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August 20, 2021

Ms. Samantha Meserve
Deputy Director, Renewable and Alternative Energy Division
Massachusetts Department of Energy Resources
100 Cambridge Street, 10th Floor
Boston, MA 02114

Subject: Next Grid Markets Comments on APS

Dear Ms. Meserve,

The purpose of this letter is for Next Grid Markets (Next Grid) to provide comments on the Alternative Energy Portfolio Standard (APS) review being conducted by the Massachusetts Department of Energy Resources (DOER). These comments pertain to the Straw Proposal put forth by the DOER.

It is important to note that Next Grid supports the DOER's Greenhouse Gas (GHG) reduction goals. Climate change is an existential crisis facing humanity and it is critical that the Commonwealth show leadership on this front to demonstrate that reducing emissions is not mutually exclusive from having a growing, innovative economy. Massachusetts is home to the first public school, the first subway, the first public park, the first police department, and countless inventions springing from our world class educational institutions and innovation economy. We have always led the way, and it can be no different with respect to climate change.

This transformation has to be done in a way that is inclusive, however. It has to respect that energy users have different needs. For example, a home's energy needs are very different than the needs of critical facilities like hospitals or research facilities that require high pressure steam and the ability to operate independent of the grid (i.e., "island mode"). We have to respect that it is important to continue to foster businesses that manufacture products in Massachusetts - particularly in the wake of the pandemic in which supply chains were interrupted and there was pronounced need for US-based critical manufacturing, such as vaccine production, semiconductors and even toilet paper. These manufacturing businesses are critical not only to the local economies but also to national security and stability. We need to recognize that the APS is an elegant piece of industrial policy that allows critical local hospital, research, and manufacturing facilities to be able to compete, therefore allowing for good paying jobs located here in the Commonwealth. We also need to respect that the climate is changing and we need to reduce emissions and any policy put forth by the Commonwealth must recognize that reality.

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It is in this spirit that these comments are presented to the DOER. We applaud the DOER for increasing the ACP and increasing supply. This will undoubtedly result in higher prices, therefore serving to attract new, low carbon participants into the program. Higher prices, however, do not help CHP plants that are phased out of the program, even as these projects provide GHG reductions, resiliency and economic competitive benefits for critical infrastructure.

BACKGROUND

Next Grid is a Massachusetts-based company focused on developing and optimizing distributed generation assets, predominately in Massachusetts. Next Grid is uniquely qualified to provide comments on the APS due to fact that Next Grid has worked with numerous CHP, heat pump, energy from waste, and biodiesel clients to successfully qualify, verify and monetize their energy credits, and is the Commonwealth's leading marketer of renewable and alternative energy credits, managing hundreds of thousands of Alternative Energy Portfolio Standard (APS) and Renewable Energy Portfolio Standard (RPS) credits per year. Next Grid also holds the MA statewide contract for alternative and renewable energy certificate services with the Division of Capital Asset Management and Maintenance (DCAMM).

Below you will find Next Grid's comments to the Straw Proposal.

COMMENTS

Comment #1 – APS Prices

As stated above, we support the DOER's increase in the ACP and the percentage requirement. This will result in higher prices and more market stability for program participants who have faced pricing volatility in the past. In fact, the suggested change has already led to an uptick in pricing. To put numbers on it, we estimate the requirement in 2021 will be approximately 2.1 million AECs. Supply in 2021 will likely be approximately 2.4 million. Of that supply of 2.4 million, we estimate that CHP represents approximately 1.8 million credits.

When the program increases to 7.5% of load in 2023, we estimate that will result in a requirement of approximately 3.3 million credits, increasing over time not only with the 0.25% annual increase but also due to higher loads from electrification.

If the DOER maintains a CHP multiplier of 0.7, this would result in CHP supply of approximately 1.25 million credits. If there are another ~550,000 credits from biodiesel and waste to energy, this would result in a supply of approximately 1.8 million, or a shortfall of approximately 1.5 million credits. If the ACP increases to $40, this should result in prices in the mid-$30s.

In other words, the proposal to increase the requirement and the ACP should cause higher prices, which we support.

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Comment #2 – Combined Heat and Power Emission Reductions

We do not, however, support the phasing out of CHP. We understand that currently CHP comprises the majority of the APS market, and that the program needs to make room for other technologies. In light of this and the fact that the price per AEC will likely increase, some sort of factor would be acceptable, such as a consistent factor of 0.7, which should allow for credit values in line with where they have been historically.

Our position is that CHP should remain eligible so long as the system continues to provide emission reductions and helps to ensure that critical infrastructure remains resilient.

We do not support the phasing out of CHP for the following reasons:

1. CHP provides emissions reductions which contributes to Massachusetts' reduction goals;
2. CHP provides resiliency benefits to critical facilities (black start and islanding) that other existing infrastructure cannot provide;
3. These facilities have made large long-term capital infrastructure decisions based on APS regulations; and
4. CHP is vital to economic competitiveness for critical infrastructure.

Based on the Frontier Energy CHP CO_2 emissions study[1], efficient CHP currently provides, and is projected to continue to provide, emissions reductions for some time as compared to if the same site had used the electric grid for electricity, and a boiler as a separate heating source. We recognize that as the grid becomes cleaner with additional renewable resources, the CHP should continue to be emissions competitive.

It is our position that a CHP system should qualify for an APS payment when the system has a lower Carbon Intensity (CI) than the average marginal emissions of the grid. If the CHP system provides emissions benefits over a period of time (for example, per hour, per quarter, or per year), it should receive APS credits for generation over the relevant time period. If the CHP system is not providing emissions benefits during that period of time, it should not receive a credit.

This approach would accomplish the DOER's goal of reducing emissions while also creating a space for critical infrastructure. The following outlines an actual example of a MA APS incentivized CHP's CO_2 emissions as compared to the 2019 hourly marginal emissions of the ISO NE electric grid[2]. 2019 data was used in the comparison to represent normal "pre-covid" operations and because that is the latest year in which the ISO provided hourly marginal emissions data.

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[1] Frontier Energy, Inc., *A Study of CO2 Emissions from CHP Systems and Comparable Alternatives in Massachusetts*, August 2021.
[2] 8760 analysis conducted by Frontier Energy, Inc.

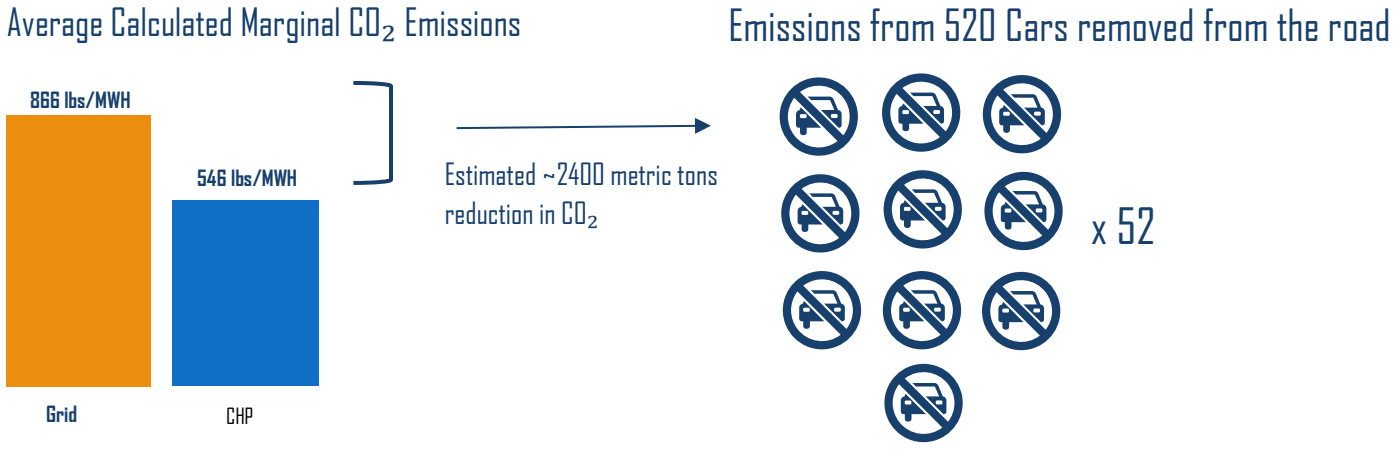
Profile of the representative CHP at a MA critical facility:

- Hospital
- CHP provides:
  - Black start and islanding (resiliency enabling the site to continue providing critical care to patients in electric grid outages)
  - High pressure steam

CHP 2019 Data Summary

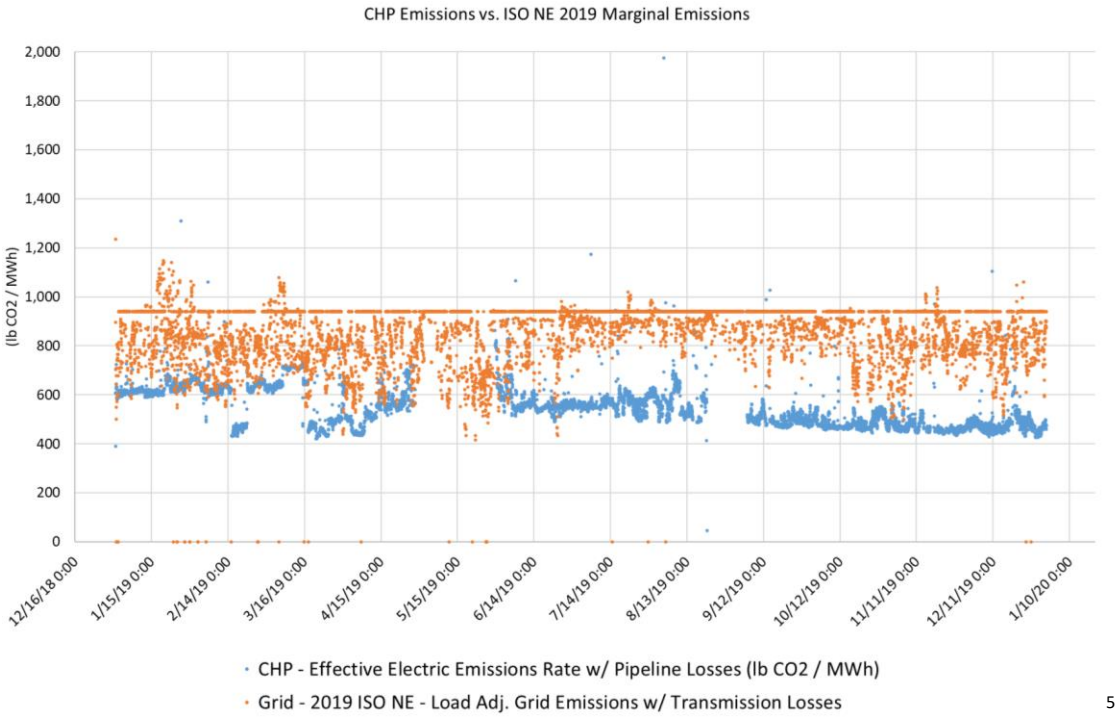
CHP Size	Average Overall Yearly Efficiency	Uptime[3]	Electric Generation (MWH)
2.6 MW	~83%	7713 – 88% of year	16,200

The analysis compared the CHP's hourly 2019 Effective Electric Emissions[4] to the calculated hourly ISO NE marginal grid emissions. The results indicated that the CHP provided significant emissions reductions:



Of the 7713 hours the CHP was operating, the CHP was cleaner than the grid over 95% of the time. It is likely that the percentage of time in which the grid is cleaner will increase over time. As this happens, it will be incumbent on CHP operators to continue to lower the carbon intensity of the CHP systems, either by increasing efficiency and/or by blending renewable fuels (see discussion of RNG below).

[3] This includes scheduled maintenance. Downtime was higher than usual due to a scheduled major overhaul.
[4] Effective Electric Emissions is used as a metric to compare CHP electric emissions directly to the CO_2 emissions of the grid by: CHP CO_2 emissions (lb/hr) minus Displaced Boiler CHP Emissions (lb/hr) divided by CHP MWh. I.e. ((MMBTU CHP fuel input minus CHP produced thermal/boiler efficiency) x natural gas fuel factor (lbs/MMBTU)/ CHP MWh Electrical Output = lbs/MWh effective electric emissions.



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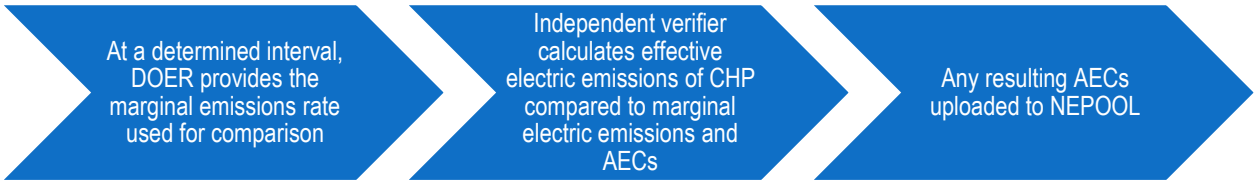
This comparison of the CHP's emissions to the marginal emissions can easily be implemented. As the DOER is well aware, there is a lag between when a system generates electricity and thermal energy and when it needs to be reported to the NEPOOL GIS system. For example, the deadline to upload Q1 generation into NEPOOL is July 10 of the same year. During that lag, the Independent Verifier (IV) reviews the generation data for accuracy and ultimately loads the data into their NEPOOL GIS account. Or it could be based on the previous year's data, to be provided by either the ISO or EPA.

Therefore, if the DOER could provide the appropriate marginal emissions information for the relevant generation period, then the IV could incorporate this data into their analysis, calculate the effective electric emissions rate during the period, determine the benefit during the time period, and calculate the APS credits generated.

Potential Method



Using transparent CI metrics, should also make CHP systems more dispatchable. In other words, a sophisticated operator will model in real-time the CI of the grid and begin to make decisions on how to operate based on that CI. For example, if the real-time model shows that the estimate of the average marginal emissions is lower than the CI of the CHP system, they may turn down or turn off the CHP system because it would impact the system's ability to generated AECs. Incentivizing CHP systems by only giving the systems credit when they are providing an emissions benefit should cause them to react to carbon in real-time, which is the direction that we ultimately need to go.

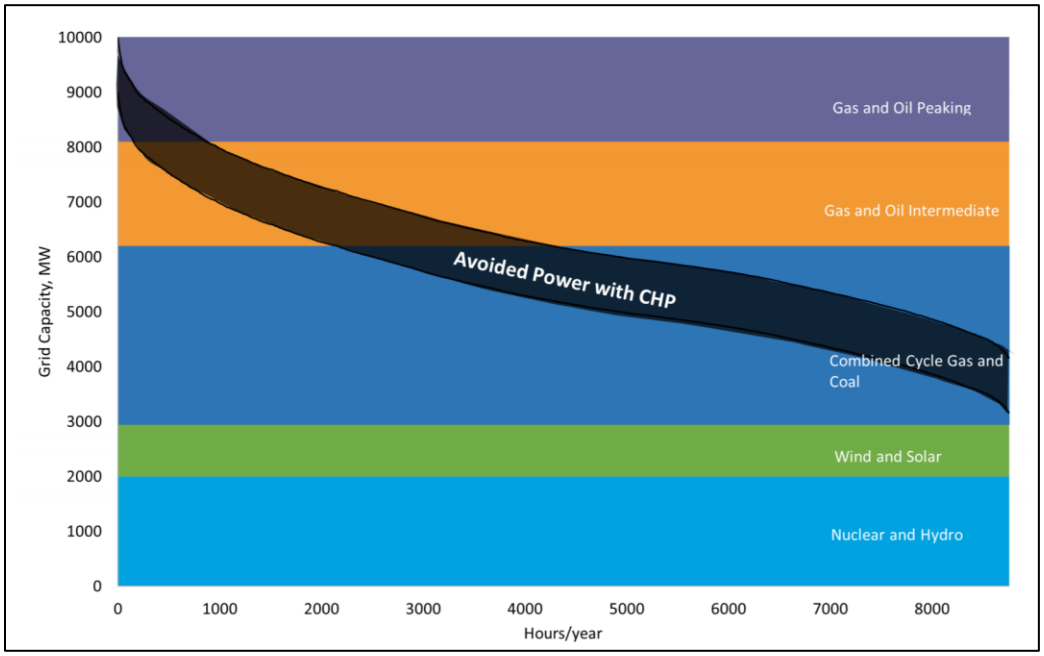
Other Factors to Consider – Which Marginal Value

Marginal emissions are the appropriate method of emissions comparison to CHP and as recommended by the EPA[6]. Marginal should be used because, if a CHP system trips off, which can happen on a regular basis in part due to grid instability, the incremental demand is naturally served by the marginal resource. If a 7 MW CHP trips, the "grid" instantaneously needs to serve another 7 MW, which would come from the marginal resource (usually natural gas) providing an additional 7 MW. It would not come from a baseload resource because a baseload resource would already be running at full capacity, either because it must run (i.e., a nuclear plant) or it is less expensive than the next resource (i.e., a gas plant with a lower heat rate).

This is very well explained on pages 26-28 of the following EPA report:
https://www.epa.gov/sites/default/files/2015-07/documents/fuel_and_carbon_dioxide_emissions_savings_calculation_methodology_for_combined_heat_and_power_systems.pdf

[6] EPA Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems June 2021, see pages 26-28 "Load Duration Curves and Grid Dispatch Order" for discussion on marginal.

Marginal Displaced Generation due to 1,000 MW of CHP



It is also worth noting that APS regulations currently recommend emitting marginal units for emission comparison purposes:

> *Net Carbon Dioxide Emissions Rate. A Generation Unit that generates electricity shall not exceed a net site carbon dioxide emissions rate equal to the average emissions rate of the current average value for emitting locational marginal units as shown in the most recent ISO-NE Electric Generator Air Emissions Report available in the same year in which an SQA is submitted for the Generation Unit*[7].

At the time regulation was released in 2019, the latest ISO NE report was the 2017 report, with an Annual Average Emitting Locational Marginal Unit (LMU) value of 971 lbs CO_2/MWH[8].

[7] *225 CMR 16.00 Alternative Energy Portfolio Standard (APS),* June2019, 16.05 (1)(e) Net Carbon Dioxide Emissions Rate: https://www.mass.gov/files/documents/2019/07/01/225%20CMR%2016%20APS%20Regulation%20CLEAN%20FINAL%20%28060619%29.pdf

[8] *2017 ISO New England Electric Generator Air Emissions Report*, April 2019, Table 5-4, page 26: https://www.iso-ne.com/static-assets/documents/2019/04/2017_emissions_report.pdf

Table 5-4
2017 LMU Marginal Emission Rates—Emitting LMUs (lb/MWh)

Ozone / Non-Ozone Season Emissions (NOX)					
Air Emission	Ozone Season		Non-Ozone Season		Annual Average (All Hours)
	On-Peak	Off-Peak	On-Peak	Off-Peak	
NO_X	0.31	0.14	0.25	0.24	0.23
Annual Emissions (SO_2 and CO_2)					
Air Emission		Annual			Annual Average (All Hours)
		On-Peak	Off-Peak		
SO_2		0.18	0.08		0.12
CO_2		981	964		971

However, there are different values for marginal emissions, as shown below.

2019 ISO – NE Average Emitting Locational Marginal Unit (lbs CO_2/MWh) Used in APS Regulation [9]	2019 ISO NE Load-Weighted All LMUs Marginal with Grid T&D Losses (lbs CO_2 /MWh)[10]	Frontier Energy Calculated 2019 hourly ISO NE Marginal (lbs CO_2/MWh) [11]	EPA eGrid 2019 NPCC Non-Baseload Marginal (lbs CO_2 /MWh)[12]	EPA eGrid2019 Subregion Match NEWE Non-Baseload[13] (lbs CO_2 /MWh)
943	758	866	840	888

A discussion is needed in order to standardize which marginal emission value should be used as comparison against the CHP's effective electric emissions. Also the frequency in which the marginal value is updated would also need to be decided.

[9] *2019 ISO New England Electric Generator Air Emissions Report,* March 2021: Table 5-6 https://www.iso-ne.com/static-assets/documents/2021/03/2019_air_emissions_report.pdf. Assumes "Load-Weighted."
[10] *2019 ISO New England Electric Generator Air Emissions Report*, March 2021: Table 5-7 https://www.iso-ne.com/static-assets/documents/2021/03/2019_air_emissions_report.pdf . 2019 All LMUS Load Weighted Annual Rate (lbs/MWh) = 719 lbs/MWh *5.4% T&D Losses = 758 lbs/MWh. T&D losses from eGRID2019 Technical Guide, Table 3-6 for Eastern Power Grid
[11] 8760 Frontier Energy, ISO NE 2019 hourly marginal load-weighted, with 5.4% T&D Losses
[12] *EPA Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems* June 2021, Table B-3.
[13] *EPA Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems*, June 2021, Table B-5. Includes T&D%

As the electric grid becomes cleaner, then CHP systems will have to adapt by blending higher amounts of renewable fuels to lower the system's CI. To this end, please reference Comment #4 on biogas/RNG.

Natural Gas Phase-Out Factor

It is also important to note that while Next Grid does not support phasing out of efficient CHP, the interpretation of the proposed natural gas factor is a factor against the total AEC calculated value and not the CHP's electric MWh generation[14]. This is because the independent verifier already calculates the AECs based on the prescribed AEC calculation method[15] which is an efficiency metric that considers both thermal and electric production. If the factor was applied to the electric MWh generation only, it would favor sites that produce more electricity, rather than wholistically looking at the overall efficiency of the system. This could then have the impact of incentivizing more inefficient systems. Below is an illustrative example of two 1 MW systems (A and B) with assumed 90% capacity factors, 90% uptime and 30% electrical efficiency.

Both 1 MW systems have the same electrical efficiency, whereas system B is less thermally efficient:

CHP System	Electric Output (MWh)	Thermal Output (MMBTU)	Fuel Input (MMBTU)	Electrical Efficiency	Thermal Efficiency	Overall Efficiency (HHV)	AECs Generated Traditional Calculation Method Pre-Factor	0.7 Factor applied to:	New "AECs" after Factor Applied
A	7,096	32,280	80,701	30%	40%	70%	9,676	MWH Electric Generation	4,967
								AEC Total	6,773
B	7,096	24,210	80,701	30%	30%	60%	6,719	MWH Electric Generation	4,967
								AEC Total	4,704

[14] *DOER Alternative Energy Portfolio Standard Straw Proposal*, Page 13, Natural Gas Phase Down, table reads "AEC per MWH Generated" https://www.mass.gov/doc/aps-straw-proposal/download

[15] Electrical energy generated per calendar quarter in MWh) / 0.33 plus ([Useful Thermal Energy produced in the calendar quarter in MMBtu] / 3.412 MMBtu/MWh) / 0.8 minus (all fuel and any other incremental energy consumed in the calendar quarter in MMBtu / 3.412 MMBtu/MWh) equals Alternative Generation Attributes (as AECs) in the calendar quarter in MWh. *APS Guideline for CHP,* June 14, 2011 https://www.mass.gov/files/documents/2016/08/tt/aps-chp-guidelines-jun14-2011.pdf

As the table shows, in the case of the factor being applied to electric MWh generation, both A and B would have the same resulting AECs, while CHP B is overall 10% less efficient than A. In other words, using MWh electric output vs the AEC calculation would inadvertently result in incentivizing less efficient systems.

Comment #3 – Price Stability

While the changes proposed in the Straw Proposal are likely to lead to an increase in credit prices, the history of the various credit markets in Massachusetts suggests this could be a temporary solution. Higher prices will ideally lead to more market participants, which will likely eventually lead to an oversupply condition similar to the current situation.

DOER has recognized this problem in other incentive programs and taken action to address it. Boom and bust pricing of Renewable Portfolio Standard (RPS) credits caused by fluctuating supply and rigid demand contributed to the agency's decision to create the SMART program. And in the version of regulations recently promulgated for the Clean Peak Standard, DOER included a ratchet that automatically increases demand when the supply of credits equals exceeds the supply.

We therefore urge the DOER to adopt the structure within the Clean Peak Standard which includes a corrective provision in the APS regulations that would increase demand for APS credits in the event that supply equals or exceeds demand.

For example, as in the case of the Clean Peak Standard, the APS regulations could have a provision that automatically increases demand for APS credits in the following year when supply has equaled or exceeded demand over the course of the prior compliance year. We believe this would lead to greater price stability.

Comment #4 – Role of RNG

There is a limited supply of biogas, particularly in New England. Current APS regulations require a dedicated pipeline in order to qualify for APS credits. We believe that this is unnecessarily limiting and that the goal of the regulations should be to incentivize the generation of renewable energy, regardless of location.

To this end, the regulations should be amended to no longer require physical delivery. This models how the California Low Carbon Fuel Standard and the federal RFS has treated biogas/Renewable Natural Gas (RNG). Both programs are related to transportation sector but the idea is the same; they allow injection of a pipeline quality RNG into a pipeline is location "X" (a landfill in Ohio, for example) and it can be counted in location "Y" (Boston, for example), so long as producers can:

> *demonstrate that a verifiable contractual pathway exists and that such pathway ensures that (1) a specific volume of landfill gas was placed into a commercial pipeline that ultimately serves the transportation fueling facility and (2) that the drawn into this facility from that pipeline matches the*

volume of landfill gas placed into the pipeline system. Thus facilities using such a fuel pathway may then use an appropriate D code for generation of RINs.[16]

The LCFS and RFS have procedures in place to avoid double counting. The actual RFS pathway that describes how double counting is avoided can be found at:

https://www.epa.gov/renewable-fuel-standard-program/renewable-fuel-pathways-ii-final-rule-identify-additional-fuel#rule-summary.

Thus a project can qualify for a LCFS credit and a RIN without having physical delivery. It is therefore our argument that something similar would help critical infrastructure decarbonize while also providing the resiliency benefits that are so critical.

Two other points on biogas/RNG:

1. In addition to allowing this type of biogas/RNG to qualify for the APS, the DOER should also allow it to qualify for the RPS and APS. That would allow for increased blend levels of the biogas/RNG and lead to further decarbonization.
2. Massachusetts should allow the gas LDCs to enter into long-term contracts for biogas/RNG.

Together with qualifying the gas for the RPS, APS, and CPS, long-term contracts would be valuable enough to attract biogas/RNG into Massachusetts. Without these changes, biogas will continue to flow to other, more valuable, markets, like the LCFS and RFS.

RENEWABLE THERMAL – HEAT PUMPS

Next Grid appreciates DOER's review of the renewable thermal guidance and its suggestions to increase program participation. The following comments focus specifically on heat pumps.

Comment #5 – Small Heat Pumps

Next Grid supports and is in agreement with the Straw Proposal suggestion to move heat pump system design eligibility criteria to the guideline to provide greater flexibility (slide 14). On the same slide, Next Grid thinks there should be clarification on the definition of "full displacement." If this is in relation to removal of back up/ non-renewable supplemental heating for small air source heat pumps, Next Grid recommends that heat pumps should still be eligible if they have an emergency backup heating system,

[16] This comes from page 14712 of https://www.govinfo.gov/content/pkg/FR-2010-03-26/pdf/2010-3851.pdf - see pages 14711 to 14712 for more background.

or if the heat pump supplies 90% of annual heat load (as in current guidance), in case the heat pump cannot provide sufficient heating during extreme cold events.

In response to DOER's first two APS Straw Proposal questions related to renewable thermal generation, please see below.

Question #1 - Please provide suggestions for where the break between non-metered and metered renewable thermal Generation Units should occur, in kBtu/hr.

Next Grid suggests the following size thresholds and metering methods for heat pumps (GSHP, ASHP) specifically. The suggestion includes keeping small, intermediate and large categories but providing the option for "intermediate" to be metered or non-metered and minted on an ongoing basis. Further explanation on the metering methods and change in intermediate threshold is contained in the response to Question #2.

Size	Small	Intermediate	Large
Threshold	Up to 134 kBTU/hr (same as the current threshold)	Between 134 kBTU- 2000 kBTU/hr (doubling the larger end of the range from 1000 kBTU/hr to 2000 kBTU/hr)	2000 kBTU/hr+
Metering Method	Non-metered or can choose to be in a larger category	Provide a non-metered option for ongoing AEC generation, for example, using a certified energy projection. IV reviews site provided electric bills to true up AEC generation. Site can elect to meter using the intermediate guidance.	Metered. For GSHP: BTU at the well and options for COP look up tables to alleviate kW meters. Allow for more cost-effective metering
Minting method	Pre-mint/Upfront payment	Quarterly minting	Quarterly minting

Question #2 - Please provide suggestions for technically and financially feasible metering schemes for metered renewable thermal Generation Units.

Next Grid believes the constraint of not allowing cooling, and simultaneous heating and cooling, is one of the main reasons for project metering complexities. Unless these constraints are mitigated then it may be difficult to simplify the metering schemes much more. Next Grid understands that cooling is not included in the legislation. Therefore, given the bounds of the programs, the most recent DOER guidance on "large" system metering measurements including use of COP look up tables for parasitic load and grid electricity estimation is practical. For larger projects, it's likely that sites would already be planning for metering and BMS capabilities in their initial design, and APS revenue from the project is more likely to go towards project costs.

However, the current intermediate threshold defined as a between 134,000 BTU/hr and 1,000,000 BTU/hr is a category that may be able to be approved upon. The intermediate systems are large enough that they should not be considered "small" and therefore should not be subject to the current Straw Proposal's MassSave proposed limitations, and small enough that they should not be held to "large" system i.e. metered requirements.

Intermediate projects need simplified metering due to costs associated with

- Meters
- Installation costs, also prevailing wage for public entities
- Ongoing Independent Verifier fees
- Data acquisition service and integration costs

It's important to note that the cost for a meter may be relatively inexpensive but the installation and data acquisition integration costs can make it financially unattractive for some intermediate sites to pursue the APS program. To that end, it is suggested to expand the intermediate category to 2000 kBTU/hr to capture more sites in which it could be costly to do larger system metering.

Next Grid has reviewed numerous private, municipal, state and university renewable thermal projects. Based on experience with commercial-sized projects, particularly for heat pumps systems (air source and ground source), these requirements raise costs and create complexity, therefore constructing a higher hurdle in terms of program participation.

Take for example the quoted costs for an actual MA-based intermediate GSHP project that was interested in the APS program:

System Size	Metering Method	Total Quoted Equipment Cost with DAS Integration	Estimated yearly revenue at $30/AEC	Ongoing Costs
0.215 MMBTU/hr	Intermediate	~$26,500	$10,500[17]	IV fees plus DAS fees potentially upwards of $1000/yr

[17] Estimation was based on available energy estimations, a standard x5 multiplier and no Net Zero adder. At the time, $8-15/AEC was estimated, but given Straw Proposal changes the estimate was increased to $30/AEC as reflected in the table.

Based on the contractor's quote, it would take over two years to pay off the metering even assuming higher AEC prices with an increased ACP. It is our belief that the program revenue should aim to help incentivize the installation of more efficient alternative technologies, not be used to pay back the program metering costs alone.

As a potential alternative to metering, Next Grid suggests the following ideas for intermediate sites:

1. Quarterly AEC Generation based on projection and true up:
    a. At the start of the project, an engineer provides an AEC forecast based on estimated annual energy use. The site generates quarterly AECs based on the energy forecast verified by qualified personnel approved by DOER (ex. engineer, CEM or qualified individual with energy forecasting experience). The energy use projection would have to fall within a standard EUI, based on occupancy type, and be approved by DOER. The site would also have to provide an affidavit certifying the data provided.
    b. After initial operation, the independent verifier reviews site provided certified energy bills, building energy use and occupancy type to true up generation. This would be ongoing for the system.
    c. This method provides an additional advantage as it connects the initial design with the operations side, to make sure that the heat pump is operating as projected.

2. Alternatively, DOER could set a maximum annual AEC generation threshold based on specific performance criteria such as maximum EUI threshold for heating by occupancy type, or AECs/sf. This way users with higher energy use and revenue potential are encouraged to implement metering if their projected use exceeds the cap.

Similar to the current framework for "small" sites, the intermediate site could choose whether they prefer to meter or do the nonmetered quarterly AEC generation method.

As per the December 2020 comments, some further specific issues and suggestions related to metering methods are:

- In instances where kW metering is required, a suggestion is to relax ANSI C12.20 standards for kW meters for renewable thermal projects, or to allow for metering points within the equipment itself. Revenue grade metering for often numerous heat pumps can be cost prohibitive, but there are still accurate metering alternatives that are not necessarily "revenue-grade."
- Based on past DOER guidance, insertion type flow meters have not been allowed for the program. It would be useful to have clarification if this is still the case. If so, a suggestion is to allow insertion flow meters as it can avoid purchasing the common alternative of more costly flange type meters.
- With respect to VRF air and ground source systems, a suggestion is to simplify the calculations by measuring/calculating the net amount of heat being sent to the building via the outdoor unit, instead of individually monitoring terminal unit loads, which can provide increased data management and complexity.

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We appreciate the opportunity to provide comments on this program. Next Grid is in support of measures that promote program participation and reduce program barriers.

We are available should you have any questions.

Best regards,

Matthew Wolfe
Managing Partner, Next Grid Markets, LLC