# BIOGAS PRODUCTION COMPONENTS SALES TAX EXEMPTION

EVALUATION SUMMARY

SEPTEMBER 2018
2018-TE13

THIS EVALUATION IS INCLUDED IN COMPILATION REPORT SEPTEMBER 2018

| | |
|---|---|
| YEAR ENACTED | 2014 |
| REPEAL/EXPIRATION DATE | July 1, 2019 |
| REVENUE IMPACT | $1.2 to $2.2 million (BETWEEN MAY 2014 AND JULY 2018) |
| NUMBER OF TAXPAYERS | Could not determine |
| AVERAGE TAXPAYER BENEFIT | Could not determine |
| IS IT MEETING ITS PURPOSE? | Yes, but only to a limited extent |

## WHAT DOES THIS TAX EXPENDITURE DO?

The Biogas Production Components Sales Tax Exemption (Biogas Exemption) exempts the sale, storage, and use of components used in biogas production systems from state sales and use tax. To be eligible for the exemption, the biogas produced must be (1) sold to a power generator, (2) used as a transportation fuel, or (3) converted into renewable natural gas.

## WHAT IS THE PURPOSE OF THIS TAX EXPENDITURE?

Statute does not explicitly state a purpose for this exemption. We inferred that the purpose is to encourage the development of projects that produce biogas-derived energy from renewable sources in Colorado.

## WHAT DID THE EVALUATION FIND?

We determined that the Biogas Exemption is meeting its purpose, but only to a limited extent. Specifically, we found that the exemption may provide a small additional incentive to develop biogas facilities in the state, but likely has not caused a significant increase in biogas energy production capacity.

## WHAT POLICY CONSIDERATIONS DID THE EVALUATION IDENTIFY?

The General Assembly could consider expanding the Biogas Exemption to include biogas used to produce electricity and heat that is consumed on site.

STATE · OF · COLORADO
UNION AND CONSTITUTION
NIL SINE NUMINE
1876

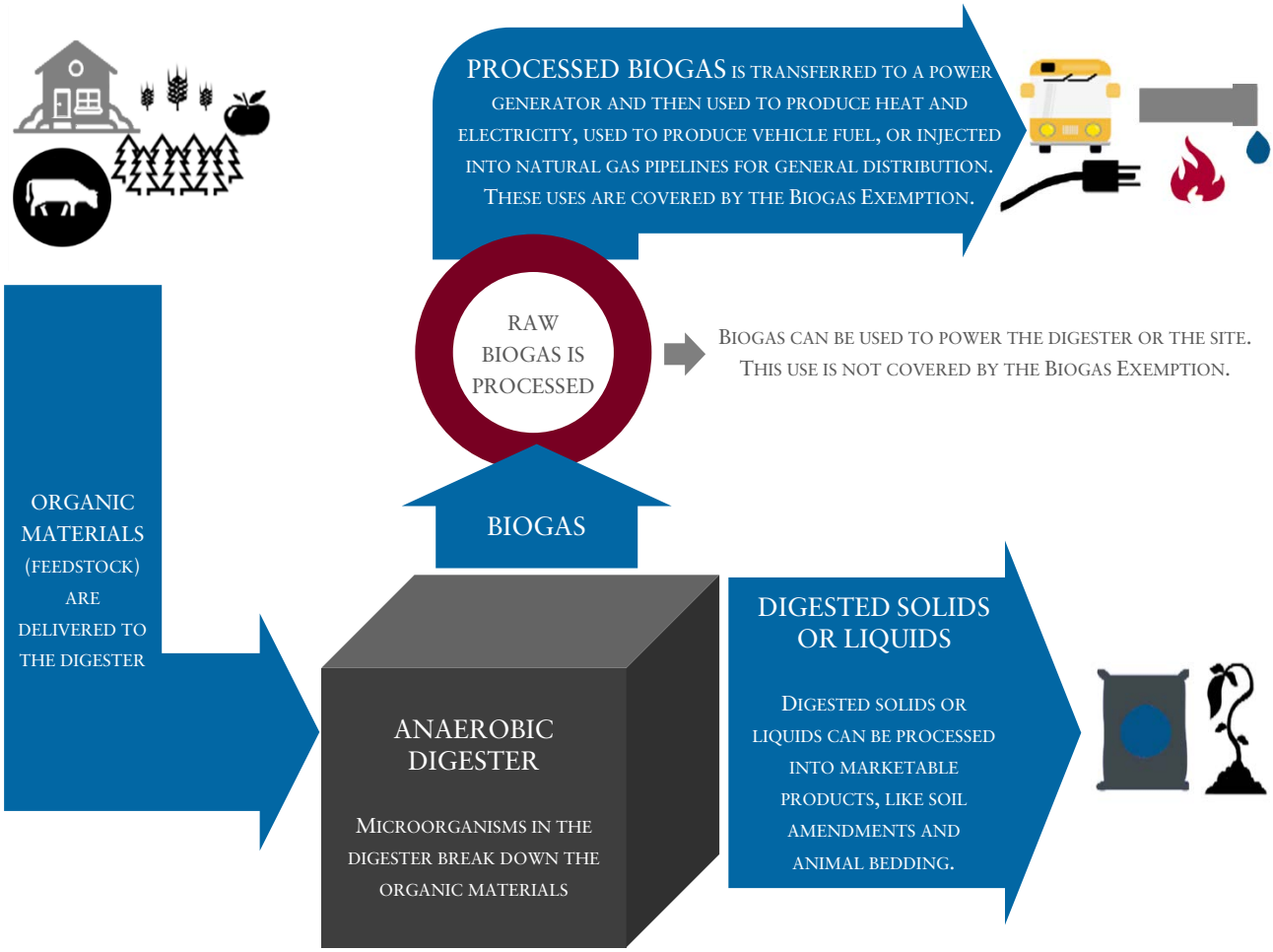
# BIOGAS PRODUCTION COMPONENTS SALES TAX EXEMPTION

## EVALUATION RESULTS

### WHAT IS THE TAX EXPENDITURE?

The Biogas Production Components Sales Tax Exemption (Biogas Exemption) excludes the sale, storage, and use of components found in biogas production systems from state sales and use tax [Section 39-26-724(1)(c), C.R.S.]. Biogas is one end-product of anaerobic digestion, which occurs when microorganisms break down organic waste feedstock (e.g., manure, municipal solid waste, food waste, or crop residue) in the absence of oxygen. Biogas is composed primarily of methane (60 to 70 percent) and carbon dioxide (30 to 40 percent) and can be processed for use as fuel for heat and/or electricity generation, or converted into renewable natural gas, which is similar to natural gas derived from fossil fuel sources and can be upgraded for use as transportation fuel. Other byproducts of anaerobic digestion include a fibrous solid that can be used as animal bedding or a soil amendment, and a nutrient rich liquid that can act as a soil amendment. Often, biogas systems are constructed onsite at agricultural or industrial operations or at waste management facilities, although they can also be stand-alone commercial operations that process organic waste from other nearby sources. EXHIBIT 1.1 shows the biogas production process.

EXHIBIT 1.1. BIOGAS PRODUCTION SYSTEM




SOURCE: Office of the State Auditor created diagram explaining the anaerobic digestion and biogas generation process based on information from the American Biogas Council, the Environmental Protection Agency and Section 39-26-724(1)(c), C.R.S.

Biogas production facilities can sell the solid and liquid by-products and the biogas, use the biogas to heat or power their buildings, and/or collect fees from third parties that use the biogas production system to dispose of their waste. Additionally, if the biogas production system processes waste that is produced onsite and would otherwise need to be landfilled, the system's owners may benefit from reduced waste transportation costs and disposal fees.

The exemption was created by House Bill 14-1159 in 2014 and has remained unchanged since its initial enactment. To be eligible for the exemption, the biogas produced must be: (1) sold to a power generator,

(2) used as a transportation fuel, or (3) converted into renewable natural gas. Statute [Section 39-26-724(2)(a)(I), C.R.S.] defines the components used in biogas production systems as "all tangible personal property used in connection with the production of biogas and related solid by-products and liquid by-products," including but not limited to anaerobic digestion systems, biogas upgrade systems, and digested solids systems. Statute [Section 39-26-724(2)(a)(1)(A) through (C), C.R.S.] also provides a non-exhaustive list of specific items of tangible personal property that comprise anaerobic digestion systems, biogas upgrade systems, and digested solids systems and are covered under the exemption. The Biogas Exemption has been available since May 17, 2014, and it has a scheduled repeal date of July 1, 2019.

To apply the exemption, biogas components suppliers must include the exempt sale amount on the Department of Revenue's Retail Sales Tax Return (Form DR 0100) on the renewable energy components line of the Exemptions Schedule. Alternatively, purchasers of qualifying components who are charged sales tax at the time of purchase can apply to the Department of Revenue for a refund of the sales taxes they paid.

## WHO ARE THE INTENDED BENEFICIARIES OF THE TAX EXPENDITURE?

Statute did not explicitly identify the intended beneficiaries of this exemption. We inferred that the intended beneficiaries are companies, project developers, and investors that finance, build, or operate biogas production systems since these entities benefit from lower capital costs on some components of biogas projects due to the exemption. Indirect beneficiaries of the Biogas Exemption could be industries and facilities that produce organic material waste, such as the agricultural industry, the restaurant and hospitality industry, landfills, and wastewater treatment facilities, since biogas facilities can potentially accept this waste at a lower cost.

Currently, the biogas industry in Colorado is small and produces less than 1 percent of Colorado's renewable electric energy. Based on

information provided by stakeholder organizations, we identified 25 biogas production facilities in the state that are currently operating, were recently operating, or were in development as of July 2018. Of these 25 biogas production facilities, it appears that a maximum of five facilities could be eligible for the exemption, as shown in EXHIBIT 1.2.

EXHIBIT 1.2. COLORADO BIOGAS PRODUCTION FACILITIES CURRENTLY OR RECENTLY OPERATIONAL, OR CURRENTLY IN DEVELOPMENT, AS OF JULY 2018

| BIOGAS PRODUCTION FACILITY TYPE | NUMBER OF FACILITIES IDENTIFIED | ABLE TO BENEFIT FROM THE EXEMPTION? WHY? |
|---|---|---|
| Municipal waste water treatment facilities | 20 | No. Municipalities are already exempt from state sales tax on all sales taxable purchases under Section 39-26-704(1), C.R.S. |
| Facilities located onsite at an agricultural or industrial operation | 3 | Possibly. These facilities typically use biogas for purposes not covered under the exemption, such as powering or heating their own buildings, but they may also use biogas for a qualifying purpose. |
| Stand-alone facilities | 2 | Yes. These facilities are constructed for the primary purpose of producing biogas from organic waste produced by third parties nearby and are therefore likely to sell the biogas for one of the three exempt purposes. |

SOURCE: Office of the State Auditor analysis of data from news sources, the American Biogas Council and Resource Recovery Data.

## WHAT IS THE PURPOSE OF THE TAX EXPENDITURE?

Statute does not explicitly state a purpose for this exemption. Based on the legislative history, the statutory language of the exemption, and other states' evaluations of similar exemptions, we inferred that the purpose is to encourage the development of projects that produce biogas-derived energy from renewable sources in Colorado. This purpose is consistent with the original legislative declaration for the 2007 bill that created a similar renewable energy exemption, which is located in the same statutory section [Section 39-26-724, C.R.S.] as the Biogas Exemption. Specifically, the legislative declaration of House Bill 07-1279 stated that it is "the [G]eneral [A]ssembly's intent to encourage the development of projects that produce electricity from renewable energy sources in Colorado." Biogas is a form of renewable energy, according to the U.S. Energy Information Administration, and can be used to produce electricity for use

onsite, which is not a use covered by the exemption, or sold to a power generator, which is covered by the exemption.

## IS THE TAX EXPENDITURE MEETING ITS PURPOSE AND WHAT PERFORMANCE MEASURES WERE USED TO MAKE THIS DETERMINATION?

We determined that the Biogas Exemption is meeting its purpose, but only to a limited extent. Specifically, we found that the exemption may provide a small additional incentive to develop biogas facilities in the state, but likely has not caused a significant increase in biogas energy production capacity.

Statute does not provide quantifiable performance measures for this exemption. Therefore, we created and applied the following performance measure to determine the extent to which the exemption is meeting its inferred purpose.

**PERFORMANCE MEASURE:** *To what extent has the Biogas Exemption incentivized the development of biogas production systems?*

**RESULT:** The Biogas Exemption may have provided a small additional incentive to develop biogas production systems in the state since its enactment in 2014. Specifically, of the five facilities that we identified as possibly benefiting from the exemption, two were constructed or planned for construction from 2014 to 2018 for the purpose of producing biogas as an energy source. One of these facilities, located in Weld County, was large (the largest biogas production facility in North America according to media sources); however, in part due to odor and permitting concerns, the Weld County Board of Commissioners ordered the facility to suspend operations in December 2016, and the facility continues to be closed. The other facility, located in Yuma County, was still in the planning phase, as of July 2018. Neither of the two facilities was in full operation prior to the exemption's enactment in 2014. However, the Weld County facility had been in the planning phase since 2009, 5 years prior to the enactment date of the exemption. Therefore, it appears unlikely that the

exemption drove the decision to go forward with the project. Industry representatives we interviewed stated that the exemption is helpful in providing some financial support for biogas projects and could help attract investment in projects, especially if investors are choosing between states. However, they also indicated that it does not provide a sufficient financial incentive to be a decisive factor in whether to develop and construct a biogas production system in Colorado.

To quantify the potential incentive provided by the Biogas Exemption, we assessed the taxpayer savings that could be realized under several hypothetical biogas production facility projects. We developed these scenarios based on industry reports and stakeholder feedback, indicating that anaerobic digestion projects typically cost between $1 million and $30 million, and between 40 percent and 75 percent of this cost is attributable to components in the biogas production system that may be eligible for the Biogas Exemption. EXHIBIT 1.3 uses these figures to calculate the estimated cost to taxpayers for a small, onsite anaerobic digester (the low end of the range of project expenses) and a large, stand-alone biogas production facility (the high end of the range of project expenses). To calculate the taxpayer savings we multiplied the estimated expenses eligible for the exemption under each scenario by the state sales tax rate of 2.9 percent.

EXHIBIT 1.3. ESTIMATED TAXPAYER SAVINGS FOR PROJECT SCENARIOS

| PROJECT COST RANGE | TOTAL INCURRED CAPITAL EXPENSES | PERCENTAGE OF CAPITAL EXPENSES ELIGIBLE FOR EXEMPTION | EXPENSES ELIGIBLE FOR EXEMPTION | TAXPAYER SAVINGS |
|---|---|---|---|---|
| SCENARIO 1: Small, Onsite System | $1,000,000 | 40% | $400,000 | $11,600 |
| SCENARIO 2: Small, Onsite System | $1,000,000 | 75% | $750,000 | $21,750 |
| SCENARIO 3: Large, Stand-alone System | $30 million | 40% | $12 million | $348,000 |
| SCENARIO 4: Large, Stand-alone System | $30 million | 75% | $22.5 million | $652,500 |

SOURCE: Office of the State Auditor analysis of industry reports and stakeholder feedback.

Overall, our analysis shows a typical taxpayer savings rate of about 1.16 to 2.18 percent of the project's total capital costs. Though this savings could be significant enough to encourage developers to invest in projects where the decision of whether to go forward is very close, in most cases, it would likely only provide a modest additional incentive rather than drive a decision.

## WHAT ARE THE ECONOMIC COSTS AND BENEFITS OF THE TAX EXPENDITURE?

We estimate that the revenue impact to the State was between $1.2 million to $2.2 million, in total, for May 2014 through July 2018. To develop this estimate, we used newspaper articles that reported the estimated project costs for the facility we identified as having been built after the exemption went into effect, as well as feedback from industry representatives estimating that no less than 40 percent and up to 75 percent of a typical biogas project's costs are attributable to biogas production components that would likely be eligible for the exemption. Although there may have been some additional revenue impact from smaller facilities that existed at the time the exemption was created, the additional revenue impact from these facilities would be due to component parts that were used for repairs or expansion of existing biogas systems, this would likely have a relatively small impact. EXHIBIT 1.4 provides more detailed calculations of the revenue impact based on this estimate of the minimum and maximum costs of eligible biogas production components.

EXHIBIT 1.4. ESTIMATED IMPACT TO STATE REVENUE, THROUGH JULY 2018

| TOTAL PROJECT COST | $102 MILLION |
|---|---|
| Minimum estimated amount spent on biogas production components (40 percent of total project cost) | $40.8 million |
| Maximum estimated amount spent on biogas production components (75 percent of total project cost) | $76.5 million |
| Colorado retail sales tax rate | 2.9% |
| Minimum revenue impact resulting from exemption | $1.2 million |
| Maximum revenue impact resulting from exemption | $2.2 million |

SOURCE: Office of the State Auditor analysis of estimated project costs reported in news articles and legal filings.

## WHAT IMPACT WOULD ELIMINATING THE TAX EXPENDITURE HAVE ON BENEFICIARIES?

The Biogas Exemption is scheduled for repeal on July 1, 2019. Allowing the exemption to expire would increase the cost of components used in the production of biogas by a minimum of 2.9 percent and present a modest financial barrier for those seeking to develop biogas production systems in Colorado. The additional cost to the taxpayer from eliminating the exemption depends on the total estimated project costs, as well as the percentage of total costs that would be eligible for the exemption. In addition, the exemption covers eligible replacement parts that may need to be purchased after a project's initial development. Allowing the exemption to expire would also increase the total incurred costs of these replacement parts. Although the impact of eliminating the exemption appears to be modest, stakeholders reported that since there are comparatively few financial incentives for biogas systems in Colorado, this exemption is one of the few tools the biogas industry can use to help convince investors to provide financial backing for these projects.

## ARE THERE SIMILAR TAX EXPENDITURES IN OTHER STATES?

We examined the tax expenditures that are, or have recently been, available for biogas production systems in states with at least 10 non-municipal biogas production facilities. Because other types of feedstock (e.g., organic landfill waste and solid waste) tend to be associated with municipal operations, we limited our analysis to biogas production facilities that use agricultural and/or food waste as their primary feedstock. According to data from the U. S. Environmental Protection Agency, there are nine states with more than 10 facilities that use agricultural and/or food waste as their primary feedstock. We examined the state tax laws of these nine states, and found that six currently offer a tax incentive for biogas projects. EXHIBIT 1.5 summarizes the tax expenditures currently and previously available in these states.

EXHIBIT 1.5. STATES WITH 10 OR MORE NON-MUNICIPAL BIOGAS PRODUCTION SYSTEMS USING AGRICULTURAL, AND/OR FOOD WASTE AS FEEDSTOCK AND TAX EXPENDITURES AVAILABLE IN THESE STATES

| STATE | NUMBER OF SYSTEMS | TYPE OF TAX INCENTIVE |
|---|---|---|
| Wisconsin | 44 | Sales tax exemption |
| California | 37 | Sales tax exemption |
| New York | 37 | Property tax exemption |
| Pennsylvania | 34 | Income tax credit (expired 2016) |
| Vermont | 22 | Sales tax exemption<br>Income tax credit (expired 2016) |
| Ohio | 14 | Sales tax exemption<br>Property tax exemption |
| Missouri | 13 | Sales tax exemption (for all power plants) |
| North Carolina | 12 | Income tax credit (expired 2016) |
| Indiana | 10 | None identified |
| TOTAL | 223 | 7 current, 3 expired |

SOURCE: Office of the State Auditor analysis of EPA anaerobic digestion facilities data and other state tax laws.

In addition, we identified four states bordering Colorado and/or in the Rocky Mountain region that currently offer tax incentives for biogas production facilities: Arizona, Montana, New Mexico, and Utah. In total, there are eight biogas production facilities that use agricultural and/or food waste as their primary feedstock in these four states.

## ARE THERE OTHER TAX EXPENDITURES OR PROGRAMS WITH A SIMILAR PURPOSE AVAILABLE IN THE STATE?

We identified the following state programs and tax incentives, and one federal tax incentive that could potentially apply to biogas projects.

- **ADVANCED INDUSTRY TAX CREDIT.** This tax expenditure is administered by the Governor's Office of Economic Development and International Trade (OEDIT) and provides an investor in an advanced industry business with an income tax credit of up to 30 percent of the qualified investment and is capped at $50,000 for each qualified investment. Colorado has seven statutorily recognized advanced industries: advanced manufacturing; aerospace, bioscience, electronics, energy and natural resources, infrastructure engineering, and information technology [Section 24-48.5-117(2)(a), C.R.S.]. Biogas projects, which may be considered part of the bioscience or

energy and natural resources industries, could be eligible for this tax credit if they meet the following criteria—less than $10 million received from third party investors since the business was formed, less than $5 million in annual revenues, and the investor cannot have held more than 30 percent of the voting power before the investment and must hold less than 50 percent of the voting power after the investment, and are approved by OEDIT. According to OEDIT, it granted one Advanced Industry Tax Credit in the amount of $25,000 to an investor for its investment in a biogas project in 2014.

- **Advanced Industry Grants.** OEDIT also offers several advanced industry grants, some of which biogas projects would be eligible to apply for, including grants for early stage capital, retention, infrastructure, and proof of concept. However, the eligibility requirements for each of these grants are very specific, and the grants are competitive. OEDIT staff reported that it receives approximately 100 applications for each grant cycle, and it is only able to provide grants to approximately 10 to 15 percent of applicants; each grant is generally around $250,000. OEDIT awarded an Advanced Industry Grant to one research-oriented biogas project in Fiscal Year 2017. Since 2013, there have been four other grant applications for biogas projects, and none of them have been awarded a grant.

- **Federal Energy Credit.** Some biogas projects may be eligible for the Federal Energy Credit [26 USC 48]. However, the federal credit is limited to certain types of energy property, and the only biogas-related eligible property is combined heat and power property, which is not one of the three statutorily-required uses of biogas to be eligible for the Biogas Exemption in Colorado.

## WHAT DATA CONSTRAINTS IMPACTED OUR ABILITY TO EVALUATE THE TAX EXPENDITURE?

The Department of Revenue could not provide data on the total amount of Biogas Exemptions that have been claimed. Sales covered by the Biogas Exemption are reported on the Colorado Retail Sales Tax Return (Form

DR 0100) on the line for "Renewable energy components," which aggregates the sale of biogas components with other renewable energy components exempt under Section 39-26-724(1)(a), C.R.S. The Department of Revenue does not currently capture this data in an extractable format in GenTax, its tax processing and information system, and would need to make programming changes to capture and retrieve the data going forward, as well as add a separate line to disaggregate the biogas component sales from other renewable energy component sales. Additionally, the renewable energy component sales reported on DR 0100 may not include some exempt sales of biogas components, if those exemptions were claimed as a refund rather than taken at the time of sale. As a result, we could not determine the amount claimed for the Biogas Exemption using Department of Revenue data.

Further, the Department of Revenue lacked additional data from exemption beneficiaries, such as total project costs, cost and type of components purchased under the exemption, and the projects' expected biogas production and use, which would also be useful to evaluate the effectiveness of the Biogas Exemption. However, collecting this information would require the Department of Revenue to create a new form, which would require additional resources, and would increase the burden and reporting requirements for taxpayers claiming the exemption (see the Tax Expenditures Overview section of this Compilation Report for details on the limitations of Department of Revenue data and the potential costs of addressing these limitations).

## WHAT POLICY CONSIDERATIONS DID THE EVALUATION IDENTIFY?

The General Assembly could consider expanding the Biogas Exemption to include electricity and heat produced and consumed on site. Statute [Section 39-26-724(1)(c)(I), C.R.S.] designates three permissible uses for biogas that is produced in order for the biogas production components to be exempt from sales tax: (1) for sale to a power generator, (2) used as a transportation fuel, and (3) turned into renewable natural gas. This list does not include heat and electricity

produced on site, and it is unclear whether on site electricity production from biogas is covered by another tax expenditure, the Alternating Current Exemption authorized in Section 39-26-724(1)(a), C.R.S., which provides that components used in the production of alternating current electricity from a renewable energy source are exempt from sales tax. However, interviews with stakeholders, as well as additional research into uses of biogas, indicated that on site heat and electricity production is also a common usage of biogas. Therefore, the General Assembly could consider expanding the eligibility requirements for the Biogas Exemption to include biogas systems that are used to generate heat or electricity on site or clarifying whether biogas production systems that are used to produce alternating current electricity, either entirely or partially, are exempt from sales and use tax under the Alternating Current Exemption. If implemented, this change would potentially increase the revenue impact of the exemption and may incentivize smaller scale production facilities than what may have been originally intended.