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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2020
or
☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
FOR THE TRANSITION PERIOD FROM _____ TO _____
Commission file number: 001-35073

Gevo, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**87-0747704**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
345 Inverness Drive South, Building C, Suite 310, Englewood, CO (Address of Principal Executive Offices)	**80112** (Zip Code)

(303) 858-8358
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	**Trading Symbol**	**Name of Each Exchange on Which Registered**
Common Stock, par value $0.01 per share	**GEVO**	**Nasdaq Capital Market**

Securities registered pursuant to Section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of common equity held by non-affiliates of the registrant was approximately $11.1 million as of June 30, 2020, the last trading day of the registrant's most recently completed second fiscal quarter, based on the closing price of the common stock as reported on the Nasdaq Capital Market on June 30, 2020. Shares of common stock held by each officer, director and holder of 10% or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of February 26, 2021, the number of outstanding shares of the registrant's common stock, par value $0.01 per share, was 198,171,915.

DOCUMENTS INCORPORATED BY REFERENCE

Part III of this Annual Report on Form 10-K incorporates certain information by reference from the registrant's proxy statement for the 2021 annual meeting of stockholders to be filed no later than 120 days after the end of the registrant's fiscal year ended December 31, 2020.

GEVO, INC.
FORM 10-K—ANNUAL REPORT
For the Fiscal Year Ended December 31, 2020
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Forward-Looking Statements

This report contains forward-looking statements within the meaning of Section 21 E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). When used in this Annual Report on Form 10-K (this "Report"), the words "expect," "believe," "anticipate," "estimate," "intend," "plan" and similar expressions are intended to identify forward-looking statements. These statements relate to future events or our future financial or operational performance and involve known and unknown risks, uncertainties and other factors that could cause our actual results, levels of activity, performance or achievement to differ materially from those expressed or implied by these forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. These forward-looking statements include, among other things, statements about: risks and uncertainties related to our ability to sell our products, our ability to expand or continue production of our products at our Net-Zero 1 Project (defined below), our Luverne Facility (as defined below) or elsewhere, our ability to meet our production, financial and operational guidance, our strategy to pursue low-carbon or "net-zero" carbon renewable fuels for sale into California and elsewhere, our ability to replace our fossil-based energy sources with renewable energy sources at our Net-Zero 1 Project, our Luverne Facility and elsewhere, our ability and plans to construct a greenfield commercial hydrocarbon facility to produce sustainable aviation fuel ("SAF") and renewable premium gasoline/isooctane, our ability to raise additional funds to finance our business, our ability to perform under our existing offtake agreements and other supply agreements we may enter into in the future, our ability to obtain project finance debt and third-party equity for our renewable natural gas ("RNG") projects, our ability to produce isobutanol and renewable hydrocarbon products at a commercial level and at a profit, achievement of advances in our technology platform, the availability of suitable and cost-competitive feedstocks, our ability to gain market acceptance for our products, the expected cost-competitiveness and relative performance attributes of our products, additional competition and changes in economic conditions and the future price and volatility of petroleum and products derived from petroleum. Important factors could cause actual results to differ materially from those indicated or implied by forward-looking statements such as those contained in documents we have filed with the U.S. Securities and Exchange Commission (the "SEC"), including this Report in Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations," Item 1A. "Risk Factors" and subsequent reports on Form 10-Q. All forward-looking statements in this Report are qualified entirely by the cautionary statements included in this Report and such other filings. These risks and uncertainties or other important factors could cause actual results to differ materially from results expressed or implied by forward-looking statements contained in this Report. These forward-looking statements speak only as of the date of this Report. We undertake no intention or obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, and readers should not rely on the forward-looking statements as representing the Company's views as of any date subsequent to the date of the filing of this Report.

Unless the context requires otherwise, in this Report the terms "Gevo," "we," "us," "our" and "Company" refer to Gevo, Inc. and its wholly owned, direct and indirect subsidiaries.

Risk Factors Summary

Our business is subject to a number of risks and uncertainties, including those described in Part I, Item 1A. Risk Factors of this annual report. These risks include, but are not limited to, the following:

- Our business has been impacted by the COVID-19 pandemic, and our financial condition, results of operations and liquidity may be materially and adversely impacted by it in the future.
- We have a history of net losses, and we may not achieve or maintain profitability.
- Our business is capital-intensive in nature and we rely on external financing to fund our growth strategy, including the development and construction of the Net-Zero 1 Project and other similar growth projects. Limitations on access to external financing could adversely affect our operating results.
- Our proposed growth projects may not be completed or, if completed, may not perform as expected. Our project development activities may consume a significant portion of our management's focus, and if not successful, reduce our profitability.
- We may be unable to successfully perform under current or future supply and distribution agreements to provide our isobutanol, SAF and other renewable hydrocarbon products, which could harm our commercial prospects.
- Our take-or-pay contracts, including our take-or-pay purchase agreement with Trafigura, are subject to significant conditions precedent and, as a result, the revenues that we expect from such contracts may never be realized.
- The Luverne Facility is our first commercial isobutanol and ethanol production facility, and, as such, we may be unable to produce planned quantities of isobutanol, SAF and renewable premium gasoline and any such production may be costlier than we anticipate.
- Fluctuations in the price of corn and other feedstocks may affect our profitability.
- Fluctuations in the price and availability of energy to power our production facilities may harm our financial performance.
- Fluctuations in petroleum prices and customer demand patterns may reduce demand for renewable fuels and bio-based chemicals.
- Changes in the prices of distillers grains and iDGs could have a material adverse effect on our financial condition.
- If we elect to produce ethanol rather than isobutanol, or during periods in which we make the strategic decision to revert to ethanol production, or produce both products simultaneously, we will be vulnerable to fluctuations in the price of and cost to produce ethanol.
- Sustained narrow commodity margins for ethanol caused us to operate at a loss and caused us to terminate production at the Luverne Facility. We may or may not be able to recommence production when margins improve.
- We may not be successful in the production of commercial quantities of isobutanol or renewable hydrocarbon products from plant feedstocks in a timely or economic manner, or at all.
- The technological and logistical challenges associated with producing, marketing, selling and distributing isobutanol, renewable hydrocarbon products and ethanol are extraordinary, and we may not be able to resolve any difficulties that arise in a timely or cost-effective manner, or at all.
- Our actual costs may be greater than expected in developing our growth projects, causing us to realize significantly lower profits or losses on our projects.
- Our facilities and processes may fail to produce products at the volumes, rates and costs we expect.
- We may be unable to produce isobutanol, renewable hydrocarbon products like SAF or other products in accordance with customer specifications.
- We lack significant experience operating commercial-scale isobutanol, renewable hydrocarbon and ethanol facilities and may encounter substantial difficulties operating commercial plants or expanding our business.
- We may have difficulty adapting our technology to commercial-scale fermentation, which could delay or prevent our commercialization of SAF and renewable premium gasoline.
- We may have difficulties gaining market acceptance and successfully marketing our isobutanol and renewable hydrocarbon products to customers, including chemical producers, fuel distributors and refiners.
- We may have difficulties scaling up our renewable hydrocarbon technology, and, as such, we may be unable to produce commercial quantities of our renewable hydrocarbon products and any such production may be costlier than we anticipate.
- We may be reliant on Butamax Advanced Biofuels LLC ("Butamax") to develop certain markets for isobutanol.
- We may be required to pay Butamax royalties for selling isobutanol into certain markets, which could hinder our ability to competitively sell our isobutanol into those markets.
- Even if we are successful in consistently producing isobutanol and renewable hydrocarbon products on a commercial scale, we may not be successful in negotiating additional supply agreements or pricing terms to support the growth of our business.
- Our isobutanol may be less compatible with existing refining and transportation infrastructure than we believe, which may hinder our ability to market our product on a large scale.
- A sustained low oil price environment may negatively impact the price we receive for the sale of our isobutanol, renewable hydrocarbon products and ethanol.
- If we engage in acquisitions, we will incur a variety of costs and may potentially face numerous risks that could adversely affect our business and operations.
- If we engage in joint ventures, we will incur a variety of costs and may potentially face numerous risks that could adversely affect our business and operations.
- If we lose key personnel, including key management personnel, or are unable to attract and retain additional personnel, it could delay our product development programs and harm our research and development efforts, make it more difficult to pursue partnerships or develop our own products or otherwise have a material adverse effect on our business.
- We may face substantial competition from companies with greater resources and financial strength, which could adversely affect our performance and growth.
- Our future success will depend on our ability to maintain a competitive position with respect to technological advances.
- We may face significant and substantial competition as it relates to our proprietary renewable fuels which could adversely affect our performance and growth.
- Our competitive position in the polyester, rubber, plastics, fibers and other polymers markets versus the incumbent petroleum-derived products and other renewable butanol producers may not be favorable.
- Business interruptions, including those related to COVID-19, may have an adverse impact on our business and our financial results.
- Our business and operations would suffer in the event of information technology system failures or a cyber-attack.
- We may engage in hedging transactions, which could harm our business.
- Ethical, legal and social concerns about genetically engineered products and processes, and similar concerns about feedstocks grown on land that could be used for food production, could limit or prevent the use of our products, processes and technologies and limit our revenues.
- As isobutanol, SAF and renewable premium gasoline has not previously been used as a commercial fuel in significant amounts, its use subjects us to product liability risks.

- We may not be able to use some or all of our net operating loss carry-forwards to offset future income.
- We may enter into letters of intent, memoranda of understanding and other largely non-binding agreements with potential customers or partners that may not result in legally binding, definitive agreements.
- Competitiveness of our products for fuel use depends in part on government economic incentives for renewable energy projects or other related policies that could change.
- Our ability to compete may be adversely affected if we are unsuccessful in defending against any claims by competitors or others that we are infringing upon their intellectual property rights.
- Our ability to compete may be adversely affected if we do not adequately protect our proprietary technologies or if we lose some of our intellectual property rights through costly litigation or administrative proceedings.
- If our biocatalysts, or the genes that code for our biocatalysts, are stolen, misappropriated or reverse engineered, others could use these biocatalysts or genes to produce competing products.
- We may not be able to enforce our intellectual property rights throughout the world.
- Confidentiality agreements with employees and others may not adequately prevent disclosures of trade secrets and other proprietary information.
- We have received funding from U.S. government agencies, which could negatively affect our intellectual property rights.
- Any decline in the value of carbon credits associated with our products could have a material adverse effect on our results of operations, cash flow and financial condition.
- The U.S. renewable fuels industry is highly dependent upon certain federal and state legislation and regulation and any changes in legislation or regulation could have a material adverse effect on our results of operations, cash flows and financial condition.
- We may face substantial delays in obtaining regulatory approvals for use of our renewable premium gasoline product, which could substantially hinder our ability to commercialize our renewable premium gasoline product in the U.S.
- Our isobutanol product may encounter physical or regulatory issues that could limit its usefulness as a gasoline blendstock.
- We may be required to obtain additional regulatory approvals for use of our iDGs as animal feed, which could delay our ability to sell iDGs increasing our net cost of production and harming our operating results.
- Reductions or changes to existing regulations and policies may present technical, regulatory and economic barriers, all of which may significantly reduce demand for renewable fuels or our ability to supply our products.
- We use hazardous materials in our business and we must comply with environmental laws and regulations. Any claims relating to improper handling, storage or disposal of these materials or noncompliance with applicable laws and regulations could be time consuming and costly and could adversely affect our business and results of operations.
- Our expanded international activities may increase our exposure to potential liability under anti-corruption, trade protection, tax and other laws and regulations.
- During the ordinary course of business, we may become subject to lawsuits or indemnity claims, which could materially and adversely affect our business and results of operations.
- The market price of our common stock may be adversely affected by the future issuance and sale of additional shares of our common stock or by our announcement that such issuances and sales may occur.
- Future issuances of our common stock or instruments convertible or exercisable into our common stock may materially and adversely affect the price of our common stock and cause dilution to our existing stockholders.
- Our stock price may be volatile, and your investment in our securities could suffer a decline in value.
- Our quarterly operating results may fluctuate in the future. As a result, we may fail to meet or exceed the expectations of investment research analysts or investors, which could cause our stock price to decline.
- The estimates and assumptions on which our financial projections are based may prove to be inaccurate, which may cause our actual results to materially differ from such projections, which may adversely affect our future profitability, cash flows and stock price.
- Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies.
- We may pay vendors in stock as consideration for their services, which may result in additional costs and may cause dilution to our existing stockholders.
- We do not anticipate paying cash dividends, and accordingly, stockholders must rely on stock appreciation for any return on their investment.
- If securities or industry analysts do not publish research or reports about our business, or publish negative reports about our business, our stock price and trading volume could decline. The trading market for our common stock will be influenced by the research and reports that securities or industry analysts publish about us or our business.
- We are subject to anti-takeover provisions in our amended and restated certificate of incorporation, our amended and restated bylaws and under Delaware law that could delay or prevent an acquisition of the Company, even if the acquisition would be beneficial to our stockholders.
- Our amended and restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, or employees.

PART I

Item 1. Business.

Company Overview

We are a growth-oriented renewable fuels technology and development company that is commercializing the next generation of renewable low-carbon liquid transportation fuels, such as SAF, and renewable isooctane (which we refer to as "renewable premium gasoline"), with the potential to achieve a "net zero" greenhouse gas ("GHG") footprint and address global needs of reducing GHG emissions with sustainable alternatives to petroleum fuels. Our technology transforms carbon from the atmosphere using photosynthetic energy, wind energy and biogas energy into liquid hydrocarbons with a low or potentially "net-zero" GHG footprint.

As next generation renewable fuels, our hydrocarbon transportation fuels have the advantage of being "drop-in" substitutes for conventional fuels that are derived from crude oil, working seamlessly and without modification in existing fossil-fuel based engines, supply chains and storage infrastructure. In addition, with SAF, the carbon footprint of air travel can be reduced, or in the long run, eliminated on a net carbon basis, without change to planes or fuel systems. In addition to the potential of net-zero carbon emissions across the whole fuel life-cycle, our renewable fuels eliminate other pollutants associated with the burning of traditional fossil fuels such as particulates and sulfur, while delivering superior performance. We believe that the world is substantially under-supplied with low-carbon, drop-in renewable fuels that can be immediately used in existing transportation engines and infrastructure, and we are uniquely positioned to grow in serving that demand.

We use low-carbon, renewable resource-based raw materials as feedstocks. In the near-term, our feedstocks will primarily consist of non-food corn. As our technology is applied globally, feedstocks can consist of sugar cane, molasses or other cellulosic sugars derived from wood, agricultural residues and waste. Our patented fermentation yeast biocatalyst produces isobutanol, a four-carbon alcohol, via the fermentation of renewable plant biomass carbohydrates. The resulting renewable isobutanol has a variety of direct applications but, more importantly to our fundamental strategy, serves as a building block to make renewable premium gasoline and SAF using simple and common chemical conversion processes. We also plan to reduce or eliminate fossil-based process energy inputs by replacing them with renewable energy such as wind-powered electricity and renewable natural gas ("RNG").

Our technology represents a new generation of renewable fuel technology that overcomes the limitations of first-generation renewable fuels, highlighted by the following:

- Potential to replace the whole gallon of liquid transportation fuels, including for airplanes, automobiles, boats, trucks and ships of all types, while delivering massively reduced or negative GHG emissions and reducing or eliminating pollutants such as particulates and sulfur, which have been linked to cancer and other human health issues;
- Drop-in compatibility and performance, without modification to existing vehicles, airplanes and other infrastructure;
- Scalability as a global and sustainable transportation fuel solution;
- Potential for a "net zero" or even negative carbon footprint for our fuel products across the lifecycles and value chains of our products through sustainable or regenerative agriculture practices to reduce the carbon footprint of the carbohydrates used to make our products and the use of renewable energy (such as wind power and biogas) to run our production facilities;
- The production of value-added feed and food products, including protein, bran, and vegetable oil, to help feed the world using sustainably grown corn to make our products;
- Through our platform fermentation technology, we possess the ability to use carbohydrates from various types of feedstock (including starch, dextrose, sugar, molasses, agricultural residues, and wood), thereby allowing our technology to be used in various economic conditions and taking advantage of raw materials abundant in different parts of the world;
- Through our platform alcohols-to-hydrocarbons technology, which converts fermentation alcohols into chemical products, we have developed the ability to produce renewable chemicals such as aroma chemicals, flavorings, para-xylene for use polyester textile fibers and polyethylene terephthalate plastic used in drinking bottles; renewable synthetic rubber; renewable propylene and hydrogen. We expect to license these technologies in the future; and
- The opportunity to further optimize the performance of our biocatalyst to improve the economics associated with the production of our products.

We use the Argonne National Laboratory's GREET (Greenhouse gases, Regulated Emissions, and Energy use in Transportation) model (the "GREET Model"), the pre-eminent science-based lifecycle analysis model, to measure and predict GHG emissions across the life-cycle of our products. The GREET Model takes into account emissions and impacts "cradle to cradle" for renewable resource-based fuels including: inputs and generation of raw materials, agriculture practices, chemicals used in production processes of both feedstocks and products, energy sources used in production and transportation, and end fate of products, which for fuel products is usually burning to release energy.

Over the last decade we believe that we have proven the biotechnology and fermentation technology at our production facility in Luverne, Minnesota (the "Luverne Facility") where we have used a full-scale commercial fermenter system (~265,000 gallon fermenter scale). We believe that we have proven the hydrocarbon production technology at a 100,000 gallon/year demonstration plant in Silsbee, Texas which has been in operation since 2011. Our SAF complies with the commercial ASTM standards and has been used for commercial and business aviation. Our gasoline products are high octane fuels and have been sold for racing car applications. We believe our technology is proven to work, that our product performance is proven to work, that our potential to eliminate the fossil GHG footprint of our transportation fuels is real, and that there is significant marketplace demand for building world scale production plants.

Global GHG emissions, as a result of the widespread use of fossil fuels, are increasing and will continue to increase unless there is a global systemic change in energy consumption. Many industries, including the commercial airline industry, expect to experience strong growth but have also committed to hold GHG emission flat and, in some cases, even committed to take steps to reduce GHG emissions in the future. In addition, governments are taking steps to reduce GHG gas emissions, and consumers are increasingly focusing on GHGs and their effect on the global climate. To address these concerns, we believe that industries must eliminate burning fossil-based carbon in the production of electricity and transportation fuels, and that we must use forestry and agriculture to capture carbon in soil, plants, and trees. Because we have shown that our renewable-based products perform as well or better than traditional fossil-based fuels in existing fuels infrastructure, including internal combustion engines as well as transportation and storage infrastructure, we believe we are in a position to address the global GHG emission crisis head-on as a major player in the low-carbon fuel industry.

Our Strategy

Our products address global needs for drop-in low-carbon, clean-burning, high-performance fuels. Our strategy is to exploit our patented technology, process know-how, proven operations, proven product performance, business systems and product offtake agreements to develop the business and markets for low carbon renewable fuels that contain captured renewable energy and the monetary value from reductions in fossil carbon emissions normally associated with transportation fuels. We plan to build capacity and partner with others globally to meet the volumes from customer off-take agreements. We are, or intend to be, market developers, business developers, project developers, technology licensors, plant operators, and equity owners of production facilities for renewable fuels.

Key elements of our strategy include:

- **Continue to enter into supply agreements for low-carbon hydrocarbon fuels using our proprietary technology, and use these agreements to support financing to build production capacity of renewable fuels.** We intend to build large scale production facilities of renewable fuels in order to support existing and future supply agreements.
- **Use a project finance approach to build out production capacity.** In a project finance approach, financing for plant construction is secured by non-recourse or limited recourse debt and, potentially, partially by third-party equity investors through special purpose entities. We have engaged Citigroup to finance the construction of the Net-Zero 1 Project and additional production facilities to produce our products. We currently intend to own a majority equity position in the first two plant projects.
- **Expand the global production capacity of renewable premium gasoline and jet fuel, and intermediates for chemical and plastics production via licensing core and adjacent technologies around the world.** We believe that we have proven that our isobutanol production process works in full-scale fermenter systems at the Luverne Facility, and we believe that we have also proven that our renewable isobutanol can be readily converted to hydrocarbon products at our demonstration plant in Silsbee, Texas that was developed and is operated in partnership with South Hampton Resources Inc. (the "South Hampton Facility"). Our technology can be used to produce isobutanol from feedstocks other than corn, such as sugar, molasses, agricultural residues (e.g., straw, bagasse, stover), wood and wood residues and biogenic municipal solid waste. Feedstocks differ in their abundancy around the world. We intend to expand the global production of isobutanol and its derivative hydrocarbon products beyond the Luverne Facility through a low-cost, high-margin licensing model, in collaboration with partners such as Praj Industries Ltd., with whom we have previously announced an agreement. We have several technologies that we expect to eventually license. We believe that we have already proven that fully renewable polyester can be produced using intermediates from our renewable premium gasoline production. We have developed a technology to convert ethanol to hydrogen and propylene. We have developed a technology to convert short chain fermentation alcohols into fine chemicals such as flavors and fragrances.
- **Grow our business to achieve economies of scale to reduce selling prices of renewable fuels.** We believe that the long-term price of oil is relevant to the demand for our products, and the value in the market for reducing carbon should make our selling prices more attractive in the future. In addition, as we scale up our business and achieve economies of scale, we can drive down our selling price of our renewable fuels to make our products more economical and attractive to our customers. We believe we can drive economies of scale by securing additional offtake supply agreements, with continued expansion of our production facilities and/or licensing our technology to others. Already, the net selling price to the customer approaches parity with fossil-based fuels. We also believe that with additional plants using our technology and with contracts for products that we expect to establish, we should be able to achieve attractive reinvestment economics making further plant buildouts attractive to project investors.
- **Establish a business system that has potential to deliver "net zero" carbon emission fuel products.** The concept of "net zero" carbon emissions is based on using sustainably produced, renewable resource-based raw materials as the product carbon source combined with reducing or eliminating fossil-based process energy inputs by using renewable electricity and RNG. The full life-cycle carbon footprint of our products, from generation of feedstocks to actual burning of the fuels, can be zero or even negative if regenerative or sustainable agricultural practices are used for the feedstock production. Our potential use of blockchain techniques could allow a complete and accurate accounting for positive and negative contributions to environmental metric which, in turn, would enable value transfers that incentivize systemic renewable and regenerative business practices across the value chain.
- **Establish RNG production for use in our future production plants.** RNG can be used to displace fossil based natural gas, thereby lowering the carbon footprint of our production processes. We are developing a biogas project in Northwest Iowa that we expect to begin production in 2022.

Competitive Strengths

- **Platform technologies and products to address large markets**. Because isobutanol can be readily converted into hydrocarbon products, including isooctane (renewable premium gasoline), isooctene, SAF, lubricants, polyester, rubber, plastics, fibers and other polymers, we believe that the addressable markets are very large; potentially ultimately reaching 40% of the global petrochemicals markets and 50% of the renewable premium gasoline and SAF markets, in each case depending on the price of oil and the market value of carbon footprint reduction.
- **Growing, take-or-pay contracted demand for our renewable products.** We currently have take-or-pay contracts in place for approximately 45 million gallons per year of our renewable premium gasoline and jet fuel, and we expect to enter into additional agreements in the future. We believe these take-or-pay contracts are suitable for sponsoring debt and equity project financing for expansion of our production capabilities.
- **Proven commercial production processes.** We believe that our renewable isobutanol production technology has been proven to work at a commercial scale in a 265,000 gallon fermenter at our Luverne Facility. We believe that our technology to convert renewable isobutanol into renewable jet fuel, isooctane, isooctene and para-xylene (building block for polyester) has been proven at our South Hampton Facility.
- **Proven commercial products, renewable premium gasoline and SAF.**
  - Renewable premium gasoline. We produce a product called isooctane that we refer to as renewable premium gasoline. We have demonstrated that isooctane can make up 50% to 60% of fossil-based premium gasoline, and we believe isooctane is a direct substitute for alkylate and reformate. Given that our isooctane is renewable, we have the ability to produce a renewable low-carbon premium gasoline. We believe that our renewable premium gasoline is substantially similar to fossil-based premium gasoline. Subject to receipt of certain regulatory approvals, our renewable premium gasoline could be a direct substitute for fossil-based premium gasoline for use in commerce in the U.S. Additionally, our renewable isooctane, like alkylate or reformate, when added to lower-octane fossil-based gasoline, produces a higher octane premium gasoline simultaneously lowering the GHG footprint and other pollution emissions. In the consumer gasoline markets, we expect that the demand will grow for premium gasoline with high octane ratings as more cars come onto the road with engines designed for high miles per gallon.
  - SAF. In 2016, ASTM International included our SAF in ASTM D7566 (Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons), which means that our SAF can be used in commercial aviation on a blended basis up to 50% with petroleum-based jet fuel. In fact, our SAF has been used to fuel commercial flights in the U.S.
- **Existing commercial-scale production facility and expansion to additional facilities.** Our Luverne Facility is located in the middle of the U.S. with access to attractively priced renewable wind power electricity (for our electricity demand), renewable natural gas (for thermal energy), certified sustainable corn as a feedstock, rail services, and a trained production leadership team who knows how to produce our products and train employees. We also have secured an option to purchase land to build a "greenfield" production facility of approximately 240 acres in Lake Preston, South Dakota, which is contemplated to produce approximately 45 million gallons per year of renewable hydrocarbon products.
- **Abundant, readily sourced feedstocks available globally.** Through our platform fermentation technology, we have the ability to use carbohydrates from various types of feedstock (including starch, dextrose, sugar, molasses, agricultural residues and wood), allowing our technology to be used in various economic conditions. The feedstocks are abundantly available across the globe, typically at reasonable prices and easily aggregated.
- **Experienced management team.** Our management team brings over 100 years of combined experienced in the development and commercialization of low-carbon products, projects and businesses.

Existing Supply Commitments and Expansion of Our Production Facilities

We have a growing portfolio of long-term, take-or-pay contracts for our products. As of the date of this report, we have entered into the following take or pay contracts, among others:

- Trafigura. In August 2020, we entered into a long-term take-or-pay purchase agreement with Trafigura Trading LLC ("Trafigura") pursuant to which we agreed to supply renewable hydrocarbons to Trafigura, subject to certain conditions. Performance under the agreement is subject to certain conditions, including acquiring a production facility to produce the renewable hydrocarbon products contemplated by the agreement and closing a financing transaction for sufficient funds to acquire or retrofit the production facility contemplated by the agreement. The Net-Zero 1 Project (as defined below) is expected to produce the products for the Trafigura agreement beginning in 2024.
- Delta Air Lines. In December 2019, and as subsequently amended in April 2020, we entered into a long-term, take-or-pay purchase agreement with Delta Air Lines, Inc. ("Delta") pursuant to which we agreed to sell and deliver 10 million gallons per year of SAF to Delta, subject to certain conditions and exceptions, including Delta's right to eliminate the take-or-pay requirements in certain circumstances. The Net-Zero 1 Project is expected to produce the products for the Delta agreement beginning in 2024.
- Air Total. In August 2019, we entered into a take-or-pay purchase agreement with Air Total International, S.A. ("Air Total") pursuant to which we agreed to supply SAF to Air Total under a three-year offtake agreement. Air Total will initially purchase small quantities of SAF and we expect to sell Air Total increasing amounts of SAF upon the completion of the Net-Zero 1 Project beginning in 2024.
- HCS Group GmbH. In February 2019, we entered into a take-or-pay purchase agreement with HCS Holding GmbH ("HCS"), pursuant to which we agreed to supply renewable premium gasoline to HCS under a 10-year offtake agreement. HCS will initially purchase small quantities of renewable premium gasoline. The Net-Zero 1 Project is expected to produce the products for the HCS agreement beginning in 2024.
- Scandinavian Airlines System. On February 16, 2021, we and Scandinavian Airlines System ("SAS") entered into Amendment No. 1 (the "Amendment") to the Fuel Sales Agreement, dated October 28, 2019, by and between us and SAS (as amended by the Amendment, the "SAS Agreement"), pursuant to which we agreed, subject to the terms and conditions set forth in the Agreement, to supply SAF to SAS. We expect to supply the SAF for the SAS agreement from our second Net-Zero Project in 2024.

In addition, as of the date of this Report, we have entered into the following licensing arrangements:

Praj Industries. In August 2020, we entered into a binding, definitive Master Framework Agreement (“MFA”) with Praj Industries Ltd. (“Praj”) to collaborate on providing renewable, low carbon, low particulate SAF and renewable premium gasoline in India and neighboring countries. This follows an earlier announcement in April 2019 between us and Praj regarding the commercialization of renewable isobutanol, SAF and renewable premium gasoline. We plan to license our technology and Praj will provide technology, plant equipment and engineering, procurement and construction (“EPC”) services to sugar mills and ethanol plants to produce renewable isobutanol from 1G feedstock (such as cane juice, cane molasses and sugar syrup) and 2G feedstock (such as cellulosic biomass like straws and bagasse). The renewable isobutanol will be aggregated and transferred to various refineries. We will also license our technology and Praj will provide technology, plant equipment and EPC services to refineries for converting renewable isobutanol into SAF and renewable premium gasoline through the ASTM-approved pathway of our SAF.

Net-Zero Projects

In early 2021, we announced the concept of “Net-Zero Projects” for the production of energy dense liquid hydrocarbons using renewable energy and our proprietary technology. The concept of a Net-Zero Project is to convert renewable energy (photosynthetic, wind, RNG, biogas) from a variety of sources into energy dense liquid hydrocarbons, that when burned in traditional engines, have the potential to achieve net-zero GHG emissions across the whole lifecycle of the liquid fuel: from the way carbon is captured from the atmosphere, processed to make liquid fuel products, and including the end use (burning as a fuel for cars, planes, trucks, and ships). We announced that our project that is currently planned to be constructed at Lake Preston, South Dakota will be the first Net-Zero Project (the “Net-Zero 1 Project”). We expect that the Net-Zero 1 Project will have the capability to produce liquid hydrocarbons that when burned have a “net-zero” greenhouse gas footprint. We currently expect the Net-Zero 1 Project to have a capacity of 45 MGPY of hydrocarbons (for renewable premium gasoline and SAF to produce more than 350,000,000 pounds per year of high protein feed products for use in the food chain, to produce enough RNG to be self-sufficient for the production process needs, and also to generate renewable electricity with a combined heat and power system. We also expect that the Net-Zero 1 Project will utilize wind energy, and we have entered into a development agreement with Juhl Energy Development, Inc. to design and develop a behind-the-meter wind project near the Net Zero 1 project site . Based on current engineering work completed to date, the unleveraged capital cost for the Net-Zero 1 Project is projected to be on the order of $650 million, including the hydrocarbon production and related renewable energy infrastructure which includes water treatment and anaerobic digestion to produce biogas that will be used for plant thermal energy and, with an on-site combined heat and power facility, generate electricity.

Wind Energy Project

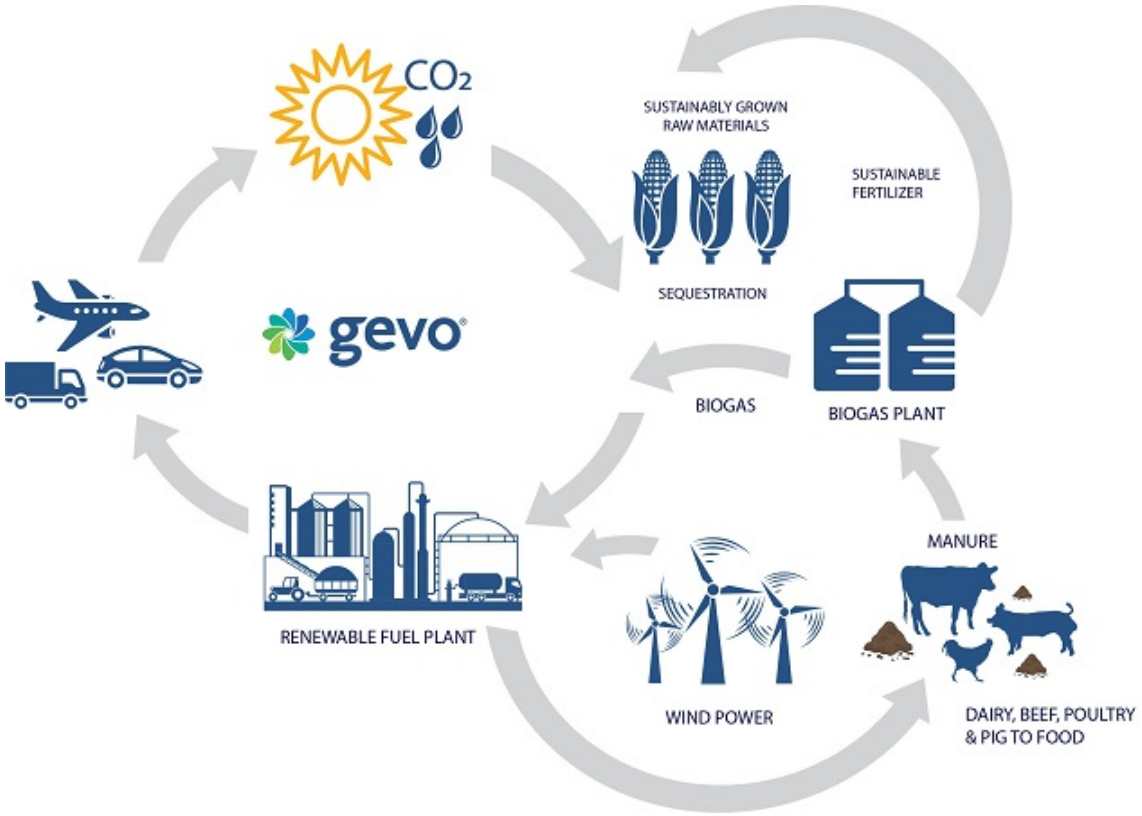
In September 2019, Agri-Energy, LLC ("Agri-Energy"), our wholly-owned subsidiary, entered into an Environmental Attributes Purchase and Sale Agreement with an affiliate of Juhl Clean Energy Assets, Inc. (“Juhl”), which provides for Agri-Energy to purchase all environmental attributes, including renewable energy credits, related to the development of a wind electrical energy generating facility near the Luverne Facility. The wind project is comprised of two 2.5 megawatt wind turbines with a maximum output capacity of 5.0 megawatts and achieved commercial operation in the first half of 2020. Agri-Energy purchases the electricity generated by the wind project from the City of Luverne, Minnesota, and the electricity will be delivered directly to the Luverne Facility through a direct transmission line from the wind generation units. This is expected to enable the wind electricity to meet California’s requirement to be counted in determining the carbon intensity of the renewable transportation fuels produced at the Luverne Facility under California’s Low Carbon Fuel Standard Program (“LCFS”). The wind turbines began providing electricity to the Luverne Facility during the second quarter 2020.

Renewable Natural Gas Projects

In 2019, we began developing RNG projects . Manure from cows and pigs can be digested anaerobically to produce low-carbon methane. We expect that securing low-carbon methane for our production energy will assist us in achieving carbon negative GHG emissions on our end products. The end products resulting from such a decarbonization process are rewarded with a lower carbon intensity score, which increases the market value of certain products, in addition to having a more positive impact on the environment. We are currently working on financing the first RNG project in Northwest Iowa (the “NW Iowa RNG Project”). We expect financing of the NW Iowa RNG Project to close in the first half of 2021 and the project to begin producing RNG in 2022 to potentially supply RNG as a process energy input to Gevo’s Net-Zero Projects and to sell into natural gas pipelines to third party purchasers.

Our Business System and Sustainability

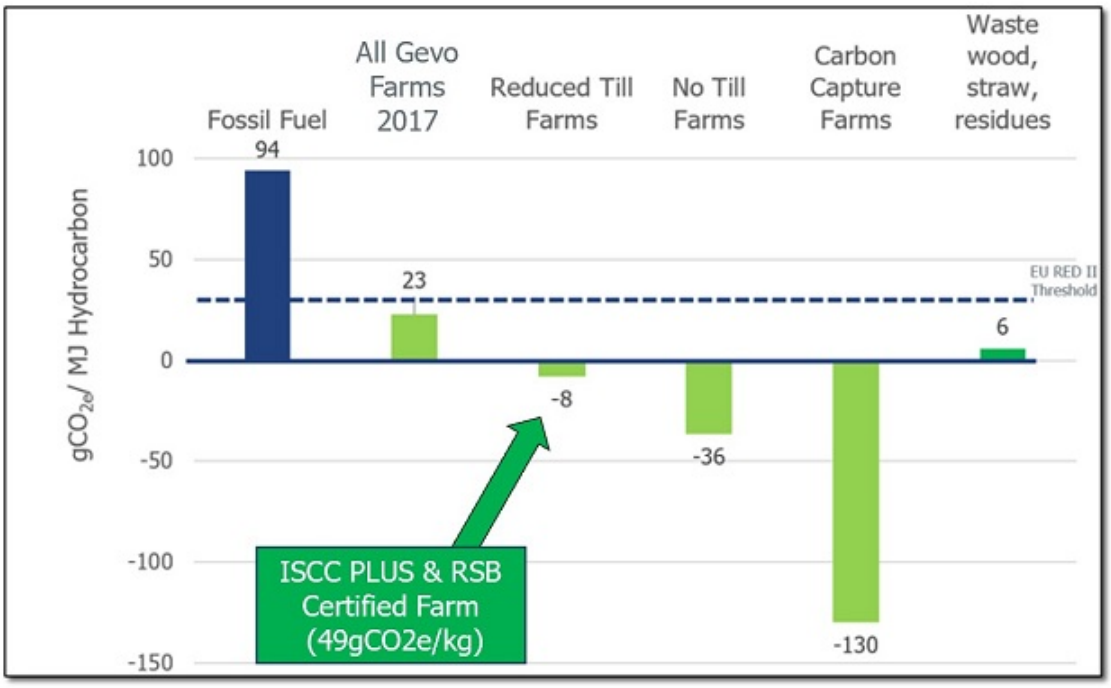
Our business system (from the raw materials to use of our advanced renewable fuels in all types of transportation) represents the entire circular economy in action. The graphic below is a summary representation of our business system at work in the Midwest region of the United States, and how each of the processes work together to produce advanced renewable fuels with a low-carbon footprint. We believe this system can work just as effectively in most other parts of the world.



In the above representation of our system, the most basic raw material for making our renewable fuel products is the carbon dioxide in the atmosphere (i.e., the GHG). Atmospheric carbon dioxide and water are captured by growing plants through photosynthesis (via sunlight) to produce carbohydrates. Carbohydrates sources already shown to work in our system include starch, dextrose, sucrose, molasses and from cellulosics such as wood waste, wood and agricultural residues such as straw. In our first plants, we plan on using sustainably grown field corn as the carbohydrate source. Kernels of corn are comprised of approximately 70% carbohydrate and 30% protein. The kernels are ground up, and then the protein is separated from the carbohydrates either before or after the fermentation process. The carbohydrates are used for fermentation producing isobutanol. The protein is a valuable component of animal feed product delivering nutrition to animals in meat and dairy production. The feed products are value added, having the starch removed. With the starch removed, cattle and other livestock emit less enteric emissions than if they ate whole corn, yet 100% of the nutritional value of corn is delivered to the food chain. In our process, approximately 10 pounds collectively of vegetable oil products and protein-rich feed product is produced for each gallon of renewable fuel produced.

Reducing the fossil carbon footprint of the energy sources in our business system is important to reducing the carbon footprint of our renewable fuel products. In September 2019, we secured 5 megawatts of wind power from our partnership with Juhl to offset the grid electricity needed at the Luverne Facility. With the NW Iowa RNG Project, we are also establishing a supply of RNG to be used at one or more of our production facilities. We have contracted with three dairies in the Midwest that are expected to produce about 350,000 MMBtus of RNG per year using anaerobic digestion. About half of the RNG production is expected to be used at one or more of our production facilities and the remaining production is expected to be sold in the RNG markets, which are highly developed in places like California. An additional benefit of RNG production is that nitrogen, phosphorus and potassium nutrients are captured from the manure and can be used as field fertilizer. We believe that practices around the full accounting for both negative and positive externalities are evolving and will increasingly benefit us.

The impact of using renewable energy at our plants has potential to significantly reduce the carbon footprint associated with our products. When sustainable farming techniques used to grow our corn feedstocks (such as regenerative agriculture techniques) are accounted for, our renewable premium gasoline and SAF products from our Net-Zero 1 Project could realize a GHG reduction of approximately 100% using the GREET Model and using the averages based upon the corn supplied to us. Furthermore, if we source feedstock from the farms that use conservation tillage such as strip tillage or drills, the corn GHG footprints are so low that we believe that we can run our total business system at a negative carbon footprint. We believe that we can achieve similar results by using waste wood, straw or municipal solid waste as feedstocks, depending upon the GHG footprint of the feedstock and the energy source used for production.



Our technology and business system embrace a new generation of systemic sustainability. We are focused on, and committed to, addressing the problem of supplying transportation fuels with a meaningful alternative that reduces GHGs and pollution, including the land utilization practices to generate our raw materials. We are working to establish accountability for the sustainability attributes of our entire business system, from the establishment of audited certification of our feedstocks (i.e. International Sustainability and Carbon Certification System and the Roundtable on Sustainable Biomaterials), to the development of distributed ledger technology in partnership with Blocksize Capital to enable the tracking of sustainability attributes proving assurance of sustainability to our customers.

As discussed below, beyond direct use as a chemical and gasoline blendstock, isobutanol can be dehydrated to produce butenes, which can then be converted into other products such as para-xylene ("PX"), SAF and many other renewable hydrocarbon fuels and blendstocks, and specialty chemicals offering substantial potential for additional demand. The conversion of isobutanol into butenes is a fundamentally important process that enables isobutanol to be used as a building block chemical in multiple markets.

Our Products

Sustainable Aviation Fuel

In April 2016, ASTM International completed its process of approving a revision of ASTM D7566 (Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons) to include alcohol to jet synthetic paraffinic kerosene derived from renewable isobutanol. This allows our SAF to be used as a blending component in standard Jet A-1 fuel for commercial airline use in the U.S. and around the globe.

Renewable Premium Gasoline (Isooctane) and Other Hydrocarbon Fuels

Isooctane (which we refer to as renewable premium gasoline), isooctene, diesel fuel and bunker fuel may also be produced from our isobutanol. Since 2011, we have been producing SAF and isooctane for renewable gasoline at a demonstration facility that we operate with South Hampton Resources, Inc. in Silsbee, Texas (the "South Hampton Facility"). The products produced at our South Hampton Facility are sold on a commercial basis to help develop the markets for these products. We continue to optimize the technologies and production systems, and we believe this technology is ready to scale up on a full commercial basis.

We currently believe that we have no competitors for renewable low-carbon isooctane, a substitute for alkylate, for premium gasoline in the marketplace. Additionally, we expect isooctane demand to increase because of the advent of engines with higher compression that get more mileage. We expect that isooctane will be in increasing demand as these more efficient engines come to market, and when blended with certain other renewable ingredients such a renewable naptha, and isobutanol or ethanol, it is possible to produce a complete gallon of gasoline.

PX and Polyethylene Terephthalate ("PET")

Isobutanol can be used to produce PX, polyester and their derivatives, which are used in the beverage, food packaging, textile and fibers markets. PX is a key raw material in PET production.

We have demonstrated the conversion of our isobutanol into renewable PX at our South Hampton Facility by producing renewable PX from October 2013 through March 2014.

Butenes

Traditionally butenes have been produced as co-products from the process of cracking naphtha in the production of ethylene. Historically, lower natural gas prices and reported reductions in the use of naphtha as the feedstock for the production of ethylene have resulted in a projected reduction in the volume of available butenes**.** This structural shift in feedstocks increases the potential market opportunity for our isobutanol in the production of butenes.

Isobutanol can be sold to isobutylene and n-butene (butenes) chemicals users for conversion into lubricants, methyl, methacrylate and rubber applications.

Feed Products Market

High protein animal feed is produced as a co-product of isobutanol and ethanol production. High protein animal feed is a valuable component of feed rations primarily to dairies and beef cattle markets, both nationally and internationally. The Luverne Facility has the capability to produce high protein animal feed from both isobutanol and ethanol. Producing high protein animal feed also allows us to lower the carbon footprint of our Luverne Facility, thereby increasing demand in California where premiums are paid for the low-carbon attributes. In addition, we recently installed a new system to manufacture value-added animal feed products. We expect that this system will be capable of producing several feed products with a value higher than that of typical high protein animal feed. We expect this system to be fully operational once we begin operating the Luverne Facility.

Isobutanol Direct Use Markets

Without modification, isobutanol has applications in the specialty chemical and gasoline blendstock markets. Since our potential customers in these markets would not be required to develop any additional infrastructure to use our isobutanol, we believe that selling into these markets should result in a relatively low risk profile and produce attractive margins.

Gasoline Blendstocks

Isobutanol has direct applications as a gasoline blendstock. Fuel-grade isobutanol may be used as a high energy content, low Reid Vapor Pressure ("RVP"), gasoline blendstock and oxygenate. Based on isobutanol's low water solubility, in contrast with ethanol, we believe that isobutanol will be compatible with existing refinery infrastructure, allowing for blending at the refinery rather than blending at the terminal.

Further, based on isobutanol's high energy content and low water solubility, as well as testing completed by the National Marine Manufacturers Association, the Outdoor Power Equipment Institute and Briggs & Stratton, we believe that isobutanol has direct applications as a blendstock in high value fuels markets serving marine, off-road vehicles, small engine and sports vehicle markets.

Specialty Chemicals

Isobutanol has direct applications as a specialty chemical. High-purity and chemical-grade isobutanol can be used as a solvent and chemical intermediate. We plan to produce high-purity and chemical-grade isobutanol that can be used in the existing butanol markets as a cost-effective, environmentally sensitive alternative to petroleum-based products.

We believe that our production route will be cost-efficient and will allow for significant expansion of the historical isobutanol markets within existing butanol markets through displacing n-butanol, a related compound to isobutanol that is currently sold into butanol markets.

Our Production Facilities

We operate two existing production facilities. First, we operate the South Hampton Facility in Silsbee, Texas that was developed and is operated in partnership with South Hampton Resources, Inc. The South Hampton Facility has a capacity of approximately 100,000 gallons per year of renewable hydrocarbon products, including renewable premium gasoline and SAF, that is converted from our renewable isobutanol.

Second, we operate the Luverne Facility, a wholly-owned, commercial-scale renewable isobutanol plant in Luverne, Minnesota, which has a current capacity of approximately 1.5 million gallons per year of isobutanol. Using the proven technologies and experience gained at both the Luverne Facility and the South Hampton Facility, we intend to expand production capabilities to produce substantially increased quantities of isobutanol and significant quantities of renewable premium gasoline and renewable jet fuel. We are planning to develop greenfield production sites in addition to the Luverne Facility. As previously disclosed, production for ethanol operations at the Luverne Facility is currently shut down until further notice. Currently, the South Hampton Facility is not producing renewable premium gasoline or jet fuel. We expect to produce isobutanol in intermittent campaigns during 2021 to supply the South Hampton Facility so that renewable premium gasoline or jet fuel can be produced in 2021.

In December 2020, we secured an option to purchase land to build a “greenfield” production facility of approximately 240 acres in Lake Preston, South Dakota (the “Lake Preston Site”). The Lake Preston Site is expected to be utilized for our Net-Zero 1 Project. In addition, we previously announced that we have engaged Citigroup Global Markets, Inc. (“Citigroup”) to assist us in exploring, among other things, project funding needed for our production expansion projects. We intend to make a decision on whether to purchase the Lake Preston Site in the future as part of the Citigroup led project financing.

Conversion of Isobutanol into Hydrocarbons

We have demonstrated conversion of our isobutanol into a wide variety of renewable hydrocarbon products that are currently used to produce hydrocarbon fuels, plastics, fibers, polyester, rubber and other polymers and chemicals. Hydrocarbon products consist entirely of hydrogen and carbon and have historically been derived almost exclusively from petroleum, natural gas and coal. Importantly, isobutanol can be dehydrated to produce butenes, which are an intermediate product in the production of hydrocarbon products with many industrial uses. The straightforward conversion of our isobutanol into butenes is a fundamentally important process that enables isobutanol to be used as a building block chemical. Much of the technology necessary to convert isobutanol into butenes and subsequently into these hydrocarbon products is commonly known and practiced in the chemicals industry today. For example, the dehydration of ethanol to ethylene, which uses a similar process and technology to the dehydration of isobutanol, is practiced commercially today to serve the ethylene market. The dehydration of t-butanol into butenes is commercially practiced today.

Third Party Retrofit and Construction Activities

We have commenced a licensing strategy whereby a licensee would invest the capital for (i) the modification of an existing ethanol production facility whereby equipment is added to the facility and the existing fermenters are used to produce isobutanol rather than ethanol, or (ii) the modification of an existing ethanol facility to add fermenters and other equipment such that the facility is capable of producing both isobutanol and ethanol simultaneously "side-by-side" (collectively referred to as “Retrofit”)of its own ethanol plant or for a new greenfield build-out of an isobutanol-producing plant. In return, we, as the licensor, would expect to receive an up-front license fee and ongoing royalty payments from the projects, as well as other potential revenue streams such as yeast sales. This licensing strategy is expected to take some time to develop, and we cannot assure that it will be successful. The ability to license a technology is generally related to the commercial track record of the underlying technology itself. In addition, revenues from licensing our isobutanol and/or hydrocarbon technologies are expected to be directly linked to the build out of specific projects, which may take multiple years to construct.

Our Production Technology Platform

We have used tools from synthetic biology, biotechnology, chemical catalysis and process engineering to develop a proprietary set of technologies that enable the potential of cost-effective production of isobutanol and hydrocarbon fuels and chemicals. We believe the technologies have been proven to work as demonstrated by the fact that we have made and sold products using these technologies.

We have a proprietary fermentation yeast biocatalyst that effectively produces isobutanol. The advantage of this biocatalyst is that it (i) works in large scale fermentation systems, and (ii) can operate in complex biological mixtures such as corn mash or molasses and produce a suitable clean isobutanol product. The technology is designed to use similar carbohydrate feedstocks, similar to ethanol technology. For example, carbohydrates from non-food corn, sugar cane, molasses or cellulosic sugars each could be used depending upon cost and availability. We believe that our technology can be deployed in stand-alone production units and has the potential to add value to existing ethanol production sites by increasing the site profitability if our technologies are deployed.

We have demonstrated that our isobutanol to hydrocarbon technologies for the production of SAF, isooctane, isooctene, and paraxylene appear to be viable from a technical and process point of view. These catalytic technologies appear to be effective and scalable.

High protein animal feed, protein and oil are important products that can be produced at our Luverne Facility. We market our high-protein, high-energy animal feed to the beef, swine and poultry industries. The spent yeast from fermentation adds protein to the mix, resulting in a higher protein content than corn itself. By selling the feed, protein and oil products, we generate additional revenues and effectively reduce the net cost of fermentation feedstock.

Biocatalyst Overview

Our biocatalysts are microorganisms that have been designed to consume carbohydrates and produce isobutanol as a product. Our technology team developed these proprietary biocatalysts to efficiently convert fermentable sugars of all types into isobutanol by engineering isobutanol pathways into the biocatalysts. We designed our biocatalysts to be able to use the yeast improvement technologies currently in use and being developed for the ethanol industry. We have already achieved yield (percentage of the theoretical maximum percentage of isobutanol that can be made from a given amount of feedstock) and rate (how fast the sugar fed to the fermentation is converted to isobutanol) sufficient for commercialization. To achieve this, we believe that more than 100 genetic changes have been made to our yeast biocatalyst. We achieved our target fermentation performance goals at our Luverne Facility at a commercial scale in August 2015. We have embarked on a continuous improvement program for the performance parameters of our biocatalyst with a goal of reducing projected capital and operating costs, increasing operating reliability and increasing the volume of isobutanol production.

While we believe that the majority of the development work on a commercially viable isobutanol producing yeast is complete, we expect to continue to make incremental improvements targeted to its commercial performance.

Raw Material Feedstocks

In the U.S., non-food corn is a commercially attractive feedstock for both isobutanol and ethanol, because it is abundant and readily available, but more importantly because this corn generates low cost carbohydrates, protein and feed and corn oil for the food chain. In other parts of the world, sugar or molasses from cane, beets, or other sugar producing crops could be used. In the future, certain types of cellulosic sugars could be used once the cost to acquire those sugars becomes cost effective. We have designed our biocatalyst platform to be capable of producing isobutanol from any fuel ethanol feedstock currently in commercial use, which we believe, in conjunction with our proprietary isobutanol separation unit, will permit us to modify any existing fuel ethanol facility to produce our products.

Our Luverne Facility is currently, and our Net-Zero 1 Project will be, set up to use non-food corn as a feedstock. The starch is fermented to isobutanol, the fiber and protein are isolated from the process and sold as animal feed, and the corn oil is sold for industrial use.

We expect that our feedstock flexibility will allow our technology to be deployed worldwide and will enable us to offer our customers protection from the raw material cost volatility historically associated with petroleum-based products. For example, in some parts of the world, it may be that molasses is a lower cost feedstock; in others, sugar from beets or cane might be the lower cost feedstock. As cellulosic sugars become economical, we expect that these could be viable as a feedstock too.

In the future, we expect feedstocks to be chosen on the collective basis of (i) cost, (ii) carbon and/or sustainability footprint with associated value, (iii) positive contribution to food chain where possible, and (iv) availability of the feedstock at a practical scale.

In June 2015, Agri-Energy entered into a Price Risk Management, Origination and Merchandising Agreement, as amended as of December 21, 2017 (the "Origination Agreement"), with FCStone Merchant Services, LLC ("FCStone") and a Grain Bin Lease Agreement with FCStone, as amended as of December 21, 2017. In 2020, we terminated the Grain Bin Lease Agreement with FCStone.

Pursuant to the Origination Agreement, FCStone originates and sells to Agri-Energy, the owner of the Luverne Facility, and Agri-Energy purchases from FCStone, the entire volume of corn grain used by the Luverne Facility.

Our ETO Technology

We have also developed new technologies using ethanol as a feedstock for the production of hydrocarbons, renewable hydrogen and other chemical intermediates, which we describe as our ethanol-to-olefins ("ETO") technologies. The process produces tailored mixes of isobutylene, propylene, hydrogen and / or acetone, which are valuable as standalone molecules, or as feedstocks to produce other chemical products and longer chain alcohols. This technology has the potential to address additional markets in the chemicals, fuels, and plastics fields, such as renewable polypropylene for automobiles and packaging and renewable hydrogen for use in chemical and fuel cell markets. At this time, this technology has only been operated at a laboratory scale, but if successfully scaled up to commercial level, this technology may provide a broader set of end-product market and margin opportunities.

Underpinning the ETO technology is our development of proprietary catalysts that produce light olefins, such as propylene and butylene, or acetone in high yields in a single processing step. One of the benefits of the technology is that we can use conventional fuel grade specification ethanol that can be sourced from a variety of feedstocks with no apparent adverse impact on end product yields. Water, which is co-fed with the ethanol, is able to be recycled resulting in a process which generates minimal waste. The ethanol and water mixture is vaporized and fed across a fixed catalyst bed resulting in a gaseous product mix consisting of the light olefins, such as propylene and butylene or acetone, in addition to hydrogen and carbon dioxide, along with lesser amounts of methane and ethylene. Separation of gaseous products can be achieved via conventional process technologies and unit operations within the petroleum industry.

We have found that our ETO technology is effective at converting fusel oils into flavors, fragrances and certain specialty chemicals. We are evaluating the business opportunities and commercial potential.

Butamax Advanced Biofuels LLC

Between 2011 and 2015, we were involved in an intellectual property dispute with Butamax Advanced Biofuels LLC ("Butamax"). We believe the dispute was satisfactorily resolved, enabling each of our companies to pursue their respective businesses.

Cross License Agreement

On August 22, 2015, we entered into a Settlement Agreement and Mutual Release (the "Settlement Agreement") with Butamax, E.I. du Pont de Nemours & Company ("DuPont") and BP renewable fuels North America LLC ("BP" and, together with Butamax and DuPont, the "Butamax Parties"), that resolved the various disputes, lawsuits and other proceedings between one or more of the Butamax Parties and us, as previously disclosed and as specifically identified in the Settlement Agreement (the "Subject Litigation"), and creates a new business relationship pursuant to which we and Butamax and we have granted rights to each other under certain patents and patent applications in accordance with the terms of a Patent Cross-License Agreement (the "License Agreement"), which was entered into by us and Butamax concurrently with the Settlement Agreement. For additional information concerning the settlement agreement, please see our Annual Report on Form 10-K for the year-ended December 31, 2015 — Item 3 Legal Proceedings.

Pursuant to the terms of the License Agreement, each party receives a non-exclusive license under certain patents and patent applications owned or licensed (and sublicensable) by the other party for the production and use of biocatalysts in the manufacture of isobutanol using certain production process technology for the separation of isobutanol, and to manufacture and sell such isobutanol in any fields relating to the production or use of isobutanol and isobutanol derivatives, subject to the customer-facing field restrictions described below. Each party also receives a non-exclusive license to perform research and development on biocatalysts for the production, recovery and use of isobutanol.

Each party may produce and sell up to 30 MGPY of isobutanol in any field on a royalty-free basis. Butamax will be the primary customer-facing seller of isobutanol in the field of fuel blending (subject to certain exceptions, the "Direct Fuel Blending" field) and we will be the primary customer-facing seller of isobutanol in the field of jet fuel for use in aviation gas turbines (the "Jet" field, also subject to certain exceptions). As such, subject to each party's right to sell up to 30 MGPY of isobutanol in any field on a royalty-free basis, other than with Butamax's written consent, we will only sell isobutanol through Butamax in the Direct Fuel Blending field subject to a royalty based on the net sales price for each gallon of isobutanol sold or transferred by us, our affiliates or sublicensees within the Direct Fuel Blending field (whether through Butamax or not) and on commercially reasonable terms to be negotiated between the parties and Butamax will only sell isobutanol through us in the Jet field subject to a royalty based on the net sales price for each gallon of isobutanol sold or transferred by Butamax, its affiliates or sublicensees within the Jet field (whether through us or not) and on commercially reasonable terms to be negotiated between the parties; provided, that each party may sell up to 15 MGPY of isobutanol in a given year directly to customers in the other party's customer-facing field on a royalty-free basis so long as the isobutanol volumes are within the permitted 30 MGPY of isobutanol sold or otherwise transferred per year in any field described above and, in certain instances, each party may then sell up to the total permitted 30 MGPY in the other party's customer-facing field on a royalty-free basis. In addition, in order to maintain its status as the primary customer-facing seller in these specific fields, each party must meet certain milestones within the first five years of the License Agreement. If such milestones are not met as determined by an arbitration panel, then a party will have the right to sell directly to customers in the other party's customer-facing field subject to the payment of certain royalties to the other party on such sales.

In addition to the royalties discussed above for sales of isobutanol in the Direct Fuel Blending field, and subject to our right to sell up to 30 MGPY of isobutanol in any field on a royalty-free basis, we will pay to Butamax a royalty per gallon of isobutanol sold or transferred by us, our affiliates or sublicensees within the field of isobutylene (a derivative of isobutanol) applications (other than isobutylene for paraxylene, isooctane, Jet, diesel and oligomerized isobutylene applications). Likewise, in addition to the royalties discussed above for sales of isobutanol in the Jet field, and subject to Butamax's right to sell up to 30 MGPY of isobutanol in any field on a royalty-free basis, Butamax will pay to us a royalty per gallon of isobutanol sold or transferred by Butamax, its affiliates or sublicensees within the fields of marine gasoline, retail packaged fuels and paraxylene (except for gasoline blending that results in use in marine or other fuel applications). The royalties described above will be due only once for any volume of isobutanol sold or transferred under the License Agreement, and such royalties accrue when such volume of isobutanol is distributed for end use in the particular royalty-bearing field. All sales of isobutanol in other fields will be royalty-free, subject to the potential technology fee described below.

In the event that we, our affiliates or sublicensees choose to employ a certain solids separation technology for the production of isobutanol at one of their respective plants ("Solids Separation Technology"), we are granted an option to license such technology from Butamax on a non-exclusive basis subject to the payment of a one-time technology license fee based on the rated isobutanol capacity for each such plant (subject to additional fees upon expansion of such capacity). We also receive the option to obtain an engineering package from Butamax to implement the Solids Separation Technology on commercially reasonable terms to be negotiated between the parties and subject to the technology fee described above and an additional technology licensing fee for use of the Solids Separation Technology applicable to ethanol capacity as provided in such engineering package from Butamax (which capacity is not duplicative of the rated isobutanol capacity referenced above) in instances where Butamax provides an engineering package for use at a particular plant that will run isobutanol and ethanol production side-by-side using the licensed Solids Separation Technology at such plant.

The License Agreement encompasses both parties' patents for producing isobutanol, including biocatalysts and separation technologies, as well as for producing hydrocarbon products derived from isobutanol, including certain improvements and new patent applications filed within seven years of the date of the License Agreement. While the parties have cross-licensed their patents for making and using isobutanol, the parties will not share their own proprietary biocatalysts with each other. The parties may use third parties to manufacture biocatalysts on their behalf and may license their respective technology packages for the production of isobutanol to third parties, subject to certain restrictions. A third-party licensee would be granted a sub-license and would be subject to terms and conditions that are consistent with those under the License Agreement.

Under the License Agreement, the parties also agreed to certain limitations on the making or participating in a challenge of the other party's patents that are at issue in the Subject Litigation. The parties have also made certain representations, warranties and covenants to each other including, without limitation, with respect to obtaining certain consents, indebtedness, rights in the licensed patents, and relationships with certain other ethanol plant process technology providers.

The License Agreement will continue in effect until the expiration of the licensed patents, unless earlier terminated by a party as provided in the License Agreement. The parties also have certain termination rights with respect to the term of the license granted to the other party under the License Agreement upon the occurrence of, among other things, a material uncured breach by the other party. In the event that a party's license is terminated under the License Agreement, such party's sublicense agreements may be assigned to the other party, subject to certain restrictions.

The parties may not assign the License Agreement or any right or obligation thereunder without the prior written consent of the other party. However, the parties may assign the License Agreement to an affiliate or a person that acquires all of the business or assets of such party, subject to certain restrictions.

Competition

We face competitors in each market, some of which are limited to individual markets, and some of which will compete with us across all of our target markets. Many of our competitors have greater financial resources, more comprehensive product lines, broader market presence, longer standing relationships with customers, longer operating histories, greater production capabilities, stronger brand recognition and greater marketing resources than we do. In addition, if we fail to raise sufficient additional capital for our business and strategy, we may not be able to successfully compete.

Hydrocarbon fuels. Beyond direct use as a fuel additive, isobutanol can be converted into many hydrocarbon fuels and blendstocks, offering substantial potential for additional demand in the fuels markets. We compete with the incumbent petroleum-based fuels industry, as well as renewable fuels companies. The incumbent petroleum-based fuels industry makes the vast majority of the world's gasoline, jet and diesel fuels and blendstocks. The petroleum-based fuels industry is mature and includes a substantial base of infrastructure for the production and distribution of petroleum-derived products. However, the industry faces challenges from its dependence on petroleum. High and volatile oil prices will provide an opportunity for renewable producers relying on biobased feedstocks like corn, which in recent years have had lower price volatility than oil, to compete.

Renewable fuels companies will provide substantial competition in the gasoline market. These renewable fuel competitors are numerous and include both large established companies and numerous startups. Government tax incentives for renewable fuel producers and regulations such as the Renewable Fuel Standards ("RFS") program (the "RFS Program") help provide opportunities for renewable fuels producers to compete. In particular, in the gasoline and gasoline blendstock markets, Virent Energy Systems, Inc. ("Virent") offers a process for making gasoline and gasoline blendstocks in a mixture than subsequently needs to be refined. However, we have the advantage of being able to target conversion of isobutanol into specific high-value molecules such as isooctane, which can be used to make gasoline blendstocks with a higher value than whole gasoline, which we do not believe Virent's process can match. Renewable Energy Group, Inc., Neste Corporation, World Energy, LLC and others are also targeting production of SAF from vegetable oils and animal fats. Red Rock Biofuels LLC, Fulcrum BioEnergy, Inc. and others are planning to produce SAF from renewable biomass using Fisher Tropsch types of technology. We believe that the Gevo production process is economically competitive with any other potential routes and that we are the only company with technology to convert carbohydrates into SAF.

Renewable Premium Gasoline (Isooctane). We believe that we currently have no competitors for our renewable premium gasoline product (isooctane), a substitute for alkylate, for premium gasoline in the marketplace. We are aware that Global Bioenergies, S.A. is developing a technology to make renewable isooctane. Even with the increasing demand for electric vehicles ("EVs"), which are needed to help address the GHG emissions of the transportation sector, we believe that low-carbon liquid fuels will continue to be needed. The U.S. Energy Information Administration indicates that the vast majority of transportation will be still be powered by liquid transportation fuels in 2050 and beyond, with EV occupying only a small share of the market. Additionally, we expect renewable premium gasoline demand to increase because of the advent of engines with higher compression that get more mileage. We expect that renewable premium gasoline will be in increasing demand as these more efficient engines come to market, and when blended with certain other renewable ingredients such a renewable naptha, and isobutanol or ethanol, it is possible to produce a complete gallon of gasoline.

Renewable isobutanol. We are a leader in the development of renewable isobutanol via fermentation of renewable plant biomass. While the competitive landscape in renewable isobutanol production is limited at this time, we are aware of other companies that are seeking to develop isobutanol production capabilities, including Butamax with whom we have entered into the License Agreement. See —"Butamax Advanced renewable fuels LLC—Cross License Agreement".

Our isobutanol is targeted for use in producing SAF and renewable premium gasoline. In addition, isobutanol can be used in the following markets: direct use as a solvent and gasoline blendstock, use in the chemicals industry for producing rubber, plastics, fibers, polyester and other polymers and use in the production of hydrocarbon fuels.

Solvent markets. We also face competition from companies that are focused on the development of n-butanol, a related compound to isobutanol. These companies include Cathay Industrial Biotech Ltd., METabolic EXplorer S.A. and Eastman Chemicals Company. We understand that these companies produce n-butanol from an acetone-butanol-ethanol ("ABE") fermentation process primarily for the small chemicals markets. ABE fermentation using a Clostridia biocatalyst has been used in industrial settings since 1919. As discussed in several academic papers analyzing the ABE process, such fermentation is handicapped in competitiveness by high energy costs due to low concentrations of butanol produced and significant volumes of water processed. It requires high capital and operating costs to support industrial scale production due to the low rates of the Clostridia fermentation, and results in a lower butanol yield because it produces ethanol and acetone as by-products. We believe our proprietary process has many significant advantages over the ABE process because of its relatively limited requirements for new capital expenditures, its production output of only isobutanol as a primary product and its limited water usage in production. We believe these advantages will produce a lower cost isobutanol compared to n-butanol produced by ABE fermentation. N-butanol's lower octane rating compared to isobutanol gives it a lower value in the gasoline blendstock market, but n-butanol can compete directly in many solvent markets where n-butanol and isobutanol have similar performance characteristics.

Gasoline blendstocks. In the gasoline blendstock market, isobutanol competes with non-renewable alkylate and renewable ethanol. Alkylate is a premium value gasoline blendstock typically derived from petroleum. However, petroleum feeds for alkylate manufacture are pressured by continued increases in the use of natural gas to generate olefins for the production of alkylate, due to the low relative cost of natural gas compared to petroleum. Isobutanol and isooctane have fuel properties similar to alkylate and, as such, we expect that isobutanol and isooctane could be used as a substitute for some alkylate in fuel applications. Ethanol is renewable and has a high-octane rating, and although it has a high RVP, ethanol receives a one-pound RVP waiver in a large portion of the U.S. gasoline market. Renewability is important in the U.S. because the RFS Program mandates that a minimum volume of renewable blendstocks be used in gasoline each year. A high-octane rating is important for engine performance and is a valuable characteristic because many inexpensive gasoline blendstocks have lower octane ratings. Low RVP is important because the U.S. Environmental Protection Agency ("EPA") sets maximum permissible RVP levels for gasoline. In markets where low RVP is important, isobutanol can enable refiners to meet fuel specifications at lower cost. Ethanol's vapor pressure waiver is valuable because it offsets much of the negative value of ethanol's high RVP. We believe that our isobutanol will be valued for its combination of low RVP, low water solubility, relatively high octane and renewability.

Many production and technology supply companies are working to develop ethanol production from cellulosic feedstocks, including Raizen Energia S.A., Praj Industries Ltd., Clariant Corporation and POET, LLC and many smaller startup companies. Successful commercialization by some or all of these companies will increase the supply of renewable gasoline blendstocks worldwide, potentially reducing the market size or margins available to isobutanol.

Plastics, fibers, polyester, rubber and other polymers. Isobutanol can be dehydrated to produce butenes, hydrocarbon intermediates currently used in the production of plastics, fibers, polyester, rubber and other polymers. The straightforward conversion of our isobutanol into butenes is a fundamentally important process that enables isobutanol to be used as a building block chemical in multiple markets. These markets include butyl rubber, lubricants and additives derived from butenes such as isobutylene, poly methyl methacrylate from isobutanol, propylene for polypropylene from isobutylene, polyesters made via PX from isobutylene and polystyrene made via styrene.

In these markets, we compete with the renewable isobutanol companies and renewable n-butanol producers described previously and face similar competitive challenges. Our competitive position versus petroleum-derived plastics, fibers, rubber and other polymers varies, but we believe that the high volatility of petroleum prices, often tight supply markets for petroleum-based petrochemical feedstocks and the desire of many consumers for goods made from more renewable sources will enable us to compete effectively. However, petrochemical companies may develop alternative pathways to produce petrochemical-based hydrocarbon products that may be less expensive than our isobutanol or more readily available or developed in conjunction with major petrochemical, refiner or end user companies. These products may have economic or other advantages over the plastics, fibers, polyester, rubber and other polymers developed from our isobutanol. Further, some of these companies have access to significantly more resources than we do to develop products.

Additionally, Global Bioenergies, S.A. is pursuing the direct production of isobutylene from renewable carbohydrates. Through analysis of the fermentation pathway, we believe that the direct production of butenes such as isobutylene via fermentation will have higher capital and operating costs than production of butenes derived from our isobutanol.

Ethanol. As mentioned above, we do not expect to produce ethanol in the future. We compete with numerous ethanol producers located throughout the U.S., many of which have much greater resources than we do, including Archer-Daniels-Midland Company, Green Plains, Inc., POET, LLC and Valero Energy Corporation. Competition for corn supply from other ethanol plants and other corn consumers will likely exist in all areas and regions in which our current and future plants will operate. We also face competition from foreign producers of ethanol and such competition may increase significantly in the future. Large international companies have developed, or are developing, increased foreign ethanol production capacities. Brazil is the world's second largest ethanol producing country. Brazil's ethanol production is sugarcane-based, as opposed to corn-based, and has historically been less expensive to produce.

Intellectual Property

Our success depends in large part on our proprietary products and technology for which we seek protection under patent, copyright, trademark and trade secret laws. Such protection is also maintained in part using confidential non-disclosure agreements. Protection of our technologies is important so that we may offer our customers and partners proprietary services and products unavailable from our competitors, and so that we may exclude our competitors from using technology that we have developed or exclusively licensed. If competitors in our industry have access to the same technology, our competitive position may be adversely affected.

We have submitted hundreds of patent applications in the U.S. and in various foreign jurisdictions. These patent applications are directed to our technologies and specific methods and products that support our business in the renewable fuels and bioindustrial markets. We continue to file new patent applications, for which terms extend up to 20 years from the filing date in the U.S.

We have also been issued multiple patents in the U.S. and in foreign jurisdictions.

In addition to the patents and applications described above, we have a global cross-license to certain patents and applications relating to the production, recovery, and use of isobutanol that are owned or licensed by Butamax. The global cross-license allows us to freely practice the licensed inventions, subject to the terms of the cross-license. For information regarding this license, see —"Butamax Advanced renewable fuels LLC—Cross License Agreement".

We have filed and prosecuted, and intend to continue to file and prosecute, patent applications and maintain trade secrets, as is consistent with our business plan, in an ongoing effort to protect our intellectual property. It is possible that our licensors' current patents, or patents which we may later acquire or license, may be successfully challenged or invalidated in whole or in part. It is also possible that we may not obtain issued patents from our filed applications and may not be able to obtain patents regarding other inventions we seek to protect. We also may not file patents in each country in which we plan to do business or actually conduct business. Under appropriate circumstances, we may sometimes permit certain intellectual property to lapse or go abandoned. Due to uncertainties inherent in prosecuting patent applications, sometimes patent applications are rejected and we may subsequently abandon them. It is also possible that we will develop products or technologies that will not be patentable or that the patents of others will limit or preclude our ability to do business. In addition, any patent issued to us may provide us with little or no competitive advantage, in which case we may abandon such patent or license it to another entity.

We have obtained registered trademarks for GIFT™ and Gevo® in the U.S. These registered and pending U.S. trademarks are also registered or pending in certain foreign countries.

Our means of protecting our proprietary rights may not be adequate and our competitors may independently develop technology or products that are similar to or compete with ours. Patent, trademark and trade secret laws afford only limited protection for our technology platform and products. The laws of many countries do not protect our proprietary rights to as great an extent as do the laws of the U.S. Despite our efforts to protect our proprietary rights, unauthorized parties have in the past attempted, and may in the future attempt, to operate using aspects of our intellectual property or products or to obtain and use information that we regard as proprietary. Third parties may also design around our proprietary rights, which may render our protected technology and products less valuable. In addition, if any of our products or technologies is covered by third-party patents or other intellectual property rights, we could be subject to various legal actions. We cannot assure you that our technology platform and products do not infringe patents held by others or that they will not in the future.

Litigation may be necessary to enforce our intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others or to defend against claims of infringement, invalidity, misappropriation or other allegations. Any such litigation could result in substantial costs and diversion of our resources. We may be unable to finance litigation costs, which may harm our ability to enforce our intellectual property rights. Any settlement of or adverse judgment resulting from such litigation could require us to obtain a license to continue to make, use or sell the products or technology that is the subject of the claim, or otherwise restrict or prohibit our use of the technology.

Customers

In 2020, Eco-Energy, LLC ("Eco-Energy") accounted for approximately 52% of our consolidated revenue, HCS accounted for approximately 21% and Purina Animal Nutrition, LLC, formerly Land O'Lakes Purina Feed LLC ("Purina") accounted for approximately 15% of our consolidated revenue. HCS is a customer of Gevo segment. Eco-Energy and Purina are customers of our Gevo Development/Agri-Energy segment (see Note 16). Given the production capacity compared to the overall size of the North American market and the fungible demand for our products, we do not believe that a decline in a specific customer's purchases would have a material adverse long-term effect upon our financial results.

Government Regulation - Environmental Compliance Costs

Regulation by governmental authorities in the U.S. and other countries is a significant factor in the development, manufacture and marketing of second-generation renewable fuels. Our isobutanol and the next generation products isobutanol will be used to produce may require regulatory approval by governmental agencies prior to commercialization. In particular, renewable fuels are subject to rigorous testing and premarket approval requirements by the EPA's Office of Transportation and Air Quality and regulatory authorities in other countries. In the U.S., various federal, and, in some cases, state statutes and regulations also govern or impact the manufacturing, safety, storage and use of renewable fuels. The process of seeking required approvals and the continuing need for compliance with applicable statutes and regulations requires the expenditure of substantial resources. Regulatory approval, if and when obtained for any of the next generation products isobutanol is used to produce, may be limited in scope, which may significantly limit the uses for which our isobutanol and these next generation products may be marketed.

When built at a dry-mill facility, our GIFT™ fermentation process creates iDGs™, a potential animal feed component, as a co-product. We are currently approved to sell iDGs™ as animal feed through the self-assessed Generally Regarded as Safe ("GRAS") process of the United States Food and Drug Administration (the "FDA") via third party scientific review. While we believe we can rely on the GRAS process as we update our biocatalysts to increase isobutanol production, for further customer assurance, we also intend to pursue approval upon a completed biocatalyst from the Center for Veterinary Medicine of the FDA. Even if we receive such approval, the FDA's policies may change and additional government regulations may be enacted that could prevent, delay or require regulatory approval of our co-products. We cannot predict the likelihood, nature or extent of adverse governmental regulations that might arise from future legislative or administrative action, either in the U.S. or abroad.

Our process contains a genetically engineered organism which, when used in an industrial process, is considered a new chemical under the EPA's Toxic Substances Control Act program ("TSCA"). The EPA's Biotechnology Program under TSCA requires the submission of certain information of the Office of Pollution Prevention and Toxic Substances. Due to the nature of our microorganism, we can utilize the TSCA Biotechnology Program Tier I and Tier II exemption criteria at our Luverne Facility. As we expand our business activities, we will pursue the EPA's Microbial Commercial Activity Notice process for future plants. We do not anticipate a material adverse effect on our business or financial condition as a result of our efforts to comply with these requirements. However, the TSCA new chemical submission policies may change and additional government regulations may be enacted that could prevent or delay regulatory approval of our products. We cannot predict the likelihood, nature or extent of adverse governmental regulations that might arise from future legislative or administrative action, either in the U.S. or abroad.

There are various third-party certification organizations, such as ASTM International and Underwriters' Laboratories, Inc. ("UL"), involved in certifying the transportation, dispensing and use of liquid fuel in the U.S. and internationally. In 2013, a specification for fuel grade isobutanol titled ASTM D7862 "Standard Specification for Butanol for Blending with Gasoline for Use as Automotive Spark-Ignition Engine Fuel" was published. In April 2016, ASTM International completed its process of approving the revision of ASTM D7566 (Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons) to include alcohol to jet synthetic paraffinic kerosene ("ATJ-SPK") derived from renewable isobutanol. Gevo's SAF is ATJ-SPK for purposes of ASTM D7566. In addition, UL has published guidance on the use of isobutanol-gasoline blends in its UL87A fuel dispensers. When ATJ-SPK, which meets the specifications of ASTM D7566, is blended at a level of 30% or lower with petroleum-based jet fuel, which meets the specifications of ASTM D1655, the entire blended product meets the specifications of ASTM D1655, conventional jet fuel. In other words, the blend containing the ATJ-SPK is completely fungible with any conventional D1655 jet fuel. Voluntary standards development organizations may change and additional requirements may be enacted that could prevent or delay marketing approval of our products. The process of seeking required approvals and the continuing need for compliance with applicable statutes and regulations require the expenditure of substantial resources. We do not anticipate a material adverse effect on our business or financial conditions as a result of our efforts to comply with these requirements, but we cannot predict the likelihood, nature or extent of adverse third-party requirements that might arise from future action, either in the U.S. or abroad.

We are subject to various federal, state and local environmental laws and regulations, including those relating to the discharge of materials into the air, water and ground, the generation, storage, handling, use, transportation and disposal of hazardous materials and the health and safety of our employees. These laws and regulations require us to obtain environmental permits and comply with numerous environmental restrictions as we construct and operate isobutanol assets. They may require expensive pollution control equipment or operation changes to limit actual or potential impacts to the environment. A violation of these laws, regulations or permit conditions can result in substantial fines, natural resource damage, criminal sanctions, permit revocations and facility shutdowns.

There is a risk of liability for the investigation and cleanup of environmental contamination at each of the properties that we own or operate and at off-site locations where we arrange for the disposal of hazardous substances. If these substances are or have been disposed of or released at sites that undergo investigation or remediation by regulatory agencies, we may be responsible under the Comprehensive Environmental Response, Compensation and Liability Act or other environmental laws for all or part of the costs of investigation and remediation. We may also be subject to related claims by private parties alleging property damage and personal injury due to exposure to hazardous or other materials at or from the properties. Some of these matters may require us to expend significant amounts for investigation and cleanup or other costs. We are not aware of any material environmental liabilities relating to contamination at or from our facilities or at off-site locations where we have transported or arranged for the disposal of hazardous substances.

In addition, new laws, new interpretations of existing laws, increased governmental enforcement of environmental laws or other developments could require us to make significant additional expenditures. Continued government and public emphasis on environmental issues can be expected to result in increased future investments in environmental controls at our facilities which cannot be estimated at this time. Present and future environmental laws and regulations applicable to our operations, more vigorous enforcement policies and discovery of currently unknown conditions could all require us to make substantial expenditures. For example, our air emissions are subject to the Clean Air Act, the Clean Air Act Amendments of 1990 and similar state and local laws and associated regulations. Under the Clean Air Act, the EPA has promulgated National Emissions Standards for Hazardous Air Pollutants ("NESHAP"), which could apply to facilities that we own or operate if the emissions of hazardous air pollutants exceed certain thresholds. If a facility we operate is authorized to emit hazardous air pollutants above the threshold level, then we might still be required to come into compliance with another NESHAP at some future time. New or expanded facilities might be required to comply with both standards upon startup if they exceed the hazardous air pollutant threshold. In addition to costs for achieving and maintaining compliance with these laws, more stringent standards may also limit our operating flexibility.

As a condition to granting the permits necessary for operating our facilities, regulators could make demands that increase our construction and operations costs, which might force us to obtain additional financing. For example, unanticipated water discharge limits could sharply increase construction costs for our projects. Permit conditions could also restrict or limit the extent of our operations. We cannot guarantee that we will be able to obtain or comply with the terms of all necessary permits to complete the retrofit of an ethanol plant. Failure to obtain and comply with all applicable permits and licenses could halt our construction and could subject us to future claims.

Our products benefit from the RFS Program in that our isobutanol and ethanol are currently eligible for Renewable Identification Numbers ("RINS") that have value based on the current RFS Program. The RFS Program could change, impacting our products, positively or negatively.

Various systems are being put in place around the world to measure carbon intensity and reduction of GHGs, with the intent of creating a system to monetize the value of the reduction of carbon. In order to benefit from such systems, companies need to have their products qualified through a regulatory process. There is no guarantee that any benefit could be gained. In 2019, we submitted a design pathway application to the California Air Resources Board to gain approval for low-carbon intensity ethanol utilizing beef manure biogas as a process input under the LCFS, and we may also seek approval under similar programs in the future.

Employees

As of December 31, 2020, we employed 31 employees, 24 of whom were employed by us in our principal offices located in Englewood, Colorado and 21 of whom were full-time. Of these employees at our principal offices, 11 were engaged in research and development activities and 13 were engaged in general, administrative and business development activities. As of December 31, 2020, our subsidiary, Agri-Energy, employed 7 employees, all of whom were located in Luverne, Minnesota, and involved in the operations of our production facility, of which 5 are full-time. None of our employees are represented by a labor union and we consider our employee relations to be good.

Corporate Information

We were incorporated in Delaware in June 2005 as a corporation under the name Methanotech, Inc. and filed an amendment to our certificate of incorporation changing our name to Gevo, Inc. on March 29, 2006. Our principal executive offices are located at 345 Inverness Drive South, Building C, Suite 310, Englewood, Colorado 80112, and our telephone number is (303) 858-8358.

Website Access to SEC Filings

We are subject to the reporting requirements under the Exchange Act. Consequently, we are required to file reports and information with the SEC, including reports on the following forms: Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. These reports and other information concerning us may be accessed, free of charge, through the SEC's website at www.sec.gov and on our website at www.gevo.com. Such filings are placed on our website as soon as reasonably practical after they are filed with the SEC. Any information contained in, or that can be accessed through our website, is not incorporated by reference into, nor is it in any way part of, this Report.

Item 1A. Risk Factors

You should carefully consider the risk factors described below before you decide to invest in our securities. The risks described below are not the only ones facing us. Our business is also subject to the risks that affect many other companies, such as competition, technological obsolescence, labor relations, general economic conditions, geopolitical changes and international operations. Additional risks and uncertainties not presently known to us or that we currently believe are immaterial may also impair our business operations and our liquidity. The risks described below could cause our actual results to differ materially from those contained in the forward-looking statements we have made in this Report, the information incorporated herein by reference and those forward-looking statements we may make from time to time.

Risk Related to our Business and Strategy

Our business has been impacted by the COVID-19 pandemic, and our financial condition, results of operations and liquidity may be materially and adversely impacted by it in the future.

The COVID-19 pandemic has had an adverse impact on global commercial activity, including the global transportation industry and its supply chain, and has contributed to significant volatility in financial markets. It has also resulted in increased travel restrictions and extended shutdowns of businesses in various industries including, among others, the airline industry, and significantly reduced overall economic output. It is possible that that the impact of the COVID-19 pandemic on general economic activity could negatively impact our revenue and operating results for 2021 and beyond. In light of the current and potential future disruption to our business operations and those of our customers, suppliers and other third parties with whom we do business, we considered the impact of the COVID-19 pandemic on our business. This analysis considered our resilience and continuity plans, financial modeling and stress testing of liquidity and financial resources. The impact of the COVID-19 pandemic on the global transportation industry could continue to result in less demand for our transportation fuel products, which could have a material adverse effect on our business and financial condition for the foreseeable future. The suspension of ethanol production at our Luverne Facility and reduction in our workforce during the first quarter of 2020 due to the impact of COVID-19 had an adverse impact on our financial results for the fiscal year ended 2020 reducing revenue by 77% compared to 2019. There is also a risk that COVID-19 could have a material adverse impact on the development of our Net-Zero 1 Project, customer demand and cash flow, depending on the extent of our future production activities.

In addition, we have experienced minor temporary workforce disruptions as a result of the COVID-19 pandemic. We have implemented employee safety measures, based on guidance from the Centers for Disease Control and Prevention, across all of our facilities, including proper hygiene, social distancing and mask use. These measures may not be sufficient to prevent the spread of COVID-19 among our employees, illness, travel restrictions, absenteeism or other workforce disruptions could negatively affect our supply chain, production, distribution or other business processes. We may face additional production disruptions in the future which may place constraints on our ability to produce products in a timely manner or may increase our costs.

The risks generally associated with the COVID-19 pandemic could magnify other risks discussed in this Report and any of our SEC filings. For example, the rapidly evolving changes in financial markets could have a material impact on our ability to obtain additional financing, which could impact our liquidity. Volatility in the financial markets could make it more difficult to raise money from selling equity on the capital markets, the impact of COVID-19 on financial markets could limit potential lenders' ability to provide funds for the financing of the Net-Zero 1 Project or the terms of any finance transactions could be worse than anticipated. In addition, the effectiveness of external parties, including governmental and non-governmental organizations, in combating the spread and severity of COVID-19 could have a material impact on demand for our business. Further, steps taken by market counterparties such as commercial airlines could have an impact on their ability to perform under agreements to which we are a party, which could impact our business. For example, in connection with the impact that the COVID-19 pandemic has had on the economy and on the resulting disruption to the airline industry specifically, we and Delta amended portions of our previously disclosed Fuel Sales Agreement in April 2020. Other commercial counterparties may also seek to amend supply agreements in the future as a result of COVID-19 or other similar pandemics. The full extent of the impact and effects of the COVID-19 pandemic on our business, operations, liquidity, financial condition and results of operations remain uncertain at this time.

We have a history of net losses, and we may not achieve or maintain profitability.

We incurred net losses of $40.2 million and $28.7 million during the years ended December 31, 2020 and 2019, respectively. As of December 31, 2020, we had an accumulated deficit of $498.2 million. We expect to incur losses and negative cash flows from operating activities for the foreseeable future. We currently derive limited revenue primarily from the sale of products produced at the South Hampton Facility although over certain periods of time we have ceased production at the South Hampton Facility due to a lack of isobutanol required to produce hydrocarbon products.

Furthermore, we expect to spend significant amounts on the further development and commercial implementation of our technology.

We also expect to spend significant amounts on developing and financing the Net-Zero 1 Project and other similar growth projects, on marketing, general and administrative expenses associated with our planned growth, on management of operations as a public company and on debt service obligations. In addition, the cost of preparing, filing, prosecuting, maintaining and enforcing patent, trademark and other intellectual property rights and defending ourselves against claims by others that we may be violating their intellectual property rights may be significant.

In particular, over time, costs related to defending the validity of our issued patents and challenging the validity of the patents of others at the United States Patent and Trademark Office ("USPTO") may be significant. As a result, even if our revenues increase substantially, we expect that our expenses will exceed revenues for the foreseeable future. We do not expect to achieve profitability during the foreseeable future and may never achieve it. If we fail to achieve profitability, or if the time required to achieve profitability is longer than we anticipate, we may not be able to continue our business. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

Our business is capital-intensive in nature and we rely on external financing to fund our growth strategy, including the development and construction of the Net-Zero 1 Project and other similar growth projects. Limitations on access to external financing could adversely affect our operating results.

We are in a capital-intensive business and we rely heavily on external financing for the costs of development and construction of our growth projects, such as the Net-Zero 1 Project, and other projected capital expenditures. Completion of our growth projects will require significant capital expenditures and construction costs. The recovery of the capital investment in our growth projects will generally occur over a long period of time. As a result, we must obtain funds from external sources to help develop and construct our existing project pipeline, to help finance the acquisition of system components, to help identify and develop new projects, to help fund research and development expenses and to help pay the general and administrative costs of operating our business. We may not be able to obtain the needed funds on terms acceptable to us, or at all. If we are unable to raise additional funds when needed, we could be required to delay development and construction of projects, reduce the scope of, abandon or sell some or all of our growth projects or default on our contractual commitments in the future, any of which would have a material adverse effect on our business, financial condition and operating results.

Our proposed growth projects may not be completed or, if completed, may not perform as expected. Our project development activities may consume a significant portion of our management's focus, and if not successful, reduce our profitability.

We plan to grow our business by building multiple production facilities that will require project development. The development projects are expected to include greenfield and brownfield projects. Development projects require us to spend significant sums for engineering, permitting, legal, financial advisory and other expenses before we determine whether a development project is feasible, economically attractive or capable of being financed.

Our development projects are typically planned to be large and complex, and we may not be able to complete them. There can be no assurance that we will be able to negotiate the required agreements, overcome any local opposition, or obtain the necessary licenses, permits and financing. Failure to achieve any of these elements may prevent the development and construction of a project. If that were to occur, we could lose all of our investment in development expenditures and may be required to write-off project development assets.

We may be unable to successfully perform under current or future supply and distribution agreements to provide our isobutanol, SAF and other renewable hydrocarbon products, which could harm our commercial prospects.

We have entered into several supply agreements pursuant to which we agreed to supply an aggregate of approximately 45 MGPY of SAF, renewable premium gasoline and other renewable hydrocarbon products. Under certain of these supply agreements, the purchasers agreed to pay for and receive, or cause to be received by a third party, or pay for even if not taken, the renewable hydrocarbon products under contract (a "take-or-pay" arrangement). The timing and volume commitment of certain of these agreements are conditioned upon, and subject to, our ability to complete the construction of a new or expanded production facility (the "Expanded Facility"). In order to commence construction of and complete the Expanded Facility, we must secure third party financing. While we believe that we can secure adequate financing in order to commence construction of and complete the Expanded Facility and, in turn, perform under these agreements, we cannot assure you that we will be able to obtain adequate financing on favorable terms, or at all. Furthermore, we have not demonstrated that we can meet the production levels and specifications contemplated in certain of our current supply agreements, and we may enter into additional supply agreements in the future with similar production and specification level requirements. If our production scale-up proceeds more slowly than we expect, or if we encounter difficulties in successfully completing the Expanded Facility, our counterparties may terminate our existing supply agreements and potential customers may be less willing to negotiate definitive supply agreements, or demand terms less favorable to us, and our performance may suffer.

Our take-or-pay contracts, including our take-or-pay purchase agreement with Trafigura, are subject to significant conditions precedent and, as a result, the revenues that we expect from such contracts may never be realized.

Our ability to realize revenue under our take-or-pay-contracts, including our take-or-pay purchase agreement with Trafigura, is not guaranteed and is subject to significant conditions precedent. In order to actually realize revenue under such contracts, we are required to, among other things, complete the Expanded Facility or acquire, construct or retrofit a facility at another suitable location, which is, in turn, dependent on our ability to secure the requisite financing. If we are unable to raise sufficient capital on acceptable terms, or at all, the revenues under such contracts may never be achieved. Our ability to obtain adequate financing will depend on, among other things, the status of our product development, our financial condition and general conditions in the capital, financial and debt markets at the time such financing is sought. In addition, any further common stock, warrant or convertible debt financings could result in the dilution of ownership interests of our then-current stockholders. Furthermore, even if we are able to satisfy all conditions precedent to our take-or-pay contracts, including completion of the Expanded Facility or acquiring, constructing or retrofitting a facility at another suitable location, and securing adequate funding, we still may never realize the full amount of revenue that we expect or project to earn from such contracts. In any event, failure to realize the expected revenue thereunder would have a material adverse effect on our business, financial condition, results of operation and liquidity.

The Luverne Facility is our first commercial isobutanol and ethanol production facility, and, as such, we may be unable to produce planned quantities of isobutanol, SAF and renewable premium gasoline and any such production may be costlier than we anticipate.

Since commencing initial startup operations for the production of isobutanol at the Luverne Facility in May 2012, we have encountered some production challenges, including contamination issues, which have resulted in lower than planned isobutanol production. While we were able to resume production of isobutanol at the Luverne Facility, this is our first commercial isobutanol production facility and we may encounter further production challenges at the Luverne Facility or at our planned Net-Zero 1 Project, including, but not limited to, being unable to manage plant contamination, and we may add additional processing steps or incur additional capital expenditures to achieve our target customers' product specifications and/or to increase production levels at the Luverne Facility our the planned Net-Zero 1 Project.

The Luverne Facility has the capability to produce low-carbon ethanol side-by-side with low-carbon isobutanol. With certain capital improvements, the Luverne Facility could also produce SAF, renewable premium gasoline and other related renewable hydrocarbon products that can be made from isobutanol.

In addition, if we decide to utilize the Luverne Facility for production of our products, it is important to note that the Luverne Facility was constructed in 1998. As an older production facility, the Luverne Facility may be more susceptible to maintenance issues that result in production challenges than newer production facilities. Any such production challenges may delay our ramp up of production capacity, prevent us from producing significant quantities of isobutanol, significantly increase our cost to produce isobutanol or cause us to switch to producing ethanol or produce both products simultaneously, which could have a material adverse effect on our business, financial condition and results of operations.

Fluctuations in the price of corn and other feedstocks may affect our cost structure.

Our approach to the renewable fuels and chemicals markets will be dependent on the price of corn and other feedstocks that will be used to produce isobutanol, renewable hydrocarbon products and ethanol. A decrease in the availability of plant feedstocks or an increase in the price may have a material adverse effect on our financial condition and operating results. At certain levels, prices may make these products uneconomical to use and produce as we may be unable to pass the full amount of feedstock cost increases on to our customers.

The price and availability of corn and other plant feedstocks may be influenced by general economic, market and regulatory factors. These factors include weather conditions, farming decisions, government policies and subsidies with respect to agriculture and international trade and global demand and supply. For example, corn prices may increase significantly in response to drought conditions in the midwestern region of the U.S. and any resulting decrease in the supply of corn could lead to the restriction of corn supplies, which in turn could cause further increases in the price of corn. The significance and relative impact of these factors on the price of plant feedstocks is difficult to predict, especially without knowing what types of plant feedstock materials we may need to use.

Fluctuations in the price and availability of energy to power our production facilities may harm our performance.

Our production facilities use significant amounts of electricity and natural gas to produce our products. Accordingly, our business is dependent upon electricity and natural gas supplied by third parties. The prices for and availability of natural gas are subject to volatile market conditions. These market conditions are affected by factors beyond our control, such as weather conditions, overall economic conditions and governmental regulations. Should the price of natural gas increase, our performance could suffer. Likewise, disruptions in the supply of natural gas could have a material impact on our business and results of operations.

Fluctuations in petroleum prices and customer demand patterns may reduce demand for renewable fuels and bio-based chemicals.

We anticipate marketing our renewable fuels as an alternative to petroleum-based fuels. Therefore, if the price of oil falls, any revenues that we generate from renewable fuel products could decline and we may be unable to produce products that are a commercially viable alternative to petroleum-based fuels. Additionally, demand for liquid transportation fuels, including renewable fuels, may decrease due to economic conditions or otherwise, including as a result of the COVID-19 pandemic, during which individuals are travelling substantially less than prior to the start of the COVID-19 pandemic. We will encounter similar risks in the chemicals industry, where declines in the price of oil may make petroleum-based hydrocarbons less expensive, which could reduce the competitiveness of our bio-based alternatives.

Changes in the prices of distillers grains and iDGs could have a material adverse effect on our financial condition.

We sell distillers grains as a co-product from the production of ethanol at the Luverne Facility during any period in which the production of isobutanol is temporarily paused and our management decides that the Luverne Facility will be temporarily reverted to ethanol production, or during periods in which we produce both isobutanol and ethanol simultaneously. We may also sell distillers grains produced by other ethanol facilities that we acquire, enter into a joint venture or tolling arrangement with, or license to in the future. We also sell the iDGs that are produced as a co-product of our commercial isobutanol production. Distillers grains and iDGs compete with other animal feed products and decreases in the prices of these other products could decrease the demand for and price of distillers grains and iDGs. Additionally, we have produced limited quantities of commercial iDGs and, as such, there is a risk that our iDGs may not meet market requirements. If the price of distillers grains and iDGs decreases or our iDGs do not meet market requirements, our revenue from the sale of distillers grains and future revenue from the sale of iDGs could suffer, which could have a material adverse effect on our financial condition.

If we elect to we produce ethanol rather than isobutanol, or during periods in which we make the strategic decision to revert to ethanol production, or produce both products simultaneously, we will be vulnerable to fluctuations in the price of and cost to produce ethanol.

In certain cases, we may obtain income the production of ethanol. Further, we have designed our isobutanol production technology (including the upgrade of the Luverne Facility) to allow us to produce ethanol and isobutanol simultaneously or to produce just ethanol or just isobutanol depending on market conditions. Our earnings from ethanol revenue, if any, will be dependent on the price of, demand for and cost to produce ethanol. Decreases in the price of ethanol, as have been experienced during 2020 and in early 2021, whether caused by decreases in gasoline prices, changes in regulations, seasonal fluctuations or otherwise, will reduce our revenues, while increases in the cost of production will reduce our margins. To the extent that ethanol production costs increase or price decreases, earnings from ethanol production, if any, could suffer, which could have a material adverse effect on our business.

Sustained narrow commodity margins for ethanol caused us to operate at a loss and caused us to terminate production at the Luverne Facility. Wemay or may not be able to recommence production when margins improve.

Our results from operations will be substantially dependent on commodity prices. Many of the risks associated with volatile commodity prices, including fluctuations in feedstock costs and natural gas costs, apply to the production of isobutanol, renewable hydrocarbon products and ethanol. Sustained unfavorable commodity prices, as have been experienced during 2020 and in early 2021, have and may in the future cause our combined revenues from sales of ethanol, isobutanol and related co-products to decline below our marginal cost of production. As market conditions change, our management has from time-to-time decided to terminate, reduce or suspend production of isobutanol and/or ethanol at the Luverne Facility and may do so in the future. Currently, ethanol production is terminated indefinitely at the Luverne Facility.

The decision to terminate, reduce or suspend production at a facility may create additional costs related to continued maintenance, termination of staff, certain unavoidable fixed costs, termination of customer contracts and increased costs to increase or recommence production in the future. These costs may make it difficult or impractical to increase or recommence production of isobutanol and/or ethanol at the Luverne Facility even if margins improve. In addition, any reduction or suspension of the production of isobutanol and/or ethanol at the Luverne Facility may slow or stop our commercialization process, which could have a material adverse effect on our business, financial condition and results of operations.

We may not be successful in the development of individual steps in the production of commercial quantities of isobutanol or renewable hydrocarbon products from plant feedstocks in a timely or economic manner, or at all.

As of the date of this Report, we have produced only limited quantities of isobutanol and renewable hydrocarbon products at commercial scale. We may not be successful in increasing our production of isobutanol or renewable hydrocarbon products.

Our future success depends on our ability to produce commercial quantities of low-carbon isobutanol and renewable hydrocarbon products in a timely and economic manner. While we have produced isobutanol using our biocatalysts at the Luverne Facility in commercial-scale fermenters, our biocatalysts have not yet produced isobutanol at fully optimized levels in fermenters typical of full scale operation at a large commercial facility. The risk of contamination and other problems rises as we increase the scale of our isobutanol production. If we are unable to successfully manage these risks, we may encounter difficulties in achieving our target isobutanol production yield, rate, concentration or purity at a commercial scale, which could delay or increase the costs involved in commercializing our isobutanol production.

The technological and logistical challenges associated with producing, marketing, selling and distributing isobutanol, renewable hydrocarbon products and ethanol are extraordinary, and we may not be able to resolve any difficulties that arise in a timely or cost-effective manner, or at all.

Prior to our purchase of the Luverne Facility, we had never operated or built (through Retrofit or otherwise) a commercial isobutanol, renewable hydrocarbon or ethanol facility. We believe that we understand the engineering and process characteristics necessary to successfully build the additional facilities that we are contemplating and to scale up to larger facilities. We expect to incur additional capital expenditures to increase production of low-carbon isobutanol and renewable hydrocarbon products at our Net-Zero 1 Project and potentially also at the Luverne Facility. Our assumptions, however, may prove to be incorrect. Accordingly, we cannot be certain that we can consistently produce low-carbon isobutanol, renewable hydrocarbon products or ethanol in an economical manner in commercial quantities. If we fail to consistently produce low-carbon isobutanol, renewable hydrocarbon products and/or ethanol economically on a commercial scale or in commercial volumes, our commercialization of low-carbon isobutanol, renewable hydrocarbon products and ethanol and our business, financial condition and results of operations will be materially adversely affected.

Our actual costs may be greater than expected in developing our growth projects, causing us to realize significantly lower profits or losses on our projects.

We generally must estimate the costs of completing a specific project to prior to the construction of the project. The actual cost of labor and materials may vary from the costs we originally estimated. These variations may cause gross profit for a project to differ from those we originally estimated. Cost overruns on our growth projects could occur due to changes in a variety of factors such as:

- Failure to properly estimate costs of engineering, materials, equipment or labor;
- Unanticipated technical problems with the structures, materials or services;
- Unanticipated project modifications;
- Changes in the costs of equipment, materials, labor or contractors;
- Our suppliers or contractors failure to perform;
- Changes in local laws and regulations; and
- Delays caused by weather conditions.

As projects grow in size and complexity, multiple factors may contribute to reduced profit or losses, and depending on the size of the particular project, variations from the estimated project costs could have a material adverse effect on our business. For example, if project costs exceed our estimates it could causing us to realize significantly lower profits or losses on our projects.

Our facilities and processes may fail to produce products at the volumes, rates and costs we expect.

Some or all of our future production facilities may be in locations distant from corn or other feedstock sources, which could increase our feedstock costs or prevent us from acquiring sufficient feedstock volumes for commercial production. General market conditions might also cause increases in feedstock prices, which could likewise increase our production costs.

Even if we secure access to sufficient volumes of feedstock, our production facilities may fail to perform as expected. The equipment and subsystems that we install in our production facilities may never operate as planned. Our systems may prove incompatible with the original facility or require additional modification after installation. Unexpected problems may force us to cease or delay production and the time and costs involved with such delays may prove prohibitive. Any or all of these risks could prevent us from achieving the production throughput and yields necessary to achieve our target annualized production run rates and/or to meet the volume demands or minimum requirements of our customers, including pursuant to definitive supply or distribution agreements that we may enter into, which may subject us to monetary damages. Failure to achieve these rates or meet these minimum requirements, or achieving them only after significant additional expenditures, could substantially harm our commercial performance.

We may be unable to produce isobutanol, renewable hydrocarbon products like SAF or other products in accordance with customer specifications.

Even if we produce isobutanol, renewable hydrocarbon products like SAF or other products at our targeted rates, we may be unable to produce these products to meet customer specifications, including those defined in ASTM D7862 "Standard Specification for Butanol for Blending with Gasoline for Use as Automotive Spark-Ignition Engine Fuel," ASTM D7566 "Standard Specifications for Aviation Turbine Fuel Containing Synthesized Hydrocarbons" or specifications to carbon intensity standards. We may need to add additional processing steps or incur capital expenditures in order to meet customer specifications which could add significant costs to our production process. If we fail to meet specific product or volume specifications contained in a supply agreement, the customer may have the right to seek an alternate supply of isobutanol or renewable hydrocarbon products and/or terminate the agreement completely, and we could be required to pay shortfall fees or otherwise be subject to damages. A failure to successfully meet the specifications of our potential customers could decrease demand and significantly hinder market adoption of our products.

We lack significant experience operating commercial-scale isobutanol, renewable hydrocarbon and ethanol facilities and may encounter substantial difficulties operating commercial plants or expanding our business.

We have very limited experience operating commercial-scale isobutanol, renewable hydrocarbon and ethanol facilities concurrently. Accordingly, we may encounter significant difficulties operating at a commercial scale once we expand our production capabilities, including at our Net-Zero 1 Project. In addition, we believe that certain of our future facilities, like the Luverne Facility, could be able to continue producing ethanol during much of the Retrofit process if we elect to produce ethanol. If we elect to produce ethanol, we will need to successfully administer and manage this production. Although the employees at the Luverne Facility are experienced in the operation of ethanol facilities, and our future development partners or the entities that we acquire may likewise have such experience, we may be unable to manage ethanol-producing operations, especially given the possible complications associated with a simultaneous Retrofit. Once we complete a commercial Retrofit, operational difficulties may increase, because neither we nor anyone else has significant experience operating a pure isobutanol fermentation facility at a commercial scale. The skills and knowledge gained in operating commercial ethanol facilities or small-scale isobutanol plants may prove insufficient for successful operation of a large-scale isobutanol and hydrocarbon facility or the Expanded Facility, and we may be required to expend significant time and money to develop our capabilities in isobutanol and renewable hydrocarbon facility operation. We may also need to hire new employees or contract with third parties to help manage our operations, and our performance will suffer if we are unable to hire qualified parties or if they perform poorly.

We may face additional operational difficulties as we further expand our production capacity, including the Expanded Facility. Integrating new facilities with our existing operations may prove difficult. Rapid growth, resulting from our operation of, or other involvement with, isobutanol and renewable hydrocarbon facilities or otherwise, may impose a significant burden on our administrative and operational resources. To effectively manage our growth and execute our expansion plans, we will need to expand our administrative and operational resources substantially and attract, train, manage and retain qualified management, technicians and other personnel. We may be unable to do so. Failure to meet the operational challenges of developing and managing increased production of isobutanol, renewable hydrocarbon products and/or ethanol, or failure to otherwise manage our growth, may have a material adverse effect on our business, financial condition and results of operations.

We may have difficulty adapting our technology to commercial-scale fermentation, which could delay or prevent our commercialization of SAF and renewable premium gasoline.

While we have demonstrated some ability to produce isobutanol under the demonstration plant operating conditions and under commercial scale operating conditions at the Luverne Facility, and we have succeeded in reaching our commercial fermentation performance targets for isobutanol concentration, fermentation productivity and isobutanol yield in laboratory tests, we have not yet reached all performance targets in a commercial plant environment at the larger scale we contemplate constructing at the Expanded Facility involving multiple fermenters. Ultimately, our yeast biocatalyst may not be able to meet the commercial performance targets in a timely manner, or ever. In addition, the risk of contamination and other problems may increase as we seek to ramp up our production capacity, which could negatively impact our cost of production or require additional capital expenditures to solve for these problems. If we encounter difficulties in optimizing our production, our commercialization of isobutanol, SAF, renewable premium gasoline and our business, financial condition and results of operations will be materially adversely affected.

We may have difficulties gaining market acceptance and successfully marketing our isobutanol and renewable hydrocarbon products to customers, including chemical producers, fuel distributors and refiners.

A key component of our business strategy is to market our isobutanol and renewable hydrocarbon products to chemical producers, fuels distributors, refiners and other fuel and chemical industry market participants. We have limited experience marketing isobutanol and renewable hydrocarbon products on a commercial scale and we may fail to successfully negotiate marketing agreements in a timely manner or on favorable terms. If we fail to successfully market our isobutanol or renewable hydrocarbon products to refiners, fuels distributors, chemical producers and others, our business, financial condition and results of operations will be materially adversely affected.

A very limited market currently exists for isobutanol as a fuel or as a gasoline blendstock. Therefore, to gain market acceptance and successfully market our isobutanol to fuels distributors and refiners, we must effectively demonstrate the commercial advantages of using isobutanol over other renewable fuels and blendstocks, as well as our ability to produce isobutanol reliably on a commercial scale at a sufficiently low cost. We must show that isobutanol is compatible with existing infrastructure and does not damage pipes, engines, storage facilities or pumps. We must also overcome marketing and lobbying efforts by producers of other renewable fuels and blendstocks, including ethanol, many of whom may have greater resources than we do. If the markets for isobutanol as a fuel or as a gasoline blendstock do not develop as we currently anticipate, or if we are unable to penetrate these markets successfully, our revenue and growth rate could be materially and adversely affected.

We also intend to market our isobutanol to chemical producers for use in making various chemicals such as isobutylene, a type of butene that can be produced through the dehydration of isobutanol. Although a significant market currently exists for isobutylene produced from petroleum, which is widely used in the production of plastics, specialty chemicals, alkylate for gasoline blending and high octane aviation gasoline, no one has successfully created isobutylene on a commercial scale from bio-isobutanol. Therefore, to gain market acceptance and successfully market our isobutanol to chemical producers, we must show that our isobutanol can be converted into isobutylene at a commercial scale. As no company currently dehydrates commercial volumes of isobutanol into isobutylene, we must demonstrate the large-scale feasibility of the process and potentially reach agreements with companies that are willing to invest in the necessary dehydration infrastructure. Failure to reach favorable agreements with these companies, or the inability of their plants to convert isobutanol into isobutylene at sufficient scale, may slow our development in the chemicals market and could significantly affect our profitability.

Obtaining market acceptance in the chemicals industry is complicated by the fact that many potential chemicals industry customers have invested substantial amounts of time and money in developing petroleum-based production channels. These potential customers generally have well-developed manufacturing processes and arrangements with suppliers of chemical components and may display substantial resistance to changing these processes. Pre-existing contractual commitments, unwillingness to invest in new infrastructure, distrust of new production methods and lengthy relationships with current suppliers may all slow market acceptance of isobutanol.

We believe that consumer demand for environmentally sensitive products will drive demand among large brand owners for isobutanol, renewable hydrocarbon products and low-carbon ethanol. One of our marketing strategies is to leverage this demand to obtain commitments from large brand owners to purchase our products. We believe these commitments will, in turn, promote chemicals industry demand for our isobutanol and renewable hydrocarbon products. If consumer demand for environmentally sensitive products fails to develop at sufficient scale or if such demand fails to drive large brand owners to seek sources of renewable isobutanol or renewable hydrocarbon products, our revenue and growth rate could be materially and adversely affected.

We may have difficulties scaling up our renewable hydrocarbon technology, and, as such, we may be unable to produce commercial quantities of our renewable hydrocarbon products and any such production may be costlier than we anticipate.

We have developed the South Hampton Facility in Silsbee, Texas in partnership with South Hampton Resources. Currently, the South Hampton Facility can produce approximately 100,000 gallons of renewable hydrocarbon products from our renewable isobutanol for use as fuels and chemicals. We have demonstrated the ability to convert our isobutanol at this level into products such as SAF, isooctane, isooctene and par-xylene.

The production and sale of commercial volumes of renewable hydrocarbon products, such as SAF, isooctane and isooctene, produced from our isobutanol is an important part of our business plans. However, we may encounter challenges in scaling up our process to convert isobutanol into renewable hydrocarbon products successfully. In addition, the cost to construct commercial hydrocarbons facilities or the production costs associated with the operation of such facilities may be higher than we project. If we encounter such difficulties, this may significantly impact the development of the markets for our renewable hydrocarbon products, impact performance under our supply agreements and could significantly affect our profitability.

We may be reliant on Butamax to develop certain markets for isobutanol.

As part of the License Agreement entered into with Butamax, it was agreed that Butamax would take the lead in developing the markets for on-road gasoline blendstocks. This would entail progressing the required approvals for these markets, as well as managing the marketing and distribution of our isobutanol and our potential licensee's isobutanol in these markets beyond certain minimum volumes. On June 12, 2018, the EPA announced that it approved the registration of isobutanol as a fuel additive for blending into gasoline at levels up to 16 volume percent for on-road automotive use. If Butamax is unable to maintain or obtain the necessary approvals to sell isobutanol into the on-road gasoline blendstock markets, or if it is unsuccessful in building market demand for isobutanol as an on-road gasoline blendstock, our revenue and growth rate could be materially and adversely affected.

We may be required to pay Butamax royalties for selling isobutanol into certain markets, which could hinder our ability to competitively sell our isobutanol into those markets.

As part of the License Agreement entered into with Butamax, it was agreed that we, and our potential licensees, may be required to pay Butamax royalties for selling isobutanol into the on-road gasoline blendstock markets and the chemical isobutylene applications markets beyond certain minimum volumes. The addition of these royalties may make our isobutanol uncompetitive from a price perspective, which may hinder our ability to sell into these markets. If this is the case, our revenue and growth rate could be materially and adversely affected.

Even if we are successful in consistently producing isobutanol and renewable hydrocarbon products on a commercial scale, we may not be successful in negotiating additional supply agreements or pricing terms to support the growth of our business.

We expect that many of our customers will be large companies with extensive experience operating in the fuels or chemicals markets. As an early stage company, we lack significant commercial operating experience, and may face difficulties in developing marketing expertise in these fields. Our business model relies upon our ability to successfully negotiate and structure long-term supply agreements for the isobutanol, renewable hydrocarbon products and other products we produce and to negotiate pricing terms that generate positive results from our production operations. Certain agreements with existing and potential customers may initially only provide for the purchase of limited quantities from us. Our ability to increase our sales will depend in large part upon our ability to expand these existing customer relationships into long-term supply agreements. Maintaining and expanding our existing relationships and establishing new ones can require substantial investment without any assurance from customers that they will place significant orders. In addition, many of our potential customers may be more experienced in these matters than we are, and we may fail to successfully negotiate these agreements in a timely manner or on favorable terms which, in turn, may force us to slow our production, dedicate additional resources to increasing our storage capacity and/or dedicate resources to sales in spot markets. Furthermore, should we become more dependent on spot market sales, our profitability will become increasingly vulnerable to short-term fluctuations in the price and demand for petroleum-based fuels and competing substitutes.

Our isobutanol may be less compatible with existing refining and transportation infrastructure than we believe, which may hinder our ability to market our product on a large scale.

We developed our business model based on our belief that our isobutanol is fully compatible with existing refinery infrastructure. For example, when making isobutanol blends, we believe that gasoline refineries will be able to pump our isobutanol through their pipes and blend it in their existing facilities without damaging their equipment. If our isobutanol proves unsuitable for such handling, it will be more expensive for refiners to use our isobutanol than we anticipate, and they may be less willing to adopt it as a gasoline blendstock, forcing us to seek alternative purchasers.

Likewise, our plans for marketing our isobutanol are based upon our belief that it will be compatible with the pipes, tanks and other infrastructure currently used for transporting, storing and distributing gasoline. If our isobutanol or products incorporating our isobutanol cannot be transported with this equipment, we will be forced to seek alternative transportation arrangements, which will make our isobutanol and products produced from our isobutanol more expensive to transport and less appealing to potential customers. Reduced compatibility with either refinery or transportation infrastructure may slow or prevent market adoption of our isobutanol, which could substantially harm our performance.

A sustained low oil price environment may negatively impact the price we receive for the sale of our isobutanol, renewable hydrocarbon products and ethanol.

Many of our end-products such as isobutanol, renewable hydrocarbon products and ethanol have some level of price correlation with crude oil. If crude oil prices were to remain at low levels over a sustained period of time, this may have an impact on the pricing that we are able to achieve in the marketplace for many of those end-products. This may cause us to operate at a lower, or negative, operating margin and, as a result, our management may decide to terminate, reduce or suspend production of isobutanol and/or ethanol at the Luverne Facility. Unfavorable operating margins may also impact our ability to enter into commercial agreements with development partners or licensees.

If we engage in acquisitions, we will incur a variety of costs and may potentially face numerous risks that could adversely affect our business and operations.

If appropriate opportunities become available, we may acquire businesses, assets, technologies or products to enhance our business in the future. In connection with any future acquisitions, we could, subject to certain limitations in the agreements governing our indebtedness at such time:

- issue additional equity securities which would dilute our current stockholders;
- incur substantial debt to fund the acquisitions; or
- assume significant known or unknown liabilities.

Acquisitions involve numerous risks, including problems integrating the purchased operations, technologies or products, unanticipated costs and other liabilities, diversion of management's attention from our core business, adverse effects on existing business relationships with current and/or prospective partners, customers and/or suppliers, risks associated with entering markets in which we have no or limited prior experience and potential loss of key employees. Other than our acquisition of the Luverne Facility, we have not engaged in acquisitions in the past, and do not have experience in managing the integration process. Therefore, we may not be able to successfully integrate any businesses, assets, products, technologies or personnel that we might acquire in the future without a significant expenditure of operating, financial and management resources, if at all. The integration process could divert management time from focusing on operating our business, result in a decline in employee morale and cause retention issues to arise from changes in compensation, reporting relationships, future prospects or the direction of the business. In addition, we may acquire companies that have insufficient internal financial controls, which could impair our ability to integrate the acquired company and adversely impact our financial reporting. If we fail in our integration efforts with respect to acquisitions and are unable to efficiently operate as a combined organization, our business, financial condition and results of operations may be materially adversely affected.

If we engage in joint ventures, we will incur a variety of costs and may potentially face numerous risks that could adversely affect our business and operations.

If appropriate opportunities become available, we may enter into joint ventures with the owners of existing ethanol production facilities in order to acquire access to additional isobutanol production capacity and hydrocarbon production capabilities. We currently anticipate that in each such joint venture, the ethanol producer would contribute access to its existing ethanol production facility and we would be responsible for Retrofitting such facility to produce isobutanol and/or hydrocarbon products. Upon completion of the Retrofit, and in some cases the attainment of certain performance targets, both parties to the joint venture would receive a portion of the profits from the sale of isobutanol or hydrocarbon products , consistent with our business model. In connection with these joint ventures, we could incur substantial debt to fund the Retrofit of the accessed facilities and we could assume significant liabilities.

Realizing the anticipated benefits of joint ventures, including projected increases to production capacity and additional revenue opportunities, involves a number of potential challenges. The failure to meet these challenges could seriously harm our financial condition and results of operations. Joint ventures are complex and time consuming and we may encounter unexpected difficulties or incur unexpected costs related to such arrangements, including:

- difficulties negotiating joint venture agreements with favorable terms and establishing relevant performance metrics;
- difficulties completing the Retrofits of the accessed facilities using our integrated fermentation technology;
- the inability to meet applicable performance targets related to the production of isobutanol and hydrocarbons;
- difficulties obtaining the permits and approvals required to produce and sell our products in different geographic areas;
- complexities associated with managing the geographic separation of accessed facilities;
- diversion of management attention from ongoing business concerns to matters related to the joint ventures;
- difficulties maintaining effective relationships with personnel from different corporate cultures; and
- the inability to generate sufficient revenue to offset Retrofit costs.

Additionally, we plan to be a leading marketer for all isobutanol and hydrocarbon products produced using our proprietary technology and sold in markets other than on-road gasoline blendstocks including, without limitation, all isobutanol and hydrocarbon products that are produced by any facilities that we access via joint venture. Marketing agreements can be very complex and the obligations that we assume as a leading marketer may be time consuming. We have little experience marketing isobutanol and hydrocarbon products on a commercial scale and we may fail to successfully negotiate marketing agreements in a timely manner or on favorable terms. If we fail to successfully market the isobutanol and hydrocarbon products produced using our proprietary technology, our business, financial condition and results of operations will be materially adversely affected.

Our joint venture partners may have significant amounts of existing debt and may not be able to service their existing debt obligations, which could cause the failure of a specific project and the loss by us of any investment we have made to Retrofit the facilities owned by the joint venture partner. In addition, if we are unable to meet specified performance targets related to the production of isobutanol or hydrocarbon products at a facility owned by one of our joint venture partners, we may never become eligible to receive a portion of the profits of the joint venture and may be unable to recover the costs of Retrofitting the facility.

Additionally, we plan to be a leading marketer for all isobutanol and hydrocarbon products produced using our proprietary technology and sold in markets other than on-road gasoline blendstocks including, without limitation, all isobutanol and hydrocarbon products that are produced by any facilities that we access via joint venture. Marketing agreements can be very complex and the obligations that we assume as a leading marketer may be time consuming. We have little experience marketing isobutanol and hydrocarbon products on a commercial scale and we may fail to successfully negotiate marketing agreements in a timely manner or on favorable terms. If we fail to successfully market the isobutanol and hydrocarbon products produced using our proprietary technology, our business, financial condition and results of operations will be materially adversely affected.

If we lose key personnel, including key management personnel, or are unable to attract and retain additional personnel, it could delay our product development programs and harm our research and development efforts, make it more difficult to pursue partnerships or develop our own products or otherwise have a material adverse effect on our business.

Our business is complex and we intend to target a variety of markets. Therefore, it is critical that our management team and employee workforce are knowledgeable in the areas in which we operate. The departure, illness or absence of any key members of our management, including our named executive officers, or the failure to attract or retain other key employees who possess the requisite expertise for the conduct of our business, could prevent us from developing and commercializing our products for our target markets and entering into partnerships or licensing arrangements to execute our business strategy. In addition, the loss of any key scientific staff, or the failure to attract or retain other key scientific employees, could prevent us from developing and commercializing our products for our target markets and entering into partnerships or licensing arrangements to execute our business strategy. We may not be able to attract or retain qualified employees in the future due to the intense competition for qualified personnel among biotechnology and other technology-based businesses, particularly in the advanced renewable fuels area, or due to the limited availability of personnel with the qualifications or experience necessary for our renewable chemicals and advanced renewable fuels business. If we are not able to attract and retain the necessary personnel to accomplish our business objectives, we may experience staffing constraints that will adversely affect our ability to meet the demands of our partners and customers in a timely fashion or to support our internal research and development programs. In particular, our product and process development programs are dependent on our ability to attract and retain highly skilled scientists. Competition for experienced scientists and other technical personnel from numerous companies and academic and other research institutions may limit our ability to do so on acceptable terms. All of our employees are at-will employees, meaning that either the employee or we may terminate their employment at any time.

Our planned activities will require additional expertise in specific industries and areas applicable to the products and processes developed through our technology platform or acquired through strategic or other transactions, especially in the end markets that we seek to penetrate. These activities will require the addition of new personnel, and the development of additional expertise by existing personnel. The inability to attract personnel with appropriate skills or to develop the necessary expertise could impair our ability to grow our business.

We may face substantial competition from companies with greater resources and financial strength, which could adversely affect our performance and growth.

We may face substantial competition in the markets for isobutanol, renewable hydrocarbon products, polyester, rubber, plastics, fibers, other polymers and ethanol. Our competitors include companies in the incumbent petroleum-based industry as well as those in the nascent renewable fuels industry. The incumbent petroleum-based industry benefits from a large established infrastructure, production capability and business relationships. The incumbents' greater resources and financial strength provide significant competitive advantages that we may not be able to overcome in a timely manner. Academic and government institutions may also develop technologies which will compete with us in the chemicals, solvents and blendstock markets.

Our ability to compete successfully will depend on our ability to develop proprietary products that reach the market in a timely manner and are technologically superior to and/or are less expensive than other products on the market. Many of our competitors have substantially greater production, financial, research and development, personnel and marketing resources than we do. In addition, certain of our competitors may also benefit from local government subsidies and other incentives that are not available to us. As a result, our competitors may be able to develop competing and/or superior technologies and processes, and compete more aggressively and sustain that competition over a longer period of time than we could. Our technologies and products may be rendered obsolete or uneconomical by technological advances or entirely different approaches developed by one or more of our competitors. As more companies develop new intellectual property in our markets, the possibility of a competitor acquiring patent or other rights that may limit our products or potential products increases, which could lead to litigation. Furthermore, to secure purchase agreements from certain customers, we may be required to enter into exclusive supply contracts, which could limit our ability to further expand our sales to new customers. Likewise, major potential customers may be locked into long-term, exclusive agreements with our competitors, which could inhibit our ability to compete for their business.

In addition, various governments have recently announced a number of spending programs focused on the development of clean technologies, including alternatives to petroleum-based fuels and the reduction of carbon emissions. Such spending programs could lead to increased funding for our competitors or a rapid increase in the number of competitors within those markets.

We also may face substantial competition as we develop our RNG projects and seek to work with farmers and landowners to source our biogas feedstock and lease land to install and operate RNG processing facilities. Our competitors include established companies and developers with significantly greater resources and financial strength, which may provide them with competitive advantages that we may not be able to overcome in a timely manner, or at all.

Our limited resources relative to many of our competitors may cause us to fail to anticipate or respond adequately to new developments and other competitive pressures. This failure could reduce our competitiveness and market share, adversely affect our results of operations and financial position and prevent us from obtaining or maintaining profitability.

Our future success will depend on our ability to maintain a competitive position with respect to technological advances.

The renewable fuels industry is characterized by rapid technological change. Our future success will depend on our ability to maintain a competitive position with respect to technological advances. Technological development by others may impact the competitiveness of our products in the marketplace. Competitors and potential competitors who have greater resources and experience than we do may develop products and technologies that make ours obsolete or may use their greater resources to gain market share at our expense.

We may face significant and substantial competition as it relates to our proprietary renewable fuels which could adversely affect our performance and growth.

Renewable fuels companies may provide substantial competition in the renewable hydrocarbons market. With respect to production of renewable gasoline, renewable fuels competitors are numerous and include both large established companies and numerous startups. For example, Virent Energy Systems, Inc. has developed a process for making gasoline and gasoline blendstocks. Many other competitors may do so as well. In the SAF fuel market, we will face competition from companies such as Neste Corporation, Synthetic Genomics, Inc., and Exxon-Mobil Corporation that are pursuing production of SAF from algae-based technology. Renewable Energy Group, Inc. and others are also targeting production of SAF fuels from vegetable oils and animal fats. Red Rock Biofuels, Fulcom BioEnergy, Inc. and others are planning to produce SAF fuel from renewable biomass. We may also face competition from companies working to produce jet fuel from hydrogenated fatty acid methyl esters. In the diesel fuels market, competitors such as Amyris Biotechnologies, Inc. have developed technologies for production of alternative hydrocarbon diesel fuel.

In the production of other renewable fuels, including our renewable hydrocarbon products, key competitors include Shell Oil Company, POET, LLC, ICM, Inc., Archer Daniels Midland Company, Zea 2 LLC, Iogen Corporation and many smaller startup companies. If these companies are successful in establishing low cost cellulosic ethanol or other fuel production, it could negatively impact the market for our isobutanol as a gasoline blendstock. In the markets for the hydrocarbon fuels that we plan to produce from our isobutanol, we will face competition from the incumbent petroleum-based fuels industry. The incumbent petroleum-based fuels industry makes the vast majority of the world's gasoline, jet and diesel fuels and blendstocks. It is a mature industry with a substantial base of infrastructure for the production and distribution of petroleum-derived products. The size, established infrastructure and significant resources of many companies in this industry may put us at a substantial competitive disadvantage and delay or prevent the establishment and growth of our business in the market for hydrocarbon fuels.

In the production of isobutanol, we face competition from Butamax. Additionally, a number of companies including Cathay Industrial Biotech, Ltd., METabolic EXplorer, S.A. and Eastman Chemical Company are developing n-butanol production capability from a variety of renewable feedstocks.

In the gasoline blendstock market, we will compete with our isobutanol against renewable ethanol producers (including those working to produce ethanol from cellulosic feedstocks), producers of alkylate from petroleum and producers of other blendstocks, all of whom may reduce our ability to obtain market share or maintain our price levels. If any of these competitors succeed in producing blendstocks more efficiently, in higher volumes or offering superior performance than our isobutanol, our financial performance may suffer. Furthermore, if our competitors have more success marketing their products or reaching development or supply agreements with major customers, our competitive position may also be harmed.

In the ethanol market, we operate in a highly competitive industry in the U.S. According to the BBI International, there are over 200 ethanol facilities in the U.S. with an installed nameplate capacity of over 16 billion gallons. Some of the key competitors in the U.S. include Archer-Daniels-Midland Company, Green Plains, Inc., POET, LLC and Valero Energy Corporation. We also face competition from foreign producers of ethanol. Brazil is believed to be the world's second largest ethanol producing country. Many producers have much larger production capacities and operate at a lower cost of production than we do. As a result, these companies may be able to compete more effectively in narrower commodity margin environments.

Our competitive position in the polyester, rubber, plastics, fibers and other polymers markets versus the incumbent petroleum-derived products and other renewable butanol producers may not be favorable.

In the polyester, rubber, plastics, fibers and other polymers markets, we face competition from incumbent petroleum-derived products, other renewable isobutanol producers and renewable n-butanol producers. Our competitive position versus the incumbent petroleum-derived products and other renewable butanol producers may not be favorable. Petroleum-derived products have dominated the market for many years and there is substantial existing infrastructure for production from petroleum sources, which may impede our ability to establish a position in these markets. Other isobutanol and n-butanol companies may develop technologies that prove more effective than our isobutanol production technology, or such companies may be more adept at marketing their production. Additionally, one company in France, Global Bioenergies, S.A., is pursuing the production of isobutylene from renewable carbohydrates directly. Since conversion of isobutanol to butenes such as isobutylene is a key step in producing many polyester, rubber, plastics, fibers and other polymers from our isobutanol, this direct production of renewable isobutylene, if successful, could limit our opportunities in these markets.

In the polyester, rubber, plastics, fibers and other polymers markets, we expect to face vigorous competition from existing technologies. The companies we may compete with may have significantly greater access to resources, far more industry experience and/or more established sales and marketing networks. Additionally, since we do not plan to produce most of these products directly, we will depend on the willingness of potential customers to purchase and convert our isobutanol into their products. These potential customers generally have well-developed manufacturing processes and arrangements with suppliers of the chemical components of their products and may have a resistance to changing these processes and components. These potential customers frequently impose lengthy and complex product qualification procedures on their suppliers, influenced by consumer preference, manufacturing considerations such as process changes and capital and other costs associated with transitioning to alternative components, supplier operating history, regulatory issues, product liability and other factors, many of which are unknown to, or not well understood by, us. Satisfying these processes may take many months or years. If we are unable to convince these potential customers that our isobutanol is comparable or superior to the alternatives that they currently use, we will not be successful in entering these markets and our business will be adversely affected.

Business interruptions, including those related to COVID-19, may have an adverse impact on our business and our financial results.

We are vulnerable to natural disasters and other events that could disrupt our operations, such as riots, civil disturbances, war, terrorist acts, pandemics, such as COVID-19, floods, infections in our laboratory or production facilities or those of our contract manufacturers and other events beyond our control. We do not have a detailed disaster recovery plan. In addition, we may not carry sufficient business interruption insurance to compensate us for losses that may occur. Any losses or damages we incur could have a material adverse effect on our cash flows and success as an overall business.

Our business and operations would suffer in the event of information technology system failures or a cyber-attack.

Our business is dependent on proprietary technologies, processes and information that we have developed, much of which is stored on our computer systems. We also have entered into agreements with third parties for hardware, software, telecommunications and other information technology ("IT") services in connection with our operations. Our operations depend, in part, on how well we and our vendors protect networks, equipment, IT systems and software against damage from a number of threats, including, but not limited to, cable cuts, damage to physical plants, natural disasters, intentional damage and destruction, fire, power loss, hacking, computer viruses, vandalism, theft, malware, ransomware and phishing attacks. Any of these and other events could result in IT system failures, delays, a material disruption of our business or increases in capital expenses. Our operations also depend on the timely maintenance, upgrade and replacement of networks, equipment and IT systems and software, as well as preemptive expenses to mitigate the risks of failures.

Furthermore, the importance of such information technology systems and networks and systems has increased due to many of our employees working remotely as a result of the COVID-19 pandemic. Additionally, if one of our service providers were to fail and we were unable to find a suitable replacement in a timely manner, we could be unable to properly administer our outsourced functions.

As cyber threats continue to evolve, we may be required to expend significant additional resources to continue to modify or enhance our protective measures or to investigate and remediate any information security vulnerabilities. While we have implemented security resources to protect our data security and information technology systems, such measures may not prevent such events. Significant disruption to our IT system or breaches of data security could have a material adverse effect on our business, financial condition and results of operations.

We may engage in hedging transactions, which could harm our business.

In the future, we may engage in hedging transactions to offset some of the effects of volatility in commodity prices. Hedging activities may cause us to suffer losses, such as if we purchase a position in a declining market or sell a position in a rising market. Furthermore, hedging would expose us to the risk that we may have under- or over-estimated our need for a specific commodity or that the other party to a hedging contract may default on its obligation. If there are significant swings in commodity prices, or if we purchase more corn for future delivery than we can process, we may have to pay to terminate a futures contract, resell unneeded corn inventory at a loss, or produce our products at a loss, all of which would have a material adverse effect on our financial performance. We may vary the hedging strategies we undertake, which could leave us more vulnerable to increases in commodity prices or decreases in the prices of isobutanol, distillers grains, iDGs or ethanol. Future losses from hedging activities and changes in hedging strategy could have a material adverse effect on our operations.

Ethical, legal and social concerns about genetically engineered products and processes, and similar concerns about feedstocks grown on land that could be used for food production, could limit or prevent the use of our products, processes and technologies and limit our revenues.

Some of our processes involve the use of genetically engineered organisms or genetic engineering technologies. Additionally, our feedstocks may be grown on land that could be used for food production, which subjects our feedstock sources to "food versus fuel" concerns. If we are not able to overcome the ethical, legal and social concerns relating to genetic engineering or food versus fuel, our products and processes may not be accepted. Any of the risks discussed below could result in increased expenses, delays or other impediments to our programs or the public acceptance and commercialization of products and processes dependent on our technologies or inventions.

Our ability to develop and commercialize one or more of our technologies, products or processes could be limited by the following factors:

- public attitudes about the safety and environmental hazards of, and ethical concerns over, genetic research and genetically engineered products and processes, which could influence public acceptance of our technologies, products and processes;
- public attitudes regarding and potential changes to laws governing ownership of genetic material, which could harm our intellectual property rights with respect to our genetic material and discourage others from supporting, developing or commercializing our products, processes and technologies;
- public attitudes and ethical concerns surrounding production of feedstocks on land which could be used to grow food, which could influence public acceptance of our technologies, products and processes;
- governmental reaction to negative publicity concerning genetically engineered organisms, which could result in greater government regulation of genetic research and derivative products; and
- governmental reaction to negative publicity concerning feedstocks produced on land which could be used to grow food, which could result in greater government regulation of feedstock sources.

The subjects of genetically engineered organisms and food versus fuel have received negative publicity, which has aroused public debate. This adverse publicity could lead to greater regulation and trade restrictions on imports of genetically engineered products or feedstocks grown on land suitable for food production.

The biocatalysts that we develop have significantly enhanced characteristics compared to those found in naturally occurring enzymes or microbes. While we produce our biocatalysts only for use in a controlled industrial environment, the release of such biocatalysts into uncontrolled environments could have unintended consequences. Any adverse effect resulting from such a release could have a material adverse effect on our business and financial condition, and we may be exposed to liability for any resulting harm.

As isobutanol, SAF and renewable premium gasoline has not previously been used as a commercial fuel in significant amounts, its use subjects us to product liability risks.

Isobutanol, SAF and renewable premium gasoline have not been used as a commercial fuel in large quantities or for a long period of time. Research regarding these products and its distribution infrastructure is ongoing. Although isobutanol, SAF and renewable premium gasolines have been tested on some engines, there is a risk that they may damage engines or otherwise fail to perform as expected. If these products degrade the performance or reduce the lifecycle of engines, or cause them to fail to meet emissions standards, market acceptance could be slowed or stopped, and we could be subject to product liability claims. A significant product liability lawsuit could substantially impair our production efforts and could have a material adverse effect on our business, reputation, financial condition and results of operations.

We may not be able to use some or all of our net operating loss carry-forwards to offset future income.

We have net operating loss carryforwards due to prior period losses generated before January 1, 2021, which if not utilized will begin to expire at various times over the next 20 years. If we are unable to generate sufficient taxable income to utilize our net operating loss carryforwards, these carryforwards could expire unused and be unavailable to offset future income tax liabilities.

In addition, under Section 382 of the Internal Revenue Code of 1986, as amended (the "Code"), a corporation that undergoes an "ownership change" (generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period) is subject to limitation on its ability to utilize its pre-change net operating loss carry-forwards, or net operating losses, to offset future taxable income. We undertook a detailed study of our net operating loss carryforwards through July 9, 2020 to determine whether such amounts are likely to be limited by Section 382 of the Code. As a result of this analysis, we currently believe any Section 382 of the Code limitations will significantly impact our ability to offset income with available net operating loss carryforwards. We have experienced more than one ownership change in prior years, and the issuance of shares in connection with our initial public offering itself triggered an ownership change. In addition, future changes in our stock ownership, which may be outside of our control, may trigger an ownership change, as may future equity offerings or acquisitions that have equity as a component of the purchase price.

We may enter into letters of intent, memoranda of understanding and other largely non-binding agreements with potential customers or partners that may not result in legally binding, definitive agreements.

From time to time, we may enter into letters of intent, memoranda of understanding and other largely non-binding agreements or understandings with potential customers or partners in order to develop our business and the markets that we serve. We can make no assurance that legally binding, definitive agreements reflecting the terms of such non-binding agreements will be completed with such customers or partners, or at all.

Competitiveness of our products for fuel use depends in part on government economic incentives for renewable energy projects or other related policies that could change.

We depend, in part, on international, federal, state and local government incentives, including but not limited to RINs, LCFS credits in California, Clean Fuel Program credits in Oregon, Renewable Energy Credits ("RECs"), rebates, tax credits and other incentives to end users, distributors, system integrators and manufacturers of renewable energy projects, that promote the use of renewable energy. These government economic incentives could be reduced or eliminated altogether, or the categories of renewable energy qualifying for such government economic incentives could be changed. These renewable energy program incentives are subject to regulatory oversight and could be administratively or legislatively changed in a manner that could have a material adverse effect on our operations. Reductions in, changes to, or eliminations or expirations of governmental incentives could result in decreased demand for, and lower revenues from, our projects and products.

In addition, we may be required to register our projects or qualify our products with the federal government, various states or other countries. Delays in obtaining registration or qualification of our projects or products could delay future revenues and could adversely affect our cash flows. Further, failure of our projects or products to qualify for government economic incentives could have a material adverse effect on our business.

Risks Related to Intellectual Property

Our ability to compete may be adversely affected if we are unsuccessful in defending against any claims by competitors or others that we are infringing upon their intellectual property rights.

The various bioindustrial markets in which we plan to operate are subject to frequent and extensive litigation regarding patents and other intellectual property rights. In addition, many companies in intellectual property-dependent industries, including the renewable energy industry, have employed intellectual property litigation as a means to gain an advantage over their competitors. As a result, we may be required to defend against claims of intellectual property infringement that may be asserted by our competitors against us and, if the outcome of any such litigation is adverse to us, it may affect our ability to compete effectively.

Litigation, interferences, opposition proceedings or other intellectual property proceedings inside and outside of the U.S. may divert management time from focusing on business operations, could cause us to spend significant amounts of money and may have no guarantee of success. Any future intellectual property litigation could also force us to do one or more of the following:

- stop selling, incorporating, manufacturing or using our products that use the subject intellectual property;
- obtain from a third party asserting its intellectual property rights, a license to sell or use the relevant technology, which license may not be available on reasonable terms, or at all;
- redesign those products or processes, such as our processes for producing isobutanol and ethanol, that use any allegedly infringing or misappropriated technology, which may result in significant cost or delay to us, or which redesign could be technically infeasible;
- pay attorneys' fees and expenses; or
- pay damages, including the possibility of treble damages in a patent case if a court finds us to have willfully infringed certain intellectual property rights.

We are aware of a significant number of patents and patent applications relating to aspects of our technologies filed by, and issued to, third parties. We cannot assure you that we will ultimately prevail if any of this third-party intellectual property is asserted against us.

Our ability to compete may be adversely affected if we do not adequately protect our proprietary technologies or if we lose some of our intellectual property rights through costly litigation or administrative proceedings.

Our success will depend in part on our ability to obtain patents and maintain adequate protection of our intellectual property covering our technologies and products and potential products in the U.S. and other countries. We have adopted a strategy of seeking patent protection in the U.S. and in certain foreign countries with respect to certain of the technologies used in or relating to our products and processes. We own rights to hundreds of issued patents and filed patent applications in the U.S. and in various foreign jurisdictions. When and if issued, patents would expire at the end of their term and any patent would only provide us commercial advantage for a limited period of time, if at all. Our patent applications are directed to our enabling technologies and to our methods and products which support our business in the advanced renewable fuels and renewable chemicals markets. We intend to continue to apply for patents relating to our technologies, methods and products as we deem appropriate.

Only some of the patent applications that we have filed in the U.S. or in any foreign jurisdictions, and only certain of the patent applications filed by third parties in which we own rights, have been issued. A filed patent application does not guarantee a patent will issue and a patent issuing does not guarantee its validity, nor does it give us the right to practice the patented technology or commercialize the patented product. Third parties may have or obtain rights to "blocking patents" that could be used to prevent us from commercializing our products or practicing our technology. The scope and validity of patents and success in prosecuting patent applications involve complex legal and factual questions and, therefore, issuance, coverage and validity cannot be predicted with any certainty. Patents issuing from our filed applications may be challenged, invalidated or circumvented. Moreover, third parties could practice our inventions in secret and in territories where we do not have patent protection. Such third parties may then try to sell or import products made using our inventions in and into the U.S. or other territories and we may be unable to prove that such products were made using our inventions. Additional uncertainty may result from implementation of the Leahy-Smith America Invents Act, enacted in September 2011, as well as other potential patent reform legislation passed by the U.S. Congress and from legal precedent handed down by the Federal Circuit Court and the U.S. Supreme Court, as they determine legal issues concerning the scope, validity and construction of patent claims. Because patent applications in the U.S. and many foreign jurisdictions are typically not published until 18 months after filing, or in some cases not at all, and because publication of discoveries in the scientific literature often lags behind the actual discoveries, there is additional uncertainty as to the validity of any patents that may issue and the potential for "blocking patents" coming into force at some future date. Accordingly, we cannot ensure that any of our currently filed or future patent applications will result in issued patents, or even if issued, predict the scope of the claims that may issue in our and other companies' patents. Any proceedings challenging our patents may result in the claims being amended or canceled. If the claims are amended or canceled, the scope of our patent claims may be narrowed, which may reduce the scope of protection afforded by our patent portfolio. Given that the degree of future protection for our proprietary rights is uncertain, we cannot ensure that (i) we were the first to make the inventions covered by each of our filed applications, (ii) we were the first to file patent applications for these inventions, (iii) the proprietary technologies we develop will be patentable, (iv) any patents issued will be broad enough in scope to provide commercial advantage and prevent circumvention, and (v) competitors and other parties do not have or will not obtain patent protection that will block our development and commercialization activities.

These concerns apply equally to patents we have licensed, which may likewise be challenged, invalidated or circumvented, and the licensed technologies may be obstructed from commercialization by competitors' "blocking patents." In addition, we generally do not control the patent prosecution and maintenance of subject matter that we license from others. Generally, the licensors are primarily or wholly responsible for the patent prosecution and maintenance activities pertaining to the patent applications and patents we license, while we may only be afforded opportunities to comment on such activities. Accordingly, we are unable to exercise the same degree of control over licensed intellectual property as we exercise over our own intellectual property and we face the risk that our licensors will not prosecute or maintain it as effectively as we would like.

In addition, unauthorized parties may attempt to copy or otherwise obtain and use our products or technology. Monitoring unauthorized use of our intellectual property is difficult, particularly where, as here, the end products reaching the market generally do not reveal the processes used in their manufacture, and particularly in certain foreign countries where the local laws may not protect our proprietary rights as fully as in the U.S., so we cannot be certain that the steps we have taken in obtaining intellectual property and other proprietary rights will prevent unauthorized use of our technology. If competitors are able to use our technology without our authorization, our ability to compete effectively could be adversely affected. Moreover, competitors and other parties such as universities may independently develop and obtain patents for technologies that are similar to or superior to our technologies. If that happens, the potential competitive advantages provided by our intellectual property may be adversely affected. We may then need to license these competing technologies, and we may not be able to obtain licenses on reasonable terms, if at all, which could cause material harm to our business. Accordingly, litigation may be necessary for us to assert claims of infringement, enforce patents we own or license, protect trade secrets or determine the enforceability, scope and validity of the intellectual property rights of others.

Our commercial success also depends in part on not infringing patents and proprietary rights of third parties, and not breaching any licenses or other agreements that we have entered into with regard to our technologies, products and business. We cannot be certain that patents have not or will not be issued to third parties that could block our ability to obtain patents or to operate our business as we would like, or at all. There may be patents in some countries that, if valid, may block our ability to commercialize products in those countries if we are unsuccessful in circumventing or acquiring rights to these patents. There may also be claims in patent applications filed in some countries that, if granted and valid, may also block our ability to commercialize products or processes in these countries if we are unable to circumvent or license them.

As is commonplace in the biotechnology industries, some of our directors, employees and consultants are or have been employed at, or associated with, companies and universities that compete with us or have or will develop similar technologies and related intellectual property. While employed at these companies, these employees, directors and consultants may have been exposed to or involved in research and technology similar to the areas of research and technology in which we are engaged. Though we have not received such a complaint, we may be subject to allegations that we, our directors, employees or consultants have inadvertently or otherwise used, misappropriated or disclosed alleged trade secrets or confidential or proprietary information of those companies. Litigation may be necessary to defend against such allegations and the outcome of any such litigation would be uncertain.

Under some of our research agreements, our partners share joint rights in certain intellectual property we develop. Such provisions may limit our ability to gain commercial benefit from some of the intellectual property we develop and may lead to costly or time-consuming disputes with parties with whom we have commercial relationships over rights to certain innovations.

If any other party has filed patent applications or obtained patents that claim inventions also claimed by us, we may have to participate in interference, derivation or other proceedings declared by the USPTO to determine priority of invention and, thus, the right to the patents for these inventions in the U.S. These proceedings could result in substantial cost to us even if the outcome is favorable. Even if successful, such a proceeding may result in the loss of certain claims. Even successful outcomes of such proceedings could result in significant legal fees and other expenses, diversion of management time and efforts and disruption in our business. Uncertainties resulting from initiation and continuation of any patent or related litigation could harm our ability to compete.

If our biocatalysts, or the genes that code for our biocatalysts, are stolen, misappropriated or reverse engineered, others could use these biocatalysts or genes to produce competing products.

Third parties, including our contract manufacturers, customers and those involved in shipping our biocatalysts, may have custody or control of our biocatalysts. If our biocatalysts, or the genes that code for our biocatalysts, were stolen, misappropriated or reverse engineered, they could be used by other parties who may be able to reproduce these biocatalysts for their own commercial gain. If this were to occur, it would be difficult for us to discover or challenge this type of use, especially in countries with limited intellectual property protection.

We may not be able to enforce our intellectual property rights throughout the world.

The laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the U.S. Many companies have encountered significant problems in protecting and enforcing intellectual property rights in certain foreign jurisdictions, and, particularly as we move forward in our partnerships with Praj and future international partners, we may face new and increased risks and challenges in protecting and enforcing our intellectual property rights abroad. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to bioindustrial technologies. This could make it difficult for us to stop the infringement of our patents or misappropriation of our other intellectual property rights. Proceedings to enforce our patents and other proprietary rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business. Accordingly, our efforts to enforce our intellectual property rights in such countries may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop.

Confidentiality agreements with employees and others may not adequately prevent disclosures of trade secrets and other proprietary information.

We rely in part on trade secret protection to protect our confidential and proprietary information and processes. However, trade secrets are difficult to protect. We have taken measures to protect our trade secrets and proprietary information, but these measures may not be effective. We require new employees and consultants to execute confidentiality agreements upon the commencement of an employment or consulting arrangement with us. These agreements generally require that all confidential information developed by the individual or made known to the individual by us during the course of the individual's relationship with us be kept confidential and not disclosed to third parties. These agreements also generally provide that know-how and inventions conceived by the individual in the course of rendering services to us shall be our exclusive property. Nevertheless, these agreements may not be enforceable, our proprietary information may be disclosed, third parties could reverse engineer our biocatalysts and others may independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets. Costly and time-consuming litigation could be necessary to enforce and determine the scope of our proprietary rights, and failure to obtain or maintain trade secret protection could adversely affect our competitive business position. In addition, an unauthorized breach in our information technology systems may expose our trade secrets and other proprietary information to unauthorized parties.

We have received funding from U.S. government agencies, which could negatively affect our intellectual property rights.

Some of our research has been funded by grants from U.S. government agencies. When new technologies are developed with U.S. government funding, the government obtains certain rights in any resulting patents and technical data, generally including, at a minimum, a nonexclusive license authorizing the government to use the invention or technical data for noncommercial purposes. U.S. government funding must be disclosed in any resulting patent applications, and our rights in such inventions will normally be subject to government license rights, periodic progress reporting, foreign manufacturing restrictions and march-in rights. March-in rights refer to the right of the U.S. government, under certain limited circumstances, to require us to grant a license to technology developed under a government grant to a responsible applicant or, if we refuse, to grant such a license itself. March-in rights can be triggered if the government determines that we have failed to work sufficiently towards achieving practical application of a technology or if action is necessary to alleviate health or safety needs, to meet requirements of federal regulations or to give preference to U.S. industry. If we breach the terms of our grants, the government may gain rights to the intellectual property developed in our related research. The government's rights in our intellectual property may lessen its commercial value, which could adversely affect our performance.

Risks Related to Legal and Regulatory

Any decline in the value of carbon credits associated with our products could have a material adverse effect on our results of operations, cash flow and financial condition.

The sale of our products is often dependent on the value of carbon credits under the RFS Program, LCFS and other similar regulatory regimes. The value of these credits fluctuates based on market forces outside of our control. There is a risk that the supply of low-carbon alternative fuels outstrips demand, resulting in the value of carbon credits declining. Any such declines could mean that the economic benefits from our efforts to de-carbonize the Luverne Facility might not be realized. Any decline in the value of carbon credits associated with our products could have a material adverse effect on our results of operations, cash flow and financial condition.

The U.S. renewable fuels industry is highly dependent upon certain federal and state legislation and regulation and any changes in legislation or regulation could have a material adverse effect on our results of operations, cash flows and financial condition.

The EPA has implemented the RFS Program pursuant to the Energy Policy Act of 2005 (the "Energy Policy Act") and the Energy Independence and Security Act of 2007. The RFS Program sets annual quotas for the quantity of renewable fuels that must be blended into motor fuels consumed in the U.S. The domestic market for renewable fuels is significantly impacted by federal mandates under the RFS Program for volumes of renewable fuels required to be blended with gasoline. Future demand for renewable fuels will be largely dependent upon incentives to blend renewable fuels into motor fuels, including the price of renewable fuels relative to the price of gasoline, the relative octane value of the renewable fuel, constraints in the ability of vehicles to use higher renewable fuel blends, the RFS Program and other applicable environmental requirements. Any significant increase in production capacity above the RFS Program minimum requirements may have an adverse impact on renewable fuel prices. Any change in government policies regarding the RFS Program could have a material adverse effect on our business and the results of our operations.

Waivers of the RFS minimum levels of renewable fuels included in motor fuels or of the requirements by obligated parties to comply with the regulations could have a material adverse effect on our results of operations. Under the Energy Policy Act, the U.S. Department of Energy, in consultation with the Secretary of Agriculture and the Secretary of Energy, may waive the renewable fuels mandate with respect to one or more states if the Administrator of the EPA determines that implementing the requirements would severely harm the economy or the environment of a state, a region or the nation, or that there is inadequate supply to meet the requirement. Additionally, the EPA has exercised the authority to waive the requirements of the RFS minimum levels for certain small refiners. Any waiver of the RFS minimum levels with respect to one or more states would reduce demand for renewable fuels and could cause our results of operations to decline and our financial condition to suffer. Further activity by the EPA to waive the requirements for small refiners could cause softening of pricing in the industry and cause our results of operations to similarly decline.

A critical state program is California's LCFS program, which is designed to reduce greenhouse gas emissions associated with transportation fuels used in California by ensuring that the fuel sold in California meets declining targets for such emissions. The regulation quantifies lifecycle greenhouse gas emissions by assigning a carbon intensity ("CI") score to each transportation fuel based on that fuel's lifecycle assessment. Each petroleum fuel provider, generally the fuel's producer or importer (the "Regulated Party"), is required to ensure that the overall CI score for its fuel pool meets the annual carbon intensity target for a given year. A Regulated Party's fuel pool can include gasoline, diesel, and their blend stocks and substitutes. This obligation is tracked through credits and deficits. Fuels with a CI score lower than the annual standard earn a credit, and fuels that are higher than the standard result in a deficit. Several other states also have or are considering adopting this model. Oregon's Clean Fuels Program, enacted in 2009 and implemented in 2016, operates using a credit system similar to the California LCFS program. Any changes to California's LCFS program or failure of other states to implement similar programs could have a material adverse effect on our business and the results of our operations.

We may face substantial delays in obtaining regulatory approvals for use of our renewable premium gasoline product, which could substantially hinder our ability to commercialize our renewable premium gasoline product in the U.S.

Commercialization of our renewable premium gasoline product in the U.S. requires approvals from state and/or federal agencies. Before we can sell our renewable premium gasoline product as a fuel or as a gasoline blendstock, we must obtain certain approvals or certifications from the EPA. There can be no assurances that the EPA will grant such approvals or certifications. Any delay or failure in receiving approval will slow or prevent the commercialization of our renewable premium gasoline product, which could have a material adverse effect on our business, financial condition and results of operations.

Additionally, California requires that fuels meet both its fuel certification requirements and a separate state low-carbon fuel standard. Any delay or failure in receiving approval for our renewable premium gasoline product will slow or prevent the commercialization of our renewable premium gasoline product, which could have a material adverse effect on our business, financial condition and results of operations.

There are also various third-party certification organizations, such as ASTM International and Underwriters' Laboratories, Inc., involved in standard-setting regarding the transportation, dispensing and use of liquid fuel in the U.S. and abroad. These organizations may change the current standards and additional requirements may be enacted that could prevent or delay approval of our renewable premium gasoline product. The process of seeking required approvals and the continuing need for compliance with applicable standards may require the expenditure of substantial resources, and there is no guarantee that we will satisfy these standards in a timely manner, if ever.

Our isobutanol product may encounter physical or regulatory issues that could limit its usefulness as a gasoline blendstock.

In the gasoline blendstock market, isobutanol can be used in conjunction with, or as a substitute for, ethanol and other widely used fuel oxygenates, and we believe our isobutanol is physically compatible with typical gasoline engines. However, there is a risk that under actual engine conditions, isobutanol will face significant limitations, making it unsuitable for use in high percentage gasoline blends. Additionally, current regulations limit gasoline blends to low percentages of isobutanol, and also limit combination isobutanol-ethanol blends. On June 12, 2018, the EPA announced that it approved the registration of isobutanol as a fuel additive for blending into gasoline at levels up to 16 volume percent for on-road automotive use. There can be no assurances that the EPA registration of isobutanol as a fuel additive for blending into gasoline at levels up to 16 volume percent will not be revoked or changed. Government agencies may maintain or even increase the restrictions on isobutanol gasoline blends. As we believe that the potential to use isobutanol in higher percentage blends than is feasible for ethanol will be an important factor in successfully marketing isobutanol to refiners, a low blend wall could significantly limit commercialization of isobutanol as a gasoline blendstock.

We may be required to obtain additional regulatory approvals for use of our iDGs as animal feed, which could delay our ability to sell iDGs increasing our net cost of production and harming our operating results.

Our production facilities and many of the ethanol plants that we might Retrofit use or will use dry-milled corn as a feedstock. We plan to sell, as animal feed, the iDGs left as a co-product of fermenting isobutanol from dry-milled corn. We believe that this will enable us to offset a significant portion of the expense of purchasing corn for fermentation. We are currently approved to sell iDGs as animal feed through the self-assessed GRAS process of the FDA via third party scientific review. In order to improve the value of our iDGs, we are working with The Association of American Feed Control Officials ("AAFCO") to establish a formal definition for our iDGs as well as clearance for the materials into animal feed. We believe obtaining AAFCO approval will increase the value of our iDGs by offering customers of our iDGs further assurance of the safety of our iDGs. If we make certain changes in our biocatalyst whereby we can no longer rely on our GRAS process, we would be required to obtain FDA approval for marketing our iDGs. While we believe we can rely on the GRAS process as we update our biocatalysts to increase isobutanol production, for further customer assurance, we also intend to pursue approval upon a completed biocatalyst from the Center for Veterinary Medicine of the FDA. FDA testing and approval can take a significant amount of time, and there is no guarantee that we will ever receive such approval. While we have sold initial quantities of our iDGs from the Luverne Facility, if FDA or AAFCO approval is delayed or never obtained, or if we are unable to secure market acceptance for our iDGs, our net cost of production will increase, which may hurt our operating results.

Reductions or changes to existing regulations and policies may present technical, regulatory and economic barriers, all of which may significantly reduce demand for renewable fuels or our ability to supply our products.

The market for renewable fuels is heavily influenced by foreign, federal, state and local government laws, regulations and policies. Changes in these laws, regulations and policies or how these laws, regulations and policies are implemented and enforced could cause the demand for renewable fuels to decline and deter investment in the research and development of renewable fuels.

Concerns associated with renewable fuels, including land usage, national security interests and food crop usage, continue to receive legislative, industry and public attention. This attention could result in future legislation, regulation and/or administrative action that could adversely affect our business. Any inability to address these requirements and any regulatory or policy changes could have a material adverse effect on our business, financial condition and results of operations.

Additionally, like the ethanol facilities that we Retrofit, our isobutanol and renewable hydrocarbon plants may emit GHG. Any changes in state or federal emissions regulations, including the passage of cap-and-trade legislation or a carbon tax, could limit our production of isobutanol, renewable hydrocarbon products and iDGs and increase our operating costs, which could have a material adverse effect on our business, financial condition and results of operations. The results of U.S. elections could lead to changes in federal or state laws and regulations that could have a material adverse effect on our business, prospects, financial condition and results of operations.

We use hazardous materials in our business and we must comply with environmental laws and regulations. Any claims relating to improper handling, storage or disposal of these materials or noncompliance with applicable laws and regulations could be time consuming and costly and could adversely affect our business and results of operations.

Our research and development processes involve the use of hazardous materials, including chemical, radioactive and biological materials. Our operations also produce hazardous waste. We cannot eliminate entirely the risk of accidental contamination or discharge and any resultant injury from these materials. Federal, state and local laws and regulations govern the use, manufacture, storage, handling and disposal of, and human exposure to, these materials. We may be sued for any injury or contamination that results from our use or the use by third parties of these materials, and our liability may exceed our total assets. Although we believe that our activities conform in all material respects with environmental laws, there can be no assurance that violations of environmental, health and safety laws will not occur in the future as a result of human error, accident, equipment failure or other causes. Compliance with applicable environmental laws and regulations may be expensive, and the failure to comply with past, present, or future laws could result in the imposition of fines, third-party property damage, product liability and personal injury claims, investigation and remediation costs, the suspension of production or a cessation of operations, and our liability may exceed our total assets. Liability under environmental laws can be joint and several and without regard to comparative fault. Environmental laws could become more stringent over time, imposing greater compliance costs and increasing risks and penalties associated with violations, which could impair our research, development or production efforts and harm our business.

Our expanded international activities may increase our exposure to potential liability under anti-corruption, trade protection, tax and other laws and regulations.

In the course of our relationships with Praj and other future international partners, we may become subject to certain foreign tax, environmental and health and safety regulations that did not previously apply to us or our products. Such regulations may be unclear, not consistently applied and subject to sudden change. Implementation of compliance policies could result in additional operating costs, and our failure to comply with such laws, even inadvertently, could result in significant fines and/or penalties.

Additionally, the Foreign Corrupt Practices Act and other anti-corruption laws and regulations (“Anti-Corruption Laws”) prohibit corrupt payments by our employees, vendors or agents. Even with implementation of policies, training and internal controls designed to reduce the risk of corrupt payments, our employees, vendors or agents may violate our policies. Our international partnerships may significantly increase our exposure to potential liability. Our failure to comply with Anti-Corruption Laws could result in significant fines and penalties, criminal sanctions against us, our officers or our employees, prohibitions on the conduct of our business, and damage to our reputation.

During the ordinary course of business, we may become subject to lawsuits or indemnity claims, which could materially and adversely affect our business and results of operations.

From time to time, we may in the ordinary course of business be named as a defendant in lawsuits, claims and other legal proceedings. These actions may seek, among other things, compensation for alleged personal injury, worker’s compensation, employment discrimination, breach of contract, property damages, civil penalties and other losses of injunctive or declaratory relief. In the event that such actions or indemnities are ultimately resolved unfavorably at amounts exceeding our accrued liability, or at material amounts, the outcome could materially and adversely affect our reputation, business and results of operations. In addition, payments of significant amounts, even if reserved, could adversely affect our liquidity position.

Risks Related to Owning Our Securities

The market price of our common stock may be adversely affected by the future issuance and sale of additional shares of our common stock or by our announcement that such issuances and sales may occur.

We cannot predict the size of future issuances or sales of shares of our common stock in connection with future acquisitions or capital raising activities, or the effect, if any, that such issuances or sales may have on the market price of our common stock. The issuance and sale of substantial amounts of shares of our common stock, or the announcement that such issuances and sales may occur, could adversely affect the market price of our common stock.

Future issuances of our common stock or instruments convertible or exercisable into our common stock may materially and adversely affect the price of our common stock and cause dilution to our existing stockholders.

Historically, we have raised capital by issuing common stock and warrants in underwritten public offerings because no other reasonable sources of capital were available. These underwritten public offerings of common stock and warrants have materially and adversely affected the prevailing market prices of our common stock and caused significant dilution to our stockholders. We have also historically raised capital or refinanced outstanding debt through the issuance of convertible notes.

We may need to raise capital through these public offerings of common stock, warrants and convertible debt in the future.

We may obtain additional funds through public or private debt or equity financings, subject to certain limitations in the agreements governing our indebtedness. If we issue additional shares of common stock or instruments convertible into common stock, it may materially and adversely affect the price of our common stock. In addition, the exercise of some or all of our warrants may dilute the ownership interests of our stockholders, and any sales in the public market of any of our common stock issuable upon such conversion or exercise could adversely affect prevailing market prices of our common stock.

Our stock price may be volatile, and your investment in our securities could suffer a decline in value.

The market price of shares of our common stock has experienced significant price and volume fluctuations. We cannot predict whether the price of our common stock will rise or fall. A variety of factors may have a significant effect on our stock price, including:

- actual or anticipated fluctuations in our liquidity, financial condition and operating results;
- the position of our cash and cash equivalents;
- the capital costs required to construct the Net-Zero 1 Project;
- our ability to obtain certain regulatory permits or approvals for our production facilities, including the Net-Zero 1 Project;
- the impact of the novel coronavirus (COVID-19) pandemic to our business, our financial condition, our results of operation and liquidity;
- actual or anticipated changes in our growth rate relative to our competitors;
- actual or anticipated fluctuations in our competitors' operating results or changes in their growth rate;
- announcements of technological innovations by us, our partners or our competitors;
- announcements by us, our partners or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- the entry into, modification or termination of licensing arrangements, marketing arrangements, and/or research, development, commercialization, supply, off-take or distribution arrangements;
- our ability to consistently produce commercial quantities of isobutanol, renewable hydrocarbon products and ethanol at the Luverne Facility, the planned Expanded Facility and the ramp up production to nameplate capacity;
- additions or losses of customers or partners;
- our ability to obtain certain regulatory approvals for the use of our isobutanol and ethanol in various fuels and chemicals markets;
- commodity prices, including oil, ethanol and corn prices;
- additions or departures of key management or scientific personnel;
- competition from existing products or new products that may emerge;
- issuance of new or updated research reports by securities or industry analysts;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- litigation involving us, our general industry or both;
- disputes or other developments related to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- announcements or expectations of additional financing efforts or the pursuit of strategic alternatives;
- changes in existing laws, regulations and policies applicable to our business and products, and the adoption of or failure to adopt carbon emissions regulation;
- sales of our common stock or equity-linked securities, such as warrants, by us or our stockholders;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- general market conditions in our industry; and
- general economic and market conditions, including as a result of the COVID-19 pandemic.

Furthermore, the stock markets have experienced extreme price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market and industry fluctuations, as well as general economic, political and market conditions such as recessions, interest rate changes or international currency fluctuations, may negatively impact the market price of shares of our common stock, regardless of our operating performance, and cause the value of your investment to decline.

Additionally, in the past, companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation or other derivative shareholder lawsuits. We may be the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business regardless of the outcome.

The price of our common stock could also be affected by possible sales of common stock by investors who view our warrants as a more attractive means of equity participation in us and by hedging or engaging in arbitrage activity involving our common stock. The hedging or arbitrage could, in turn, affect the trading prices of our warrants, if any trading market becomes established, or any common stock that holders receive upon exercise of such warrants.

Sales of a substantial number of shares of our common stock or securities linked to our common stock, such as our warrants (should an established market for such securities then exist), in the public market could occur at any time. These sales, or the perception in the market that such sales may occur, could reduce the market price of our common stock.

In addition, certain holders of our outstanding common stock have rights, subject to certain conditions, to require us to file registration statements covering their shares and to include their shares in registration statements that we may file for ourselves or other stockholders.

Our quarterly operating results may fluctuate in the future. As a result, we may fail to meet or exceed the expectations of investment research analysts or investors, which could cause our stock price to decline.

Our financial condition and operating results have varied significantly in the past and may continue to fluctuate from quarter to quarter and year to year in the future due to a variety of factors, many of which are beyond our control. Factors relating to our business that may contribute to these fluctuations are described in this Report and other reports that we have filed with the SEC. Accordingly, the results of any prior quarterly or annual periods should not be relied upon as indications of our future operating performance.

The estimates and assumptions on which our financial projections are based may prove to be inaccurate, which may cause our actual results to materially differ from such projections, which may adversely affect our future profitability, cash flows and stock price.

Our financial projections, including any projected investment returns on projects, sales or earnings guidance or outlook we may provide from time to time, are dependent on certain estimates and assumptions related to, among other things, , industry growth, product and plant development, estimated capital expenses for growth development projects, market share projections, product pricing and sale, customer interest in our products, availability of government incentives, tax rates, accruals for estimated liabilities, , and our ability to raise sufficient funds or generate sufficient cash flow to continue operations and/or expand our production capabilities. Our financial projections are based on historical experience and on various other estimates and assumptions that we believe to be reasonable under the circumstances and at the time they are made, and our actual results may differ materially from our financial projections, especially in light of the increased difficulty in making such estimates and assumptions as a result of the COVID-19 pandemic. Any material variation between our financial projections and our actual results may adversely affect our financial future profitability, cash flows and stock price.

Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies.

We may seek additional capital through a combination of public and private equity offerings, debt financings, strategic partnerships and licensing arrangements. To the extent that we raise additional capital through the sale or issuance of equity, warrants or convertible debt securities, the ownership interest of our existing shareholders will be diluted, and the terms of such securities may include liquidation or other preferences that adversely affect your rights as a stockholder. If we raise capital through debt financing, it may involve agreements that include covenants further limiting or restricting our ability to take certain actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through strategic partnerships or licensing agreements with third parties, we may have to relinquish valuable rights to our technologies or grant licenses on terms that are not favorable to us. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our development and commercialization efforts.

We may pay vendors in stock as consideration for their services, which may result in additional costs and may cause dilution to our existing stockholders.

In order for us to preserve our cash resources, we may in the future pay vendors, including technology partners, in shares, warrants or options to purchase shares of our common stock rather than cash. Payments for services in stock may materially and adversely affect our stockholders by diluting the value of outstanding shares of our common stock. In addition, in situations where we agree to register the shares issued to a vendor, this will generally cause us to incur additional expenses associated with such registration.

We do not anticipate paying cash dividends, and accordingly, stockholders must rely on stock appreciation for any return on their investment.

We have never paid cash dividends on our common stock and we do not expect to pay cash dividends on our common stock at any time in the foreseeable future. The future payment of dividends directly depends upon our future earnings, capital requirements, financial requirements and other factors that our board of directors will consider. As a result, only appreciation of the price of our common stock, which may never occur, will provide a return to stockholders. Investors seeking cash dividends should not invest in our common stock.

If securities or industry analysts do not publish research or reports about our business, or publish negative reports about our business, our stock price and trading volume could decline. The trading market for our common stock will be influenced by the research and reports that securities or industry analysts publish about us or our business.

We do not have any control over securities or industry analysts. If one or more of the analysts who cover us downgrade our common stock or change their opinion of our common stock, our common stock price would likely decline which in turn would likely cause a decline in the value of our warrants. If one or more of these analysts cease coverage of us or fail to regularly publish reports on us, we could lose visibility in the financial markets, which could cause our common stock price and the price of our warrants to decline or the trading volume of our common stock to decline.

We are subject to anti-takeover provisions in our amended and restated certificate of incorporation, our amended and restated bylaws and under Delaware law that could delay or prevent an acquisition of the Company, even if the acquisition would be beneficial to our stockholders.

Provisions in our amended and restated certificate of incorporation and our amended and restated bylaws may delay or prevent an acquisition of the Company. Among other things, our amended and restated certificate of incorporation and amended and restated bylaws provide for a board of directors that is divided into three classes with staggered three-year terms, provide that all stockholder action must be effected at a duly called meeting of the stockholders and not by a consent in writing, and further provide that only our board of directors may call a special meeting of the stockholders. These provisions may also frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors, who are responsible for appointing the members of our management team. Furthermore, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law (the "DGCL"), which prohibits, with some exceptions, stockholders owning in excess of 15% of our outstanding voting stock from merging or combining with us. Finally, our charter documents establish advance notice requirements for nominations for election to our board of directors and for proposing matters that can be acted upon at stockholder meetings. Although we believe these provisions together provide an opportunity to receive higher bids by requiring potential acquirers to negotiate with our board of directors, they would apply even if an offer to acquire the Company may be considered beneficial by some stockholders.

Our amended and restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, or employees.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware shall, unless we consent in writing to the selection of an alternative forum, be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Company, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Company to the Company or its stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, or (iv) any action asserting a claim governed by the internal affairs doctrine, in each case subject to said Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein.

The exclusive forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers, employees or agents, which may discourage such lawsuits against us and our directors, officers, employees and agents. Stockholders who do bring a claim in the Court of Chancery could face additional litigation costs in pursuing any such claim, particularly if they do not reside in or near the State of Delaware. The Court of Chancery may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments or results may be more favorable to us than to our stockholders. Alternatively, if a court were to find the choice of forum provision contained in our certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business and financial condition. Notwithstanding the foregoing, the exclusive forum provision shall not preclude or contract the scope of exclusive federal or concurrent jurisdiction for actions brought under the Exchange Act or the Securities Act, or the respective rules and regulations promulgated thereunder.

Any person or entity purchasing or otherwise acquiring any interest in any of our securities shall be deemed to have notice of and consented to these provisions. This exclusive forum provision may limit a stockholder's ability to bring a claim in a judicial forum of its choosing for disputes with us or our directors, officers or other employees, which may discourage lawsuits against us and our directors, officers and other employees.

If a court were to find the exclusive forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, results of operations, and financial condition. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management and other employees.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our corporate headquarters and research and development laboratories, included in our Gevo, Inc, segment, are located in Englewood, Colorado. Our lease terminates in July 2021. The leased space is approximately 19,241 square feet. We believe that the facility will be adequate for our needs for the immediate future and that, should it be needed, additional space can be leased to accommodate any future growth.

We own and operate an isobutanol and ethanol production facility located in Luverne, Minnesota on approximately 55 acres of land, which contains approximately 50,000 square feet of building space. The production facility was originally constructed in 1998.

Item 3. Legal Proceedings

From time to time, we have been and may again become involved in legal proceedings arising in the ordinary course of our business. We are not presently a party to any litigation that we believe to be material and we are not aware of any pending or threatened litigation against us that we believe could have a material adverse effect on our business, operating results, financial condition or cash flows.

Item 4. Mine Safety Disclosures

Not Applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities Market for Common Stock

The Company's common stock is listed and traded on the Nasdaq Capital Market under the symbol "GEVO".

Holders of Record

As of February 26, 2021, there were approximately 34 holders of record of our common stock. We believe that the number of beneficial owners is substantially greater than the number of record holders because a large portion of our common stock is held of record through brokerage firms in "street name."

Dividends

No cash dividends have been paid on our common stock to date, nor do we anticipate paying dividends in the foreseeable future. Any future determination to declare cash dividends on our common stock will be made at the discretion of our Board of Directors, subject to compliance and limitations under our debt arrangements in effect at such time.

Recent Sales of Unregistered Securities; Use of Proceeds from Registered Securities

None.

Purchases of Equity Securities by the Issuer

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number of Shares that May Yet Be Purchased Under the Plans or Programs
October 1, 2020 to October 31, 2020	—	$ —	—	—
November 1, 2020 to November 30, 2020	—	$ —	—	—
December 1, 2020 to December 31, 2020 (1)	9,834	$ 2.17	—	—
Total	9,834	$ 2.17	—	—

(1) Represents shares withheld from employees to cover tax withholding obligations upon the vesting of restricted stock awards. The average prices listed in the above table are averages of the fair market prices at which we valued shares withheld for purposes of calculating the number of shares to be withheld.

Performance Graph

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide information under this item.

Item 6. Selected Financial Data

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide information under this item.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

Company Overview

We are a growth-oriented renewable fuels technology and development company that is commercializing the next generation of renewable low-carbon liquid transportation fuels, such as sustainable aviation fuel and renewable isooctane (which we refer to as "renewable premium gasoline"), with the potential to achieve a "net zero" greenhouse gas footprint and address global needs of reducing GHG emissions with sustainable alternatives to petroleum fuels. Our technology transforms carbon from the atmosphere using photosynthetic energy, wind energy and biogas energy into liquid hydrocarbons with a low or potentially "net-zero" GHG footprint.

As next generation renewable fuels, our hydrocarbon transportation fuels have the advantage of being "drop-in" substitutes for conventional fuels that are derived from crude oil, working seamlessly and without modification in existing fossil-fuel based engines, supply chains and storage infrastructure. In addition, with SAF, the carbon footprint of air travel can be reduced, or in the long run, eliminated on a net carbon basis, without change to planes or fuel systems. In addition to the potential of net-zero carbon emissions across the whole fuel life-cycle, our renewable fuels eliminate other pollutants associated with the burning of traditional fossil fuels such as particulates and sulfur, while delivering superior performance. We believe that the world is substantially under-supplied with low-carbon, drop-in renewable fuels that can be immediately used in existing transportation engines and infrastructure, and we are uniquely positioned to grow in serving that demand.

We use low-carbon, renewable resource-based raw materials as feedstocks. In the near-term, our feedstocks will primarily consist of non-food corn. As our technology is applied globally, feedstocks can consist of sugar cane, molasses or other cellulosic sugars derived from wood, agricultural residues and waste. Our patented fermentation yeast biocatalyst produces isobutanol, a four-carbon alcohol, via the fermentation of renewable plant biomass carbohydrates. The resulting renewable isobutanol has a variety of direct applications but, more importantly to our fundamental strategy, serves as a building block to make renewable isooctane (which we refer to as renewable premium gasoline) and SAF using simple and common chemical conversion processes. We also plan to reduce or eliminate fossil-based process energy inputs by replacing them with renewable energy such as wind-powered electricity and renewable natural gas.

Our technology represents a new generation of renewable fuel technology that overcomes the limitations of first-generation renewable fuels.

Net-Zero Projects

In early 2021, we announced the concept of "Net-Zero Projects" for the production of energy dense liquid hydrocarbons using renewable energy and our proprietary technology. The concept of a Net-Zero Project is to convert renewable energy (photosynthetic, wind, renewable natural gas, biogas) from a variety of sources into energy dense liquid hydrocarbons, that when burned in traditional engines, have the potential to achieve net-zero GHG emissions across the whole lifecycle of the liquid fuel: from the way carbon is captured from the atmosphere, processed to make liquid fuel products, and including the end use (burning as a fuel for cars, planes, trucks, and ships). We announced that our project is currently planned to be constructed at Lake Preston, South Dakota will be the first Net-Zero Project (the "Net-Zero 1 Project"). We expect that the Net-Zero 1 Project will have the capability to produce liquid hydrocarbons that when burned have a "net-zero" greenhouse gas footprint. We currently expect the Net-Zero 1 Project to have a capacity of 45 MGPY of hydrocarbons (for renewable premium gasoline and SAF, based on current take-or-pay contracts), to produce more than 350,000,000 pounds per year of high protein feed products for use in the food chain, to produce enough renewable natural gas to be self-sufficient for the production process needs, and also to generate renewable electricity with a combined heat and power system. We also expect that the Net-Zero 1 Project will utilize wind energy. Based on current engineering work completed to date, the unleveraged capital cost for the Net-Zero 1 Project is projected to be on the order of $650 million, including the hydrocarbon production and related renewable energy infrastructure which includes anaerobic digestion to produce biogas to run our plant and generate some electricity on-site.

Recent Developments

SAS Amendment. In February 2021, we signed an amendment to our Fuel Sales Agreement with Scandinavian Airlines System ("SAS") to supply 5 million gallons per year of SAF beginning in 2024.

Lake Preston Site. On December 21, 2020, we announced that we optioned the right to purchase approximately 240 acres of land near Lake Preston, SD (the "Lake Preston Site"). The Lake Preston Site is expected to be the location of the Net-Zero 1 Project. We intend to make a decision on whether to purchase the Lake Preston Site in the future as part of the Citigroup led project financing process.

Senior Secured Debt. On December 31, 2020, we reported that all obligations under its 12% convertible senior secured notes due 2020/2021 (the "2020/21 Notes") had been fully paid and satisfied, and the 2020/21 Notes and the related indenture have been terminated in accordance with its terms at maturity on December 31, 2020.

On July 10, 2020, the holders of the 2020/21 Notes converted $2.0 million in aggregate outstanding principal amount of 2020/21 Notes (including the applicable make-whole payment) into an aggregate of 4,169,426 shares of common stock. In December 2020, the holders of the 2020/21 Notes converted the remaining $12.7 million in aggregate outstanding principal amount of 2020/21 Notes (including the applicable make-whole payment) into an aggregate of 5,672,654 shares of common stock pursuant to the terms of the indenture, which represented the entire outstanding principal amount of the 2020/21 Notes.

At-the-Market Offering Program. On December 30, 2020, the at-the-market offering program was amended to provide available capacity under the at-the-market offering program of $150.0 million.

During the year ended December 31, 2020, we issued 3,518,121 shares of common stock under the at-the-market offering program for total proceeds of $8.4 million, net of commissions and other offering related expenses. During the period January 1, 2021 to February 26, 2021, we issued

24,420,579 shares of common stock under the at-the-market offering program for total proceeds of $135.8 million, net of commissions and other offering related expenses.

January 2021 Offering. On January 19, 2021, we completed a registered direct offering of common stock priced at-the-market under Nasdaq rules of an aggregate of 43,750,000 shares of common stock at a purchase price of $8.00 per share. After deducting placement agent's fees, advisory fees and other offering expenses payable by us, we received net proceeds of approximately $321.7 million.

COVID-19

The COVID-19 pandemic has had an adverse impact on global commercial activity, including the global transportation industry and its supply chain, and has contributed to significant volatility in financial markets. It has also resulted in increased travel restrictions and extended shutdowns of businesses in various industries including, among others, the airline industry, and significantly reduced overall economic output. It is possible that that the impact of the COVID-19 pandemic on general economic activity could negatively impact our revenue and operating results for 2021 and beyond. In light of the current and potential future disruption to our business operations and those of its customers, suppliers and other third parties with whom we do business, we considered the impact of the COVID-19 pandemic on our business. The impact of the COVID-19 pandemic on the global transportation industry could continue to result in less demand for our transportation fuel products, which could have a material adverse effect on our business, financial condition and our prospects for the foreseeable future. The suspension of ethanol production at our Luverne Facility and reduction in our workforce during the first quarter of 2020 due to the impact of COVID-19 had an adverse impact on our financial results for the fiscal year ended 2020 reducing revenue by 77% compared to 2019. There is also a risk that COVID-19 could have a material adverse impact on the development of our Net-Zero 1 Project, customer demand and cash flow, depending on the extent of our future production activities.

Results of Operations

The following discussion of our financial condition and results of operations should be read in conjunction with our Consolidated Financial Statements and the notes to those Consolidated Financial Statements appearing in this Report. This discussion contains forward-looking statements that involve significant risks and uncertainties. As a result of many factors, such as those set forth under "Risk Factors" in Part I, Item 1A of this Report, our actual results may differ materially from those anticipated in these forward-looking statements.

This section of this Report discusses year-to-year comparisons between 2020 and 2019, as well as other discussions of 2020 and 2019 items. We have omitted discussion of the year ended December 31, 2018 (the earliest of the three years covered by our Consolidated Financial Statements presented in this Report) as permitted by the SEC's recent amendments to Regulation S-K. The complete Management's Discussion and Analysis of Financial Condition and Results of Operations for year-to-year comparisons between 2019 and 2018 and other discussions of 2018 items can be found within Part II, Item 7, to our Annual Report on Form 10-K filed with the SEC on March 17, 2020, which is available free of charge on the SEC's website at www.sec.gov and our corporate website at www.gevo.com.

Comparison of the years ended December 31, 2020 and 2019
(in thousands)

	Years Ended December 31,		
	2020	**2019**	**Change**
Revenue and cost of goods sold			
Ethanol sales and related products, net	$ 3,809	$ 22,115	$ (18,306)
Hydrocarbon revenue	1,501	2,338	(837)
Grant and other revenue	226	34	192
Total revenues	5,536	24,487	(18,951)
Cost of goods sold	15,003	36,733	(21,730)
Gross loss	(9,467)	(12,246)	2,779
Operating expenses			
Research and development expense	4,086	4,020	66
Selling, general and administrative expense	12,528	10,085	2,443
Restructuring charges	254	—	254
Total operating expenses	16,868	14,105	2,763
Loss from operations	(26,335)	(26,351)	16
Other (expense) income			
Interest expense	(2,094)	(2,732)	638
(Loss) from modification of 2020 Notes	(732)	—	(732)
(Loss) on conversion of 2020/21 Notes to common stock	(1,916)	—	(1,916)
(Loss) gain from change in fair value of 2020/21 Notes and 2020 Notes embedded derivative liability	(8,607)	394	(9,001)
(Loss) gain from change in fair value of derivative warrant liability	(23)	14	(37)
Other income (expense)	(479)	15	(494)
Total other (expense) income	(13,851)	(2,309)	(11,542)
Net loss	**$ (40,186)**	**$ (28,660)**	**$ (11,526)**

Revenue. During the year ended December 31, 2020, we recognized revenue of $5.5 million associated with the sale of 2.4 million gallons of ethanol, as well as isobutanol and related products, a decrease of $19.0 million from the year ended December 31, 2019. This decrease was primarily the result of terminating ethanol and distiller's grains production at the Luverne Facility in March 2020 as a result of COVID-19 and in response to an unfavorable commodity environment. Our Luverne Facility is currently shut down until further notice. Currently, the South Hampton Facility is not producing renewable premium gasoline or jet fuel. We expect to produce isobutanol in intermittent campaigns during 2021 to supply the South Hampton Facility so that renewable premium gasoline or jet fuel can be produced in 2021.

Hydrocarbon revenues are comprised of SAF, isooctane and isooctene sales. Hydrocarbon revenue decreased $0.8 million during the year ended December 31, 2020 primarily as a result of fewer shipments of finished products from the South Hampton Facility.

Cost of goods sold. Our cost of goods sold decreased $21.7 million during the year ended December 31, 2020 compared to the prior year. Production was decreased compared to the prior year due to terminating ethanol production in March 2020 as a result of COVID-19 and in response to an unfavorable commodity environment. Cost of goods sold during the year ended December 31, 2020 included $9.3 million associated with the production of isobutanol, ethanol and related products and $5.7 million in depreciation expense. Cost of goods sold during the year ended December 31, 2019 included $30.4 million associated with the production of isobutanol, ethanol and related products and $6.3 million in depreciation expense.

Until the Luverne Facility restarts production, cost of goods sold will primarily be comprised of costs to process SAF, isooctane and isooctene at our South Hampton Facility as well as costs to maintain the Luverne Facility.

Research and development expense. We continue to develop technologies for the production of isobutanol. Research and development expenses stayed relatively flat during the year ended December 31, 2020 compared to the prior year.

Selling, general and administrative expense. Selling, general and administrative expenses increased $2.4 million during the year ended December 31, 2020 compared to the prior year, primarily due to increases of $1.5 million in personal cost attributed to increased hiring, increases of $0.9 million in consulting service due to related regulatory requirements, marketing and investor relations expenditures and increases in insurance cost totaling $0.5 million, offset by a reduction $0.4 million in travel expenses due to COVID-19.

Restructuring Costs. During the year ended December 31, 2020, we incurred $0.3 million of restructuring charges related to the restructuring of Agri-Energy in response to COVID-19, termination of employees at Agri-Energy and Gevo and renegotiating contracts.

Interest expense. Interest expense during the year ended December 31, 2020 was $2.1 million as compared to $2.7 million during the year ended December 31, 2019. The decrease of $0.6 million of interest expense was due to lower amortization of original issue discounts and debt issuance costs and conversion of $2.0 million of 2020/21 Notes into common stock during July 2020. The remaining $12.7 million of 2020/21 Notes was converted to common stock during December 2020.

(Loss) from modification of 2020 Notes. During the year ended December 31, 2020, we incurred $0.7 million of legal and professional fees to modify the 12% Convertible Senior Notes due 2020, which were issued to WB Gevo, Ltd. and its affiliates in June 2017 (the "2020 Notes"), into the 2020/21 Notes.

(Loss) on conversion of 2020/21 Notes. During the year ended December 31, 2020, we incurred a $1.9 million loss related to the conversion of $2.0 million of 2020/21 Notes into common stock during July 2020 and $12.7 million of 2020/21 Notes into common stock during December 2020, which reflects the cost of the make-whole payments.

(Loss) gain from change in fair value of the 2020/21 Notes and 2020 Notes embedded derivative liability. During the year ended December 31, 2020, we recognized a noncash loss of $8.6 million related to the 2020/21 Notes embedded derivative liability as a result of increasing stock price at the time that the 2021/21 Notes were converted into common stock. The loss recorded is the result of the change in fair value between the beginning of the period and the end of the period, or the date on which the derivative liability was extinguished through conversion.

Sources of Our Revenues

Our revenues are primarily derived from: (i) the sale of isobutanol and related products; (ii) hydrocarbon sales consisting primarily of the sale of SAF and isooctane derived from our isobutanol for purposes of certification and testing; and (iii) government grants and research and development programs.

Principal Components of Our Cost Structure

Cost of Goods Sold. Our cost of goods sold consists primarily of costs directly associated with the production of isobutanol at the Luverne Facility and production of biojet fuel and isooctane at the South Hampton Facility. Such costs include direct materials, direct labor, depreciation, other operating costs and certain plant overhead costs. Direct materials include corn feedstock, denaturant and process chemicals. Direct labor includes compensation of personnel directly involved in production operations at the Luverne Facility. Other operating costs include utilities and natural gas usage.

Research and Development. Our research and development costs consist of expenses incurred to identify, develop and test our technologies for the production of isobutanol and the development of downstream applications thereof. Research and development expenses include personnel costs (including stock-based compensation), consultants and related contract research, facility costs, supplies, depreciation and amortization expense on property, plant and equipment used in product development, license fees paid to third parties for use of their intellectual property and patent rights and other overhead expenses incurred to support our research and development programs.

Selling, General and Administrative. Selling, general and administrative expenses consist of personnel costs (including stock-based compensation), consulting and service provider expenses (including patent counsel-related costs), legal fees, marketing costs, insurance costs, occupancy-related costs, depreciation and amortization expenses on property, plant and equipment not used in our product development programs or recorded in cost of goods sold, travel and relocation expenses and hiring expenses.

Interest Expense. Our senior secured notes had a fixed interest rate of 12%. As of December 31, 2020, the 2020/21 Notes were repaid in full.

Liquidity and Capital Resources

Since our inception in 2005, we have devoted most of our cash resources to manufacturing ethanol, isobutanol and related products, research and development and selling, general and administrative activities related to the commercialization of isobutanol, as well as related products from renewable feedstocks. We have incurred losses since inception and expect to incur losses through at least 2022. We have financed our operations primarily with proceeds from multiple sales of equity and debt securities, borrowings under debt facilities and product sales.

We have incurred consolidated net losses since inception and had a significant accumulated deficit as of December 31, 2020. Our cash and cash equivalents as of December 31, 2020 totaled $78.3 million. As noted above, in January 2021, we raised $321.7 million through a registered direct offering. We also raised $135.8 million during the period January 1, 2021 to February 26, 2021 through its At-the-Market Offering Programs. Our transition to profitability is dependent upon the successful development of the Net-Zero 1 Project and the achievement of a level of revenues adequate to support our cost structure. We may never achieve profitability or generate positive cash flows, and unless and until we do, we may need to raise additional cash by issuing securities. There can be no assurance that we will be able to raise additional funds or achieve or sustain profitability or positive cash flows from operations.

The following table sets forth the major sources and uses of cash for each of the periods set forth below (in thousands):

	Year Ended December 31,	
	2020	2019
Net cash used in operating activities	$ (19,338)	$ (20,839)
Net cash used in investing activities	(5,905)	(7,457)
Net cash provided by financing activities	87,279	10,864

Operating Activities

Our primary uses of cash from operating activities are personnel related expenses and research and development-related expenses including costs incurred under development agreements, costs of licensing of technology, legal-related costs, expenses for production of isobutanol, ethanol and related products, logistics and further processing of isobutanol and ethanol at the Luverne Facility and for the operation of our South Hampton Facility.

During the year ended December 31, 2020, net cash used for operating activities was $19.3 million compared to $20.8 million for the year ended December 31, 2019. The $1.5 million decrease in operating cash flows was primarily due to reduced production at the Luverne Facility, as discussed below, offset by increased engineering and development costs for our RNG project. During the first quarter of 2020, we terminated our ethanol production at the Luverne Facility due to COVID-19 and an unfavorable commodity environment, largely the result of greater corn costs as compared to national markets than the region has historically produced. We are currently maintaining the Luverne Facility until we arrange financing of its expansion for the production of hydrocarbons.

During the year ended December 31, 2019, we used $20.8 million in cash for operating activities due to a net loss of $28.7 million, excluding the impact of $9.1 million in non-cash expenses and $1.2 million net cash increase associated with a decrease in working capital primarily a result of a decreases in both receivables and inventories.

We currently plan to spend approximately $50 million - $60 million over the next 12 months for engineering and development costs related to our RNG and Net-Zero 1 projects and other business initiatives.

Investing Activities

During the year ended December 31, 2020, we used $5.9 million in cash for investing activities, including $1.0 million related to capital expenditures at our Luverne Facility related to dry fractionation and hydrocarbon skid equipment and $4.5 million related to our RNG project. We are installing equipment to fractionate distillers grains at the Luverne Facility totaling approximately $2.0 million as of December 31, 2020. The cost of the fractionation machine and the thermal dryer have been funded with financing leases. No amounts are payable on this financing lease until the equipment is operational. The fractionation machine is expected to be operational in the first half of 2023.

We are developing an RNG project comprised of anaerobic digesters to be located at three dairy farms in northwest Iowa, plus associated gas upgrading equipment, to supply our Net Zero 1 project with renewable thermal energy upon its startup in 2024. We expect to finance the RNG project with approximately $69 million of private activity bonds during the first half of 2021. Agri-Energy is expected to have a purchase option on approximately 50% of the RNG project's estimated annual 350,000 MMBtu of RNG production. The RNG project is expected to be operational in early 2022, subject to securing adequate financing to complete the RNG project.

We are also evaluating whether to install approximately $20.0 million of manufacturing equipment at our Luverne Facility that is intended to support the development of a 1 MGPY hydrocarbon production facility and to reduce the cost of producing isobutanol. If we decide to move forward with this project, the manufacturing equipment is expected to be operational in the first half of 2022. We anticipate equipment financing the hydrocarbon manufacturing equipment and funding the isobutanol production improvements with equity.

During the year ended December 31, 2019, we used $7.5 million in cash for investing activities including $6.0 million related to capital expenditures at our Luverne Facility and $1.5 million investment in Juhl.

Financing Activities

During the year ended December 31, 2020, we generated $87.3 million in cash from financing activities, which primarily consisted of $8.4 million of net proceeds under our "at-the-market" offering program, receiving $16.1 million from the sale of common stock and warrants in the July 2020 Offering, $45.8 million from the sale of common stock and pre-funded warrants in the August 2020 Offering, $17.1 million from the exercise of the Series 2020-A Warrants, the Series 2020-B Warrants and the Series 2020-C Warrants, and $1.0 million from the Small Business Administration's Paycheck Protection Program discussed below, offset by $0.5 million paid on loans payable - other.

On July 6, 2020, we completed a public offering (the “July 2020 Offering”) of (i) 20,896,666 Series 1 units (the “Series 1 Units”) at a price of $0.60 per Series 1 Unit, and (ii) 9,103,334 Series 2 units (the “Series 2 Units”) at a price of $0.59 per Series 2 Unit. The net proceeds to us from the July 2020 Offering were approximately $16.1 million, after deducting placement agent fees and other estimated offering expenses payable by the Company, and not including any future proceeds from the exercise of the Warrants. The Company intends to use the net proceeds from the July 2020 Offering to fund working capital and for other general corporate purposes. See Note 1, *Nature of Business, Financial Condition and Basis of Presentation*, to our consolidated financial statements included herein for additional information regarding the July 2020 Offering. As of December 31, 2020, all of the Series 2020-B warrants were exercised.

During the year ended December 31, 2020, the Company received notices of exercise from holders of our Series 2020-A Warrants to issue an aggregate of 28,042,834 shares of common stock for total gross proceeds of approximately $16.8 million. During the period January 1, 2021 to February 26, 2021, the Company received notices of exercise from holders of our Series 2020-A Warrants to issue an aggregate of 1,863,058 shares of common stock for total gross proceeds of approximately $1.1 million. Following these exercises, Series 2020-A Warrants to purchase 94,108 shares of the Company's common stock remain outstanding at an exercise price of $0.60 per share as of February 26, 2021.

On August 25, 2020, we completed a registered direct offering pursuant to a securities purchase agreement with certain institutional and accredited investors providing for the issuance and sale by us of an aggregate of (i) 21,929,313 shares of our common stock (the “Shares”) at a price of $1.30 per share, and (ii) 16,532,232 pre-funded Series 2020-C warrants to purchase one share of our common stock (each, a “Series 2020-C Warrant”) at a price of $1.29 per Series 2020-C Warrant, in a registered direct offering (the “August 2020 Offering”). The net proceeds from the August 202 Offering were approximately $45.8 million, after deducting placement agent fees and other estimated offering expenses. The Company intends to use the net proceeds from the August 2020 Offering to fund working capital and for other general corporate purposes. See Note 1, *Nature of Business, Financial Condition and Basis of Presentation*, to our consolidated financial statements included herein for additional information regarding the August 2020 Offering. As of December 31, 2020, all of the Series 2020-C warrants were exercised.

January 2021 Offering. On January 19, 2021, the Company completed a registered direct offering pursuant to a securities purchase agreement with certain institutional and accredited investors providing for the issuance and sale by the Company of an aggregate of 43,750,000 shares of the Company’s common stock (the “Shares”) at a price of $8.00 per share in a registered direct offering (the “January 2021 Offering”).

The net proceeds to the Company from the January 2021 Offering were approximately $321.7 million, after deducting placement agent fees and other estimated offering expenses payable by the Company, and not including any future proceeds from the exercise of the Warrants. The Company intends to use the net proceeds from the January 2021 Offering to fund development and investment in our RNG and Net-Zero 1 projects, working capital and for other general corporate purposes.

During the year ended December 31, 2019, we generated $10.9 million in cash from financing activities, which primarily consisted of $11.6 million of net proceeds under our "at-the-market" offering program discussed below offset by $0.3 million paid on equipment and insurance financed, $0.2 million of debt and equity offering costs and $0.2 million net settlement of common stock under stock plans.

At-the-Market Offering Program. In February 2018, the Company commenced an at-the-market offering program, which allows it to sell and issue shares of its common stock from time-to-time. In August 2019, the at-the-market offering program was amended to provide available capacity under the at-the-market offering program of $10.7 million. On December 30, 2020, the at-the-market offering program was amended to provide available capacity under the at-the-market offering program of $150.0 million.

During the year ended December 31, 2020, the Company issued 3,518,121 shares of common stock under the at-the-market offering program for total proceeds of $8.4 million, net of commissions and other offering related expenses. During the period January 1, 2021 to February 26, 2021, the Company issued 24,420,579 shares of common stock under the at-the-market offering program for total proceeds of $135.8 million, net of commissions and other offering related expenses.

2020/21 Notes. On January 10, 2020, the Company entered into an Exchange and Purchase Agreement which exchanged all of the outstanding principal amount of the 2020 Notes, which totaled $14.1 million including unpaid accrued interest, for approximately $14.4 million in aggregate principal amount of the Company's newly created 2020/21 Notes. During the year ended December 31, 2020, the Company recognized an approximately $0.7 million loss on the modification of the 2020 Notes within the Consolidated Statements of Operations.

On July 10, 2020, certain holders of the 2020/21 Notes converted $2.0 million in the aggregate principal amount of 2020/21 Notes (including the conversion of an additional $0.3 million for make-whole payment) into 4,169,426 shares of common stock pursuant to the terms of the indenture. In December 2020, certain holders of the 2020/21 Notes converted the remaining $12.7 million in aggregate principal amount of 2020/21 Notes (including the conversion of an additional $1.2 million for make-whole payment) into an aggregate of 5,672,654 shares of common stock pursuant to the terms of the 2020/21 Notes related Indenture. As a result, as of December 31, 2020, all obligations under the 2020/2021 Notes had been fully paid and satisfied, and the 2020/2021 Notes related indenture had been terminated in accordance with its terms at maturity on December 31, 2020. During the year ended December 31, 2020, the Company recognized an approximately $1.9 million loss on the conversion as a result of the make-whole payments of the 2020/21 Notes into common stock within the Consolidated Statements of Operations.

See Note 9, *Debt*, to our consolidated financial statements included herein for further discussion of the 2020/21 Notes.

Loans Payable - Other. During the first quarter of 2020, we purchased equipment under a financing lease. During the fourth quarter of 2019, we financed part of our insurance obligation. The equipment notes and financing lease pay interest between 4% and 21%, have total monthly payments of $0.1 million and mature at various date from August 2020 to February 2025. The equipment loans are secured by the related equipment.

In April 2020, we entered into two loan agreements with Live Oak Banking Company, pursuant to which we obtained two unsecured loans from the Small Business Administration's Paycheck Protection Program (“SBA PPP”) totaling $1.0 million in the aggregate (the "SBA Loans"). The SBA Loans will mature in April 2022 and bear interest at a rate equal to 1% per annum, subject to the potential for partial or full loan forgiveness as dictated by U.S. federal law. Principal and interest are deferred until August 2021 and interest continues to accrue during the deferral period. The SBA Loans are payable monthly beginning August 5, 2021, with aggregate payments totaling $0.1 million per month, including interest and principal. The SBA Loans must be used for payroll, rent payments, mortgage interest payments and utilities payments as governed by the SBA PPP and are subject to partial or full forgiveness for the initial 24-week period following the loan disbursement if all proceeds are used for eligible purposes and within certain thresholds, we maintain certain employment levels and that we maintain certain compensation levels. No assurance can be given that we will obtain forgiveness of the loan in whole or in part. The loan contains customary events of default relating to, among other things, payment defaults, making materially false and misleading representations to the lender or breaching the terms of the loan documents.

See Note 9, *Debt*, to our consolidated financial statements included herein for further discussion.

Contractual Obligations and Commitments

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide information under this item.

Off-Balance Sheet Arrangements

As of December 31, 2020, we did not have any off-balance sheet arrangements or relationships with unconsolidated entities, such as entities often referred to as structured finance or special purpose entities, established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Critical Accounting Estimates

Our Consolidated Financial Statements are based on the application of U.S. GAAP, which requires us to make estimates and assumptions about future events that affect the amounts reported in our Consolidated Financial Statements and the accompanying notes. Future events and their effects cannot be determined with certainty; therefore, the determination of estimates requires the exercise of judgment. We believe our judgments related to these accounting estimates are appropriate. However, if different assumptions or conditions were to prevail, the results could be materially different from the amounts recorded.

Critical Accounting Policies

While our significant accounting policies are more fully described in Note 2 to our Consolidated Financial Statements included in this Report, we believe that the following accounting policies are the most critical to aid you in fully understanding and evaluating our reported financial results and reflect the more significant judgments and estimates that we use in the preparation of our Consolidated Financial Statements.

Accounting for Senior Secured Debt, Convertible Notes and Embedded Derivative

In June 2017, the Company issued its 12% convertible senior secured notes due 2020 (the "2020 Notes") in exchange for its 12% convertible senior secured notes due 2017 (the "2017 Notes"). In January 2020, the Company issued 12% convertible senior secured notes due 2020/2021 (the "2020/21 Notes") in exchange for its 2020 Notes.

The 2020 Notes contained the following embedded derivatives: (i) a Make-Whole Payment (as defined in the indenture governing the 2020 Notes (the "2020 Notes Indenture")) upon either conversion or redemption; (ii) right to redeem the outstanding principal upon a Fundamental Change (as defined in the 2020 Notes Indenture); (iii) issuer rights to convert into a limited number of shares in any given three-month period commencing nine months from the issuance date and dependent on the stock price exceeding 150% of the then in-effect conversion price over a ten-business day period; and (iv) holder rights to convert into either shares of the Company's common stock or pre-funded warrants upon the election of the holders of the 2020 Notes.

The 2020/21 Notes contain the following embedded derivatives: (i) a Make-Whole Payment (as defined in the 2020/21 Notes Indenture (as defined below) upon either conversion or redemption in certain circumstances; (ii) holder right to require the Company to repurchase the outstanding principal upon a Fundamental Change (as defined in the 2020/21 Notes Indenture); and (iii) holder rights to convert into either shares of the Company's common stock or pre-funded warrants upon the election of the holders of the 2020/21 Notes.

Embedded derivatives are separated from the host contract and the 2020 Notes and 202/21 Notes and carried at fair value when: (a) the embedded derivative possesses economic characteristics that are not clearly and closely related to the economic characteristics of the host contract; and (b) a separate, stand-alone instrument with the same terms would qualify as a derivative instrument. The Company has concluded that certain embedded derivatives within the 2020 Notes and 2020/21 Notes meet these criteria and, as such, must be valued separate and apart from the 2020 Notes and 2020/21 Notes as one embedded derivative and recorded at fair value each reporting period.

The Company used a binomial lattice model in order to estimate the fair value of the embedded derivative in the 2020 Notes and 2020/21 Notes. A binomial lattice model generates two probable outcomes, whether up or down, arising at each point in time, starting from the date of valuation until the maturity date. A lattice was initially used to determine if the 2020 Notes and 20200/21 Notes would be converted by the holder, called by the issuer, or held at each decision point. Within the lattice model, the following assumptions are made: (i) the 2020 Notes and 2020/21 Notes will be converted by the holder if the conversion value plus the holder's Make-Whole Payment is greater than the holding value; or (ii) the 2020 Notes and 2020/21 Notes will be called by the issuer if (a) the stock price exceeds 150% of the then in-effect conversion price over a ten-business day period and (b) if the holding value is greater than the conversion value plus the Make-Whole Payment at the time.

Using this lattice model, the Company valued the embedded derivative using a "with-and-without method", where the value of the 2020 Notes and 2020/21 Notes including the embedded derivative is defined as the "with", and the value of the 2020 Notes and 2020/21 Notes excluding the embedded derivative is defined as the "without". This method estimates the value of the embedded derivative by comparing the difference in the values between the 2020 Notes and 2020/21 Notes with the embedded derivative and the value of the 2020 Notes and 2020/21 Notes without the embedded derivative. The lattice model requires the following inputs: (i) price of Gevo common stock; (ii) Conversion Rate (as defined in the 2020 Notes Indenture and the 2020/21 Notes Indenture); (iii) Conversion Price (as defined in the 2020 Notes Indenture the 2020/21 Notes Indenture); (iv) maturity date; (v) risk-free interest rate; (vi) estimated stock volatility; and (vii) estimated credit spread for the Company.

We had concluded that the embedded derivatives within the 2020 Notes and the 2020/21 Notes required separation from the host instrument and was re-valued each reporting period, with changes in the fair value of the embedded derivatives recognized as a component of our Consolidated Statements of Operations.

Warrants

The Company has warrants outstanding as of December 31, 2020 representing 2,013,901 shares of Gevo's common stock, which expire at various dates through July 6, 2025. The exercise prices of the warrants range from $0.60 to $220.00 as of December 31, 2020. Based on the terms of the warrant agreements, the Company has determined that all warrants issued between 2013 and 2019 qualify as derivatives and, as such, are included in "*Accounts Payable and Accrued Liabilities"* on the Consolidated Balance Sheets and recorded at fair value each reporting period. The decrease (increase) in the estimated fair value of the warrants outstanding as of December 31, 2020 and 2019 represents an unrealized gain (loss) which has been recorded as a gain (loss) from the change in fair value of derivative warrant liability in the Consolidated Statements of Operations.

The Series 2020-A Warrants, Series 2020-B Warrants and Series 2020-C Warrants issued during 2020 are classified as component of permanent equity because they are freestanding financial instruments that are legally detachable and separately exercisable from the shares of common stock with which they were issued, are immediately exercisable, do not embody an obligation for the Company to repurchase its shares, and permit the holders to receive a fixed number of shares of common stock upon exercise. In addition, the Warrants do not provide any guarantee of value or return. The Company valued the Series 2020-A Warrants, the Series 2020-B Warrants and the Series 2020-C Warrants at issuance using the Black-Scholes option pricing model and determined the fair value. The key inputs to the valuation model included a weighted average volatility of 130% to 141%, risk-free rate of 0.30% to 0.31% and an expected term of five years.

Revenue Recognition

Revenue Recognition. We record revenue from the sale of hydrocarbon products and related products. We recognize revenue when all of the following criteria are satisfied: (i) we have identified a contract with a customer; (ii) we have identified the performance obligations of the customer; (iii) we have determined the transaction price; (iv) we have allocated the transaction price to the identified performance obligations in the contract with the customer; and (v) we have satisfied each individual performance obligation with the contract with a customer.

Hydrocarbon related products are generally shipped free on board shipping point for domestic sales and free on board destination point for foreign sales. Collectability of revenue is reasonably assured based on historical evidence of collectability with our customers. In accordance with our agreements for the marketing and sale of hydrocarbon and related products, commissions due to marketers were deducted from the gross sales price at the time payment was remitted.

Revenue related to government research grants and cooperative agreements is recognized in the period during which the related costs are incurred, provided that the conditions under the awards have been met and only perfunctory obligations are outstanding.

Revenues related to operating lease agreements are recognized on a straight-line basis over the term of the contract.

For the years ended December 31, 2020 and 2019, Eco-Energy, accounted for approximately 52% and 71% of our consolidated revenue, respectively. For the years ended December 31, 2020 and 2019, HCS accounted for approximately 21% and 7% of our consolidated revenue, respectively. For the years ended December 31, 2020 and 2019, Purina accounted for approximately 15% and 17% of our consolidated revenue, respectively. HCS is a customer of our Gevo segment. Eco-Energy and Purina are customers of our Gevo Development/Agri-Energy segment. Given the production capacity compared to the overall size of the North American market and the fungible demand for our products, we do not believe that a decline in a specific customer's purchases would have a material adverse long-term effect upon our financial results.

Recent Accounting Pronouncements

See Note 2 in Item 8. “Financial Statements and Supplemental Data,” of this Report, for a discussion of recent accounting pronouncements.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide information under this item.

Item 8. Financial Statements and Supplementary Data

Index to Gevo, Inc. Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Gevo, Inc.

Opinion on the financial statements
We have audited the accompanying consolidated balance sheets of Gevo, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2020 and 2019, the related consolidated statements of operations, changes in stockholders' equity, and cash flows for each of the two years in the period ended December 31, 2020, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2020, in conformity with accounting principles generally accepted in the United States of America.

Basis for opinion
These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical audit matters
Critical audit matters are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. We determined that there are no critical audit matters.

/s/ GRANT THORNTON LLP

We have served as the Company's auditor since 2015.

Denver, Colorado
March 17, 2021

GEVO, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except share and per share amounts)

	December 31,	
	2020	**2019**
Assets		
Current assets:		
Cash and cash equivalents	$ 78,338	$ 16,302
Accounts receivable	527	1,135
Inventories	2,256	3,201
Prepaid expenses and other current assets	2,149	3,590
Total current assets	83,270	24,228
Property, plant and equipment, net	66,408	66,696
Investment in Juhl	1,500	1,500
Deposits and other assets	921	935
Total assets	$ 152,099	$ 93,359
Liabilities		
Current liabilities:		
Accounts payable and accrued liabilities	$ 4,123	$ 5,678
2020 Notes (current), net	—	13,900
Loans payable - other (current)	809	516
Total current liabilities	4,932	20,094
Loans payable - other (long-term)	457	233
Other long-term liabilities	331	528
Total liabilities	5,720	20,855
Commitments and Contingencies (See Note 14)		
Stockholders' Equity		
Common stock, $0.01 par value per share; 250,000,000 authorized;128,138,311 and 14,083,232 shares issued and outstanding at December 31, 2020 and 2019, respectively.	1,282	141
Additional paid-in capital	643,269	530,349
Accumulated deficit	(498,172)	(457,986)
Total stockholders' equity	146,379	72,504
Total liabilities and stockholders' equity	$ 152,099	$ 93,359

See the accompanying Notes to the Consolidated Financial Statements.

GEVO, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except share and per share amounts)

	Year Ended December 31,	
	2020	**2019**
Revenue and cost of goods sold		
Ethanol sales and related products, net	$ 3,809	$ 22,115
Hydrocarbon revenue	1,501	2,338
Grant and other revenue	226	34
Total revenues	5,536	24,487
Cost of goods sold	15,003	36,733
Gross loss	(9,467)	(12,246)
Operating expenses		
Research and development expense	4,086	4,020
Selling, general and administrative expense	12,528	10,085
Restructuring expenses	254	—
Total operating expenses	16,868	14,105
Loss from operations	(26,335)	(26,351)
Other income (expense)		
Interest expense	(2,094)	(2,732)
(Loss) on modification of 2020 Notes	(732)	—
(Loss) on conversion of 2020/21 Notes to common stock	(1,916)	—
(Loss) gain from change in fair value of 2020/21 Notes and 2020 Notes embedded derivative liability	(8,607)	394
(Loss) gain from change in fair value of derivative warrant liability	(23)	14
Other (expense) income	(479)	15
Total other income (expense)	(13,851)	(2,309)
Net loss	$ (40,186)	$ (28,660)
Net loss per share - basic and diluted	$ (0.71)	$ (2.35)
Weighted-average number of common shares outstanding - basic and diluted	56,881,586	12,177,906

See the accompanying Notes to the Consolidated Financial Statements.

GEVO, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands, except share amounts)

	Common Stock		Paid-In Capital	Accumulated Deficit	Stockholders' Equity
	Shares	Amount			
Balance, December 31, 2018	8,640,583	$ 86	$ 518,027	$ (429,326)	$ 88,787
Issuance of common stock, net of issue costs	3,965,688	40	11,317	—	11,357
Non-cash stock-based compensation	—	—	1,221	—	1,221
Issuance of common stock under stock plans, net of taxes	1,476,961	15	(216)	—	(201)
Net loss	—	—	—	(28,660)	(28,660)
Balance, December 31, 2019	14,083,232	141	530,349	(457,986)	72,504
Issuance of common stock and common stock warrants, net of issue costs	46,290,808	463	69,614	—	70,077
Issuance of common stock upon exercise of warrants	53,678,400	537	16,545	—	17,082
Issuance of common stock upon conversion of 2020/21 Notes	9,842,080	99	24,958	—	25,057
Issuance of common stock in exchange for services rendered	101,730	1	93	—	94
Non-cash stock-based compensation	—	—	2,101	—	2,101
Issuance of common stock under stock plans, net of taxes	4,142,061	41	(391)	—	(350)
Net loss	—	—	—	(40,186)	(40,186)
Balance, December 31, 2020	128,138,311	$ 1,282	$ 643,269	$ (498,172)	$ 146,379

See the accompanying Notes to the Consolidated Financial Statements.

GEVO, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,	
	2020	**2019**
Operating Activities		
Net loss	$ (40,186)	$ (28,660)
Adjustments to reconcile net loss to net cash used in operating activities:		
Loss (gain) from the change in fair value of derivative warrant liability	23	(14)
Loss (gain) from the change in fair value of 2020/21 Notes and 2020 Notes embedded derivative	8,607	(394)
Loss on conversion of 2020/21 Notes to common stock	1,916	—
Loss on sale of property, plant and equipment	625	4
Stock-based compensation	2,125	1,349
Depreciation and amortization	5,905	6,656
Non-cash lease expense	62	48
Non-cash interest expense	761	1,346
Changes in operating assets and liabilities:		
Accounts receivable	608	(609)
Inventories	945	(35)
Prepaid expenses and other current assets, deposits and other assets	782	(1,824)
Accounts payable, accrued expenses and long-term liabilities	(1,511)	1,294
Net cash used in operating activities	**(19,338)**	**(20,839)**
Investing Activities		
Acquisitions of property, plant and equipment	(5,905)	(5,989)
Proceeds from sale of property, plant and equipment	—	32
Investment in Juhl	—	(1,500)
Net cash used in investing activities	**(5,905)**	**(7,457)**
Financing Activities		
Payment on secured debt	(503)	(292)
Debt and equity offering costs	(6,370)	(232)
Proceeds from issuance of common stock and common stock warrants	76,414	11,589
Proceeds from the exercise of warrants	17,082	—
Net settlement of common stock under stock plans	(350)	(201)
Proceeds from SBA Loan	1,006	—
Net cash provided by financing activities	**87,279**	**10,864**
Net increase (decrease) in cash and cash equivalents	**62,036**	**(17,432)**
Cash and cash equivalents	16,302	33,734
Beginning of year		
	$ **78,338**	$ **16,302**
End of year		

See the accompanying Notes to the Consolidated Financial Statements.

GEVO, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS—(Continued)
(In thousands)

Supplemental disclosures of cash and non-cash investing and financing transactions	Year Ended December 31, 2020	2019
Cash paid for interest	$ 1,333	$ 1,386
Non-cash purchase of property, plant and equipment	197	368
Issuance of common stock upon exchange of debt	25,057	—
Issuance of common stock in exchange for services rendered	94	—
Original issue discount paid with 2020/21 Notes	282	280
Right-of-use asset purchased with financing lease	192	—
Equipment and insurance financed with notes payable	—	1,041

See the accompanying Notes to the Consolidated Financial Statements.

GEVO, INC.
Notes to Consolidated Financial Statements

1. Nature of Business and Financial Condition

Nature of Business. Gevo, Inc. ("Gevo" or the "Company," which, unless otherwise indicated, refers to Gevo, Inc. and its subsidiaries) is a growth-oriented renewable fuels technology and development company that is commercializing the next generation of renewable low-carbon liquid transportation fuels, such as sustainable aviation fuel ("SAF") and renewable isooctane (which we refer to as "renewable premium gasoline"), with the potential to achieve a "net zero" greenhouse gas ("GHG") footprint and address global needs of reducing GHG emissions with sustainable alternatives to petroleum fuels. Its technology transforms carbon from the atmosphere using photosynthetic energy, wind energy and biogas energy into liquid hydrocarbons with a low or potentially "net-zero" GHG footprint.

As next generation renewable fuels, Gevo's hydrocarbon transportation fuels have the advantage of being "drop-in" substitutes for conventional fuels that are derived from crude oil, working seamlessly and without modification in existing fossil-fuel based engines, supply chains and storage infrastructure. In addition, with SAF, the carbon footprint of air travel can be reduced, or in the long run, eliminated on a net carbon basis, without change to planes or fuel systems. In addition to the potential of net-zero carbon emissions across the whole fuel life-cycle, its renewable fuels eliminate other pollutants associated with the burning of traditional fossil fuels such as particulates and sulfur, while delivering superior performance. The Company believes that the world is substantially under-supplied with low-carbon, drop-in renewable fuels that can be immediately used in existing transportation engines and infrastructure, and Gevo is uniquely positioned to grow in serving that demand.

Gevo uses low-carbon, renewable resource-based raw materials as feedstocks. In the near-term, its feedstocks will primarily consist of non-food corn. As the Company's technology is applied globally, feedstocks can consist of sugar cane, molasses or other cellulosic sugars derived from wood, agricultural residues and waste. Gevo's patented fermentation yeast biocatalyst produces isobutanol, a four-carbon alcohol, via the fermentation of renewable plant biomass carbohydrates. The resulting renewable isobutanol has a variety of direct applications but, more importantly to our fundamental strategy, serves as a building block to make renewable isooctane (which we refer to as renewable premium gasoline) and SAF using simple and common chemical conversion processes. The Company also plans to reduce or eliminate fossil-based process energy inputs by replacing them with renewable energy such as wind-powered electricity and renewable natural gas ("RNG").

Gevo's technology represents a new generation of renewable fuel technology that overcomes the limitations of first-generation renewable fuels.

Ultimately, the Company believes that the attainment of profitable operations is dependent upon future events, including (i) the successful development of the Net-Zero 1 Project; and (ii) the achievement of a level of revenues adequate to support our cost structure.

COVID-19. The novel coronavirus ("COVID-19") pandemic has had an adverse impact on global commercial activity, including the global transportation industry and its supply chain, and has contributed to significant volatility in financial markets. It has also resulted in increased travel restrictions and extended shutdowns of businesses in various industries including, among others, the airline industry, and significantly reduced overall economic output. It is possible that that the impact of the COVID-19 pandemic on general economic activity could negatively impact the Company's revenue and operating results for 2021 and beyond. In light of the current and potential future disruption to its business operations and those of its customers, suppliers and other third parties with whom the Company does business, management considered the impact of the COVID-19 pandemic on its business. The impact of the COVID-19 pandemic on the global transportation industry could continue to result in less demand for our transportation fuel products, which could have a material adverse effect on the Gevo's business, financial condition and our prospects for the foreseeable future. The suspension of ethanol production at its Luverne Facility and reduction in the Company's workforce during the first quarter of 2020 due to the impact of COVID-19 had an adverse impact on Gevo's financial results for the fiscal year ended 2020 reducing revenue by 77% compared to 2019. There is also a risk that COVID-19 could have a material adverse impact on the development of the Company's Net-Zero 1 Project, customer demand and cash flow, depending on the extent of our future production activities.

The Company has considered multiple scenarios, with both positive and negative inputs, as part of the significant estimates and assumptions that are inherent in its financial statements and are based on trends in customer behavior and the economic environment throughout the year ended December 31, 2020 and beyond as the COVID-19 pandemic has impacted the industries in which the Company operates. These estimates and assumptions include the collectability of billed receivables and the estimation of revenue and tangible assets. With regard to collectability, the Company believes it may face atypical delays in client payments going forward but the Company has not experienced significant delays in collection as of December 31, 2020. In addition, management believes that the demand for certain discretionary lines of business may decrease, and that such decrease will impact its financial results in succeeding periods. Non-discretionary lines of business may also be adversely affected, for example because reduced economic activity or disruption in hydrocarbon markets reduces demand for or the extent of SAF, isooctane and isooctene.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

Restructuring Expenses. During the first quarter of 2020, the Company terminated its ethanol production at the Luverne Facility. In addition, due to the impact of the COVID-19 pandemic on the global economy and the Company's industry, in March 2020, the Company reduced its workforce, impacting 26 people at the Luverne Facility and four people at the Company's corporate headquarters. Affected employees were offered a severance package which included a one-time payment, one month of health insurance and acceleration of vesting for any unvested restricted stock awards.

The Company incurred $0.1 million related to severance costs and $0.2 million related to lease agreements for which it no longer received value during the year ended December 31, 2020, which are recorded as *Restructuring expenses* on the Consolidated Statements of Operations. Restructuring expense totaled $0.02 million and $0.3 million for Gevo and Gevo Development/Agri-Energy segments, respectively, during the year ended December 31, 2020.

The Company intends to continue developing its hydrocarbon business, including the planned expansion of the Luverne Facility, and the Company expects to move forward in securing the project funding needed to expand the Luverne Facility. The expansion is designed to allow the Company to produce large quantities of sustainable aviation fuel and renewable gasoline. The Company also expects to continue engineering efforts for the construction of a commercial renewable hydrocarbon production facility, as well as additional decarbonization projects, at the Luverne Facility.

As of December 31, 2020, the Company had the following liabilities outstanding related to the restructuring expenses included in *"Accounts payable and accrued liabilities*" in the Consolidated Balance Sheets:

	December 31, 2019	Additions	Payments	December 31, 2020
Severance (including payroll taxes)	$ —	$ 96	$ (96)	$ —
Lease agreements	—	158	(158)	—
Total	$ —	$ 254	$ (254)	$ —

Financial Condition. The Company has incurred consolidated net losses since inception and had a significant accumulated deficit as of December 31, 2020. The Company's cash and cash equivalents as of December 31, 2020 totaled $78.3 million. As noted below, in January 2021, the Company raised $321.7 million through a registered direct offering. The Company also raised $135.8 million during the period January 1, 2021 to February 26, 2021 through its At-the-Market Offering Programs. Gevo expects to use its cash and cash equivalents for the following purposes: (i) development of the Luverne Facility expansion plan; (ii) identification of new production facilities and to plan for expanded production to fulfill existing off-take agreements; (iii) operating activities at the Company's corporate headquarters in Colorado, including research and development work; (iv) development projects associated with the Company's RNG projects; (v) exploration of strategic alternatives and additional financings, including project financing; and (vi) debt service obligations.

The Company expects to incur future net losses as it continues to fund the development and commercialization of its product candidates. To date, the Company has financed its operations primarily with proceeds from issuance of equity and debt securities, borrowings under debt facilities and product sales. The Company's transition to profitability is dependent upon, among other things, the successful development and commercialization of its product candidates and the achievement of a level of revenues adequate to support the Company's cost structure. The Company may never achieve profitability or positive cash flows, and unless and until it does, the Company will continue to need to raise additional capital. Management intends to fund future operations through additional private and/or public offerings of debt or equity securities. In addition, the Company may seek additional capital through arrangements with strategic partners or from other sources, and it will continue to address its cost structure. Notwithstanding, there can be no assurance that the Company will be able to raise additional funds or achieve or sustain profitability or positive cash flows from operations. Management believes it has adequate cash to fund operations for one year from the date the financial statements are issued.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

July 2020 Offering. On July 6, 2020, Gevo completed a public offering (the "July 2020 Offering") of (i) 20,896,666 Series 1 units (the "Series 1 Units") at a price of $0.60 per Series 1 Unit, and (ii) 9,103,334 Series 2 units (the "Series 2 Units") at a price of $0.59 per Series 2 Unit. The July 2020 Offering was made under a registration statement on Form S-1 filed with the Securities and Exchange Commission, declared effective on September 30, 2020.

Each Series 1 Unit consisted of one share of the Company's common stock and one Series 2020-A warrant to purchase one share of the Company's common stock (each, a "Series 2020-A Warrant"). Each Series 2 Unit consists of a pre-funded Series 2020-B warrant to purchase one share of the Company's common stock (each, a "Series 2020-B Warrant" and, together with the Series 2020-A Warrants, the "Warrants") and one Series 2020-A Warrant. The Series 2020-A Warrants are exercisable beginning on the date of original issuance and will expire five years from the date of issuance, at an exercise price of $0.60 per share. The pre-funded Series 2020-B Warrants are exercisable beginning on the date of issuance at a nominal exercise price of $0.01 per share of common stock any time until the Series 2020-B Warrants are exercised in full. In connection with the July 2020 Offering, the Company issued Series 2020-A Warrants to purchase an aggregate of 30,000,000 shares of common stock. As of December 31, 2020, all of the Series 2020-B Warrants were exercised.

The net proceeds to the Company from the July 2020 Offering were approximately $16.1 million, after deducting placement agent fees and other offering expenses payable by the Company, and not including any future proceeds from the exercise of the Warrants. The Company intends to use the net proceeds from the July 2020 Offering to fund working capital and for other general corporate purposes.

During the year ended December 31, 2020, the Company received notices of exercise from holders of our Series 2020-A Warrants to issue an aggregate of 28,042,834 shares of common stock for total gross proceeds of approximately $16.8 million. During the period January 1, 2021 to February 26, 2021, the Company received notices of exercise from holders of our Series 2020-A Warrants to issue an aggregate of 1,863,058 shares of common stock for total gross proceeds of approximately $1.1 million. Following these exercises, Series 2020-A Warrants to purchase 94,108 shares of the Company's common stock remain outstanding at an exercise price of $0.60 per share as of February 26, 2021.

August 2020 Offering. On August 25, 2020, the Company completed a registered direct offering pursuant to a securities purchase agreement with certain institutional and accredited investors providing for the issuance and sale by the Company of an aggregate of (i) 21,929,313 shares of the Company's common stock (the "Shares") at a price of $1.30 per share, and (ii) 16,532,232 pre-funded Series 2020-C warrants to purchase one share of the Company's common stock (each, a "Series 2020-C Warrant") at a price of $1.29 per Series 2020-C Warrant, in a registered direct offering (the "August 2020 Offering"). The pre-funded Series 2020-C Warrants are exercisable beginning on the date of issuance at a nominal exercise price of $0.01 per share of common stock any time until the Series 2020-C Warrants are exercised in full. As of December 31, 2020, all of the Series 2020-C Warrants were exercised.

The net proceeds to the Company from the August 2020 Offering were approximately $45.8 million, after deducting placement agent fees and other estimated offering expenses payable by the Company, and not including any future proceeds from the exercise of the Warrants. The Company intends to use the net proceeds from the August 2020 Offering to fund working capital and for other general corporate purposes.

January 2021 Offering. On January 19, 2021, the Company completed a registered direct offering pursuant to a securities purchase agreement with certain institutional and accredited investors providing for the issuance and sale by the Company of an aggregate of 43,750,000 shares of the Company's common stock (the "2021 Shares") at a price of $8.00 per share in a registered direct offering (the "January 2021 Offering").

The net proceeds to the Company from the January 2021 Offering were approximately $321.7 million, after deducting placement agent fees and other estimated offering expenses payable by the Company, and not including any future proceeds from the exercise of the Warrants. The Company intends to use the net proceeds from the January 2021 Offering to fund working capital and for other general corporate purposes.

Conversion of 2020/21 Notes. On July 10, 2020, certain holders of the 2020/21 Notes converted $2.0 million in aggregate principal amount of 2020/21 Notes (including the conversion of an additional $0.3 million for make-whole payment) into an aggregate of 4,169,426 shares of common stock pursuant to the terms of the 2020/21 Notes related indenture. During December 2020, certain holders of the 2020/21 Notes converted the remaining $12.7 million in aggregate principal amount of 2020/21 Notes (including the conversion of an additional $1.2 million for make-whole payment) into an aggregate of 5,672,654 shares of common stock pursuant to the terms of the 2020/21 Notes related indenture. The Company recorded a *Loss on conversion of 2020/21 Notes* of $1.9 million on its Consolidated Statements of Operations as a result of the make-whole payments. As a result, as of December 31, 2020, all obligations under the 2020/2021 Notes had been fully paid and satisfied, and the 2020/2021 Notes related indenture had been terminated in accordance with its terms at maturity on December 31, 2020.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

At-the-Market Offering Program. In February 2018, the Company commenced an at-the-market offering program, which allows it to sell and issue shares of its common stock from time-to-time. The at-the-market offering program was amended multiple times during 2018 to increase the available capacity under the at-the-market offering program by an aggregate of approximately $84.9 million. In August 2019, the at-the-market offering was further amended to increase the available capacity under the at-the-market offering program by $10.7 million. On December 30, 2020, the at-the-market offering program was amended to provide available capacity under the at-the-market offering program of $150.0 million.

During the year ended December 31, 2020, the Company issued 3,518,121 shares of common stock under the at-the-market offering program for total proceeds of $8.4 million, net of commissions and other offering related expenses. During the period January 1, 2021 to February 26, 2021, the Company issued 24,420,579 shares of common stock under the at-the-market offering program for total proceeds of $135.8 million, net of commissions and other offering related expenses.

As of February 26, 2021, the Company has remaining capacity to issue up to approximately $10.6 million of common stock under the at-the-market offering program.

During the year ended December 31, 2019, the Company issued 3,965,688 shares of common stock under the at-the-market offering program for gross proceeds of $11.5 million, net of commissions and other offering related expenses.

Related Party Transaction. During the year ended December 31, 2020, Gevo paid Blocksize Capital GmbH ("Blocksize"), a company in which one director of Gevo has an indirect ownership interest, and Leaf Resources, a company in which one director of Gevo serves as a director, a total of $0.1 million for services rendered. The Company owed these companies a total of $0.1 million as of December 31, 2020.

2. Summary of Significant Accounting Policies

Principles of Consolidation. The Consolidated Financial Statements of Gevo include the accounts of its wholly-owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Basis of Presentation. The Consolidated Financial Statements of the Company (which include the accounts of its wholly-owned subsidiaries Gevo Development, LLC and Agri-Energy, LLC) have been prepared pursuant to the rules and regulations of the U.S. Securities and Exchange Commission (the "SEC") and accounting principles generally accepted in the U.S. ("GAAP") for complete financial statements. These statements reflect all normal and recurring adjustments which, in the opinion of management, are necessary to present fairly the financial position, results of operations and cash flows of the Company at December 31, 2020.

Use of Estimates. The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ materially from those estimates.

Concentrations of Credit Risk. The Company's financial instruments that are exposed to concentrations of credit risk consist of cash and cash equivalents in excess of the federally insured limits. The Company's cash and cash equivalents are deposited with high credit-quality financial institutions and are primarily in demand deposit accounts.

Cash and Cash Equivalents. The Company maintains its cash and cash equivalents in highly liquid interest-bearing money market accounts or non-interest bearing demand accounts. The Company considers all highly liquid investments purchased with a maturity of three months or less at the date of acquisition to be cash equivalents.

Accounts Receivable. The Company records receivables for products shipped and services provided but for which payment has not yet been received. As of December 31, 2020, one customer, HCS Group GmbH ("HCS") comprised approximately 79% of the Company's outstanding trade accounts receivable, respectively. As of December 31, 2020 and 2019, no allowance for doubtful accounts has been recorded, based upon the expected full collection of the accounts receivable. As of December 31, 2019, three customers, Eco-Energy, LLC ("Eco-Energy"), Purina Animal Nutrition, LLC ("Purina"), formerly Land O'Lakes Purina Feed, LLC, and HCS comprised 57%, 13% and 15% of the Company's outstanding trade accounts receivable, respectively.

Inventories. Inventory is recorded at net realizable value. Cost of goods sold is determined by average cost method. Isobutanol and ethanol inventory cost consists of the applicable share of raw material, direct labor and manufacturing overhead costs. Spare Parts inventory consists of the parts required to maintain and operate the Company's Luverne Facility and is recorded at cost. For each reporting period, the Company reviews the value of inventories on hand to estimate the recoverability through future sales. We reduce our inventories with adjustments for lower of cost or market valuation. During the years ended December 31, 2020 and 2019, we recorded impairment charges of $0.6 million and $0 million, respectively. These charges are included in "Cost of goods sold" in the Consolidated Statements of Operations.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

Property, Plant and Equipment. Property, plant and equipment are recorded at cost less accumulated depreciation and amortization. Depreciation and amortization are computed using the straight-line method over the assets' estimated useful lives. Leasehold improvements are amortized over the term of the lease agreement or the service lives of the improvements, whichever is shorter. Assets under construction are depreciated when they are placed into service. Maintenance and repairs are charged to expense as incurred and expenditures for major improvements are capitalized.

Impairment of Property, Plant and Equipment. The Company's property, plant and equipment consist primarily of assets associated with the acquisition and upgrade of the Luverne Facility. The Company assesses impairment of property, plant and equipment for recoverability when events or changes in circumstances indicate that their carrying amount may not be recoverable. Circumstances which could trigger a review include, but are not limited to: significant decreases in the market price of the asset; significant adverse changes in the business climate, or legal or regulatory factors; accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the asset; or expectations that the asset will more likely than not be sold or disposed of significantly before the end of its estimated useful life. The carrying amount of a long-lived asset is considered to be impaired if it exceeds the sum of the undiscounted cash flows expected to result from the use and eventual disposition of the assets.

The Company evaluated its Luverne Facility for impairment as of December 31, 2020 and 2019. Based upon the Company's evaluation, the Company concluded that the estimated undiscounted future cash flows from the Luverne Facility exceeded the carrying value and, as such, these assets were not impaired.

Investment in Juhl. In September 2019, Agri-Energy purchased 1.5 million shares of Series A preferred stock of Juhl Clean Energy Assets, Inc. ("Juhl") for a purchase price of $1.00 per share in connection with the development of wind electrical energy generating facility project near the Luverne Facility. An affiliate of Juhl constructed, owns and operates the wind project, and Agri-Energy purchases the electricity directly from the City of Luverne. The investment in Juhl is accounted for under the cost method.

Leases, Right-to-Use Assets and Related Liabilities. The Company enters into various arrangements which constitute a lease as defined by ASC 842, *Leases,* as part of its ongoing business activities and operations. Leases represent a contract or part of a contract that conveys the right to control the use of identified property, plant or equipment (an identified asset) for a period of time in exchange for consideration. Such contracts result in both (a) right-to-use assets, which represent the Company's right to use an underlying asset for the term of the contract; and (b) a corresponding lease liability which represents the Company's obligation to make the lease payments arising from the contract, measured on a discounted basis.

Debt Issue Costs. Debt issue costs are costs incurred in connection with the Company's debt financings that have been capitalized and are being amortized over the stated maturity period or estimated life of the related debt using the effective interest method.

Warrants. Warrants are classified as a component of permanent equity when they are freestanding financial instruments that are legally detachable and separately exercisable from the shares of common stock with which they were issued, are immediately exercisable, do not embody an obligation for the Company to repurchase its shares, permit the holders to receive a fixed number of shares of common stock upon exercise and do not provide any guarantee of value or return. The Series 2020-A Warrants, Series 2020-B Warrants and Series 2020-C Warrants are classified as a component of permanent equity. The Company valued the Series 2020-A Warrants, the Series 2020-B Warrants and the Series 2020-C Warrants at issuance using the Black-Scholes option pricing model and determined the fair value. The key inputs to the valuation model included a weighted average volatility of 130% to 141%, risk free rate of 0.30% to 0.31% and an expected term of five years.

Revenue Recognition. The Company records revenue from the sale of ethanol and related products, hydrocarbon products and funding from government grants and cooperative agreements. The Company recognizes revenue when all of the following criteria are satisfied: (i) it has identified a contract with a customer; (ii) it has identified the performance obligations of the customer; (iii) it has determined the transaction price; (iv) it has allocated the transaction price to the identified performance obligations in the contract with the customer; and (v) it has satisfied each individual performance obligation with the contract with a customer.

Ethanol and related products as well as hydrocarbon products are generally shipped free-on-board shipping point. Collectability of revenue is reasonably assured based on historical evidence of collectability between the Company and its customers. In accordance with the Company's agreements for the marketing and sale of ethanol and related products, commissions due to marketers are deducted from the gross sales price at the time payment was remitted. Ethanol and related products sales are recorded net of commissions and shipping and handling costs. Sales and other taxes that the Company collects concurrent with revenue-producing activities are excluded from revenue.

Revenue related to government research grants and cooperative agreements is recognized in the period during which the related costs are incurred, provided that the conditions under the awards have been met and only perfunctory obligations are outstanding. Revenues related to lease agreements are recognized on a straight-line basis over the term of the contract.

Our Luverne Facility is currently shut down until further notice. Currently, the South Hampton Facility is not producing renewable premium gasoline or jet fuel. We expect to produce isobutanol in intermittent campaigns during 2021 to supply the South Hampton Facility so that renewable premium gasoline or jet fuel can be produced in 2021.

For the year ended December 31, 2020, Eco-Energy, HCS and Purina accounted for approximately 52%, 21% and 15% of the Company's consolidated revenue, respectively. HCS, Coryton and Total Cray Valley are customers of the Company's Gevo segment. Eco-Energy and Purina are customers of the Company's Gevo Development/Agri-Energy segment. For the year ended December 31, 2019, Eco-Energy accounted for approximately 71% of the Company's consolidated revenue. Purina represented approximately 17% of the Company's consolidated revenue for the year ended December 31, 2019. All are customers of the Company's Gevo Development/Agri-Energy segment (see Note 16). Given the production capacity compared to the overall size of the North American market and the fungible demand for the Company's products, the Company does not believe that a decline in a specific customer's purchases would have a material adverse long-term effect upon the Company's financial results.

Cost of Goods Sold. Cost of goods sold includes costs incurred in conjunction with the operations for the production of isobutanol at the Luverne Facility and costs directly associated with the ethanol and related products production process such as costs for direct materials, direct labor and certain plant overhead costs. Costs associated with the operations for the production of isobutanol includes costs for direct materials, direct labor, plant utilities, including natural gas and plant depreciation. Direct materials consist of dextrose for initial production of isobutanol, corn feedstock, denaturant and process chemicals. Direct labor includes compensation of personnel directly involved in production operations at the Luverne Facility. Costs of direct materials for the production of ethanol and related products consist of corn feedstock, denaturant and process chemicals. Direct labor includes compensation of personnel directly involved in the operation of the Luverne Facility. Plant overhead costs primarily consist of plant utilities and plant depreciation. Cost of goods sold is mainly affected by the cost of corn and natural gas. Corn is the most significant raw material cost. The Company purchases natural gas to power steam generation in the production process and to dry the distillers grains, a by-product of ethanol and related products production.

Patents. All costs related to filing and pursuing patent applications are expensed as incurred as recoverability of such expenditures is uncertain. Patent-related legal expenses incurred are recorded as selling, general and administrative expense.

Research and Development. Research and development costs are expensed as incurred and are recorded as research and development expense in the Consolidated Statements of Operations. The Company's research and development costs consist of expenses incurred to identify, develop, and test its technologies for the production of isobutanol and the development of downstream applications thereof. Research and development expense includes personnel costs, consultants and related contract research, facility costs, supplies, depreciation on property, plant and equipment used in development, license fees and milestone payments paid to third parties for use of their intellectual property and patent rights and other direct and allocated expenses incurred to support the Company's overall research and development programs.

Income Taxes. Deferred tax assets and liabilities are recognized based on the difference between the carrying amounts of assets and liabilities in the financial statements and their respective tax bases. Deferred tax assets and liabilities are measured using currently enacted tax rates in effect in the years in which those temporary differences are expected to reverse. Deferred tax assets should be reduced by a valuation allowance if, based on the weight of available evidence, it is more likely than not that some portion or all of the deferred tax assets will not be realized.

Stock-Based Compensation. The Company's stock-based compensation expense includes expenses associated with share-based awards granted to employees and board members, and expenses associated with awards under its employee stock purchase plan ("ESPP"). Stock-based compensation expense for all share-based payment awards granted is based on the grant date fair value. The grant date fair value for stock option awards is estimated using the Black-Scholes option pricing model and the grant date fair value for restricted stock awards is based upon the closing price of the Company's common stock on the date of grant. The Company recognizes compensation costs for share-based payment awards granted to employees net of estimated forfeitures and recognizes stock-based compensation expense for only those awards expected to vest on a straight-line basis over the requisite service period of the award, which is currently the vesting term of up to four years.

Net Loss Per Share. Basic net loss per share is computed by dividing the net loss attributable to Gevo's common stockholders for the period by the weighted-average number of common shares outstanding during the period. Diluted earnings per share ("EPS") includes the dilutive effect of common stock equivalents and is computed using the weighted-average number of common stock and common stock equivalents outstanding during the reporting period. Diluted EPS for the years ending December 31, 2020 and 2019 excluded common stock equivalents because the effect of their inclusion would be anti-dilutive or would decrease the reported loss per share.

The following table sets forth securities that could potentially dilute the calculation of diluted earnings per share:

	Year Ended December 31,	
	2020	2019
Warrants to purchase common stock - liability classified	56,735	54,989
Warrants to purchase common stock - equity classified	1,957,166	—
Convertible 2020 Notes	—	974,139
Outstanding options to purchase common stock	1,552	1,561
Stock appreciation rights	67,739	127,225
Total	2,083,192	1,157,914

Recent Accounting Pronouncements

Financial Instruments - Credit Losses. Measurement of Credit Losses on Financial Instruments. In June 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-13, *Financial Instruments - Credit Losses Measurement of Credits Losses on Financial Instruments* ("ASU 2016-13"), which replaces accounting for credit losses for most financial assets, including trade accounts receivable, and certain other instruments that are not measured at fair value through income. ASU 2016-13 replaces the current "incurred loss" model, in which losses are recognized when a loss is incurred as of the date of the balance sheet, to an "expected credit loss" model, which includes a broader range of information to estimate expected credit losses over the lifetime of the financial asset. ASU 2016-13 is effective for fiscal years beginning after December 15, 2022. It is expected that the adoption of this standard will primarily apply to the valuation of the Company's trade accounts receivables. The Company sells primarily to a small quantity of large customers with significant balance sheets and those financial assets are often settled within one-to-two weeks after the completion of the corresponding sales transaction. The Company does not anticipate that the adoption of this standard will have a material impact on the Company's Consolidated Financial Statements.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

3. Revenues from Contracts with Customers and Other Revenues

The Company's current and historical revenues have consisted of the following: (a) ethanol sales and related products revenue, net; (b) hydrocarbon revenue; and (c) grant and other revenue, which has historically consisted primarily of revenues from governmental and cooperative research grants.

Ethanol sales and related products revenues, net. Ethanol sales and related products revenues, net, are sold to customers on a free-on-board, shipping point basis. Each transaction occurs independent of any other sale, and once sold, there are no future obligations on the part of the Company to provide post-sale support or promises to deliver future goods or services.

Hydrocarbon revenue. Hydrocarbon revenues include sales of SAF, isooctene and isooctane and are sold mostly on a free-on-board, shipping point basis. Each transaction occurs independent of any other sale, and once sold, there are no future obligations on the part of the Company to provide post-sale support or promises to deliver future goods or services.

Grant and other revenues. Grant revenues have historically consisted of governmental and cooperative research grants. Other revenues have historically included occasional short-term (less than one-year) consulting services and leases of certain storage facilities located at the Luverne Facility.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

The following table sets forth the components of the Company's revenues between those generated from contracts with customers and those generated from arrangements that do not constitute a contract with a customer (in thousands):

	Year Ended December 31, 2020		
Major Goods/Service Line	**Revenues from Contracts with Customers**	**Other Revenues**	**Total**
Ethanol sales and related products, net	$ 3,809	$ —	$ 3,809
Hydrocarbon revenue	1,501	—	1,501
Grant and other revenue	153	73	226
	$ 5,463	$ 73	$ 5,536
Timing of Revenue Recognition			
Goods transferred at a point in time	$ 5,310	$ —	$ 5,310
Services transferred over time	153	73	226
	$ 5,463	$ 73	$ 5,536

	Year Ended December 31, 2019		
Major Goods/Service Line	**Revenues from Contracts with Customers**	**Other Revenues**	**Total**
Ethanol sales and related products, net	$ 22,115	$ —	$ 22,115
Hydrocarbon revenue	2,338	—	2,338
Grant and other revenue	—	34	34
	$ 24,453	$ 34	$ 24,487
Timing of Revenue Recognition			
Goods transferred at a point in time	$ 24,453	$ —	$ 24,453
Services transferred over time	—	34	34
	$ 24,453	$ 34	$ 24,487

Goods transferred at a point-in-time. For the years ended December 31, 2020 and 2019, there were no contracts with customers for which consideration was variable or for which there were multiple performance obligations for any given contract. Accordingly, the entire transaction price is allocated to the goods transferred. As of December 31, 2020 and 2019, there were no remaining unfulfilled or partially fulfilled performance obligations.

All goods transferred are tested to ensure product sold satisfies contractual product specifications prior to transfer. The customer obtains control of the goods when title and risk of loss for the goods has transferred, which in most cases is "*free-on-board, shipping point*". All material contracts have payment terms of between one to three months and there are no return or refund rights.

Services transferred over time. For the years ended December 31, 2020 and 2019, there were no contracts for which consideration was variable or for which there were multiple performance obligation for any given contract. Accordingly, the entire transaction price is allocated to the individual service performance obligation. As of December 31, 2020 and 2019, respectively, there were no material unfulfilled or partially fulfilled performance obligations.

For the years ended December 2020 and 2019, revenues were recognized ratably over time, as the performance obligation was satisfied and benefit to the customer was transferred on a ratable basis over time.

Contract Assets and Trade Receivables. As of December 31, 2020 and 2019, there were no contract assets or liabilities as all customer amounts owed to the Company are unconditional and the Company does not receive payment in advance for its products. Accordingly, amounts owed by customers are classified as account receivables on the Company's Consolidated Balance Sheets. In addition, due to the nature of the Company's contracts, there are no costs incurred or to be paid in the future that qualify for asset recognition as a cost to fulfill or obtain a contract. The Company did not incur any impairment losses on any receivables as all amounts owed were paid or current as of December 31, 2020 or 2019.

4. Leases, Right-to-Use Assets and Related Liabilities

The contracts for the Company are comprised of facility and equipment leases necessary to conduct the Company's day-to-day operations for which the Company maintains control of right-to-use assets and incurs the related liabilities. Right-of-use assets totaling $0.3 million are included in "Deposits and other assets," $0.2 million and $0.2 million of lease liabilities are included in "Accounts payable and accrued liabilities" and "Other long-term liabilities" in the Consolidated Balance Sheets, respectively.

The Company has two lease agreements that qualify as “operating” based on the terms and conditions at the commencement date for each lease. The first lease is for the Company's office and research facility in Englewood, Colorado, which expires in July 2021, and includes monthly charges for common area and maintenance charges. The second lease is for plant equipment used by Agri-Energy at the Luverne Facility that expires in January 2021. All other leases qualified for the short-term scope exemption.

The Company recognizes rent expense on its operating leases on a straight-line basis.

There is one contractual agreement related to equipment improvements at the Luverne Facility that was not recognized as of December 31, 2020 as a result of operating contingencies which must be satisfied before the Company is obligated under the terms of the contract. The total estimated fair value of unrecognized right-to-use assets and related lease liabilities relating to these contracts was approximately $2.0 million as of December 31, 2020.

The Company began leasing its grain bins in Luverne, Minnesota in October 2020 through a short-term operating lease agreement which expires in July 2021. Rental income for 2020 totaled $0.1 million.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

The following table presents the (a) costs by lease category and (b) other quantitative information relating to the Company's leases for the years ended December 31, 2020 and 2019 (in thousands):

	Years Ended December 31,	
	2020	**2019**
Lease cost		
Financing lease cost	$ 5	$ —
Operating lease cost	605	1,554
Short-term lease cost	307	66
Variable lease cost (1)	144	119
Total lease cost	$ 1,061	$ 1,739

(1) Represents amounts incurred in excess of minimum payments for common area maintenance and present value discounts.

	Years Ended December 31,	
	2020	**2019**
Other Information		
Cash paid for the measurement of lease liabilities		
Operating cash flows from finance lease	$ 6	—
Operating cash flows from operating leases	605	1,554
Finance cash flows from finance lease	2	—
Right-to-use assets obtained in exchange for new operating lease liabilities	192	280
Weighted-average remaining lease term, financing lease (months)	224	—
Weighted-average remaining lease term, operating leases (months)	7	21
Weighted-average discount rate - financing lease (2)	13%	—
Weighted-average discount rate - operating leases (3)	12%	12%

(2) The discount rate used for the finance lease was based on the rate implicit in the lease.
(3) The discount rate used for operating leases is based on our implicit borrowing rate at the date the Company entered into the lease.

The table below shows the future minimum payments under non-cancelable operating leases at December 31, 2020 (in thousands):

Year Ending December 31, 2020	**Financing Leases**	**Operating Leases**
2021	$ 36	$ 180
2022	26	—
2023	26	—
2024	26	—
2025	22	—
2026 and thereafter	301	—
Total	437	180
Less: Amounts representing present value discounts	(258)	(5)
Total lease liabilities	$ 179	$ 175

5. Inventories

The following table sets forth the components of the Company's inventory balances (in thousands):

	December 31,	
	2020	2019
Raw materials		
Corn	$ —	$ 267
Enzymes and other inputs	133	184
Nutrients	1	—
Finished goods		
SAF, Isooctane and Isooctene	756	571
Isobutanol	—	135
Ethanol	—	93
Distillers grains	—	54
Work in process		
Agri-Energy	—	254
Gevo	5	122
Spare parts	1,361	1,521
Total inventories	$ 2,256	$ 3,201

Work in process inventory includes unfinished SAF, isooctane and isooctene inventory.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

6. Property, Plant and Equipment

The following table sets forth the Company's property, plant and equipment by classification (in thousands):

	Useful Life (in years)	December 31, 2020	December 31, 2019
Luverne retrofit asset	20	$ 70,820	$ 70,820
Plant machinery and equipment	10	17,374	17,413
Site improvements	10	7,157	7,054
Lab equipment, furniture and fixtures and vehicles	5	6,396	6,393
Demonstration plant	2	3,597	3,597
Buildings	10	2,543	2,543
Leasehold improvements, pilot plant, land and support equipment	2 to 5	2,523	2,523
Computer, office equipment and software	3 to 6	1,983	2,034
Construction in progress	—	13,132	7,710
Total Property, plant and equipment		125,525	120,087
Less accumulated depreciation and amortization		(59,117)	(53,391)
Property, plant and equipment, net		$ 66,408	$ 66,696

The Company recorded depreciation and amortization expense related to property, plant and equipment as follows (in thousands):

	Year Ended December 31, 2020	Year Ended December 31, 2019
Cost of goods sold	$ 5,669	$ 6,282
Operating expenses	212	210
Total depreciation and amortization	$ 5,881	$ 6,492

7. Embedded Derivatives

2020 Notes Embedded Derivative

In June 2017, the Company issued its 12% convertible senior secured notes due 2020 (the "2020 Notes") in exchange for its 12% convertible senior secured notes due 2017 (the "2017 Notes"). The 2020 Notes contained the following embedded derivatives: (i) a Make-Whole Payment (as defined in the indenture governing the 2020 Notes (the "2020 Notes Indenture")) upon either conversion or redemption; (ii) right to redeem the outstanding principal upon a Fundamental Change (as defined in the 2020 Notes Indenture); (iii) issuer rights to convert into a limited number of shares in any given three-month period commencing nine months from the issuance date and dependent on the stock price exceeding 150% of the then in-effect conversion price over a ten-business day period; and (iv) holder rights to convert into either shares of the Company's common stock or pre-funded warrants upon the election of the holders of the 2020 Notes.

Embedded derivatives are separated from the host contract and the 2020 Notes and carried at fair value when: (a) the embedded derivative possesses economic characteristics that are not clearly and closely related to the economic characteristics of the host contract; and (b) a separate, stand-alone instrument with the same terms would qualify as a derivative instrument. The Company has concluded that certain embedded derivatives within the 2020 Notes meet these criteria and, as such, must be valued separate and apart from the 2020 Notes as one embedded derivative and recorded at fair value each reporting period.

The Company used a binomial lattice model in order to estimate the fair value of the embedded derivative in the 2020 Notes. A binomial lattice model generates two probable outcomes, whether up or down, arising at each point in time, starting from the date of valuation until the maturity date. A lattice was initially used to determine if the 2020 Notes would be converted by the holder, called by the issuer, or held at each decision point. Within the lattice model, the following assumptions are made: (i) the 2020 Notes will be converted by the holder if the conversion value plus the holder's Make-Whole Payment is greater than the holding value; or (ii) the 2020 Notes will be called by the issuer if (a) the stock price exceeds 150% of the then in-effect conversion price over a ten-business day period and (b) if the holding value is greater than the conversion value plus the Make-Whole Payment at the time.

Using this lattice model, the Company valued the embedded derivative using a "with-and-without method", where the value of the 2020 Notes including the embedded derivative is defined as the "with", and the value of the 2020 Notes excluding the embedded derivative is defined as the "without". This method estimates the value of the embedded derivative by comparing the difference in the values between the 2020 Notes with the embedded derivative and the value of the 2020 Notes without the embedded derivative. The lattice model requires the following inputs: (i) price of Gevo common stock; (ii) Conversion Rate (as defined in the 2020 Notes Indenture); (iii) Conversion Price (as defined in the 2020 Notes Indenture); (iv) maturity date; (v) risk-free interest rate; (vi) estimated stock volatility; and (vii) estimated credit spread for the Company.

2020/21 Notes Embedded Derivative

In January 2020, the Company issued 12% convertible senior secured notes due 2020/2021 (the "2020/21 Notes") in exchange for its 12% convertible senior secured notes due March 2020 (the "2020 Notes"). The 2020/21 Notes contain the following embedded derivatives: (i) a Make-Whole Payment (as defined in the 2020/21 Notes Indenture (as defined below) upon either conversion or redemption in certain circumstances; (ii) holder right to require the Company to repurchase the outstanding principal upon a Fundamental Change (as defined in the 2020/21 Notes Indenture); and (iii) holder rights to convert into either shares of the Company's common stock or pre-funded warrants upon the election of the holders of the 2020/21 Notes.

The Company used a binomial lattice model in order to estimate the fair value of the embedded derivative in the 2020/21 Notes. Using this lattice model, the Company valued the embedded derivative using a "with-and-without method".

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

There is no embedded derivative liability for the 2020/21 Notes at December 31, 2020.

The following table sets forth the inputs to the lattice model that were used to value the embedded derivatives:

	January 10, 2020	December 31, 2019
Stock price	$ 2.27	$ 2.31
Conversion Rate	$ 409.50	$ 67.95
Conversion Price	$ 2.44	$ 14.72
Maturity date	December 31, 2020	March 15, 2020
Risk-free interest rate	1.52%	1.52%
Estimated stock volatility	40%	60%
Estimated credit spread	36%	27%

Changes in certain inputs into the lattice model can have a significant impact on changes in the estimated fair value of the embedded featured within the 2020 Notes and 2020/21 Notes. For example, the estimated fair value will generally decrease with: (1) a decline in the stock price; (2) decreases in the estimated stock volatility; and (3) a decrease in the estimated credit spread.

As of December 31, 2020 there were no embedded derivatives and as of December 31, 2019, the estimated fair value of the embedded derivatives was nil. The Company recorded a $8.6 million loss and $0.4 million gain to reflect the change in fair value of the embedded derivative in the Consolidated Statements of Operations for the years ended December 31, 2020 and 2019, respectively. The loss recorded is the result of the change in fair value between the beginning of the period and the end of the period, or the date on which the derivative liability was extinguished through conversion.

Derivative Warrant Liability

The following warrants were sold by the Company during the year ended December 31, 2020:

- In July 2020, the Company sold Series 2020-A Warrants to purchase 30,000,000 shares of the Company's common stock and Series 2020-B Warrants to purchase 9,103,334 shares of the Company's common stock, pursuant to an underwritten public offering.
- In August 2020, the Company sold Series 2020-C Warrants to purchase 16,532,232 shares of the Company's common stock, pursuant to a registered direct offering.

The following table sets forth information pertaining to shares issued upon the exercise of such warrants as of December 31, 2020:

	Issuance Date	Expiration Date	Exercise Price as of December 31, 2020	Shares Underlying Warrants on Issuance Date	Shares Issued Upon Warrant Exercises as of December 31, 2020	Shares Underlying Warrants as of December 31, 2020
Series F Warrants	04/01/2016	04/01/2021	$ 40.00	25,733	11,692	14,041
Series I Warrants	09/13/2016	09/13/2021	$ 220.00	35,368	—	35,368
Series K Warrants	02/17/2017	02/17/2022	$ 2.00	315,986	308,660	7,326
Series 2020-A Warrants (1)	07/06/2020	07/06/2025	$ 0.60	30,000,000	28,042,834	1,957,166
Series 2020-B Warrants (1)	07/06/2020	07/06/2025	$ 0.01	9,103,334	9,103,334	—
Series 2020-C Warrants (1)	08/25/2020	08/25/2025	$ 0.01	16,532,232	16,532,232	—
				56,012,653	53,998,752	2,013,901

(1) The Series 2020-A Warrants, the Series 2020-B Warrants and the Series 2020-C Warrants are equity-classified warrants.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

The agreements governing the above warrants include the following terms:

- certain warrants have exercise prices which are subject to adjustment for certain events, including the issuance of stock dividends on the Company's common stock and, in certain instances, the issuance of the Company's common stock or instruments convertible into the Company's common stock at a price per share less than the exercise price of the respective warrants;
- warrant holders may exercise the warrants through a cashless exercise if, and only if, the Company does not have an effective registration statement then available for the issuance of the shares of its common stock. If an effective registration statement is available for the issuance of its common stock a holder may only exercise the warrants through a cash exercise;
- the exercise price and the number and type of securities purchasable upon exercise of the warrants are subject to adjustment upon certain corporate events, including certain combinations, consolidations, liquidations, mergers, recapitalizations, reclassifications, reorganizations, stock dividends and stock splits, a sale of all or substantially all of the Company's assets and certain other events; and
- in the event of an "extraordinary transaction" or a "fundamental transaction" (as such terms are defined in the respective warrant agreements), generally including any merger with or into another entity, sale of all or substantially all of the Company's assets, tender offer or exchange offer, or reclassification of its common stock, in which the successor entity (as defined in the respective warrant agreements) that assumes the successor entity is not a publicly traded company, the Company or any successor entity will pay the warrant holder, at such holder's option, exercisable at any time concurrently with or within 30 days after the consummation of the extraordinary transaction or fundamental transaction, an amount of cash equal to the value of such holder's warrants as determined in accordance with the Black-Scholes option pricing model and the terms of the respective warrant agreement. In some circumstances, the Company or successor entity may be obligated to make such payments regardless of whether the successor entity that assumes the warrants is a publicly traded company.

Derivative Instruments. The Company evaluates its contracts which Gevo, Inc. uses to raise capital for potential derivatives.

Warrants. The Company has warrants outstanding as of December 31, 2020 representing 2,013,901 shares of Gevo's common stock, which expire at various dates through July 6, 2025. The exercise prices of the warrants range from $0.60 to $220.00 as of December 31, 2020. Based on the terms of the warrant agreements, the Company has determined that all warrants issued between 2013 and 2019 qualify as derivatives and, as such, are included in "*Accounts Payable and Accrued Liabilities"* on the Consolidated Balance Sheets and recorded at fair value each reporting period. The decrease (increase) in the estimated fair value of the warrants outstanding as of December 31, 2020 and 2019 represents an unrealized gain (loss) which has been recorded as a gain (loss) from the change in fair value of derivative warrant liability in the Consolidated Statements of Operations.

The Series 2020-A Warrants, Series 2020-B Warrants and Series 2020-C Warrants issued during 2020 are classified as component of permanent equity because they are freestanding financial instruments that are legally detachable and separately exercisable from the shares of common stock with which they were issued, are immediately exercisable, do not embody an obligation for the Company to repurchase its shares, and permit the holders to receive a fixed number of shares of common stock upon exercise. In addition, the Warrants do not provide any guarantee of value or return. The Company valued the Series 2020-A Warrants, the Series 2020-B Warrants and the Series 2020-C Warrants at issuance using the Black-Scholes option pricing model and determined the fair value of the Series 2020-A Warrants, the Series 2020-B Warrants and the Series 2020-C Warrants to purchase the Company's common stock at $8.3 million, $2.9 million and $21.4 million, respectively. The key inputs to the valuation model included a weighted average volatility of 130% to 141%, risk-free rate of 0.30% to 0.31% and an expected term of five years.

During the year ended December 31, 2020, common stock was issued as a result of exercise of warrants as described below (dollars in thousands):

	Common Stock Issued	Proceeds
Series 2020-A Warrants	28,042,834	$ 16,826
Series 2020-B Warrants	9,103,334	91
Series 2020-C Warrants	16,532,232	165
	53,678,400	$ 17,082

During the period January 1, 2021 to February 26, 2021, the Company received notices of exercise from holders of the Series 2020-A Warrants to issue an aggregate of 1,863,058 shares of common stock or total gross proceeds of approximately $1.1 million. Following these exercises, Series 2020-A Warrants to purchase 94,108 shares of the Company's common stock remain outstanding at an exercise price of $0.60 as of February 26, 2021.

8. Accounts Payable and Accrued Liabilities

The following table sets forth the components of the Company's accounts payable and accrued liabilities in the Consolidated Balance Sheets (in thousands):

	December 31,	
	2020	2019
Accrued employee compensation	$ 1,960	$ 1,946
Accounts payable - trade	897	1,474
Accrued utilities and supplies	5	645
Other accrued liabilities	1,261	1,613
Total accounts payable and accrued liabilities	$ 4,123	$ 5,678

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

9. Debt

2020 Notes

The following table sets forth information pertaining to the 2020/21 Notes which is included in the Company's Consolidated Balance Sheets (in thousands):

	Principal Amount of 2020 Notes	Principal Amount of 2020/21 Notes	Debt Discount	Debt Issue Costs	Total Notes	2020 Notes Embedded Derivative	Total 2020 Notes and 2020/21 Notes Embedded Derivative
Balance, December 31, 2018	$ 13,775	$ —	$ (979)	$ (242)	$ 12,554	$ 394	$ 12,948
Amortization of debt discount	—	—	856	—	856	—	856
Amortization of debt issue costs	—	—	—	212	212	—	212
Paid-in-kind interest	278	—	—	—	278	—	278
Change in fair value of 2020 Notes embedded derivative liability	—	—	—	—	—	(394)	(394)
Balance, December 31, 2019	14,053	—	(123)	(30)	13,900	—	13,900
Amortization of debt discount	—	—	405	—	405	—	405
Amortization of debt issue costs	—	—	—	30	30	—	30
Paid-in-kind interest	47	269	—	—	316	—	316
Exchange of 2020 Notes for 2020/21 Notes	(14,100)	14,100	—	—	—	—	—
Conversion of 2020/21 Notes into common Stock	—	(14,651)	—	—	(14,651)	—	(14,651)
Original issue discount paid with 2020/21 Notes	—	282	(282)	—	—	—	—
Fair value of 2020/21 embedded derivative liability upon issuance	—	—	—	—	—	2,848	2,848
Increase in fair value of 2020/21 Notes embedded derivative liability prior to conversion of 2020/21 Notes	—	—	—	—	—	5,759	5,759
Decrease in fair value of 2020/21 Notes embedded derivative liability upon conversion to common stock	—	—	—	—	—	(8,607)	(8,607)
Balance, December 31,2020	$ —	$ —	$ —	$ —	$ —	$ —	$ —

On April 19, 2017, the Company entered into an Exchange and Purchase Agreement (the “2017 Purchase Agreement”) with WB Gevo, LTD (the “2017 Holder”) the holder of the Company's 12% convertible senior secured notes due 2017 (the "2017 Notes"), which were issued under that certain Indenture dated as of June 6, 2014, by and among the Company, the guarantors party thereto, and Wilmington Savings Fund Society ("FSB"), as trustee and as collateral trustee (as supplemented, the “2017 Notes Indenture”), and Whitebox Advisors LLC ("Whitebox"), in its capacity as representative of the 2017 Holder. Pursuant to the terms of the 2017 Purchase Agreement, the 2017 Holder, subject to certain conditions, including approval of the transaction by the Company's stockholders (which was received on June 15, 2017), agreed to exchange all of the outstanding principal amount of the 2017 Notes for an equal principal amount of the 2020 Notes, plus an amount in cash equal to the accrued and unpaid interest (other than interest paid in kind) on the 2017 Notes (the “2017 Exchange”). On June 20, 2017, the Company completed the 2017 Exchange, terminated the 2017 Notes Indenture and cancelled the 2017 Notes.

The 2020 Notes had a maturity date of March 15, 2020 and were secured by a first lien on substantially all of our assets. The 2020 Notes had an interest rate equal to 12% per annum (with 2% potentially payable as PIK Interest (as defined and described below) at our option), payable on March 31, June 30, September 30 and December 31 of each year. To the extent that the Company paid any portion of the interest due on the 2020 Notes as PIK Interest, the maximum aggregate principal amount of 2020 Notes that would have been convertible into shares of the Company's common stock increased.

Under certain circumstances, the Company had the option to pay a portion of the interest due on the 2020 Notes by either (a) increasing the principal amount of the 2020 Notes by the amount of interest then due or (b) issuing additional 2020 Notes with a principal amount equal to the amount of interest then due (interest paid in the manner set forth in (a) or (b) being referred to as “PIK Interest”).

Additional shares of the Company's common stock could also have become issuable pursuant to the 2020 Notes in the event the Company was required to make certain make-whole payments as provided in the 2020 Notes Indenture.

The 2020 Notes were convertible into shares of the Company's common stock, subject to certain terms and conditions. The initial conversion price of the 2020 Notes was equal to $14.72 per share of common stock, or 0.0679 shares of common stock per $1 principal amount of 2020 Notes.

2020/21 Notes

On January 10, 2020, the Company entered into an Exchange and Purchase Agreement (the “2020/21 Purchase Agreement”) with the guarantors party thereto, the 2017 Holder and Whitebox Advisors LLC ("Whitebox"), in its capacity as representative of the 2017 Holder. Pursuant to the terms of the 2020/21 Purchase Agreement, the 2017 Holder, subject to certain conditions, agreed to exchange all of the outstanding principal amount of the 2020 Notes, which was approximately $14.1 million including unpaid accrued interest, for approximately $14.4 million in aggregate principal amount of the Company's newly created 12% Convertible Senior Notes due 2020/21 (the "2020/21 Notes") (the “2020/21 Exchange”). On January 10, 2020, the Company completed the 2020/21 Exchange, terminated the 2017 Notes Indenture and cancelled the 2020 Notes. In addition, the Company entered into an Indenture by and among the Company, the guarantors named therein (the “2020/21 Notes Guarantors”) and FSB, as trustee and as collateral trustee (the “2020/21 Notes Indenture”), pursuant to which the Company issued the 2020/21 Notes.

The 2020/21 Notes matured on December 31, 2020. The 2020/21 Notes bore interest at a rate equal to 12% per annum (with 4% payable as PIK Interest (as defined and described above)), payable on March 31, June 30, September 30 and December 31 of each year. In the event the Company pays any portion of the interest due on the 2020/21 Notes as PIK Interest, the maximum aggregate principal amount of 2020/21 Notes that could be convertible into shares of the Company's common stock will be increased.

The 2020/21 Notes were convertible into shares of the Company's common stock voluntarily by the 2017 Holder at the conversion price, subject to certain terms and conditions. The initial conversion price of the 2020/21 Notes was equal to $2.442 per share of the Company's common stock (the "2020/21 Notes Conversion Price"), or 0.4095 shares of the Company's common stock per $1 principal amount of 2020/21 Notes. The Company and the 2017 Holder may also mutually agree on other conversions of the 2020/21 Notes into shares of the Company's common stock on a monthly basis (a "Contractual Conversion") pursuant to the terms of the 2020/21 Notes Indenture. The 2020/21 Notes Conversion Price in a Contractual Conversion will be reduced to the lesser of the then-applicable 2020/21 Notes Conversion Price or a 10% discount to the average of the daily volume weighted average price of the Company's common stock for the three forward trading days prior to the date of the Contractual Conversion.

Each 2017 Holder has agreed not to convert its 2020/21 Notes into shares of the Company's common stock to the extent that, after giving effect to such conversion, the number of shares of the Company's common stock beneficially owned by such 2017 Holder and its affiliates would exceed 4.99% of the Company's common stock outstanding at the time of such conversion (the "4.99% Ownership Limitation"); provided that a 2017 Holder may, at its option and upon 61 days' prior notice to the Company, increase such threshold to 9.99% (the "9.99% Ownership Limitation"). If a conversion of 2020/21 Notes by a 2017 Holder would exceed the 4.99% Ownership Limitation or the 9.99% Ownership Limitation, as applicable, the 2020/21 Purchase Agreement contains a provision granting the 2017 Holder a fully funded prepaid warrant for such common stock with a term of nine months, subject to a six-month extension, which it can draw down from time to time.

The 2020/21 Notes did not contain any anti-dilution adjustments for future equity issuances that were below the 2020/21 Notes Conversion Price, and adjustments to the 2020/21 Notes Conversion Price would only generally be made in the event that there is a dividend or distribution paid on shares of the Company's common stock, a subdivision, combination or reclassification of the Company's common stock, or at the discretion of the Board of Directors of the Company in limited circumstances and subject to certain conditions.

The 2020/21 Notes were secured by a lien on substantially all of the assets of the Company and the 2020/21 Notes Guarantors, including intellectual property and real property, and were guaranteed by the Company's existing subsidiaries.

Under certain circumstances, the Company may file one or more registration statements on Form S-3 or amend filings in order to register shares of common stock for sale or resale, as necessary in connection with the 2020/21 Notes.

Conversion of 2020/21 Notes

On July 10, 2020, certain holders of the 2020/21 Notes converted $2.0 million in the aggregate principal amount of 2020/21 Notes (including the conversion of an additional $0.3 million for make-whole payment) into 4,169,426 shares of common stock pursuant to the terms of the indenture.
In December 2020, certain holders of the 2020/21 Notes converted the remaining $12.7 million in aggregate principal amount of 2020/21 Notes (including the conversion of an additional $1.2 million for make-whole payment) into an aggregate of 5,672,654 shares of common stock pursuant to the terms of the 2020/21 Notes related Indenture. As a result, as of December 31, 2020, all obligations under the 2020/2021 Notes had been fully paid and satisfied, and the 2020/2021 Notes related indenture had been terminated in accordance with its terms at maturity on December 31, 2020. During the year ended December 31, 2020, the Company recognized an approximately $1.9 million loss on the conversion of the 2020/21 Notes into common stock within the Consolidated Statements of Operations as a result of the make-whole payments.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

Loans Payable - Other

During the first quarter of 2020, the Company purchased equipment under a financing lease. During the fourth quarter 2019, the Company purchased equipment and financed part of its insurance obligation. The equipment notes and financing lease incur interest between 4% and 21%, have total monthly payments of $0.1 million and mature at various dates from August 2020 to February 2025. The equipment loans are secured by the related equipment.

In April 2020, the Company and Agri-Energy each entered into a loan agreement with Live Oak Banking Company, pursuant to which the Company and Agri-Energy obtained loans from the Small Business Administration's Paycheck Protection Program (“SBA PPP”) totaling $1.0 million in the aggregate (the "SBA Loans"). The SBA Loans will mature in April 2022 and bear interest at a rate equal to 1% per annum, subject to the potential for partial or full loan forgiveness as dictated by U.S. federal law. Principal and interest are deferred until August 2021 and interest continues to accrue during the deferral period. The SBA Loans are payable monthly beginning August 5, 2021, with aggregate payments totaling $0.1 million per month, including interest and principal. The SBA Loans must be used for payroll, rent payments, mortgage interest payments and utilities payments as governed by the SBA PPP and are subject to partial or full forgiveness for the initial 24-week period following the loan disbursement if all proceeds are used for eligible purposes and within certain thresholds, the Company maintains certain employment levels and the Company maintains certain compensation levels.

The balance of these loans as of December 31, 2020 and 2019 are as follows (in thousands):

	Years Ended December 31,	
	2020	**2019**
SBA loans	$ 1,006	$ —
Equipment	260	321
Insurance	—	428
	1,266	749
Less current portion	(809)	(516)
Long-term portion	$ 457	$ 233

Future payments for Loans Payable - Other are as follows (in thousands):

Year ending December 31,	**Amount**
2021	$ 809
2022	356
2023	65
2024	35
2025	1
	$ 1,266

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

10. Equity Incentive Plans

2010 Stock Incentive Plan. In February 2011, the Company's stockholders approved the Gevo, Inc. 2010 Stock Incentive Plan (as amended and restated, the "2010 Plan"). The 2010 Plan provides for the grant of non-qualified stock options, incentive stock options, stock appreciation rights, restricted stock awards, restricted stock units and other equity awards to employees and directors of the Company. On June 3, 2020, the 2010 Plan was amended and restated, which increased the number of shares of common stock reserved for issuance by 3,713,413 shares to a total of 6,980,074 shares. At December 31, 2020, 1,230,359 shares were available for future issuance under the 2010 Plan.

Restricted common stock activity during the year ended December 31, 2020 consisted of the following:

Period		Total Number of Restricted Shares Issued	Vesting Periods Years		
January 1, 2020 to March 31, 2020	(1) (3)	106,540	2.0	to	3.0
April 1, 2020 to June 30, 2020	(1) (2) (4)	190,419	0.0	to	0.1
July 1, 2020 to September 30, 2020	(1) (2) (4) (5)	3,960,036	0.1	to	2.0
October 1, 2020 to December 31, 2020	(1)	(12,546)		N/A	
Total		4,244,449			

(1) Includes shares withheld from employees to cover tax withholding obligations upon the vesting of restricted stock awards.
(2) Includes share awarded to employees attributed to 20% reduction in salaries and wages.
(3) Includes restricted stock awards granted to employees February 27, 2020.
(4) Includes restricted stock awards granted in exchange for services rendered.
(5) Includes restricted stock awards granted to employees during July 2020

Employee Stock Purchase Plan. In February 2011, the Company's stockholders approved the ESPP. The offering periods for the ESPP are from January 1 to June 30 and from July 1 to December 31 of each calendar year. The Company has reserved 190 shares of common stock for issuance under the ESPP, of which 190 shares as of December 31, 2020 are available for future issuance. The purchase price of the common stock under the ESPP is 85% of the lower of the fair market value of a share of common stock on the first or last day of the purchase period. There were no purchases of common stock under the ESPP during 2020.

11. Stock-Based Compensation

Stock-Based Compensation Expense. The Company records stock-based compensation expense during the requisite service period for share-based payment awards granted to employees and non-employees.

The following table sets forth the Company's stock-based compensation expense (in thousands):

	Year Ended December 31,	
	2020	2019
Restricted stock awards		
Research and development	$ 481	$ 228
Selling, general and administrative	1,620	993
Stock appreciation rights		
Research and Development	137	66
Selling, general and administrative	(113)	62
Total stock-based compensation	$ 2,125	$ 1,349

There were no stock options granted during the years ended December 31, 2020 or 2019.

Due to the Company's limited history of grant activity, the expected life of options granted was estimated using the "simplified method" in accordance with SEC Staff Accounting Bulletin 110, where the expected life equals the arithmetic average of the vesting term and the original contractual term of the options. The volatility factor was determined based upon management's estimate using inputs from comparable public companies. The risk-free interest rate assumption is determined based upon observed interest rates appropriate for the expected term of the Company's employee stock options. The dividend yield assumption is based on the Company's history of dividend payouts.

An annual forfeiture rate is estimated at the time of grant for all share-based payment awards, and revised, if necessary, in subsequent periods if the actual forfeiture rate differs from the Company's estimate. Forfeitures have been estimated by the Company based upon historical and expected forfeiture experience. Estimated forfeiture rates used for the periods presented were from 0% to 5%.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

Stock Option Award Activity. Stock option activity under the Company's option plans at December 31, 2020 and changes during the year ended December 31, 2020 were as follows.

	Number of Options	Weighted-Average Exercise Price (1)	Weighted-Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Options outstanding at December 31, 2019	1,561	$ 928.79	6.56	$ —
Granted	—	$ —		
Canceled or forfeited	(9)	$ 72,891.04		
Exercised	—	$ —		
Options outstanding at December 31, 2020	1,552	$ 556.13	5.58	$ —
Options exercisable at December 31, 2020	1,552	$ 556.13	5.58	$ —
Options vested and expected to vest at December 31, 2020	1,552	$ 556.13	5.58	$ —

(1) Exercise price of options outstanding range from $20 to $99,300 as of December 31, 2020.

The aggregate intrinsic values in the table above represent the total pretax intrinsic values (the difference between the closing price of Gevo's common stock on the last trading day of the 2019 calendar year and the exercise price, multiplied by the number of in-the-money stock option shares) that would have been received by the option holders had all in-the-money outstanding stock options been exercised on December 31, 2020.

As of December 31, 2020, there was no unrecognized compensation cost related to stock options.

There is a maximum contractual term of ten years for the share options. The Company settles stock option exercises with newly issued common shares. No tax benefits were realized by the Company in connection with these exercises as the Company maintains net operating loss carryforwards and has established a valuation allowance against the entire tax benefit.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

Restricted Stock. The Company periodically grants restricted stock awards to employees and directors. The vesting period for restricted stock awards granted may be based upon a service period or based upon the attainment of performance objectives. The Company recognizes stock-based compensation over the vesting period, generally two to three years, for awards that vest based upon a service period.

Non-vested restricted stock awards at December 31, 2020 and changes during the year ended December 31, 2020 were as follows.

	Number of Shares	Weighted-Average Grant-Date Fair Value
Non-vested at December 31, 2019	1,308,613	$ 1.91
Granted	4,454,046	$ 0.63
Vested	(1,051,417)	$ 1.47
Canceled or forfeited	(9,686)	$ 1.90
Non-vested at December 31, 2020	4,701,556	$ 0.79

The total fair value of restricted stock that vested during the years ended December 31, 2020 and 2019 was $1.5 million and $0.7 million, respectively. As of December 31, 2020, the total unrecognized compensation expense, net of estimated forfeitures, relating to restricted stock awards was $2.5 million, which is expected to be recognized over the remaining weighted-average period of approximately 1.4 years.

Stock Appreciation Rights. The Company granted 67,739 stock appreciation rights valued at an aggregate of $0.6 million on the respective dates of grant during the year ended December 31, 2018. The vesting period for stock appreciation rights granted are based upon a service period. The stock appreciation rights have the potential to be cash settled in the event there are insufficient shares available from the 2010 Plan and are therefore classified as a liability and remeasured at each reporting period based on the price of the Company's common stock.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

12. Income Taxes

There is no provision for income taxes because the Company has incurred operating losses since inception. As of December 31, 2020, the Company had federal and state net operating loss ("NOL") carryforwards of approximately $66.2 million and $21.5 million, respectively, which may be used to offset future taxable income. Management has determine based on NOL evaluation of Internal Revenue Code, as amended ("IRC") Section 382 that ownership changed as of July 9, 2020 and the entire NOL carryforwards of approximately $66.2 million is subject to a $0.1 million annual limitation for each year following said ownership change. The Company will be able to utilize the $0.1 million of the net operating loss carryforward to offset future taxable incomes. If the Company is not able to utilize any or all of the $0.1 million limitation, the balance will be available in future years to offset taxable income that is not subject to the IRC Section 382 limitations set on July 9, 2020. The Company also had federal research and development tax credit carryforwards and other federal tax credit carryforwards which aggregate to $3.5 million at December 31, 2020. These carryforwards expire at various times through 2040 and may be limited in their annual usage by IRC Section 383 relating to ownership changes.

The following table sets forth the tax effects of temporary differences that give rise to significant portions of the Company's net deferred tax assets (in thousands):

	December 31,	
	2020	2019
Deferred tax assets, net:		
Net operating loss carryforwards	$ 15,406	$ 109,813
Research and other credits	—	3,482
Operating lease assets	(82)	(170)
Operating lease liabilities	88	199
Restricted stock	992	452
Business interest expense	1,441	980
Depreciation	3,427	—
Other temporary differences	321	3,419
Deferred tax assets	21,593	118,175
Valuation allowance	(21,593)	(118,175)
Net deferred tax assets	$ —	$ —

The Company recognizes uncertain tax positions net, against any operating losses or applicable research credits as they arise. Currently, there are no uncertain tax positions recognized at December 31, 2020 and 2019, respectively. The Company has provided a full valuation allowance on its deferred tax assets at December 31, 2020 and 2019, respectively, as management believes it is more likely than not that the related deferred tax asset will not be realized. The reported amount of income tax expense differs from the amount that would result from applying domestic federal statutory tax rates to pretax losses, primarily because of changes in the valuation allowance.

The following table sets forth reconciling items from income tax computed at the statutory federal rate:

	Year Ended December 31,	
	2020	2019
Federal income tax at statutory rate	21.0%	21.0%
State income taxes, net of federal benefits	4.1%	7.0%
Impact of change in statutory tax rates	(0.8%)	(0.2%)
Impact of NOL write-offs	(250.4%)	—
Impact of R&D credit write-off	(8.7%)	—
Permanent deductions	(5.3%)	(0.1%)
Valuation allowance	240.1%	(27.7%)
Effective tax rate	—%	—%

Accounting literature regarding liabilities for unrecognized tax benefits provides guidance for the recognition and measurement in financial statements of uncertain tax positions taken or expected to be taken in a tax return. The Company's evaluation was performed for the tax periods from inception to December 31, 2020. The Company is subject to examination by major tax jurisdictions for the years ended December 31, 2015 to 2020.

The Company may from time to time be assessed interest or penalties by major tax jurisdictions, although there have been no such assessments historically with any material impact to its financial results. The Company would recognize interest and penalties related to unrecognized tax benefits within the income tax expense line in the accompanying Consolidated Statements of Operations. Accrued interest and penalties would be included within the related tax liability line in the Consolidated Balance Sheets.

13. Employee Benefit Plan

The Company's employees participate in the Gevo, Inc. 401(k) Plan (the "401(k) Plan"). Subject to certain eligibility requirements, the 401(k) Plan covers substantially all employees after three months of service with quarterly entry dates. Employee contributions are deposited by the Company into the 401(k) Plan and may not exceed the maximum statutory contribution amount. The Company may make matching and/or discretionary contributions to the 401(k) Plan. The Company did not provide an employer match during the years ended December 31, 2020 or 2019.

14. Commitments and Contingencies

Legal Matters. From time to time, the Company has been and may again become involved in legal proceedings arising in the ordinary course of its business. The Company is not aware of any pending or threatened litigation against the Company that it believes could have a material adverse effect on its business, operating results, financial condition or cash flows.

Indemnifications. In the ordinary course of its business, the Company makes certain indemnities under which it may be required to make payments in relation to certain transactions. As of December 31, 2020 and 2019, the Company did not have any liabilities associated with indemnities.

In addition, the Company, as permitted under Delaware law and in accordance with its amended and restated certificate of incorporation and amended and restated bylaws, in each case, as amended to date, indemnifies its officers and directors for certain events or occurrences, subject to certain limits, while the officer or director is or was serving at the Company's request in such capacity. The duration of these indemnifications, commitments, and guarantees varies and, in certain cases, is indefinite. The maximum amount of potential future indemnification is unlimited; however, the Company has a director and officer insurance policy that may enable it to recover a portion of any future amounts paid. The Company accrues for losses for any known contingent liability, including those that may arise from indemnification provisions, when future payment is probable. No such losses have been recorded to date.

Environmental Liabilities. The Company's operations are subject to environmental laws and regulations adopted by various governmental authorities in the jurisdictions in which it operates. These laws require the Company to investigate and remediate the effects of the release or disposal of materials at its locations. Accordingly, the Company has adopted policies, practices and procedures in the areas of pollution control, occupational health and the production, handling, storage and use of hazardous materials to prevent material environmental or other damage, and to limit the financial liability which could result from such events. Environmental liabilities are recorded when the Company's liability is probable and the costs can be reasonably estimated. No environmental liabilities have been recorded as of December 31, 2020.

15. Fair Value Measurements and Fair Value of Financial Instruments

Accounting standards define fair value, outline a framework for measuring fair value, and detail the required disclosures about fair value measurements. Under these standards, fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date in the principal or most advantageous market. Standards establish a hierarchy in determining the fair market value of an asset or liability. The fair value hierarchy has three levels of inputs, both observable and unobservable. Standards require the utilization of the highest possible level of input to determine fair value.

Level 1 – inputs include quoted market prices in an active market for identical assets or liabilities.

Level 2 – inputs are market data, other than Level 1, that are observable either directly or indirectly. Level 2 inputs include quoted market prices for similar assets or liabilities, quoted market prices in an inactive market, and other observable information that can be corroborated by market data.

Level 3 – inputs are unobservable and corroborated by little or no market data.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

These tables present the carrying value and fair value, by fair value hierarchy, of the Company's financial instruments at December 31, 2020 and 2019, respectively (in thousands). The Company believes that the fair value of its Loans Payable - Other approximated book value, which totaled $1.3 million at December 31, 2020.

		Fair Value Measurements at December 31, 2020		
	Fair Value at December 31, 2020	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Recurring				
Derivative Warrant Liability	$ 31	$ —	$ —	$ 31
Nonrecurring				
Finished goods inventory	$ 631	$ —	$ 631	$ —

		Fair Value Measurements at December 31, 2019		
	Fair Value at December 31, 2019	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Recurring				
Derivative Warrant Liability	$ 8	$ —	$ —	$ 8
Nonrecurring				
Corn and finished goods inventory	$ 940	$ 267	$ 673	$ —

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3) (in thousands)	
	Derivative Warrant Liability	2020 Embedded Derivative Liability
Balance, December 31, 2019	$ 8	$ —
Issue of 2020/21 Notes embedded derivative liability	—	2,848
Change in value from increase in fair value prior to conversion of 2020/21 Notes		5,759
Total (gains) or losses for the period included in earnings	23	(8,607)
Balance, December 31, 2020	$ 31	$ —

There were no transfers between Level 1 and Level 2 inputs. There were no transfers in or out of Level 3 inputs. There were no issuances, purchases, sales or settlements of Level 3 inputs during the year ended December 31, 2020.

The Company believes that the fair value of its accounts receivable and accounts payable approximate its book value due to their short-term nature.

Fair Value Methodology

Inventories. The Company records its corn inventory at fair value only when the Company's cost of corn purchased exceeds the market value for corn. The Company determines the market value of corn and dry distiller's grain based upon Level 1 inputs using quoted market prices. The Company records its ethanol, isobutanol and hydrocarbon inventory at market using Level 2 inputs.

2020/21 *Notes Embedded Derivative*. The Company repaid its 2020/21 notes in full as of December 31, 2020. The estimated fair value of the embedded derivative was $0 at December 31, 2020. Changes in the fair value of the embedded derivative is recognized each reporting period as a "*Change in fair value of 2020/21 Notes embedded derivative*" in the consolidated Statements of Operations and Statements of Cash Flows. See Note 7, *Embedded Derivatives*, for the fair value inputs used to estimate the fair value of the embedded derivative.

Derivative Warrant Liability. The Company valued the Series F Warrants and Series K Warrants using a Monte-Carlo model (Level 3) and other warrants using Black-Scholes models comprised of some inputs requiring the use of Monte-Carlo models (Level 3). The Company has estimated the fair value of the derivative warrant liability to be nominal as of December 31, 2020 and 2019.

While the Company believes that its valuation methods are appropriate and consistent with other market participants, it recognizes that the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different estimate of fair value at the reporting date.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

16. Segments

The Company has determined that it has two operating segments: (i) Gevo, Inc. segment; and (ii) Gevo Development/Agri-Energy segment. The Company organizes its business segments based on the nature of the products and services offered through each of its consolidated legal entities. Transactions between segments are eliminated in consolidation.

Gevo Segment. The Gevo segment is responsible for all research and development activities related to the future production of isobutanol, including the development of the Company's proprietary biocatalysts, the production and sale of renewable jet and other fuels, the Retrofit process and the next generation of chemicals and renewable fuels that will be based on the Company's isobutanol technology. The Gevo segment also develops, maintains and protects its intellectual property portfolio, develops future markets for its isobutanol and provides corporate oversight services.

Gevo Development/Agri-Energy. The Gevo Development/Agri-Energy segment is currently responsible for the operation of the Luverne Facility and the production of ethanol, isobutanol and related products.

GEVO, INC.
Notes to Consolidated Financial Statements (Continued)

The Company's chief operating decision maker is provided with and reviews the financial results of each of the Company's consolidated legal entities, Gevo, Inc., Gevo Development, LLC and Agri-Energy, LLC. The Company organizes its business segments based on the nature of the products and services offered through each of its consolidated legal entities. All revenue is earned and all assets are held in the U.S.

	Year Ended December 31,	
	2020	2019
	(In thousands)	
Revenues from external customers		
Gevo	$ 1,650	$ 2,338
Gevo Development / Agri-Energy	3,886	22,149
Consolidated	$ 5,536	$ 24,487
Loss from operations		
Gevo	$ (14,914)	$ (12,360)
Gevo Development / Agri-Energy	(11,421)	(13,991)
Consolidated	$ (26,335)	$ (26,351)
Interest expense		
Gevo	$ 2,075	$ 2,732
Gevo Development / Agri-Energy	19	—
Consolidated	$ 2,094	$ 2,732
Depreciation and amortization expense		
Gevo	$ 214	$ 210
Gevo Development / Agri-Energy	5,691	6,446
Consolidated	$ 5,905	$ 6,656
Acquisitions of plant, property and equipment		
Gevo	$ 4,501	$ 130
Gevo Development / Agri-Energy	1,716	6,367
Consolidated	$ 6,217	$ 6,497
Revenue by geographic area		
United States	$ 4,082	$ 22,149
Other	1,454	2,338
Consolidated	$ 5,536	$ 24,487

	December 31,	
	2020	2019
Total assets		
Gevo	$ 152,177	$ 91,861
Gevo Development / Agri-Energy	131,893	143,349
Intercompany eliminations (1)	(131,971)	(141,851)
Consolidated (2)	$ 152,099	$ 93,359

(1) Includes intercompany sales of $0.1 million and $0.4 million during the years ended December 31, 2020 and 2019, respectively, for hydrocarbon sales.
(2) All other significant non-cash items relate to the activities of Gevo.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures, as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, that are designed to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC rules and regulations, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Principal Financial Officer, as appropriate, to allow timely decisions regarding required financial disclosures. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Based on their evaluation as of December 31, 2020, our Chief Executive Officer and our Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2020.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Our internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets; (ii) provide reasonable assurance that transactions are recorded to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the Company are made only in accordance with authorizations of our management and directors; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Under the supervision and with the participation of our management, including our Chief Executive Officer and our Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework set forth in *Internal Control—Integrated Framework* (2013 framework) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based upon the results of the evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2020.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the quarter ended December 31, 2020 that have materially affected, or reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item is incorporated by reference to our definitive proxy statement for the 2021 annual meeting of stockholders to be filed with the SEC within 120 days after our fiscal year ended December 31, 2020.

We have a written code of business conduct and ethics in place that applies to all of our directors, officers and employees, including our principal executive officer and principal financial officer. A copy of our code of ethics is available on our website: https://investors.gevo.com/corporate/corporate-governance/. We are required to disclose certain changes to, or waivers from, that code for our senior financial officers. We intend to use our website as a method of disseminating any change to, or waiver from, our code of ethics as permitted by applicable SEC rules.

PART III

Item 11. Executive Compensation

The information required by this item is incorporated by reference to our definitive proxy statement for the 2021 annual meeting of stockholders to be filed with the SEC within 120 days after our fiscal year ended December 31, 2020.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this item is incorporated by reference to our definitive proxy statement for the 2021 annual meeting of stockholders to be filed with the SEC within 120 days after our fiscal year ended December 31, 2020.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this item is incorporated by reference to our definitive proxy statement for the 2021 annual meeting of stockholders to be filed with the SEC within 120 days after our fiscal year ended December 31, 2020.

Item 14. Principal Accountant Fees and Services

The information required by this item is incorporated by reference to our definitive proxy statement for the 2021 annual meeting of stockholders to be filed with the SEC within 120 days after our fiscal year ended December 31, 2020.

PART IV

Item 15. Exhibits, Financial Statement Schedules

(a)(1) Financial Statements

The following Consolidated Financial Statements are included:

(a)(2) Financial Statement Schedules

All financial statement schedules have been omitted because they are not applicable or are not required, or because the information required to be set forth therein is included in the Consolidated Financial Statements or notes thereto.

(a)(3) Exhibits

Exhibit No.	Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Filing Date	Exhibit	
3.1	Amended and Restated Certificate of Incorporation of Gevo, Inc.	10-K	001-35073	March 29, 2011	3.1	
3.2	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Gevo, Inc.	8-K	001-35073	June 10, 2013	3.1	
3.3	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Gevo, Inc.	8-K	001-35073	July 9, 2014	3.1	
3.4	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Gevo, Inc.	8-K	001-35073	April 22, 2015	3.1	
3.5	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Gevo, Inc.	8-K	001-35073	January 6, 2017	3.1	
3.6	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Gevo, Inc.	8-K	001-35073	June 4, 2018	3.1	
3.7	Amended and Restated Bylaws of Gevo, Inc.	10-K	001-35073	March 29, 2011	3.2	
4.1	Form of the Gevo, Inc. Common Stock Certificate.	S-1	333-168792	January 19, 2011	4.1	
4.2†	Stock Issuance and Stockholder's Rights Agreement, dated July 12, 2005, by and between Gevo, Inc. and the California Institute of Technology.	S-1	333-168792	August 12, 2010	4.3	

Exhibit No.	Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Filing Date	Exhibit	
4.3	Form of Series F Warrant to Purchase Common Stock.	8-K	001-35073	April 5, 2016	4.1	
4.4	Form of Series I Warrant to Purchase Common Stock.	8-K	001-35073	September 15, 2016	4.1	
4.5	Form of Series K Warrant to Purchase Common Stock.	8-K	001-35073	February 22, 2017	4.1	
4.6	Form of Series 2020-A Warrant.	8-K	001-35073	July 8, 2020	4.1	
4.7	Description of Securities.	10-K	001-35073	March 17, 2020	4.13	
10.1†	Ethanol and Isobutanol Purchase and Marketing Agreement, dated February 16, 2018, between Eco-Energy, LLC and Agri-Energy, LLC.	8-K	001-35073	February 22, 2018	10.1	
10.2†	License Agreement, dated July 12, 2005, by and between Gevo, Inc. and the California Institute of Technology.	S-1	333-168792	November 4, 2010	10.6	
10.3†	Amendment No. 4, dated October 1, 2010, to the License Agreement, by and between Gevo, Inc. and the California Institute of Technology, dated July 12, 2005.	S-1	333-168792	October 21, 2010	10.10	

Exhibit No.	Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Filing Date	Exhibit	
10.4#	Gevo, Inc. Amended and Restated 2010 Stock Incentive Plan.	8-K	001-35073	June 13, 2010	10.1	
10.5#	Form of Restricted Stock Unit Agreement under the Amended and Restated 2010 Stock Incentive Plan.	S-1	333-168792	January 19, 2011	10.15	
10.6#	Form of Restricted Shares Award Agreement under the Amended and Restated 2010 Stock Incentive Plan.	10-Q	001-35073	August 8, 2018	10.7	
10.7#	Form of Stock Option Award Agreement under the Amended and Restated 2010 Stock Incentive Plan.	10-Q	001-35073	August 8, 2018	10.6	
10.8#	Form of Stock Appreciation Rights Award Agreement under the Amended and Restated 2010 Stock Incentive Plan.	10-Q	001-35073	August 8, 2018	10.8	
10.9#	Gevo, Inc. Employee Stock Purchase Plan.	S-8	333-172771	March 11, 2011	4.7	
10.10#	Gevo, Inc. Executive Health Management Plan.	10-Q	001-35073	November 2, 2011	10.1	
10.11#	Form of Indemnification Agreement between Gevo, Inc. and its directors and officers.	S-1	333-168792	January 19, 2011	10.33	
10.12#	Employment Agreement, dated June 4, 2010, by and between Gevo, Inc. and Patrick Gruber.	S-1	333-168792	November 4, 2010	10.14	
10.13#	Amendment Agreement, dated December 21, 2011, by and between and Patrick Gruber.	8-K	001-35073	December 27, 2011	10.1	
10.14#	Second Amendment Agreement, dated February 16, 2015, by and between Gevo, Inc. and Patrick Gruber.	8-K	001-35073	February 17, 2015	10.1	
10.15#	Employment Agreement, dated June 4, 2010, by and between Gevo, Inc. and Christopher Ryan.	S-1	333-168792	November 4, 2010	10.16	

Exhibit No.	Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Filing Date	Exhibit	
10.16#	Offer of Employment Letter, dated December 21,2015, by and between Gevo, Inc. and Geoffrey T. Williams, Jr.	10-Q	001-35073	May 9, 2017	10.1	
10.17#	Change of Control Agreement for Geoffrey T. Williams, Jr., dated February 18, 2016.	10-Q	001-35073	May 9, 2017	10.2	
10.18#	Offer Letter, dated July 20, 2019, by and between Gevo, Inc. and Carolyn Romero.	10-Q	001-35073	November 13, 2019	10.1	
10.19#	Offer Letter, dated November 9, 2019, by and between Gevo, Inc. and L. Lynn Smull.	8-K	001-35073	November 15, 2019	10.1	
10.20#‡	Offer Letter dated February 22,2018 by and between Gevo, Inc. and Timothy J. Cesarek	10-Q	001-35073	May 13, 2020	10.1	
10.21†	Price Risk Management, Origination and Merchandising and between Agri-Energy, LLC and FCStone Merchant Services, LLC	10-Q	001-35073	August 7, 2015	10.3	
10.22‡	Unsecured Guaranty Agreement, dated June 1, 2015, by Gevo, Inc. in favor of FCStone Merchant Services, LLC.	10-Q	001-35073	August 7, 2015	10.5	
10.23†	Fuel Sales Agreement, dated October 28, 2019, by and between Gevo, Inc. and Scandinavian Airlines System.	8-K	001-35073	February 22, 2021	10.1	
10.24†	Amendment No. 1 to Fuel Sales Agreement, dated February 16, 2021, by and between Gevo, Inc. and Scandinavian Airlines System.	8-K	001-35073	February 22, 2021	10.2	
10.25†	First Amendment to Price Risk Management, Origination and Merchandising Agreement, dated December 21, 2017, Agri-Energy, LLC and FCStone Merchant Services, LLC.	10-K	001-35073	March 28, 2018	10.28	
10.26†	Settlement Agreement and Mutual Release, dated August 22, 2015, by and among Gevo, Inc., Butamax Advanced Biofuels, LLC, E.I. du Pont de Nemours & Company and BP Biofuels North America LLC.	10-Q	001-35073	November 5, 2015	10.2	
10.27†	Patent Cross-License Agreement, dated August 22, 2015, by and between Gevo, Inc. and Butamax Advanced Biofuels LLC.	10-Q	001-35073	November 5, 2015	10.3	
10.28	Joint Development Agreement, dated April 4, 2019, by and between Gevo, Inc. and Praj Industries Ltd.	8-K	001-35073	April 9, 2019	10.2	
10.29+	Development License Agreement, dated April 4, 2019, by and between Gevo, Inc. and Praj Industries Ltd.	8-K	001-35073	April 9, 2019	10.3	

Exhibit No.	Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Filing Date	Exhibit	
10.30†	Renewable Isooctane Purchase and Sale Agreement, dated February 21, 2019 by and between Gevo, Inc. and HCS Group GmbH.	8-K	001-35073	February 27, 2019	10.1	
10.31†	At-The-Market Offering Agreement, dated February 13, 2018, between Gevo, Inc. and H.C. Wainwright & Co., LLC.	8-K	001-35073	February 13, 2018	1.1	
10.32	Amendment to At-The-Market Offering Agreement and Engagement Agreement, dated June 20, 2018, between Gevo, Inc. and H.C. Wainwright & Co., LLC.	8-K	001-35073	June 20, 2018	1.2	
10.33†	Amendment to At-The-Market Offering Agreement, dated June 25, 2018, between Gevo, Inc. and H.C. Wainwright & Co., LLC.	8-K	001-35073	June 25, 2018	1.3	
10.34	Amendment to At-The-Market Offering Agreement and Engagement Agreement, dated June 28, 2018, between Gevo, Inc. and H.C. Wainwright & Co., LLC.	8-K	001-35073	June 28, 2018	1.4	
10.35	Amendment to At-The-Market Offering Agreement and Engagement Agreement, dated August 15, 2019, between Gevo, Inc. and H.C. Wainwright & Co., LLC.	8-K	001-35073	August 15, 2019	1.5	
10.36	Amendment to At-The-Market Offering Agreement and Engagement Agreement, dated December 30, 2020, between Gevo, Inc. and H.C. Wainwright & Co., LLC.	8-K	001-35073	December 30, 2020	10.1	
10.37+	Renewable ATJ Purchase and Sale Agreement, effective July 26, 2019, by and between Gevo, Inc. and Air Total International, S.A.	8-K	001-35073	August 13, 2019	10.1	
10.38+	Fuel Sales Agreement, dated as of December 11, 2019, by and between Gevo, Inc. and Delta Air Lines, Inc.	8-K	001-35073	December 17, 2019	10.1	
10.39+	Amendment No. 1 to Fuel Sales Agreement, dated as of April 22, 2020, by and between the Company and Delta Air Lines, Inc.	8-K	001-35073	April 28, 2020	10.1	
10.40+	Master Framework Agreement, dated August 13, 2020, by and between Gevo, Inc. and Praj Industries Ltd.	8-K	001-35073	August 18, 2020	10.1	
10.41+	Renewable Hydrocarbons Purchase and Sale Agreement, dated August 14, 2020, by and between Gevo, Inc. and Trafigura Trading LLC.	8-K	001-35073	August 20, 2020	10.1	
21.1	List of Subsidiaries.					X
23.1	Consent of Grant Thornton LLP.					X

Exhibit No.	Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Filing Date	Exhibit	
31.1	Section 302 Certification of the Principal Executive Officer.					X
31.2	Section 302 Certification of the Principal Financial Officer.					X
32.1 *	Section 906 Certifications of the Principal Executive Officer and the Principal Financial Officer.					X **
101	Interactive Data Files Pursuant to Rule 405 of Regulation S-T: (i) Consolidated Balance Sheets at December 31, 2020 and December 31, 2019, (ii) Consolidated Statements of Operations for each of the two years in the period ended December 31, 2020, (iii) Consolidated Statements of Stockholders' Equity for each of the two years in the period ended December 31, 2020, (iv) Consolidated Statements of Cash Flows for each of the two years in the period ended December 31, 2020; and (iv) Notes to the Consolidated Financial Statements.					X

† Certain portions have been omitted pursuant to a confidential treatment request. Omitted information has been filed separately with the SEC.

+ Certain portions of the exhibit have been omitted pursuant to Rule 601(b)(10) of Regulation S-K. The omitted information is (i) not material and (ii) would likely cause competitive harm to the Company if publicly disclosed.

# Indicates a management contract or compensatory plan or arrangement.

* Furnished herewith

(b) Exhibits

See Item 15(a)(3) above.

(c) Financial Statement Schedules

See Item 15(a)(2) above.

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized.

GEVO, INC.

By: /s/ Carolyn M. Romero
Carolyn M. Romero, CPA
Chief Accounting Officer
Principal Accounting Officer

Date: March 17, 2021

Pursuant to the requirements of the Securities Exchange Act of 1934, this Report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated:

Signatures	Title	Date
/s/ PATRICK R. GRUBER **Patrick R. Gruber, Ph.D.**	Chief Executive Officer (Principal Executive Officer) and Director	March 17, 2021
/s/ L. LYNN SMULL **L. Lynn Smull**	Chief Financial Officer (Principal Financial Officer)	March 17, 2021
/s/ CAROLYN M. ROMERO **Carolyn M. Romero, CPA**	Chief Accounting Officer (Principal Accounting Officer)	March 17, 2021
/s/ RUTH I. DREESSEN **Ruth I. Dreessen**	Chairperson of the Board of Directors	March 17, 2021
/s/ GARY W. MIZE **Gary W. Mize**	Director	March 17, 2021
/s/ ANDREW J. MARSH **Andrew J. Marsh**	Director	March 17, 2021
/s/ WILLIAM H. BAUM **William H. Baum**	Director	March 17, 2021

Exhibit 21.1

Subsidiaries of Gevo, Inc.

Name of Subsidiary	Jurisdiction
Gevo Asset, LLC (fka Gevo Development, LLC)	Delaware
Gevo RNG Holdco, LLC	Delaware
Gevo NW Iowa RNG, LLC	Delaware
Agri-Energy, LLC	Minnesota

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our report dated March 17, 2021, with respect to the consolidated financial statements of Gevo, Inc. and subsidiaries included in the Annual Report on Form 10-K for the year ended December 31, 2020. We consent to the incorporation by reference of said report in the Registration Statements of Gevo, Inc. on Form S-8 (File Nos. 333-172771, 333-195264, 333-207172**,** 333-212391, 333-226689, 333-232267 and 333-239275) and on Form S-3 (File Nos. 333-252229 and 333-226686).

/s/ Grant Thornton LLP

Denver, Colorado
March 17, 2021

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER

I, Patrick R. Gruber, certify that:

1. I have reviewed this annual report on Form 10-K of Gevo, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 17, 2021

/s/ Patrick R. Gruber

Patrick R. Gruber
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER

I, Lynn Smull, certify that:

1. I have reviewed this annual report on Form 10-K of Gevo, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 17, 2021

/s/ L. Lynn Smull

L. Lynn Smull
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATIONS

I, Patrick R. Gruber, Chief Executive Officer of Gevo, Inc. (the "Company"), and I, Lynn Smull, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Annual Report on Form 10-K of the Company for the year ended December 31, 2020, (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company for the period covered by the Report.

/s/ Patrick R. Gruber

Patrick R. Gruber
Chief Executive Officer
(Principal Executive Officer)

Date: March 17, 2021

/s/ L. Lynn Smull

L. Lynn Smull
Chief Financial Officer
(Principal Financial Officer)

Date: March 17, 2021

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the U.S. Securities and Exchange Commission or its staff upon request.

This certification accompanies the Report to which it relates, is not deemed filed with the U.S. Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, whether made before or after the date of the Report and irrespective of any general incorporation language contained in such filing.