

**Department of Legislative Services**  
Maryland General Assembly  
2012 Session

**FISCAL AND POLICY NOTE**  
**Revised**

Senate Bill 1004

(Senator Middleton)

Finance

Economic Matters

---

**Renewable Energy Portfolio Standard - Renewable Energy Credits - Thermal  
Biomass Systems**

---

This bill defines energy from “thermal biomass systems” as a Tier 1 renewable source. Energy from a thermal biomass system is eligible for inclusion in meeting the State’s Renewable Energy Portfolio Standard (RPS). An eligible system owner or operator receives a Renewable Energy Credit (REC) for the amount of energy generated by the system and used on-site, as measured by a specified on-site meter. Specified systems must demonstrate certain environmental benefits to the Maryland Department of the Environment (MDE) to receive a REC. The Public Service Commission (PSC) must adopt regulations to implement the bill.

The bill takes effect January 1, 2013.

---

**Fiscal Summary**

**State Effect:** PSC and MDE can implement the bill with existing budgeted resources. The inclusion of specified thermal biomass systems is not anticipated to materially affect State finances.

**Local Effect:** Minimal.

**Small Business Effect:** Meaningful.

---

**Analysis**

**Bill Summary:** “Thermal biomass system” means a system that uses (1) primarily animal manure, including poultry litter, and associated bedding to generate thermal energy, and food waste or qualifying biomass for the remainder of the feed stock; (2) is

used in the State; and (3) complies with all applicable State and federal laws and regulations, as determined by the appropriate regulatory authority.

A Tier 1 renewable source includes thermal energy from a thermal biomass system.

Energy from a thermal biomass system is eligible for inclusion in meeting RPS. A person that owns and operates a thermal biomass system is eligible to receive a REC for the energy generated by the system and used on-site, subject to certain conditions for thermochemical systems. Specifically, a person that owns and operates a thermal biomass system that uses a thermochemical process must demonstrate to MDE that the operation of the system is not significantly contributing to local or regional air quality impairments, and that the system will substantially decrease emissions of nitrogen oxides beyond that achieved by a direct burn combustion unit. A person that owns and operates an anaerobic digestion system does need to demonstrate the system's environmental benefits to MDE to be eligible to receive a REC.

Thermal energy is converted from British Thermal Units (BTUs) to kilowatt-hours to determine RECs received. The total amount of energy generated and consumed for a residential, nonresidential, or commercial thermal biomass system must be measured by an on-site meter that meets performance standards established by PSC.

PSC must adopt regulations for the metering, verification, and reporting of the output of thermal biomass systems.

**Current Law:** A REC is a tradable commodity representing the renewable energy generation attributes of one megawatt-hour of electricity. RECs are awarded to operators who generate electricity using specified renewable energy sources. A renewable on-site generator of electricity owns and may sell or transfer RECs to another party. RECs are not awarded for electricity conservation measures.

Maryland's RPS requires that renewable sources generate specified percentages of Maryland's electricity supply each year, increasing to 20%, including 2% from solar power, by 2022. Electricity suppliers must submit RECs equal to the percentage mandated by statute each year, or pay an alternative compliance payment equivalent to the supplier's shortfall. RECs are classified as Tier 1, Tier 1 Solar, or Tier 2. Examples of Tier 1 sources include solar; wind; qualifying biomass; methane from anaerobic decomposition of organic materials in a landfill or wastewater treatment plant; geothermal; ocean, including energy from waves, tides, currents, and thermal differences; a fuel cell that produces electricity from a Tier 1 renewable source; a small hydroelectric plant of less than 30 megawatts; poultry litter-to-energy; and waste-to-energy. Examples of Tier 2 sources include a hydroelectric plant of greater than 30 megawatts. Solar RECs

may be generated from photovoltaic cells and residential solar water heating systems commissioned in fiscal 2012 or later.

### *Biomass*

“Qualifying biomass” for Tier 1 RPS compliance means a nonhazardous, organic material that is available on a renewable or recurring basis, and is waste material that is segregated from inorganic waste material and is derived from sources including:

- mill residue, except sawdust and wood shavings;
- precommercial soft wood thinning, slash, brush, or yard waste;
- a pallet or crate;
- agricultural and silvicultural sources, including tree crops, vineyard materials, grain, legumes, sugar, and other crop by-products or residue;
- gas produced from the anaerobic decomposition of animal waste or poultry waste; or
- a plant cultivated exclusively for the purpose of being used as a renewable source to produce electricity.

Qualifying biomass does not include old growth timber, unsegregated solid waste or postconsumer wastepaper, or invasive exotic plant species. An electricity supplier receives credit toward meeting RPS for electricity derived from the biomass fraction of biomass co-fired with other fuels. A net metered customer generator may operate a biomass generating facility.

Chapter 140 of 2008 established a State income tax credit of \$0.03 per gallon up to \$500 for the purchase of bio-heating oil for space and water heating. To qualify, the bio-heating oil must contain at least 5% biodiesel. The tax credit applies to tax years 2008 through 2012.

### **Background:**

#### *Thermal Biomass Systems*

A thermal biomass system specified in the bill is a manure-to-energy system for which there are generally two ways to produce energy: directly burning the manure for fuel (thermochemical), or anaerobic digestion to convert waste solids to methane, which can then be burned to produce thermal energy. There are advantages and disadvantages to each method, depending on the specific fuel source and the intended location of the system. In 2011, the U.S. Department of Agriculture issued \$850,000 in grants to the National Fish and Wildlife Foundation to help farmers in Maryland and surrounding states convert manure to energy.

Chapters 135 and 136 of 2008 classified electricity (not thermal energy) produced from poultry litter an eligible Tier 1 resource. Poultry litter-to-energy (PLE) is an established method of biomass electricity generation. PLE facilities have been proposed in several other states including: Arkansas, Georgia, Michigan, Mississippi, North Carolina, Pennsylvania, and Virginia.

### *Wood as a Fuel Source for Thermal Biomass Systems*

The Maryland Wood Energy Coalition, organized by the University of Maryland Extension and the Department of Natural Resources, released a report in February 2012 on advanced biomass thermal technology in the State. The report details a wide array of the policy options and technical considerations to increase the use of woody biomass for thermal energy, and included as a policy option the inclusion of thermal biomass systems in the State RPS.

According to the report, thermal energy in the form of heating and cooling for buildings and industrial processes represents 40% of all energy consumed in the State. Maryland primarily relies on natural gas, electricity, and heating oil for heating and cooling. According to the U.S. Energy Information Administration, wood is a comparatively inexpensive fuel source for thermal energy. The fuel cost per million BTUs for wood (though variable based on the species of wood), is \$17. For comparison, a natural gas furnace is \$14 and a baseboard electric heater is \$35 per million BTUs.

The report also describes some of the potential thermal biomass systems, their fuel and technology type, heat output, and average biomass consumption. For example, specified firewood and pellet stoves, used for residential heating, can produce 0.1 to 0.3 million BTU per hour. Medium-sized systems can produce 0.5 to 3.0 million BTU per hour, while large systems are capable of up to 30 million BTU per hour.

### *Thermal Energy*

The U.S. Energy Information Administration defines a BTU as “the quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).” The standard conversion factor for BTUs to megawatt-hours is 3.412 million BTUs per megawatt-hour. Put another way, since a REC is representative of one megawatt-hour of renewable energy, a thermal biomass system would earn one REC per 3.412 million BTUs of heat output. Legislative Services notes that some thermal biomass systems are capable of producing millions of BTUs per hour of operation, and thus a significant quantity of RECs.

Oxides of nitrogen, or NO<sub>x</sub>, is the generic term for a group of highly reactive gasses, all of which contain nitrogen and oxygen in varying amounts. NO<sub>x</sub> form when fuel is burned at high temperatures, as in a combustion process. According to MDE, while NO<sub>x</sub> can be formed naturally, the primary manmade sources of NO<sub>x</sub> are motor vehicles; electric utilities; and other industrial, commercial, and residential sources that burn fuel. Nitrogen dioxide (NO<sub>2</sub>) is produced when nitric oxide (NO) combines with oxygen in the atmosphere. In addition to being a criteria pollutant regulated directly by the U.S. Environmental Protection Agency, NO<sub>2</sub> is a precursor for ozone and contributes to acid rain.

**Small Business Effect:** Small businesses that operate thermal biomass systems will benefit from the revenue generated by selling RECs. Small businesses that install, repair, or supply fuel for thermal biomass systems will benefit from an increase in the demand for thermal biomass system installations.

---

### **Additional Information**

**Prior Introductions:** None.

**Cross File:** HB 1339 (Delegate McIntosh, *et al.*) - Economic Matters.

**Information Source(s):** Maryland Department of Agriculture, Department of Natural Resources, Maryland Department of the Environment, Maryland Energy Administration, Public Service Commission, U.S. Energy Information Administration, U.S. Environmental Protection Agency, Manure-to-Energy Summit, Maryland Wood Energy Coalition, Washington Examiner, Department of Legislative Services

**Fiscal Note History:** First Reader - March 14, 2012  
ncs/lgc Revised - Senate Third Reader - April 5, 2012

---

Analysis by: Stephen M. Ross

Direct Inquiries to:  
(410) 946-5510  
(301) 970-5510