An Introduction to Institutional Renewable Energy Procurement Options in Massachusetts

A Boston Green Ribbon Commission Report

Prepared by Meister Consultants Group
on behalf of the Boston Green Ribbon Commission

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BOSTON Green Ribbon COMMISSION

MEISTER CONSULTANTS GROUP

A. THE CONTEXT: DRAMATIC DECLINES IN RENEWABLE ENERGY COSTS MAY ALLOW INSTITUTIONS TO LOCK IN LOW ENERGY PRICES

Renewable energy costs have decreased dramatically in recent years. For example, installed costs for solar PV in the US fell by nearly 52% between 2009 and 2014 alone (see Figure 1). Declining prices have led to a boom in renewable energy: in 2014 solar photovoltaic (PV) installations were 30 percent higher than 2013 and more than 12 times the amount installed in 2009, bringing total US installed PV capacity to 18 GW. The US wind power industry also continues to see year-on-year growth with total installed capacity of 63 GW—almost double the installed wind capacity in 2009. In the past, renewable energy was typically purchased at a premium; however, today there are innovative opportunities to purchase renewable energy at a savings—both for onsite generation and also purchases of energy generated offsite.

Figure 1 - US Average Installed Cost for Behind-the-Meter PV

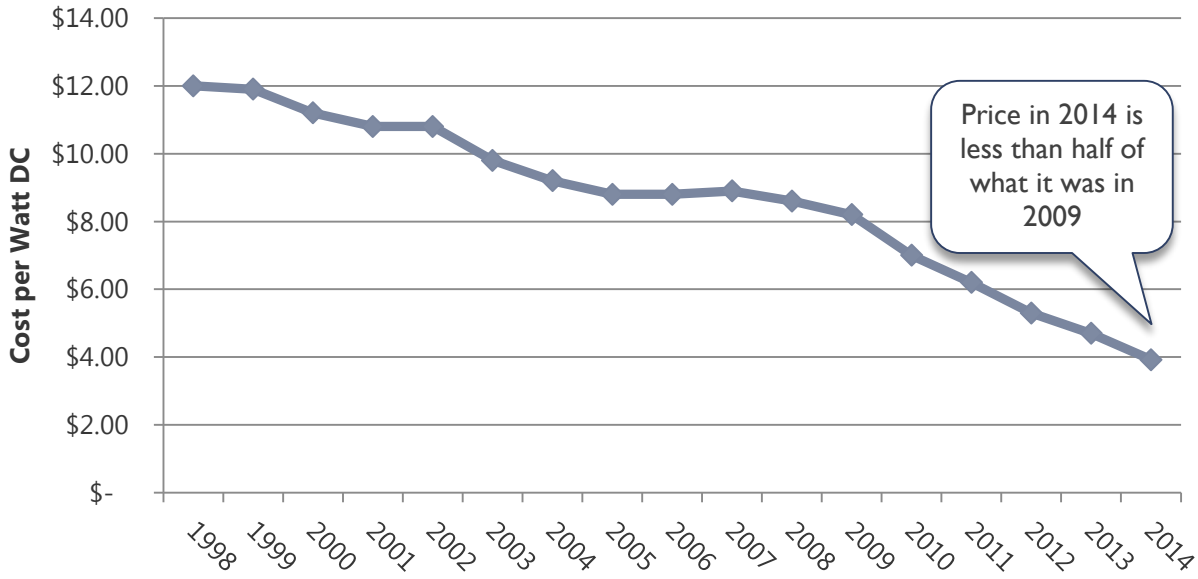


Figure 2 - US Cumulative Installed PV Capacity by Year

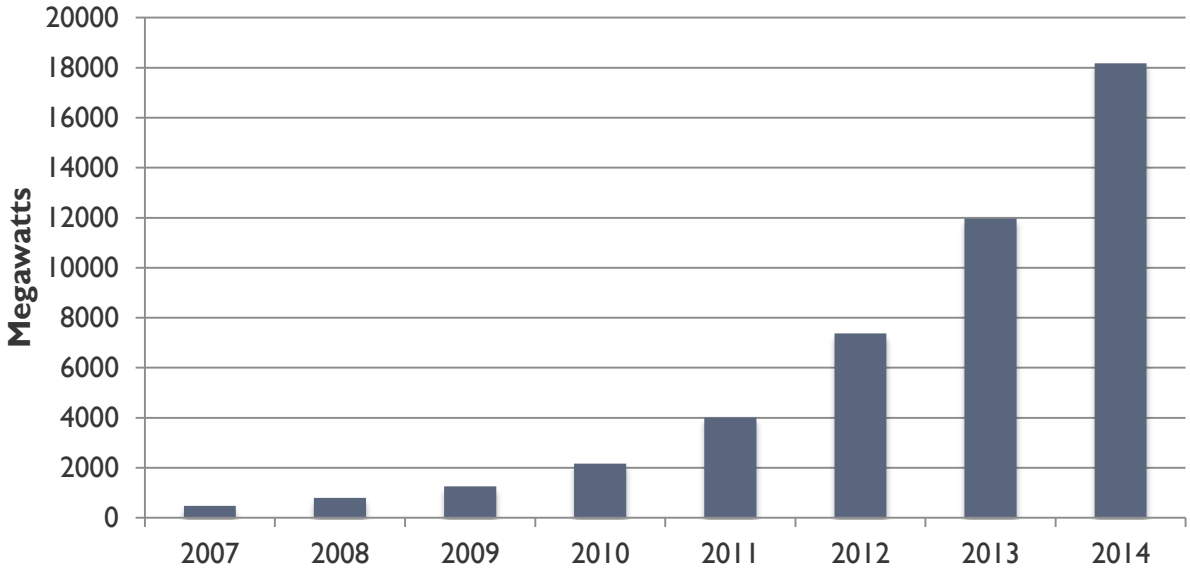
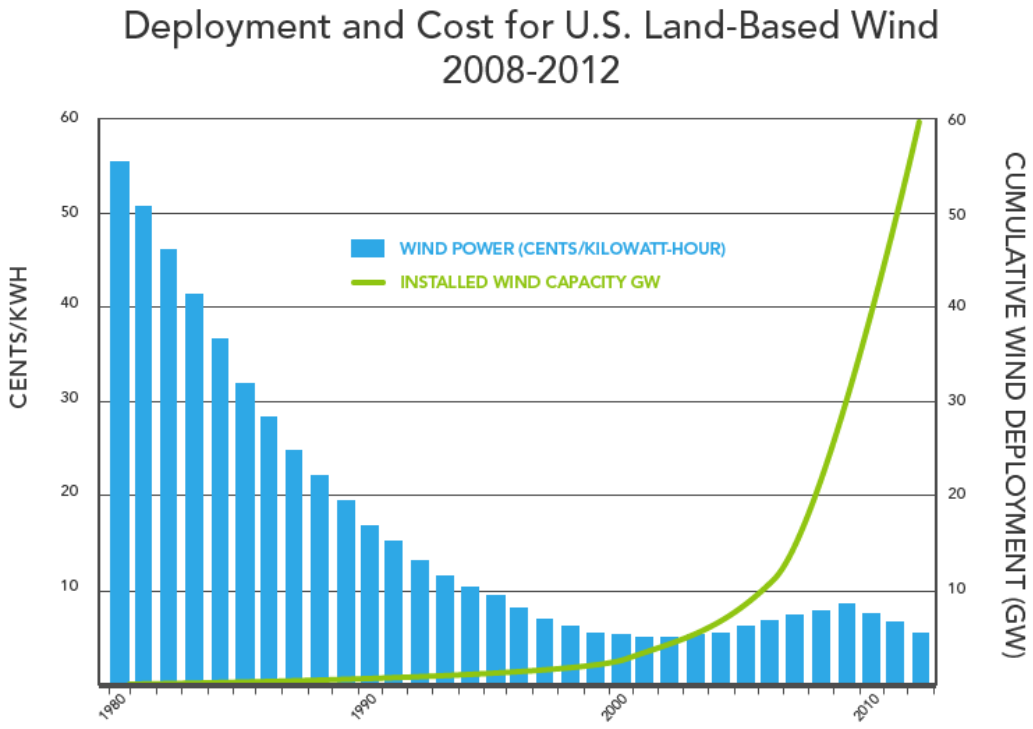


Figure 3 - US Cumulative Installed Wind Capacity by Year



These significant price drops create opportunities for large institutions to save money by procuring renewable energy. Because of their substantial demand, institutions can use their purchasing power to procure renewable electricity at substantial savings over both traditional sources of electricity and at prices lower than current retail rates. In addition to lower costs, renewable energy procurement allows institutions to lock in electricity costs for the next 20 years or more, creating a hedge against price volatility. Large institutions are also motivated to pursue renewable energy purchasing strategies in order to meet climate and sustainability goals.

The private and institutional sector has the potential to be a major driver of emissions reduction and clean energy growth. For example, it is estimated that corporations alone could double US demand for renewable energy through aggressive procurement.[1] Recently large corporations and other institutions have publicized investments in renewables that are unprecedented in size. These investments have been made by a range of different types of institutions and reflect a number of different purchasing strategies. Examples of these large projects are shown in Table 1:[2]

Box 1 – What is a Renewable Energy Purchase?

Adding to the complexity of a renewable energy purchase itself is that the term is difficult to define. In states with renewable portfolio standards, renewable energy certificates (RECs) are bought by the utility to meet their renewable energy purchasing obligations. By selling RECs to the utility, a renewable energy system owner is transferring their claim to the "environmental attributes" of the energy to the utility (these "benefits" are then passed along to all ratepayers). This affects who can claim the associated greenhouse gas emissions reductions: in some markets, the RECs should be held onto ("retired") by the system owner in order to make any emissions reduction claims. However, by investing in a renewable energy project, or signing a PPA an institution can be enabling the construction of renewable energy projects that would not have otherwise been built, even if the RECs are assigned to the utility and the environmental attributes shared among all ratepayers. There are basically three requirements for a renewable project to be built: 1) cash to build the project, 2) an offtaker for the power (buy the electricity/power purchase agreement), 3) offtaker for the RECs. Does participating in any of these three functions make one a "purchaser of renewable energy?" Should an institution be able to say they are purchasing renewable energy from a project even if they are not claiming the environmental benefits that go along with it? There remains no definitive answer and it depends on the overall goal of the institution and what the institution would like to claim (e.g. supporting renewable energy, buying "green" power, being an offtaker for a renewable energy project).

[1] http://www.epa.gov/greenpower/documents/events/webinar_20140930_touati.pdf
[2] http://www.forbes.com/sites/manishbapna/2015/02/23/what-do-apple-citi-and-shell-have-in-common/

Table 1 - Examples of large renewable energy procurement projects

THE GEORGE WASHINGTON UNIVERSITY WASHINGTON, DC	IKEA	KAISER PERMANENTE®
GWU signed a 20-year PPA to supply **50% of its electricity needs from solar projects** in North Carolina.	IKEA has **solar PV installed on 90% of its U.S. facilities** and purchased a **165MW wind farm** in Texas in late 2014.	Kaiser Permanente agreed to buy more than **150 MW of wind and solar power**, and to install **70 MW of solar arrays** at its CA facilities through NRG Energy.
amazon.com	GM	Google
Amazon announced it will invest in a **150 MW wind** farm to power its data centers in Indiana.	General Motors plans to build a **34 MW wind farm** to power manufacturing facilities in Mexico.	Apple is investing **$848 million** in First Solar's California Flats solar PV project.
		Google signed long-term contracts for **43 MW of wind energy** to help power its CA headquarters.

B. THE CHALLENGE: TRANSACTION COSTS CAN BE HIGH AND THE MARKET IS STILL EMERGING

Momentum for large institutional purchases is building, but barriers to nationwide scale-up remain. First, many large institutions are unaware of the opportunity presented by the rapidly changing renewable energy market. Second, the inertia of the status quo is strong and institutions may not have staff that are trained or empowered to explore renewable energy purchases. It is easier for staff to procure electricity through traditional electricity supply markets than to embark on "new" initiatives that are not central to either their job description or the core mission of the institution. Even when large institutions are aware of the opportunity, complexity remains. There is a general lack of standardization and transparency within the market, there is a diverse set of

expertise needed to evaluate deals, and there are comparatively few buyers and sellers.[3] The complexity of deals themselves from a legal and accounting standpoint can be daunting and deals can be delayed or breakdown if the financing and legal departments are not comfortable with the proposition. For example, it remains unclear whether a 20-year PPA must be reported on or off-balance sheet based on accounting standards, having significant financial implications for the institution.

In addition, the US has fifty different renewable energy policy environments. Each state offers different economic incentives for the development of renewable energy projects. As a result some procurement pathways may not provide savings if the state does not have incentive structures in place.

C. THE OPPORTUNITY: USING PROCUREMENT NETWORKS TO POOL BUYING POWER, RESOURCES, AND KNOWLEDGE

One possible solution for focusing resources, attention, and expertise on the renewable energy opportunity is to aggregate demand and create a network of institutions interested in procuring renewable energy. Such a network established through the GRC could provide a platform for sharing experiences and resources, combining purchasing power, finding experts, and broadcasting best practices and lessons learned. A place-based network has the potential to build on recent national examples in a streamlined and replicable manner. An aggregated purchase could build momentum for similar purchases by other institutions within Boston and serve as a template for other cities. Green power purchasing at scale could also make a significant contribution to meeting both City and State greenhouse gas emissions reductions goals.

This paper is intended to serve as an introduction for development of a GRC Working Group on renewable energy procurement. Near-term goals for this group going forward include:

- Understand the options for institutional clean power purchasing, including collaborative purchasing efforts.

[3] Contract terms regarding price have not been made public and so it is difficult to benchmark savings from renewable procurement deals thus far.

- Understand the current thinking and efforts at leading higher education and health care institutions regarding clean power purchasing.
- Explore whether or not collaboration in this area between the GRC Higher Education and Health Care working groups would be value added.
- Define specific next steps.

D. PROCUREMENT OPTIONS IN MASSACHUSETTS

There are numerous ways to procure renewable energy, some of which provide financial benefits while others exclusively provide environmental benefits (often at a price premium). This section provides a brief overview of the various options available to institutions, summarized in Table 2 and discussed in each subsection below.

Table 2 - Summary of Procurement Options

Option	Features	MA Context	Financial Implications
1. Renewable Energy Credit (REC) Purchase	The institution purchases RECs to match energy usage, therefore, "offsetting" traditional power purchases with "green" power.	There are a handful of utility REC programs and institutions could purchase REC from local or national REC retailers.	REC products cost a premium over current retail rates.
2. Direct Investment	The institution provides capital, debt, or Power Purchase Agreement (PPA) financing to a renewable project located on-site or offsite either through a direct purchase or PPA.	Massachusetts net metering and virtual net metering rules limit project sizes to 1MW or smaller for receiving a full-retail value credit.	In states with strong renewables policies, PPAs can be signed at rates lower than retail. PPA deals can also be completed with little or no up-front costs to the institution.
3. Competitive Supply	In deregulated markets like Massachusetts, institutions can purchase energy from an alternative supplier than the default	Massachusetts has a number of competitive suppliers and some of	Financial impacts vary. Some are slightly more, some less and some

	utility and the alternative supplier can offer renewable energy.	them offer renewable energy options.	roughly the same costs as traditional sources.
4. Synthetic Power Purchase Agreement (PPA)	A financial transaction where the power is delivered to the grid and the institution benefits from a hedge contract.	Synthetic PPA structures are available anywhere depending on the structure of the deal.	Synthetic PPA contracts can provide savings or hedge via locking-in current electricity rates.

D.1 OPTION 1: GREEN TAGS/RECS (GREEN POWER PROGRAM)

One of the simplest ways for an institution to associate its electricity consumption with renewable sources of energy is to participate in a green power purchasing program. Doing so can involve purchasing green power through the institution's electricity provider or purchasing the environmental attributes of renewable electricity—in the form of renewable energy certificates (RECs)—from third-party suppliers. The latter is a common way to "green" the electricity that institutions purchase from the grid. Currently about 75% of large institutional purchases of renewables is in the form of RECs.[4]

Utility green power programs. Purchasing a green power product directly from a utility typically involves paying a premium on top of the electric bill (in Massachusetts, somewhere between 0.5-6.5 cents/kWh) in order to support the utility's investments in renewable energy projects. The utility then uses the premium to purchase Renewable Energy Certificates (RECs) on behalf of the customer. RECs can also be referred to as green tags, or green certificates. The premium is often tied to a certain amount of electricity (e.g. 100kWh blocks), making it easy for an institution to match the purchase to its own power consumption. In Massachusetts, programs from Eversource,[5] National Grid (NGRID), Braintree, Concord, Shrewsbury, and Wellesley utilities support local solar, wind, and small hydro projects.[6] Eversource's program, NSTAR Green, will be terminated in mid-2015; however, NGRID's GreenUp[7] program is still available.

[4] http://www.epa.gov/greenpower/documents/events/webinar_20141007_capitalpartnerssolarproject.pdf
[5] Formerly known as NSTAR.
[6] http://www.concordma.gov/Pages/ConcordMA_TownManager/townreport06/Light_Plant/conservation.html; http://apps3.eere.energy.gov/greenpower/markets/pricing.shtml?page=2&companyid=750; http://apps3.eere.energy.gov/greenpower/buying/buying_power.shtml?state=MA
[7] https://www.nationalgridus.com/masselectric/business/energychoice/4_greenup_provider.asp

Third party suppliers. The alternative to utility green pricing programs is to purchase RECs from a third party supplier in amounts that match an institution's electricity bill. A REC represents the environmental attributes of one MWh of electricity from renewable energy, and is can be sold by a renewable energy project owner separately from the electricity generated by that project. An institution may thus claim to consume 100% green power if it matches its normal electricity bill to an equivalent quantity of RECs. Third party REC programs are more common than utility green pricing programs because they are logistically streamlined and many more suppliers offer them. Institutions in MA can purchase RECs from suppliers who source from New England projects, (e.g. the Massachusetts Energy Consumers Alliance offers New England-based green power purchase options[8]), or from suppliers brokering RECs from projects nationwide. The U.S. DOE's Office of Energy Efficiency and Renewable Energy and the EPA Green Power Program have compiled the various green power purchase options by state including both REC suppliers and purchasers.[9]

One disadvantage of this option is that Green Power programs do not typically offer any type of cost savings to the institution. Some critics have also questioned the effectiveness of REC-only-based green power programs in driving investment in new renewables, especially when the projects are located out-of-state or in states without a strong REC market.[10] State RPSs have specific rules regarding which out-of-state projects can supply RECs to meet RPS goals.[11] REC revenue can be a relatively small portion of the income stream of a project and therefore the sale of those RECs may not be of enough value to influence the construction of the project. Some have argued that if the REC purchase is not a meaningful driver of the project's development, then the purchase of these RECs is merely "greenwashing" and not really contributing to renewable project development or carbon reductions. In states where RECs are a critical part of the revenue stream of a project, these RECs are often prohibitively expensive. For example, SRECs in strong solar markets can cost upwards of $150-300/MWh (15-30 cents/kWh)[12] compared to "cheap" RECs that sell for 1-2 cents/kWh and are often sold after the project has been built. When an institution retains RPS compliance RECs, the market for renewable energy within that jurisdiction is expanded. Voluntary RECs not tied to a state RPS, however, are often seen as an after-thought and do not typically contribute to additional renewable energy development.

RECs and carbon offsets are not the same. Carbon offsets have different standards and reporting criteria that RECs. The predominant REC certification system in the U.S. is Green-e.[13] Non-profit groups such as Rocky Mountain Institute, World Resources Institute, and World Wildlife Fund

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[8] http://info.massenergy.org/nstargreen

[9] http://apps3.eere.energy.gov/greenpower/buying/buying_power.shtml?state=MA

[10] http://thinkprogress.org/climate/2011/06/07/238244/clean-energy-trainwreck-why-most-recs-are-bad-and-how-to-find-the-good-ones/

[11] http://www.cesa.org/assets/2014-Files/Potential-RPS-Markets-Report-Holt-January-2014.pdf However, it has been suggested that in-state preferences are un-constitutional in violation of the commerce clause. See: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2376411

[12] https://s3-us-west-2.amazonaws.com/pricingsheets/2015_04_02_SRECTrade_SREC_Markets.pdf

[13] http://www.green-e.org/

developed renewable procurement guidance, case studies, and criteria for purchasing renewable energy and RECS, and how to communicate the environmental benefits of these purchases.[14]

D.2 OPTION 2: DIRECT INVESTMENT IN CLEAN ENERGY PROJECTS

Large institutions can invest directly in clean energy projects – directly applying dollars to the capital cost of the project – located either on-site of off-site.[15] An institution can build and own a renewable energy project on-site (either by purchasing the project or via an on-site power purchase agreement), utilizing the power generated to offset its own electricity load; or it can invest in a project off-site without having any physical relationship to the power generated.

Massachusetts law requires investor-owned utilities to offer net metering to customers, which allows consumers to install renewables projects "behind their electric meters" and run the meter backwards when their system produces more power than the consumer uses. This excess is then converted into a dollar amount that is credited to the consumer's monthly electric bill.

On-site. When putting a renewable energy project on its own facility, an institution finances the project upfront (either with cash or via debt) and recoups this investment through its own energy savings and the sale of RECs or SRECs. Alternatively the institution signs a PPA agreement with a third party that owns and operates the project located on the institution's property. IKEA, for example, owns PV systems installed on 90% of its buildings in the U.S., totaling 38MW of capacity, while Staples has signed PPAs for on-site renewables at 37 of its U.S. facilities in seven states totaling 14MW of capacity.[16,17]

Off-site. Investment in an off-site renewable energy project can give an institution an equity holding in a project, to be recouped as the project earns money from the sale of its power or its environmental attributes (RECs). Alternatively an institution can sign a PPA and receive virtual net

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[14] See: WRI: http://www.wri.org/publication/corporate-renewable-energy-buyers-principles;
RMI: http://www.rmi.org/business_renewables_center;
WWF: http://wwf.panda.org/what_we_do/how_we_work/businesses/climate/climate_savers/;
CERES: http://www.ceres.org/resources/reports/power-forward-2.0-how-american-companies-are-setting-clean-energy-targets-and-capturing-greater-business-value

[15] A fourth possible way is via a tax equity investment; however, this option is of limited value to the current GRC working group since most universities and hospitals operate as not-for-profits and therefore do not have the requisite tax "appetite" to be a tax equity investor. If an institution does pay taxes, then the tax equity investment option could be compelling especially before the tax credit drops from 30% to 10% in 2017.

[16] http://www.bloomberg.com/news/articles/2014-11-18/ikea-buys-second-u-s-wind-farm-plans-more-in-renewables-push

[17] http://www.nrel.gov/docs/fy15osti/63216.pdf

metering credits from a project located off-site. This is only allowed in the 17 states that have authorized virtual (or sometime referred to as aggregate) net metering.[18]

Both on-site and off-site project can benefit from net metering. However, net metering rules place limits on the scale of renewable projects that can benefit from these policies.

Examples: Google, IKEA, Staples, Kaiser Permanente, Sprint, and numerous colleges and universities have utilized some form of the direct investment model (e.g. Ohio State, University of Oklahoma, Oklahoma State (these three universities also bought the RECs).

Box 2 - Net Metering and Virtual Net Metering in Massachusetts

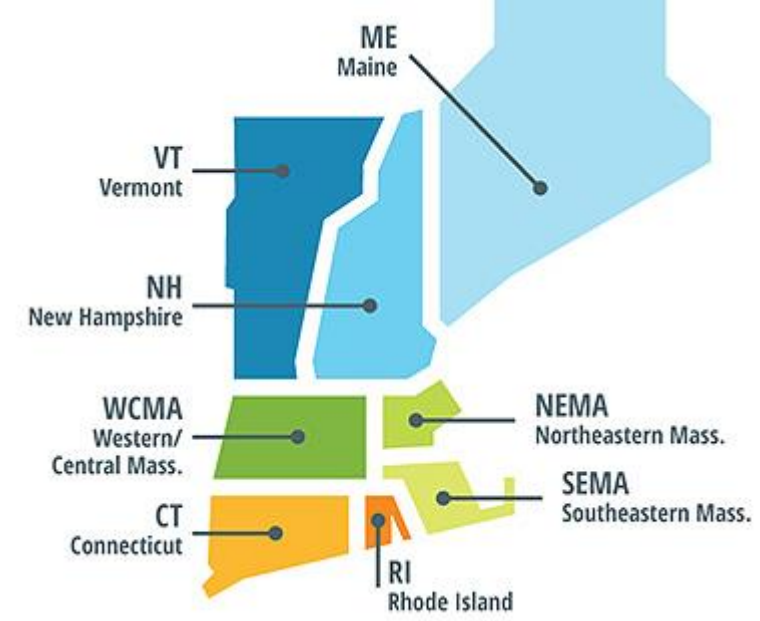
Massachusetts currently has one of the most progressive net metering rules in the country. Net metering allows a utility meter to spin both forwards and backwards depending on whether the property where the renewable energy project is located is using or producing excess energy. Excess energy that is produced is credited to electricity bills going forward. The monetary credits applied to electric bills are called net metering credits.

In most states the net metering credits can only be applied to an electric bill for the site where the actual renewable project is located. "Virtual net metering" rules in Massachusetts allow the excess electricity to be applied to *any* electric bill so long as it is within the same utility service territory and ISO-NE "load zone." The state is divided into 3 load zones (Northeast Mass/Boston (NEMA), Southeast Mass. (SEMA), and Western and Central Mass. (WCMA)). For example a project located within Eversource's territory and in the Northeast/Boston load zone can supply net metering credits to any other Eversource account in the Northeast/Boston load zone.

Virtual net metering allows institutions to receive net metering energy credits on their electric bills from projects located off-site. State law used to permit large, remote multi-megawatt scale facilities to virtual net meter electricity to multiple large loads. Current state net metering policies, however, encourage the development of small (<1MW) projects – and projects on rooftops, brownfields, or parking lots – rather than large off-site projects. Current policies also favor public offtakers instead of private offtakers of the power. The current net metering regime limits the market for off-site net metering credit PPA deals available to non-governmental entities.

[18] http://www.icleiusa.org/action-center/aggregate-net-metering-opportunities-for-local-governments

Figure 4 - ISO-NE Load Zones



While this is the general policy, there are a number of specific regulations that limit the application of virtual net metering:

- Net metering is allowed for agricultural (AG), wind, solar, and anaerobic digestion (AD) renewable technologies. However, the value of the net metering credits depends on the Class (size) of the project (See the Appendix for tables summarizing net metering class distinctions). Projects under 1MW (Class I and II) in size can offset nearly the entire retail cost of the bill, whereas projects over 1MW in size (Class III) do not offset the distribution half of the electric bill.[19] This essentially limits renewable projects that are net metered to 1 MW for private facilities.
- Solar net metering projects are limited in size to 6 MW for SREC eligibility, therefore solar projects over 6MW in size do not qualify for SRECs.
- The total amount of net metering is capped at 12% of each investor-owned utility's historical maximum demand. This is known as the net metering cap. 6% of the cap is reserved for public entities (municipalities) and 6% for private entities. The public cap in NGRID's territory is currently full with a waitlist.
- For solar projects the state incentive level varies depending on the location of the project. Solar PV projects larger than 650kW, and projects located on "greenfield" sites receive 70% of the total value of the SREC incentive. Small projects (under 25kW) and solar canopy projects get the full value of the SREC incentive. This structure encourages smaller projects and limits the number of large-scale projects developed in the state.
- In addition, the state limits SREC eligibility for "greenfield" solar projects and there is a waiting list to develop these types of projects.

D.3 OPTION 3: COMPETITIVE SUPPLY CONTRACT

In Massachusetts, the Electric Industry Restructuring Act of 1997 allows all Massachusetts customers to buy their electricity from a "competitive supplier" (i.e., an Electric Service Provider (ESP)) rather than from the distribution company. This form of competition for electric supply means that an institution can change electricity suppliers at the retail level or purchase electricity at the wholesale level if there is enough demand to make the transaction costs worthwhile. Changing electricity suppliers means that the institution is purchasing electricity from a different generator than the customer's traditional utility, but continuing to utilize the distribution utility and its infrastructure for the physical delivery of that electricity. An Electric Service Provider, which is independent from the utility, will be responsible for meeting the customer's electricity needs, and the utility will be responsible, as it was before, for providing reliable transmission and distribution services.

Most institutions are familiar with competitive supply contracts for the commodity portion of their electric bill. However, this option can be used to procure green power as well. Under this scenario the institution must select an ESP—in this case, a company explicitly offering clean power services—and negotiate a purchase agreement. The ESP will charge the customer for power, and the utility will charge for transmission and distribution. This arrangement requires a favorable administrative atmosphere: there must be a framework for cooperation between utilities and ESPs, involving paperwork that ensures that the ESP meets the requirements of state public utilities commissions, as well as the technical or financial requirements of the specific utility. The variety of ESPs varies by jurisdiction. Pacific Power utility in Oregon has approved three ESPs for its customers, while SCE and SDG&E in California offer over 20.[20] The scale of the agreement can also vary. Some large institutions have been able to negotiate their own supply contract with the existing distribution utility based on renewable generation, a strategy used by Facebook when procuring green power for one of its data centers in Iowa.[21] Some experts have suggested that the scale necessary for these types of transactions is a project in the 25-50MW range (equivalent of 25-60 million kWhs per year if using a solar PV project).

The territories in which competitive supply is available in Massachusetts are Fitchburg Gas & Electric Light Company d/b/a Unitil, National Grid, and Eversource, each of which offers a list of approved electricity suppliers and brokers on its website.[22]

Examples: Facebook was able to sign an agreement with MidAmerican Energy who owns and operates the wind farm that serves Facebook's energy load. Google has also used this model to

[19] Municipalities/Government entities can offset the distribution charge above 2MW and can install multiple "unit" of 2MW each and still net meter from each of these "units."

[20] https://www.pacificpower.net/bus/oda/ess.html; https://ia.cpuc.ca.gov/esp_lists/esp_udc.htm

[21] http://www.epa.gov/greenpower/documents/events/webinar_20140930_touati.pdf

[22] http://www.mass.gov/eea/energy-utilities-clean-tech/electric-power/electric-market-info/choose-supplier.html

procure renewable energy for its operations although publically available details on these transactions is limited.

D.4 OPTION 4: SYNTHETIC PPA

A synthetic PPA is a form of hedge, in which a renewable energy project sells its power into the open electricity market. However, unlike a direct access tariff, the project owner enters into a contract with a third party (e.g. an institutional client) that ensures a price floor on the market electricity rate. The institution and renewable energy project developer agree on a benchmark, or "strike" price, and if the market price of electricity falls below the strike price, the institution pays the difference to the developer; if the price of electricity rises above the strike price, the developer pays the difference to the institution. The institution is therefore able to lock-in a portion of its electricity supply at a given price and helps finance the project by providing a long-term contract to the project.

This arrangement simultaneously serves the needs of the developer and the institution that would both prefer fixed electricity rates. The developer gets a fixed price for the electricity generated by the renewable energy system, and the institution maintains a predictable cost for the electricity it consumes. In this arrangement, the developer secures a price floor that will enable the clean power project to be profitably developed, while the institution indirectly secures a price ceiling on its own electricity bill, as the difference between the strike price and the price it actually pays for its electricity will be paid back by the project developer.[23]

A synthetic PPA is a financial arrangement with complex elements and several different structures. It makes the most sense for projects within ISO/RTO territories like ISO-NE or PJM.[24] This option can deliver economic benefits to a commercial electricity customer while making a critical difference in the ability of a project developer to finance a renewable energy project.

Examples: Synthetic PPAs have been used by Google, Mars, Kaiser Permanente, and Microsoft. Mars signed a hedge contract with a Texas wind farm project (including the RECs) equal to 100% of Mars's U.S. electricity needs.

[23] http://www.chadbourne.com/SyntheticPowerContracts_projectfinance/
[24] http://www.nawindpower.com/issues/NAW1404/FEAT_02_Financing-Wind-Projects-With-Synthetic-PPAs.html

E. INITIAL STEPS FOR IMPLEMENTING A CLEAN ENERGY PROCUREMENT STRATEGY

Based on initial analysis the most compelling options for large-scale institutional procurement is to utilize options 3 or 4, where institutions would work with a competitive supplier to secure a long-term contract for renewables or contract with a renewable energy developer via a synthetic PPA (with or without RECs). Under Option 1, REC only purchases fail to offer any possibility of savings to an institution and under Option 2, current net metering rules limit the scale of projects to sizes of less than 1 MW.

Preparatory steps for any institution considering a clean energy procurement strategy include the following:

1. Determine the goal of the procurement (e.g. reduce energy costs, procure "green" energy, support local projects, on-site projects, or out-of-state projects)
2. Determine what staff resources and external expertise is needed to manage the project.
3. Determine the volume of kWhs to be purchased.
4. Identify appropriate stakeholders to involve, including in-house or external legal team that will be reviewing agreements and procurement documents.
5. Choose a procurement pathway (on-site, or off-site, technology, in-state or out-of-state).

APPENDIX:
NET METERING IN MASSACHUSETTS

Massachusetts Net Metering Class Distinctions	
Class Number	**Size of Facility**
Class I Net Metering Facility	Less than 60 kW
Class II Net Metering Facility	60 kW to 1 MW
Class III Net Metering Facility	1 MW to 2 MW

Components for the Calculation of Net Metering Credits		Units	Class I- Solar, Wind, AG, & AD	Class II	Class III
Delivery	**Distribution Charge**	¢/kWh	Y	Y	Only for Municipalities
	Transmission Charge	¢/kWh	Y	Y	Y
	Transition Charge	¢/kWh	Y	Y	Y
Supply	**Basic Service**	¢/kWh	Y	Y	Y

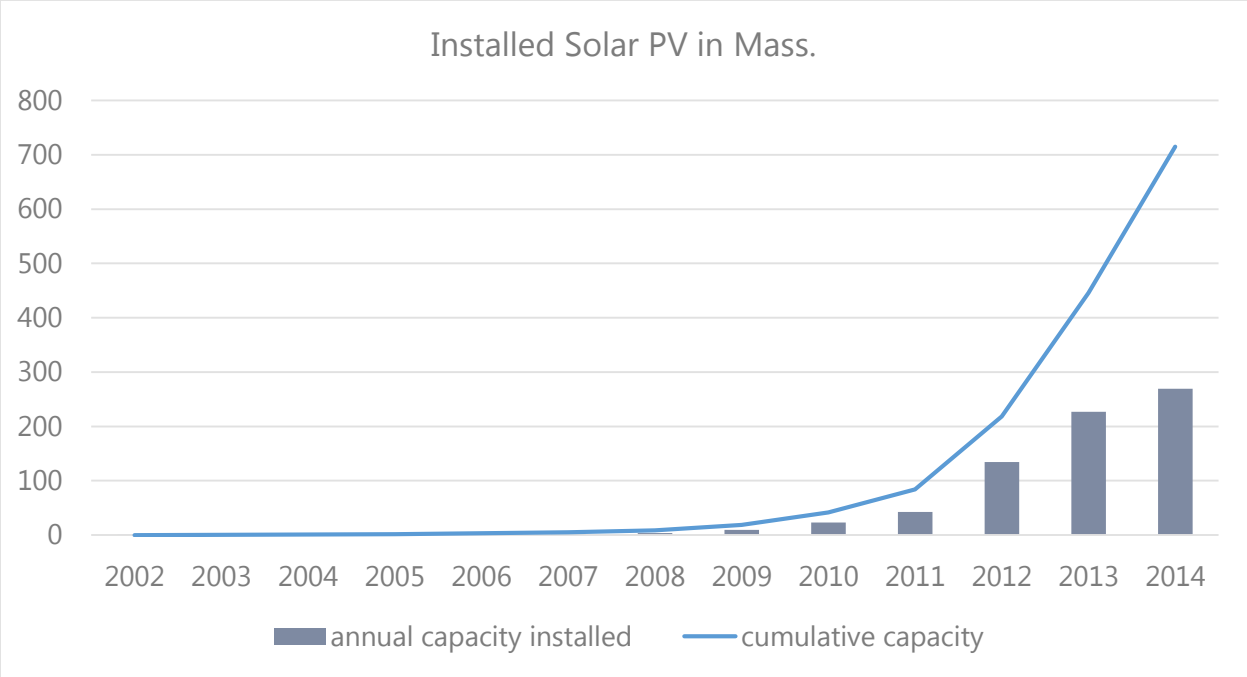
Projects under the RPS Solar Carve-Out II Program are each assigned to a particular Market Sector and SREC Factor:

Market Sector	Generation Unit Type	SREC Factor
A	1. Generation Units with a capacity of <=25 kW DC 2. Solar Canopy Generation Units 3. Emergency Power Generation Units 4. Community Shared Solar Generation Units 5. Low or Moderate Income Housing Generation Units	1.0
B	1. Building Mounted Generation Units 2. Ground mounted Generation Units with a capacity > 25 kW DC with 67% or more of the electric output on an annual basis used by an on-site load	0.9
C	1. Generation Units sited on Eligible Landfills 2. Generation Units sited on Brownfields 3. Ground mounted Generation Units with a capacity of <= 650 kW with less than 67% of the electrical output on an annual basis used by an on-site load.	0.8
Managed Growth	Unit that does not meet the criteria of Market Sector A, B, or C.	0.7

MASSACHUSETTS NET METERING POLICY DYNAMICS

In 2013 the net metering caps were reached, and the state solar incentive capacity was reached 4-years earlier than expected. The amount of solar capacity in Massachusetts quadrupled between 2012 and 2014 (see Figure 5 below). Emergency regulations were required to put incentives back in place and raise the net metering caps, and a new solar incentive structure was created. As projects raced to be built before the next change in policy, a number of solar project deals have fallen apart over the past two to three years. This is part of the reason why some GRC members have seen net metering credit PPA deals fall through within this timeframe.

Figure 5 - Installed Solar Capacity in Massachusetts



Source: Massachusetts Department of Energy Resources

There are currently 173 MW of capacity available to private entities under the net metering cap. The Public cap has been filling faster with the NGRID Public Cap already full with 2.2 MW on the waiting list.[25]

There is a limited amount of open space available and property values are relatively high in the Northeast/Boston load zone and therefore there are few large net metered projects within the greater Boston area.

[25] https://app.massaca.org/allocationreport/report.aspx

The organizations in the GRC network are primarily located in the Northeast/Boston load zone. There is a limited amount of open space for large solar projects within this part of the state and real estate prices are high. As a result most of the large ground mounted projects are located in the Western Mass. load zone and therefore these Western Mass. projects can only supply net metering credits to entities also in the Western Mass. load zone.

There are still opportunities to develop rooftops and carports. Carport projects tend to be more expensive because the pole and shade structure for the carport/solar canopy must be included in the construction cost. Anecdotal evidence suggests that this will add 1-2 cents per kWh to the cost of net metering credits.

In the typical structure of a net metering credits contract the institution pays the developer a fixed price per kWh for the energy produced from the facility with a small price escalator (e.g. 10 cents with a 1.5% escalator). The credit is worth the full retail price of electricity (e.g. 17 cents/kWh). The difference in price between the retail price and the net metering contract amount is the savings realized by the institution.