Bovine Manure for Biofuel

ORS 315.176	Year Enacted:	2017	Transferable:	Yes
	Length:	1-year	Means Tested:	No
	Refundable:	No	Carryforward:	4-years
TER 1.430	Kind of cap:	Program	Inflation Adjusted:	No

Policy Purpose

The bovine manure for biofuel tax credit was created in 2017 as a spin-off from the expired production or collection of biomass credit that sunset at the end of 2017. While the purpose of the biomass tax credit was largely focused on biomass energy production/use and obtaining desired associated environmental improvements, the ***policy purpose of the bovine manure for biofuel tax credit is to ensure the viability and use of digester technology investment.***[62] Discussions that occurred during committee hearings for the enacting legislation revolved around the monetary value of the credit and its use in supporting the construction and operation of manure digestors.

Description

Producers or collectors of bovine manure are allowed a tax credit that they may use to offset their personal or corporate income tax liability. Producers and collectors of bovine manure refer to persons that produce or collect bovine manure in Oregon that is used, in Oregon, as biofuel or to produce biofuel. The bovine manure is required to be produced on Oregon farms and derived from cows, heifers, bulls, steers, or calves.

The amount of the credit is equal to $3.50 per wet ton of bovine manure. The credit can be claimed only once for each wet ton of bovine manure. The amount of the credit used in a given tax year cannot exceed the tax liability of the individual or corporation claiming the credit though unused portions of the credit may be carried forward for up to four succeeding tax years. A person that has earned the tax credit may also transfer the credit to another taxpayer.

To claim the credit, producers/collectors must apply for credit certification through the Oregon Department of Agriculture (ODA).[63] Certification of the tax credit is limited to $5 million for all taxpayers for any calendar year. If demand for credit certifications exceeds the $5 million annual limit, ODA proportionately reduces credit certifications to the limit. The credit is scheduled to sunset on January 1, 2022.

Policy Analysis

A relatively small number of taxpayers claim the bovine manure tax credit. The credit first became available beginning with tax year 2018 though prior to that, the credit was a component of the biomass credit. Certification data displayed in this report reflects current bovine manure credit and biomass credit certifications specific to manure.[64]

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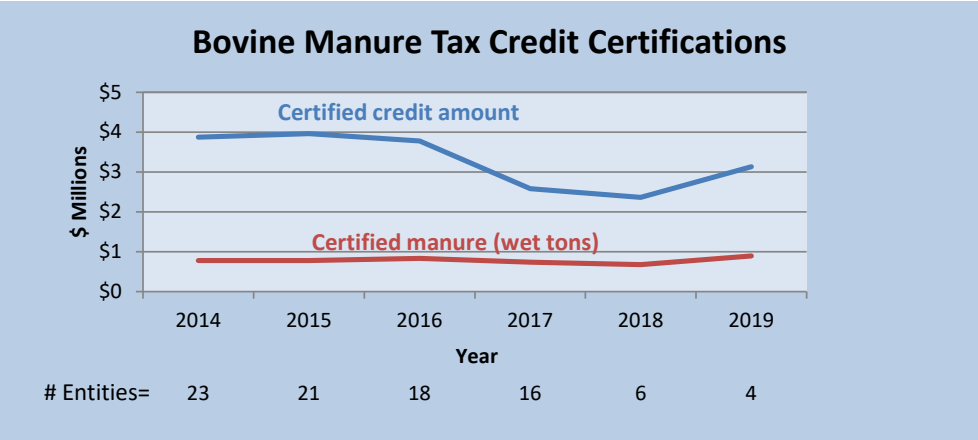
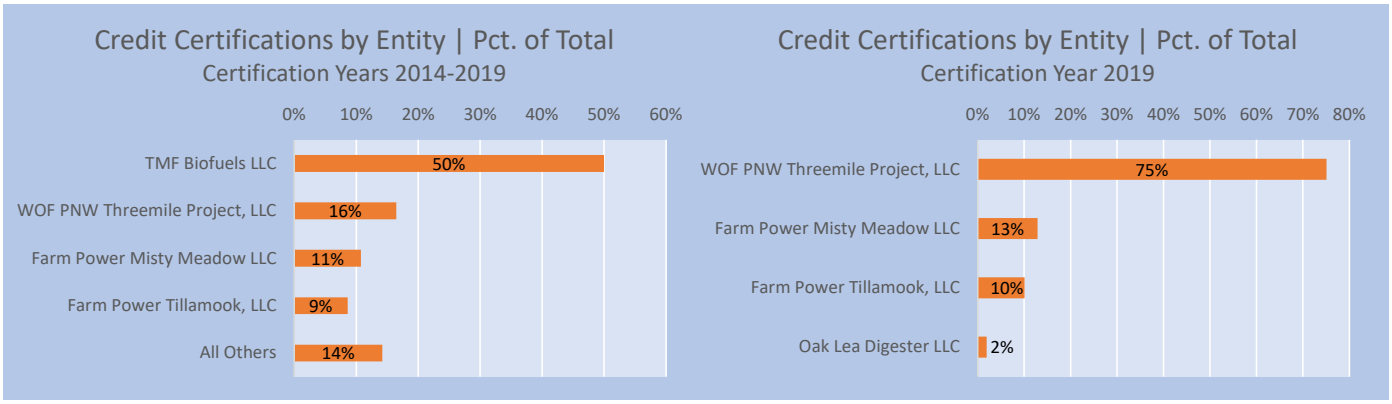
[62] Per the stated policy purpose contained in the enacting legislation's revenue impact statement - HB 2066 (2017).
[63] ODA is allowed to charge a certification application fee to cover the agency's cost in administering the credit certification. The application fee is equal to $100 + 3.8% of the total amount of tax credit.
[64] Certification data was queried from the Oregon Transparency Website with recent year data appended from certification data received from Oregon Department of Agriculture.

In 2018, twenty personal income taxpayers claimed $1.6 million in tax credits. Tax year 2018 credit numbers for corporate income taxpayers claiming the credit are not available due to disclosure law limitations. Credit certification data is available and displays the concentrated use of the credit by individual business entities. The first exhibit below displays the amount of tax credits certified by year and the number of unique entities receiving credit certification. Also displayed is the amount of manure for which credit certification was received. As displayed, the amount of certified manure has been relatively stable. The shift down in certified credit amount beginning in 2017 reflects the credit amount per wet ton of manure being reduced from $5.00 to $3.50.



The two exhibits below display cumulative tax credit certifications for years 2014-2019 and for just 2019 certifications. As displayed, credit certification has been concentrated amongst a few entities. Cumulatively, for years 2014-2019 about half of all credit certifications (by amount of credit certified) were certified to one entity with a bit over 85% of all certifications being certified to four entities. In years 2014-2019, a cumulative total of 27 entities were certified for the credit and a total of 241 credit certifications were issued. In 2019, four entities received credit certification with 75% of the credit by value going to a single entity. The credit is available to a bovine manure producer or collector, but the credit can only be claimed once for each wet ton of bovine manure. According to the Oregon Department of Energy, as of 2018 Oregon had nine anaerobic digesters located on farms in Oregon, though four were not in operation (Oregon Department of Energy, 2018).



A body of literature exists regarding anerobic digesters. What follows is a brief summary of literature relevant to the policy purpose of Oregon's bovine manure tax credit. Anerobic digesters are in use throughout the world though the literature discussed here is focused on the U.S. market.

Anerobic digester systems capture methane from lagoon or pit manure storage facilities. The captured methane can be used to generate electricity or heat or may also be burned directly (a practice referred to as flaring). Manure is collected and transported to the digester where water, nutrients, and heat are adjusted to optimize the output of methane. In addition to methane, digestion byproducts can also be of value in such uses as fertilizer, animal bedding and amendments to soil.

Multiple factors can influence the financial viability of digester system installation and operation. According to one EPA study of market opportunities for biogas recovery,

> *Profitability depends on the ability to recover capital and operating costs at a reasonable rate of return and generate a long-term income stream. Experience has shown that the profitability of biogas systems depends on the size of the operation, the method of manure management, and local energy costs. (U.S. Environmental Protection Agency, 2018)*

The EPA report (U.S. Environmental Protection Agency, 2018) found that a positive financial return for construction, operation and maintenance of a digester system is most likely at dairy operations with milking herds of at least 500 cows. Size is important in that sufficient size of cattle operation allows for a high frequency in collection of manure, which minimizes loss of biodegradable organic matter that is converted into biogas through the digestion process (U.S. Environmental Protection Agency, 2018). Energy costs are also of importance in that an operating digester can offset on-farm electricity use and provide a source of heat for on-farm use (U.S. Department of Agriculture: Economic Research Service, 2011). Additionally, an operating digestor may be able to sell excess electricity to the local electric utility. Upgrading biogas to pipeline-quality natural gas is also a possible revenue source (U.S. Environmental Protection Agency, 2018).

Smaller cattle operations are generally considered to be less financially feasible locations for on-farm digesters absent certain market and/or farm conditions. In certain instances, using produced biogas for on-farm energy offsetting purposes can be economically advantageous, especially in remote settings where energy costs are higher (U.S. Department of Agriculture: Natural Resources Conservation Service, 2007). Research suggests that instituting cost sharing approaches can increase the financial viability of smaller scale operations. In one study, researchers found that digesters systems can be made financially viable on smaller operations of 250 cow dairies when 50% cost sharing was available (Klavon, Lansing, Moss, & Felton, 2013).

Whether it is referred to as cost sharing, incentivizing, or subsidizing, various forms of intervention are or have been available/used to modify the financial circumstances in which digesters are constructed and operated. A prominent program is the U.S. Department of Agriculture's (USDA) Rural Energy for America Program (REAP) which provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements.[65] Additionally, various incentives are made available by individual states.

One study examined the effectiveness of U.S. state-level incentives promoting the adoption of anaerobic digester systems. Study authors Sam, Bi and Farnsworth looked at the adoption rate of digester systems in 38 states over the period of 2002 to 2014. In addition to the previously discussed importance of farm

[65] Other USDA identified programs include: Conservation Loan program, Value-Added Produce Grant and the Environmental Quality Incentives Program along with energy audit/feasibility studies https://www.usda.gov/media/blog/2010/11/18/usda-offers-funding-help-farmers-turn-manure-energy.

operation size, manure management, and electricity costs, the authors found that various forms of cost-offsetting can impact the construction and operation of anaerobic digesters (Sam, Bi, & Farnsworth, 2017). In the numerous states that Sam et. al. used in their analysis it was found that states often utilized multiple policy interventions to incentivize the construction of anaerobic digesters. This multi incentive policy approach can make it difficult to isolate the effectiveness of a single policy. The authors generally found that performance-based incentives and state adoption of renewable portfolio standards (RPS) increased adoption of anaerobic digester systems in a state (Sam, Bi, & Farnsworth, 2017).

Research has also indicated that carbon offset programs have the potential to positively impact the construction and operation of anaerobic digesters. This is accomplished as carbon offset programs offer another positive financial return for operating digesters.[66] One general theme from conducting the literature review is the finding that a market with a known demand for energy produced by anaerobic digesters can stabilize future financial returns thereby increasing the financial attractiveness of constructing and maintaining digesters. Authors Key and Sneeringer found that financial returns from a carbon offset market can sufficiently alter the potential profitability of a digester leading to increased construction and operation of such digesters (Key & Sneeringer, 2011). The authors did note that

> *Larger operations would be more likely to adopt a digester, and likely would earn substantially higher profits on average than smaller operations. Hence, introduction of a carbon market in a region could enhance existing economies of scale in production and result in further concentration of production on the largest operations. (Key & Sneeringer, 2011).*

Other States

A myriad of related programs and incentives exist nationally and in other states that influence the construction and operation of anaerobic digesters in the U.S. The U.S. Environmental Protection Agency (EPA) maintains a website, AgSTAR, that promotes the use of biogas recovery systems to reduce methane emissions from livestock waste. AgSTAR "assists those who enable, purchase or implement anaerobic digesters"... and "provides information and participates in events to create a supporting environment for anaerobic digester implementation" (About AgSTAR, 2021). AgSTAR functions as a hub for information relating to anaerobic digesters including information on building and operating digesters along with acting as a source for identifying various state and national programs providing financial incentives. Related federal programs include Conservation Loan program, Rural Energy for America Program (REAP), Value-Added Produce Grant, and the Environmental Quality Incentives Program (USDA Offers Funding To Help Farmers Turn Manure into Energy, 2017).

Digester incentives can generally be categorized into four groups: grants, loans, tax credits & exemptions, and production incentives.[67] States often will incorporate multiple incentives that may also be part of a larger renewable energy policy goal (Sam, Bi, & Farnsworth, 2017).[68] California provides a case study in incorporation of multiple incentives and regulations. California's Dairy Digester Research and Development Program (DDRDP) awarded $183.4 million in grants to 108 dairy digester projects starting in 2014 through 2019 (Dairy Digester Research and Development Program, 2020). Under the

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[66] A carbon offset market allows those that reduce methane emissions to sell such reductions or receive compensation in another form.

[67] Production incentives are financial payments, usually on a dollar amount per quantity (e.g. - per kilowatt hour, per wet ton of manure).

[68] Authors examined 38 states in their study related to state anaerobic digester incentives.

DDRDP, grants can equal up to 50 percent of total project costs (limited to $3 million). In addition to grant funding, two California policies, Cap and Trade, and the Low Carbon Fuel Standard, provide further financial incentives for construction and operation of anaerobic digesters (AcMoody & Sousa, 2020). All three programs contribute to California's legislated goal of reducing dairy manure methane emissions by 40% below 2013 levels.