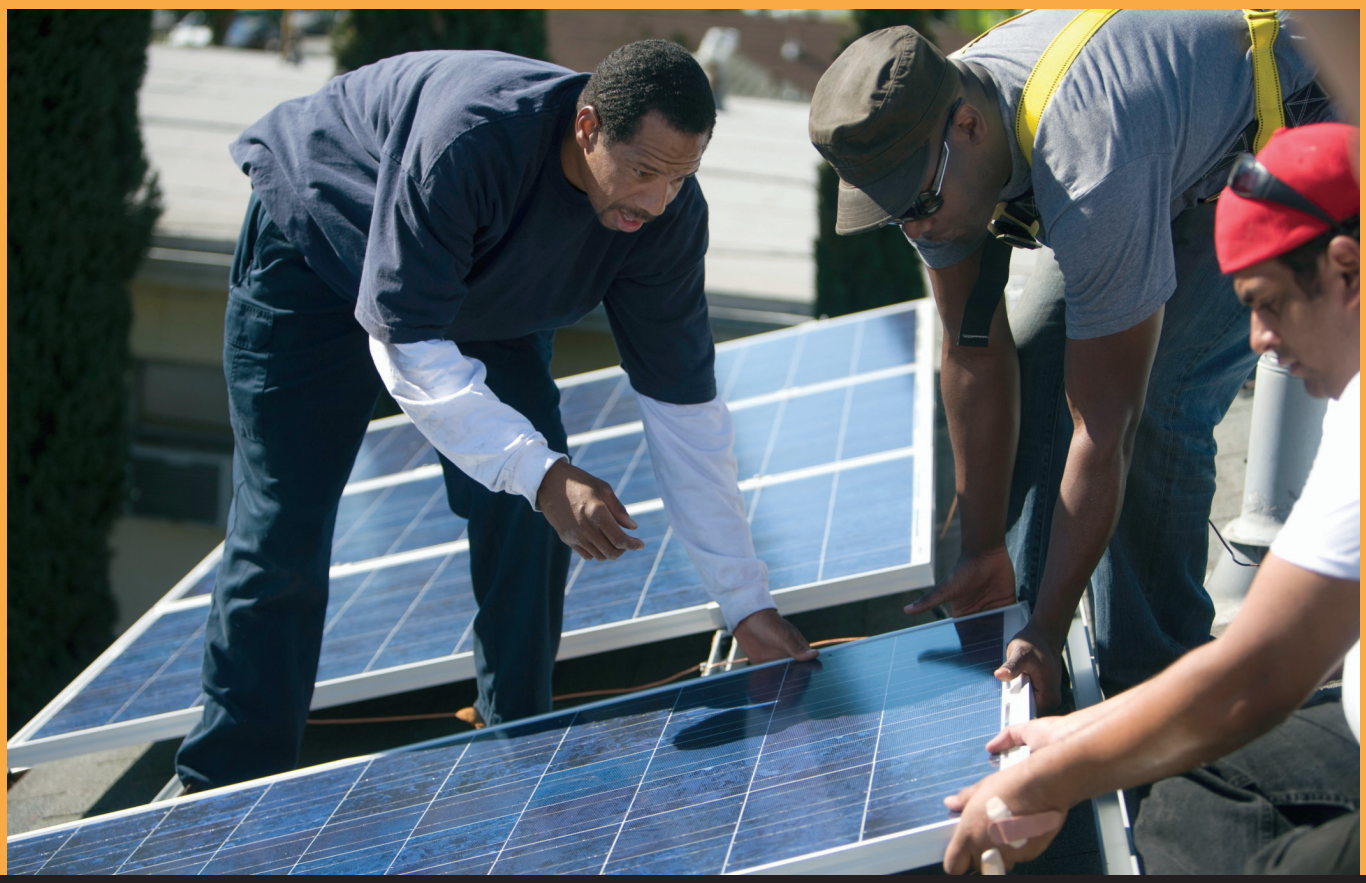
Clean Energy States Alliance (CESA) is a national, nonprofit coalition of public agencies and organi-zations working together to advance clean energy. CESA members—mostly state agencies—include many of the most innovative, successful, and influential public funders of clean energy initiatives in the country.

CESA works with state leaders, federal agencies, industry representatives, and other stakeholders to develop and promote clean energy technologies and markets. It supports effective state and local policies, programs, and innovation in the clean energy sector, with emphasis on renewable energy, power generation, financing strategies, and economic development. CESA facilitates information sharing, provides technical assistance, coordinates multi-state collaborative projects, and communicates the positions and achievements of its members. Learn more at *www.cesa.org*.

Powered by SunShot U.S. Department of Energy

DOER Massachusetts Department of Energy Resources

CleanEnergy States Alliance



A Solar Guide for Condominium Owners and Associations in Massachusetts

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DOER is an agency of the Executive Office of Energy and Environmental Affairs (EEA). Learn more at *www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/doer*.

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