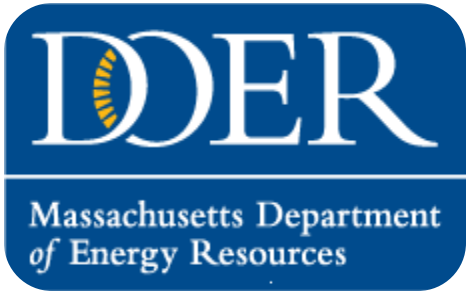
Creating A Cleaner Energy Future For the Commonwealth



COMMONWEALTH OF MASSACHUSETTS

Charles D. Baker, Governor
Karyn E. Polito, Lt. Governor
Matthew A. Beaton, Secretary
Judith Judson, Commissioner

Massachusetts Renewable Thermal Stakeholder Sessions

Sessions 3 & 4

January 12, 2018

Creating A Cleaner Energy Future For the Commonwealth

DOER
Massachusetts Department of Energy Resources

Session 3: Woody Biomass

Agenda

- APS overview
- Eligibility requirements
- Metering requirements and production reporting
- Application process and requirements
- Ongoing reporting procedures
- APS next steps
- Question and answer opportunity

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APS Overview

Alternative Energy Portfolio Standard (APS) Background

- The APS was established as of January 1, 2009, under the Green Communities Act of 2008
- Supports alternative energy technologies that increase energy efficiency and reduce the need for conventional fossil fuel-based power generation
- The Green Communities Act specifically included the following as eligible technologies:
  - Combined Heat and Power
  - Flywheel Storage
  - Gasification with Carbon Capture and Permanent Sequestration
  - Paper Derived Fuel
  - Efficient Steam Technology
- Eligible technologies are able to generate one Alternative Energy Certificate (AEC) for each MWh of electricity or 3,412,000 Btus of Useful Thermal Energy produced

What is the APS?

- State program requiring a certain percentage of the in-state electric load served by Load Serving Entities (LSEs) come from renewable energy
- LSEs meet their yearly obligations by procuring Alternative Energy Certificates (AECs)
- One AEC = 1 MWh (or 3,412,000 Btus)
- Obligation typically expressed as percent of total electric load

Example:

Utility serves 1,000,000 MWh of load in 2017 and has an obligation to procure 4.25% of that through the purchase of AECs

1,000,000 MWh x 0.0425 = 42,500 MWh (number of AECs they must procure)

Summary of MA Portfolio Standard Programs

RPS Class	Sub Class	Technology	Minimum Standard	2017 ACP Rate, $/MWh
Class I		Wind, LFG, Biomass, Solar PV, Small Hydro, AD, etc.	12% in 2017; increases by 1% each year	$67.70; increases with CPI
	Solar Carve-Out	Solar PV; 6 MW or less, in MA	1.6313% in 2017; set by formula annually	$448; reduced annually per 10-year schedule
	Solar Carve-Out II	Solar PV; 6 MW or less, in MA	2.8628% in 2017; set by formula annually	$350; reduced annually per 10-year schedule
Class II	Renewable	same as Class I	2.5909%; increases per schedule in regulation	$27.79; increases with CPI
	Waste Energy	Waste to Energy Plants, in MA	3.5%; stays constant	$11.12; increases with CPI
APS		CHP in MA, flywheels, storage, etc.	4.25% in 2017; increases to 5% in 2020	$22.23; increases with CPI

Program Participants

- Generation Unit Owners
- Installers
- Authorized Representatives
- Independent Verifiers
  - MassCEC will be the Independent Verifier for all small renewable thermal systems
- Aggregators
  - DOER encourages all Generation Unit owners to work with an aggregator

AEC Pricing

- Market driven
- State sets two variables:
  - Minimum Standard
  - Alternative Compliance Payment (ACP) Rate
- Minimum Standard refers to yearly percentage obligations placed upon compliance entities
- ACP rate is the price LSEs must pay for every MWh they are short of meeting their obligation

2014 and 2016 Statutory Changes

Chapter 251 of the Acts of 2014 required DOER to make changes to the existing APS regulations, including:

- Adding the following generation and fuel sources as eligible renewable thermal technologies:
  - Ground Source Heat Pumps (GSHP) and Air Source Heat Pumps (ASHP)
  - Solar Hot Water (SHW) and Solar Hot Air
  - Biomass, Biogas, and Biofuels
- Removing the following technologies as eligible:
  - Gasification with Carbon Capture and Permanent Sequestration
  - Paper Derived Fuel

Chapter 188 of the Acts of 2016 further required DOER to make changes to the APS regulations, including:

- Adding the following generation and fuel sources as eligible technologies:
  - Fuel Cells
  - Waste-to-Energy Thermal

Rulemaking Process

- Stakeholder meetings were held in late 2014 and early 2015 to discuss implementation of statutory changes
- Regulation initially filed on May 19, 2016
  - Public hearings were held on June 15, 2016 and June 17, 2016 in Amherst and Boston
  - Written comments were accepted through June 30, 2016
  - Over 50 sets of comments received
- Second draft of the APS Regulations incorporating 2016 statutory changes and changes in response to the first public comment period was filed on June 2, 2017
  - Public hearings were held on July 14, 2017 and August 7, 2017 in Boston and Holyoke
  - Written comments were accepted through August 7, 2017
  - Over 75 sets of comments received
- On October 13, 2017, DOER filed with the Clerk of the House of Representatives the amended draft with changes in response to public comments. It was referred to the Joint Committee on Telecommunications, Utilities, and Energy on October 16, 2017.
- After receiving no comments from the Joint Committee, DOER filed the final regulation with the Secretary of State's office on December 15, 2017
- Final regulation was promulgated and became effective on December 29, 2017

New Eligible Fuel and Technology Types

- Renewable thermal technologies:
  - Heat pumps (air source and ground source)
  - Solar thermal
  - Liquid biofuels
  - Biomass
  - Biogas
  - Compost heat exchange systems
- Non-renewable fuel cells (e.g. natural gas)
- Waste-to-energy thermal

Small, Intermediate, and Large Generators

- All renewable thermal generators are divided into three size categories as follows:

	Size Classification			
	Small	Intermediate		Large
AEC calculation basis	**Calculated net renewable thermal output**	**Calculated net renewable thermal based on indirect metering**	**Calculated net renewable thermal output based on direct metering of fuel input**	**Metered net renewable thermal output**
Solar thermal: evacuated tube and flat plate solar hot water	Collector surface area less than or equal to 660 sq ft	Collector surface area between 660 and 4,000 sq ft	-	Collector surface area greater than or equal to 4,000 sq ft
Solar thermal: solar hot air	-	Collector surface area less than or equal to 10,000 sq ft	-	Collector surface area greater than 10,000 sq ft
Solar sludge dryer	-	-	-	All
Eligible Biomass Fuel	-	-	Capacity less than or equal to 1,000,000 Btu per hour	Capacity greater than 1,000,000 Btu per hour
Compost heat exchange system	-	-	-	All
Air source heat pump: electric motor or engine driven	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Ground source heat pump	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Deep geothermal	-	-	-	All

- Classification determines whether the generators must directly meter thermal output
- No small and some intermediate systems are required to meter their thermal output, but instead receive AECs per formulae established in DOER Guidelines

Pre-Minting and Forward Minting

- Small heat pumps and solar hot water and air systems may choose to pre-mint or forward mint AECs
- **Pre-minting** of AECs allows certain generators to receive 10 years of AECs upfront in the first quarter of operation
- **Forward minting** of AECs allows generators to receive a pre-determined number of AECs each quarter over a period of 10 years
- Both options allow generators to receive AECs without directly metering their thermal output
- If the APS market is **more than** 25% undersupplied, **Pre-minting** is the default option available
- If the APS market is **less than** 25% undersupplied, **Forward minting** is automatically triggered for new generators
- Biomass, biogas, and liquid biofuel generators may not pre-mint or forward mint their AECs

Certificate Multipliers for Non-Emitting Renewable Thermal Technologies

- The statute allows for DOER to establish certificate multipliers for "non-emitting renewable thermal technologies", which results in more AECs being earned for the same 3,412,000 British thermal units of net useful thermal energy
- DOER has established the following multipliers for non-emitting renewable thermal technologies:

		APS Renewable Thermal Generation Unit Multiplier		
	System Size	**Small**	**Intermediate**	**Large**
Technology Type	Active solar hot water systems used for domestic hot water	3	3	3
	Active solar hot water systems used for domestic hot water, space conditioning or process loads	1	1	1
	Active solar hot air systems	-	5	5
	Solar sludge dryer	-	-	1
	Ground source heat pumps	5	5	5
	Deep geothermal	-	-	1
	Air source heat pumps (electric or engine driven) – supplying less than 100% of building heating load	2	-	-
	Air source heat pumps (electric or engine driven) – all other	3	3	3
	Compost heat exchange system	-	-	1
	Biomass, biofuels, biogas	N/A	N/A	N/A

Heat pumps installed in highly energy efficient homes, passive homes or zero net energy buildings are eligible to receive an additional multiplier of 2, added to their base multiplier in the table above

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Eligibility Requirements

Eligible Biomass Fuel

Fuel sources consisting of the following:

(a) Eligible Biomass Woody Fuel

(b) Dedicated Energy Crops

(c) Manufactured Biomass Fuel

(d) Eligible Biogas Fuel

(e) By-products or waste from animals or ag. crops

(f) Food or vegetative material

(g) Algae

(h) Organic refuse derived fuel

(i) Eligible Liquid Biofuel

Woody Biomass Fuels

Wood Pellets

Wood Chips

Wood Logs *

Types of Woody Biomass Fuels

Four Categories of Eligible Biomass Woody Fuels :

1. Forest-Derived Thinnings
2. Forest-Derived Residues
3. Forest Salvage (*Residues*)
4. Non-Forest-Derived Residues:
   - Forest products industry
   - Agricultural land use change
   - Wood waste
   - Agricultural wood waste

All Woody Biomass Fuel must be <u>Clean Wood</u>

Clean Wood

Clean Wood consists of trees, stumps, and brush, including but not limited to sawdust, chips, shavings, bark, and new or used lumber.

Clean wood does not include:

a) Wood from commingled construction and demolition waste

b) Engineered wood products

c) Wood containing or likely to contain:

   1. Asbestos
   2. Chemical preservatives such as, but not limited to, chromated copper arsenate (CCA), creosote or pentachlorophenol
   3. Paints, stains or other coatings, or adhesives

Forest-Derived Thinnings

- Trees considered structurally weak or that have low vigor and do not have the potential to eventually yield an 8 foot saw log or survive for at least the next 10 years.

- Trees removed during thinning operations, to reduce stand density and enhance diameter growth/volume of acceptable growing stock within the residual stand.

- Generally “Intermediate” or “Suppressed” members of a forest’s crown class.

Forest-Derived Residues

- Tops, crooks and other portions of trees produced as a byproduct, and trees collaterally damaged, during the normal course of harvesting material in the implementation of a silvicultural prescription.

- Trees and portions of trees harvested for the purposed of the restoration and management of habitat for rare & endangered species as listed by the Massachusetts Division of Fisheries and Wildlife.

- Other woody vegetation that interferes with regeneration or the natural growth of the forest, limited to locally invasive native species and non-native invasive woody vegetation.

Forest Salvage

- Damaged, dying, or dead trees removed due to injurious agents, such as wind or ice storms or the spread of invasive epidemic forest pathogens, insects and diseases or other epidemic biological risks to the forest, but not removed due to competition.

  - Must be accompanied by a declaration from a State or Federal agency -

- Trees removed to reduce fire hazard within fire-adapted forest ecosystems, as certified by a letter to the DOER from the state agency responsible for forestry.

Non-Forest-Derived Residues

- Forest products industry: Residues derived from wood products manufacturing consisting of Clean Wood.
- Agricultural land use change: Trees cut or otherwise removed in the process of converting forest land to agricultural usage, either for new or restored farm land.
- Wood waste: Pruned branches, stumps, and whole trees removed during the normal course of maintenance of public or private roads, highways, driveways, utility lines, rights of way, and parks.
- Agricultural wood waste: Pruned branches, stumps, and whole trees resulting from maintenance activities directly related to the production of an agricultural product.

Feedstock Requirement

100% of APS wood must be Eligible Biomass Woody Fuel, meeting sustainable forestry requirements.

DOER has established a minimum feedstock threshold of 30% forest-derived materials in order to support the local and regional forest product industry.

Included in the required 30%:

- Direct from forest
- Post manufacturing (mill waste)

Not Included in the required 30%

- Utility-derived residues
- Agriculturally-derived residues
- Urban wood waste

Fuel Quality Specifications

Type I.

A boiler or furnace of less than 3MMBtu/hr. (rated input) without an emission control device (e.g., electrostatic precipitator) must meet the following fuel quality specifications:

	Pellets	**Chips**
Calorific value	> 8,000 Btu per pound	≥ 5,500 Btu per pound
Moisture	≤ 8 percent	≤ 35 percent
Ash content by weight	≤ 1 percent	≤ 1.5 percent
Chip Size (percent retained by a ½ inch screen)	Not applicable	75 percent or adhere to manufacturer's protocol
Chlorides	≤ 300 parts per million	Not applicable

Fuel Quality Specifications Cont.

Type II

- A boiler or furnace of any size equipped with an emission control device (e.g., electrostatic precipitator) is not constrained to the afore mentioned fuel quality specifications (moisture content, sizing etc.).

This allows for green chips to be used.

Type III

- A boiler or furnace of greater than or equal to 3MMBtu per hour rated heat input must receive a MassDEP plan approval pursuant to 310 CMR 7.02(5), which shall dictate fuel quality specifications.

Sustainable Forestry Definition

Practicing a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat, and aesthetics and the stewardship and use of forests and forest lands in a way, and a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality, and potential to fulfill, now and in the future, relevant ecological, economic, and social functions at local, national, and global levels, and that does not cause damage to other ecosystems. Criteria for sustainable forestry include:

- conservation of biological diversity;
- maintenance of productive capacity of forest ecosystems;
- maintenance of forest ecosystem health and vitality;
- conservation and maintenance of soil and water resources;
- maintenance of forest contributions to global carbon cycles;
- maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies; and
- a legal, institutional, and economic framework for forest conservation and sustainable management.

Forest Sustainability Verification

- Massachusetts forest derived products must have a DCR approved cutting plan under the long term management option, signed by a state forester that attests to best management practices, and the Forest Stewards Guild's biomass retention guidelines.

- Non-Massachusetts forest derived products must either:
  - Have a cutting plan that is approved by a licensed or certified (SAF or host state) forester attesting that the harvest complied with Sustainable Forestry Management definition, best management practices of the host state, and the Forest Stewards Guild's biomass retention guidelines.

  - Biomass fuel is certified to an independent third-party certification that includes Forest Stewardship Council (FSC) and Program for the Endorsement of Forest Certification (PEFC), which includes the Sustainable Forestry Initiative (SFI) and American Tree Farm System (ATFS).

- Self Supply of fuel is also permissible, with registration.

System Performance Standards

All facilities must comply with the following fuel efficiency standards, which ensure that only best in class commercially feasible technologies will be installed:

Performance Requirement	**Pellets**	**Chips**
Thermal efficiency @ nominal output	≥ **85%** Higher Heating Value	≥ **75%** Higher Heating Value or ≥ **80%** Lower Heating Value if using EN303-5 to verify particulate emissions
Start up	Adhere to manufacturer's ignition protocol	
Modulation/shut off	The system must automatically modulate to lower output and/or turn itself off when the heating load decreases or is satisfied	
Pressurized elements	Compliant with 522 CMR 4.00	
Thermal storage	Required, unless an exception is issued by the Department	
Fuel storage	The system must have covered bulk storage	
Feedstock conveyance	The system must be automatically fed from feedstock storage to the furnace or boiler	

Thermal Storage Requirements

Thermal storage is required for qualification within the APS

Lead boiler system size (heat output)	Thermal storage required
< 80,000 Btu/hr	80 gallons
80,000 Btu/hr - 119,000 Btu/hr	1 gallon per 1,000 Btu/hr.
119,000 Btu/hr – 1 MMBtu/hr	119 gallons
> 1 MMBtu/hr.	2 gallons per 1,000 Btu/hr.

The thermal storage tank must have a minimum of R12 insulation with controls integrating with the central heater to decrease boiler cycling.

Thermal Storage Exceptions

All RTGUs must incorporate thermal storage unless they have submitted independent test lab results based on EN 303-5, EPA Test Method 28 WHH, or CSA B415 documenting that the boiler system is capable of all of the following:

1. Modulating below 20% of maximum capacity
2. Maintaining emissions standards at the system's minimum tested capacity.
3. Maintaining thermal efficiency that meet regulatory standards at the system's minimum tested capacity

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Facilities may also submit requests for an exception if they believe that it would deteriorate the efficiency or air emissions performance of the Generation Unit.

Emission Performance Standards

Boilers or furnaces less than 3 MMBtu/hr. (input) must meet applicable emissions limits below:		
	Pellets	**Chips**
Particulate Matter emissions (PM)	≤ 0.08 lb $PM_{2.5}$ per MMBtu $_{input}$ or ≤ 0.03 lb $PM_{2.5}$ per MMBtu $_{input}$ at sensitive populations	≤ 0.10 lb $PM_{2.5}$ per MMBtu $_{input}$ or *if EN303-5 is used to verify emissions* ≤ 0.05 lbs total PM per MMBtu $_{input}$ or ≤ 0.03 lb $PM_{2.5}$ per MMBtu $_{input}$ at sensitive populations
Carbon monoxide (CO)	270 ppm at 7% oxygen	270 ppm at 7% oxygen
A boiler or furnace of greater than or equal to 3 MMBtu/hr. heat input must be:		
Issued a Commonwealth of Massachusetts Department of Environmental Protection (MassDEP) plan approval, pursuant to 310 CMR 7.02(5). This requirement is irrespective of fuel type.		

Lifecycle Greenhouse Gas Emissions Analysis

- Generation Unit owners that do not purchase fuel from the Biomass Supplier's List will need to provide an annual analysis that shows, based on the type of woody biomass used, that there was a 50% reduction in greenhouse gas emissions over a 30-year time period.

- Analysis closely mirrors that used to demonstrate lifecycle GHG compliance under the RPS and relies closely on data from the Manomet Study.

Lifecycle Greenhouse Gas Emissions Tool

Massachusetts Department of Energy Resources
Alternative Energy Portfolio Standard - 225 CMR 16.00

Statement of Qualification Application (SQA)
Worksheet for the Calculation of Overall Efficiency - Annual

Generation Unit Name (as identified in SQA):	Typical Residential Biomass Pellet Boiler	Please complete all blue cells

Proposed Annual Operation

Biomass Fuel Input		
Type of Biomass Fuel input	Wood Pellets	choose from drop-down list
Moisture Content - **Dry Wood Chips Only**		%
Higher Heating Value	8000	BTU/lb
Annual Use or Production	1	dry tons

Dry Wood Chips must enter the average moisture content of the fuel supply over the previous year. Green Wood Chips are assumed to have an average moisture content of 50%.

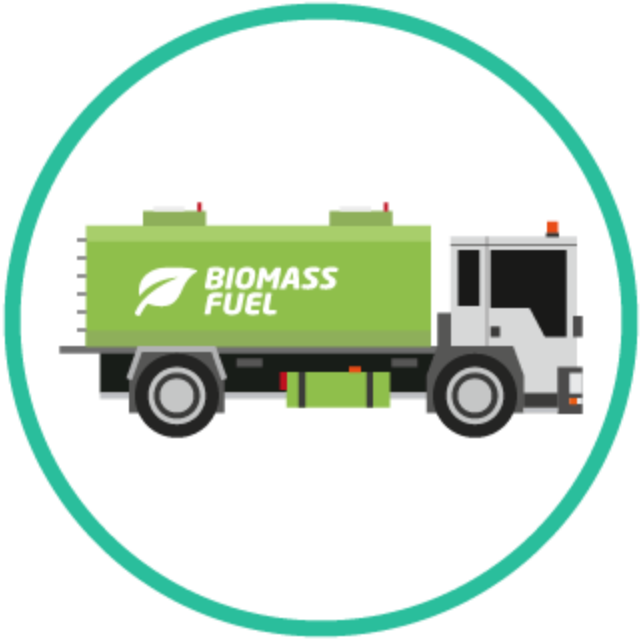
Energy Output		
Useful Thermal Load Description	Describe Load in Text Box	
Useful Thermal Energy delivered	13.6	MMBTUs annually
Renewable Electricity Generated		
Used "Behind-the-Meter	0	MWh annually
Delivered to ISO-NE Grid	0	MWh annually

Thermal Load Description:

Calculation of Overall Efficiency		
Biomass Input Heat Content	5	MWh_fuel
Useful Thermal Energy	4	MWh_therm
RE Elect - "Behind-the-Meter"	0	MWh_elec
RE Elect - delivered to Grid	0	MWh_elec

OVERALL EFFICIENCY	**85.0%**

Biomass Suppliers List



To ensure accountability and streamline fuel purchasing DOER will establish a pre-screened (and routinely audited) list of biomass suppliers.

Biomass Supplier List

Depending on the characteristics of the fuel being displaced, there are different requirements on the composition of the woody biomass that must used by a biomass system.

	Fuel Being Displaced	**Minimum Percentage of Residues**
Class I	Natural gas, Electric resistance, Propane, Fuel oil #6 and #2	**55%**
Class II	Electric resistance, Propane, Fuel oil #6 and #2	**50%**
Class III	Fuel oil #6 and #2	**35%**

If the fuel supplier does not report to the Department annually, or does not meet the required minimum requirements for residue, the fuel supplier will be taken off the list. Fuel suppliers may reapply to be placed back on the list, if they can meet the Department's standards.

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Metering Requirements and Production Reporting

Renewable thermal generators are divided into three size categories

	Size Classification			
	Small	Intermediate		Large
AEC calculation basis	**Calculated net renewable thermal output**	**Calculated net renewable thermal based on indirect metering**	**Calculated net renewable thermal output based on direct metering of fuel input**	**Metered net renewable thermal output**
Solar thermal: evacuated tube and flat plate solar hot water	Collector surface area less than or equal to 660 sq ft	Collector surface area between 660 and 4,000 sq ft	-	Collector surface area greater than or equal to 4,000 sq ft
Solar thermal: solar hot air	-	Collector surface area less than or equal to 10,000 sq ft	-	Collector surface area greater than 10,000 sq ft
Solar sludge dryer	-	-	-	All
Eligible Biomass Fuel	-	-	Capacity less than or equal to 1,000,000 Btu per hour	Capacity greater than 1,000,000 Btu per hour
Compost heat exchange system	-	-	-	All
Air source heat pump: electric motor or engine driven	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Ground source heat pump	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Deep geothermal	-	-	-	All

Renewable thermal generators are divided into three size categories

	Size Classification			
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Solar thermal: solar hot air	-	Collector surface area less than or equal to 10,000 sq ft	-	Collector surface area greater than 10,000 sq ft
Solar sludge dryer	-	-	-	All
Eligible Biomass Fuel	-	-	**Capacity less than or equal to 1,000,000 Btu per hour**	**Capacity greater than 1,000,000 Btu per hour**
Compost heat exchange system	-	-	-	All
Air source heat pump: electric motor or engine driven	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Ground source heat pump	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Deep geothermal	-	-	-	All

Intermediate Generation Units- AEC Formulas

- Less than 134,000 Btu/hr.
  - Fuel is metered
    - Reported via web to Mass Clean Energy Center (site under construction)

Useful Thermal Energy = (HHV * Eff * Fuel) / 3,412,000

Where:

Thermal Useful Energy = MWh/quarter

HHV = Higher Heating Value of the fuel delivered

HHV Fixed for green chips and pellets

HHV for dry chips allows for sliding scale for moisture content

Eff = The efficiency of the RTGU

Fuel= The amount of eligible fuel delivered to the RTGU

Intermediate Generation Units- AEC Formulas (cont.)

- Less than 134,000 Btu/hr.

Useful Thermal Energy = (HHV * Eff * Fuel) / 3,412,000

Example- Wood Pellets- Boiler:

Useful Thermal Energy = (8,000 Btu/lb *85% * 10,000 lbs)/3,412,000 = 19.9 MWh

19.9 MWh = 19 AECs

More information is available in Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units- Part 1

Production Reporting Procedure

- Generation Unit submits a Statement of Qualification Application to DOER
- DOER reviews and approves the application
- Generation Unit uploads fuel to Clean Energy Center website (quarterly)
- Clean Energy Center calculates AECs and reports the production to the NEPOOL GIS
- The AECs are minted on a quarterly basis

Intermediate Generation Units- AEC Formulas

- 134,000 to 1,000,000 Btu/hr.
  - Fuel is metered
    - Independent Verifier
    - Exploring options with Clean Energy Center

Useful Thermal Energy = (RH – G/0.44), where RH=RF * CRO

Where:

RH = Net Renewable heat transferred to a useful load (indirectly metered)

G = Grid supplied electrical energy

RF = Renewable Fuel

CRO = The RTGU Certified Renewable Thermal Output (MWh thermal output per MWh Renewable Fuel converted)

More information is available in Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units- Part 2

Large Generation Units- AEC Formulas

All Woody Biomass RTGU's with output in excess of 1MMBtu/hr. must engage an Independent Verifier to quantify useful thermal production (quarterly).

- Large Generation Units:
  - Thermal meters, flow sensor, fuel meter
    - Including a BTU computer and data acquisition system

More information is available in Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units- Part 2

Production Reporting Procedure

- Generation Unit submits a Statement of Qualification Application to DOER
- DOER reviews and approves the application
- The Independent Verifier begins recording and verifying energy production
- The Independent Verifier reports the production to the NEPOOL GIS
- The AECs are minted on a quarterly basis

Pre-Minting and Forward Minting

- Pre-minting and Forward minting are only available to small heat pumps and solar hot thermal systems.

- Biomass systems can utilize MassCEC rebates to help defray upfront capital costs.

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Application Process and Requirements

Application Portal

- All Statement Qualification Applications must be submitted on-line through application portal
- Hosted by the Massachusetts Clean Energy Center
- Portal and process is similar to the SREC II program
- The application is six steps, with the ability to save and exit after each step
- Includes in-portal communication function and automatic email updates

Application portal going live on January 16th

Renewable Thermal Application

Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6

System Information

System name REQUIRED

A personalized name for your project

System Address

Street REQUIRED

Apartment or Suite

City REQUIRED

-- specify one --

State REQUIRED

Massachusetts

Zip REQUIRED

Enter five digit zip code (12345) or five digit code with four digit extension (12345-6789)

System Details

Electric Distribution Company REQUIRED

-- specify one --

Gas Distribution Company REQUIRED

-- specify one --

Facility Type REQUIRED

-- specify one --

About this Application

Systems may choose to size up their classification (Small to Intermediate or Large; Intermediate to Large) if they wish to implement additional metering technology. System owners should refer to the Department's Guideline on Metering for further information.

Please complete all required fields prior to moving to the next Step. Changes to this page will not be saved until the 'Save and Continue' option has moved the application to the next Step.

Contact Us

Tel	(617) 626-1180
Email	thermal.doer@state.ma.us

Application Requirements

- Generation Unit location and capacity
- Existing heating system details
  - Annual heat load
  - Primary heating fuel and distribution type
- Generation Unit installation and design details
  - Capacity compared to load
  - Equipment information
  - Rating information
  - System cost
  - Installer
- Contact information
- NEPOOL GIS information

Application Attachments

Small Generation Units:

- AEC Services Agreement- (optional- for aggregators/authorized representatives only)

Intermediate and Large Generation Units only:

- AEC Services Agreement (for aggregators/authorized representatives)
- Independent Verifier Request Form
- Fuel Supply Plan and Greenhouse Gas Emission Analysis
- Process Flow Diagram with all APS meters shown
- One Line Electrical Diagram with all APS Meters Shown
- Metering Plan
- List of APS Meters
- System Information Data Sheet

Application Attachments cont.

Intermediate and Large Generation Units only (cont.):

- Equipment Arrangement Drawing
- General Site Plan
- Annotated Product Literature for all major equipment, each APS meter, and the Data Acquisition System
- Description of System Controls and Sequence of Operations
- System Performance Workbook
- Certified Performance Data Construct (Intermediate Only)

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Ongoing Reporting

To Ensure Sustainability Woody Biomass Fuel Origins Must Be Reported

https://apx.com/registries/nar/massbiomass/

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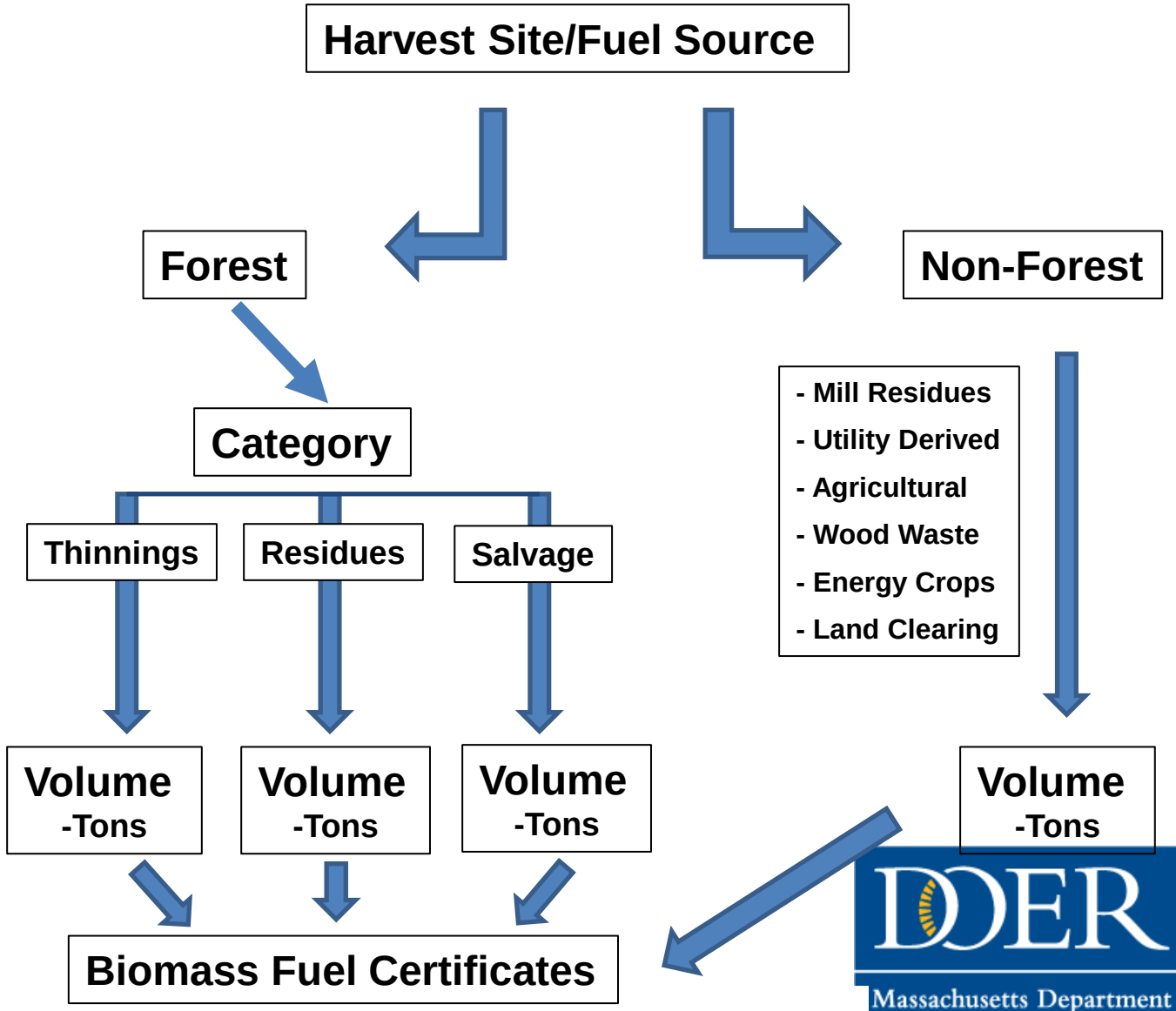
APX Fuel Tracking

1. Source Registry
2. Fuel Source Type
3. Fuel Characterization
4. Tonnage Registered



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Woody Biomass Fuel Reporting

On a quarterly basis APS fuels will be reported by:

- Generation Units
  - ➢ Pellet and chip vendors
- Woody Biomass Fuel Distributors
  - ➢ Pellet and chip supplier
- Woody Biomass Fuel Suppliers
  - ➢ Harvesters
  - ➢ Self-suppliers

Quarterly Fuel Reporting

	Q1	Q2	Q3	Q4
Start	January	April	July	Oct
End	March	June	Sep	Dec
RTGU Fuel Reports Due	**April 15th**	**July 15th**	**Oct 15th**	**Jan 15th**
Distributor Obligation set	May 1st	Aug 1st	Nov 1st	Feb 1st
Distributors Fuel Reports Due	**May 15th**	**Aug 15th**	**Nov 15th**	**Feb 15th**
Supplier Obligation set	June 1st	Sep 1st	Dec 1st	March 1st
Suppliers Fuel Reports Due	**June 15th**	**Sep 15th**	**Dec 15th**	**March 15th**
AEC Minting	**July 15th**	**Oct 15th**	**Jan 15th**	**April 15th**

DOER will implement an auditing program to verify compliance with all elements within the APS.

APS Next Steps

- Statement of Qualification application portal will open on January 16th

- Webinar- January 16th, 10:30am – 12:00pm
  - APS Application Process

Questions?

Creating A Cleaner Energy Future For the Commonwealth

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Session 4: Liquid Biofuels

Agenda

- APS Overview
- Eligibility
- Cap on the Available Attributes for Biofuel Generation Units
- Application Process and Requirements
- Reporting Procedures

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APS Overview

Alternative Energy Portfolio Standard (APS) Background

- The APS was established as of January 1, 2009, under the Green Communities Act of 2008
- Supports alternative energy technologies that increase energy efficiency and reduce the need for conventional fossil fuel-based power generation
- The Green Communities Act specifically included the following as eligible technologies:
  - Combined Heat and Power
  - Flywheel Storage
  - Gasification with Carbon Capture and Permanent Sequestration
  - Paper Derived Fuel
  - Efficient Steam Technology
- Eligible technologies are able to generate one Alternative Energy Certificate (AEC) for each MWh of electricity or 3,412,000 Btus of Useful Thermal Energy produced

What is the APS?

- State program requiring a certain percentage of the in-state electric load served by Load Serving Entities (LSEs) come from renewable energy
- LSEs meet their yearly obligations by procuring Alternative Energy Certificates (AECs)
- One AEC = 1 MWh (or 3,412,000 Btus)
- Obligation typically expressed as percent of total electric load

Example:

Utility serves 1,000,000 MWh of load in 2017 and has an obligation to procure 4.25% of that through the purchase of AECs

1,000,000 MWh x 0.0425 = 42,500 MWh (number of AECs they must procure)

Summary of MA Portfolio Standard Programs

RPS Class	Sub Class	Technology	Minimum Standard	2017 ACP Rate, $/MWh
Class I		Wind, LFG, Biomass, Solar PV, Small Hydro, AD, etc.	12% in 2017; increases by 1% each year	$67.70; increases with CPI
	Solar Carve-Out	Solar PV; 6 MW or less, in MA	1.6313% in 2017; set by formula annually	$448; reduced annually per 10-year schedule
	Solar Carve-Out II	Solar PV; 6 MW or less, in MA	2.8628% in 2017; set by formula annually	$350; reduced annually per 10-year schedule
Class II	Renewable	same as Class I	2.5909%; increases per schedule in regulation	$27.79; increases with CPI
	Waste Energy	Waste to Energy Plants, in MA	3.5%; stays constant	$11.12; increases with CPI
APS		CHP in MA, flywheels, storage, etc.	4.25% in 2017; increases to 5% in 2020	$22.23; increases with CPI

Program Participants

- Generation Unit Owners
- Installers
- Authorized Representatives
- Independent Verifiers
  - MassCEC will be the Independent Verifier for all small renewable thermal systems
- Aggregators
  - DOER encourages all Generation Unit owners to work with an aggregator

AEC Pricing

- Market driven
- State sets two variables:
  - Minimum Standard
  - Alternative Compliance Payment (ACP) Rate
- Minimum Standard refers to yearly percentage obligations placed upon compliance entities
- ACP rate is the price LSEs must pay for every MWh they are short of meeting their obligation

2014 and 2016 Statutory Changes

Chapter 251 of the Acts of 2014 required DOER to make changes to the existing APS regulations, including:

- Adding the following generation and fuel sources as eligible renewable thermal technologies:
  - Ground Source Heat Pumps (GSHP) and Air Source Heat Pumps (ASHP)
  - Solar Hot Water (SHW) and Solar Hot Air
  - Biomass, Biogas, and Biofuels
- Removing the following technologies as eligible:
  - Gasification with Carbon Capture and Permanent Sequestration
  - Paper Derived Fuel

Chapter 188 of the Acts of 2016 further required DOER to make changes to the APS regulations, including:

- Adding the following generation and fuel sources as eligible technologies:
  - Fuel Cells
  - Waste-to-Energy Thermal

Rulemaking Process

- Stakeholder meetings were held in late 2014 and early 2015 to discuss implementation of statutory changes
- Regulation initially filed on May 19, 2016
  - Public hearings were held on June 15, 2016 and June 17, 2016 in Amherst and Boston
  - Written comments were accepted through June 30, 2016
  - Over 50 sets of comments received
- Second draft of the APS Regulations incorporating 2016 statutory changes and changes in response to the first public comment period was filed on June 2, 2017
  - Public hearings were held on July 14, 2017 and August 7, 2017 in Boston and Holyoke
  - Written comments were accepted through August 7, 2017
  - Over 75 sets of comments received
- On October 13, 2017, DOER filed with the Clerk of the House of Representatives the amended draft with changes in response to public comments. It was referred to the Joint Committee on Telecommunications, Utilities, and Energy on October 16, 2017.
- After receiving no comments from the Joint Committee, DOER filed the final regulation with the Secretary of State's office on December 15, 2017
- Final regulation was promulgated and became effective on December 29, 2017

New Eligible Fuel and Technology Types

- Renewable thermal technologies:
  - Heat pumps (air source and ground source)
  - Solar thermal
  - Liquid biofuels
  - Biomass
  - Biogas
  - Compost heat exchange systems
- Non-renewable fuel cells (e.g. natural gas)
- Waste-to-energy thermal

Small, Intermediate, and Large Generators

- All renewable thermal generators are divided into three size categories as follows:

	Size Classification			
	Small	Intermediate		Large
AEC calculation basis	**Calculated net renewable thermal output**	**Calculated net renewable thermal based on indirect metering**	**Calculated net renewable thermal output based on direct metering of fuel input**	**Metered net renewable thermal output**
Solar thermal: evacuated tube and flat plate solar hot water	Collector surface area less than or equal to 660 sq ft	Collector surface area between 660 and 4,000 sq ft	-	Collector surface area greater than or equal to 4,000 sq ft
Solar thermal: solar hot air	-	Collector surface area less than or equal to 10,000 sq ft	-	Collector surface area greater than 10,000 sq ft
Solar sludge dryer	-	-	-	All
Eligible Biomass Fuel	-	-	Capacity less than or equal to 1,000,000 Btu per hour	Capacity greater than 1,000,000 Btu per hour
Compost heat exchange system	-	-	-	All
Air source heat pump: electric motor or engine driven	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Ground source heat pump	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Deep geothermal	-	-	-	All

- Classification determines whether the generators must directly meter thermal output
- No small and some intermediate systems are required to meter their thermal output, but instead receive AECs per formulae established in DOER Guidelines

Pre-Minting and Forward Minting

- Small heat pumps and solar hot water and air systems may choose to pre-mint or forward mint AECs
- **Pre-minting** of AECs allows certain generators to receive 10 years of AECs upfront in the first quarter of operation
- **Forward minting** of AECs allows generators to receive a pre-determined number of AECs each quarter over a period of 10 years
- Both options allow generators to receive AECs without directly metering their thermal output
- If the APS market is **more than** 25% undersupplied, **Pre-minting** is the default option available
- If the APS market is **less than** 25% undersupplied, **Forward minting** is automatically triggered for new generators
- Biomass, biogas, and liquid biofuel generators may not pre-mint or forward mint their AECs

Certificate Multipliers for Non-Emitting Renewable Thermal Technologies

- The statute allows for DOER to establish certificate multipliers for "non-emitting renewable thermal technologies", which results in more AECs being earned for the same 3,412,000 British thermal units of net useful thermal energy
- DOER has established the following multipliers for non-emitting renewable thermal technologies:

		APS Renewable Thermal Generation Unit Multiplier		
	System Size	**Small**	**Intermediate**	**Large**
Technology Type	Active solar hot water systems used for domestic hot water	3	3	3
	Active solar hot water systems used for domestic hot water, space conditioning or process loads	1	1	1
	Active solar hot air systems	-	5	5
	Solar sludge dryer	-	-	1
	Ground source heat pumps	5	5	5
	Deep geothermal	-	-	1
	Air source heat pumps (electric or engine driven) – supplying less than 100% of building heating load	2	-	-
	Air source heat pumps (electric or engine driven) – all other	3	3	3
	Compost heat exchange system	-	-	1
	Biomass, biofuels, biogas	N/A	N/A	N/A

Heat pumps installed in highly energy efficient homes, passive homes or zero net energy buildings are eligible to receive an additional multiplier of 2, added to their base multiplier in the table above

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Eligibility

Size Classification

	Size Classification			
	Small	**Intermediate**		**Large**
AEC calculation basis	**Calculated net renewable thermal output**	**Calculated net renewable thermal based on indirect metering**	**Calculated net renewable thermal output based on direct metering of fuel input**	**Metered net renewable thermal output**
Solar thermal: evacuated tube and flat plate solar hot water	Collector surface area less than or equal to 660 sq ft	Collector surface area between 660 and 4,000 sq ft	-	Collector surface area greater than or equal to 4,000 sq ft
Solar thermal: solar hot air	-	Collector surface area less than or equal to 10,000 sq ft	-	Collector surface area greater than 10,000 sq ft
Solar sludge dryer	-	-	-	All
Eligible Biomass Fuel	-	-	Capacity less than or equal to 1,000,000 Btu per hour	Capacity greater than 1,000,000 Btu per hour
Compost heat exchange system	-	-	-	All
Air source heat pump: electric motor or engine driven	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Ground source heat pump	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Deep geothermal	-	-	-	All

Size Classification

	Size Classification			
	Small	**Intermediate**		**Large**
AEC calculation basis	**Calculated net renewable thermal output**	**Calculated net renewable thermal based on indirect metering**	**Calculated net renewable thermal output based on direct metering of fuel input**	**Metered net renewable thermal output**
Solar thermal: evacuated tube and flat plate solar hot water	Collector surface area less than or equal to 660 sq ft	Collector surface area between 660 and 4,000 sq ft	-	Collector surface area greater than or equal to 4,000 sq ft
Solar thermal: solar hot air	-	Collector surface area less than or equal to 10,000 sq ft	-	Collector surface area greater than 10,000 sq ft
Solar sludge dryer	-	-	-	**All**
Eligible Biomass Fuel	-	-	**Capacity less than or equal to 1,000,000 Btu per hour**	**Capacity greater than 1,000,000 Btu per hour**
Compost heat exchange system	-	-	-	All
Air source heat pump: electric motor or engine driven	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Ground source heat pump	Output capacity less than or equal to 134,000 Btu per hour	-	Output capacity between 134,000 and 1,000,000 Btu per hour	Output capacity greater than or equal to 1,000,000 Btu per hour
Deep geothermal	-	-	-	All

General Requirements

- A liquid fuel that is derived from organic waste feedstocks
  - waste vegetable oils
  - waste animal fats
  - grease trap waste
  - Others as approved by DOER
- May not include petroleum-based waste or Hazardous Waste per 310 CMR 40.0006
- May blend with petroleum, but must have a minimum of 10% Eligible Liquid Biofuel

General Requirements cont.

- All fuel must be registered as part of the EPA Renewable Fuel Standard as Advanced Biofuel
  - a D-code of 3, 4, or 5
- Must adhere to one of the following ASTM specifications:
  - ASTM Standard D6751 (Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels
  - ASTM D396 - 15C (Standard Specification for Fuel Oils)
- Must qualify as part of an aggregation

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Cap on the Available Attributes for Biofuel Generation Units

Cap on the Available AECs for Biofuel Generation Units

- In each Compliance Year the total number of AECs minted to Generation Units using Eligible Liquid Biofuel may not exceed 20% of the total projected annual compliance obligation for the Compliance Year
  - No more than 10% of the Attributes generated prior to July 1st.
- If 100% of the Attributes available prior to July 1st are not allocated, the remaining number of available Attributes shall be rolled over and allocated during either of the remaining quarters in that calendar year
- If the number of Attributes reported by Generation Units exceeds the available Attributes, the number of available Attributes shall be allocated on a prorated basis

Cap on the Available AECs for Biofuel Generation Units for 2018

2016 Aggregated APS Obligation	1,874,577
Total Attributes Available for Biofuel Generation Units (20% of 2016 Aggregated Obligation)	374,915
Total Attributes Available for Biofuel Generation Units in Q1 and Q2 2018	187,458
Attributes Minted for Biofuel Generation Units in Q1 and Q2 2018	-
Total Attributes Available for Biofuel Generation Units Q3 and Q4	No less than 187,458
Attributes Minted for Biofuel Generation Units in Q3 and Q4 2018	-

Example: Cap is not exceeded

2016 Aggregated APS Obligation	1,874,577
Total Attributes Available for Biofuel Generation Units (20% of 2016 Aggregated Obligation)	374,915
Total Attributes Available for Biofuel Generation Units in Q1 and Q2/Q3 and Q4 (10% of 2016 Aggregated Obligation)	187,458

	Attributes Available	MWh equivalent reported	Attributes Minted	Remaining Under Cap
Q1	187,458	90,000	90,000	97,458
Q2	97,458	95,000	95,000	2,458
Q3	189,916	100,000	100,000	89,916
Q4	89,916	85,000	85,000	4,916

All aggregations get the full number of certificates reported

Example: Cap is exceeded

2016 Aggregated APS Obligation	1,874,577
Total Attributes Available for Biofuel Generation Units (20% of 2016 Aggregated Obligation)	374,915
Total Attributes Available for Biofuel Generation Units in Q1 and Q2/Q3 and Q4 (10% of 2016 Aggregated Obligation)	187,458

	Attributes Available	MWh equivalent reported	Attributes Minted	Remaining Under Cap
Q1	187,458	90,000	90,000	97,458
Q2	97,458	95,000	95,000	2,458
Q3	189,916	100,000	100,000	89,916
Q4	89,916	140,000	89,916	-

All aggregations get 64% of the number of MWhs reported in Q4

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Application Process and Requirements

Intermediate Generation Units

- Certificates are owned by the person/entity who provides the fuel onto the end use customer
  - Most likely the biofuel distributer
- AECs are calculated based on indirect metering of Useful Thermal Energy by directly metering the fuel input

Application Portal for Intermediate Generation Units

- Company information
- Contact information
- Fuel supply plan
- Certifications

Large Generation Units

- Certificates are owned by the person/entity who owns the Generation Unit
- The Generation Unit must still be a part of an aggregation
- Must contract with the Independent Verifier
- AECs are calculated based on direct metering of Useful Thermal Energy
  - Electric meters
  - Btu meters

Application Portal for Large Generation Units

- All Statement Qualification Applications must be submitted on-line through application portal
- Hosted by the Massachusetts Clean Energy Center
- Portal and process is similar to the SREC II program
- The application is six steps, with the ability to save and exit after each step
- Includes in-portal communication function and automatic email updates

Application portal going live on January 16th

Renewable Thermal Application

Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6

System Information

System name REQUIRED

A personalized name for your project

System Address

Street REQUIRED

Apartment or Suite

City REQUIRED

-- specify one --

State REQUIRED

Massachusetts

Zip REQUIRED

Enter five digit zip code (12345) or five digit code with four digit extension (12345-6789)

System Details

Electric Distribution Company REQUIRED

-- specify one --

Gas Distribution Company REQUIRED

-- specify one --

Facility Type REQUIRED

-- specify one --

About this Application

Systems may choose to size up their classification (Small to Intermediate or Large; Intermediate to Large) if they wish to implement additional metering technology. System owners should refer to the Department's Guideline on Metering for further information.

Please complete all required fields prior to moving to the next Step. Changes to this page will not be saved until the 'Save and Continue' option has moved the application to the next Step.

Contact Us

Tel	(617) 626-1180
Email	thermal.doer@state.ma.us

Application Requirements

- Generation Unit location and capacity
- Existing heating system details
  - Annual heat load
  - Primary heating fuel and distribution type
- Generation Unit installation and design details
  - Capacity compared to load
  - Equipment information
  - Rating information
  - System cost
  - Installer
- Contact information
- NEPOOL GIS information

Application Attachments

Small Generation Units:

- AEC Services Agreement- (optional- for aggregators/authorized representatives only)

Intermediate and Large Generation Units only:

- AEC Services Agreement (for aggregators/authorized representatives)
- Independent Verifier Request Form
- Process Flow Diagram with all APS meters shown
- One Line Electrical Diagram with all APS Meters Shown
- Metering Plan
- List of APS Meters
- System Information Data Sheet

Application Attachments cont.

Intermediate and Large Generation Units only (cont.):

- Equipment Arrangement Drawing
- General Site Plan
- Annotated Product Literature for all major equipment, each APS meter, and the Data Acquisition System
- Description of System Controls and Sequence of Operations
- System Performance Workbook
- Certified Performance Data Construct (Intermediate Only)

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Reporting Procedures

Biofuel Supplier vs Distributor

Biofuel Supplier: A person or entity who produces Eligible Liquid Biofuel

Biofuel Distributor: A person or entity who does not produce Eligible Liquid Biofuel, but buys and sells Eligible Liquid Biofuel to an end user

Biofuels Supplier List

The Department shall establish and maintain a list of suppliers of Eligible Liquid Biofuel on its website.

A fuel supplier must complete and submit an application to the Department to be included on the Department's Eligible Liquid Biofuel suppliers list. Fuel suppliers must be registered in the Environmental Protection Agency's Renewable Fuel Standard (RFS2), and must verify that they produce biodiesel from organic waste feedstocks.

Biofuels Supplier List Application

- Company information
- Contact information
- EPA Renewable Fuel Standard Attestation
- Third party engineering report, as submitted to the EPA RFS
- Feedstock supply plan
- Certifications

Biofuels Supplier List Application

Biofuel Supplier Quarterly Reporting

- Biofuel Feedstock Provider
- Type of Biofuel Feedstock
- Quantity of Feedstock Delivered (tons)
- Quantity of Eligible Liquid Biofuel Produced (gallons)
- Percentage of feedstock to biofuel produced

Suppliers must also submit a quarterly RFS2 EMTS RIN Generation Report

Supplier Quarterly Report

Biofuel Distributor Quarterly Reporting

- Fuel Distributor submits an aggregation Statement of Qualification Application to DOER
- DOER reviews and approves the application
- Fuel Distributor submits a quarterly report to DOER including fuel sales and DOER calculates the number of AECs based on the Eligible Liquid Biofuel sold
- MassCEC verifies the calculation and reports the number of AECs to NEPOOL GIS
- The AECs are minted in the next quarterly minting

AEC Formula

Useful Thermal Energy = (Fuel * Volume * EFC * Eff) / 3,412,000

Where:

Fuel = Btu content of the fuel delivered to the RTGU, established as 127,000 Btu/gal for biofuel

Volume = The total volume of fuel delivered

EFC = Eligible fuel content (the blend of the fuel delivered to the Generation Unit)

Eff = The efficiency of the Generation Unit, established as 85% for boilers and 80% for furnaces

If the equipment information isn't know, the default efficiency will be 80%

AEC Formula

Example.

1,000 gallons of a B20 blend delivered to a boiler

Useful Thermal Energy = (127,000 (Btu/gal) * 1,000 (gal) * 0.2 * 0.85) / 3,412,000

Useful Thermal Energy = 6 MWH equivalent or AECs

Distributor Quarterly Report

- Eligible Liquid Biofuel Sales
  - Customer information
  - Equipment information
  - Blend level
  - Total volume of sale
- Eligible Liquid Biofuel Purchases
  - Biofuel supplier (from DOER's Biofuel Suppliers List)
  - Blend level
  - Total volume of purchase

Purchases must be greater than sales

Distributor Quarterly Report

Reporting Procedure

- Generation Unit submits a Statement of Qualification Application to DOER
- DOER reviews and approves the application
- The Independent Verifier begins recording and verifying production
- The Independent Verifier reports the production to the NEPOOL GIS
- The AECs are minted on a quarterly basis

APS Next Steps

- Statement of Qualification application portal will open on January 16th

- Webinar- January 16th, 10:30am – 12:00pm
  - APS Application Process

Questions?