OREGON DEPARTMENT OF ENERGY

Biomass

HB 2449 – Benefits to Oregon

Using Animal Manure for energy production

The Biomass Producer or Collector tax credit provides incentives for a number of biomass feedstocks, including an incentive to use animal manure to produce biogas. The program has been effective at supporting the growth of Oregon's biogas industry while supporting dairy operations. Treating animal manure through anaerobic digestion provides energy, economic and environmental benefits to Oregon and can help the state meet its greenhouse gas reduction goals.

From 2010 through 2013, the Oregon Department of Energy certified $5,241,812 in biomass tax credits for animal manure used to produce energy. For this time period, approximately 64 percent of the certified tax credit amount for animal manure was issued during the 2013 tax year, as that is when the majority of the anaerobic digesters in the state began operating at full capacity.

Energy Benefits

Anaerobic digestion produces biogas from animal manure and other biomass feedstocks. This biogas, which is about 50-60 percent methane, can be used to generate electricity or upgraded into a transportation fuel. Oregon's biogas industry has grown from just two anaerobic digesters treating animal manure in 2007 to eight facilities in 2015. These eight facilities have a combined capacity of more than 10 MW of electrical generation – enough to power about 6,700 homes per year.

Greenhouse Gas Benefits

Anaerobic digestion of animal manure results in reduced greenhouse gas emissions. Methane produced by the manure is used to generate electricity and replace power that may have been generated through fossil fuels. Anaerobic digesters currently operating in Oregon result in reductions of approximately 152,000 tons of carbon dioxide equivalent greenhouse gas emissions. These reductions are a benefit that can be monetized and sold as carbon credits. Carbon markets are currently paying digesters between $5 and $10 per ton of carbon dioxide equivalent (Climate Action Reserve, U.S. Livestock Project Protocol, January 2013).

Economic Benefits

Anaerobic digestion systems can generate additional farm revenue through the sale of electricity to a local utility, sale of carbon credits, and sale of byproducts such as animal bedding and nutrients. A recent report produced for the Innovation Center for U.S. Dairy found that under the most likely scenario, anaerobic digesters provide $715 of net economic benefits per cow, per year. The $715 in net economic benefits per cow, per year includes $228 in electrical energy generation and $487 in soil amendments and ecosystem markets, such as renewable energy credits or greenhouse gas offset credits (Informa Economics, February 2013). By producing fiber bedding material, anaerobic digesters reduce demand for sawdust and other bedding, freeing that material up for other value-added uses. Biogas production capacity from anaerobic digesters could be shifted from electricity to renewable natural gas if future needs changed.

April 8, 2015

Ecological Benefits

Anaerobic digesters provide air and water quality benefits compared to traditional storage lagoons and tanks. These benefits include odor and pathogen reduction and nutrient management benefits in addition to the greenhouse gas reductions (U.S. EPA, 2015) (Hamilton, 2012).

According to research commissioned by EPA, anaerobic digestion reduces manure chemical oxygen demand by an average of 41.9 percent. Chemical oxygen demand reduces oxygen availability in fresh water and can lead to fish kills and other water quality impacts from untreated manure (Eastern Research Group, Inc, 2004). According to Washington State University research, anaerobic digestion of cow manure reduces pathogen counts in raw manure by 98.8 to 99.9 percent for generic E-coli and 84.5 to 95.8 percent for enterococci, thereby significantly reducing the bacteria load on crop fields and protecting ground and surface water from the risks inherent in manure application (Harrison, et al.).

Anaerobic digesters also contribute to improved local air quality by reducing odors. Anaerobic digestion of cow manure reduces odor-causing compounds by 29.7 to 87.8 percent (U.S. Environmental Protection Agency).

References

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