Creating A Cleaner Energy Future For the Commonwealth

COMMONWEALTH OF MASSACHUSETTS

Deval L. Patrick, Governor
Richard K. Sullivan, Jr., Secretary
Mark Sylvia, Commissioner

Massachusetts Department of Energy Resources

Webinar

May 16, 2012

10:00 AM

Biomass Energy Rulemaking Summary of Proposed Final Regulation

225 CMR 14.00 Renewable Energy Portfolio Standard (RPS) Class 1

The webinar will start in a few minutes……

Recording & Presentation

- The webinar is being recorded and will be available on our website in approximately 48 hours at: http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html
- The slide presentation will also be posted at the above website
- This website is also listed at end of presentation

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Key Changes to the Regulation

- **Eligible Forest Biomass and Forest Sustainability**
- **Biomass Fuel Certificates and the Biomass Certificate Registry**
- **Overall Efficiency Criterion**
- **Carbon Accounting**
- **Annual Compliance of Generation Units and Provisions for Under-Compliance**
- **Treatment of Previously Qualified Biomass Units**

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Eligible Woody Biomass Fuels
(and categorization for carbon accounting purposes)

THINNINGS

Forest-Derived Thinnings
- Unacceptable growing stock, managed thinnings

RESIDUES

Forest-Derived Residues
- Tops and branches from harvests
- Invasive species

Other Residues
- Forest Salvage (pests, storms – government declared event)
- Non-Forest Residues (wood industry, trimmings, land-use change)

Dedicated Energy Crops
- On previously non-forest, marginal lands

No Construction and Demolition Material

4

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Restrictions on Removal of Forest-Derived Biomass

Eligible Biomass Removal is prescribed by the Forester in the *Eligible Forest Biomass Tonnage Report* (in Guideline) and depends on:

1) **Tons of Forest Products harvested, and**
2) **Soil Conditions, as follows:**
   - Soils within harvest site are identified by forester using USDA, NRCS soil maps.
   - Poor Soils are identified based on the following criteria:
     1) Shallow-to-bedrock;
     2) Dysic histosols (organic wetland soils, low nutrients, low pH); or
     3) Dry, nutrient-poor sandy soils

5

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Allowable Biomass removals (as a percent of the forest products harvested) depend on Soil Conditions

Soil Restrictions (based on USDA NRCS Criteria)	Good Soils	Poor Soils
Percent of Tops and Branches of Forest Products Harvested that must be retained on site	25%	100%
Percent of Weight of Forest Products Harvested that may be removed (as Residues or Thinnings) as Eligible Biomass Woody Fuel	30%	30%

Additional Forest Sustainability criteria must be met on harvest site
- **No removals from old growth forest stands, or from steep slopes**
- **Retention/protection of forest litter, forest floor, stumps/roots**
- **No removal of naturally down woody material**
- **Retention of adequate supplies of den trees, snags for ecological needs**

- Removal limits are applied on each section of the harvest with different soil conditions. For small harvests (<50 acres) removals are based on the averaging of soil conditions present on the site.

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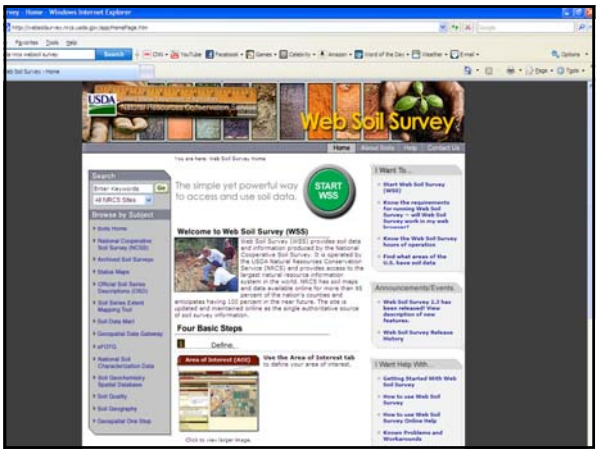

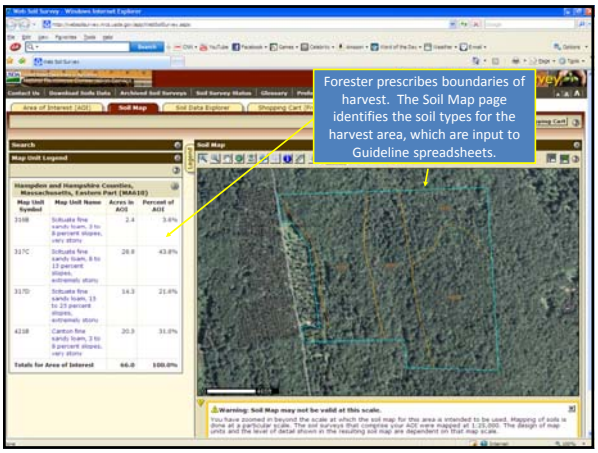

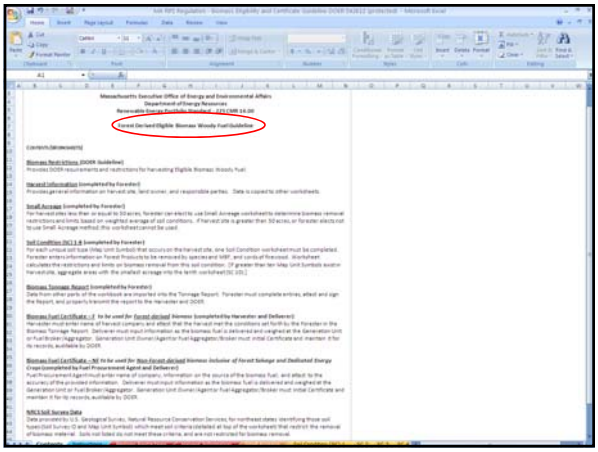

Key Worksheets in the Eligible Biomass Woody Fuel Guideline

- Biomass Restriction Rules and Sustainability Criteria
- General Harvest Information
- Prescribed Forest Products harvest and Biomass Removal (thinnings/residues) for each of the Soil Conditions identified on site
- Biomass Tonnage Report (summarizes prescribed harvest and biomass removal for harvester and DOER
- Forest Derived Biomass Fuel Certificate (to be printed and accompany fuel leaving harvest site)
- Non-Forest Derived Biomass Fuel Certificate
- USDA NRCS Soil Survey Data (reference)

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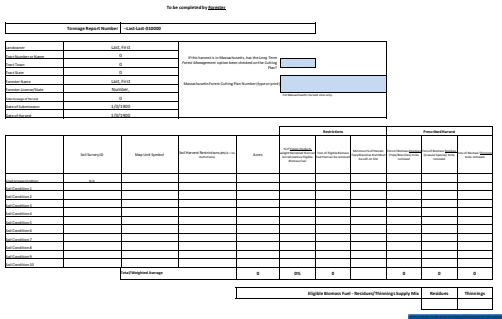
Biomass Tonnage Report



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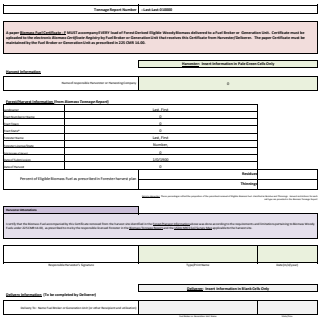
Biomass Fuel Certificate (Forest-Derived)



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Fuel Certificates and Registry

Biomass Fuel Certificates

- Forest Derived Biomass: Generated from Forester's *Biomass Tonnage Report*
- Non-Forest Derived Biomass: Generated by fuel provider
- Specifies fuel source as Thinnings or Residues
- All Certificates uploaded to Biomass Certificate Registry; and then denominated as one Certificate for each ton of fuel

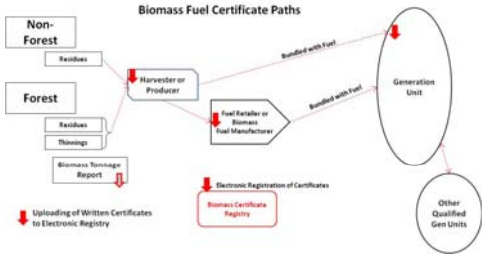
Certificate Pathways

- Directly from fuel source to Unit, without mixing (bundled with fuel).
- From source to fuel retailer, and accompanying a delivery of Co-Mingled Biomass Woody Fuel from the fuel retailer directly to Unit (bundled with fuel).
- Trading of Certificates between qualified Units.

Co-Mingled Biomass Woody Fuel

- Any woody biomass fuel that is physically co-mingled with Eligible Biomass Woody Fuel (e.g. at a fuel aggregation facility)

Fuel Certificate Paths and Registry



Biomass Certificate Registry

- Electronic Registry, to be established by DOER
- Tracks Certificates from Source to Generator
- Limited Use and Trading
- Certificate Volume (Thinnings and Residues) basis for Annual Compliance

Generation Unit – Minimum Overall Efficiency

Overall Efficiency – Definition, calculated on a quarterly basis

Overall Efficiency =

[Electric generation not utilized behind-the-meter +
Electric generation utilized behind-the-meter divided by 0.92 (line losses) +
Useful Thermal Energy +
Merchantable Bio-Products energy content]

divided by Biomass Input Heat Content

Overall Efficiency – Eligibility Thresholds

Standard Technology

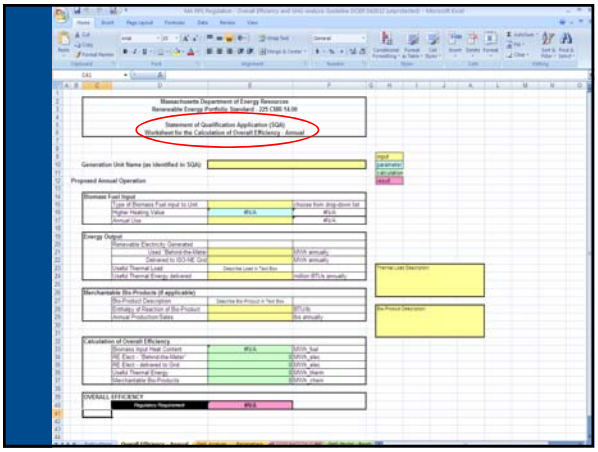
- 50% for ½ REC value, increasing linearly to a full REC value at 60%

Advancement of Biomass Conversion Technology

- 40% for ½ REC value, increasing linearly to a full REC value at 60%

Advancement of Biomass Conversion Generation Unit

Units that demonstrate advancements in fuel-to-energy conversion, fuel processing, emissions controls. SQAs open for public comment.



Greenhouse Gas Accounting for Biomass Units

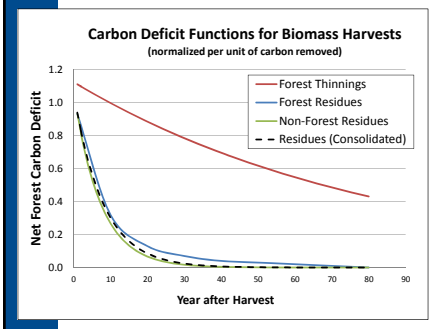
Threshold

- 50% reduction in GHG over 20 years, relative to a natural gas, combined-cycle generation unit
- Must be met on an annual basis
- Under-Compliance Mechanism provides some flexibility

GHG Accounting

- *Guideline* provides spreadsheet for demonstrating GHG threshold for RPS Application, and for Annual Compliance Reporting
- Accounting is based on:
  - Overall Efficiency
  - Displaced Fuels
  - Biomass Fuel Use: Thinnings and Residues

GHG Analysis – Thinnings and Residues



Thinnings: Long deficit reduction period during forest re-sequestration.

Residues: Short deficit reduction period due to avoided biomass decomposition.

Analyses based on Manomet Study (thinnings) and literature (residues). See *GHG Analysis Guideline*.

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
DEPARTMENT OF ENERGY RESOURCES (DOER)
Renewable Energy Portfolio Standard - 225 CMR 14.00

Guideline for the Calculation of Overall Efficiency and Lifecycle GHG Analysis
December 2011

OVERVIEW AND INSTRUCTIONS

Under 225 CMR 14.00, any operator or owner of a woody biomass Units applying to the Department of Energy Resources (DOER) for qualification under the Renewable Energy Portfolio Standard (RPS) program must meet certain conditions pertaining to the Overall Efficiency of the Unit (as provided in 225 CMR 14.05(1)(a)(7)(f)(ii)) and the Lifecycle Greenhouse Gas Emissions from the Unit (as provided in 225 CMR 14.05(1)(a)(7)(f)(iii)). This Guideline provides a set of worksheets to be used by the applicant to demonstrate that the Unit meets these two criteria.

Overall Efficiency

The applicant shall input Unit information required in the yellow shaded cells of the *Overall Efficiency - Annual* worksheet. The applicant shall also enter additional descriptive information in the yellow shaded text cells, as necessary. The applicant may provide further description under separate cover, and DOER may request additional information to assist its review of a Unit's application.

Data are to be input into the worksheet based on the applicant's projected *annual* (one Calendar Year) system performance. The worksheet is used to determine if an applicant can meet the regulatory requirement of at least an Overall Efficiency of 50%. An applicant that is unable to demonstrate an annual Overall Efficiency at or above 50% but projects operation at or above 50% during one or more calendar quarters, must complete this worksheet based on annual performance. However, the applicant must also complete the four *Overall Efficiency – Quarterly* worksheets found as the final four worksheets of the workbook. *For projects which are determined by DOER to be Advancement of Biomass Conversion Generation Units, this paragraph holds except that the minimum Overall Efficiency is modified to be 40%.*

Lifecycle Greenhouse Gas Analysis

The applicant shall complete the *GHG Analysis* worksheet. The worksheet is provided by DOER as a template for the purposes of demonstration that the Unit meets the regulatory criterion of reducing GHG emissions by at least 50% compared to natural gas combined cycle electricity generation in 20 years (based on 1-Year or Single Year Analysis).

Data are to be input to the provided worksheet in the yellow shaded cells. Other cells will be automatically completed as calculations, parameters, or copied from the Overall Efficiency worksheet. Applicants who wish to utilize parameter values different than those used in this template may propose alternative assumptions with justification to DOER for approval.

If an applicant can justify to DOER's satisfaction that unique features of its Unit merit substantially different assumptions and methodologies than those underlying this template, the applicant may alternatively submit to DOER an independent analysis with full documentation of assumptions and methodologies. Such analysis must be deemed complete, acceptable to DOER, and in compliance with efficiency and greenhouse gas requirements of the regulation.

Similarly, if DOER deems that a project sufficiently departs from the standard design and operation of a biomass Unit as provided in this template (for example, in the case of co-firing), DOER may require the applicant to utilize this template with different assumptions or parameters, or submit an independent analysis to the satisfaction of DOER.

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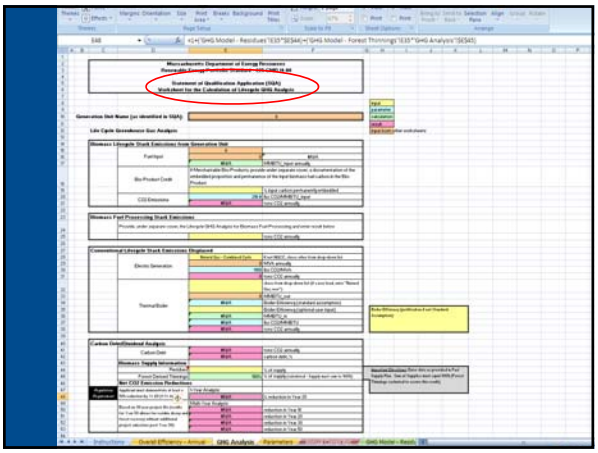

Other Key Worksheets in the *Guideline for the Calculation of Overall Efficiency and Lifecycle GHG Analysis*

- Quarterly Overall Efficiency calculations to demonstrate REC eligibility by Unit's Third-party Meter Reader.
- Annual Compliance Report (to be filed to DOER by each Generation Unit, to demonstrate compliance with GHG threshold).

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Under Compliance Mechanism

Generation Unit Annual Compliance Report

- Annual report, covering the prior calendar year, to DOER providing Unit's Overall Efficiency and GHG reductions relative to 50% reduction in 20 years threshold.
- Calculation methodology and reporting per *Guideline*.

Under-Compliance

- Unit that demonstrates a reduction in 20 years of GHG less than 50% are deemed to be in Under-Compliance.
- Percentage points below the 50% threshold is the Percent Under-Compliance.

Under-Compliance Mechanism

- Unit pays Under-Compliance Payment equal to $0.50 times the Percent Under-Compliance for each REC settled for compliance in MA. [For example, a Unit reducing GHG emissions by 40% will be 10 Percent Under-Compliance and need to pay (0.50 x 10) $5 per settled REC.]
  - Fees paid to MassCEC and used as directed by DOER for residue fuel supply infrastructure and tree planting.
- Unit enters Probationary Status for 5 years.
  - Increasingly rigorous steps to assure compliance – require demonstration that more and more of the fuel supply is contracted from residue sources.
  - Probationary status waived if over-compliance offsets under-compliance, or if compliance is met for three years.
  - Otherwise, Unit's qualification is revoked after Probationary Status.

22

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Treatment of Previously Qualified Units

- All Units maintain qualification through 2012
- Units maintain qualification through 2014 if they provide DOER a Fuel Supply Plan and utilize Eligible Biomass Woody Fuel as demonstrated through ownership of Biomass Fuel Certificates.
- Beginning in 2016, all Units must meet the Overall Efficiency, GHG reduction threshold, and all provisions of the regulation.

23

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Program Verification and Review

Advisory Panel

- Membership: EEA, DOER, DCR, DEP, and 5 non-government entities
- Meet not less than twice per year
- Provide findings and recommendations to DOER regarding confidence in verification and enforcement of:
  - Tracking/enforcement of *Eligible* and *Co-Mingled Biomass Woody Fuel*
  - Operations of the electronic tracking of Biomass Fuel Certificates and impact on fuel markets

Forest Impact Assessment

- DOER, in coordination with DCR, will assess the impact on forests resulting from biomass fuel removals, every five years, starting in 2015.
- Assessment will also survey aggregate fuel use by sources, and evaluate appropriateness and accuracy of GHG accounting methodologies.

24

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Further Information on Rulemaking

- **Follow all rulemaking activities at DOER's website:** http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html

- **Public Comment Period**
  The Department will accept written comments on this proposed final regulation between May 19th and June 18th, 2012. Any interested party may submit written comments electronically in pdf format by 5:00 pm on June 18, 2012 to doer.biomass@state.ma.us

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