DG Collaborative Working Group – Plenary Meeting #2 (6/13/12)

Location: National Grid, N. Andover, MA

Facilitator: Dr. Jonathan Raab, Raab Associates, Ltd.

**DRAFT Meeting Summary**

33 people attended the second plenary meeting (attendee list can be found in Appendix 2). Following is a high-level meeting summary. The more detailed running meeting notes are available in Appendix 1. See all the documents from Plenary #2 on the website at: <http://massdg.raabassociates.org/events.asp?type=eid&event=60>

**Review Goals and Agenda for Day—Jonathan Raab, Raab Associates**

Dr. Raab went over the agenda and explained that the goals for the day were to continue to explore the underlying causes of the interconnection delays from several vantage points. The afternoon would be spent looking at the utilities interconnection-related staffing, thinking about future trends in the DG industry, and discussing the potential issues for the Working Group to address over the next 3 months.

**Finalize Work Group Structure, Schedule, Groundrules, and Representation**

Dr. Raab went over the list of Representative and Alternates, and said that he was still leaving open the possibility of filling another customer seat and potentially another CHP seat, as there hasn’t been a lot of interest from those two sectors. There were no other issues regarding representation.

Dr. Raab then reviewed the groundrules. He was asked to add a couple more sentences from the DPU order in the Purpose section. Dr. Raab also mentioned that all of the caucuses except the utility caucus expressed some concern about the draft groundrules that said the facilitator and the Working Group participants should refrain from discussing substance outside regularly scheduled meetings and caucuses. The concern was that this would hamper the facilitator from effectively orchestrating the process. Dr. Raab proposed, and the Working Group accepted, lifting the restraint on the facilitator contacting Members to discuss substance under certain circumstances, but maintained, for the time being, the constraint on Members initiating discussions with the facilitator about substantive matters.

**Digging Deeper on Delay Data and Root Causes**

DOER Analysis of Expedited/Standard Data—Gerry Bingham

Gerry Bingham from DOER presented a set of slides based on the utility monthly interconnection process report that went deeper than the slides presented at Plenary #1 but was still not able to pinpoint the causes of the delay (without additional data from the utilities). See slides on website.

There isn’t a lot of data available to determine the cause of project delays between when an application is deemed complete and is approved for interconnection. For example, utilities don’t track stoppage time, when the utility has requested information from applicants. Suggestions for improving data availability and transparency include:

* Breaking the study process into standard stages that line up with actual utility steps, to make it easier for utilities to track and report
* Having a series of check boxes rather than a notes field to track progress

KEMA Report on DG/Utility Survey Interviews—Jonathan Raab

This item was skipped due to time constraints

Utility Presentation on Root Causes-- Mike Brigandi, NSTAR and Cindy Janke, WMECo

See slides on website

*Strategy/findings for deeper dive (including project status)*

Discussion following the utility presentation: There’s a lot of variability in these issues, so good data is not necessarily uniformly available. But the group needs some additional data from “inside the black box” to do the deeper dive analysis -- need to develop a strategy to get the data we need. To start, utilities should confirm the accuracy of the notes column in their tracking database. The next step coule be to determine how to track customer delays (e.g. track the date of utility information requests and when the project proponent response is received)

Ultimately, we don’t want spend a lot of resources, but the group needs to figure out how to get at what it needs for this process in a relatively easy way. Dr. Raab requested that the small group of participants including DOER and the utilities continue to discuss developing a data gathering strategy which could include providing Gerry with additional data or taking a closer look at a random sample of delayed applications.

*Top ten questions by DG and of DG*

The list is available in the utility presentation posted online.

*Utility observations/hypothesis on root causes*

Utilities have observed several issues that may contribute to application/study delays (see their slides), including:

* Speculative projects—where developers submit multiple projects, intending to only go forward with a sub-set that look the most profitable. Presence of speculative projects is one reason that queue is so crowded
* Ill prepared project proponents that do not understand the application process and/or do not provide adequate information without a lot of back and forth and prodding by the utility. This takes time and uses resources.
* It is more time consuming to study large projects (additional equipment and upgrades) and more complicated to study multiple projects in the same location

DG/End User observations/hypothesis on root causes—Borrego; My Generation; CVEC/CLC; (Also CHP and Wind)

*Borrego*

Developers need more and better communication from the utilities so they have a better sense for how to manage other aspects of their development process. Maintaining accurate timelines is very important for project timing and financing.

*My Generation*

Unsure of what the root causes may be because utilities provide very little information regarding delays. MGE presented an Expedited Interconnection Timeline of a Class I Net Metering Facility installation to demonstrate this point. The timeline can be found in Appendix 2 below.

*CVEC/CLC*

CVEC presented a gantt chart demonstrating the timeline of the first round of solar projects being built on the Cape. All of the projects are expected to exceed the tariff timelines. There will be another round of projects soon, and CVEC suggested the working group could use this opportunity as a case study to review an interconnection application from the beginning of the process. The CVEC presentation is available on the DG website.

*Veolia*

CHP projects are often different from solar because they are sited at a facility that uses the power; in other words, CHP rarely exports to the grid. Because the systems are installed as part of larger construction projects it can also be more difficult to get completely accurate upfront information about exact equipment, which is needed to complete the interconnection application.

In general, the process should have a more formal check list and increased coordination between the developer and the different groups within each utility. However, the timeline in the tariff also seems to create “false hope” in developers, which leads to timeline complaints.

*MassCEC*

Wind projects have multiple approvals/permits going on that have to be coordinated, and interconnection is one part of this larger process. Aspects of the project can change as a result of any one of these processes (e.g. equipment may need to change, or economics may dictate a new financial model), rigid timelines for interconnection are only part of a larger process, and the working group should consider this as it moves through the consensus process.

**Current Utility Staffing, Structure, Resources, and Costs to Process Applications (all Tracks)—Tim Roughan, NGRID**

Utilities have increased staffing for DG by 3-4 times over 2008 levels (from around 9 FTE in 2008 to 35 FTE in 2012). The bulk of this increase took place in the spring of 2010 when the SREC program was put in place.

Staff levels are quantified using FTEs, which include contractors, and these positions work on things other than DG. For example storm recovery is always a priority. But even when there are no problems, the DG staff have some other responsibilities. The FTE numbers provided by the utilities cover the requirements of the tariff/study process, and do not include construction. Also the FTEs are made up of multiple positions, including people who spend only some time on DG work and some interns. In other words, most positions work part time on DG and part time on other issues.

In terms of costs, the general range for applications in the Simplified track is $200-800; the general range for projects in the Expedited track is $500-3,500. If projects exceed $3,500 they are moved in the standard track.

**Presentation & Discussion of Future Trends—Bob Grace, Sustainable Energy Advantage**

Mr. Grace presented data from SEA’s Solar Energy Market Outlook and a recent report conducted for the New York State Energy Research & Development Authority (NYSERDA) (see slides on website). He showed the various factors that could either increase or decrease wind and solar activity in Massachusetts. At a high level Mr. Grace concludes that the number of DG project applications will continue to exceed 2010 levels, but that the very high number of applications in the first quarter of 2012 is probably not sustainable. In other words, while the number of applications will remain relatively high, it will not be as high as we’ve recently seen.

The data Mr. Grace presented also demonstrated how strongly state policy influences the size distribution of projects. For example, MA is incentivizing a specific size of project, and that’s being reflected in the higher number of recent MW-scale DG interconnection applications.

**Work Planning Session**

Issue List for DG WG and Subcommittees

During the plenary meeting the group discussed the issue list generated by caucus discussions. Dr. Raab asked whether any issues were missing and the group suggested adding several issues. The updated list is available online at the website.

Subcommittee Scoping (Identification, Charging, and Launch)

Dr. Raab suggested forming two subcommittees that shift focus as necessary to discuss relevant issues. One subcommittee will focus generally on process, timeline, and cost. The second subcommittee will focus generally on technical issues.

The first meetings of both subcommittees on June 18 and 26, respectively, will focus on the following five issues:

1. **Pre-Application/Application Process**—How can we reduce the number of speculative and infeasible applications, while increasing applications of potentially viable projects submitting “complete” applications that minimize inefficient back-and-forth between utility and applicant?
2. **Queue Management**—Can we come up with an enhanced set of protocols and standards at the various stages of the interconnection review and construction processes, that the utilities can use to clear the queue of “stale” projects?
3. **Standard Track and Large Projects**—Do we need to revise the timelines, screens and procedures, and/or costs embedded in the Standard Track? Can we continue to accommodate very large projects (e.g., over 1 MW, or project with substantial export) in the Standard Track or do we need a new and separate track?
4. **Multiple Projects on a Single Feeder**—Can we come up with an enhanced process for dealing with multiple projects on a single feeder (both multiple applications that need to be acted on, and multiple installations and upgrades over time)? Should there be the option (or requirement) to cost share in both study costs and required system upgrades?
5. **Track Segmentation**—Should any of the screens that determine whether an applicant go thru the Simplified, Expedited, or Standard tracks be altered in light of experience, technology improvements, etc. (e.g., the 7.5% of circuit annual peak load, and various size screens)?

**Next Steps and Wrap Up**

The first process, timeline, and cost subcommittee meeting is June 18th at 100 Cambridge St. The first technical subcommittee meeting will be June 26th at the CLF offices at 62 Summer St. Both meetings will run from 9am to 4 pm.

Plenary #3 is scheduled for June 28th at NSTAR (Westwood) from 12pm-5pm.

**Appendix 1: Running Meeting Notes**

**Digging Deeper on Delay Data and Root Causes**

**Gerry Bingham: DOER Analysis of Expedited/Standard Data**

* Not much data on what is causing project delays, mostly anecdotal
* Expedited seem on track, but no data on stoppage (whether that made it take longer) and no data on timeline from agreement to constructed. A lot of data limitations
* Suggested additional info provided via monthly reporting to let project proponents know more info on their projects.
* Need to know stoppage time. Need to understand if there is actually a problem or if the projects that are studied are being studied on time (i.e. not counting stoppage time, projects happen on time)
* WMECO: a lot of projects, but not clear which will actually go forward
* Potentially a “clean up the queue” problem (get out the not real projects)
* Project issue = large size projects
* Overload of projects = resource issue (utilities need more resources to process applications)
* Need to figure out where to go in this working group process so can focus for the needed deeper dive
* Do utilities know the unknowns from Gerry’s presentation? Wait for utility presentation (notes below)
* There’s a black box in the process, why do some take 27 days while others take 52 (for example); would like to know from utilities what is going on in that time frame
* Breakout process into formal standard stages that line up with actual utility steps, to make it easier for utilities to track and report
* Need to define process/structure very explicitly, a series of check boxes rather than a notes field, for example

**Mike Brigandi (NSTAR) and Cindy Janke (WMECO) -- Utility Presentation on Root Causes**

* Utility “root causes” overview (list in ppt)
* Initial inquiries (not applications) can be very general and take time to respond to
* Speculative applications require review to respond with what utilities need (more info) from project proponent
* What if a utility studies a project, and then studies a second project assuming the first went online, but what if the first project never happens? Hasn’t really happened yet, but may start to be a problem now that there are more applications (some utilities have experienced this)
* Larger projects make studying multiple projects in the same location more time consuming
* Multiple projects in one area can look for cost sharing on upgrades, but have to work that out
* Can utilities ID how many are large and multiple in same location? Yes, could be captured
* Speculative = feasibility study for project proponents (need to understand the viability of the project)
* This issue gets into the level of info needed for an application; what proponents have to commit to (e.g. equipment) vs. what they can assume to complete the application
* Proponents looking for snapshot info, which could change, so utilities looking for application process (more commitment, more data, paying for a service) rather than just speculating (discussion about terminology of speculative vs. feasibility)
* Larger projects require additional study for additional engineering and equipment considerations
* Utility employees working on DG also do day-to-day stuff, so have to balance time, and resources are limited
* Often extra time/meetings to “assist” project engineers that don’t have project specific engineering experience (e.g. general engineers working on solar projects)
* Disconnect or lack of understanding on proponent side about what information utilities can provide about the system, and how useful that info is (e.g. often asking for system snapshot, which becomes obsolete very quickly)
* A lot of external factors impact projects (e.g. local permitting and tree trimming) Larger impact on construction rather than interconnection agreement (but some utilities look into construction costs before interconnection agreement so can give accurate cost estimate to customer, so this can impact application timeline)
* Above 1MW requires some ISO-NE review (more details in ppt) above 1MW and less than 5MW is a notification to ISO-NE, but utilities don’t hold up their study (terminology around notification vs. approval by ISO-NE) above 5MW requires more interaction by ISO
* Can update and structure the application process, but won’t address the need to do studies and studies backing up in the queue (just have to do certain things for studies, and these things take time)
* Fourth track for large (over 1MW) projects?
* Customer application check list, so help ensure complete applications are submitted?
* Provide more information to reduce the number of applications that are looking for more information (utilities provide this, to reduce speculative applications) need to think about what general info is useful, but what info has to be project specific (how to address this issue: minimize speculative and minimize time spent on info back and forth at start of application process)
* Utilities are limited in the info they can provide to the public; need to determine what info is restricted and not, so what specifically utilities CAN provide that will be useful to this process
* Most new applications (in WMECO) submitted by developers that have never spoken to the utility, in the past developers talked to utility before applying
* Utilities looking for “certification” for installers (or who?) because new players are less educated about the interconnection process and are just looking to get into the queue and doing so in a sloppy way (interconnection is related to net metering queue)
* Generation vs. load is important consideration (i.e. how much and how often will customer be exporting power to the grid)
* Better to study multiple options (different equipment) during initial study, rather than going through study with one option and then switching to another (will have to re-apply, do new study)
* Most FAQs seem educational, just need proponents to be more educated (most of the info is in the tariff, but people don’t read it)
* Utilities were supposed to provide data, or look into what data is available, to begin to get at what is causing delays (ppt useful but did not provide this data)
* A lot of variability in issues, so not necessarily data available
* But need something from inside the black box to do the deeper dive: data not currently available, so needed to know what we don’t know and what we need to know, to get a strategy to get the data we need
* Confirm accuracy of notes column; how to track customer delays (e.g. track date of info requests and when response received)
* Don’t want spend a lot of resources, but need to figure out how to get at what we need for this process in a relatively easy way (small group should discuss over lunch, and maybe review in afternoon)

**Borrego, My Generation, CVEC/CLC, Veolia -- DG/End User observations/hypothesis on root causes**

**Borrego**

* 1MW or larger projects; timeline issue magnified by SREC market (PTO permission to operate date)
* Clear communication about when one step is completed and on to the next (standardize between utilities
* Review of project drawings (responses not necessarily tied to modifying submitted drawing vs. just a new line) response to change, but no rationale

* Impact study costs: detail on how calculated to provide context for cost differences
* 25% cost estimate is VERY important to project economics/cost estimate
* Studies back from utilities sometimes incomplete (sometimes not all groups in the utilities are complete, so response is not complete)
* Need consistent messaging between teams at the utilities; would be nice to have a single point of contact
* Need clarity around when milestone of interconnection is achieved, to aid in net metering queue process (because now interconnection is linked to net metering)
* Communication about stacked projects (multiple in one area) to help developers make project decisions (let them know the “bad news”)

**My Generation**

* Witness test language is vague
* Example of long time of no response from utility, but unclear what the issue was (lack of transparency from utility). Presented the following example timeline:

**Business Day 0 - MGE sends in Interconnection Application for Class I Net Metering Facility on Expedited Track**

**Business Day 5 - Distribution Utility notifies MGE application deemed complete in System**

**Business Day 15 - MGE contacts Distribution Utility on status, Distribution Utility says it is in engineering and says engineering has been given a deadline of business day 32**

Business Day 28 - Estimated in-service date for project (based on DOER DG website spreadsheet)

Business Day 30 - All review screens should be completed based on tariff timeline (25 business days after deemed complete)

**Business Day 33 - MGE contacts Distribution Utility on status**

Business Day 40 - ISA is due based on Tariff Timeline

**Business Day 41 - MGE follows up again and Distribution Utility replies that they have contacted engineering many times but they have been given no report. 'As soon as we hear from them, I will let you know'**

**Business Day 42 - MGE sends email again in morning stating application past due. Distribution Utility responds at noon that design is satisfactory and sends ISA, Schedule Z, etc. Distribution Utility ISA has a page that has been replaced with language requiring insurance for the system even though the system is a Class I Net Metering Facility (when no insurance is required)**

**Business Day 47 - MGE submits Certificate of Completion, Corrected ISA & Schedule Z**

**Business Day 52 - Witness Test**

**Business Day 53 - System Authorized to Interconnect**

**CVEC**

* Round 1 = capped landfills (but that didn’t slow down the interconnection process)
* Clock stoppages around 3 days at time
* Cape projects all going over timeline
* Case study opportunity, to bring next round of Cape project into process?
* Multiple projects in same area is issue for utilities, developers interested in working with utilities on how to address multiple developer projects at the same time

**Veolia (CHP)**

* Different issues to solar (on site with load)
* Hard to get all the upfront info needed for application (especially in buildings/projects under construction)
* Would like a more formal check list, and coordination between front and back end at utility
* Studies model problems and put the problem on the new interconnector (e.g. is something happens in the system, it’s on the customer). Some aspects are part of the tariff and are not intended as a negotiation, but there are aspects of the interconnection contract that are negotiated at the end of the process
* Timeline chart is sort of source of “false hope” and causing people to have expectations, and problem is that these expectations are not being met. This timeline was generated by a consensus process, so not something the utilities came up with

**MassCEC (wind)**

* Projects have multiple approvals/permits going on that have to be coordinated, and interconnection is a part of this. Aspects of the project can change as a result of any one of these processes (e.g. equipment may need to change, or economics may dictate a new financial model), rigid timelines for interconnection are only part of a larger process

**Tim Roughan – Current Utility Staffing, Structure, Resources, and Costs to Process Applications (all Tracks)**

* 3-4 time increase in staffing (FTEs and including contractors), and these positions work on things other than DG (storm recovery is priority, but even when no problems, these staff have some other responsibilities) These just cover the tariff/study process, does not include the construction part
* FTEs are made up of multiple positions, including people who spend only some time on DG work and some interns
* Spring 2010 with SRECs, needed to respond with additional resources (utilities ramping up in response to incentives)
* Simplified $200-800; Expedited $500-3500 (if over, moves to standard)
* Projects over a certain size should be on their own transformer, to protect other customers, and that requires additional work; large projects can overload voltage and cause trips
* Upgrades costs when multiple projects are not done at the same time, cost is borne by last in (because their project caused the need for the upgrade)
* Bigger systems are now less expensive than they used to be, so more affordable to home owners, so more homeowners installing larger systems (to have a net zero energy home)
* Simplified can stay in simplified even if requires upgrade, but does have to pay for upgrade costs
* DG is essentially a service request, and utilities planning to provide more online services, including online service requests, so this could/will include DG applications
* Standard can be up to $90K for impact study and $70K for detailed facilities study (need to get +-10% and it’s more difficult to get to that for larger projects, and at larger costs this is a much more significant number)
* Impact study: modeling of feeder, make sure feeder conditions are correct in the model (1-2 weeks of data scrubbing); then put generator into the model (another week); once impacts ID’d, have to go evaluate the impacts and estimate costs; then check for customer issues (protection); all this info is combined into impact study (leads to confidence in +- 25% cost)
* Detailed facilities study: for construction work orders, evaluating construction impacts (e.g. conservation commission, permits, tree trimming, phone company) to lead to +-10% for construction, so proponent can send check and construction can start (construction work order and agreement, so agreement can be signed, check provided and work started)
* New connection part of detailed study at WMECO
* But new service is separate from DG interconnection, but can be combined processes, and new service connection will be part of the detailed study and a single construction work order
* Differences in the timeline for getting all costs back, and agreement not complete until all costs are received, so this can be problematic (if all costs not received at the same time)
* Utilities do long term planning 1,5,10 years: DG has lead to changes in the long term planning process, to fit DG projects into the planning (counting the DG project in long term plans)
* Infrastructure in WMECO sized to load not generation, and load is smaller than in past years, so have to deal with more generation; and no obligation for DG customers to generate, makes planning difficult, together with variability of e.g. solar
* Internal coordination: still working out internal coordination, establishing roles and how process should work; try to give heads up to different departments about what is coming up (e.g. a bunch of projects will need review in about 6 weeks) How often to do this, it’s labor intensive (checking on work that is happening to keep it moving, and providing heads up) communication daily on this work, but forward looking heads up/long term planning (e.g. we’re going to need 50 meters, etc.)

**Bob Grace -- Presentation & Discussion of Future Trends**

* Renewed interest in 100kW to 1MW, especially as DG projects; little interest in <100kW for wind, so not a big driver in the DG discussion
* PPT lists cost and policy drivers pushing and slowing down DG development
* S2214, has long term contract provision also (but maybe not a driver for smaller scale DG projects); 10% of the 4% for DG?? (but not a driver for wind)
* State policy significantly influences size distribution of projects (e.g. MA is incentivizing a specific size of project, and that’s being reflected in DG interconnection applications) much more MW scale projects
* High level conclusion: increased level over 2010 requests seem likely to remain, but recent very high levels are not sustainable
* Regarding blip vs. sustained increase, in terms of solar, it will be sustained increase at least up to the 400MW goal; other drivers for clean energy to continue incentives for DG
* How does SEA ppt impact what working group focuses on? What should DOER look at, what data to pull?
* Incentives help to achieve grid parity more quickly, and once grid parity achieve there will be more incentive to do DG projects
* Distinction between project MW and number of projects (so there are still many smaller size projects)
* Risk of saturation? Feeders are being used up, so looking to set up dedicated service for new DG
* How to incorporate DG into long term planning? Can’t necessarily count on the capacity for planning purposes; need project diversity to smooth out/maintain some more predictable level of capacity
* When an area reaches capacity, the costs for upgrade are prohibitive and developers don’t look to build there; are there incentives that make this work in some cases, within a certain number of miles?

**Work Planning Session**

Two subcommittees with shifting focus (#1 process, timeline, cost, and #2 technical issues). June 18th at 100 Cambridge and June 26th at CLF, 9am-3:30pm

**Process Issues (details in Issues document on website)**

* TC1: use chess box approach to measure process delays (developers have an idea for how to implement this)
* Ongoing O&M charges utilities have to cover, e.g. increased property taxes from upgrades and ongoing maintenance costs, not covered by developer construction upgrade costs (costs passed on to rate payers, not an exit fee, but costs not being borne by the entity causing the cost, the developer) DOER: look at restructuring act and interpretation of exit fees; increased DG results in less customers buying power which impacts utility ability to recover for capital costs (e.g. fewer customers paying demand fees)
* Other equipment as well (reclosers, meters, etc) ongoing maintenance
* Net metering, distribution demand charge recovered by the utility? Look into how this works and how it could be structured to help utility recover costs
* Different track (or other accommodation/different path within a track/different requirements) for exporting vs. non-exporting facilities (no reverse power flow, all used on site) Often incidental reverse export
* Education: educating people who apply, on how to apply and to interconnection
* IREC study on impact of DG on rate setting (ID’d data gaps)
* TC1: Clarification on witness test; utility, how to get this closer to what developers do anyway for commissioning
* Aligning utility and local permitting (update interconnection process to be flexible with different local permitting process)
* Pre-application screen, some amount of information sharing (NT4) (Want to avoid developers using application process to assess feasibility)
* More multiparty communication, e.g. utility lead contact, lead utility engineer to contact, etc to provide developer with points of contact (standardized/formalized response) improve communication between utilities and developers
* Some option for escalation prior to ADR (try to push collaboration with utility before adversarial process)
* How to make process a little more rigorous to avoid a lot of projects that are not likely to be built (but issues around what info developers have at early stage of project and are able to provide for an application)

**Next Steps**

**For Subcommittee consideration**

* Big Issues: Application process and before or around it (more feasible and better info) and online application process; too much time spent on stale projects (politically OK way to purge queue); large number of large projects, so maybe need a new track, but definitely need to look in detail at big projects [start with those three]; multiple applications on single feeder (feeder congestion); looking at screens and tracks
* Look for solutions from other places (e.g. CA) to get ideas for MA solutions
* Developers need to count on timelines (need certainty), so needs to be part of the discussion in one of the subcommittees
* Plenary on the 28th at NSTAR (Westwood) 12pm-5

**Appendix 2: Meeting Attendee List**

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| --- | --- | --- | --- | --- | --- |
| **Attendance: MA DG Collaborative Working Group Plenaries** | | | | **Plenary #1**  **5.31.12** | **Plenary #2**  **6.13.12** |
| **Representatives and Alternates** | | | | | |
| Abe | Jonathan | Nexamp (alt.) | DG Solar |  |  |
| Berwick | Dan | Borrego Solar | DG Solar |  | **X** |
| Bingham | Gerry | MA DOER | State Agency | **X** | **X** |
| Bolgen | Nils | MA CEC | State Agency | **X** | **X** |
| Bonazoli | John | Unitil (alt.) | Utilities | **X** |  |
| Breger | Dwayne | MA DOER (alt.) | State Agency | **X** | **X** |
| Brigandi | Michael | NSTAR (alt.) | Utilities | **X** | **X** |
| Broad | Martha | MA CEC (alt.) | State Agency |  |  |
| Burrowbridge | Ryan | Borrego Solar (alt.) | DG-Solar | **X** | **X** |
| Cummings | Fran | Peregrine for SEBANE/SEIA | DG-Solar | **X** | **X** |
| Edwards | Scott | Exelon/Constellation Energy | DG-Solar | **X** | **X** |
| Flottemesch | Robert | Exelon/Constellation Energy (alt.) | DG-Solar | **X** |  |
| Hoagland | Erik | Spire Solar Systems (alt) | DG-Solar | **X** | **X** |
| Janke | Cynthia | WMECO | Utilities |  | **X** |
| Kelly | Kevin | NGRID (alt.) | Utilities | **X** | **X** |
| McLaren | Robert | NuGen Capital Management (alt.) | DG-Solar | **X** |  |
| Miller | Gary | Unitil | Utility |  | **X** |
| Moskos | George | NSTAR | Utilities | **X** | **X** |
| Plitch | Larry | Source One/Veolia Energy (alt.) | DG-CHP/Other | **X** |  |
| Roughan | Tim | NGRID | Utilities | **X** | **X** |
| Ruiz | Kially | Aquinergy | DG-Wind | **X** |  |
| Schmidt | Douglas | Harvard | DG-CHP/Other |  | **X** |
| Smith | Mary | Harvard (alt.) |  |  |  |
| Soares | Joe | CLC/CVEC | Customers/Cities | **X** |  |
| Sprite | Reid | Source One/Veolia Energy | DG-CHP |  | **X** |
| Stone | Michael | My Generation Energy, Inc. | DG-Solar | **X** | **X** |
| Tosches | Jamie | MA AGO | State Agency | **X** | **X** |
| Walker | Jim | Solar PV Grid Tie Ameresco | DG-Solar | **X** |  |
| Walsh | Kevin | MA AGO | State Agency |  | **X** |
| Wells | Donald | NU (alt.) | Utilities | **X** |  |
| Zachas | Rebecca | BCK Law P.C. for CVEC/CLC | Customers/Cities | **X** | **X** |
|  |  |  |  |  |  |
| **Other Working Group Participants** | | | | | |
| Ahirrao | Vishal | NGRID | Utilities | **X** |  |
| Argo | Liz | Argo Consulting | Other/Cons | **X** | **X** |
| Bachman | Roberto | SolarFlair Energy | DG-Solar | **X** |  |
| Baker | Ed | UTC Power | DG-CHP/Other | **X** |  |
| Bhumgara | Rayo | Sustainable Strategies 2050 | DG-Solar | **X** |  |
| Boecke | Donald | NSTAR | Utilities | **X** |  |
| Busch | Joe | Borrego Solar | DG-Solar |  | **X** |
| Cox | Roger | NGRID | Utilities | **X** |  |
| DaSilva | John | Aegis Energy Services | DG-CHP/Other | **X** |  |
| De Veer | Henrietta | Prime Solutions | DG-Solar |  | **X** |
| DeVillars | John | BlueWave Capital | DG-Solar | **X** |  |
| DiNapoli | John | Unitil | Utilities | **X** |  |
| Enayati | Babak | NGRID | Utilities | **X** |  |
| Feeley Karp | Courtney | DOER | State Agency | **X** | **X** |
| Feraci | Joseph | NSTAR | Utilities |  | **X** |
| Fitzpatrick | Joseph | DG Clean Power | DG-CHP/Other | **X** |  |
| Foster | John | Advanced Energy | DG-Solar | **X** |  |
| Fuller | Peter | NRG Energy | DG-Solar | **X** |  |
| Grace | Bob | Sustainable Energy Advantage | Other/Cons |  | **X** |
| Greenblatt | Beth | Beacon Integrated Solutions | Other/Cons | **X** |  |
| Greenwood | Daniel | SolarFlair Energy, Inc. | DG-Solar | **X** |  |
| Gudell | Jan | NSTAR | Utilities | **X** |  |
| Habib | Jack | Keegan Werlin for NSTAR | Other/Law |  | **X** |
| Hawes | Peter | Borrego Solar | DG-Solar | **X** |  |
| Jones | Keith | NSTAR | Utilities |  | **X** |
| Keeffe | Andrea | NGRID | Utilities |  | **X** |
| Kelley | Paul | NSTAR | Utilities | **X** |  |
| Krich | Abigail | Boreas Renewables | DG-Wind | **X** |  |
| Kuriakose | Alex | NGRID | Utilities | **X** |  |
| LaBrake | Neil | NGRID | Utilities | **X** | **X** |
| Ledgerwood | Bruce | LEAN | Customers/Cities | **X** |  |
| Medeiros | Ron | NorthEast Clean Energy Corp. | DG-Solar | **X** |  |
| Melnick | Leah | Sustainable Energy Advantage | Other/Cons | **X** | **X** |
| Newman | Joe | NGRID | Utilities | **X** |  |
| O’Dougherty | Mike | Spire Solar Systems | DG-Solar | **X** |  |
| Phelps | Nathan | DPU | State Agency | **X** |  |
| Plett | Frederick | MA AGO | State Agency | **X** |  |
| Rabadjija | Neven | NSTAR | Utilities | **X** | **X** |
| Ritter | Jason | Borrego Solar | DG-Solar | **X** |  |
| Schroeder | Erica | IREC | Other/Unknown | **X** |  |
| Sins | Jack | Unison Energy | DG-CHP/Other | **X** |  |
| Skulley | Brooke | NGRID | Utilities | **X** |  |
| Smith | Daniel | Siemens | DG-Solar | **X** |  |
| Sterritt | Justin | MA EOHED | State Agency | **X** |  |
| Wallerstein | Mike | MA DPU | State Agency | **X** |  |
| Wheeler | Lorraine | Redstoke, LLC | Other/Cons | **X** | **X** |