

**Commonwealth of Massachusetts  
Department of Energy Resources (DOER)**

**MA Renewable Energy Portfolio Standard (RPS)  
225 CMR 14.00  
Draft Regulation filed on May 3, 2011**

**WOODY BIOMASS ELIGIBILITY  
SUMMARY OF REGULATORY CHANGES**

This summary provides an overview of key changes to the RPS regulation pertaining to the eligibility of woody biomass fuel and biomass units. These changes reflect revisions to the draft proposed regulation initially filed with the Secretary of State on September 17, 2010, and reflect comments received by DOER in writing and at two Public Hearings.

**Overview of Biomass Rules under the Draft Proposed Regulation filed 9/17**

From the inception of the MA RPS program in 2003, biomass power generation has played a substantial role in meeting the program compliance obligation. As new and large biomass projects were proposed in Massachusetts, and the 2008 Global Warming Solutions Act (GWSA) was enacted, public concern was raised regarding whether biomass power generation truly reduces greenhouse gas emissions, and the impact biomass plants would have on the sustainability of forest lands. Given that the implications of biomass energy on climate and forests were potentially significant but not adequately understood, DOER suspended qualification of biomass units for the RPS in December 2009 and commissioned a research team led by the Manomet Center for Conservation Science to analyze these issues. This suspension remains in effect until DOER completes its rulemaking process. DOER's goal is to provide appropriate eligibility criteria on biomass generation units to assure that these units contribute positively to the carbon reduction commitments of the Commonwealth under the GWSA, and to assure that biomass fuel removals from forest lands are sustainable.

In June 2010, the Manomet Center issued its study. Based on findings of the Manomet Study, as well as substantial oral and written comments from the public and direction from the EEA Secretary, DOER filed a draft proposed regulation with the Secretary of State on September 17, 2010. DOER subsequently received public comments at two public hearings and in writing during the public comment period.

The key provisions of the draft proposed regulation are the following:

- A definition of Eligible Biomass Woody Fuel which limits forest derived fuels primarily to residues, limited thinnings, and forest salvage resulting from storm events or pest infestations, as opposed to harvesting whole trees for fuel;
- Requirement of biomass units to provide lifecycle GHG analysis and demonstrate emissions reductions of at least 50 percent over 20 years;
- A strict limitation that no more than 15 percent of the weight of harvested forest products can be removed as Eligible Biomass Woody Fuel, to provide sufficient soil nutrient retention;
- Establishment of threshold requiring overall efficiency of biomass generation units to be at 40 percent in order to qualify for one-half REC credit per MWh of generation, with REC credit increasing linearly to a full credit at an overall efficiency of 60% or above;
- Provisions for the treatment of existing biomass generation units already qualified for the RPS Class I program, with such units required to demonstrate compliance with the use of Eligible Biomass Woody Fuel by the start of Compliance Year 2013, and with all provisions (including overall efficiency) by the start of Compliance Year 2015.

### **Key Revisions to the 9/17 Proposed Draft Regulation**

Following the release of the proposed draft regulation, DOER held two well-attended public hearings, and received nearly 500 comments (posted on DOER's website) during a written comment period. Positions expressed by stakeholders ranged across all perspectives and issues, and were well balanced. Stakeholders affiliated with the forest products sector clearly stated the importance of biomass markets for the economy of this sector. Forest land owners expressed that allowing biomass harvesting was important to enhance the economic and aesthetic value of their lands, and reduce pressures to convert land to development. On the other hand, public concerns were expressed on the impact of biomass on our public and private forests, and the ability of the government to provide safeguards against clear-cutting and non-sustainable forestry practices. Concerns were also expressed about air emissions and cooling water demands associated with biomass combustion, proper accounting of net greenhouse gas emissions, and the local impacts (truck traffic, lack of direct economic benefit) of particularly large utility scale biomass power plants.

DOER believes that the regulation provided on 9/17, as well as the revisions currently proposed, provide a prudent balance supported by the scientific foundation of the Manomet Study and recognize the issues of the forestry economy and concerns of the public.

### **Forestry Sustainability and Restrictions on Forest-Derived Biomass Removal**

One key modification in the final regulation relates to a provision in the draft regulation (Section 14.05(8)), which requires that the amount of biomass material eligible to be removed from a harvest site be limited to 15 percent by weight of the total amount of material harvested from the site for forest products (lumber, pulp wood, firewood, etc.). The 15 percent limit was based on a recommendation that 50 percent of the tops and branches from harvested trees should be left in the forest for soil nutrient retention, and that 30 percent of an average tree weight is in tops and branches. Based on comments and further research, DOER has concluded that the 15 percent limit is arbitrary and insufficiently based on science regarding soil nutrient needs. Instead, the amount of biomass that should be left in the forest varies depending on the existing soil conditions. That is, for some poor quality soils, all biomass material should be left in the forest to encourage soil nutrient retention, and in some good soils the need to leave biomass material behind is not important for soil nutrient retention.

Therefore, DOER has modified the proposed draft regulation such that the eligible woody biomass fuel from a harvest site that can be removed will be limited to a percent of the total weight of the forest products harvested – and such percent will be based on soil conditions characterized by soil class and drainage class. DOER has established in its *Forest Derived Eligible Biomass Woody Fuel Guideline*, released with the draft regulation, a matrix table providing the eligible percent biomass removal for each soil class and drainage class combinations, as classified by the well-established U.S. Department of Agriculture, Natural Resource Conservation Service Soil Surveys. The eligible percent removal ranges from zero (for soils with poor qualities) to 40 percent (for highly productive soils). For perspective, a 30 percent removal would approximately allow for all tops and branches of trees harvested for forest products to be removed as eligible woody biomass, and 40 percent would allow for this material plus limited thinning materials to be removed under the best soil quality conditions. DOER recognizes that allowing thinning material to be used for eligible fuel is consistent with Department of Conservation and Recreation programs to encourage forest sustainability and biodiversity, and allows resource managers the flexibility to manage the private forest lands in the region.

Under this rule, the certified forester shall develop a soil map for each harvest area using the USDA NRCS Soil Survey printed maps or on-line tool. Based on the DOER *Guideline*, the certified forester will consider soil conditions across the harvest site along with the planned harvest of forest products, and determine the maximum eligible biomass tonnage that can be

removed from the site and receive Biomass Fuel Certificates. The *Guideline* provides a user-friendly spreadsheet tool to input data and assure calculation accuracy.

### **Further Clarification on Overall Efficiency Determination and Threshold Requirements**

The draft proposed regulation provided that biomass units must meet a minimum overall efficiency of 40 percent, at which level the unit would receive one-half REC credit for each MWh of generation. The REC credit would then increase linearly until a full REC credit is provided for units operating at an overall efficiency of 60 percent and above.

Based on comments received and further considerations, DOER has decided to maintain this regulatory framework, but provide additional clarity on how the overall efficiency shall be determined in the following respects.

1. DOER recognizes that biomass units qualified for woody biomass fuel may use the fuel in a number of forms – green wood chips, dried wood chips, wood pellets, wood dust, producer gas, fast pyrolysis oil (bio-oil), etc. Further, such fuels may be refined from green woody biomass by companies legally and geographically separate from the generation unit and delivered to units through wholesale markets.

Therefore, to provide clear and consistent implementation procedures, DOER has clarified in the draft regulation that overall efficiency is to be determined based on the Biomass Input Heat Content of the biomass fuel when fed into the generation unit.

DOER recognizes that this approach does not fully consider the energy expenditures and GHG emissions associated with the fuel refining. Therefore, units using processed biomass fuel will need to account for GHG emissions associated with the entire fuel cycle and demonstrate to DOER that lifecycle GHG reduction requirements are satisfied.

2. Biomass generation units produce a large amount of thermal energy. When used as Useful Thermal Energy, the draft proposed regulation allows this energy to contribute to the overall efficiency of the unit. DOER needed to consider and clarify the situation in which some of the thermal output is used to dry the woody biomass fuel prior to combustion, as well as situations where thermal output is delivered to separate business entities for use to dry woody biomass fuel for the unit's use, for other units' use, or to process eligible green wood into bio-oil or wood pellets for wholesale markets (all of these situations are actively under consideration by developers in New England).

While the use of thermal energy to dry or refine green woody biomass prior to its use as a fuel may be an appropriate use of thermal energy from a biomass unit, DOER has clarified in the draft regulation that such thermal energy is *not* to be considered Useful Thermal Energy in the calculation of the overall efficiency of the unit. This position is based on the fact that fuel processing already will lead to higher overall efficiency from improved combustion of the drier processed fuel, and that units might otherwise appropriate large amounts of thermal output to dry wood utilizing very inefficient methods in order to artificially improve their overall efficiency.

3. In the calculation of overall efficiency, DOER recognizes that electrical energy that is delivered to an on-site load (“behind-the-meter”), affords efficiency benefits relative to electric power delivered to the grid by eliminating transmission and distribution line losses. To acknowledge this efficiency gain and appropriately support distributed generation, DOER has adjusted the overall efficiency determination to take into account these benefits.

With this draft regulation, DOER also provides the *Guideline for the Calculation of Overall Efficiency and Lifecycle GHG Analysis* referenced in the regulation. This *Guideline* provides a template spreadsheet for applicants to demonstrate the unit’s overall efficiency, and provide a GHG analysis and determination of whether the lifecycle reduction threshold is met.

### **Other Notable Revisions**

Based on comments from MassDEP and stakeholders, DOER has improved the clarity of the definition of Eligible Biomass Woody Fuel.

Within the broader definition of Eligible Biomass Fuel, DOER has explicitly provided that construction and demolition waste is not an eligible fuel for the purpose of the RPS program.

DOER has also addressed comments about the lifecycle greenhouse gas analysis requirement. DOER recognizes that the requirement for applicants to provide a lifecycle greenhouse gas analysis is a potentially burdensome cost to developers at risk prior to qualification, and might result in a wide variation of proposed analytical methodologies and assumptions that would be very difficult to evaluate in a consistent manner.

Therefore, DOER has provided a standard template in its *Guideline for the Calculation of Overall Efficiency and Lifecycle GHG Analysis* that is to be utilized by applicants to sufficiently meet this requirement.